Asia-Pacific
Economic Cooperation

Energy Statistics in Asia and the Pacific (1990–2009)

October 2013

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Notes:
In this publication, "$" refers to US dollars.
ADB refers to "Taipei,China." Asia-Pacific Economic Cooperation refers to "Chinese Taipei."

The energy unit used in this publication is "ton of oil equivalent" (toe) or its multiples such as thousand tons of oil equivalent (ktoe) and million tons of oil equivalent (Mtoe). One toe is equivalent to the following:

- 1.4286 tons of coal equivalent (tce)
- 107 kilocalories (kCal)
- 3.96832 x 107 British thermal units (Btu)
- 6.8 barrels of crude oil equivalent
- 4.1868 x 104 megajoules (MJ)

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Preface

This report compiles the energy statistics of the Asian and Pacific member economies of the Asian Development Bank (ADB) from 1990 to 2009. Energy data for 47 member economies in the region are presented as energy balance tables and historical summary tables. The energy balance tables use an accounting framework that traces the flow of energy from source to final consumption expressed in a common energy accounting unit (in this case, thousand tons of oil equivalent), reflecting the equivalence, and sometimes the substitutability, of different energy types. The historical summary tables present some information from the energy balance tables, as well as macroeconomic indicators, electric power generation data, and basic energy indicators.

This report updates ADB's first attempt to consolidate available energy balances and other energy and energy-related data for Asia and the Pacific, *Energy Statistics in Asia and the Pacific, 1990–2006*. Data coverage has been expanded up to 2009, which is the most recent year for which energy data are available. The years 2007 to 2009 were significant for Asia and the Pacific in terms of energy security and sustainable development, with the region witnessing increases in investments in clean energy development, including renewable energy, energy efficiency, and access to modern forms of energy.

This report also includes improvements from the previous publication by providing data on latest electrification rates, energy reserves, and four of the latest energy balance tables of the member economies; expanding the summary tables with the addition of carbon dioxide emission indicators, and supplementary macroeconomic indicators; and adding supplementary graphs in each regional and economy profile, including an energy supply and demand flow chart that details the flows of energy from source to final consumption.

The availability of accurate energy data vary across the different regions and member economies. To address this, ADB intends to build the capacity of its members in collecting and generating data for energy statistics by developing and making available training packages.

This report is among the outputs of a regional technical assistance grant, Energy Sector Strategy and Development 2007. The grant aims to increase support for ADB energy sector operations, and provide stakeholders with comprehensive updates on recent energy issues, policy requirements, and the energy outlook in the region. It is hoped that this publication will be valuable not only to ADB operations but to members' governments and institutions, for the availability of accurate and timely energy data for use in energy planning and the design of policies, interventions, and programs.

S. Chander
Director General
Regional and Sustainable Development Department

Acknowledgments

This publication is among the outputs of Energy Sector Strategy and Development 2007, a regional technical assistance grant from the Asian Development Bank (ADB).

A team of consultants from the Asia Pacific Energy Research Centre of the Institute of Energy Economics of Japan, led by Shigeru Kimura, was engaged by ADB to compile energy data from various sources and to prepare this report. Other members of the team included Momoko Aoshima, Edito Barcelona, Naoko Doi, Sichao Kan, Tomoko Matsumoto, Takuya Miyagawa, Junko Ogawa, and Zheng Lu. Kenji Kobayashi and Yukari Yamashita provided overall guidance to the team.

From ADB, Jun Tian was the overall supervisor for the report, with support from Aiming Zhou. Ashok Bhargava, Douglas H. Brooks, S. Chander, Robert Guild, Gil-Hong Kim, Bindu Lohani, Pil-Bae Song, Rune Stroem, and WooChong Um provided guidance and support in the various stages of the report.

Staff who provided comments on the report include Priyantha Cabral Wijayatunga, Bouadokpheng Chansavat, Andrew Jeffries, Anthony Jude, Rehan Kausar, Jong-Inn Kim, Lin Lu, Rafael R. Nadyrshin, Kaoru Ogino, Pradeep Perera, Zulfiyya Safarli, Martina Tonizzo, and Yongping Zhai. Pei Ling Koh (young professional) and Vahan Sargsyan (consultant) also reviewed the report drafts. Staff support was provided by Patricia Calcetas, Diana Marie Hernandez, Ruth Mangrobang, and Jake Padua. Research and technical assistance was provided by Charito Isidro. Valuable inputs were also provided by Len George and Ma. Priscila del Rosario.

ADB and the consultants also thank the Asia-Pacific Economic Cooperation (APEC) Secretariat, particularly Sun Tao, members of the APEC Energy Working Group, and Kenji Kobayashi for endorsement on the use of their energy information database.

Special thanks also go to the Government of the Lao People's Democratic Republic, International Energy Agency, Japan Automobile Manufacturers Association, United Nations Statistics Division, World Bank, and World Energy Council for the use of their energy-related and socioeconomic data in this report.

Abbreviations

AAGR	average annual growth rate
ADB	Asian Development Bank
APEC	Asia-Pacific Economic Cooperation
APERC	Asia Pacific Energy Research Centre
CIA	Central Intelligence Agency
CO_2	carbon dioxide
DMC	developing member country
FEC	final energy consumption
GDP	gross domestic product
IEA	International Energy Agency
JAMA	Japan Automobile Manufacturers Association
LPG	liquefied petroleum gas
Lao PDR	Lao People's Democratic Republic
NCV	net calorific value
NGL	natural gas liquid
PES	primary energy supply
PPP	purchasing power parity
PRC	People's Republic of China
SAARC	South Asian Association for Regional Cooperation
TFEC	total final energy consumption
TPES	total primary energy supply
UNFCCC	United Nations Framework Convention on Climate Change
UNSD	United Nations Statistics Division
WEC	World Energy Council

Weights and Measures

Btu	British thermal unit
C	Celsius
GWh	gigawatt-hour
kCal	kilocalorie
kg	kilogram
kt C	thousand tons of carbon equivalent
ktoe	thousand tons of oil equivalent
kWh	kilowatt-hour
MJ	megajoule
Mtoe	million tons of oil equivalent
t C	ton of carbon equivalent
tce	ton of coal equivalent
TJ	terajoule
toe	ton of oil equivalent
TWh	terawatt-hour

Chapter 1

Introduction

This report illustrates historical energy trends and the latest energy structures of 47 of the 48 regional members of the Asian Development Bank (ADB).[1] It contains regional energy demand and supply analyses, energy profiles of the ADB member economies, and energy data tables for each of these member economies in Asia and the Pacific.

1.1 Geographical Coverage

This publication covers six groups for these 47 regional members, which are based on geographical locations for the developing member countries/economies (DMCs) of ADB plus one group covering the developed member countries. The groups are as follows:

- **Central and West Asia.** Afghanistan, Armenia, Azerbaijan, Georgia, Kazakhstan, Kyrgyz Republic, Pakistan, Tajikistan, Turkmenistan, and Uzbekistan;
- **East Asia.** People's Republic of China (PRC); Hong Kong, China; Republic of Korea; Mongolia; and Taipei,China;
- **The Pacific.** Cook Islands, Federated States of Micronesia, Fiji, Kiribati, Marshall Islands, Nauru, Palau, Papua New Guinea, Samoa, Solomon Islands, Timor-Leste, Tonga, and Vanuatu;
- **South Asia.** Bangladesh, Bhutan, India, Maldives, Nepal, and Sri Lanka;
- **Southeast Asia.** Brunei Darussalam, Cambodia, Indonesia, Lao People's Democratic Republic (Lao PDR), Malaysia, Myanmar, Philippines, Singapore, Thailand, and Viet Nam; and
- **Developed group.** Australia, Japan, and New Zealand.

These 47 member countries cover 26.2% of the world's total land area and about 55.7% of its total population. Notably, in 2009, the region contributed only 30.0% of the world's gross domestic product (GDP) but consumed 37.7% of the world's total primary energy supply (TPES).

1.2 Energy Data

This report contains two kinds of energy data tables: (i) energy balance tables and (ii) historical summary tables.

Energy Balance Tables

Data sources. Energy balance tables of the 47 regional members were used for this report; however, only the four latest energy balance tables are actually published here. These energy balance tables are based on several sources.

[1] Tuvalu was not included due to unavailability of energy data.

The energy data of the following Asia-Pacific Economic Cooperation (APEC) economies were taken from the APEC Energy Database:[2] Australia; Brunei Darussalam; PRC; Hong Kong, China; Indonesia; Japan; Republic of Korea; Malaysia; New Zealand; Papua New Guinea; Philippines; Singapore; Taipei,China; Thailand; and Viet Nam. These data are from 1990 to 2009.

The energy data of the following members were taken from the *Energy Balances of Non-OECD Countries*:[3] Armenia, Azerbaijan, Bangladesh, Cambodia, Georgia, India, Kazakhstan, Kyrgyz Republic, Mongolia, Myanmar, Nepal, Pakistan, Sri Lanka, Tajikistan, Turkmenistan, and Uzbekistan. The data cover 1990 to 2009, except for those of Cambodia, which cover 1995 to 2009. In addition, except for Pakistan, data from 1990 to 1993 of the other eight Central and West Asian countries (i.e., Armenia, Azerbaijan, Georgia, Kazakhstan, Kyrgyz Republic, Tajikistan, Turkmenistan, and Uzbekistan) are not used, as these countries had only just declared independence from the former Soviet Union during that period.

The *2008 Energy Balances and Electricity Profiles*[4] was the source of energy data for Afghanistan, Bhutan, Cook Islands, Fiji, Kiribati, Maldives, Nauru, Palau, Samoa, Solomon Islands, Timor-Leste, Tonga, and Vanuatu. The data cover 1990 to 2008, except for those of Palau, which cover 1992 to 2008, and those of Timor-Leste, which cover 2002 to 2008.

The energy data of the Marshall Islands, and the Federated States of Micronesia were obtained from a survey commissioned by ADB[5] in 2008. The Marshall Islands data cover 2003 to 2008, while those of the Federated States of Micronesia are from 2000 to 2008.

Lastly, Lao PDR energy balance tables are estimated from energy information obtained from the Lao PDR Ministry of Energy and Mines,[6] from 1990 to 2009.

Notes. The tables use 1,000 tons of oil equivalent (ktoe) as the reporting unit for energy.

The energy content of fossil fuels is reported in net calorific value (NCV). The relationships between NCVs of various fossil fuels and their gross calorific values (GCV) are given by following formulas:

(i) **Coal.** 0.95 x GCV
(ii) **Oil.** 0.95 x GCV
(iii) **Gas.** 0.9 x GCV

The following conversion efficiencies were assumed for conversion from nonthermal sources to primary energy.

(i) **Hydro.** 100%
(ii) **Nuclear.** 33%
(iii) **Geothermal.** 10%
(iv) **Solar photovoltaic and wind.** 100%

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2 Asia Pacific Energy Research Centre. APEC Energy Database. http://www.ieej.or.jp/egeda/database/database-top.html. (accessed 29 February 2012).

3 International Energy Agency. 2011. *Energy Balances of Non-OECD Countries*. Paris. CD-ROM.

4 United Nations Statistics Division. 2011. *2008 Energy Balances and Electricity Profiles*. New York.

5 ADB. Unpublished. 2008 Survey on Energy and Energy-Related Information in the Pacific.

6 Government of the Lao PDR, Ministry of Energy and Mines. Unpublished. Energy Balances of Lao PDR from 1990 to 2012.

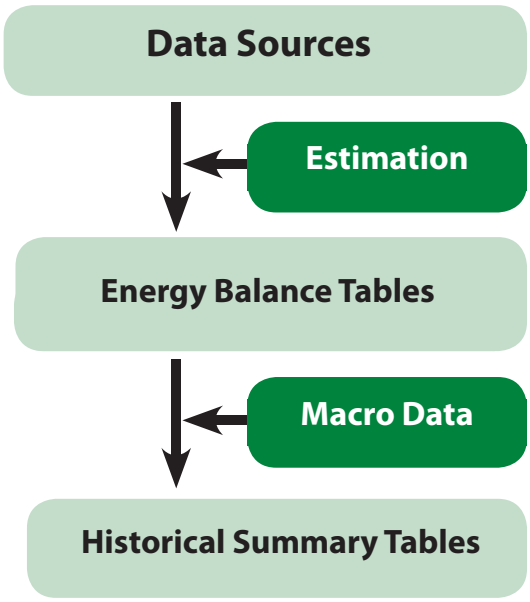
Historical Summary Tables

The historical summary tables include some information from the energy balance tables, as well as socioeconomic data, such as GDP at constant 2000 US dollars, and population. Several indicators, such as the TPES per GDP, are also included. Each table includes data on

(i) indigenous production by type of energy;
(ii) primary energy supply by source;
(iii) final energy consumption by sector and type of energy;
(iv) data on electric power generation, including electricity output by type of power plant, and fossil fuel inputs in electricity generation;
(v) carbon dioxide emissions;
(vi) macroeconomic indicators, such as population and GDP at constant 2000 US dollar values; and
(vii) basic energy indicators, such as the TPES per capita, total final energy consumption (TFEC) per capita, energy intensity, carbon dioxide intensity, electricity consumption per capita, vehicle ownership, and import dependency.

The process used to produce the energy balance tables and historical summary tables is shown in Figure 1.1.

Figure 1.1 Flowchart of the Production of the ADB Energy Data Book



Source: APERC.

Special Notes

The users of this report should take note of the following.

Gaps between the data from 1990 to 2003 and the data from 2004 to 2009. With APERC (APEC Energy Database), the use of a different reporting format from the 2004 data collection resulted in significant gaps in the data from 1990 to 2003 and from 2004 to 2009, especially in renewable energy for Indonesia; Taipei,China; Thailand; and Viet Nam.

Residential and commercial sectors. Before 2004, APEC energy data combined the energy consumption of the residential and commercial sectors into one sector (i.e., residential/commercial sector), rather than residential and commercial sectors separately. Some economies, including Brunei Darussalam; PRC; Hong Kong, China; Indonesia; Malaysia; Philippines; Taipei,China; and Thailand, submitted energy consumption of the residential and commercial sectors separately.

Electricity output by fuel type. Before 2004, only the total thermal power generation was reported in the APEC data. Therefore, power generation by fuel type (i.e., coal, oil, and gas) from 1990 until 2003 has been estimated based on IEA (2011b).

Availability of data. Available energy data from most of the 47 member countries cover 1990 to 2009 except for the following 15 countries:

(i) Afghanistan, Bhutan, Cook Islands, Fiji, Kiribati, Maldives, Nauru, Samoa, Solomon Islands, Tonga, and Vanuatu, which cover 1990–2008;
(ii) Palau, which cover 1992–2008;
(iii) Timor-Leste, which cover 2002–2008;
(iv) Federated States of Micronesia, which cover 2000–2008; and
(v) Marshall Islands; which cover 2003–2008.

In 2008, these 15 countries, collectively consumed only 0.09% of the region's total primary energy consumption, 0.11% of the total final energy consumption, 0.26% of the indigenous energy production, 1.36% of the total oil production, 0.12% of the total oil consumption, a negligible percentage of coal production and consumption, and still smaller percentages of natural gas production and consumption.

Estimation of CO_2 emissions. CO_2 emission values that appear in this publication may be different from the historical CO_2 emission values that appear in ADB 2013 publication *Energy Outlook for Asia and the Pacific* (referred to Energy Outlook below) for two reasons. First, the sources of energy data for some ADB members included in this publication differ from those used in the Energy Outlook. Second, this publication used the sectoral (bottom-up) approach in estimating the CO_2 emissions, whereas the Energy Outlook used the reference (top-down) approach. These two approaches can lead to different results for some countries even if the same set of data were used.

Chapter 2

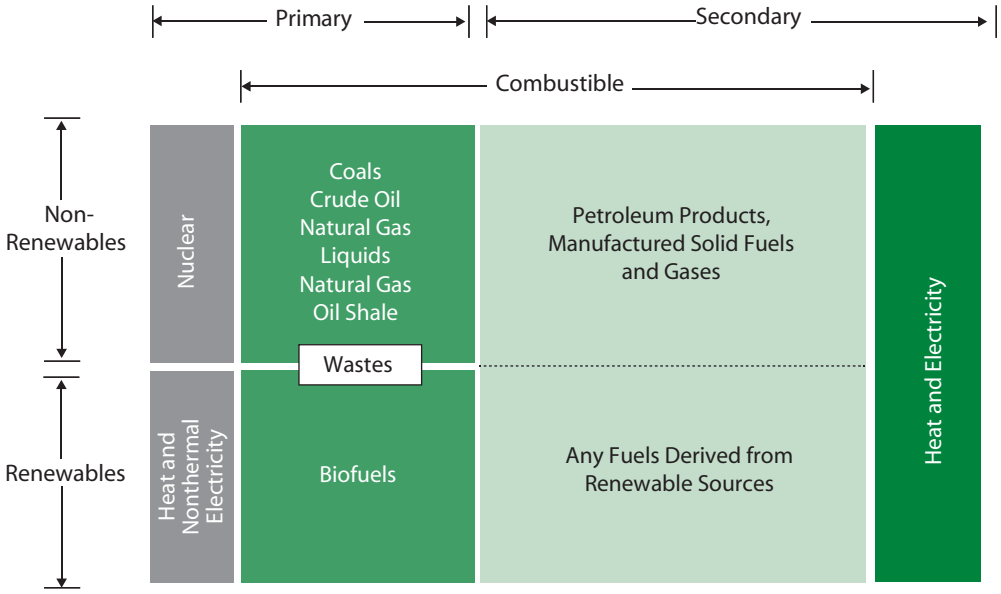
Overview of the Energy Demand and Supply Situation in Asia and the Pacific

2.1 Definition of Energy Products

Chapter 2 summarizes the energy supply and demand situation in Asia and the Pacific using the energy balance tables of member countries.

Energy products may be classified into various categories: (i) primary and secondary products, (ii) renewable and non-renewable products, and (iii) combustible and noncombustible products. Primary and secondary products can also be classified as renewable or non-renewable and combustible or noncombustible. Figure 2.1 shows how energy commodities are classified.

Figure 2.1 Classification of Energy Products



Source: IEA (2004).

Primary products are energy commodities that are either extracted or captured directly from natural sources, such as crude oil, coal, and natural gas (IEA 2004). Hydro, nuclear, and geothermal energy that are used to produce electricity (i.e., a secondary product) are also primary products. All other commodities that are produced from these primary products are secondary products. Secondary products can also be produced from secondary products like electricity produced using secondary oil products such as gas or diesel oil.

Non-renewable energy products are mostly derived from fossil fuels such as coal, oil, and natural gas. Nuclear energy is also included in this category. Renewable energy products are those that come from current or recent flows of constantly available solar and gravitational energy. An example, other than biomass, is solar energy that is harnessed as electricity generated in solar photovoltaic panels.

Combustible energy products, like biomass, need to be burned to generate practical energy for uses such as cooking or heating. Petroleum products are also combusted to produce

mechanical power to run vehicles and steam to turn turbines and to generate electricity. Non-combustible energy products are those that are not combusted to provide practical energy, like electricity, solar, and wind energy.

Coal and Coal Products

Coal and coal products are both combustible and non-renewable. Primary products of coal are coking coal, anthracite, other bituminous coal, subbituminous coal, and lignite. Secondary coal products include patent fuel, coke oven coke, coal tar, coal briquettes, gas works gas, blast furnace gas, and oxygen steel furnace gas.

Crude Oil and Petroleum Products

Crude oil and petroleum products are also combustible and non-renewable. Primary products are crude oil, natural gas liquids, refinery feedstock, additives or oxygenates, and other hydrocarbons. Secondary products are refinery gas, ethane, liquefied petroleum gas, naphtha, motor gasoline, aviation gasoline, gasoline-type jet fuel, kerosene-type jet fuel, other kerosene, gas or diesel oil, fuel oil, white spirits and special boiling point industrial spirits, lubricants, bitumen, paraffin waxes, petroleum coke, and other products.

Gas

Natural gas is also a primary energy commodity. While liquefied natural gas is still natural gas but liquefied to enable economical long-distance delivery, it is considered a secondary product in this report.

Hydro and Nuclear

This category covers all nonthermal heat and/or electricity generated from nonfossil energy resources, such as hydro, nuclear, geothermal, and solar and wind energy. The amount of primary energy is calculated from the heat and/or electricity output from these sources.

Biomass

Biomass includes wood; wood waste; black liquor; industrial and municipal waste; charcoal; and other biomass such as bagasse, rice hull, and various other agricultural wastes. Except for charcoal, all of these biomass products are primary products.

Other Products

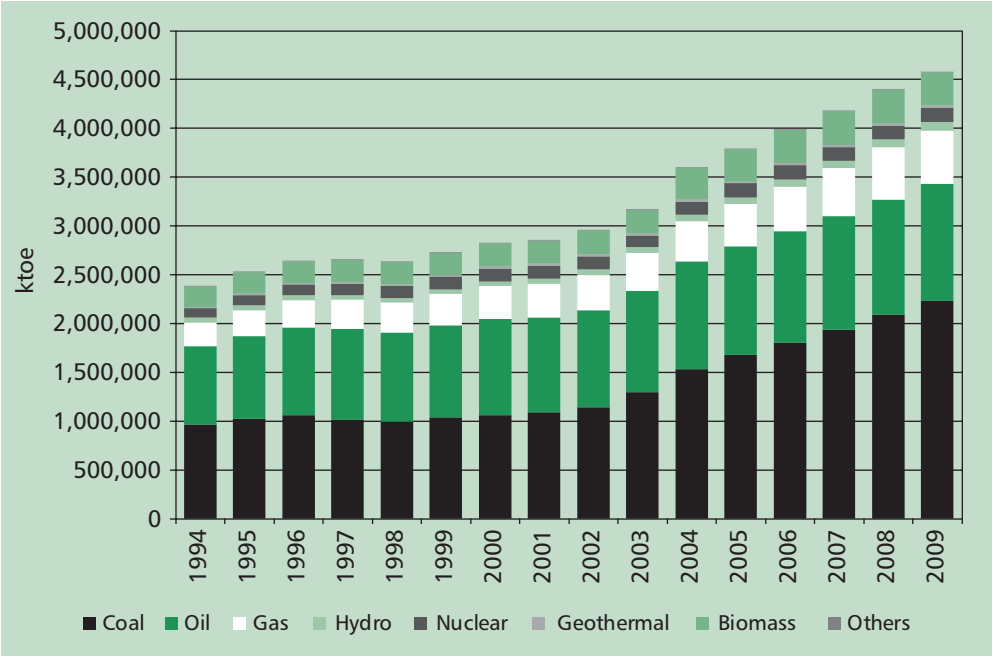
This category includes new energy products and all other energy products not included above. Liquid biofuels fall under this category, although they are derived from biomass.

2.2 Analysis of Energy Supply and Demand in Asia and the Pacific

Primary Energy Supply

The TPES in 2009 reached 4,578 million tons of oil equivalent (Mtoe), accounting for 37.7% of the world's total (12,150 Mtoe) . The TPES increased by 4.0% from the 2008 level of 4,402 Mtoe (Figure 2.2.1).

Figure 2.2.1 Total Primary Energy Supply by Type, 1994–2009



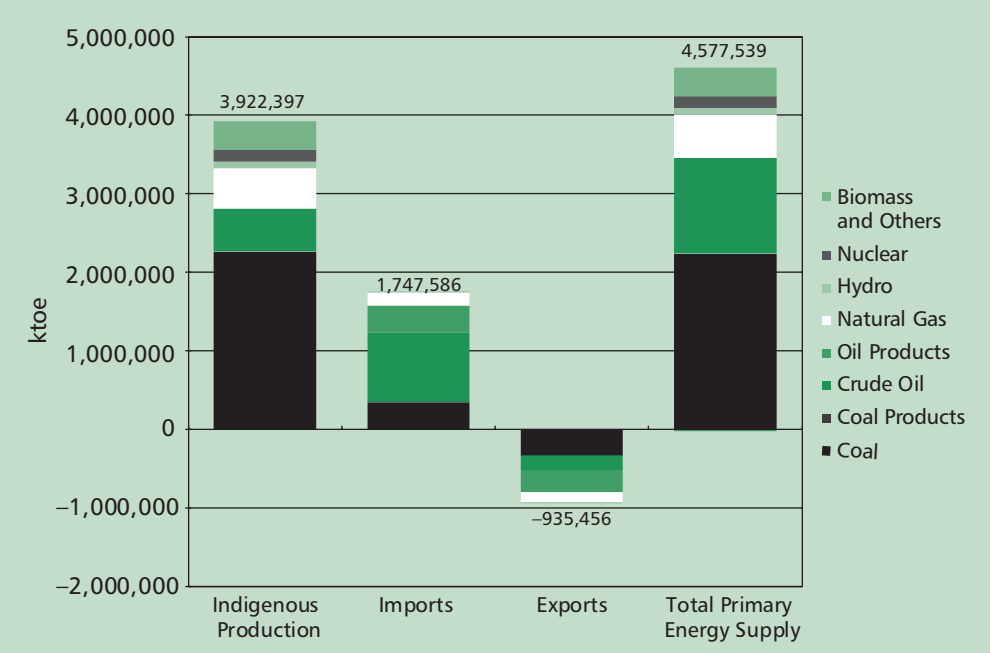
ktoe = thousand tons of oil equivalent.
Sources: ADB (unpublished), APERC (APEC Energy Database), IEA (2011b), Lao PDR Ministry of Energy and Mines (unpublished), and UNSD (2011a).

From 1994 to 2009, the TPES had an average growth rate of 4.5% per annum, in contrast with the annual 3.4% growth in real GDP over the same period. As a result, elasticity of demand was calculated at 1.3 for this period, indicating that for every 1% growth in GDP, primary energy consumption grew by 1.3%. Consequently, the region's energy intensity increased from 331 tons of oil equivalent (toe) per million US dollars (constant 2000 prices) in 1994 to 385 toe per million US dollars in 2009.

In comparison, the world TPES grew from 9,009 Mtoe in 1994 to 12,150 Mtoe in 2009, increasing at an average rate of 2.0% annually (Table 2.2.1).

In regard to the TPES by type during 1994–2009, coal supply rose at an average rate of 5.8% per annum to reach 2,230 Mtoe. The growth rate was even faster from 2008 to 2009 at 6.5%. Oil supply rose at an average rate of 2.7% per annum to reach 1,199 Mtoe from 1994 to 2009. Gas supply increased by 5.5% per annum to reach 547 Mtoe. The remaining primary energy supply (comprising hydro, nuclear, etc.) grew by 3.4% per annum from 1994 to reach 601 Mtoe in 2009.

Figure 2.2.2 Production, Trade, and Supply of Primary Energy in Asia and the Pacific, 2009



ktoe = thousand tons of oil equivalent.
Sources: ADB (unpublished), APERC (APEC Energy Database), IEA (2011b), Lao PDR Ministry of Energy and Mines (unpublished), and UNSD (2011a).

Table 2.2.1 Total Primary Energy Supply in Asia and the Pacific, 1990, 1994, and 2009

	1990[a]		1994[b]		2009[c]		AAGR[d]
	ktoe	% Share	ktoe	% Share	ktoe	% Share	%
ADB DMCs in Asia and the Pacific	1,353,756	71.6	1,791,171	75.3	3,966,605	86.7	5.4
Asia	1,352,097	71.6	1,789,216	75.2	3,964,335	86.6	5.4
Central and West Asia	44,051	2.3	197,295	8.3	242,832	5.3	1.4
Afghanistan	1,224	0.1	782	0.0	751	0.0	–0.3
Armenia	–	–	1,366	0.1	2,601	0.1	4.4
Azerbaijan	–	–	15,921	0.7	11,967	0.3	–1.9
Georgia	–	–	4,717	0.2	3,190	0.1	–2.6
Kazakhstan	–	–	57,898	2.4	65,832	1.4	0.9
Kyrgyz Republic	–	–	2,795	0.1	3,008	0.1	0.5
Pakistan	42,827	2.3	51,319	2.2	85,521	1.9	3.5
Tajikistan	–	–	2,477	0.1	2,320	0.1	–0.4
Turkmenistan	–	–	13,526	0.6	19,584	0.4	2.5
Uzbekistan	–	–	46,494	2.0	48,809	1.1	0.3
East Asia	806,626	42.7	998,705	42.0	2,471,056	54.0	6.2
People's Republic of China	654,004	34.6	793,572	33.4	2,117,844	46.3	6.8
Hong Kong, China	10,643	0.6	13,035	0.5	13,400	0.3	0.2
Republic of Korea	93,088	4.9	132,245	5.6	232,007	5.1	3.8
Mongolia	3,415	0.2	2,709	0.1	3,237	0.1	1.2
Taipei,China	45,477	2.4	57,144	2.4	104,568	2.3	4.1
South Asia	341,731	18.1	391,976	16.5	724,674	15.8	4.2
Bangladesh	12,735	0.7	14,612	0.6	29,598	0.6	4.8
Bhutan	900	0.0	920	0.0	1,366	0.0	2.9
India	316,742	16.8	364,049	15.3	675,832	14.8	4.2
Maldives	48	0.0	70	0.0	292	0.0	10.7
Nepal	5,789	0.3	6,508	0.3	9,961	0.2	2.9
Sri Lanka	5,517	0.3	5,817	0.2	9,283	0.2	3.2
Southeast Asia	159,689	8.5	201,240	8.5	525,773	11.5	6.6
Brunei Darussalam	2,071	0.1	2,392	0.1	2,679	0.1	0.8
Cambodia	–	–	3,373	0.1	5,181	0.1	3.1
Indonesia	53,252	2.8	61,190	2.6	203,005	4.4	8.3
Lao People's Democratic Republic	1,199	0.1	1,351	0.1	2,759	0.1	4.9
Malaysia	20,972	1.1	31,375	1.3	65,996	1.4	5.1
Myanmar	10,657	0.6	11,380	0.5	15,062	0.3	1.9
Philippines	28,309	1.5	31,385	1.3	38,554	0.8	1.4
Singapore	9,896	0.5	11,898	0.5	26,775	0.6	5.6
Thailand	27,918	1.5	42,536	1.8	111,440	2.4	6.6
Viet Nam	5,414	0.3	7,732	0.3	54,322	1.2	13.9
The Pacific	1,659	0.1	1,955	0.1	2,270	–	–
Cook Islands	7	0.0	7	0.0	24	0.0	8.9
Fiji	491	0.0	627	0.0	635	0.0	0.1
Kiribati	7	0.0	7	0.0	10	0.0	2.6
Marshall Islands	–	–	34	0.0	33	0.0	–0.7
Federated States of Micronesia	–	–	45	0.0	41	0.0	–1.2
Nauru	43	0.0	44	0.0	47	0.0	0.5
Palau	–	–	63	0.0	72	0.0	0.9
Papua New Guinea	866	0.0	957	0.0	2,270	0.0	5.9
Samoa	61	0.0	60	0.0	75	0.0	1.6
Solomon Islands	130	0.0	127	0.0	141	0.0	0.8
Timor-Leste	–	–	62	0.0	72	0.0	2.4
Tonga	26	0.0	36	0.0	59	0.0	3.6
Vanuatu	29	0.0	27	0.0	53	0.0	5.0
Developed Group	535,957	28.4	586,874	24.7	610,933	13.3	0.3
Australia	86,847	4.6	91,620	3.9	126,941	2.8	2.2
Japan	435,096	23.0	479,669	20.2	465,288	10.2	–0.2
New Zealand	14,014	0.7	15,585	0.7	18,704	0.4	1.2
Total Asia and the Pacific (A)	1,889,713	100.0	2,378,045	100.0	4,577,539	100.0	4.5
Total World (B)	8,782,276	–	9,009,197	–	12,150,193	–	2.0
A/B (%)	21.5	–	26.4	–	37.7	–	2.4

– = no data or not applicable, AAGR = average annual growth rate, ADB = Asian Development Bank, DMC = developing member country, ktoe = thousand tons of oil equivalent.

Notes: Energy values are rounded to the nearest ones, while percentage values are rounded to the nearest tenths. Figures may not add up to total because of rounding.

[a] Data of the former republics of the Soviet Union in Central and West Asia in 1990 are not included, as these countries had just declared independence from the former Soviet Union during that period.

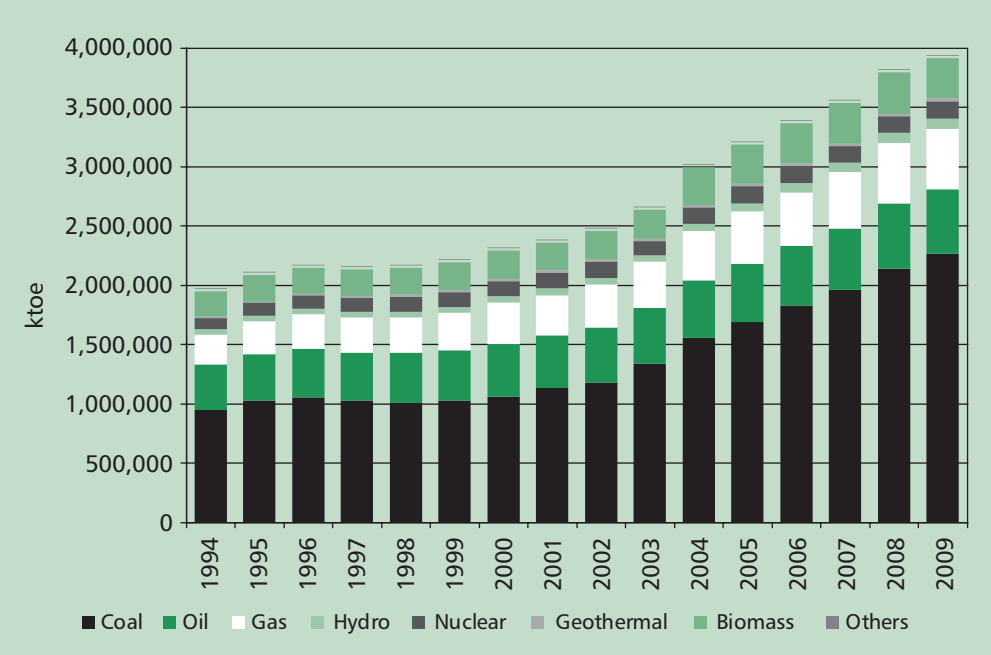
[b] Column entries for Cambodia are for the year 1995; for the Marshall Islands, for 2003; for the Federated States of Micronesia, for 2000; and for Timor-Leste, for 2000. These values are not included in the regional totals.

[c] Values for Afghanistan, Bhutan, Maldives, Cook Islands, Fiji, Kiribati, the Marshall Islands, Federated States of Micronesia, Nauru, Palau, Samoa, Solomon Islands, Timor-Leste, Tonga, and Vanuatu are 2008 data. These values are not included in the regional totals.

[d] Growth rates are estimated from 1994 to 2009, if data are available. Growth rates for Afghanistan, Bhutan, Maldives, Cook Islands, Fiji, Kiribati, Nauru, Samoa, Tonga, and Vanuatu are for the period from 1994 to 2008, while those for Cambodia are from 1995 to 2009; for the Marshall Islands, from 2003 to 2008; for the Federated States of Micronesia, from 2000 to 2008; and for Timor-Leste, from 2002 to 2008. The growth rate in the Pacific was not calculated, as only Papua New Guinea has data for 2009.

Sources: ADB (unpublished), APERC (APEC Energy Database), IEA (2011b), Lao PDR Ministry of Energy and Mines (unpublished), and UNSD (2011a).

Figure 2.2.3 Indigenous Energy Production by Type, 1994–2009



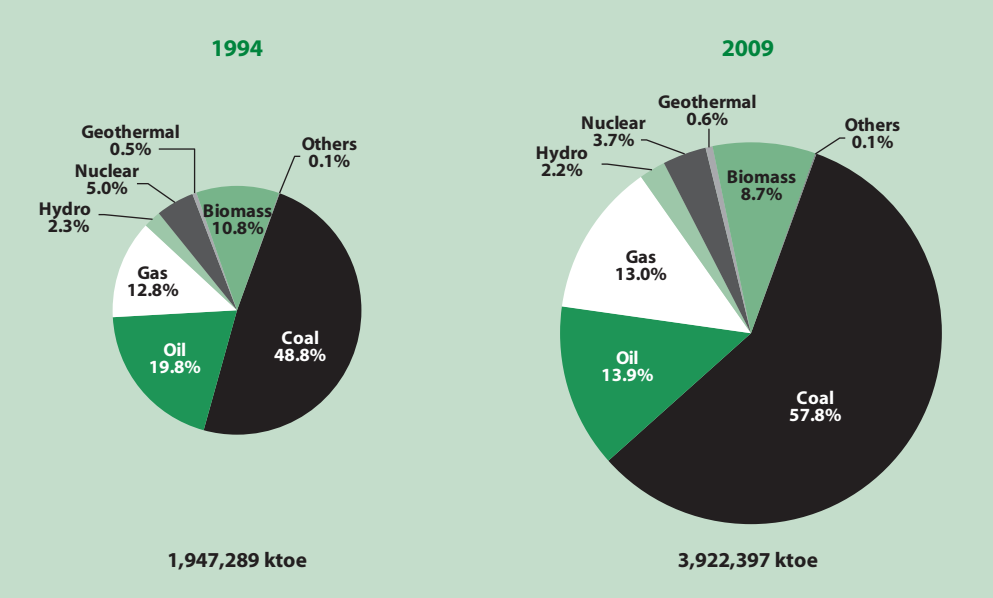
ktoe = thousand tons of oil equivalent.
Sources: ADB (unpublished), APERC (APEC Energy Database), IEA (2011b), Lao PDR Ministry of Energy and Mines (unpublished), and UNSD (2011a).

Asia and the Pacific depended on sources outside of the region for 14.3% of its primary energy needs in 2009. Although the region produced 3,922 Mtoe of energy during that year, its primary energy requirements reached 4,578 Mtoe. The region had a net energy import of 812 Mtoe, importing 1,748 Mtoe of coal, crude oil, petroleum products, and natural gas but exporting 935 Mtoe of coal, crude oil, petroleum products, and natural gas (Figure 2.2.2).

Indigenous Production

The total indigenous energy production in Asia and the Pacific in 2009 amounted to 3,922 Mtoe (Figure 2.2.3). Of this total, coal accounted for 57.8% or 2,268 Mtoe. Crude oil and natural gas comprised 13.9% (544 Mtoe) and 13.0% (510 Mtoe), respectively. Biomass had an 8.7% share, while nuclear contributed 3.7% (145 million toe), and hydro 2.2% (88 Mtoe). Other renewable energy, such as geothermal, solar, wind, and liquid biofuels, accounted for 0.7% (27 Mtoe). Figure 2.2.4 shows the composition of indigenous production in Asia and the Pacific in 1994 and 2009.

Figure 2.2.4 Indigenous Energy Production in Asia and the Pacific, 1994 and 2009



ktoe = thousand tons of oil equivalent.
Sources: ADB (unpublished), APERC (APEC Energy Database), IEA (2011b), Lao PDR Ministry of Energy and Mines (unpublished), and UNSD (2011a).

East Asia, being the largest consumer of energy, was also the largest energy producer and was responsible for 50.1% of the total energy production in Asia and the Pacific in 2009. This increased from 42.8% in 1994 (Table 2.2.2).

In 1994, Southeast Asia was only the third-largest energy producer among the six country groupings in Asia and the Pacific. Yet with its average growth rate in energy production of 5.6%, this region already surpassed South Asia in energy production by 2004, and in 2009 accounted for 15.9% of indigenous energy production in Asia and the Pacific.

By country, the PRC still had the largest share in energy production (48.4%) in 2009, followed by India (12.8%), Indonesia (8.6%), and Australia (7.6%).

Table 2.2.2 Indigenous Energy Production in Asia and the Pacific, 1990, 1994, and 2009

	1990[a]		1994[b]		2009[c]		AAGR[d]
	ktoe	% Share	ktoe	% Share	ktoe	% Share	%
ADB DMCs in Asia and the Pacific	1,322,727	84.3	1,670,554	85.8	3,515,501	89.6	5.1
Asia	1,317,781	84.0	1,664,201	85.5	3,512,752	89.6	5.1
Central and West Asia	34,740	2.2	209,050	10.7	381,573	9.7	4.1
Afghanistan	564	0.0	447	0.0	483	0.0	0.6
Armenia	–	–	303	0.0	825	0.0	6.9
Azerbaijan	–	–	14,936	0.8	64,558	1.6	10.3
Georgia	–	–	1,030	0.1	1,258	0.0	1.3
Kazakhstan	–	–	70,856	3.6	145,813	3.7	4.9
Kyrgyz Republic	–	–	1,465	0.1	1,161	0.0	–1.5
Pakistan	34,176	2.2	39,522	2.0	64,858	1.7	3.4
Tajikistan	–	–	1,537	0.1	1,502	0.0	–0.2
Turkmenistan	–	–	32,850	1.7	40,904	1.0	1.5
Uzbekistan	–	–	46,104	2.4	60,694	1.5	1.8
East Asia	741,929	47.3	833,540	42.8	1,966,083	50.1	5.9
People's Republic of China	705,811	45.0	800,991	41.1	1,897,388	48.4	5.9
Hong Kong, China	0	0.0	0	0.0	65	0.0	–
Republic of Korea	22,622	1.4	19,419	1.0	47,139	1.2	6.1
Mongolia	2,748	0.2	2,325	0.1	7,689	0.2	8.3
Taipei,China	10,748	0.7	10,805	0.6	13,801	0.4	1.6
South Asia	313,244	20.0	344,543	17.7	541,215	13.8	3.1
Bangladesh	10,757	0.7	12,455	0.6	24,837	0.6	4.7
Bhutan	980	0.1	1,035	0.1	1,720	0.0	3.7
India	291,816	18.6	321,067	16.5	502,470	12.8	3.0
Maldives	0	0.0	0	0.0	0	0.0	–
Nepal	5,500	0.4	5,989	0.3	8,822	0.2	2.6
Sri Lanka	4,191	0.3	3,997	0.2	5,086	0.1	1.6
Southeast Asia	227,868	14.5	277,068	14.2	623,881	15.9	5.6
Brunei Darussalam	15,259	1.0	16,886	0.9	19,905	0.5	1.1
Cambodia	–	–	2,901	0.1	3,668	0.1	1.7
Indonesia	119,434	7.6	146,142	7.5	335,475	8.6	5.7
Lao People's Democratic Republic	1,085	0.1	1,221	0.1	2,368	0.1	4.5
Malaysia	46,529	3.0	56,516	2.9	84,469	2.2	2.7
Myanmar	10,654	0.7	10,954	0.6	22,358	0.6	4.9
Philippines	17,222	1.1	16,473	0.8	23,295	0.6	2.3
Singapore	19	0.0	53	0.0	121	0.0	5.7
Thailand	11,854	0.8	17,586	0.9	66,024	1.7	9.2
Viet Nam	5,811	0.4	11,237	0.6	66,199	1.7	12.6
The Pacific	4,946	0.3	6,353	0.3	2,749	–	–
Cook Islands	0	0.0	0	0.0	0	0.0	–
Fiji	235	0.0	370	0.0	240	0.0	–3.0
Kiribati	0	0.0	0	0.0	0	0.0	–
Marshall Islands	–	–	0	0.0	0	0.0	–
Federated States of Micronesia	–	–	0	0.0	0	0.0	–
Nauru	0	0.0	0	0.0	0	0.0	–
Palau	–	–	2	0.0	2	0.0	–0.7
Papua New Guinea	4,612	0.3	5,882	0.3	2,749	0.1	–4.9
Samoa	18	0.0	19	0.0	21	0.0	1.0
Solomon Islands	75	0.0	75	0.0	76	0.0	0.1
Timor-Leste	–	–	7,242	0.4	7,369	0.2	0.3
Tonga	0	0.0	0	0.0	1	0.0	–
Vanuatu	5	0.0	5	0.0	20	0.0	9.8
Developed Group	246,247	15.7	276,734	14.2	406,896	10.4	2.6
Australia	158,144	10.1	173,825	8.9	296,282	7.6	3.6
Japan	75,441	4.8	89,291	4.6	94,020	2.4	0.3
New Zealand	12,662	0.8	13,619	0.7	16,593	0.4	1.3
Total Asia and the Pacific (A)	1,568,974	100.0	1,947,289	100.0	3,922,397	100.0	4.8
Total World (B)	8,815,446	–	9,036	–	12,292	–	2.1
A/B (%)	18	–	21,551	–	31,911	–	2.7

– = no data or not applicable, AAGR = average annual growth rate, ADB = Asian Development Bank, DMC = developing member country, ktoe = thousand tons of oil equivalent.

Notes: Energy values are rounded to the nearest ones, while percentage values are rounded to the nearest tenths. Figures may not add up to total because of rounding.

[a] Data of the former republics of the Soviet Union in Central and West Asia in 1990 are not included, as these countries had just declared independence from the former Soviet Union during that period.

[b] Column entries for Cambodia are for the year 1995; for the Marshall Islands, for 2003; for the Federated States of Micronesia, for 2000; and for Timor-Leste, for 2000. These values are not included in the regional totals.

[c] Values for Afghanistan, Bhutan, Maldives, Cook Islands, Fiji, Kiribati, Marshall Islands, Federated States of Micronesia, Nauru, Palau, Samoa, Solomon Islands, Timor-Leste, Tonga, and Vanuatu are 2008 data. These values are not included in the regional totals.

[d] Growth rates are estimated from 1994 to 2009, if data are available. Growth rates for Afghanistan, Bhutan, Maldives, Cook Islands, Fiji, Kiribati, Nauru, Samoa, Tonga, and Vanuatu are for the period from 1994 to 2008, while those for Cambodia are from 1995 to 2009; for the Marshall Islands, from 2003 to 2008; for the Federated States of Micronesia, from 2000 to 2008; and for Timor-Leste, from 2002 to 2008. The growth rate in the Pacific was not calculated, as only Papua New Guinea has data for 2009.

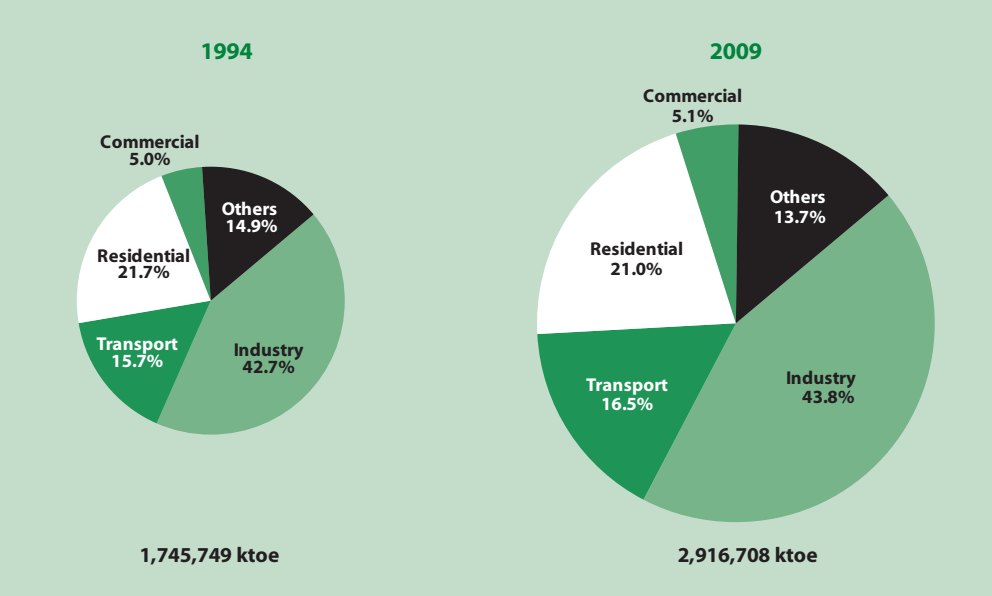
Sources: ADB (unpublished), APERC (APEC Energy Database), IEA (2011b), Lao PDR Ministry of Energy and Mines (unpublished), and UNSD (2011a).

Final Energy Consumption

The level of final energy consumption in 2009 of 2,917 Mtoe grew by 3.5% annually on average from 1,746 Mtoe in 1994 (Table 2.2.3). This growth rate from 1994 was lower than that of primary energy supply (4.5%), indicating that net energy consumption growth in the transformation sector surpassed that of the final energy consumption sector. The faster increase in the consumption of the transformation sector could be attributed to the faster growth of thermal electricity generation than hydroelectricity generation. Thermal generation, which uses fossil fuels, has lower thermal efficiencies as compared to hydro, which is assumed to have 100% conversion efficiency.

On a sector basis, the TFEC of the residential/commercial sector increased by 3.3% per annum on average, from 465 Mtoe in 1994 to 760 Mtoe in 2009. The transport sector's consumption grew by 3.8% annually, on average, from 274 Mtoe in 1994 to 480 Mtoe in 2009, while the industry sector's consumption grew by 3.6% from 1994 to 2009. Its total consumption of 1,277 Mtoe was the largest for all sectors in 2009, with a share of 43.8% to the TFEC (Figures 2.2.5 and 2.2.7). The transport sector's share was 16.5%, while the residential and commercial sectors combined represented 26.1%.

Figure 2.2.5 Final Energy Consumption by Sector in Asia and the Pacific, 1994 and 2009

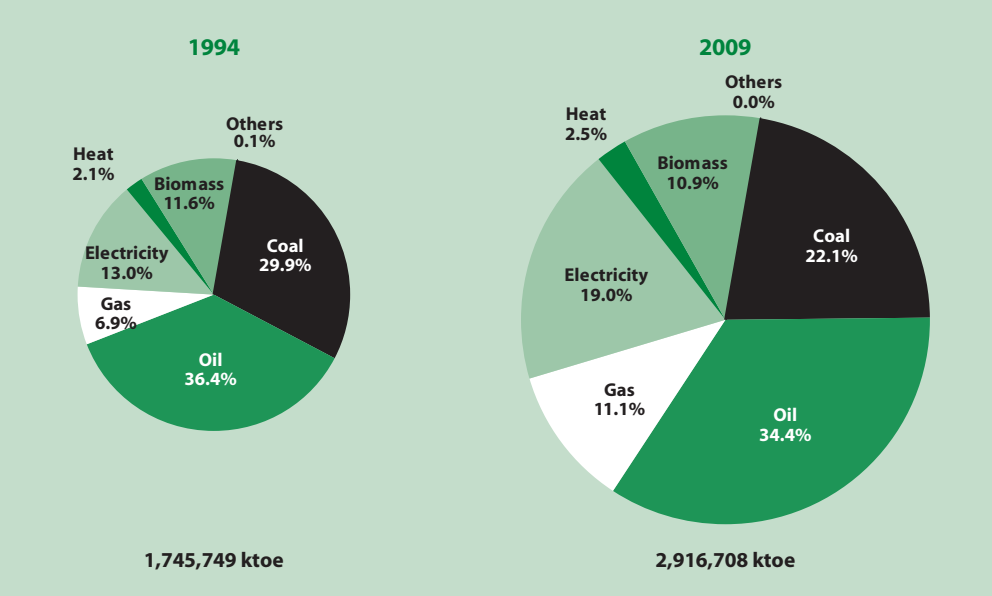


ktoe = thousand tons of oil equivalent.
Sources: ADB (unpublished), APERC (APEC Energy Database), IEA (2011b), Lao PDR Ministry of Energy and Mines (unpublished), and UNSD (2011a).

By type of fuel, oil consumption increased by 3.1% per annum on average, from 634 Mtoe in 1990 to 1,004 Mtoe in 2009 (Figures 2.2.6 and 2.2.8).

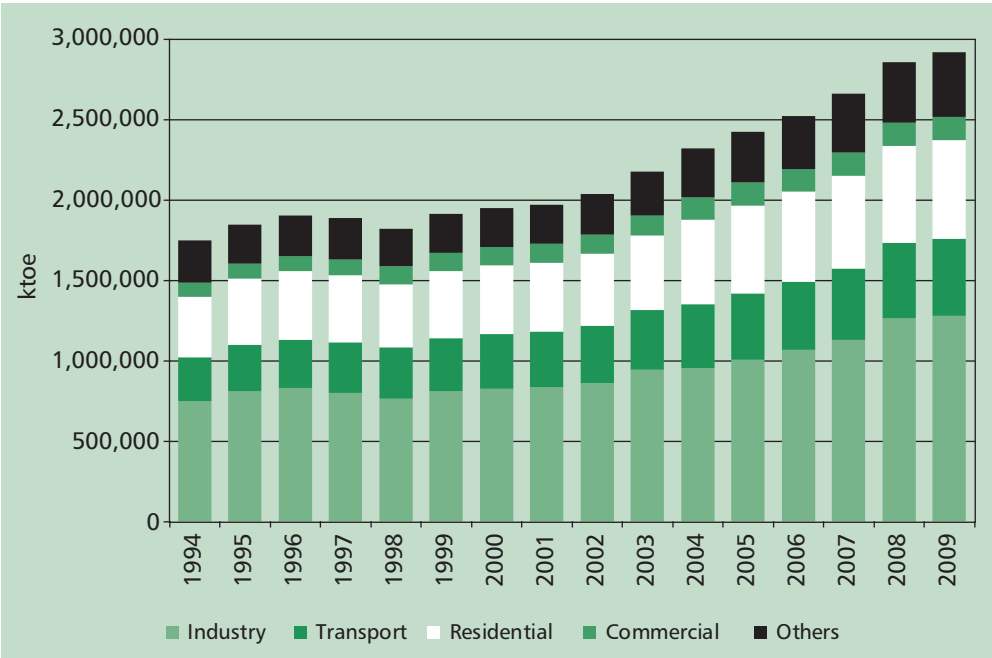
Electricity consumption rose by 6.1% per annum, from 228 Mtoe in 1994 to 554 Mtoe in 2009. Gas consumption increased by 6.9%, from 120 Mtoe in 1994 to 324 Mtoe in 2009. Coal consumption grew by 1.4%, from 523 Mtoe in 1994 to 643 Mtoe in 2009. The consumption of other fuels (mostly biomass) increased by 3.0%, from 204 Mtoe in 1994 to 320 Mtoe in 2009.

Figure 2.2.6 Final Energy Consumption by Type in Asia and the Pacific, 1994 and 2009



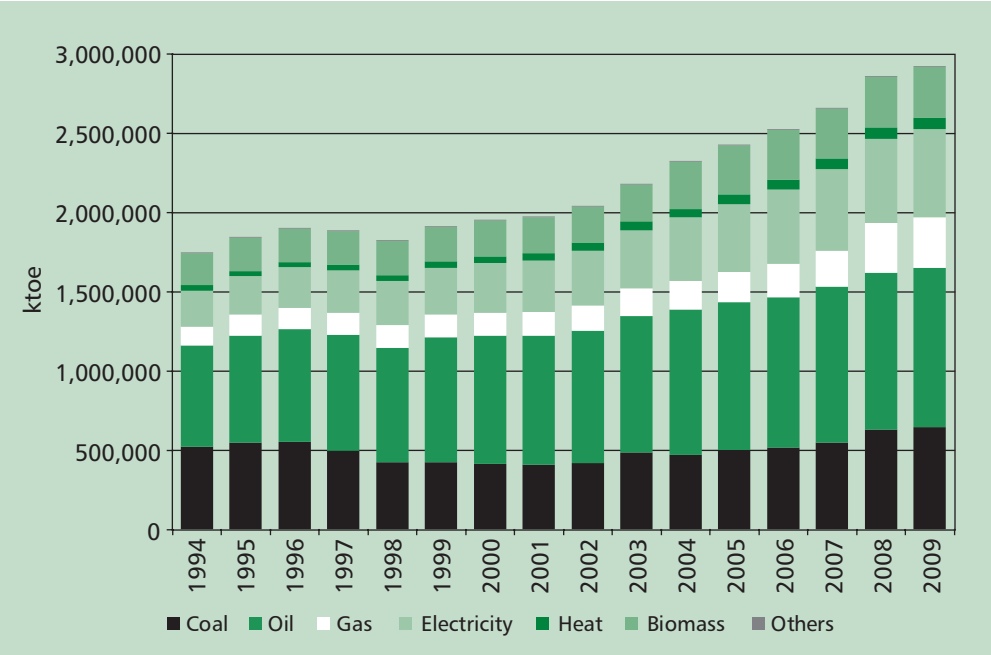
ktoe = thousand tons of oil equivalent.
Sources: ADB (unpublished), APERC (APEC Energy Database), IEA (2011b), Lao PDR Ministry of Energy and Mines (unpublished), and UNSD (2011a).

Figure 2.2.7 Final Energy Consumption by Sector, 1994–2009



ktoe = thousand tons of oil equivalent.
Sources: ADB (unpublished), APERC (APEC Energy Database), IEA (2011b), Lao PDR Ministry of Energy and Mines (unpublished), and UNSD (2011a).

Figure 2.2.8 Final Energy Consumption by Type, 1994–2009



ktoe = thousand tons of oil equivalent.
Sources: ADB (unpublished), APERC (APEC Energy Database), IEA (2011b), Lao PDR Ministry of Energy and Mines (unpublished), and UNSD (2011a).

From 1994 to 2009, Southeast Asia experienced the fastest growth in TFEC among the six country groupings, with a 6.4% average annual growth rate (Table 2.2.3). Consequently, Southeast Asia's share of TFEC in Asia and the Pacific increased from 8.0% in 1994 to 12.2% in 2009. East Asia had the second-fastest annual growth rate at 4.7%, which resulted in an increase in its share of the total from 43.2% in 1994 to 51.4% in 2009. The third-fastest annual growth rate was in South Asia at 3.3%, followed by Central and West Asia at 1.0%. The Developed Group exhibited a slight decline in consumption from 400 Mtoe in 1994 to 399 Mtoe in 2009, while the Pacific had growth of 4.0% per annum from 1994 to 2008.

Table 2.2.3 Final Energy Consumption in Asia and the Pacific, 1990, 1994 and 2009

	1990[a]		1994[b]		2009[c]		AAGR[d]
	ktoe	% Share	ktoe	% Share	ktoe	% Share	%
ADB DMCs in Asia and the Pacific	1,012,928	73.2	1,345,855	77.1	2,517,343	86.3	4.3
Asia	1,011,889	73.1	1,344,743	77.0	2,516,181	86.3	4.3
Central and West Asia	36,810	2.7	147,861	8.5	170,374	5.8	0.9
Afghanistan	608	0.0	388	0.0	661	0.0	3.9
Armenia	–	–	1,073	0.1	1,914	0.1	3.9
Azerbaijan	–	–	10,741	0.6	6,575	0.2	–3.2
Georgia	–	–	3,594	0.2	2,520	0.1	–2.3
Kazakhstan	–	–	41,660	2.4	37,426	1.3	–0.7
Kyrgyz Republic	–	–	2,448	0.1	2,666	0.1	0.6
Pakistan	36,202	2.6	42,514	2.4	69,850	2.4	3.4
Tajikistan	–	–	2,115	0.1	1,991	0.1	–0.4
Turkmenistan	–	–	8,911	0.5	11,573	0.4	1.8
Uzbekistan	–	–	34,417	2.0	35,859	1.2	0.3
East Asia	593,798	42.9	753,805	43.2	1,500,363	51.4	4.7
People's Republic of China	489,928	35.4	609,183	34.9	1,279,634	43.9	5.1
Hong Kong, China	6,689	0.5	9,236	0.5	6,887	0.2	–1.9
Republic of Korea	64,908	4.7	96,462	5.5	147,438	5.1	2.9
Mongolia	2,972	0.2	1,891	0.1	2,413	0.1	1.6
Taipei,China	29,302	2.1	37,033	2.1	63,990	2.2	3.7
South Asia	274,089	19.8	302,716	17.3	490,298	16.8	3.3
Bangladesh	10,972	0.8	12,358	0.7	23,136	0.8	4.3
Bhutan	317	0.0	397	0.0	1,335	0.0	9.1
India	251,694	18.2	277,800	15.9	449,271	15.4	3.3
Maldives	43	0.0	65	0.0	249	0.0	10.1
Nepal	5,760	0.4	6,471	0.4	9,881	0.3	2.9
Sri Lanka	5,304	0.4	5,625	0.3	8,010	0.3	2.4
Southeast Asia	107,192	7.7	140,361	8.0	355,147	12.2	6.4
Brunei Darussalam	417	0.0	564	0.0	955	0.0	3.6
Cambodia	–	–	3,154	0.2	4,664	0.2	2.8
Indonesia	33,956	2.5	44,562	2.6	137,153	4.7	7.8
Lao People's Democratic Republic	1,092	0.1	1,229	0.1	2,368	0.1	4.5
Malaysia	13,146	0.9	19,287	1.1	38,244	1.3	4.7
Myanmar	9,376	0.7	10,106	0.6	13,806	0.5	2.1
Philippines	19,474	1.4	20,404	1.2	22,926	0.8	0.8
Singapore	5,322	0.4	6,967	0.4	16,114	0.6	5.7
Thailand	20,196	1.5	30,541	1.7	72,143	2.5	5.9
Viet Nam	4,212	0.3	6,701	0.4	46,775	1.6	13.8
The Pacific	1,039	0.1	1,112	0.1	1,162	–	–
Cook Islands	3	0.0	3	0.0	8	0.0	6.3
Fiji	226	0.0	230	0.0	434	0.0	4.6
Kiribati	1	0.0	0	0.0	7	0.0	21.6
Marshall Islands	–	–	13	0.0	14	0.0	2.9
Federated States of Micronesia	–	–	25	0.0	27	0.0	1.1
Nauru	36	0.0	36	0.0	38	0.0	0.3
Palau	–	–	26	0.0	45	0.0	4.0
Papua New Guinea	613	0.0	654	0.0	1,162	0.0	3.9
Samoa	44	0.0	45	0.0	55	0.0	1.5
Solomon Islands	82	0.0	78	0.0	109	0.0	2.5
Timor-Leste	–	–	27	0.0	37	0.0	5.4
Tonga	19	0.0	26	0.0	47	0.0	4.3
Vanuatu	15	0.0	13	0.0	29	0.0	5.7
Developed Group	370,912	26.8	399,894	22.9	399,365	13.7	0.0
Australia	56,459	4.1	59,967	3.4	77,082	2.6	1.7
Japan	304,760	22.0	328,995	18.8	309,778	10.6	–0.4
New Zealand	9,693	0.7	10,932	0.6	12,504	0.4	0.9
Total Asia and the Pacific (A)	1,383,841	100.0	1,745,749	100.0	2,916,708	100.0	3.5
Total World (B)	6,292,529	–	6,404,151	–	8,352,767	–	1.8
A/B (%)	22.0	–	27.3	–	34.9	–	1.7

– = no data or not applicable, AAGR = average annual growth rate, ADB = Asian Development Bank, DMC = developing member country, ktoe = thousand tons of oil equivalent.

Notes: Energy values are rounded to the nearest ones, while percentage values are rounded to the nearest tenths. Figures may not add up to total because of rounding.

[a] Data of the former republics of the Soviet Union in Central and West Asia in 1990 are not included, as these countries had just declared independence from the former Soviet Union during that period.

[b] Column entries for Cambodia are for the year 1995; for the Marshall Islands, for 2003; for the Federated States of Micronesia, for 2000; and for Timor-Leste, for 2000. These values are not included in the regional totals.

[c] Values for Afghanistan, Bhutan, Maldives, Cook Islands, Fiji, Kiribati, Marshall Islands, Federated States of Micronesia, Nauru, Palau, Samoa, Solomon Islands, Timor-Leste, Tonga, and Vanuatu are 2008 data. These values are not included in the regional totals.

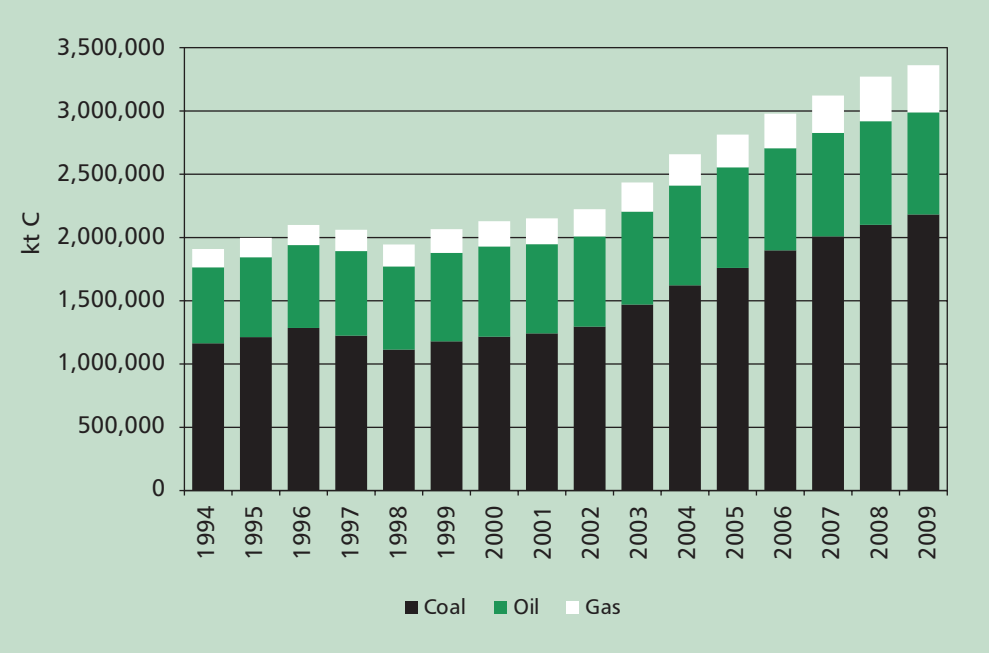
[d] Growth rates are estimated from 1994 to 2009, if data are available. Growth rates for Afghanistan, Bhutan, Maldives, Cook Islands, Fiji, Kiribati, Nauru, Samoa, Tonga, and Vanuatu are for the period from 1994 to 2008, while those for Cambodia are from 1995 to 2009; for the Marshall Islands, from 2003 to 2008; for the Federated States of Micronesia, from 2000 to 2008; and for Timor-Leste, from 2002 to 2008. The growth rate in the Pacific was not calculated, as only Papua New Guinea has data for 2009.

Sources: ADB (unpublished), APERC (APEC Energy Database), IEA (2011b), Lao PDR Ministry of Energy and Mines (unpublished), and UNSD (2011a).

Carbon Dioxide Emissions from Fuel Combustion

Carbon dioxide emissions from fuel combustion increased by 3.8% per annum, on average, from 1994 to 2009 (Figure 2.2.9). However, this growth rate is lower than the 4.5% annual increase of the TPES.

Figure 2.2.9 Carbon Dioxide Emissions from Fuel Combustion, 1994–2009



kt C = thousand tons of carbon equivalent.
Sources: APERC (APEC Energy Database) and APERC estimates.

Energy Balance Table

This section presents the 2006–2009 aggregate energy balance table for Asia and the Pacific (Tables 2.2.4–2.2.7) along with a summary table containing energy, economic, and demographic data from 1994 to 2009 (Table 2.2.8).

Data of 15 countries (Afghanistan, Bhutan, Cook Islands, Fiji, Kiribati, Maldives, Marshall Islands, Federated States of Micronesia, Nauru, Palau, Samoa, Solomon Islands, Timor-Leste, Tonga, and Vanuatu), which comprised 0.1% of the total in 2008, were not yet available at the time of publication, and are therefore not included in the 2009 energy balance table.

Asia and the Pacific's indigenous energy production in 2009 was only 85.7% of its TPES, making it a net importer of energy during the year. Also, 55.7% of the coal supply was used for power generation during the same year.

Likewise, in the same year, oil and petroleum products accounted for 34.4% of TFEC, followed in order by coal (22.1%), electricity (19.0%), gas (11.1%), biomass (11.0%), and heat (2.5%). The category "Others" consists mainly of waste and commercial renewable energy, which are used to generate electricity and consumed directly in the industry sector and the residential/commercial sector. It also includes solar, wind, heat, and imported electricity.

Table 2.2.4 Asia and the Pacific Energy Balance Table, 2006

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	1,827,514	0	508,482	0	0	0	0	0	0	0	450,423	74,562	148,928	20,610	15	988	335,217	1,290	0	0	3,368,029
2.	Imports	275,519	8,423	817,383	300,241	30,596	4,834	48,682	92,501	35,327	88,303	160,187	0	0	0	0	0	63	0	4,381	0	1,566,197
3.	Exports	−291,226	−11,242	−179,347	−210,810	−29,423	−2,827	−62,525	−43,796	−5,113	−67,126	−149,300	0	0	0	0	0	−6	0	−4,250	0	−846,182
4.	International Bunkers	0	0	0	−94,239	−9	0	−4,289	−57,317	0	−32,623	0	0	0	0	0	0	0	0	0	0	−94,239
5.	Stock Changes	−38	−2,803	−1,357	−3,499	−176	−1,995	1,438	−2,143	−615	−7	−2,036	0	0	0	0	0	−21	0	0	0	−9,754
6.	Total Primary Energy Supply	1,811,769	−5,623	1,145,161	−8,307	987	12	−16,695	−10,756	29,598	−11,454	459,274	74,562	148,928	20,610	15	988	335,253	1,290	131	0	3,984,051
7.	Transfers	0	0	−11,219	20,086	5,568	−27	194	772	9,278	4,302	0	0	0	0	0	0	0	0	0	0	8,867
8.	Total Transformation Sector	−1,359,670	135,099	−1,123,243	999,232	183,225	48,148	318,429	116,809	44,106	288,515	−194,896	−74,562	−148,928	−20,596	−15	−989	−25,209	−207	572,011	77,307	−1,164,667
8.1	Power Generation	−1,050,500	−23,067	−7,944	−86,043	−10	−296	−19,695	−57,327	−663	−8,052	−190,156	−74,562	−148,928	−20,596	−15	−989	−17,326	−207	572,015	77,307	−971,012
8.2	Gas Processing	−7,291	−1,622	0	−1,995	0	0	0	−134	−1,144	−718	−3,422	0	0	0	0	0	0	0	0	0	−14,330
8.3	Refineries	0	0	−1,120,966	1,094,375	183,235	48,444	338,125	174,291	45,917	304,362	0	0	0	0	0	0	0	0	0	0	−26,591
8.4	Coal Transformation	−301,879	159,788	0	−568	0	0	−1	−21	0	−546	−79	0	0	0	0	0	0	0	0	0	−142,738
8.5.	Other Transformation	0	0	5,667	−6,537	0	0	0	0	−4	−6,532	−1,239	0	0	0	0	0	−7,883	0	0	0	−9,991
9.	Loss and Own Use	−74,603	−8,510	−9,566	−45,100	−724	−201	−4,477	−6,549	−2,234	−30,914	−52,044	0	0	0	0	0	−46	0	−100,122	−13,970	−303,960
10.	Discrepancy	24,515	−6,524	5,916	−24,813	538	−551	2,060	−5,826	595	−21,628	−1,312	0	0	0	0	1	3,014	0	−1,360	−1,497	−2,059
11.	Total Final Energy Consumption	402,011	114,442	7,048	941,099	189,594	47,381	299,511	94,450	81,343	228,820	211,022	0	0	14	0	0	313,011	1,083	470,664	61,841	2,522,235
12.	Industry Sector	298,324	91,101	2,854	226,243	6,052	5,844	52,027	57,625	16,265	88,430	89,884	0	0	0	0	0	60,864	142	259,756	36,749	1,065,916
13.	Transport Sector	4,881	6	0	402,846	163,665	104	188,422	18,091	9,099	23,465	7,231	0	0	0	0	0	120	0	8,008	88	423,179
14.	Other Sectors	78,583	10,061	12	193,653	19,717	41,334	58,713	17,569	52,691	3,629	88,923	0	0	14	0	0	252,027	941	202,901	25,004	852,118
14.1	Residential and Commercial	61,425	9,312	0	117,047	6,911	37,884	10,409	10,105	51,664	72	78,904	0	0	14	0	0	251,916	811	164,306	18,841	702,575
14.1.1	Commerce and Public Services	8,846	1,606	0	33,072	3,377	3,788	7,719	9,843	8,275	71	20,785	0	0	6	0	0	7,373	97	66,554	1,663	140,003
14.1.2	Residential	52,579	7,705	0	83,974	3,534	34,096	2,690	263	43,390	1	58,119	0	0	8	0	0	244,543	714	97,752	17,178	562,572
14.2	Non-Specified Others	17,158	749	12	76,606	12,806	3,450	48,304	7,464	1,026	3,557	10,019	0	0	0	0	0	112	129	38,595	6,163	149,543
15.	Non-Energy Use	20,224	13,274	4,183	118,357	159	99	349	1,165	3,288	113,297	24,985	0	0	0	0	0	0	0	0	0	181,023
16.	Electricity Output (GWh)	3,795,928	1,352	354,470	83,081	0	21	1,168	187	0	59,479	879,557	867,109	571,483	17,200	177	13,415	53,628	6,869	0	0	6,644,269
17.	Heat Output (TJ)	425,587	0	99,996	9,881	0	0	0	0	0	0	195,745	0	0	0	0	0	0	13,573	0	0	744,782

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Sources: ADB (unpublished), APERC (APEC Energy Database), IEA (2011b), Lao PDR Ministry of Energy and Mines (unpublished), and UNSD (2011a).

Table 2.2.5 Asia and the Pacific Energy Balance Table, 2007

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	1,959,637	0	520,474	0	0	0	0	0	0	0	475,891	78,184	142,601	20,822	20	1,394	341,056	1,404	0	45	3,541,528
2.	Imports	299,882	9,631	839,053	321,708	32,636	5,323	56,576	92,355	34,770	100,048	169,624	0	0	0	0	0	171	0	4,358	0	1,644,428
3.	Exports	−311,072	−11,624	−186,870	−234,885	−34,147	−2,268	−72,345	−45,675	−5,623	−74,827	−152,509	0	0	0	0	0	−7	0	−4,637	0	−901,604
4.	International Bunkers	0	0	0	−97,333	−914	0	−4,095	−58,217	0	−34,108	0	0	0	0	0	0	0	0	0	0	−97,333
5.	Stock Changes	−8,239	−5,193	−48	1,422	−282	1,143	968	−349	228	−287	329	0	0	0	0	0	−23	0	0	0	−11,752
6.	Total Primary Energy Supply	1,940,208	−7,186	1,172,609	−9,088	−2,706	4,198	−18,895	−11,886	29,375	−9,173	493,335	78,184	142,601	20,822	20	1,394	341,197	1,404	−278	45	4,175,268
7.	Transfers	0	0	−12,127	18,759	5,561	−296	128	−2,807	11,126	5,046	0	0	0	0	0	0	0	0	0	0	6,631
8.	Total Transformation Sector	−1,460,663	150,893	−1,152,574	1,033,234	194,303	40,917	336,218	110,897	46,596	304,302	−212,830	−78,184	−142,601	−20,806	−20	−1,395	−27,633	−205	621,025	81,419	−1,210,340
8.1	Power Generation	−1,142,918	−22,072	−9,240	−82,828	−1	−177	−20,124	−53,792	−696	−8,038	−207,204	−78,184	−142,601	−20,806	−20	−1,395	−19,156	−205	621,025	81,419	−1,024,185
8.2	Gas Processing	−8,070	−1,823	0	−1,521	0	0	−13	−50	−967	−491	−5,149	0	0	0	0	0	0	0	0	0	−16,562
8.3	Refineries	0	0	−1,149,239	1,124,890	194,304	41,095	356,356	164,760	48,263	320,110	0	0	0	0	0	0	0	0	0	0	−24,350
8.4	Coal Transformation	−309,675	174,787	0	−581	0	0	0	−21	0	−560	−82	0	0	0	0	0	0	0	0	0	−135,551
8.5.	Other Transformation	0	0	5,905	−6,726	0	−1	−1	0	−4	−6,719	−394	0	0	0	0	0	−8,477	0	0	0	−9,692
9.	Loss and Own Use	−51,569	−10,518	−9,545	−45,466	−851	−192	−3,944	−6,426	−1,956	−32,097	−55,607	−1	0	0	0	0	−39	0	−106,002	−11,481	−290,227
10.	Discrepancy	−8,819	−8,202	9,251	−17,161	1,037	−1,143	1,680	−1,191	1,890	−19,434	2,027	1	0	0	0	1	3,015	0	−2,045	−1,720	−23,652
11.	Total Final Energy Consumption	419,157	124,987	7,614	980,278	197,343	43,484	315,189	88,588	87,030	248,644	226,926	0	0	16	0	0	316,541	1,199	512,700	68,262	2,657,680
12.	Industry Sector	315,692	100,262	2,886	220,759	7,239	5,385	51,320	53,985	17,575	85,255	95,535	0	0	0	0	0	61,027	146	290,855	42,066	1,129,229
13.	Transport Sector	4,640	4	0	422,748	169,025	112	201,780	17,520	9,172	25,138	8,945	0	0	0	0	0	134	0	8,612	100	445,183
14.	Other Sectors	77,508	9,551	0	194,627	20,884	37,902	61,782	15,915	56,375	1,768	98,012	0	0	16	0	0	255,380	1,053	213,232	26,096	875,476
14.1	Residential and Commercial	59,832	8,813	0	119,258	8,151	34,718	12,741	8,401	55,015	232	83,719	0	0	16	0	0	255,250	874	172,551	19,404	719,716
14.1.1	Commerce and Public Services	8,822	1,535	0	34,013	3,674	3,657	9,738	8,164	8,550	231	22,728	0	0	9	0	0	7,496	102	70,635	1,777	147,116
14.1.2	Residential	51,010	7,279	0	85,244	4,477	31,061	3,003	238	46,465	1	60,991	0	0	7	0	0	247,754	771	101,916	17,627	572,600
14.2	Non-Specified Others	17,676	738	0	75,369	12,733	3,184	49,042	7,514	1,360	1,536	14,294	0	0	0	0	0	130	179	40,681	6,693	155,760
15.	Non-Energy Use	21,317	15,170	4,728	142,144	195	85	306	1,168	3,908	136,483	24,433	0	0	0	0	0	0	0	0	0	207,792
16.	Electricity Output (GWh)	4,252,402	1,135	350,606	89,179	0	22	1,249	4,073	0	66,967	958,613	909,127	547,202	17,084	241	18,296	62,955	6,853	0	0	7,213,693
17.	Heat Output (TJ)	464,730	0	105,887	5,527	0	0	42	754	0	0	202,308	0	0	0	0	0	0	13,406	0	1,884	793,741

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Sources: ADB (unpublished), APERC (APEC Energy Database), IEA (2011b), Lao PDR Ministry of Energy and Mines (unpublished), and UNSD (2011a).

Table 2.2.6 Asia and the Pacific Energy Balance Table, 2008

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	2,141,454	0	546,891	0	0	0	0	0	0	0	513,917	86,067	138,304	22,805	42	1,615	346,509	1,387	0	43	3,799,033
2.	Imports	309,085	9,001	850,766	334,282	37,203	3,444	62,185	98,534	33,641	99,274	175,951	0	0	0	0	0	120	0	4,645	0	1,683,850
3.	Exports	−314,241	−10,069	−193,639	−246,803	−34,417	−2,214	−83,700	−50,938	−5,086	−70,448	−153,048	0	0	0	0	0	−71	0	−4,528	0	−922,399
4.	International Bunkers	0	0	0	−95,417	−7	0	−2,836	−58,258	0	−34,316	0	0	0	0	0	0	0	0	0	0	−95,417
5.	Stock Changes	−33,086	−7,921	−16,752	−3,275	−937	1,011	−3,548	253	−148	95	−2,192	0	0	0	0	0	−10	0	0	0	−63,234
6.	Total Primary Energy Supply	2,103,212	−8,988	1,187,266	−11,212	1,841	2,242	−27,898	−10,408	28,407	−5,395	534,628	86,067	138,304	22,805	42	1,615	346,547	1,387	117	43	4,401,833
7.	Transfers	0	0	−13,976	16,340	740	−139	−47	−2,332	11,309	6,809	0	0	0	0	0	0	0	0	0	0	2,364
8.	Total Transformation Sector	−1,508,334	127,131	−1,162,599	1,048,174	201,060	39,422	357,400	101,382	46,771	302,139	−164,568	−86,066	−138,304	−22,791	−42	−1,615	−28,728	−189	643,317	81,370	−1,213,244
8.1	Power Generation	−1,175,513	−15,247	−9,665	−80,337	−1	−141	−19,595	−51,472	−795	−8,333	−221,244	−86,066	−138,304	−22,791	−42	−1,615	−19,516	−189	643,317	81,370	−1,045,842
8.2	Gas Processing	−7,121	−1,823	0	−1,445	0	0	0	−20	−946	−479	56,758	0	0	0	0	0	0	0	0	0	46,369
8.3	Refineries	0	0	−1,158,445	1,136,306	201,062	39,563	376,995	152,896	48,800	316,992	0	0	0	0	0	0	0	0	0	0	−22,138
8.4	Coal Transformation	−325,700	144,202	0	−727	0	0	0	−21	0	−706	−82	0	0	0	0	0	0	0	0	0	−182,306
8.5.	Other Transformation	0	−1	5,511	−5,623	0	0	0	0	−287	−5,336	0	0	0	0	0	0	−9,212	0	0	0	−9,326
9.	Loss and Own Use	−69,349	−10,903	−12,150	−48,315	−827	−125	−5,968	−5,743	−1,776	−33,876	−61,923	−1	0	0	0	0	−45	0	−107,356	−10,433	−320,474
10.	Discrepancy	1,612	−5,130	9,658	−21,324	140	−123	970	−1,742	−312	−20,258	1,219	0	0	0	0	0	3,203	0	−2,539	−931	−14,231
11.	Total Final Energy Consumption	527,141	102,110	8,199	983,663	202,955	41,277	324,456	81,157	84,399	249,419	309,357	0	0	14	0	0	320,978	1,198	533,537	70,050	2,856,247
12.	Industry Sector	401,585	79,704	3,420	213,569	7,314	5,231	58,199	46,833	15,907	80,085	162,528	0	0	0	0	0	62,711	146	298,686	42,460	1,264,810
13.	Transport Sector	4,470	2	0	437,308	171,588	98	209,962	18,912	9,407	27,341	15,926	0	0	0	0	0	148	0	9,097	99	467,050
14.	Other Sectors	93,556	7,408	0	185,921	23,857	35,848	55,805	14,466	54,173	1,773	104,724	0	0	14	0	0	258,119	1,051	225,754	27,491	904,039
14.1	Residential and Commercial	72,778	6,899	0	115,377	10,249	32,935	11,757	7,301	52,908	227	90,401	0	0	14	0	0	257,919	867	183,432	20,804	748,491
14.1.1	Commerce and Public Services	14,489	873	0	24,114	1,439	3,542	4,803	7,084	7,020	226	22,566	0	0	2	0	0	7,615	105	73,060	1,892	144,716
14.1.2	Residential	58,289	6,026	0	91,263	8,810	29,393	6,954	217	45,888	1	67,835	0	0	12	0	0	250,304	761	110,372	18,912	603,775
14.2	Non–Specified Others	20,778	509	0	70,544	13,608	2,913	44,047	7,166	1,265	1,545	14,323	0	0	0	0	0	200	184	42,322	6,687	155,548
15.	Non–Energy Use	27,530	14,996	4,779	146,864	196	100	491	946	4,912	140,220	26,179	0	0	0	0	0	0	0	0	0	220,348
16.	Electricity Output (GWh)	4,382,535	1,147	343,379	83,471	0	15	1,207	1,884	0	68,605	1,007,866	1,000,766	530,715	18,115	493	21,141	75,274	6,699	0	0	7,471,599
17.	Heat Output (TJ)	1,860,507	0	113,901	3,977	0	0	42	586	0	0	253,062	0	0	0	0	0	0	12,733	0	1,800	2,245,981

GWh = gigawatt–hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Sources: ADB (unpublished), APERC (APEC Energy Database), IEA (2011b), Lao PDR Ministry of Energy and Mines (unpublished), and UNSD (2011a).

Table 2.2.7 Asia and the Pacific Energy Balance Table, 2009

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	2,268,428	0	543,664	0	0	0	0	0	0	0	509,615	87,603	145,454	23,235	78	2,103	340,666	1,511	0	40	3,922,397
2.	Imports	344,929	7,770	876,675	346,558	38,544	2,697	65,152	104,016	34,605	101,544	166,736	0	0	0	0	0	125	0	4,792	0	1,747,586
3.	Exports	−333,903	−687	−194,738	−271,826	−43,183	−2,790	−97,357	−51,124	−5,350	−72,021	−130,052	0	0	0	0	0	−179	0	−4,072	0	−935,456
4.	International Bunkers	0	0	0	−98,477	0	0	−5,797	−58,158	0	−34,522	0	0	0	0	0	0	0	0	0	0	−98,477
5.	Stock Changes	−40,786	−15,851	−5,580	2,944	−781	224	133	1,542	257	1,569	737	0	0	0	0	0	24	0	0	0	−58,511
6.	Total Primary Energy Supply	2,238,667	−8,767	1,220,021	−20,801	−5,420	131	−37,869	−3,724	29,511	−3,430	547,037	87,603	145,454	23,235	78	2,103	340,637	1,511	720	40	4,577,539
7.	Transfers	0	0	−14,492	24,183	820	41	−61	−1,415	11,402	13,396	0	0	0	0	0	0	0	0	0	0	9,691
8.	Total Transformation Sector	−1,564,095	123,629	−1,189,327	1,066,585	219,558	37,947	376,182	86,088	45,164	301,646	−156,664	−87,602	−145,454	−23,191	−78	−2,103	−25,155	−193	662,222	83,034	−1,258,392
8.1	Power Generation	−1,228,973	−13,716	−3,704	−69,205	−1	−128	−18,616	−40,871	−626	−8,962	−232,378	−87,602	−145,454	−23,191	−78	−2,103	−15,582	−193	662,222	83,034	−1,076,923
8.2	Gas Processing	−6,681	−1,090	0	−1,294	0	0	0	−3	−875	−416	75,781	0	0	0	0	0	0	0	0	0	66,716
8.3	Refineries	0	0	−1,191,462	1,143,410	219,559	38,075	394,798	126,979	47,089	316,909	0	0	0	0	0	0	0	0	0	0	−48,052
8.4	Coal Transformation	−328,441	138,436	0	−653	0	0	0	−17	0	−636	−67	0	0	0	0	0	0	0	0	0	−190,726
8.5.	Other Transformation	0	0	5,840	−5,673	0	0	0	0	−424	−5,249	0	0	0	0	0	0	−9,573	0	0	0	−9,407
9.	Loss and Own Use	−80,776	−9,746	−8,509	−47,531	−821	−123	−5,619	−4,991	−1,244	−34,733	−71,970	−2	0	0	0	0	0	0	−106,827	−10,434	−335,795
10.	Discrepancy	−51,914	−3,648	934	−27,266	−5,245	−185	−398	−3,365	2,181	−20,254	6,014	1	0	0	0	0	2,746	0	−2,311	−891	−76,336
11.	Total Final Energy Consumption	541,882	101,468	8,628	995,169	208,892	37,810	332,234	72,594	87,014	256,625	324,417	0	0	44	0	0	318,228	1,318	553,805	71,749	2,916,708
12.	Industry Sector	397,991	79,139	2,340	212,232	8,580	4,851	58,341	39,371	14,835	86,254	179,000	0	0	0	0	0	59,031	152	304,325	42,858	1,277,069
13.	Transport Sector	4,337	1	0	448,434	175,035	82	216,331	19,402	9,359	28,225	17,649	0	0	0	0	0	164	0	9,485	101	480,171
14.	Other Sectors	111,088	6,626	0	185,761	25,023	32,807	57,128	13,075	56,007	1,722	101,094	0	0	44	0	0	259,033	1,166	239,995	28,790	933,595
14.1	Residential and Commercial	73,950	6,166	0	115,762	11,856	30,053	12,704	6,297	54,654	198	89,824	0	0	44	0	0	258,841	880	193,095	21,912	760,473
14.1.1	Commerce and Public Services	15,687	721	0	23,394	1,563	3,617	5,268	5,952	6,796	197	23,260	0	0	6	0	0	7,785	113	75,707	1,865	148,538
14.1.2	Residential	58,262	5,445	0	92,368	10,293	26,436	7,435	345	47,858	1	66,564	0	0	38	0	0	251,056	768	117,387	20,047	611,935
14.2	Non-Specified Others	37,138	460	0	69,999	13,167	2,754	44,424	6,778	1,353	1,524	11,270	0	0	0	0	0	192	286	46,900	6,878	173,123
15.	Non-Energy Use	28,467	15,702	6,288	148,742	255	70	435	746	6,814	140,423	26,674	0	0	0	0	0	0	0	0	0	225,872
16.	Electricity Output (GWh)	4,585,293	1,130	264,041	76,068	0	0	76	489	0	63,964	1,040,237	1,017,639	558,151	26,884	922	28,180	94,513	6,670	0	0	7,699,728
17.	Heat Output (TJ)	1,914,656	0	95,035	2,596	0	0	0	209	0	0	244,729	0	0	0	0	0	0	12,824	0	1,675	2,271,515

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Sources: ADB (unpublished), APERC (APEC Energy Database), IEA (2011b), Lao PDR Ministry of Energy and Mines (unpublished), and UNSD (2011a).

Table 2.2.8 Asia and the Pacific Summary Table, 1990–2009

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Indigenous Production (ktoe)																				
Coal	–	–	–	–	949,470	1,024,453	1,054,243	1,024,101	1,006,991	1,027,410	1,063,271	1,132,130	1,182,133	1,338,917	1,554,198	1,691,072	1,827,514	1,959,637	2,141,454	2,268,428
Oil	–	–	–	–	385,371	397,032	407,565	409,951	425,355	421,207	444,222	445,273	462,428	468,735	490,157	492,527	508,482	520,474	546,891	543,664
Gas	–	–	–	–	249,447	278,430	294,152	292,767	295,851	319,668	348,625	340,740	363,317	389,877	411,758	439,561	450,423	475,891	513,917	509,615
Hydro	–	–	–	–	44,356	46,321	45,602	46,501	49,575	47,751	49,376	54,211	54,762	57,312	64,147	68,313	74,562	78,184	86,067	87,603
Nuclear	–	–	–	–	96,936	107,061	113,178	120,136	125,189	127,537	131,404	132,747	135,893	120,799	137,739	144,738	148,928	142,601	138,304	145,454
Geothermal	–	–	–	–	10,300	11,492	12,529	13,805	16,194	17,790	19,694	19,457	19,592	19,268	20,013	19,881	20,610	20,822	22,805	23,235
Solar	–	–	–	–	2	2	3	4	4	5	6	7	8	9	11	12	15	20	42	78
Wind	–	–	–	–	18	46	80	91	100	136	162	224	277	384	484	717	988	1,394	1,615	2,103
Biomass	–	–	–	–	209,939	219,996	220,236	224,648	226,906	231,097	235,085	238,053	242,209	245,842	320,485	329,960	335,217	341,056	346,509	340,666
Others	–	–	–	–	1,451	1,501	1,521	1,539	1,455	1,368	1,375	1,336	1,297	1,241	1,301	1,306	1,290	1,449	1,430	1,551
Total	–	–	–	–	1,947,289	2,086,333	2,149,110	2,133,544	2,147,620	2,193,970	2,293,222	2,364,177	2,461,917	2,642,384	3,000,292	3,188,087	3,368,029	3,541,528	3,799,033	3,922,397
Primary Energy Supply (ktoe)																				
Coal	–	–	–	–	963,907	1,020,422	1,056,708	1,015,220	996,977	1,036,258	1,063,202	1,091,556	1,138,831	1,294,500	1,534,146	1,681,064	1,806,146	1,933,022	2,094,224	2,229,900
Oil	–	–	–	–	806,058	848,993	901,127	930,873	909,604	945,469	984,263	970,697	998,912	1,036,459	1,101,894	1,109,339	1,136,854	1,163,521	1,176,054	1,199,221
Gas	–	–	–	–	243,980	269,693	283,324	297,007	306,387	321,465	336,460	342,521	361,613	392,090	412,003	432,836	459,274	493,335	534,628	547,037
Hydro	–	–	–	–	44,356	46,321	45,602	46,501	49,575	47,751	49,376	54,211	54,762	57,312	64,147	68,313	74,562	78,184	86,067	87,603
Nuclear	–	–	–	–	96,936	107,061	113,178	120,136	125,189	127,537	131,404	132,747	135,893	120,799	137,739	144,738	148,928	142,601	138,304	145,454
Geothermal	–	–	–	–	10,300	11,492	12,529	13,805	16,194	17,790	19,694	19,457	19,592	19,268	20,013	19,881	20,610	20,822	22,805	23,235
Solar	–	–	–	–	2	2	3	4	4	5	6	7	8	9	11	12	15	20	42	78
Wind	–	–	–	–	18	46	80	91	100	136	162	224	277	384	484	717	988	1,394	1,615	2,103
Biomass	–	–	–	–	209,936	220,018	220,243	224,671	226,937	231,124	235,120	238,080	242,242	245,873	320,537	330,016	335,253	341,197	346,547	340,637
Others	–	–	–	–	2,553	2,006	2,195	1,673	1,742	1,540	1,668	1,636	1,427	1,069	1,034	1,312	1,421	1,171	1,547	2,271
Total	–	–	–	–	2,378,045	2,526,054	2,634,991	2,649,982	2,632,708	2,729,075	2,821,354	2,851,136	2,953,557	3,167,762	3,592,008	3,788,229	3,984,051	4,175,268	4,401,833	4,577,539
Final Energy Consumption by Sector (ktoe)																				
Industry	–	–	–	–	746,003	806,799	827,431	797,032	765,260	808,796	823,894	833,658	862,106	941,879	952,354	1,004,173	1,065,916	1,129,229	1,264,810	1,277,069
Transport	–	–	–	–	273,987	293,664	299,391	314,213	317,748	331,993	343,553	345,624	356,477	372,146	396,515	412,601	423,179	445,183	467,050	480,171
Residential	–	–	–	–	378,763	409,096	429,655	420,708	392,954	413,511	426,849	429,905	443,883	462,469	528,712	548,426	562,572	572,600	603,775	611,935
Commercial	–	–	–	–	86,453	92,126	94,439	99,147	109,536	114,610	111,808	115,770	121,347	127,347	135,688	142,345	140,003	147,116	144,716	148,538
Others	–	–	–	–	260,542	241,821	249,790	253,480	233,316	241,832	242,674	246,174	254,226	272,127	307,190	316,076	330,566	363,552	375,896	398,995
Total	–	–	–	–	1,745,749	1,843,506	1,900,705	1,884,580	1,818,814	1,910,742	1,948,779	1,971,131	2,038,038	2,175,967	2,320,460	2,423,621	2,522,235	2,657,680	2,856,247	2,916,708

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Table 2.2.8 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Final Energy Consumption by Type (ktoe)																				
Coal	–	–	–	–	522,784	545,859	550,141	493,811	424,028	424,995	410,287	408,203	416,049	483,932	471,418	500,272	516,453	544,144	629,251	643,350
Oil	–	–	–	–	634,609	675,450	710,232	734,769	720,122	786,315	808,907	811,829	836,788	863,218	917,339	930,258	948,147	987,892	991,862	1,003,797
Gas	–	–	–	–	119,935	135,271	138,868	135,334	143,908	145,811	148,917	152,882	160,380	171,310	180,596	192,877	211,022	226,926	309,357	324,417
Electricity	–	–	–	–	227,750	241,001	253,372	270,300	278,054	290,951	310,111	323,535	342,868	369,906	398,255	429,757	470,664	512,700	533,537	553,805
Heat	–	–	–	–	36,863	33,411	34,384	33,931	35,081	41,187	45,260	47,057	51,070	54,010	52,928	60,467	61,841	68,262	70,050	71,749
Biomass	–	–	–	–	202,477	211,204	212,426	215,150	216,407	220,345	224,147	226,504	229,804	232,574	298,840	308,893	313,011	316,541	320,978	318,228
Others	–	–	–	–	1,331	1,311	1,282	1,285	1,214	1,138	1,150	1,121	1,080	1,017	1,084	1,098	1,097	1,215	1,212	1,362
Total	–	–	–	–	1,745,749	1,843,506	1,900,705	1,884,580	1,818,814	1,910,742	1,948,779	1,971,131	2,038,038	2,175,967	2,320,460	2,423,621	2,522,235	2,657,680	2,856,247	2,916,708
Power Generation (GWh)																				
Thermal	–	–	–	–	2,358,142	2,522,201	2,681,986	2,809,379	2,871,075	3,049,304	3,304,796	3,459,136	3,701,630	4,089,703	4,343,712	4,704,242	5,114,388	5,651,935	5,818,397	5,966,769
Hydro	–	–	–	–	515,776	538,551	530,190	540,654	576,374	555,180	574,063	630,190	636,658	666,043	745,837	794,354	867,109	909,127	1,000,766	1,017,639
Nuclear	–	–	–	–	373,290	411,826	435,398	461,576	481,704	489,842	504,864	509,948	522,129	463,865	528,547	555,401	571,483	547,202	530,715	558,151
Geothermal	–	–	–	–	10,437	11,213	12,269	13,285	15,038	16,845	17,940	16,654	16,467	16,038	16,537	16,419	17,200	17,084	18,115	26,884
Solar	–	–	–	–	18	22	32	37	44	49	64	76	89	105	120	142	177	241	493	922
Wind	–	–	–	–	207	538	937	1,059	1,162	1,611	1,961	2,803	3,618	5,095	6,728	9,830	13,415	18,296	21,141	28,180
Others	–	–	–	–	16,346	17,747	18,490	20,213	20,364	21,662	22,550	25,213	26,337	29,996	42,641	55,926	60,497	69,808	81,973	101,183
Total	–	–	–	–	3,274,215	3,502,099	3,679,303	3,846,204	3,965,762	4,134,492	4,426,239	4,644,021	4,906,927	5,270,845	5,684,122	6,136,314	6,644,269	7,213,693	7,471,599	7,699,728
Loss and Own Use of Electricity (GWh)																				
Transmission and Distribution Losses	–	–	–	–	189,081	207,934	219,797	227,363	250,419	277,037	295,589	314,781	311,942	319,652	505,992	518,075	575,258	598,372	594,545	630,173
Own Use	–	–	–	–	111,329	117,689	121,868	125,323	127,050	128,086	143,373	150,256	150,565	158,359	314,321	333,240	357,896	389,451	395,290	407,353
Total	–	–	–	–	300,410	325,623	341,665	352,685	377,470	405,123	438,962	465,037	462,507	478,011	820,314	851,315	933,154	987,823	989,835	1,037,526
Fuel Input for Power Generation (ktoe)																				
Coal	–	–	–	–	398,296	431,804	473,412	472,355	487,511	563,844	612,620	643,583	684,133	764,906	871,767	953,211	1,060,861	1,151,115	1,135,213	1,185,526
Oil	–	–	–	–	116,854	113,868	114,005	116,535	101,900	98,572	99,707	90,563	88,171	91,167	91,807	91,806	90,707	88,741	86,483	69,994
Gas	–	–	–	–	91,808	103,535	109,595	117,870	124,301	133,068	142,664	150,039	158,875	167,468	172,900	180,830	184,312	201,164	213,689	225,071
Total	–	–	–	–	606,958	649,207	697,011	706,760	713,712	795,484	854,992	884,184	931,179	1,023,541	1,136,474	1,225,847	1,335,880	1,441,020	1,435,385	1,480,591
CO_2 Emissions (kt C)																				
Coal	–	–	–	–	1,164,267	1,212,430	1,284,880	1,225,225	1,114,763	1,179,191	1,215,979	1,242,699	1,295,404	1,470,828	1,622,019	1,759,821	1,898,795	2,009,155	2,100,885	2,182,061
Oil	–	–	–	–	600,689	631,490	655,056	668,015	657,035	699,411	713,393	704,132	713,892	734,445	788,880	795,042	806,848	816,674	818,335	806,637
Gas	–	–	–	–	144,563	153,639	159,564	168,093	172,577	186,879	199,952	204,818	213,820	229,607	247,044	258,902	272,316	296,194	351,794	373,195
Total	–	–	–	–	1,909,519	1,997,559	2,099,501	2,061,333	1,944,375	2,065,481	2,129,324	2,151,648	2,223,117	2,434,880	2,657,943	2,813,765	2,977,959	3,122,023	3,271,015	3,361,894

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Table 2.2.8 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Macroeconomic Indicators																				
Population (thousand)	2,988,211	3,038,364	3,085,814	3,132,462	3,178,775	3,225,235	3,271,565	3,317,749	3,363,265	3,407,568	3,450,771	3,492,731	3,534,084	3,573,253	3,611,396	3,648,826	3,686,132	3,722,693	3,759,412	3,796,286
Urban Population, %	30.4	30.9	31.4	31.9	32.4	32.9	33.4	33.9	34.5	35.0	35.5	36.1	36.6	37.1	37.7	38.2	38.8	39.3	39.9	40.5
GDP (constant 2000 $ million)	6,315,965	6,566,550	6,750,349	6,936,755	7,181,184	7,478,480	7,813,111	8,070,886	8,022,213	8,237,381	8,611,723	8,792,226	9,059,271	9,409,832	9,890,762	10,366,548	10,923,249	11,589,590	11,898,344	11,917,372
GDP (current $ million)	5,093,987	5,639,597	6,076,520	6,790,589	7,575,924	8,536,004	8,276,749	7,970,209	7,225,123	8,008,567	8,613,753	8,077,432	8,244,630	9,110,423	10,320,348	11,073,297	11,890,954	13,545,400	15,406,706	15,978,030
GDP (constant 2005 PPP $ million)	8,515,029	8,883,313	9,283,865	9,728,694	10,268,635	10,875,193	11,520,949	12,032,881	12,120,764	12,664,741	13,360,764	13,862,122	14,532,733	15,376,102	16,407,341	17,537,514	18,870,349	20,466,740	21,461,369	22,281,833
GDP/capita (constant 2000 $)	2,121	2,168	2,195	2,215	2,259	2,319	2,388	2,433	2,385	2,417	2,496	2,517	2,563	2,633	2,739	2,841	2,963	3,113	3,165	3,139
GDP/capita (current $)	1,721	1,874	1,989	2,182	2,400	2,665	2,548	2,420	2,164	2,368	2,515	2,313	2,333	2,550	2,858	3,035	3,226	3,639	4,098	4,209
GDP - Manufacturing (% of GDP)	21.9	22.3	21.9	21.4	21.3	21.8	22.1	22.2	21.8	22.0	22.6	21.9	21.9	22.8	23.3	23.6	24.0	24.5	24.7	23.5
Car Ownership (car/1,000 persons)	32	33	35	36	37	39	40	42	43	43	44	46	49	51	52	54	56	59	61	64
Basic Energy Indicators																				
TPES/capita (toe/person)	–	–	–	–	0.75	0.78	0.81	0.80	0.78	0.80	0.82	0.82	0.84	0.89	0.99	1.04	1.08	1.12	1.17	1.22
TFEC/capita (toe/person)	–	–	–	–	0.55	0.57	0.58	0.57	0.54	0.56	0.56	0.56	0.58	0.61	0.64	0.66	0.68	0.71	0.76	0.78
TPES/GDP (toe/constant 2000 $ million)	–	–	–	–	331	338	337	328	328	331	328	324	326	337	363	365	365	360	370	385
TFEC/GDP (toe/constant 2000 $ million)	–	–	–	–	243	247	243	234	227	232	226	224	225	231	235	234	231	229	240	245
Import Dependency (%)	–	–	–	–	18.1	17.4	18.4	19.5	18.4	19.6	18.7	17.1	16.6	16.6	16.5	15.8	15.5	15.2	13.7	14.3
Oil Import Dependency (%)	–	–	–	–	52.2	53.2	54.8	56.0	53.2	55.4	54.9	54.1	53.7	54.8	55.5	55.6	55.3	55.3	53.5	54.7
Electricity/capita (kWh/ person)	–	–	–	–	836	869	901	948	962	993	1,045	1,077	1,128	1,204	1,283	1,370	1,485	1,602	1,651	1,714
CO_2 Intensity (t C/constant 2000 $ million)	–	–	–	–	266	267	269	255	242	251	247	245	245	259	269	271	273	269	275	282
CO_2/capita (t C)	–	–	–	–	0.60	0.62	0.64	0.62	0.58	0.61	0.62	0.62	0.63	0.68	0.74	0.77	0.81	0.84	0.87	0.89
CO_2/TPES (t C/toe)	–	–	–	–	0.80	0.79	0.80	0.78	0.74	0.76	0.75	0.75	0.75	0.77	0.74	0.74	0.75	0.75	0.74	0.73

– = data are not available, CO_2 = carbon dioxide, GDP = gross domestic product, GWh = gigawatt-hour, kt C = thousand tons of carbon equivalent, ktoe = thousand tons of oil equivalent, kWh = kilowatt-hour, PPP = purchasing power parity, t C = ton of carbon equivalent, TFEC = total final energy consumption, toe = ton of oil equivalent, TPES = total primary energy supply.

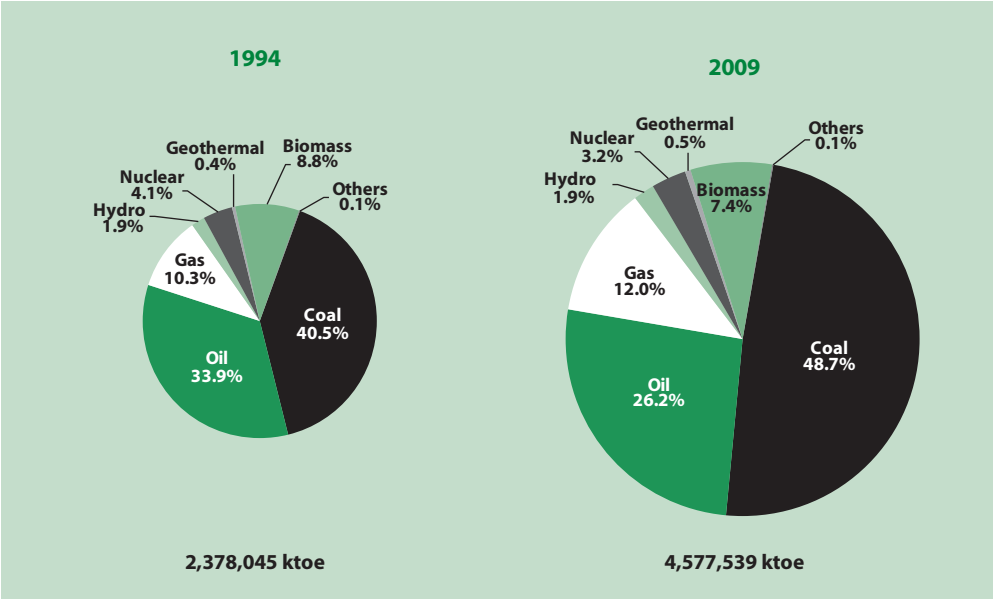
Notes:

1. Figures may not add up to total because of rounding.
2. The following countries are excluded from the calculation of basic energy indicators due to unavailability of energy data: Afghanistan (2009); Bhutan (2009); Cambodia (1994); Cook Islands (2009); Fiji (2009); Kiribati (2009); Maldives (2009); Marshall Islands (1994–2002, 2009); Federated States of Micronesia (1994 - 1999, 2009); Nauru (2009); Palau (2009); Samoa (2009); Solomon Islands (2009); Timor-Leste (1994–2001, 2009); Tonga (2009); Vanuatu (2009).

Sources: ADB (unpublished), APERC (APEC Energy Database), APERC estimates, Government of [Taipei,China] Council for Economic Planning and Development (2011), IEA (2011b), JAMA (2012), Lao PDR Ministry of Energy and Mines (unpublished), and World Bank.

2.3 Analysis of Energy Supply and Demand by Type of Energy

Figure 2.3.1 Primary Energy Supply by Source, 1994 and 2009



ktoe = thousand tons of oil equivalent.
Sources: ADB (unpublished), APERC (APEC Energy Database), IEA (2011b), Lao PDR Ministry of Energy and Mines (unpublished), and UNSD (2011a).

In 2009, the primary energy supply in Asia and the Pacific primarily came from coal (48.7%), oil (26.2%), gas (12.0%), and biomass and others (7.5%). Hydro accounted for 1.9%; nuclear for 3.2%; and geothermal for 0.5% (Figure 2.3.1).

The composition of the TPES in the region changed during the 16-year span from 1994 to 2009, with the increase in the share of coal from 40.5% in 1994 to 48.7% in 2009 and the decrease in the share of oil from 33.9% to 26.2% during the same period. The share of natural gas and hydro slightly increased, while that of nuclear energy slightly decreased. The collective share of other energy, which includes biomass, geothermal, and other renewable energy, decreased from 9.4% to 8.0%.

Coal and Coal Products

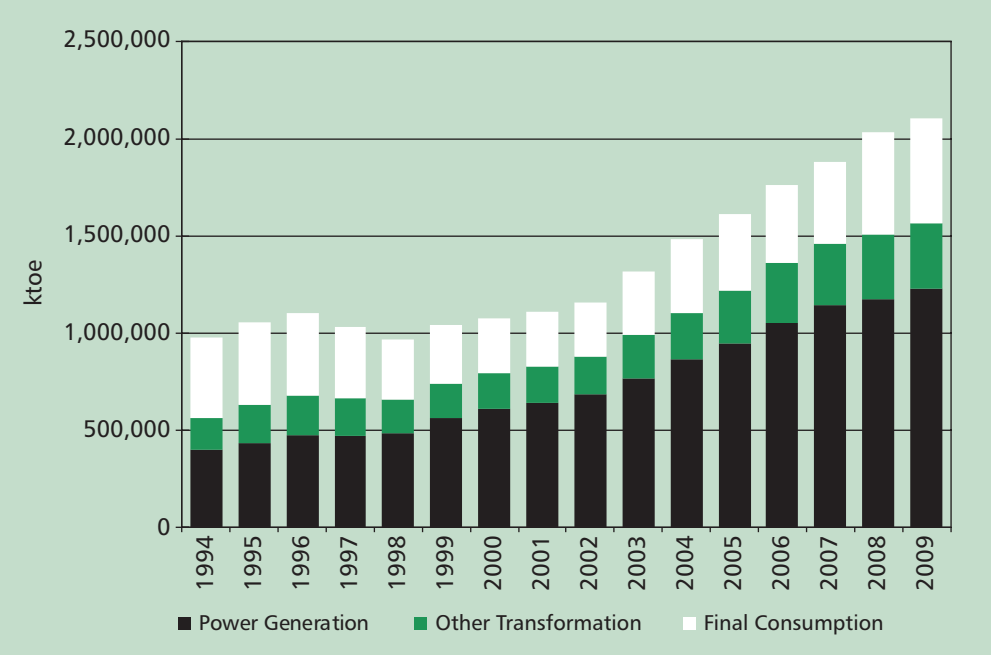
The supply of coal, which is equivalent to the total consumption of fuel, grew at an average annual rate of 5.8%, from 964 toe in 1994 to 2,230 Mtoe in 2009. Its share of TPES was 40.5% in 1994 and increased to 48.7% in 2009.

East Asia had the largest consumption of coal—75.3% in 2009 (Table 2.3.1). This is mostly from consumption in the PRC, which was also responsible for 70.4% of the total coal consumption of Asia and the Pacific. South Asia was the second-largest consumer, responsible for 12.8% of the total, with India's consumption accounting for almost all of the consumption in South Asia.

Southeast Asia registered the fastest average annual growth rate from 1994 to 2009 at 11.0%. However, its share of the total coal consumption remained small at 3.3%, barely increasing from 1.6% in 1994. This is attributed to the construction of coal-fired power plants in Indonesia, Malaysia, the Philippines, Thailand, and Viet Nam that began in the early 1990s.

The supply of coal in Asia and the Pacific was produced endogenously, as the region registered net exports of the product from 1994 to 2009. Coal production in the region amounted to 949 Mtoe in 1994 and 2,268 Mtoe in 2009, while the corresponding coal consumption registered at 964 Mtoe and 2,230 Mtoe, respectively, during the same years (Tables 2.3.1 and 2.3.2). Most of the coal consumption in Asia and the Pacific was for electricity generation, accounting for 55.7% of the total supply in 2009 (Figure 2.3.2).

Figure 2.3.2 Coal Consumption by Major Uses in Asia and the Pacific, 1994–2009



ktoe = thousand tons of oil equivalent.
Sources: ADB (unpublished), APERC (APEC Energy Database), IEA (2011b), Lao PDR Ministry of Energy and Mines (unpublished), and UNSD (2011a).

Table 2.3.1 Coal Supply in Asia and the Pacific, 1990, 1994, and 2009

	1990[a]		1994[b]		2009[c]		AAGR[d]
	ktoe	% Share	ktoe	% Share	ktoe	% Share	%
ADB DMCs in Asia and the Pacific	675,456	85.8	846,744	87.8	2,078,843	93.2	6.2
Asia	675,438	85.8	846,730	87.8	2,078,843	93.2	6.2
Central and West Asia	2,057	0.3	39,997	4.1	38,073	1.7	–0.3
Afghanistan	99	0.0	4	0.0	23	0.0	12.9
Armenia	–	–	16	0.0	0	0.0	–100.0
Azerbaijan	–	–	3	0.0	0	0.0	–100.0
Georgia	–	–	229	0.0	205	0.0	–0.7
Kazakhstan	–	–	35,011	3.6	31,555	1.4	–0.7
Kyrgyz Republic	–	–	859	0.1	433	0.0	–4.5
Pakistan	1,958	0.2	1,937	0.2	4,441	0.2	5.7
Tajikistan	–	–	30	0.0	93	0.0	7.8
Turkmenistan	–	–	0	0.0	0	0.0	–
Uzbekistan	–	–	1,908	0.2	1,346	0.1	–2.3
East Asia	556,771	70.7	661,712	68.6	1,680,019	75.3	6.4
People's Republic of China	512,155	65.1	612,647	63.6	1,568,767	70.4	6.5
Hong Kong, China	6,008	0.8	5,553	0.6	7,154	0.3	1.7
Republic of Korea	25,558	3.2	25,615	2.7	64,844	2.9	6.4
Mongolia	2,488	0.3	2,236	0.2	2,338	0.1	0.3
Taipei,China	10,562	1.3	15,660	1.6	36,916	1.7	5.9
South Asia	103,733	13.2	129,410	13.4	286,242	12.8	5.4
Bangladesh	281	0.0	29	0.0	629	0.0	22.8
Bhutan	13	0.0	17	0.0	113	0.0	14.6
India	103,385	13.1	129,296	13.4	285,364	12.8	5.4
Maldives	0	0.0	0	0.0	0	0.0	–
Nepal	49	0.0	68	0.0	195	0.0	7.3
Sri Lanka	5	0.0	0	0.0	54	0.0	–
Southeast Asia	12,877	1.6	15,612	1.6	74,509	3.3	11.0
Brunei Darussalam	0	0.0	0	0.0	0	0.0	–
Cambodia	–	–	0	0.0	0	0.0	–
Indonesia	4,056	0.5	4,268	0.4	32,805	1.5	14.6
Lao People's Democratic Republic	0	0.0	0	0.0	132	0.0	–
Malaysia	1,355	0.2	1,563	0.2	9,030	0.4	12.4
Myanmar	68	0.0	17	0.0	143	0.0	15.3
Philippines	1,358	0.2	1,350	0.1	5,310	0.2	9.6
Singapore	0	0.0	3	0.0	0	0.0	–100.0
Thailand	3,828	0.5	6,120	0.6	14,444	0.6	5.9
Viet Nam	2,212	0.3	2,291	0.2	12,645	0.6	12.1
The Pacific	18	0.0	14	0.0	0	–	–
Cook Islands	0	0.0	0	0.0	0	0.0	–
Fiji	17	0.0	14	0.0	1	0.0	–19.3
Kiribati	0	0.0	0	0.0	0	0.0	–
Marshall Islands	–	–	0	0.0	0	0.0	–
Federated States of Micronesia	–	–	0	0.0	0	0.0	–
Nauru	0	0.0	0	0.0	0	0.0	–
Palau	–	–	0	0.0	0	0.0	–
Papua New Guinea	1	0.0	0	0.0	0	0.0	–
Samoa	0	0.0	0	0.0	0	0.0	–
Solomon Islands	0	0.0	0	0.0	0	0.0	–
Timor-Leste	–	–	0	0.0	0	0.0	–
Tonga	0	0.0	0	0.0	0	0.0	–
Vanuatu	0	0.0	0	0.0	0	0.0	–
Developed Group	111,613	14.2	117,162	12.2	151,057	6.8	1.7
Australia	34,980	4.4	37,083	3.8	50,930	2.3	2.1
Japan	75,444	9.6	78,864	8.2	98,659	4.4	1.5
New Zealand	1,190	0.2	1,215	0.1	1,468	0.1	1.3
Total Asia and the Pacific (A)	787,070	100.0	963,907	100.0	2,229,900	100.0	5.8
Total World (B)	2,230,821	–	2,164,422	–	3,299,514	–	2.9
A/B (%)	35.3	–	44.5	–	67.6	–	2.8

– = no data or not applicable, AAGR = average annual growth rate, ADB = Asian Development Bank, DMC = developing member country, ktoe = thousand tons of oil equivalent.

Notes: Energy values are rounded to the nearest ones, while percentage values are rounded to the nearest tenths. Figures may not add up to total because of rounding.

[a] Data of the former republics of the Soviet Union in Central and West Asia in 1990 are not included, as these countries had just declared independence from the former Soviet Union during that period.

[b] Column entries for Cambodia are for the year 1995; for the Marshall Islands, for 2003; for the Federated States of Micronesia, for 2000; and for Timor-Leste, for 2000. These values are not included in the regional totals.

[c] Values for Afghanistan, Bhutan, Maldives, Cook Islands, Fiji, Kiribati, Marshall Islands, Federated States of Micronesia, Nauru, Palau, Samoa, Solomon Islands, Timor-Leste, Tonga, and Vanuatu are 2008 data. These values are not included in the regional totals.

[d] Growth rates are estimated from 1994 to 2009, if data are available. Growth rates for Afghanistan, Bhutan, Maldives, Cook Islands, Fiji, Kiribati, Nauru, Samoa, Tonga, and Vanuatu are for the period from 1994 to 2008, while those for Cambodia are from 1995 to 2009; for the Marshall Islands, from 2003 to 2008; for the Federated States of Micronesia, from 2000 to 2008; and for Timor-Leste, from 2002 to 2008. The growth rate in the Pacific was not calculated, as only Papua New Guinea has data for 2009.

Sources: ADB (unpublished), APERC (APEC Energy Database), IEA (2011b), Lao PDR Ministry of Energy and Mines (unpublished), and UNSD (2011a).

Table 2.3.2 Coal Production in Asia and the Pacific, 1990, 1994, and 2009

	1990[a]		1994[b]		2009[c]		AAGR[d]
	ktoe	% Share	ktoe	% Share	ktoe	% Share	%
ADB DMCs in Asia and the Pacific	669,100	85.5	824,972	86.9	2,042,888	90.1	6.2
Asia	669,100	85.5	824,972	86.9	2,042,888	90.1	6.2
Central and West Asia	1,196	0.2	49,333	5.2	47,377	2.1	–0.3
Afghanistan	99	0.0	4	0.0	23	0.0	12.9
Armenia	–	–	0	0.0	0	0.0	–
Azerbaijan	–	–	0	0.0	0	0.0	–
Georgia	–	–	110	0.0	138	0.0	1.5
Kazakhstan	–	–	45,981	4.8	44,281	2.0	–0.3
Kyrgyz Republic	–	–	333	0.0	217	0.0	–2.8
Pakistan	1,097	0.1	1,216	0.1	1,366	0.1	0.8
Tajikistan	–	–	42	0.0	86	0.0	4.9
Turkmenistan	–	–	0	0.0	0	0.0	–
Uzbekistan	–	–	1,647	0.2	1,289	0.1	–1.6
East Asia	550,469	70.3	625,449	65.9	1,565,778	69.0	6.3
People's Republic of China	539,952	69.0	619,963	65.3	1,557,291	68.7	6.3
Hong Kong, China	0	0.0	0	0.0	0	0.0	–
Republic of Korea	7,576	1.0	3,085	0.3	1,159	0.1	–6.3
Mongolia	2,663	0.3	2,233	0.2	7,328	0.3	8.2
Taipei,China	278	0.0	168	0.0	0	0.0	–100.0
South Asia	104,694	13.4	123,804	13.0	244,687	10.8	4.6
Bangladesh	0	0.0	0	0.0	500	0.0	–
Bhutan	1	0.0	45	0.0	87	0.0	4.8
India	104,693	13.4	123,759	13.0	244,177	10.8	4.6
Maldives	0	0.0	0	0.0	0	0.0	–
Nepal	0	0.0	0	0.0	10	0.0	–
Sri Lanka	0	0.0	0	0.0	0	0.0	–
Southeast Asia	12,740	1.6	26,386	2.8	185,046	8.2	13.9
Brunei Darussalam	0	0.0	0	0.0	0	0.0	–
Cambodia	–	–	0	0.0	0	0.0	–
Indonesia	5,785	0.7	17,138	1.8	150,835	6.6	15.6
Lao People's Democratic Republic	0	0.0	0	0.0	304	0.0	–
Malaysia	70	0.0	89	0.0	1,171	0.1	18.7
Myanmar	36	0.0	28	0.0	761	0.0	24.6
Philippines	649	0.1	765	0.1	2,474	0.1	8.1
Singapore	0	0.0	0	0.0	0	0.0	–
Thailand	3,603	0.5	5,174	0.5	5,021	0.2	–0.2
Viet Nam	2,597	0.3	3,192	0.3	24,480	1.1	14.5
The Pacific	0	0.0	0	0.0	0	–	–
Cook Islands	0	0.0	0	0.0	0	0.0	–
Fiji	0	0.0	0	0.0	0	0.0	–
Kiribati	0	0.0	0	0.0	0	0.0	–
Marshall Islands	–	–	0	0.0	0	0.0	–
Federated States of Micronesia	–	–	0	0.0	0	0.0	–
Nauru	0	0.0	0	0.0	0	0.0	–
Palau	–	–	0	0.0	0	0.0	–
Papua New Guinea	0	0.0	0	0.0	0	0.0	–
Samoa	0	0.0	0	0.0	0	0.0	–
Solomon Islands	0	0.0	0	0.0	0	0.0	–
Timor-Leste	–	–	0	0.0	0	0.0	–
Tonga	0	0.0	0	0.0	0	0.0	–
Vanuatu	0	0.0	0	0.0	0	0.0	–
Developed Group	113,459	14.5	124,498	13.1	225,540	9.9	4.0
Australia	106,103	13.6	118,687	12.5	222,226	9.8	4.3
Japan	5,933	0.8	4,049	0.4	654	0.0	–11.4
New Zealand	1,423	0.2	1,762	0.2	2,661	0.1	2.8
Total Asia and the Pacific (A)	782,558	100.0	949,470	100.0	2,268,428	100.0	6.0
Total World (B)	2,240,689	–	2,151,267	–	3,449,466	–	3.2
A/B (%)	34.9	–	44.1	–	65.8	–	2.7

– = no data or not applicable, AAGR = average annual growth rate, ADB = Asian Development Bank, DMC = developing member country, ktoe = thousand tons of oil equivalent.

Notes: Energy values are rounded to the nearest ones, while percentage values are rounded to the nearest tenths. Figures may not add up to total because of rounding.

[a] Data of the former republics of the Soviet Union in Central and West Asia in 1990 are not included, as these countries had just declared independence from the former Soviet Union during that period.

[b] Column entries for Cambodia are for the year 1995; for the Marshall Islands, for 2003; for the Federated States of Micronesia, for 2000; and for Timor-Leste, for 2000. These values are not included in the regional totals.

[c] Values for Afghanistan, Bhutan, Maldives, Cook Islands, Fiji, Kiribati, Marshall Islands, Federated States of Micronesia, Nauru, Palau, Samoa, Solomon Islands, Timor-Leste, Tonga, and Vanuatu are 2008 data. These values are not included in the regional totals.

[d] Growth rates are estimated from 1994 to 2009, if data are available. Growth rates for Afghanistan, Bhutan, Maldives, Cook Islands, Fiji, Kiribati, Nauru, Samoa, Tonga, and Vanuatu are for the period from 1994 to 2008, while those for Cambodia are from 1995 to 2009; for the Marshall Islands, from 2003 to 2008; for the Federated States of Micronesia, from 2000 to 2008; and for Timor-Leste, from 2002 to 2008. The growth rate in the Pacific was not calculated, as only Papua New Guinea has data for 2009.

Sources: ADB (unpublished), APERC (APEC Energy Database), IEA (2011b), Lao PDR Ministry of Energy and Mines (unpublished), and UNSD (2011a).

Crude Oil and Petroleum Products

Oil supply, which is equivalent to consumption, increased by 2.7% per annum on average, from 806 Mtoe in 1994 to 1,199 Mtoe in 2009 (Table 2.3.3). It represented 26.2% of TPES in 2009 (Table 2.3.3), falling from 33.9% in 1994.

East Asia was responsible for 44.6% or 535 Mtoe of the total oil consumption in Asia and the Pacific in 2009 (Table 2.3.3). The region also had the second-fastest annual growth rate of 4.8% per annum from 1994 to 2009 in view of the high rate of motorization in the region.

The Developed Group was the second-largest consumer, accounting for 20.4% of the total in 2009. However, the consumption actually decreased at an average annual rate 1.5% per annum from 1994, anchored by Japan's demand contraction of 2.0% per annum.

South Asia had the fastest growth rate in oil consumption (5.3% per annum). Southeast Asia came in third at 4.1% per annum. The share of South Asia in the total oil consumption of Asia and the Pacific increased from 9.6% in 1994 to 14.1% in 2009. The share of Southeast Asia, on the other hand, increased from 13.3% in 1994 to 16.5% in 2009.

Asia and the Pacific depended on energy imports, especially on oil. In 2009, crude oil production was only equivalent to 45.3% of the total oil consumption (544 Mtoe of 1,199 Mtoe, Table 2.3.4). Although Asia and the Pacific is a net oil importer, Central and West Asia as well as the Pacific are net oil exporters. In 2009, Central and West Asia produced 147 Mtoe of crude oil but only consumed 51 Mtoe.[7] Although 12 of the 14 countries of the Pacific depend on entirely on imports for their oil requirements, the region is a net oil exporter because of the oil production in Papua New Guinea and Timor-Leste.

In terms of final energy consumption, 45.1% of the petroleum products (major products being motor gasoline and automotive diesel oil) were used in the transport sector. From 1994 to 2009, there was a marked increase in the consumption of diesel (Figure 2.3.3).

[7] The net exporting countries in this area are Azerbaijan, Kazakhstan, Turkmenistan, and Uzbekistan.

Table 2.3.3 Oil Consumption in Asia and the Pacific, 1990, 1994, and 2009

	1990[a]		1994[b]		2009[c]		AAGR[d]
	ktoe	% Share	ktoe	% Share	ktoe	% Share	%
ADB DMCs in Asia and the Pacific	355,870	55.6	500,879	62.1	954,505	79.6	4.4
Asia	354,674	55.4	499,582	62.0	952,965	79.5	4.4
Central and West Asia	11,161	1.7	49,671	6.2	51,124	4.3	0.2
Afghanistan	668	0.1	324	0.0	176	0.0	–4.3
Armenia	–	–	340	0.0	371	0.0	0.6
Azerbaijan	–	–	8,451	1.0	3,527	0.3	–5.7
Georgia	–	–	1,951	0.2	878	0.1	–5.2
Kazakhstan	–	–	12,779	1.6	14,393	1.2	0.8
Kyrgyz Republic	–	–	402	0.0	1,197	0.1	7.5
Pakistan	10,493	1.6	13,932	1.7	21,082	1.8	2.8
Tajikistan	–	–	407	0.1	500	0.0	1.4
Turkmenistan	–	–	3,120	0.4	4,649	0.4	2.7
Uzbekistan	–	–	7,965	1.0	4,527	0.4	–3.7
East Asia	193,703	30.2	265,021	32.9	535,281	44.6	4.8
People's Republic of China	114,439	17.9	146,158	18.1	395,328	33.0	6.9
Hong Kong, China	4,790	0.7	6,923	0.9	2,988	0.2	–5.4
Republic of Korea	49,734	7.8	83,417	10.3	93,315	7.8	0.8
Mongolia	822	0.1	363	0.0	784	0.1	5.3
Taipei,China	23,918	3.7	28,160	3.5	42,865	3.6	2.8
South Asia	64,877	10.1	77,576	9.6	169,175	14.1	5.3
Bangladesh	1,791	0.3	2,167	0.3	4,702	0.4	5.3
Bhutan	29	0.0	32	0.0	74	0.0	6.2
India	61,439	9.6	73,019	9.1	159,412	13.3	5.3
Maldives	48	0.0	70	0.0	292	0.0	10.7
Nepal	244	0.0	444	0.1	907	0.1	4.9
Sri Lanka	1,326	0.2	1,844	0.2	4,154	0.3	5.6
Southeast Asia	84,933	13.3	107,314	13.3	197,385	16.5	4.1
Brunei Darussalam	38	0.0	499	0.1	811	0.1	3.3
Cambodia	–	–	472	0.1	1,441	0.1	8.3
Indonesia	30,430	4.8	32,092	4.0	72,172	6.0	5.6
Lao People's Democratic Republic	163	0.0	196	0.0	627	0.1	8.1
Malaysia	12,478	1.9	16,855	2.1	26,577	2.2	3.1
Myanmar	705	0.1	1,137	0.1	1,286	0.1	0.8
Philippines	10,606	1.7	14,548	1.8	13,342	1.1	–0.6
Singapore	9,878	1.5	10,714	1.3	20,421	1.7	4.4
Thailand	17,898	2.8	26,649	3.3	43,754	3.6	3.4
Viet Nam	2,737	0.4	4,624	0.6	16,954	1.4	9.0
The Pacific	1,196	0.2	1,296	0.2	1,540	–	–
Cook Islands	7	0.0	7	0.0	24	0.0	8.9
Fiji	239	0.0	243	0.0	394	0.0	3.5
Kiribati	7	0.0	7	0.0	10	0.0	2.6
Marshall Islands	–	–	34	0.0	33	0.0	–0.7
Federated States of Micronesia	–	–	45	0.0	41	0.0	–1.2
Nauru	43	0.0	44	0.0	47	0.0	0.5
Palau	–	–	62	0.0	70	0.0	0.9
Papua New Guinea	753	0.1	784	0.1	1,540	0.1	4.6
Samoa	42	0.0	41	0.0	54	0.0	1.9
Solomon Islands	54	0.0	51	0.0	64	0.0	1.7
Timor-Leste	–	–	62	0.0	72	0.0	2.4
Tonga	26	0.0	36	0.0	58	0.0	3.4
Vanuatu	23	0.0	21	0.0	33	0.0	3.2
Developed Group	284,499	44.4	305,179	37.9	244,716	20.4	–1.5
Australia	31,201	4.9	33,034	4.1	40,356	3.4	1.3
Japan	249,022	38.9	266,993	33.1	198,267	16.5	–2.0
New Zealand	4,277	0.7	5,153	0.6	6,093	0.5	1.1
Total Asia and the Pacific (A)	640,369	100.0	806,058	100.0	1,199,221	100.0	2.7
Total World (B)	3,226,209	–	3,294,286	–	3,987,412	–	1.3
A/B (%)	19.8	–	24.5	–	30.1	–	1.4

– = no data or not applicable, AAGR = average annual growth rate, ADB = Asian Development Bank, DMC = developing member country, ktoe = thousand tons of oil equivalent.

Notes: Energy values are rounded to the nearest ones, while percentage values are rounded to the nearest tenths. Figures may not add up to total because of rounding.

[a] Data of the former republics of the Soviet Union in Central and West Asia in 1990 are not included, as these countries had just declared independence from the former Soviet Union during that period.

[b] Column entries for Cambodia are for the year 1995; for the Marshall Islands, for 2003; for the Federated States of Micronesia, for 2000; and for Timor-Leste, for 2000. These values are not included in the regional totals.

[c] Values for Afghanistan, Bhutan, Maldives, Cook Islands, Fiji, Kiribati, Marshall Islands, Federated States of Micronesia, Nauru, Palau, Samoa, Solomon Islands, Timor-Leste, Tonga, and Vanuatu are 2008 data. These values are not included in the regional totals.

[d] Growth rates are estimated from 1994 to 2009, if data are available. Growth rates for Afghanistan, Bhutan, Maldives, Cook Islands, Fiji, Kiribati, Nauru, Samoa, Tonga, and Vanuatu are for the period from 1994 to 2008, while those for Cambodia are from 1995 to 2009; for the Marshall Islands, from 2003 to 2008; for the Federated States of Micronesia, from 2000 to 2008; and for Timor-Leste, from 2002 to 2008. The growth rate in the Pacific was not calculated, as only Papua New Guinea has data for 2009.

Sources: ADB (unpublished), APERC (APEC Energy Database), IEA (2011b), Lao PDR Ministry of Energy and Mines (unpublished), and UNSD (2011a).

Table 2.3.4 Crude Oil Production in Asia and the Pacific, 1990, 1994, and 2009

	1990[a]		1994[b]		2009[c]		AAGR[d]
	ktoe	% Share	ktoe	% Share	ktoe	% Share	%
ADB DMCs in Asia and the Pacific	296,097	90.2	355,227	92.2	514,661	94.7	2.5
Asia	291,597	88.8	349,518	90.7	512,643	94.3	2.6
Central and West Asia	2,712	0.8	42,155	10.9	146,926	27.0	8.7
Afghanistan	9	0.0	0	0.0	0	0.0	–
Armenia	–	–	0	0.0	0	0.0	–
Azerbaijan	–	–	9,609	2.5	50,659	9.3	11.7
Georgia	–	–	46	0.0	51	0.0	0.7
Kazakhstan	–	–	20,374	5.3	77,972	14.3	9.4
Kyrgyz Republic	–	–	88	0.0	75	0.0	–1.1
Pakistan	2,703	0.8	2,864	0.7	3,498	0.6	1.3
Tajikistan	–	–	34	0.0	26	0.0	–1.8
Turkmenistan	–	–	3,613	0.9	9,841	1.8	6.9
Uzbekistan	–	–	5,527	1.4	4,804	0.9	–0.9
East Asia	138,604	42.2	146,143	37.9	193,181	35.5	1.9
People's Republic of China	138,448	42.2	146,085	37.9	189,490	34.9	1.7
Hong Kong, China	0	0.0	0	0.0	0	0.0	–
Republic of Korea	0	0.0	0	0.0	3,418	0.6	–
Mongolia	0	0.0	0	0.0	258	0.0	–
Taipei,China	156	0.0	59	0.0	14	0.0	–8.9
South Asia	35,417	10.8	35,735	9.3	38,597	7.1	0.5
Bangladesh	94	0.0	39	0.0	70	0.0	4.0
Bhutan	0	0.0	0	0.0	0	0.0	–
India	35,323	10.8	35,696	9.3	38,527	7.1	0.5
Maldives	0	0.0	0	0.0	0	0.0	–
Nepal	0	0.0	0	0.0	0	0.0	–
Sri Lanka	0	0.0	0	0.0	0	0.0	–
Southeast Asia	114,864	35.0	125,485	32.6	133,939	24.6	0.4
Brunei Darussalam	7,677	2.3	8,676	2.3	9,301	1.7	0.5
Cambodia	–	–	0	0.0	0	0.0	–
Indonesia	70,733	21.5	73,146	19.0	54,431	10.0	–2.0
Lao People's Democratic Republic	0	0.0	0	0.0	0	0.0	–
Malaysia	30,629	9.3	32,798	8.5	34,771	6.4	0.4
Myanmar	734	0.2	700	0.2	968	0.2	2.2
Philippines	229	0.1	221	0.1	962	0.2	10.3
Singapore	0	0.0	0	0.0	0	0.0	–
Thailand	2,112	0.6	2,716	0.7	16,188	3.0	12.6
Viet Nam	2,750	0.8	7,228	1.9	17,317	3.2	6.0
The Pacific	4,500	1.4	5,709	1.5	2,018	–	–
Cook Islands	0	0.0	0	0.0	0	0.0	–
Fiji	0	0.0	0	0.0	0	0.0	–
Kiribati	0	0.0	0	0.0	0	0.0	–
Marshall Islands	–	–	0	0.0	0	0.0	–
Federated States of Micronesia	–	–	0	0.0	0	0.0	–
Nauru	0	0.0	0	0.0	0	0.0	–
Palau	–	–	0	0.0	0	0.0	–
Papua New Guinea	4,500	1.4	5,709	1.5	2,018	0.4	–6.7
Samoa	0	0.0	0	0.0	0	0.0	–
Solomon Islands	0	0.0	0	0.0	0	0.0	–
Timor-Leste	–	–	7,242	1.6	7,369	1.3	0.3
Tonga	0	0.0	0	0.0	0	0.0	–
Vanuatu	0	0.0	0	0.0	0	0.0	–
Developed Group	32,272	9.8	30,144	7.8	29,003	5.3	–0.3
Australia	29,026	8.8	26,739	6.9	25,503	4.7	–0.3
Japan	555	0.2	764	0.2	798	0.1	0.3
New Zealand	2,692	0.8	2,641	0.7	2,702	0.5	0.2
Total Asia and the Pacific (A)	328,369	100.0	385,371	100.0	543,664	100.0	2.3
Total World (B)	3,228,528	–	3,315,234	–	3,994,479	–	1.3
A/B (%)	10.2	–	11.6	–	13.6	–	1.1

– = no data or not applicable, AAGR = average annual growth rate, ADB = Asian Development Bank, DMC = developing member country, ktoe = thousand tons of oil equivalent.

Notes: Energy values are rounded to the nearest ones, while percentage values are rounded to the nearest tenths. Figures may not add up to total because of rounding.

[a] Data of the former republics of the Soviet Union in Central and West Asia in 1990 are not included, as these countries had just declared independence from the former Soviet Union during that period.

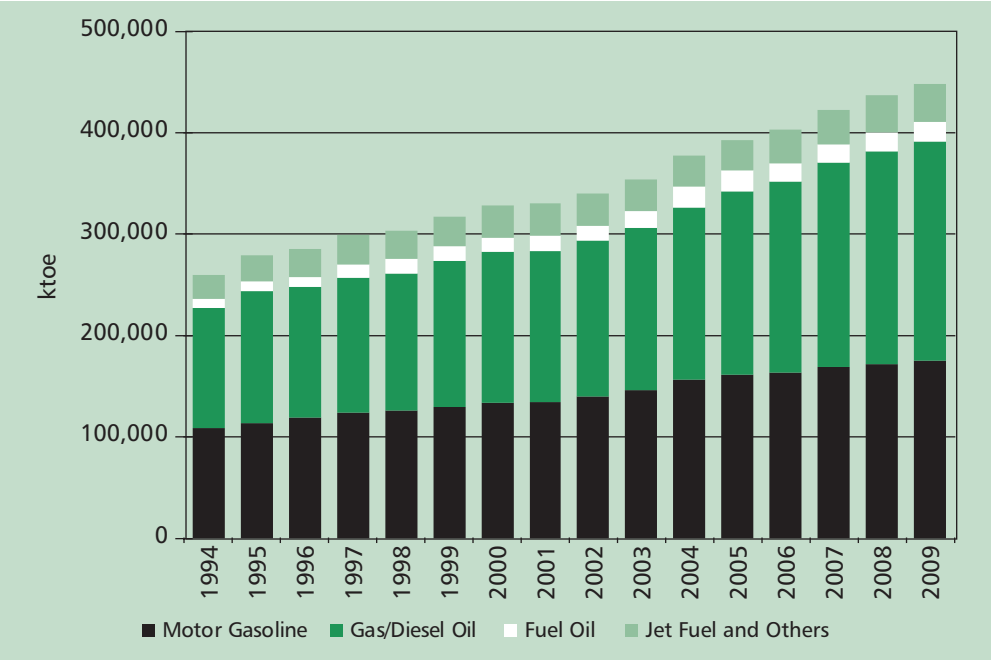
[b] Column entries for Cambodia are for the year 1995; for the Marshall Islands, for 2003; for the Federated States of Micronesia, for 2000; and for Timor-Leste, for 2000. These values are not included in the regional totals.

[c] Values for Afghanistan, Bhutan, Maldives, Cook Islands, Fiji, Kiribati, Marshall Islands, Federated States of Micronesia, Nauru, Palau, Samoa, Solomon Islands, Timor-Leste, Tonga, and Vanuatu are 2008 data. These values are not included in the regional totals.

[d] Growth rates are estimated from 1994 to 2009, if data are available. Growth rates for Afghanistan, Bhutan, Maldives, Cook Islands, Fiji, Kiribati, Nauru, Samoa, Tonga, and Vanuatu are for the period from 1994 to 2008, while those for Cambodia are from 1995 to 2009; for the Marshall Islands, from 2003 to 2008; for the Federated States of Micronesia, from 2000 to 2008; and for Timor-Leste, from 2002 to 2008. The growth rate in the Pacific was not calculated, as only Papua New Guinea has data for 2009.

Sources: ADB (unpublished), APERC (APEC Energy Database), IEA (2011b), Lao PDR Ministry of Energy and Mines (unpublished), and UNSD (2011a).

Figure 2.3.3 Oil Consumption in the Transport Sector in Asia and the Pacific, 1994–2009



ktoe = thousand tons of oil equivalent.
Sources: ADB (unpublished), APERC (APEC Energy Database), IEA (2011b), Lao PDR Ministry of Energy and Mines (unpublished), and UNSD (2011a).

Natural Gas

Asia and the Pacific's self-sufficiency level in natural gas in 2009 was relatively high at 93.2%. The supply of natural gas increased by 5.5% per annum, on average, from 244 Mtoe in 1994 to 547 Mtoe in 2009. Natural gas represented 12.0% of TPES in 2009.

A significant amount of gas was consumed in the industry, residential, and commercial sectors. In 2009, 49.1% of the gas supply was used by these sectors. However, the power sector was also a major gas consumer, using 42.5% of the supply.

The largest natural gas consumer in Asia and the Pacific in 2009 was East Asia, which was responsible for 23.6% (129 Mtoe) of the total consumption. This region surpassed Central and West Asia, which was the largest consumer in 1994. Southeast Asia had the second-largest consumption, accounting for 23.3% (127 Mtoe) of the total, closely followed by the Central and West Asia at 21.1% (115 Mtoe) and the Developed Group with 20.3% (111 Mtoe). Table 2.3.5 shows the natural gas consumption in Asia and the Pacific in 1990, 1994, and 2009.

Table 2.3.5 Natural Gas Consumption in Asia and the Pacific, 1990, 1994, and 2009

	1990[a]		1994[b]		2009[c]		AAGR[d]
	ktoe	% Share	ktoe	% Share	ktoe	% Share	%
ADB DMCs in Asia and the Pacific	75,545	54.6	172,639	70.8	436,171	79.7	6.4
Asia	75,473	54.6	172,559	70.7	435,834	79.7	6.4
Central and West Asia	10,290	7.4	78,339	32.1	115,334	21.1	2.6
Afghanistan	213	0.2	174	0.1	3	0.0	–26.1
Armenia	–	–	706	0.3	1,409	0.3	4.7
Azerbaijan	–	–	7,283	3.0	8,225	1.5	0.8
Georgia	–	–	1,622	0.7	1,086	0.2	–2.6
Kazakhstan	–	–	8,122	3.3	19,193	3.5	5.9
Kyrgyz Republic	–	–	726	0.3	550	0.1	–1.8
Pakistan	10,077	7.3	12,384	5.1	27,297	5.0	5.4
Tajikistan	–	–	648	0.3	363	0.1	–3.8
Turkmenistan	–	–	10,634	4.4	15,070	2.8	2.4
Uzbekistan	–	–	36,040	14.8	42,141	7.7	1.0
East Asia	18,696	13.5	26,686	10.9	129,011	23.6	11.1
People's Republic of China	14,242	10.3	16,347	6.7	83,505	15.3	11.5
Hong Kong, China	0	0.0	0	0.0	2,512	0.5	–
Republic of Korea	2,725	2.0	6,866	2.8	31,713	5.8	10.7
Mongolia	0	0.0	0	0.0	0	0.0	–
Taipei,China	1,728	1.2	3,473	1.4	11,280	2.1	8.2
South Asia	14,292	10.3	19,497	8.0	64,231	11.7	8.3
Bangladesh	3,724	2.7	5,145	2.1	15,321	2.8	7.5
Bhutan	0	0.0	0	0.0	0	0.0	–
India	10,568	7.6	14,352	5.9	48,910	8.9	8.5
Maldives	0	0.0	0	0.0	0	0.0	–
Nepal	0	0.0	0	0.0	0	0.0	–
Sri Lanka	0	0.0	0	0.0	0	0.0	–
Southeast Asia	32,196	23.3	48,037	19.7	127,258	23.3	6.7
Brunei Darussalam	2,033	1.5	1,893	0.8	1,868	0.3	–0.1
Cambodia	–	–	0	0.0	0	0.0	–
Indonesia	16,889	12.2	22,201	9.1	44,842	8.2	4.8
Lao People's Democratic Republic	0	0.0	0	0.0	0	0.0	–
Malaysia	6,801	4.9	12,392	5.1	29,603	5.4	6.0
Myanmar	760	0.5	1,088	0.4	2,742	0.5	6.4
Philippines	0	0.0	5	0.0	3,237	0.6	55.0
Singapore	0	0.0	1,129	0.5	6,233	1.1	12.1
Thailand	5,710	4.1	9,307	3.8	31,631	5.8	8.5
Viet Nam	3	0.0	23	0.0	7,101	1.3	46.8
The Pacific	72	0.1	80	0.0	338	–	10.9
Cook Islands	0	0.0	0	0.0	0	0.0	–
Fiji	0	0.0	0	0.0	0	0.0	–
Kiribati	0	0.0	0	0.0	0	0.0	–
Marshall Islands	–	–	0	0.0	0	0.0	–
Federated States of Micronesia	–	–	0	0.0	0	0.0	–
Nauru	0	0.0	0	0.0	0	0.0	–
Palau	–	–	0	0.0	0	0.0	–
Papua New Guinea	72	0.1	80	0.0	338	0.1	10.1
Samoa	0	0.0	0	0.0	0	0.0	–
Solomon Islands	0	0.0	0	0.0	0	0.0	–
Timor-Leste	–	–	0	0.0	0	0.0	–
Tonga	0	0.0	0	0.0	0	0.0	–
Vanuatu	0	0.0	0	0.0	0	0.0	–
Developed Group	62,740	45.4	71,341	29.2	110,866	20.3	3.0
Australia	15,344	11.1	15,922	6.5	28,286	5.2	3.9
Japan	43,525	31.5	51,367	21.1	79,120	14.5	2.9
New Zealand	3,872	2.8	4,052	1.7	3,460	0.6	–1.0
Total Asia and the Pacific (A)	138,285	100.0	243,980	100.0	547,037	100.0	5.5
Total World (B)	1,670,530	–	1,759,165	–	2,540,218	–	2.5
A/B (%)	8.3	–	13.9	–	21.5	–	3.0

– = no data or not applicable, AAGR = average annual growth rate, ADB = Asian Development Bank, DMC = developing member country, ktoe = thousand tons of oil equivalent.

Notes: Energy values are rounded to the nearest ones, while percentage values are rounded to the nearest tenths. Figures may not add up to total because of rounding.

[a] Data of the former republics of the Soviet Union in Central and West Asia in 1990 are not included, as these countries had just declared independence from the former Soviet Union during that period.

[b] Column entries for Cambodia are for the year 1995; for the Marshall Islands, for 2003; for the Federated States of Micronesia, for 2000; and for Timor-Leste, for 2000. These values are not included in the regional totals.

[c] Values for Afghanistan, Bhutan, Maldives, Cook Islands, Fiji, Kiribati, Marshall Islands, Federated States of Micronesia, Nauru, Palau, Samoa, Solomon Islands, Timor-Leste, Tonga, and Vanuatu are 2008 data. These values are not included in the regional totals.

[d] Growth rates are estimated from 1994 to 2009, if data are available. Growth rates for Afghanistan, Bhutan, Maldives, Cook Islands, Fiji, Kiribati, Nauru, Samoa, Tonga, and Vanuatu are for the period from 1994 to 2008, while those for Cambodia are from 1995 to 2009; for the Marshall Islands, from 2003 to 2008; for the Federated States of Micronesia, from 2000 to 2008; and for Timor-Leste, from 2002 to 2008. The growth rate in the Pacific was not calculated, as only Papua New Guinea has data for 2009.

Sources: ADB (unpublished), APERC (APEC Energy Database), IEA (2011b), Lao PDR Ministry of Energy and Mines (unpublished), and UNSD (2011a).

Table 2.3.6 Natural Gas Production in Asia and the Pacific, 1990, 1994, and 2009

	1990[a]		1994[b]		2009[c]		AAGR[d]
	ktoe	% Share	ktoe	% Share	ktoe	% Share	%
ADB DMCs in Asia and the Pacific	110,522	82.5	220,546	88.4	461,557	90.6	5.0
Asia	110,450	82.5	220,467	88.4	461,219	90.5	5.0
Central and West Asia	10,290	7.7	88,966	35.7	148,676	29.2	3.5
Afghanistan	213	0.2	174	0.1	3	0.0	–26.1
Armenia	–	–	0	0.0	0	0.0	–
Azerbaijan	–	–	5,168	2.1	13,660	2.7	6.7
Georgia	–	–	2	0.0	6	0.0	7.6
Kazakhstan	–	–	3,636	1.5	22,811	4.5	13.0
Kyrgyz Republic	–	–	32	0.0	13	0.0	–5.8
Pakistan	10,077	7.5	12,376	5.0	27,293	5.4	5.4
Tajikistan	–	–	26	0.0	31	0.0	1.2
Turkmenistan	–	–	29,237	11.7	31,063	6.1	0.4
Uzbekistan	–	–	38,315	15.4	53,799	10.6	2.3
East Asia	15,287	11.4	17,074	6.8	80,115	15.7	10.9
People's Republic of China	14,242	10.6	16,347	6.6	79,385	15.6	11.1
Hong Kong, China	0	0.0	0	0.0	0	0.0	–
Republic of Korea	0	0.0	0	0.0	449	0.1	–
Mongolia	0	0.0	0	0.0	0	0.0	–
Taipei,China	1,045	0.8	727	0.3	281	0.1	–6.2
South Asia	14,292	10.7	19,497	7.8	53,802	10.6	7.0
Bangladesh	3,724	2.8	5,145	2.1	15,321	3.0	7.5
Bhutan	0	0.0	0	0.0	0	0.0	–
India	10,568	7.9	14,352	5.8	38,481	7.6	6.8
Maldives	0	0.0	0	0.0	0	0.0	–
Nepal	0	0.0	0	0.0	0	0.0	–
Sri Lanka	0	0.0	0	0.0	0	0.0	–
Southeast Asia	70,582	52.7	94,929	38.1	178,627	35.1	4.3
Brunei Darussalam	7,583	5.7	8,210	3.3	10,604	2.1	1.7
Cambodia	–	–	0	0.0	0	0.0	–
Indonesia	41,040	30.6	53,230	21.3	77,022	15.1	2.5
Lao People's Democratic Republic	0	0.0	0	0.0	0	0.0	–
Malaysia	15,487	11.6	23,068	9.2	47,588	9.3	4.9
Myanmar	760	0.6	1,088	0.4	9,738	1.9	15.7
Philippines	0	0.0	5	0.0	3,237	0.6	55.0
Singapore	0	0.0	0	0.0	0	0.0	–
Thailand	5,710	4.3	9,307	3.7	23,337	4.6	6.3
Viet Nam	3	0.0	23	0.0	7,101	1.4	46.8
The Pacific	72	0.1	80	0.0	338	–	–
Cook Islands	0	0.0	0	0.0	0	0.0	–
Fiji	0	0.0	0	0.0	0	0.0	–
Kiribati	0	0.0	0	0.0	0	0.0	–
Marshall Islands	–	–	0	0.0	0	0.0	–
Federated States of Micronesia	–	–	0	0.0	0	0.0	–
Nauru	0	0.0	0	0.0	0	0.0	–
Palau	–	–	0	0.0	0	0.0	–
Papua New Guinea	72	0.1	80	0.0	338	0.1	10.1
Samoa	0	0.0	0	0.0	0	0.0	–
Solomon Islands	0	0.0	0	0.0	0	0.0	–
Timor-Leste	–	–	0	0.0	0	0.0	–
Tonga	0	0.0	0	0.0	0	0.0	–
Vanuatu	0	0.0	0	0.0	0	0.0	–
Developed Group	23,412	17.5	28,901	11.6	48,058	9.4	3.4
Australia	17,693	13.2	22,817	9.1	41,184	8.1	4.0
Japan	1,847	1.4	2,032	0.8	3,326	0.7	3.3
New Zealand	3,872	2.9	4,052	1.6	3,548	0.7	–0.9
Total Asia and the Pacific (A)	133,934	100.0	249,447	100.0	509,615	100.0	4.9
Total World (B)	1,692,426	–	1,784,661	–	2,526,422	–	2.3
A/B (%)	7.9	–	14.0	–	20.2	–	2.5

– = no data or not applicable, AAGR = average annual growth rate, ADB = Asian Development Bank, DMC = developing member country, ktoe = thousand tons of oil equivalent.

Notes: Energy values are rounded to the nearest ones, while percentage values are rounded to the nearest tenths. Figures may not add up to total because of rounding.

[a] Data of the former republics of the Soviet Union in Central and West Asia in 1990 are not included, as these countries had just declared independence from the former Soviet Union during that period.

[b] Column entries for Cambodia are for the year 1995; for the Marshall Islands, for 2003; for the Federated States of Micronesia, for 2000; and for Timor-Leste, for 2000. These values are not included in the regional totals.

[c] Values for Afghanistan, Bhutan, Maldives, Cook Islands, Fiji, Kiribati, Marshall Islands, Federated States of Micronesia, Nauru, Palau, Samoa, Solomon Islands, Timor-Leste, Tonga, and Vanuatu are 2008 data. These values are not included in the regional totals.

[d] Growth rates are estimated from 1994 to 2009, if data are available. Growth rates for Afghanistan, Bhutan, Maldives, Cook Islands, Fiji, Kiribati, Nauru, Samoa, Tonga, and Vanuatu are for the period from 1994 to 2008, while those for Cambodia are from 1995 to 2009; for the Marshall Islands, from 2003 to 2008; for the Federated States of Micronesia, from 2000 to 2008; and for Timor-Leste, from 2002 to 2008. The growth rate in the Pacific was not calculated, as only Papua New Guinea has data for 2009.

Sources: ADB (unpublished), APERC (APEC Energy Database), IEA (2011b), Lao PDR Ministry of Energy and Mines (unpublished), and UNSD (2011a).

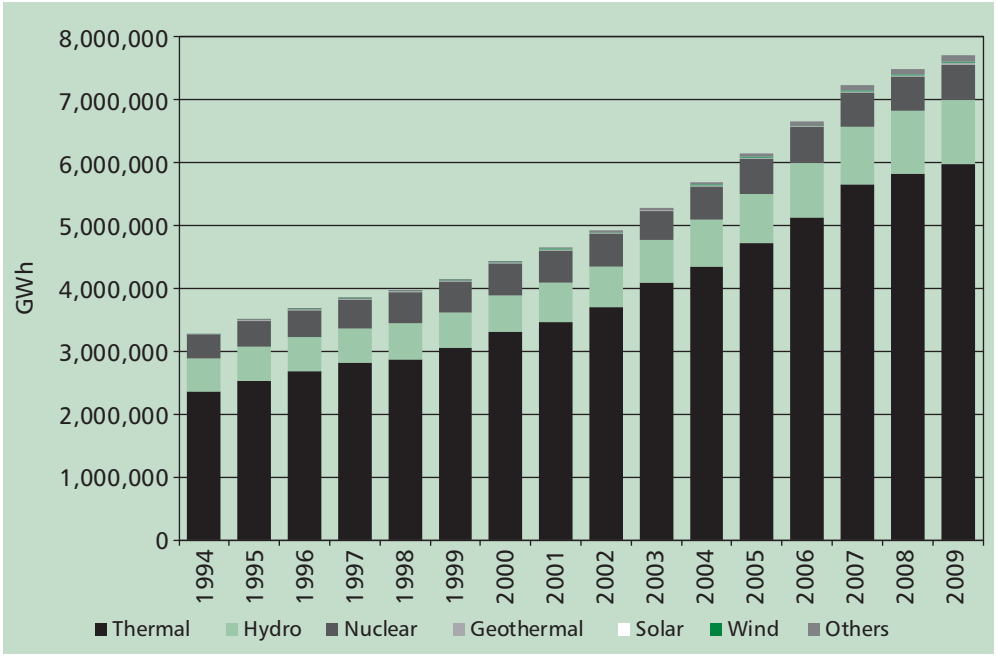
The largest natural gas producer in Asia and the Pacific was Southeast Asia, accounting for 35.1% or 179 Mtoe of the region's natural gas production in 2009 (Table 2.3.6). The second-largest producer was Central and West Asia, having contributed 29.2% or 149 Mtoe during the same year (Table 2.3.6).

Electricity

Power generation rose by 5.9% per annum on average, from 3,274 terawatt-hours (TWh) in 1994 to 7,700 TWh in 2009 (Figure 2.3.4). Thermal power generation increased by 6.4% per annum from 2,358 TWh in 1994 to 5,967 TWh in 2009. As a result, the share of thermal power generation increased to 77.5% of the total in 2009. Nuclear power generation grew by 2.7% per annum on average, from 373 TWh in 1994 to 558 TWh in 2009. Hydropower generation rose by 4.6% per annum on average, from 516 TWh in 1994 to 1,018 TWh in 2009.

Thermal power generation, which uses fossil fuels, dominates electricity generation in Asia and the Pacific. In 2009, 80.3% of the total fossil fuels consumed for electricity generation was coal, with natural gas having a 15.0% share, and oil taking the remainder of 4.7% (Figure 2.3.5).

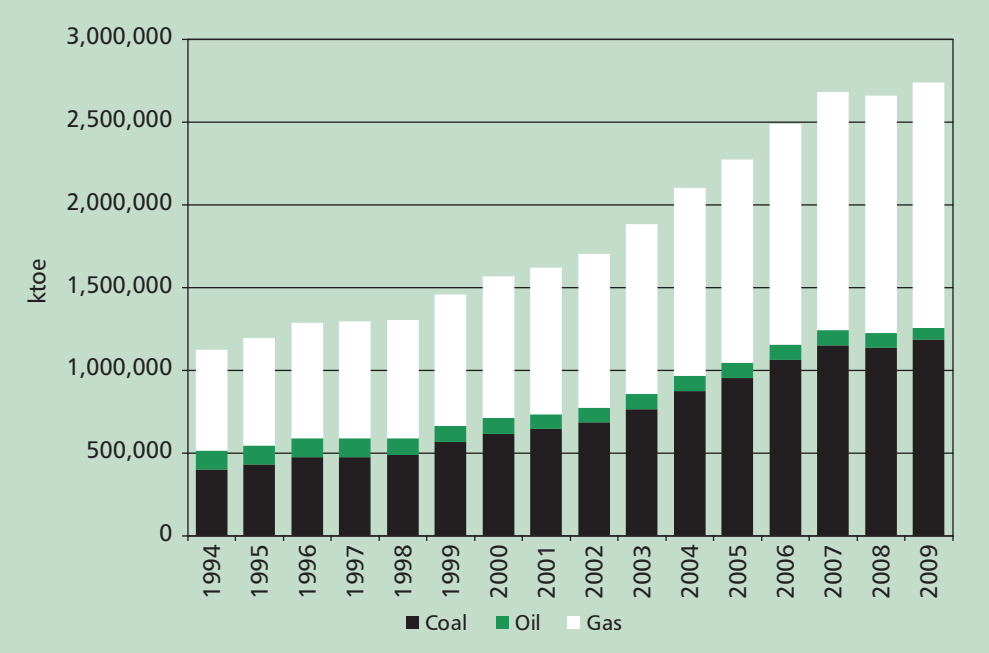
Figure 2.3.4 Electricity Generation in Asia and the Pacific, 1994–2009



GWh = gigawatt-hour.
Sources: ADB (unpublished), APERC (APEC Energy Database), IEA (2011b), Lao PDR Ministry of Energy and Mines (unpublished), and UNSD (2011a).

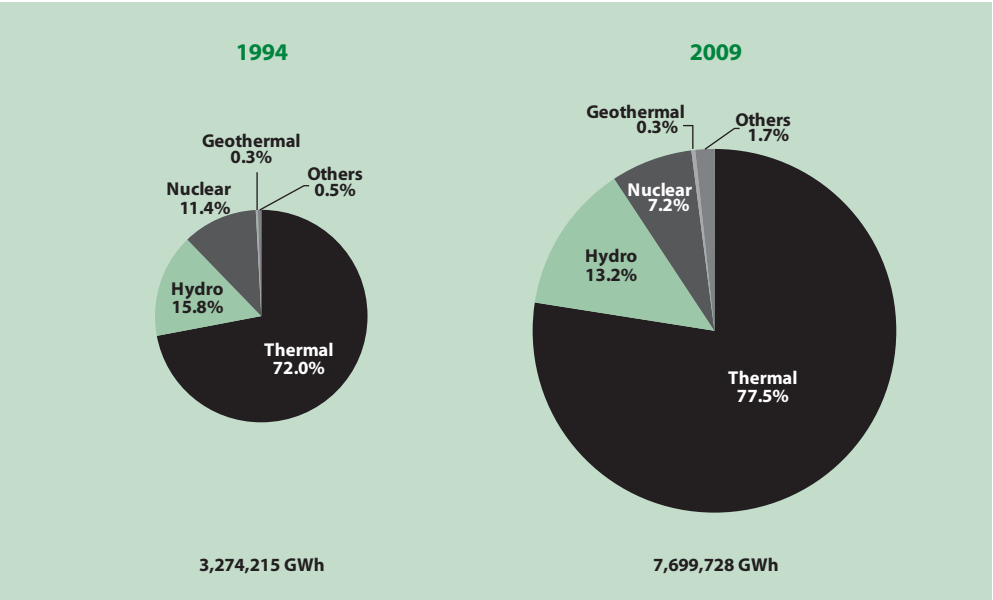
Electricity consumption per capita in Asia and the Pacific varied widely among the countries and country groupings (Figure 2.3.6 and Table 2.3.7). For instance, electricity consumption per capita in the Developed Group reached 7,858 kilowatt-hours (kWh) in 2009, compared to 477 kWh in the Pacific in 2008. Likewise, the electricity consumption per capita in the ADB DMCs was only 1,451 kWh. For the whole Asia and the Pacific, the amount is 1,714 kWh. Yet Asia and the Pacific electricity consumption per capita is only 69.7% of the world's average, which could be attributed to the very low electrification rates in most of the DMCs in the Pacific, South Asia, and Southeast Asia.

Figure 2.3.5 Fuel Inputs for Electricity Generation in Asia and the Pacific, 1994–2009



ktoe = thousand tons of oil equivalent.
Sources: ADB (unpublished), APERC (APEC Energy Database), IEA (2011b), Lao PDR Ministry of Energy and Mines (unpublished), and UNSD (2011a).

Figure 2.3.6 Electricity Generation in Asia and the Pacific, 1994 and 2009



GWh = gigawatt-hour.
Sources: ADB (unpublished), APERC (APEC Energy Database), IEA (2011b), Lao PDR Ministry of Energy and Mines (unpublished), and UNSD (2011a).

Table 2.3.7 Electricity Consumption per Capita, 1990, 1994, and 2009

	1990[a]	1994[b]	2009[c]	AAGR[d]
	kWh	kWh	kWh	%
ADB DMCs in Asia and the Pacific	428	543	1,451	6.8
Asia	428	543	1,453	6.8
Central and West Asia	223	890	969	0.6
Afghanistan	21	29	55	4.5
Armenia	–	983	1,455	2.7
Azerbaijan	–	1,888	1,387	–2.0
Georgia	–	1,923	1,332	–2.4
Kazakhstan	–	3,580	4,496	1.5
Kyrgyz Republic	–	1,842	1,353	–2.0
Pakistan	257	319	436	2.1
Tajikistan	–	2,517	1,997	–1.5
Turkmenistan	–	1,232	1,868	2.8
Uzbekistan	–	1,708	1,483	–0.9
East Asia	665	745	2,617	8.7
People's Republic of China	534	559	2,287	9.8
Hong Kong, China	4,178	4,835	5,931	1.4
Republic of Korea	2,202	3,297	8,324	6.4
Mongolia	1,300	833	1,175	2.3
Taipei,China	3,666	4,687	8,739	4.2
South Asia	222	282	553	4.6
Bangladesh	45	65	245	9.3
Bhutan	270	527	1,714	8.8
India	249	316	608	4.5
Maldives	96	181	813	11.3
Nepal	32	37	90	6.1
Sri Lanka	150	198	354	4.0
Southeast Asia	307	436	929	5.2
Brunei Darussalam	3,784	5,403	8,278	2.9
Cambodia	–	10	126	19.5
Indonesia	166	249	567	5.6
Lao People's Democratic Republic	39	60	369	12.9
Malaysia	1,095	1,688	3,447	4.9
Myanmar	44	53	98	4.2
Philippines	344	363	555	2.9
Singapore	4,659	5,529	7,531	2.1
Thailand	672	1,057	1,968	4.2
Viet Nam	94	131	894	13.7
The Pacific	393	290	477	3.4
Cook Islands	941	821	1,516	4.5
Fiji	581	581	921	3.3
Kiribati	110	70	221	8.6
Marshall Islands	–	1,195	1,040	–2.7
Federated States of Micronesia	–	696	693	–0.1
Nauru	3,169	3,016	3,689	1.4
Palau	–	5,309	6,229	2.3
Papua New Guinea	397	239	483	4.8
Samoa	298	354	580	3.6
Solomon Islands	68	124	112	–1.4
Timor-Leste	–	79	123	7.7
Tonga	210	261	389	2.9
Vanuatu	170	189	242	1.8
Developed Group	6,264	6,896	7,858	0.9
Australia	7,573	7,875	9,740	1.4
Japan	6,030	6,714	7,503	0.7
New Zealand	8,180	8,336	8,774	0.3
Total Asia and the Pacific (A)	717	836	1,713	4.9
Total World (B)	1,833	1,869	2,459	1.8
A/B (%)	39.1	44.7	69.6	3.0

– = no data or not applicable, AAGR = average annual growth rate, ADB = Asian Development Bank, DMC = developing member country, ktoe = thousand tons of oil equivalent.

Notes: Energy values are rounded to the nearest ones, while percentage values are rounded to the nearest tenths. Figures may not add up to total because of rounding.

[a] Data of the former republics of the Soviet Union in Central and West Asia in 1990 are not included, as these countries had just declared independence from the former Soviet Union during that period.

[b] Column entries for Cambodia are for the year 1995; for the Marshall Islands, for 2003; for the Federated States of Micronesia, for 2000; and for Timor-Leste, for 2000. These values are not included in the regional totals.

[c] Values for Afghanistan, Bhutan, Maldives, Cook Islands, Fiji, Kiribati, Marshall Islands, Federated States of Micronesia, Nauru, Palau, Samoa, Solomon Islands, Timor-Leste, Tonga, and Vanuatu are 2008 data. These values are not included in the regional totals.

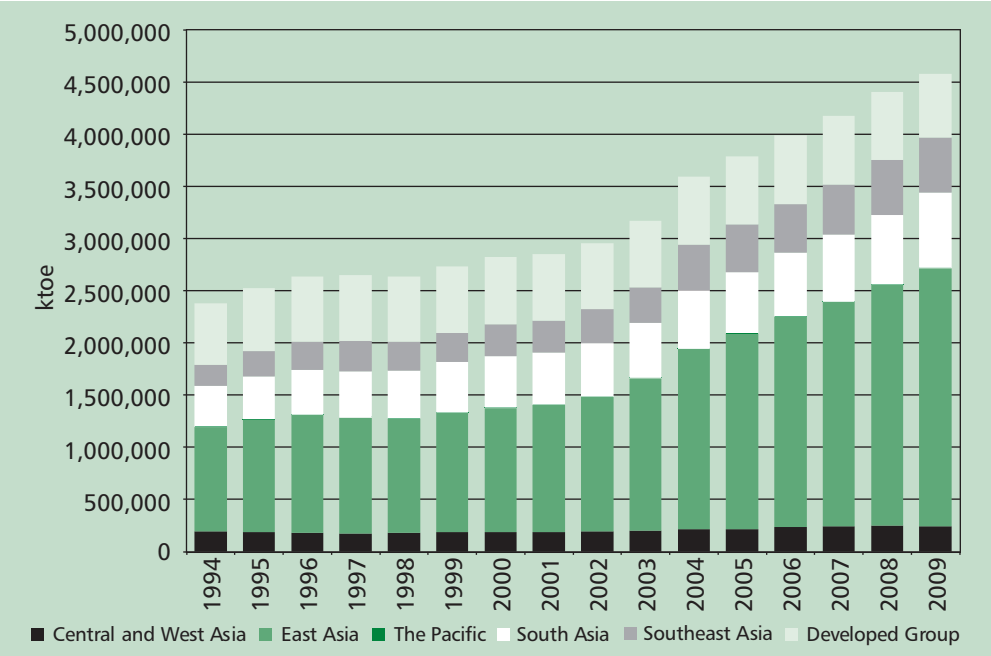
[d] Growth rates are estimated from 1994 to 2009, if data are available. Growth rates for Afghanistan, Bhutan, Maldives, Cook Islands, Fiji, Kiribati, Nauru, Samoa, Tonga, and Vanuatu are for the period from 1994 to 2008, while those for Cambodia are from 1995 to 2009; for the Marshall Islands, from 2003 to 2008; for the Federated States of Micronesia, from 2000 to 2008; and for Timor-Leste, from 2002 to 2008. The growth rate in the Pacific was not calculated, as only Papua New Guinea has data for 2009.

Sources: ADB (unpublished), APERC (APEC Energy Database), IEA (2011b), Lao PDR Ministry of Energy and Mines (unpublished), and UNSD (2011a).

2.4 Regional Energy Trends

By region, from 1994 to 2009, Southeast Asia's primary energy supply grew at the fastest annual growth rate of 6.6%, followed by East Asia at 6.2% per annum, South Asia at 4.2% per annum, and Central and West Asia at 1.4% per annum. Primary energy supply of the Pacific grew by 3.8% per annum from 1994 to 2008. Figure 2.4.1 shows the TPES in Asia and the Pacific by region and group from 1994 to 2009.

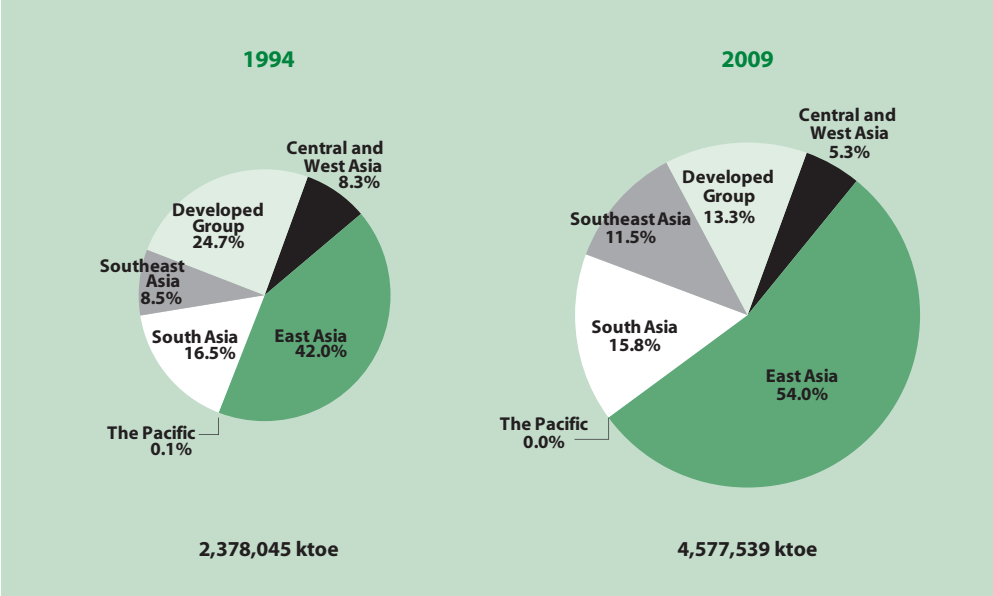
Figure 2.4.1 Primary Energy Supply by Region, 1994–2009



ktoe = thousand tons of oil equivalent.
Sources: ADB (unpublished), APERC (APEC Energy Database), IEA (2011b), Lao PDR Ministry of Energy and Mines (unpublished), and UNSD (2011a).

Of the total primary energy supply in Asia and the Pacific, East Asia represented the largest share at 54.0%, followed by South Asia at 15.8%, the Developed Group at 13.3%, Southeast Asia at 11.5%, Central and West Asia at 5.3% in 2009 (Figure 2.4.2). The Pacific had a share of at 0.1% in 2008.

Figure 2.4.2 Primary Energy Supply by Region, 1994 and 2009

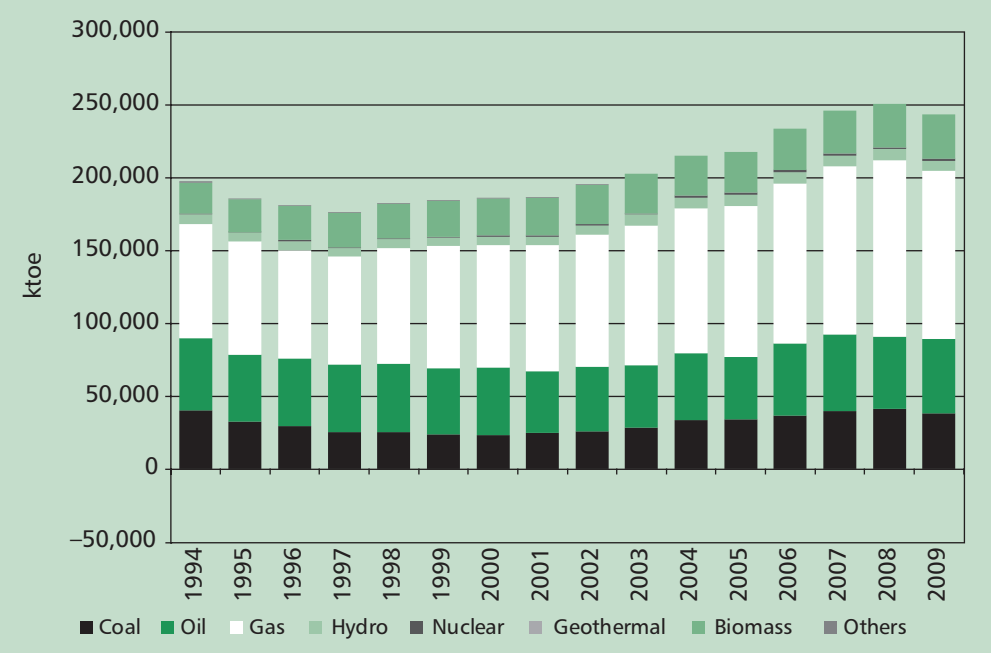


ktoe = thousand tons of oil equivalent.
Sources: ADB (unpublished), APERC (APEC Energy Database), IEA (2011b), Lao PDR Ministry of Energy and Mines (unpublished), and UNSD (2011a).

Central and West Asia

The TPES of Central and West Asia increased from 197 Mtoe in 1994 to 243 Mtoe in 2009, at an average annual rate of 1.4% (Figure 2.4.3).

Figure 2.4.3 Primary Energy Supply in Central and West Asia, 1994–2009

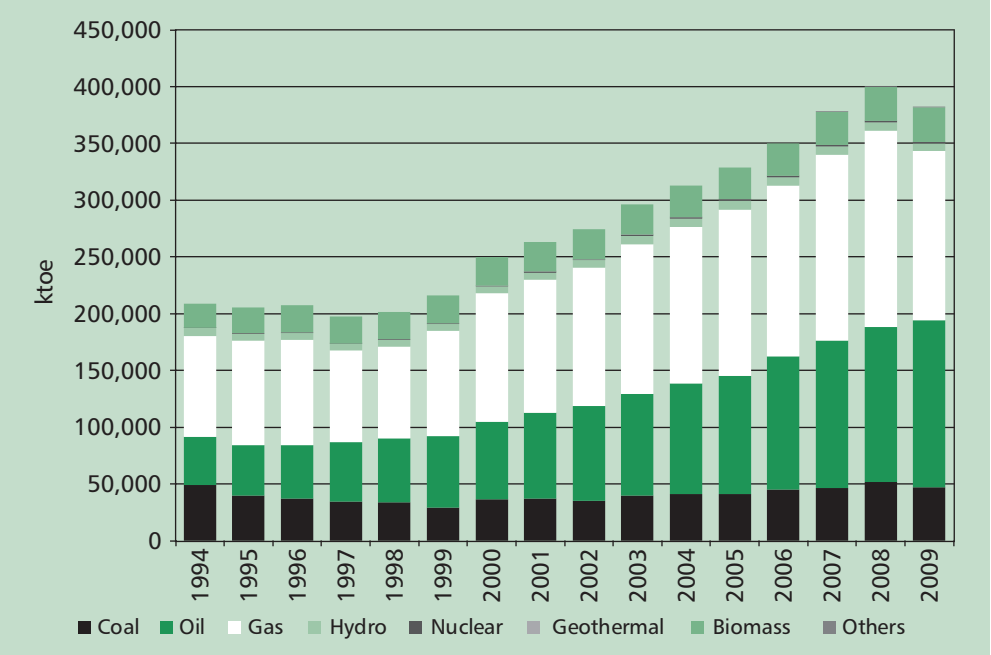


ktoe = thousand tons of oil equivalent.
Sources: IEA (2011b) and UNSD (2011a).

The supply of nuclear energy had the fastest growth rate that averaged 17.0% from 1994 to 2009. The second-fastest growing source was natural gas, which grew by 2.6% per annum, followed by biomass at 2.2% per annum. Hydroelectric energy had a 0.1% annual growth rate, while the supply of oil was the slowest growing at 0.2% per annum on average. Coal consumption decreased at an annual rate of 0.3% on average during the same period.

In terms of the energy sources' share in the TPES, natural gas had the biggest share at 45.7%, followed by oil at 21.1% in 2009 (Figure 2.4.5 Primary Energy Mix in Central and West Asia, 1994 and 2009). Coal accounted for the third-largest share at 15.7%, followed by others (mainly biomass) at 12.4% in the same year. Nuclear energy, despite its high annual growth rate of 8.7% from 1997 to 2009 accounted for a small share of the TPES, at 0.6%.

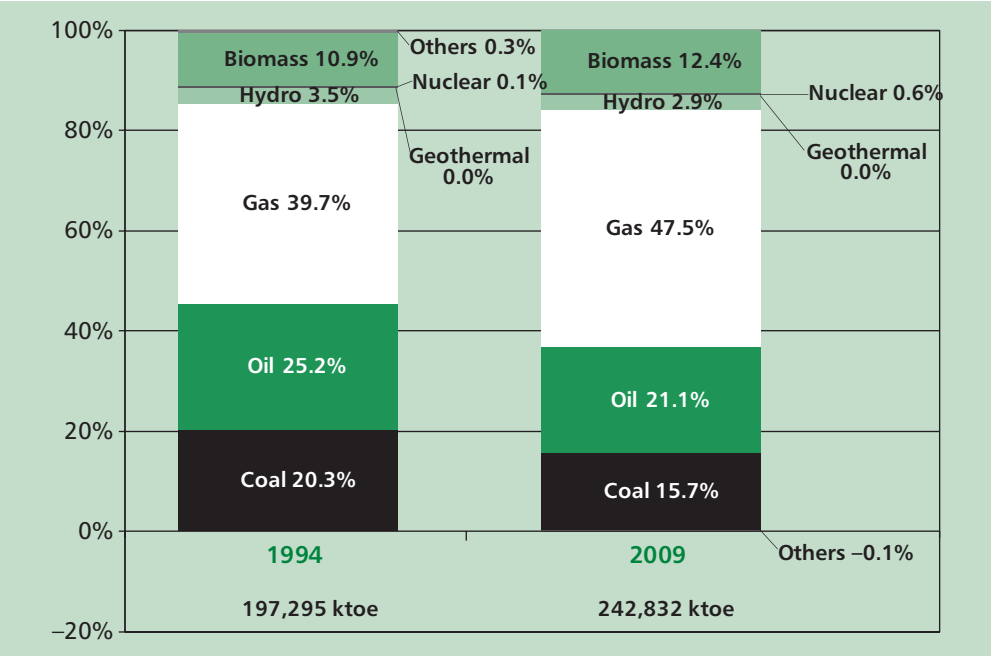
Figure 2.4.4 Indigenous Energy Production in Central and West Asia, 1994–2009



ktoe = thousand tons of oil equivalent.
Sources: IEA (2011b) and UNSD (2011a).

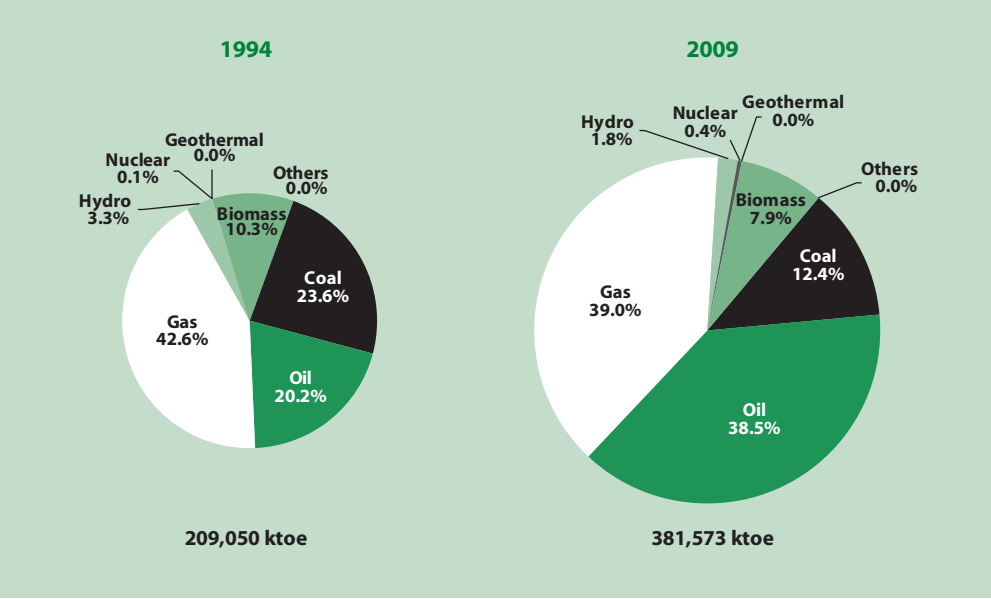
In contrast, indigenous energy production increased at an average annual rate of 4.1%, from 209.0 Mtoe in 1994 to 381.6 Mtoe in 2009 (Figures 2.4.4 and 2.4.6). Coal production in 2009 (47.4 Mtoe) is slightly lower than the production in 1994 (49.3 Mtoe). On the other hand, oil production increased from 42.2 Mtoe in 1994 to 146.9 Mtoe in 2009. Similarly, gas production increased from 89.0 Mtoe in 1994 to 148.7 Mtoe in 2009.

Figure 2.4.5 Primary Energy Mix in Central and West Asia, 1994 and 2009



ktoe = thousand tons of oil equivalent.
Sources: IEA (2011b) and UNSD (2011a).

Figure 2.4.6 Indigenous Energy Production in Central and West Asia, 1994 and 2009



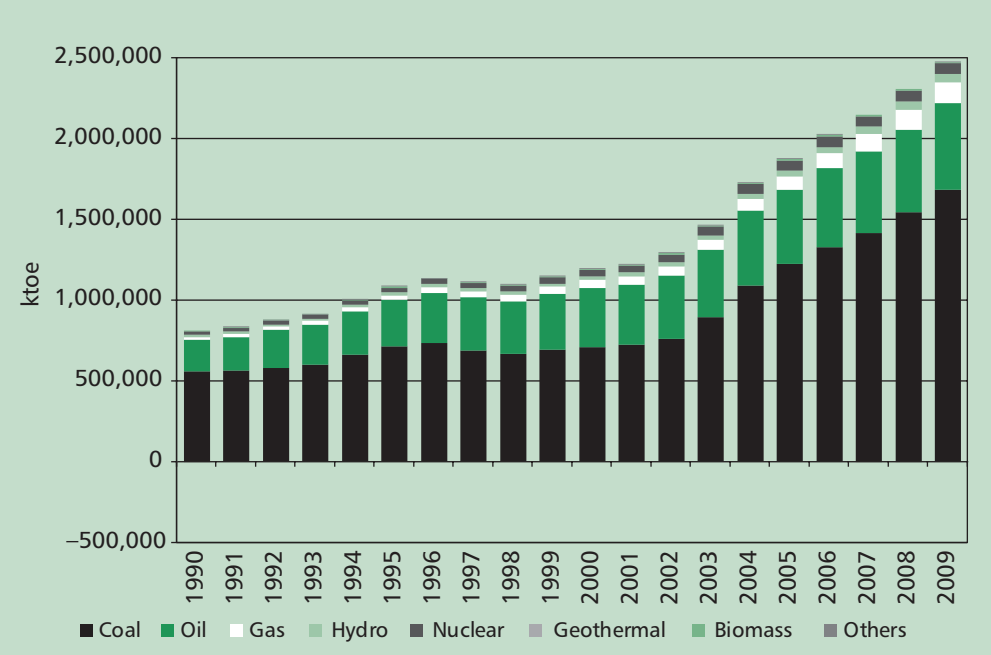
ktoe = thousand tons of oil equivalent.
Sources: IEA (2011b) and UNSD (2011a).

East Asia

The TPES of East Asia more than doubled, from 999 Mtoe in 1994 to 2,471 Mtoe in 2009, growing at an average rate of 6.2% annually (Figure 2.4.7). Natural gas was the fastest-growing fuel, with an average annual growth rate of 11.1%.

Coal represented the largest share of the TPES, at 68.0% in 2009, increasing from 66.3% in 1994. Oil accounted for the second-largest share, at 21.7% in 2009, decreasing from 26.5% in 1994. This was followed by gas and nuclear at 5.2% and 2.7%, respectively, in 2009 (Figure 2.4.9 Primary Energy Mix in East Asia, 1990, 1994, and 2009).

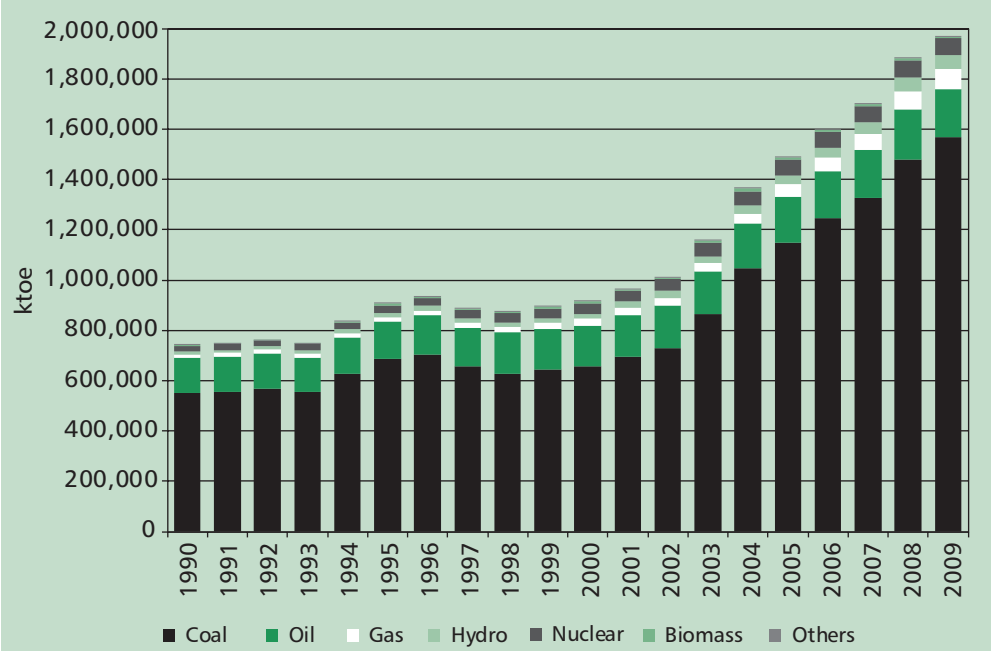
Figure 2.4.7 Primary Energy Supply in East Asia, 1990–2009



ktoe = thousand tons of oil equivalent.
Sources: APERC (APEC Energy Database) and IEA (2011b).

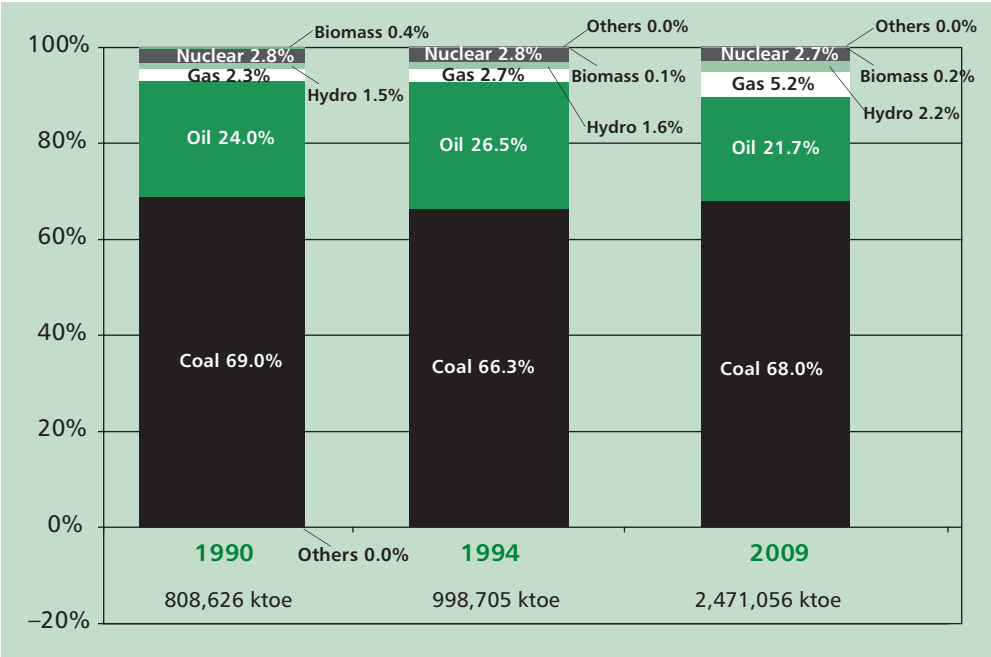
Indigenous energy production increased slower than primary energy supply, at an average rate of 5.9% per annum, increasing from 833.5 Mtoe in 1994 to 1,966.1 Mtoe in 2009 (Figures 2.4.8 and 2.4.10). On an absolute scale, coal production increased the greatest, growing from 625.4 Mtoe in 1994 to 1,565.8 Mtoe in 2009—at an average growth rate of 6.3% per annum.

Figure 2.4.8 Indigenous Energy Production in East Asia, 1990–2009



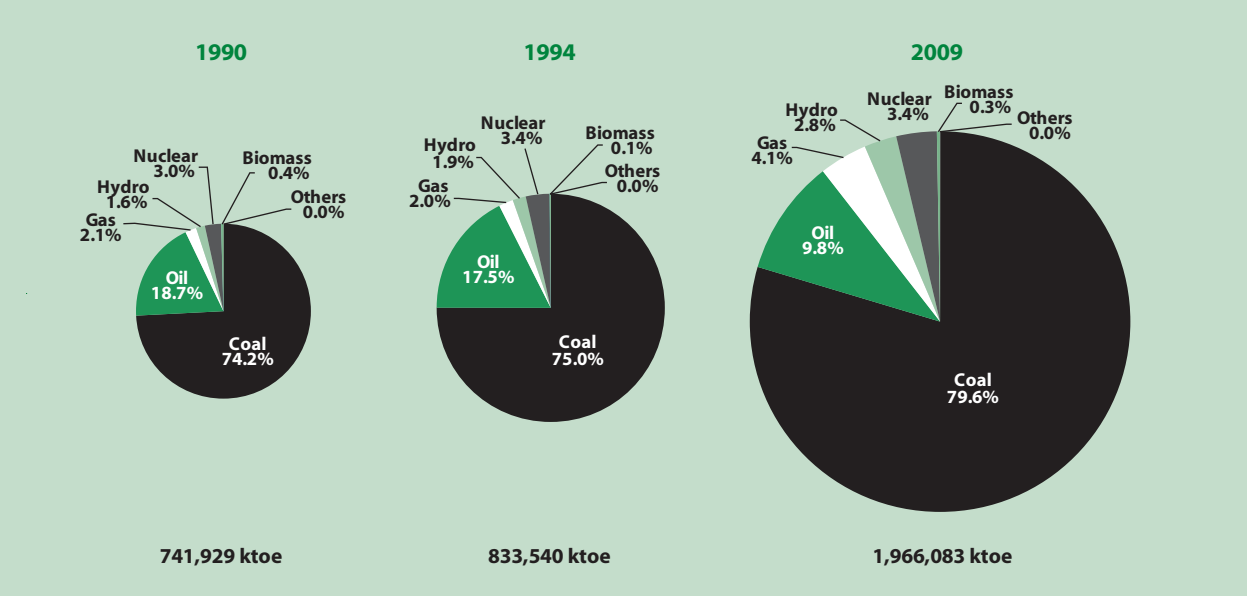
ktoe = thousand tons of oil equivalent.
Sources: APERC (APEC Energy Database) and IEA (2011b).

Figure 2.4.9 Primary Energy Mix in East Asia, 1990, 1994, and 2009



ktoe = thousand tons of oil equivalent.
Sources: APERC (APEC Energy Database) and IEA (2011b).

Figure 2.4.10 Indigenous Energy Production in East Asia, 1990, 1994, and 2009



ktoe = thousand tons of oil equivalent.

Sources: APERC (APEC Energy Database) and IEA (2011b).

The Pacific

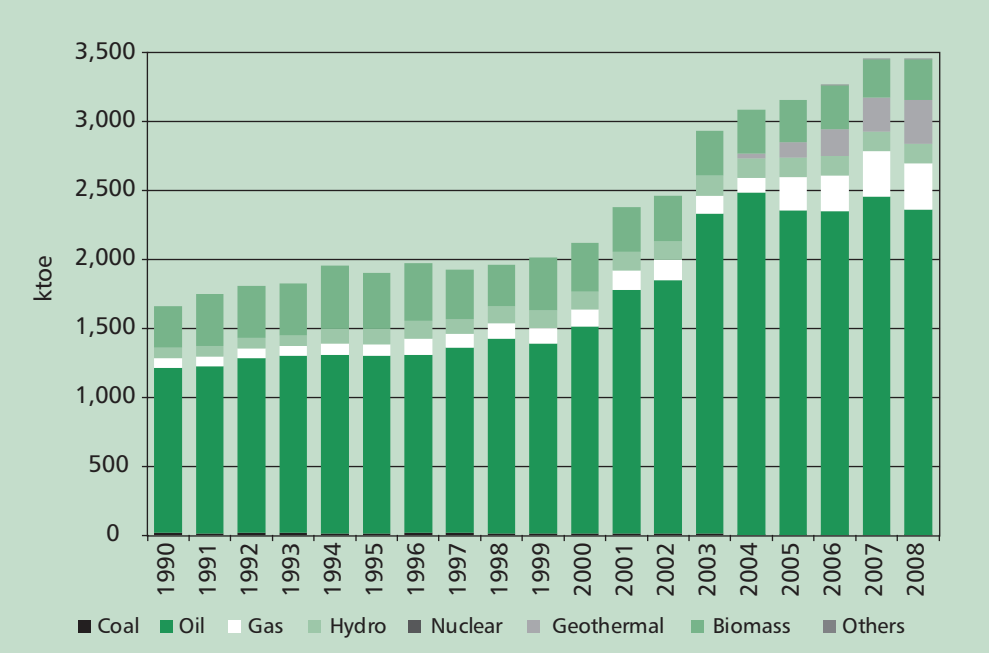
The TPES in the Pacific increased from 2 Mtoe in 1994 to 3 Mtoe in 2008, growing at an annual rate of 3.8%.[8]

Among the energy types in the Pacific's primary energy supply, natural gas grew the fastest, with an annual growth rate of 10.9%, although the product is used only in Papua New Guinea (Figure 2.4.11). Oil had the second-fastest growth rate of 4.4% per annum. The majority of countries in the Pacific imports petroleum products. Oil constituted the largest share of TPES, at 68.4% in 2008, followed by natural gas at 9.8%, geothermal energy at 9.3%, biomass at 8.5%, hydro at 4.1%, and coal at almost zero (Figure 2.4.13).

Figures 2.4.12 and 2.4.14 show the indigenous production of energy in the Pacific. The sudden jump in indigenous energy production in 2002, which is quite apparent in Figure 2.4.12, is due to the addition of Timor-Leste to the roster of ADB members in the Pacific. In 2009, indigenous energy production in the Pacific amounted to 10,562, with oil making up the biggest share (89.7%).

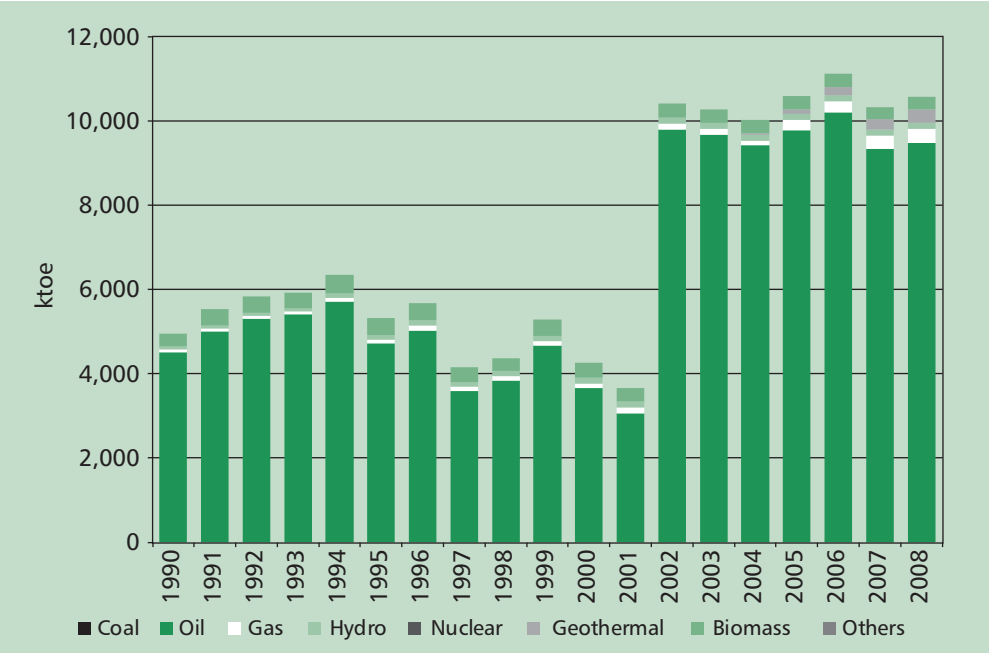
[8] The TPES growth rate considers only 11 of the 14 members in the Pacific, which have data for 1994 and 2000 (excluding the Marshall Islands, Federated States of Micronesia, Timor-Leste, and Tuvalu). As previously noted, not all of the countries in the Pacific have data for 1994. The variability in the availability of energy data among the Pacific countries also explains the sudden jumps in primary energy supply (Figure 2.4.11) and indigenous energy production (Figure 2.4.12).

Figure 2.4.11 Primary Energy Supply in the Pacific, 1990–2008



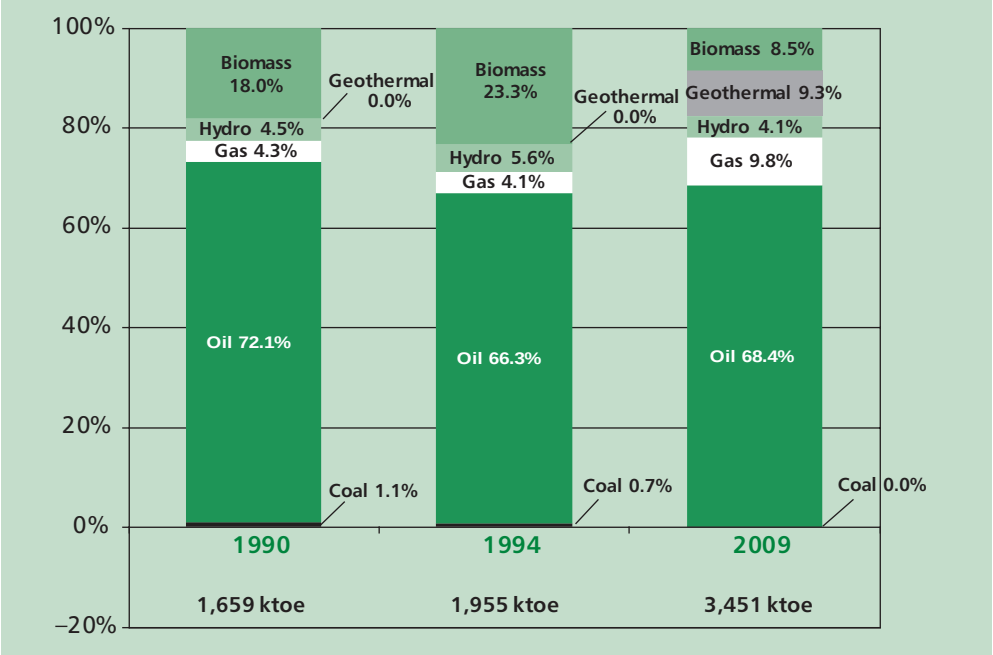
ktoe = thousand tons of oil equivalent.
Note: The real growth of primary energy supply in the Pacific is exaggerated in this figure, as not all of the countries have data from 1990 to 2008. Palau data are available only from 1992; Marshall Islands, from 2003; Federated States of Micronesia, from 2000; and Timor-Leste, from 2002.
Sources: ADB (unpublished), APERC (APEC Energy Database), and UNSD (2011a).

Figure 2.4.12 Indigenous Energy Production in the Pacific, 1990–2008



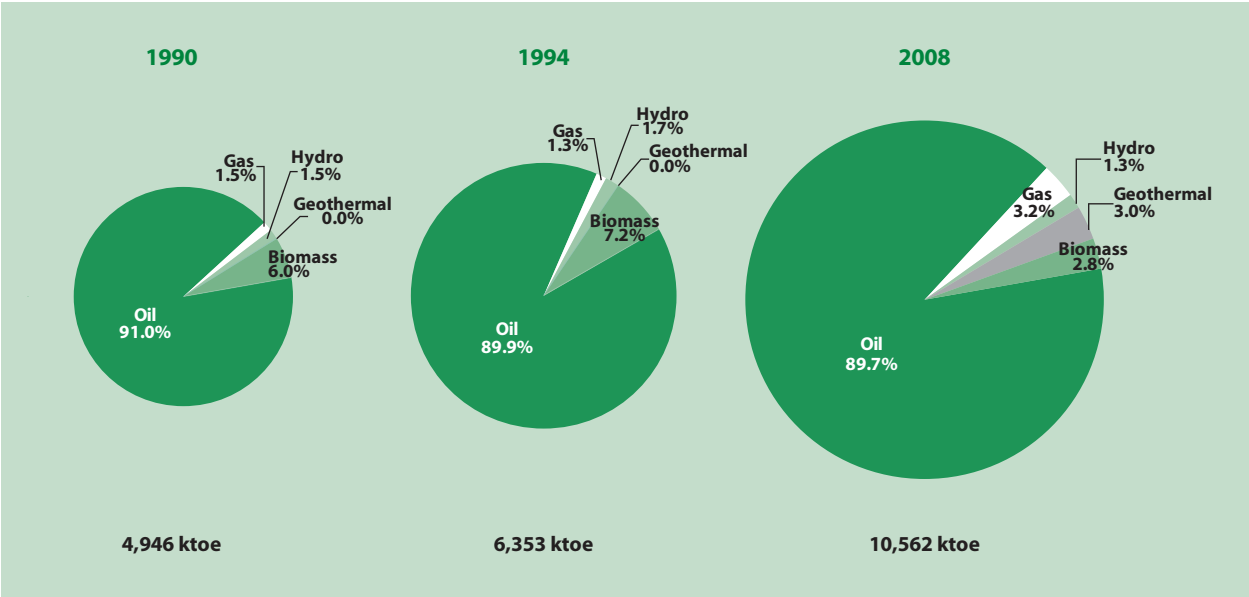
ktoe = thousand tons of oil equivalent.
Note: The sudden jump in indigenous energy production in the Pacific is due to inclusion of Timor-Leste data, which are available only from 2002. As it became a sovereign country only in 1999, before 2001, the production of its oil was lumped with that of Indonesia.
Sources: ADB (unpublished), APERC (APEC Energy Database), and UNSD (2011a).

Figure 2.4.13 Primary Energy Mix in the Pacific, 1990, 1994, and 2008



ktoe = thousand tons of oil equivalent.
Sources: ADB (unpublished), APERC (APEC Energy Database), and UNSD (2011a).

Figure 2.4.14 Indigenous Energy Production in the Pacific, 1990, 1994, and 2008



ktoe = thousand tons of oil equivalent.
Sources: ADB (unpublished), APERC (APEC Energy Database), and UNSD (2011a).

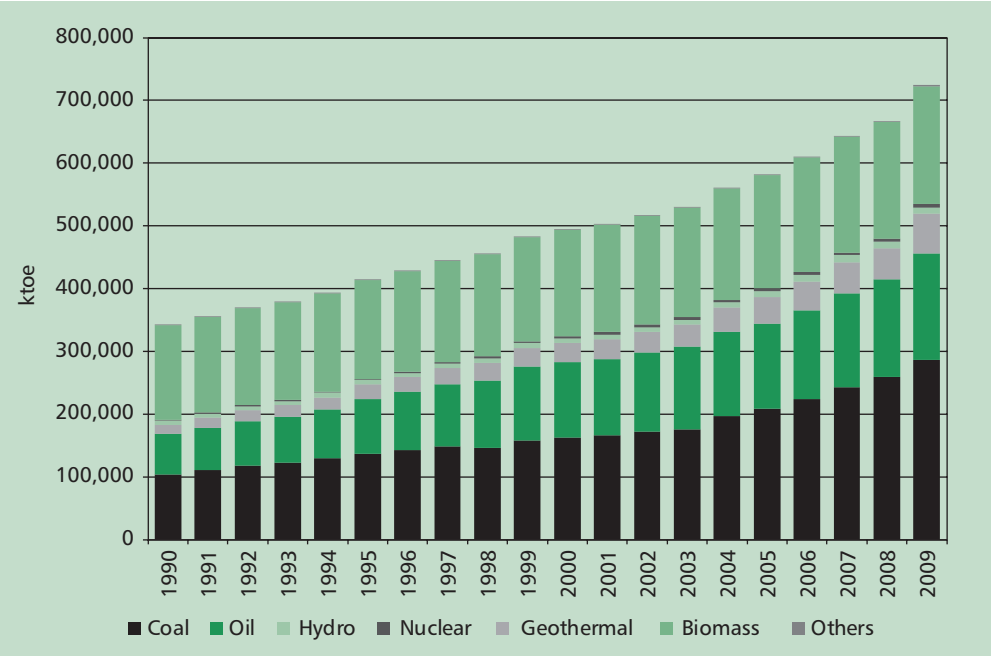
South Asia

The primary energy supply of South Asia increased from 392 Mtoe in 1994 to 725 Mtoe in 2009, at an annual rate of 4.2% (Figure 2.4.15).

From 1994 to 2009, the natural gas supply grew at a fast rate, with an average annual growth of 8.3%. Nuclear energy had an identical annual growth rate of 8.3% in view of the increase in the nuclear electricity-generating capacity in India. Coal also had a rapid growth rate of 5.4% per annum, while oil closely followed at 5.3% per annum. Hydro also increased, although at a slower growth rate of 1.7% per annum. Notably, other energy, which constitutes solar, wind, and liquid biofuels, increased at an average annual rate of 29.9%, although its share to the total primary energy supply constituted a mere 0.2% in 2009.

Coal accounted for the biggest share of the primary energy supply at 39.5% in 2009, followed by biomass at 25.9% and oil at 23.3%. Natural gas had an 8.9% share in 2009. Figure 2.4.17 Primary Energy Mix in South Asia, 1990, 1994, and 2009 shows the primary energy mix in South Asia in 2009.

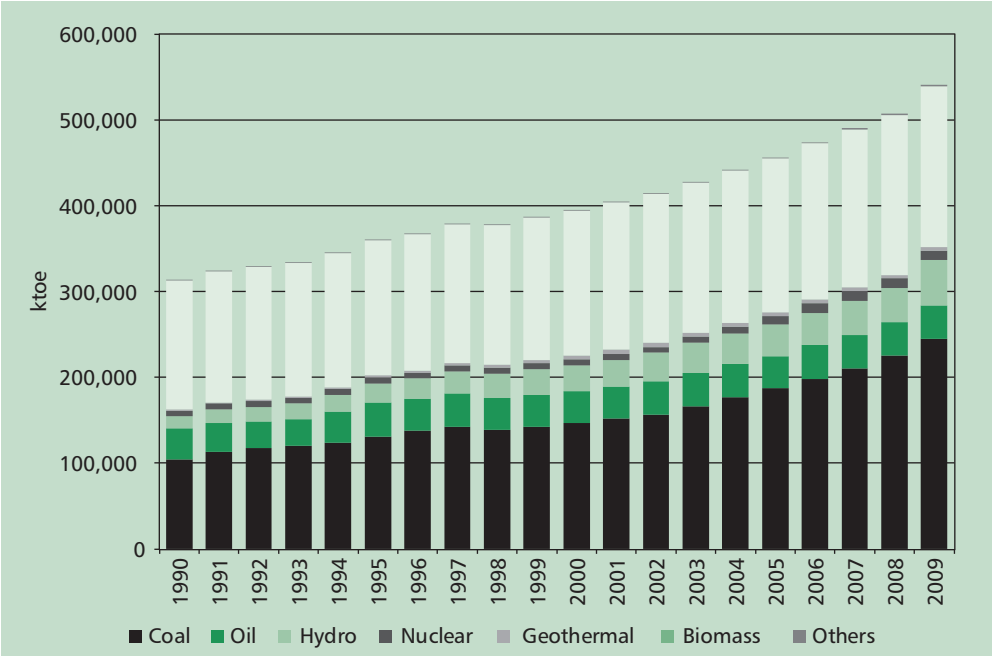
Figure 2.4.15 Primary Energy Supply in South Asia, 1990–2009



ktoe = thousand tons of oil equivalent.
Sources: IEA (2011b) and UNSD (2011a).

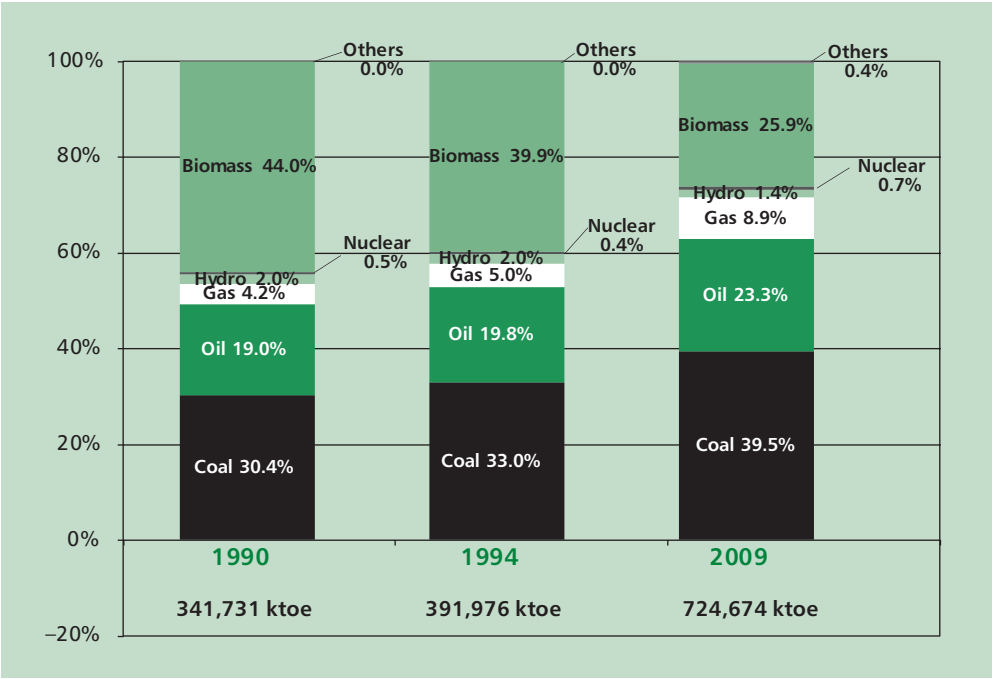
Indigenous energy production in South Asia grew at an average rate of 3.1% per annum, from 344.5 Mtoe in 1994 to 541.2 Mtoe in 2009 (Figures 2.4.16 and 2.4.18). Incremental growth in coal production , which amounts to 120.9 Mtoe, accounted for bulk (61.5%) of the 196.7 Mtoe growth in indigenous energy production. This is followed by the incremental growth in gas and biomass production, which amount to 34.3 Mtoe (17.4%) and 31.3 Mtoe (15.9%), respectively.

Figure 2.4.16 Indigenous Energy Production in South Asia, 1990–2009



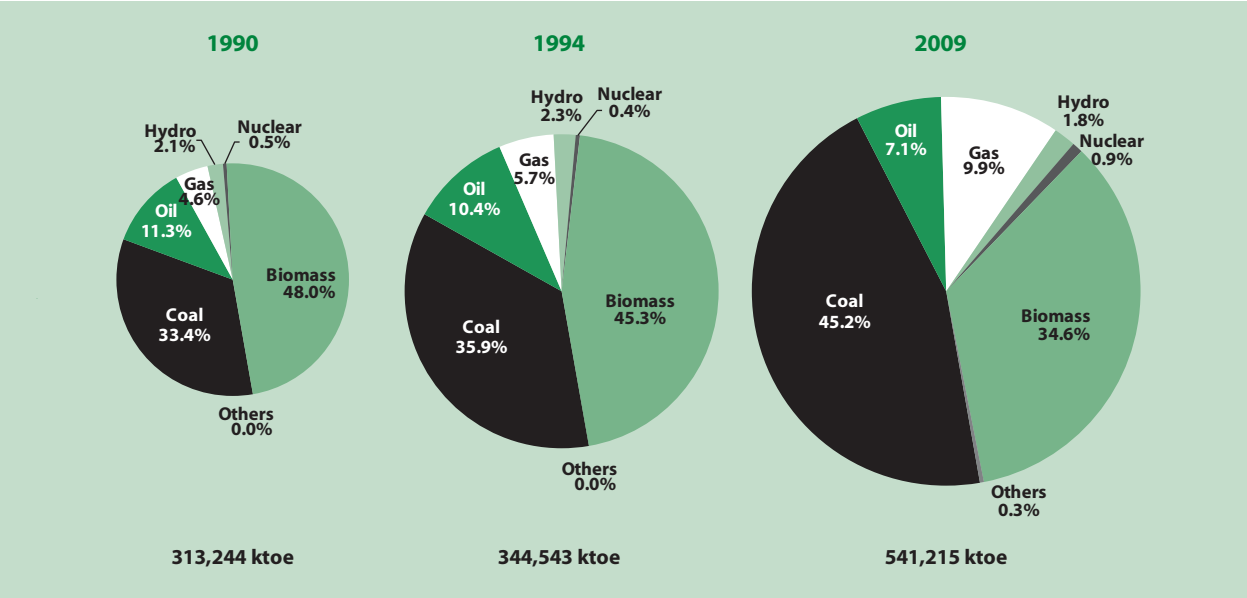
ktoe = thousand tons of oil equivalent.
Sources: IEA (2011b) and UNSD (2011a).

Figure 2.4.17 Primary Energy Mix in South Asia, 1990, 1994, and 2009



ktoe = thousand tons of oil equivalent.
Sources: IEA (2011b) and UNSD (2011a).

Figure 2.4.18 Indigenous Energy Production in South Asia, 1990, 1994, and 2009



ktoe = thousand tons of oil equivalent.
Sources: IEA (2011b) and UNSD (2011a).

Southeast Asia

The primary energy supply in Southeast Asia, excluding biomass, increased at an annual rate of 5.8%, from 181 Mtoe in 1994 to 422 Mtoe in 2009. Biomass was excluded in the analysis because data collection for this type of energy in three (i.e., Indonesia, Thailand, and Viet Nam) of the 10 Southeast Asian countries started only after 2003. As shown in Figure 2.4.19, the portion of the graph of biomass demonstrated a sudden jump in 2004 compared to its 2003 value, as four of the 10 Southeast Asian countries started to report biomass data during this year.

The primary energy supply that experienced the fastest growth during this period was coal, with an average annual growth rate of 11.0%. This is due to the construction of coal-fired power plants in Indonesia, Malaysia, Philippines, Thailand, and Viet Nam that began in the 1990s.

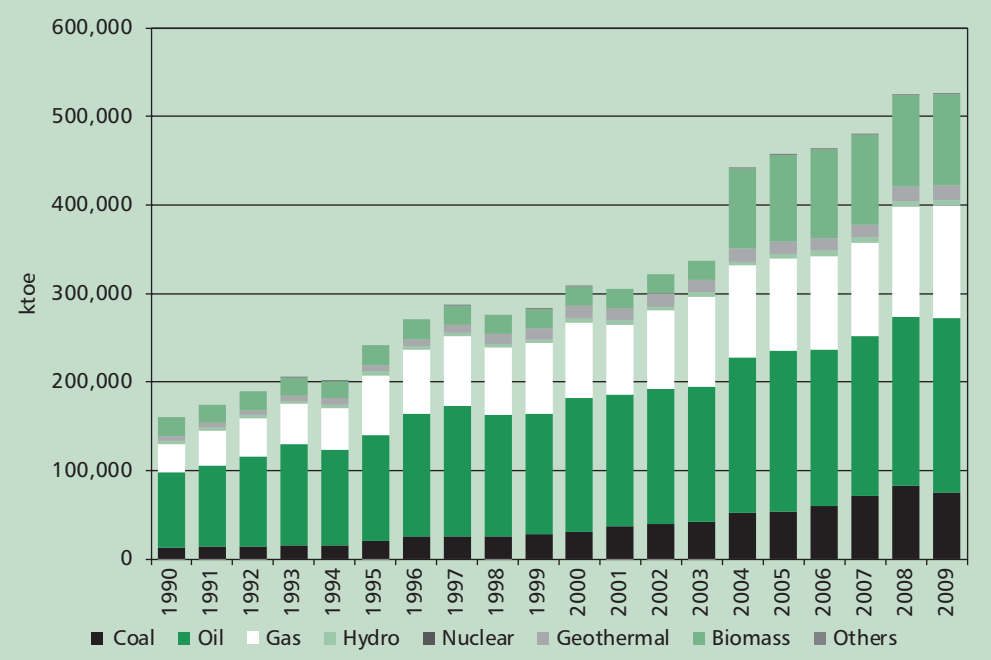
The fast growth rate of natural gas is attributable to the installation of natural gas-fired power plants in the same five countries as well as Singapore during the same period. Geothermal energy grew at an average annual rate of 5.9% per annum, which is attributable to geothermal developments in the Philippines and Indonesia.

In 2009, oil still formed the bulk of the TPES in Southeast Asia with a share of 46.8%, down from 59.2% in 1994 (Figure 2.4.21). The main reason for this decline is the replacement of old oil-fired power plants with coal- and natural gas-fired generating facilities in most of the 10 countries in this region.

In 2009, coal share stood at 17.7% while gas had 30.2%; geothermal, 3.8%; hydro, 1.5%; and others, 0.1% shows the primary energy mix (excluding biomass) in Southeast Asia in 1990, 1994, and 2009.

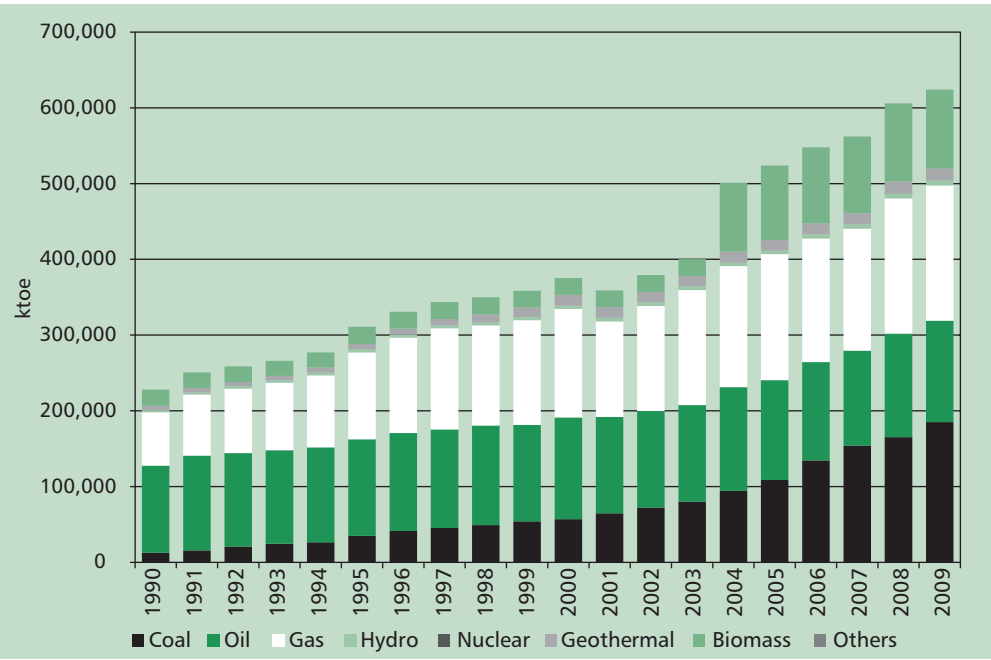
On average, indigenous energy production increased by 5.6% per annum from 1994 to 2009 (Figures 2.4.20 and 2.4.22).

Figure 2.4.19 Primary Energy Supply in Southeast Asia, 1990–2009



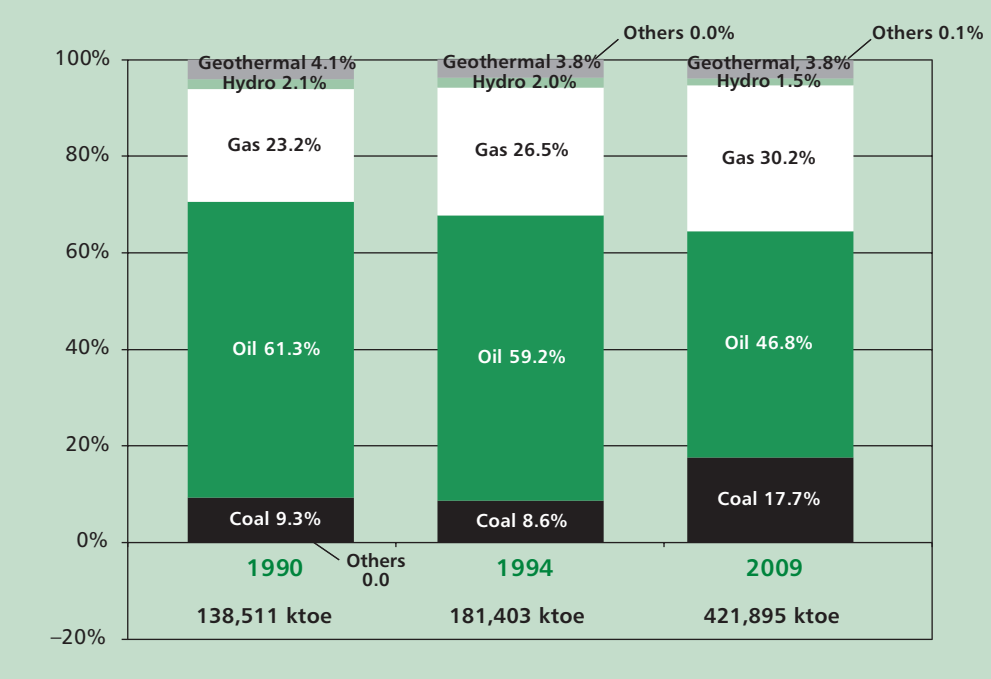
ktoe = thousand tons of oil equivalent.
Note: The big jump in primary supply of biomass is due to the unavailability of biomass data in three of the 10 Southeast Asian countries before 2004. From 2004 onwards, these countries had been reporting consumption of biomass. There was also a sizable jump in the data from 1994 to 1995 due to unavailability of data in Cambodia before 1995.
Sources: APERC (APEC Energy Database), IEA (2011b), and Lao PDR Ministry of Energy and Mines (unpublished).

Figure 2.4.20 Indigenous Energy Production in Southeast Asia, 1990–2009



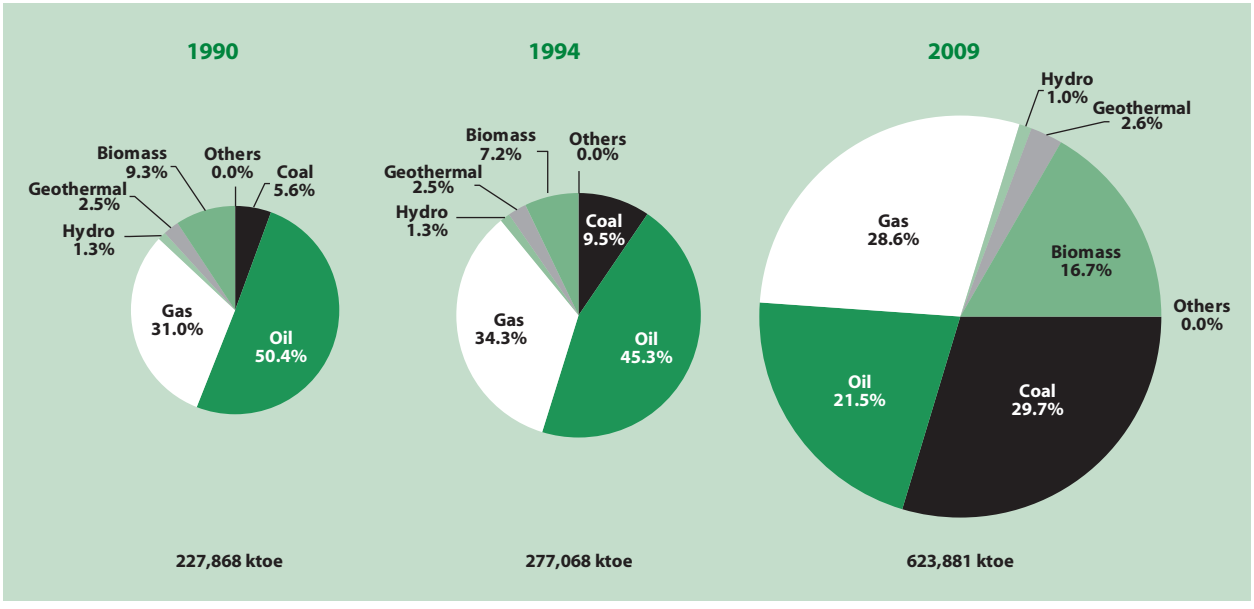
ktoe = thousand tons of oil equivalent.
Note: The big jump in primary supply of biomass is due to the unavailability of biomass data in three of the 10 Southeast Asian countries before 2004. From 2004 onwards, these countries had been reporting consumption of biomass. There was also a sizable jump in the data from 1994 to 1995 due to unavailability of data in Cambodia before 1995.
Sources: APERC (APEC Energy Database), IEA (2011b), and Lao PDR Ministry of Energy and Mines (unpublished).

Figure 2.4.21 Primary Energy Mix in Southeast Asia, 1990, 1994, and 2009



ktoe = thousand tons of oil equivalent.
Note: The big jump in primary supply of biomass is due to the unavailability of biomass data in three of the 10 Southeast Asian countries before 2004. From 2004 onwards, these countries had been reporting consumption of biomass. There was also a sizable jump in the data from 1994 to 1995 due to unavailability of data in Cambodia before 1995.
Sources: APERC (APEC Energy Database), IEA (2011b), and Lao PDR Ministry of Energy and Mines (unpublished).

Figure 2.4.22 Indigenous Energy Production in Southeast Asia, 1990, 1994, and 2009



ktoe = thousand tons of oil equivalent.
Note: These pie charts take the indigenous production of biomass into account. However, the charts for 1990 and 1994 do not include indigenous production of biomass for Indonesia, Thailand, and Viet Nam, as no data are available.
Sources: APERC (APEC Energy Database), IEA (2011b), and Lao PDR Ministry of Energy and Mines (unpublished).

Chapter 3

Central and West Asia

Central and West Asia

Regional Profile (2009)		Energy Reserves (year-end 2008)	
Total Surface Area (square kilometer)	5,637,260	Coal (million ton) - Recoverable	39,187.0
Population (thousand)	281,152	Gas (trillion cubic feet) - Proven	550.1
GDP (constant 2000 $ billion)	225.3	Oil (billion barrel) - Proven	31,356.0
Electrification Rate (%)	–		

– = no data or not applicable, GDP = gross domestic product.

Sources: ADB (2011 and 2012), APERC estimates, World Bank, and WEC (2010).

2009 Energy Supply and Demand Flow (ktoe)

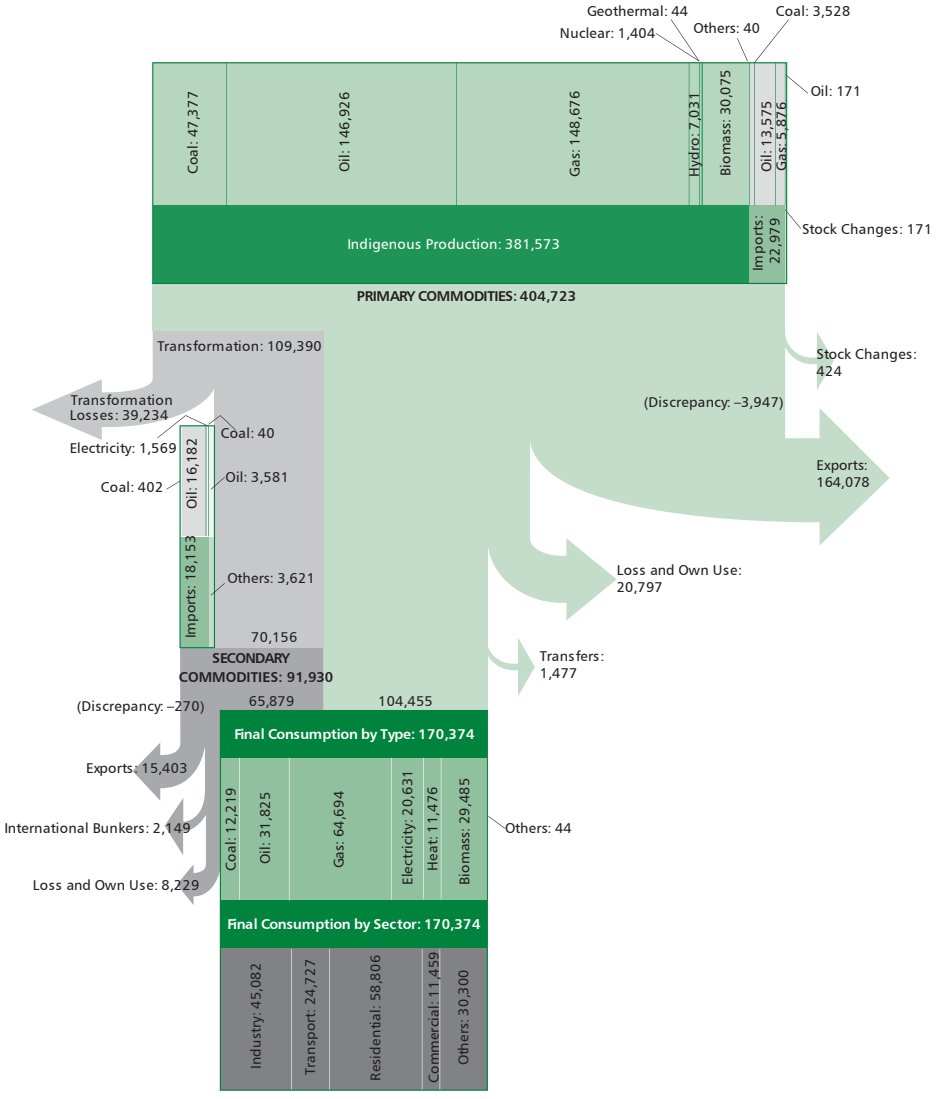


Table 3.1 Key Data and Economic Profile

	1990	1995	2000	2005	2009
Socioeconomic Data					
Population (thousand)	196,626	218,618	241,139	262,028	281,152
GDP (constant 2000 $ billion)	122.3	105.6	124.1	176.0	225.3
GDP (constant 2005 PPP $ billion)	452.6	379.9	449.3	654.0	843.8
GDP/capita (constant 2000 $)	622	483	515	672	801
GDP/capita (constant 2005 PPP $)	2,548	1,937	2,088	2,496	3,001

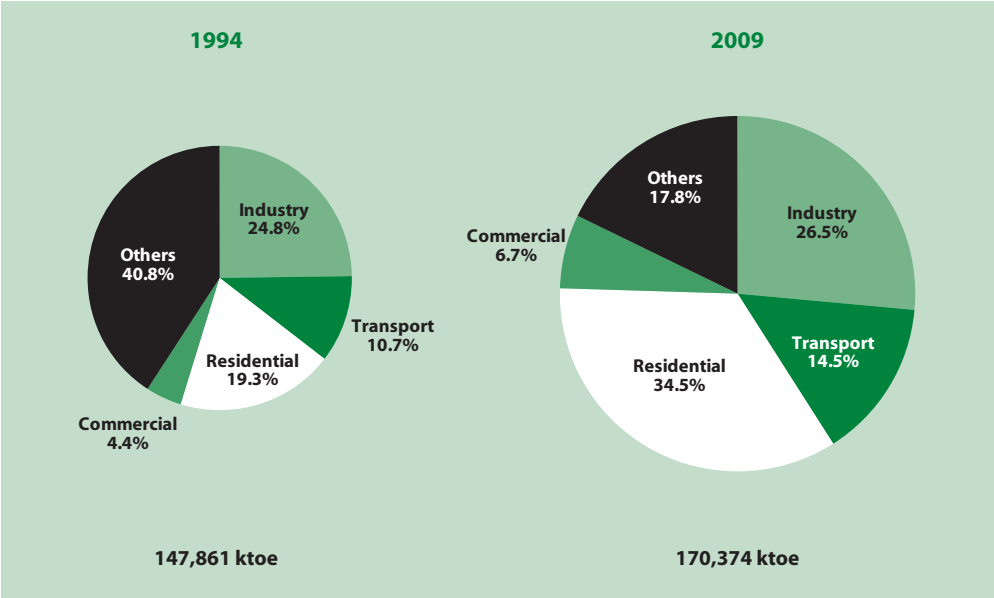
GDP = gross domestic product, PPP = purchasing power parity.
Note: In the computation of GDP/capita (constant 2005 PPP $) for 1990 to 2000, the population of Afghanistan was not included in the denominator due to unavailability of GDP data.
Sources: ADB (2011) and World Bank.

Table 3.2 Energy Supply and Demand

	1990	1995	2000	2005	2009
Primary Energy Supply (ktoe)					
Indigenous Production	–	205,218	249,868	328,896	381,573
Net Imports	–	–19,686	–64,009	–111,684	–138,741
Total PES	–	185,532	185,859	217,213	242,832
Coal	–	32,530	23,387	33,978	38,073
Oil	–	45,723	46,242	42,571	51,124
Gas	–	77,912	84,082	103,787	115,334
Biomass	–	22,525	25,091	27,930	30,075
Others	–	6,842	7,058	8,946	8,226
TPES/capita (toe)	–	0.85	0.77	0.83	0.98
TPES/GDP (toe/constant 2005 PPP $ million)	–	488	414	332	288
Final Energy Consumption (ktoe)					
Industry	–	40,362	33,354	46,416	45,082
Transportation	–	16,233	19,055	21,427	24,727
Other Sectors	–	86,176	80,438	88,138	100,565
Total FEC	–	142,771	132,848	155,981	170,374
Coal	–	13,719	6,462	11,980	12,219
Oil	–	29,968	28,773	30,736	31,825
Gas	–	48,999	48,734	54,773	64,694
Electricity	–	15,765	15,234	19,753	20,631
Biomass	–	22,055	24,609	27,387	29,485
Others	–	12,265	9,036	11,353	11,520

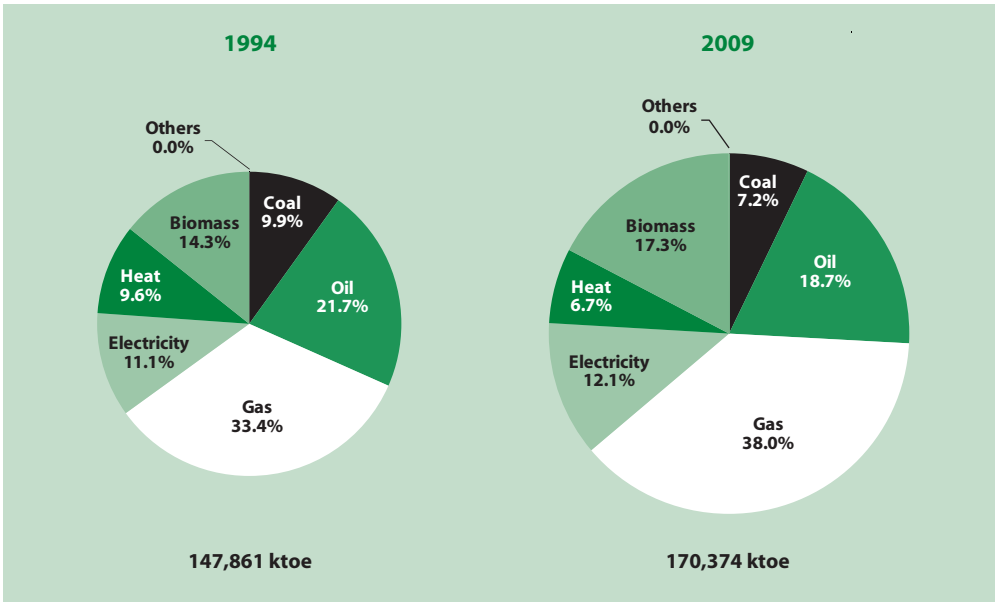
– = no data or not applicable, FEC = final energy consumption, GDP = gross domestic product, ktoe = thousand tons of oil equivalent, PES = primary energy supply, PPP = purchasing power parity, toe = ton of oil equivalent, TPES = total primary energy supply.
Sources: IEA (2011b) and UNSD (2011a).

Figure 3.1 Final Energy Consumption by Sector, 1994 and 2009



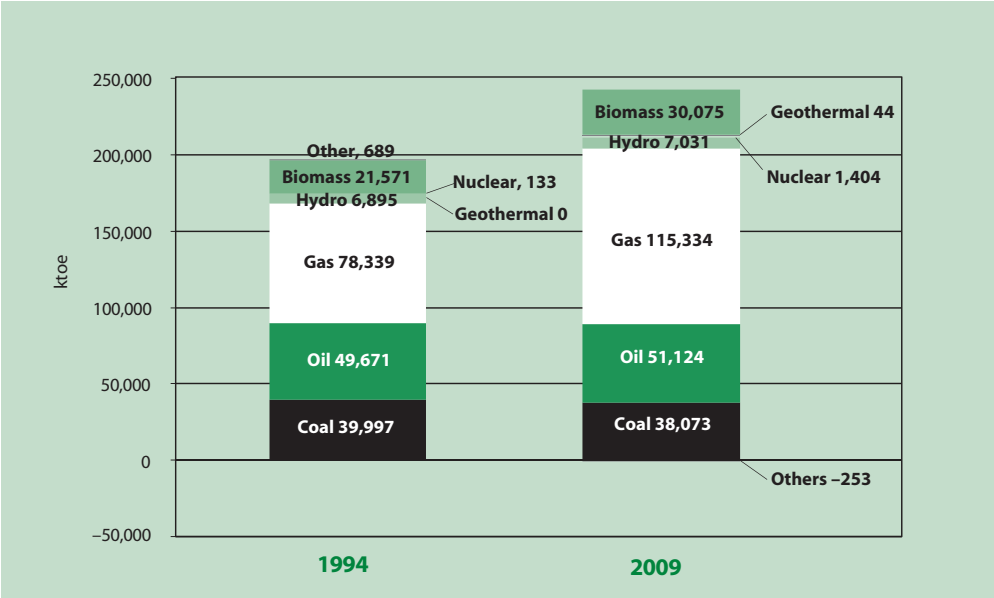
ktoe = thousand tons of oil equivalent.
Sources: IEA (2011b) and UNSD (2011a).

Figure 3.2 Final Energy Consumption by Type of Energy, 1994 and 2009



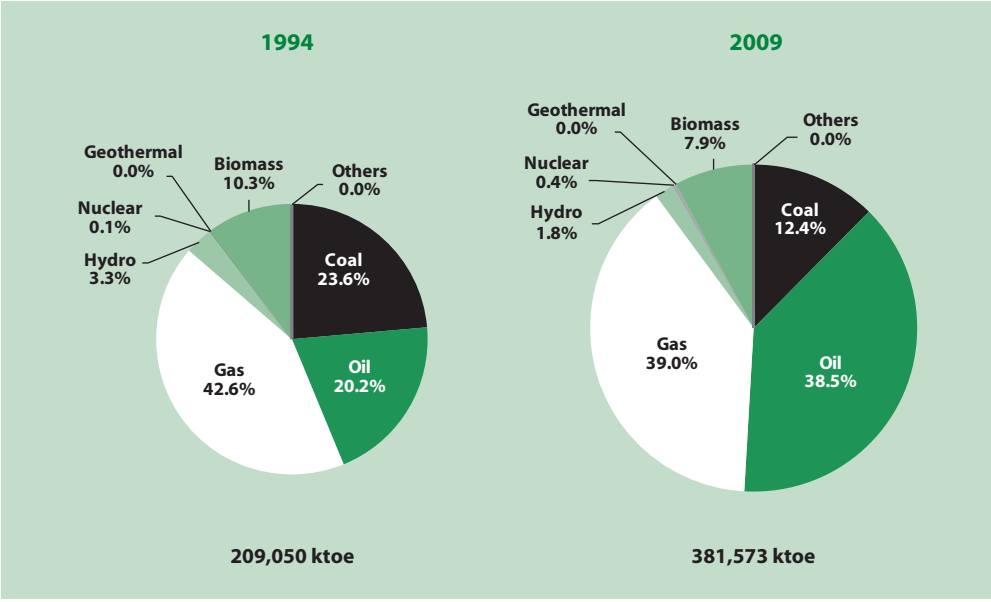
ktoe = thousand tons of oil equivalent.
Sources: IEA (2011b) and UNSD (2011a).

Figure 3.3 Total Primary Energy Supply, 1994 and 2009



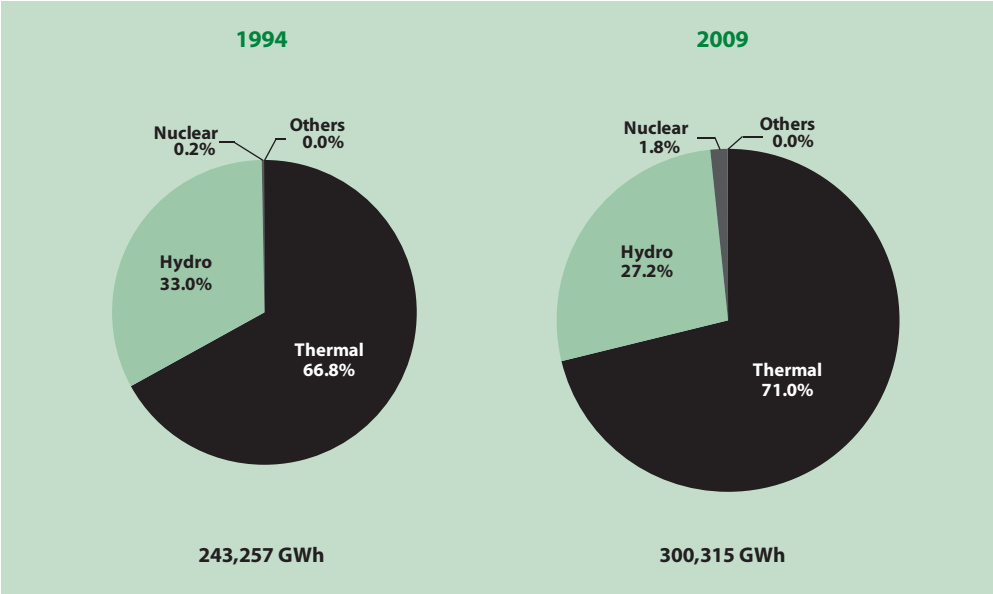
ktoe = thousand tons of oil equivalent.
Sources: IEA (2011b) and UNSD (2011a).

Figure 3.4 Indigenous Energy Production, 1994 and 2009



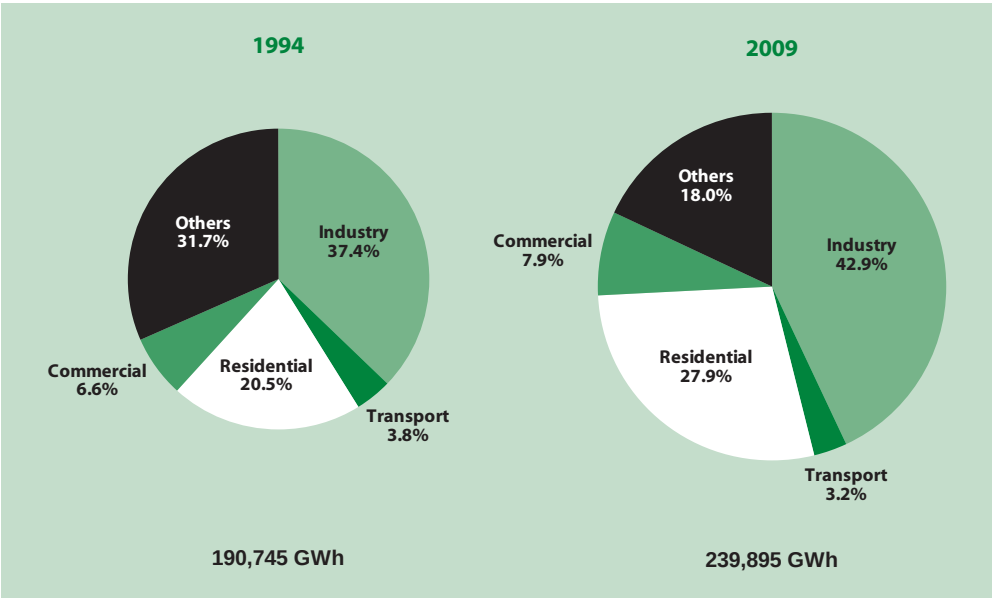
ktoe = thousand tons of oil equivalent.
Sources: IEA (2011b) and UNSD (2011a).

Figure 3.5 Electricity Generation by Plant Type, 1994 and 2009



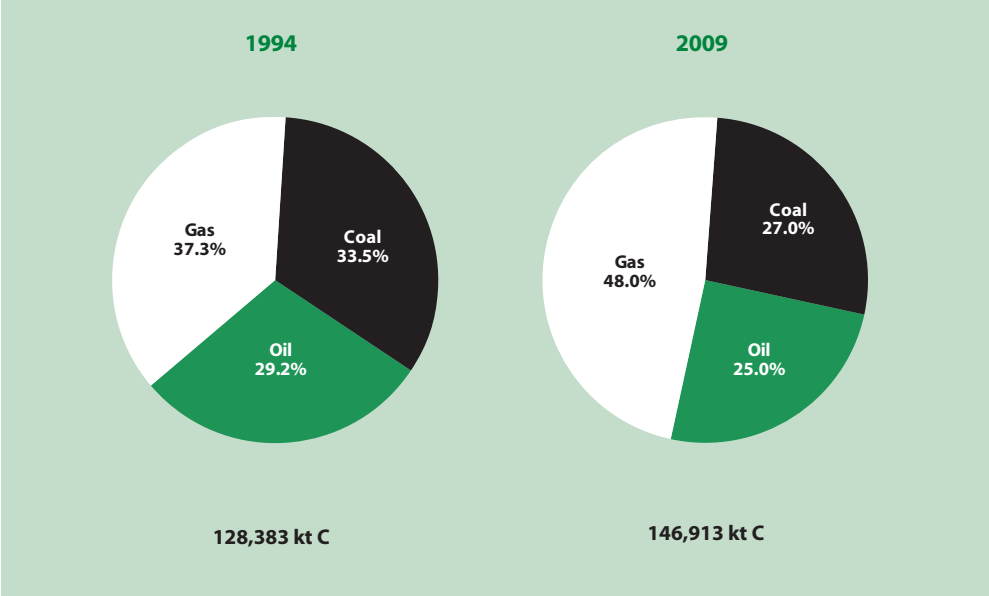
GWh = gigawatt-hour.
Sources: IEA (2011b) and UNSD (2011a).

Figure 3.6 Electricity Consumption by Sector, 1994 and 2009



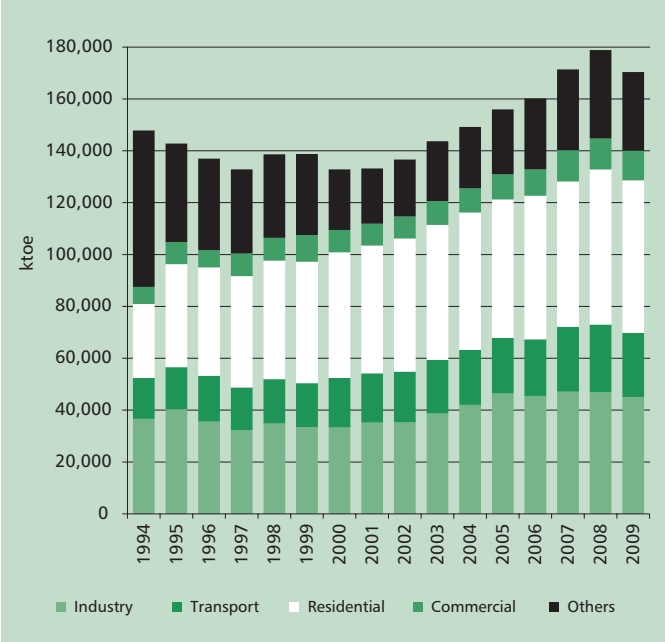
GWh = gigawatt-hour.
Sources: IEA (2011b) and UNSD (2011a).

Figure 3.7 Carbon Dioxide Emissions from Fuel Combustion, 1994 and 2009



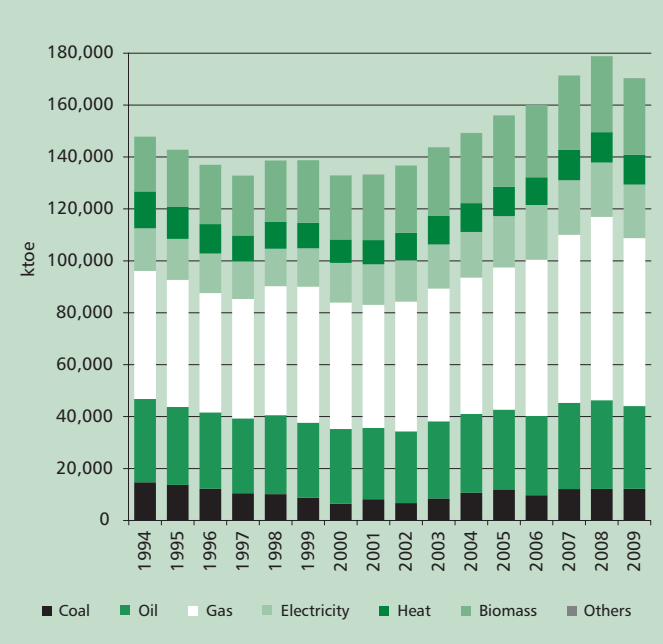
kt C = thousand tons of carbon equivalent.
Source: APERC estimates.

Figure 3.8 Final Energy Consumption by Sector, 1994–2009



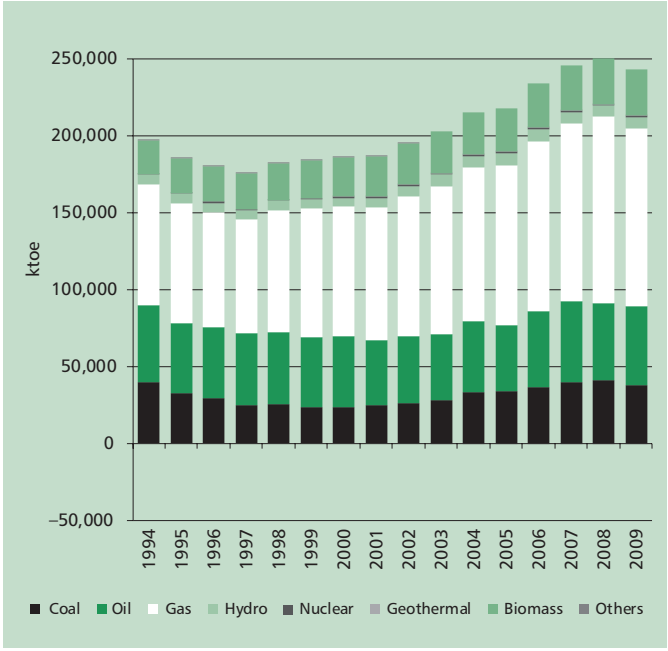
ktoe = thousand tons of oil equivalent.
Sources: IEA (2011b) and UNSD (2011a).

Figure 3.9 Final Energy Consumption by Type, 1994–2009



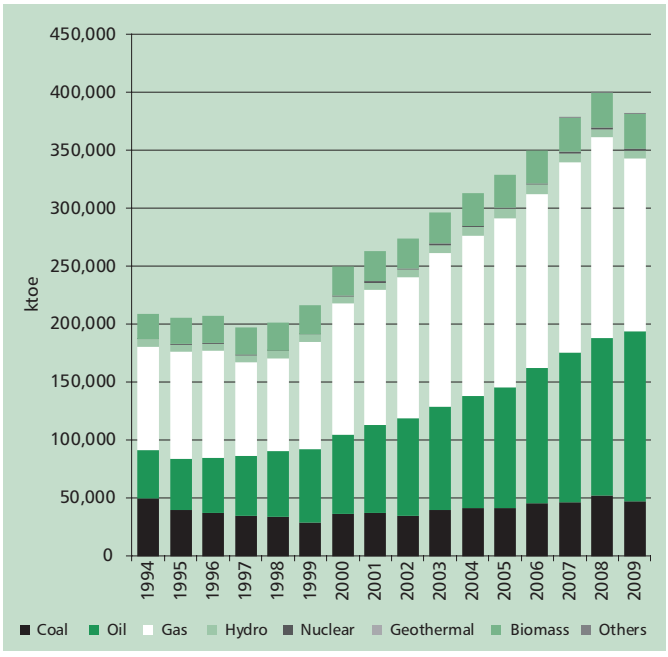
ktoe = thousand tons of oil equivalent.
Sources: IEA (2011b) and UNSD (2011a).

Figure 3.10 Total Primary Energy Supply, 1994–2009



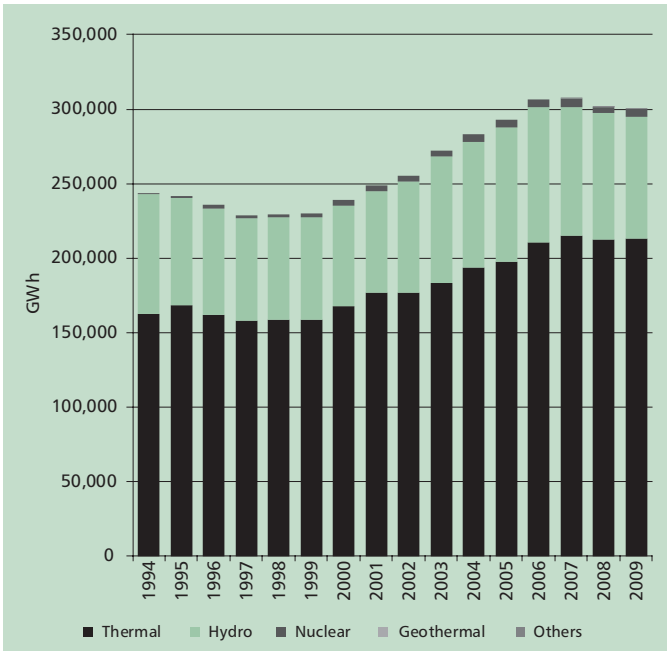
ktoe = thousand tons of oil equivalent.
Sources: IEA (2011b) and UNSD (2011a).

Figure 3.11 Indigenous Energy Production, 1994–2009



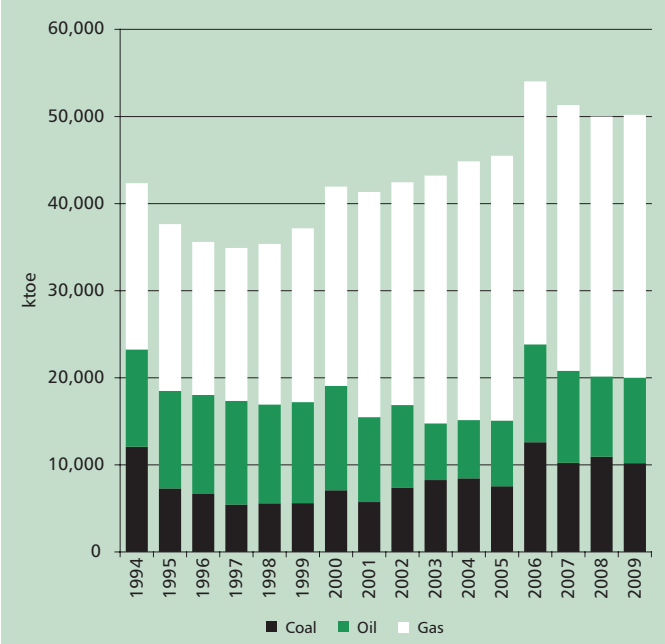
ktoe = thousand tons of oil equivalent.
Sources: IEA (2011b) and UNSD (2011a).

Figure 3.12 Electricity Generation by Source, 1994–2009



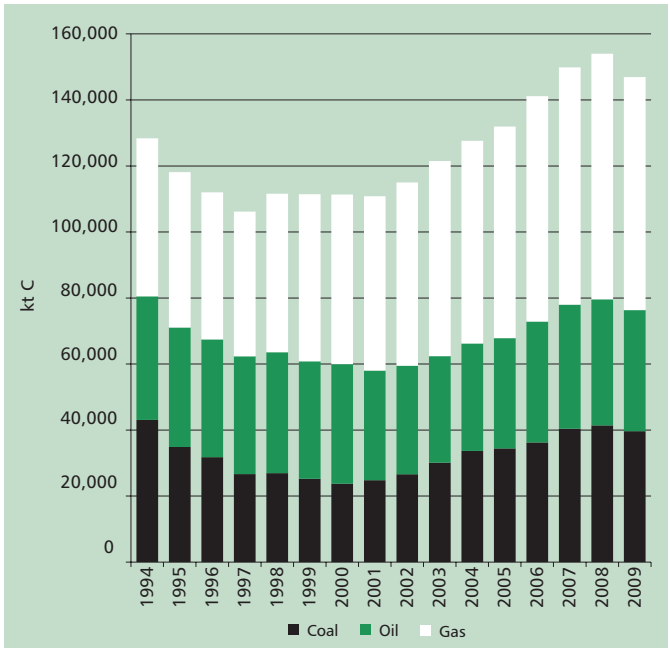
GWh = gigawatt-hour.
Sources: IEA (2011b) and UNSD (2011a).

Figure 3.13 Fuel Input for Electricity Generation, 1994–2009



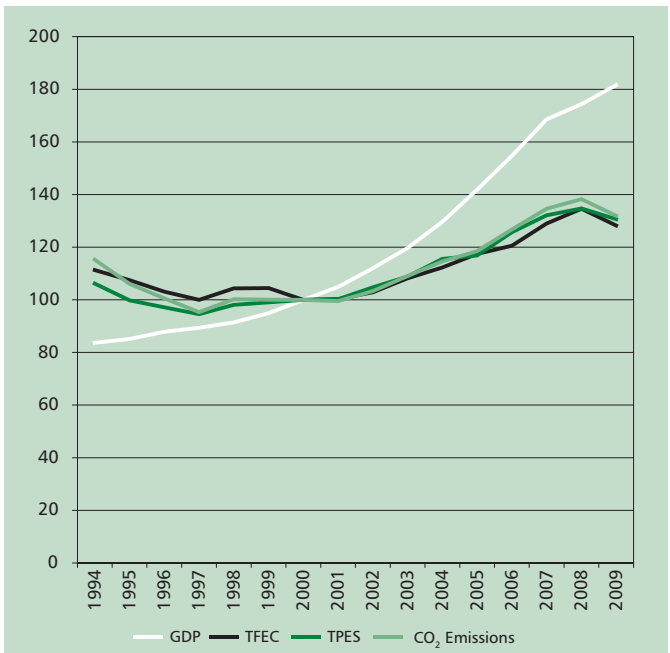
ktoe = thousand tons of oil equivalent.
Sources: IEA (2011b) and UNSD (2011a).

Figure 3.14 Carbon Dioxide Emissions from Fuel Combustion, 1994–2009



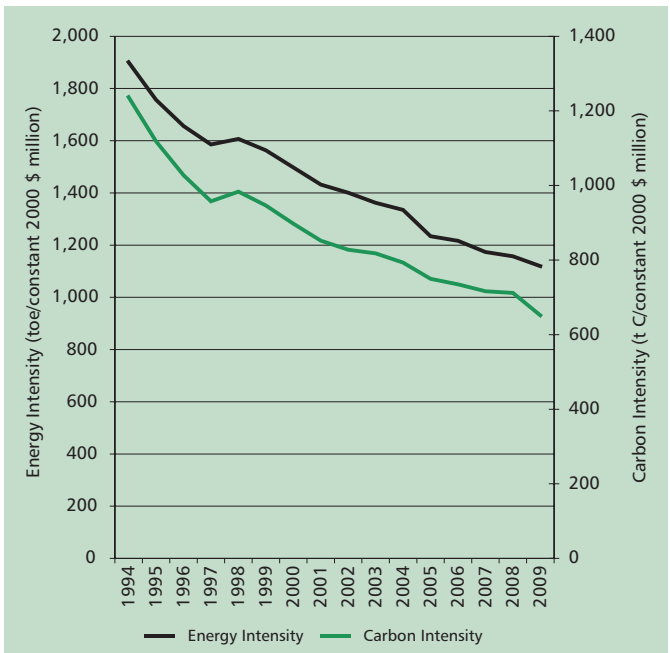
kt C = thousand tons of carbon equivalent.
Source: APERC estimates.

Figure 3.15 Growth of GDP, TFEC, TPES, and CO_2 Emissions (indexed to year 2000), 1994–2009



CO_2 = carbon dioxide, GDP = gross domestic product, TFEC = total final energy consumption, TPES = total primary energy supply.
Note: Indices are measured relative to the base year 2000 (2000 = 100).
Source: APERC estimates.

Figure 3.16 Energy and Carbon Intensities, 1994–2009



t C = ton of carbon equivalent , toe = ton of oil equivalent.
Source: APERC estimates.

Table 3.3 Central and West Asia Energy Balance Table, 2006

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	45,265	0	116,940	0	0	0	0	0	0	0	150,399	7,803	1,284	14	0	0	28,530	0	0	0	350,235
2.	Imports	3,544	522	15,041	13,019	1,595	97	5,296	4,451	234	1,345	18,997	0	0	0	0	0	3	0	2,087	0	53,213
3.	Exports	–12,793	–6	–82,393	–11,446	–1,254	–17	–4,921	–2,313	–1,017	–1,924	–58,799	0	0	0	0	0	0	0	–2,186	0	–167,623
4.	International Bunkers	0	0	0	–2,162	0	0	–19	–83	0	–2,060	0	0	0	0	0	0	0	0	0	0	–2,162
5.	Stock Changes	122	–20	363	68	–73	4	31	110	–27	23	–603	0	0	0	0	0	0	0	0	0	–70
6.	Total Primary Energy Supply	36,138	496	49,951	–522	268	84	387	2,165	–810	–2,616	109,994	7,803	1,284	14	0	0	28,533	0	–99	0	233,592
7.	Transfers	0	0	–500	666	0	0	0	–568	1,234	0	0	0	0	0	0	0	0	0	0	0	166
8.	Total Transformation Sector	–27,671	1,703	–45,113	31,562	7,645	483	13,728	1,588	858	7,260	–34,092	–7,803	–1,284	0	0	0	–554	0	26,351	11,851	–45,050
8.1	Power Generation	–23,231	0	–1,144	–10,378	0	–9	–151	–10,211	0	–7	–34,092	–7,803	–1,284	0	0	0	0	0	26,351	11,851	–39,730
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	–43,969	41,940	7,645	492	13,879	11,799	858	7,267	0	0	0	0	0	0	0	0	0	0	–2,029
8.4	Coal Transformation	–4,440	1,703	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–2,737
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–554	0	0	0	–554
9.	Loss and Own Use	–829	0	–1,536	–1,781	–22	0	–117	–210	–1	–1,431	–15,708	0	0	0	0	0	0	0	–5,215	–1,145	–26,214
10.	Discrepancy	–125	16	–2,707	518	–1	–1	–9	475	0	54	–0	0	0	0	0	0	–1	0	1	4	–2,295
11.	Total Final Energy Consumption	7,513	2,215	95	30,443	7,890	566	13,989	3,450	1,281	3,267	60,194	0	0	14	0	0	27,978	0	21,037	10,710	160,199
12.	Industry Sector	7,140	1,685	0	5,127	65	117	2,181	2,313	10	441	15,695	0	0	0	0	0	3,012	0	8,847	3,994	45,500
13.	Transport Sector	0	0	0	16,825	7,784	0	8,585	26	95	335	4,322	0	0	0	0	0	0	0	582	88	21,817
14.	Other Sectors	234	50	0	6,672	37	449	3,192	1,107	1,176	711	36,762	0	0	14	0	0	24,966	0	11,608	6,628	86,934
14.1	Residential and Commercial	20	49	0	1,415	1	191	405	61	756	1	29,254	0	0	14	0	0	24,876	0	8,025	1,851	65,504
14.1.1	Commerce and Public Services	0	0	0	536	0	51	217	61	207	0	8,027	0	0	6	0	0	24	0	1,514	17	10,124
14.1.2	Residential	20	49	0	879	1	140	188	0	549	1	21,227	0	0	8	0	0	24,852	0	6,512	1,834	55,380
14.2	Non-Specified Others	214	1	0	5,257	36	258	2,787	1,046	420	710	7,508	0	0	0	0	0	90	0	3,583	4,777	21,430
15.	Non-Energy Use	139	480	95	1,819	4	0	31	4	0	1,780	3,415	0	0	0	0	0	0	0	0	0	5,948
16.	Electricity Output (GWh)	52,230	0	0	44,092	0	0	306	0	0	28,174	114,428	90,731	4,928	0	0	0	0	0	0	0	306,409
17.	Heat Output (TJ)	355,962	0	0	9,797	0	0	0	0	0	0	130,503	0	0	0	0	0	0	0	0	0	496,261

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Sources: IEA (2011b) and UNSD (2011a).

Table 3.4 Central and West Asia Energy Balance Table, 2007

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	46,154	0	129,830	0	0	0	0	0	0	0	164,011	7,394	1,467	16	0	0	29,193	0	0	45	378,110
2.	Imports	4,428	553	15,969	15,099	2,053	113	6,250	4,513	261	1,908	10,664	0	0	0	0	0	3	0	1,850	0	48,566
3.	Exports	–11,609	–44	–94,788	–12,314	–1,304	0	–5,312	–2,552	–1,131	–2,015	–58,678	0	0	0	0	0	0	0	–2,115	0	–179,548
4.	International Bunkers	0	0	0	–2,029	0	0	–13	–117	0	–1,899	0	0	0	0	0	0	0	0	0	0	–2,029
5.	Stock Changes	385	–4	119	463	88	11	183	107	14	60	–512	0	0	0	0	0	0	0	0	0	451
6.	Total Primary Energy Supply	39,358	505	51,130	1,219	837	124	1,108	1,951	–856	–1,946	115,485	7,394	1,467	16	0	0	29,196	0	–265	45	245,549
7.	Transfers	0	0	–192	375	0	0	0	–582	1,337	–380	0	0	0	0	0	0	0	0	0	0	183
8.	Total Transformation Sector	–26,297	1,868	–45,694	33,817	8,371	515	14,449	2,025	909	7,548	–34,511	–7,394	–1,467	0	0	0	–566	0	26,397	12,808	–41,040
8.1	Power Generation	–22,112	0	–1,286	–9,443	0	–8	–286	–9,142	0	–7	–34,486	–7,394	–1,467	0	0	0	0	0	26,397	12,808	–36,984
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	–25	0	0	0	0	0	0	0	0	0	–25
8.3	Refineries	0	0	–44,408	43,260	8,371	523	14,735	11,167	909	7,555	0	0	0	0	0	0	0	0	0	0	–1,148
8.4	Coal Transformation	–4,185	1,868	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–2,317
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–566	0	0	0	–566
9.	Loss and Own Use	–3,369	0	–1,254	–1,900	–16	0	–59	–327	–3	–1,495	–16,223	0	0	0	0	0	0	0	–5,137	–1,170	–29,053
10.	Discrepancy	4	26	–3,903	–368	–9	–1	–138	–49	–2	–169	–22	0	0	0	0	0	–1	0	–9	2	–4,271
11.	Total Final Energy Consumption	9,696	2,399	87	33,142	9,183	638	15,360	3,018	1,385	3,558	64,729	0	0	16	0	0	28,629	0	20,985	11,685	171,368
12.	Industry Sector	9,201	1,875	0	3,892	72	131	1,961	1,696	2	30	15,635	0	0	0	0	0	3,077	0	9,024	4,429	47,133
13.	Transport Sector	11	0	0	19,344	9,064	0	9,799	23	61	397	4,936	0	0	0	0	0	0	0	594	100	24,985
14.	Other Sectors	364	1	0	7,640	42	507	3,583	1,290	1,321	897	40,945	0	0	16	0	0	25,552	0	11,367	7,156	93,041
14.1	Residential and Commercial	25	0	0	1,381	3	182	370	69	756	1	31,349	0	0	16	0	0	25,444	0	7,808	2,105	68,128
14.1.1	Commerce and Public Services	3	0	0	559	0	21	256	69	213	0	9,662	0	0	9	0	0	40	0	1,756	25	12,054
14.1.2	Residential	22	0	0	822	3	161	114	0	543	1	21,687	0	0	7	0	0	25,404	0	6,052	2,080	56,074
14.2	Non-Specified Others	339	1	0	6,259	39	325	3,213	1,221	565	896	9,596	0	0	0	0	0	108	0	3,559	5,051	24,913
15.	Non-Energy Use	120	523	87	2,266	5	0	17	9	1	2,234	3,213	0	0	0	0	0	0	0	0	0	6,209
16.	Electricity Output (GWh)	59,095	0	0	44,205	0	0	343	3,870	0	30,860	112,014	85,985	5,630	0	0	3	0	0	0	0	306,932
17.	Heat Output (TJ)	397,955	0	0	5,359	0	0	42	754	0	0	132,973	0	0	0	0	0	0	0	0	1,884	538,171

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Sources: IEA (2011b) and UNSD (2011a).

Table 3.5 Central and West Asia Energy Balance Table, 2008

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	51,850	0	136,272	0	0	0	0	0	0	0	173,178	7,307	1,063	14	0	0	29,859	0	0	43	399,585
2.	Imports	3,557	462	11,888	15,968	2,599	88	6,206	5,270	249	1,556	9,973	0	0	0	0	0	3	0	1,868	0	43,720
3.	Exports	−14,549	−141	−100,318	−12,602	−1,336	−2	−5,581	−2,607	−1,249	−1,827	−61,737	0	0	0	0	0	0	0	−1,920	0	−191,267
4.	International Bunkers	0	0	0	−2,217	0	0	−40	−129	0	−2,048	0	0	0	0	0	0	0	0	0	0	−2,217
5.	Stock Changes	−13	−13	139	604	379	2	82	−17	−21	179	−213	0	0	0	0	0	0	0	0	0	504
6.	Total Primary Energy Supply	40,845	308	47,981	1,753	1,642	88	667	2,517	−1,021	−2,140	121,201	7,307	1,063	14	0	0	29,862	0	−52	43	250,325
7.	Transfers	0	0	−531	685	0	0	0	−332	1,338	−321	0	0	0	0	0	0	0	0	0	0	154
8.	Total Transformation Sector	−27,934	1,902	−44,531	33,773	8,588	486	14,942	1,316	936	7,505	−33,897	−7,307	−1,063	0	0	0	−578	0	25,906	12,942	−40,787
8.1	Power Generation	−23,003	0	−120	−9,207	0	−8	−266	−8,933	0	0	−33,844	−7,307	−1,063	0	0	0	0	0	25,906	12,942	−35,696
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	−53	0	0	0	0	0	0	0	0	0	−53
8.3	Refineries	0	0	−44,411	42,980	8,588	494	15,208	10,249	936	7,505	0	0	0	0	0	0	0	0	0	0	−1,431
8.4	Coal Transformation	−4,931	1,903	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	−3,028
8.5.	Other Transformation	0	−1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	−578	0	0	0	−579
9.	Loss and Own Use	−3,031	0	−2,123	−2,142	−27	0	−56	−292	−5	−1,762	−16,633	0	0	0	0	0	0	0	−4,951	−1,325	−30,205
10.	Discrepancy	13	74	−712	−12	−9	−3	51	60	3	−114	−27	0	0	0	0	0	−1	0	15	2	−648
11.	Total Final Energy Consumption	9,893	2,284	84	34,057	10,194	571	15,604	3,269	1,251	3,168	70,644	0	0	14	0	0	29,283	0	20,919	11,662	178,839
12.	Industry Sector	8,422	1,794	0	4,066	70	96	2,093	1,777	1	29	15,906	0	0	0	0	0	3,144	0	9,087	4,484	46,903
13.	Transport Sector	15	0	0	19,911	10,080	0	9,389	30	16	396	5,449	0	0	0	0	0	0	0	646	99	26,120
14.	Other Sectors	1,419	1	0	7,989	42	467	4,081	1,452	1,234	713	44,313	0	0	14	0	0	26,139	0	11,186	7,079	98,140
14.1	Residential and Commercial	1,119	0	0	1,706	2	169	547	101	886	1	33,324	0	0	14	0	0	25,961	0	7,510	2,108	71,742
14.1.1	Commerce and Public Services	11	0	0	664	0	31	330	101	202	0	9,434	0	0	2	0	0	42	0	1,751	40	11,944
14.1.2	Residential	1,108	0	0	1,042	2	138	217	0	684	1	23,890	0	0	12	0	0	25,919	0	5,759	2,068	59,798
14.2	Non-Specified Others	300	1	0	6,283	40	298	3,534	1,351	348	712	10,989	0	0	0	0	0	178	0	3,676	4,971	26,398
15.	Non-Energy Use	37	489	84	2,091	2	8	41	10	0	2,030	4,976	0	0	0	0	0	0	0	0	0	7,677
16.	Electricity Output (GWh)	64,658	0	0	39,116	0	0	242	1,681	0	32,433	108,393	84,952	4,079	2	0	2	0	0	0	0	301,202
17.	Heat Output (TJ)	403,817	0	0	3,852	0	0	42	586	0	0	134,313	0	0	0	0	0	0	0	0	1,800	543,782

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.
Note: Figures may not add up to total because of rounding.
Sources: IEA (2011b) and UNSD (2011a).

Table 3.6 Central and West Asia Energy Balance Table, 2009

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	47,377	0	146,926	0	0	0	0	0	0	0	148,676	7,031	1,404	44	0	0	30,075	0	0	40	381,573
2.	Imports	3,528	402	13,575	16,182	2,464	60	6,167	5,850	241	1,400	5,876	0	0	0	0	0	0	0	1,569	0	41,132
3.	Exports	–13,229	–20	–112,030	–13,521	–1,070	–10	–5,523	–3,091	–1,666	–2,161	–38,819	0	0	0	0	0	0	0	–1,862	0	–179,481
4.	International Bunkers	0	0	0	–2,149	0	0	–39	–190	0	–1,920	0	0	0	0	0	0	0	0	0	0	–2,149
5.	Stock Changes	–25	40	171	1,970	–1	29	–116	1,544	3	511	–399	0	0	0	0	0	0	0	0	0	1,757
6.	Total Primary Energy Supply	37,651	422	48,642	2,482	1,393	79	489	4,113	–1,422	–2,170	115,334	7,031	1,404	44	0	0	30,075	0	–293	40	242,832
7.	Transfers	0	0	–1,477	1,611	0	0	0	0	1,610	1	0	0	0	0	0	0	0	0	0	0	134
8.	Total Transformation Sector	–25,296	1,635	–41,133	30,059	8,680	390	14,132	–1,065	1,057	6,865	–34,050	–7,031	–1,404	0	0	0	–591	0	25,826	12,636	–39,349
8.1	Power Generation	–22,099	0	–288	–9,582	0	–8	–334	–9,240	0	0	–34,012	–7,031	–1,404	0	0	0	0	0	25,826	12,636	–35,954
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	–38	0	0	0	0	0	0	0	0	0	–38
8.3	Refineries	0	0	–40,845	39,641	8,680	398	14,466	8,175	1,057	6,865	0	0	0	0	0	0	0	0	0	0	–1,204
8.4	Coal Transformation	–3,197	1,635	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–1,562
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–591	0	0	0	–591
9.	Loss and Own Use	–2,263	–26	–1,965	–2,087	–8	0	–85	–192	–4	–1,798	–16,569	0	0	0	0	0	0	0	–4,913	–1,203	–29,026
10.	Discrepancy	59	37	–3,986	–321	–16	–2	–30	–148	4	–129	–21	0	0	0	0	0	1	0	11	3	–4,217
11.	Total Final Energy Consumption	10,151	2,068	81	31,744	10,049	467	14,506	2,708	1,245	2,769	64,694	0	0	44	0	0	29,485	0	20,631	11,476	170,374
12.	Industry Sector	8,466	1,676	0	3,090	76	66	1,831	1,091	1	25	15,608	0	0	0	0	0	3,212	0	8,858	4,172	45,082
13.	Transport Sector	36	0	0	19,465	9,896	0	9,167	14	34	354	4,460	0	0	0	0	0	0	0	665	101	24,727
14.	Other Sectors	1,614	1	0	7,317	44	401	3,497	1,594	1,205	576	39,540	0	0	44	0	0	26,273	0	11,108	7,203	93,100
14.1	Residential and Commercial	1,154	0	0	1,633	2	152	421	201	856	1	31,798	0	0	44	0	0	26,097	0	7,397	2,142	70,265
14.1.1	Commerce and Public Services	56	0	0	527	0	28	246	44	209	0	9,160	0	0	6	0	0	38	0	1,635	37	11,459
14.1.2	Residential	1,098	0	0	1,106	2	124	175	157	647	1	22,638	0	0	38	0	0	26,059	0	5,762	2,105	58,806
14.2	Non-Specified Others	460	1	0	5,684	42	249	3,076	1,393	349	575	7,742	0	0	0	0	0	176	0	3,711	5,061	22,835
15.	Non-Energy Use	35	391	81	1,872	33	0	11	9	5	1,814	5,086	0	0	0	0	0	0	0	0	0	7,465
16.	Electricity Output (GWh)	61,409	0	0	40,337	0	0	47	489	0	36,218	111,420	81,755	5,388	0	0	6	0	0	0	0	300,315
17.	Heat Output (TJ)	398,667	0	0	2,512	0	0	0	209	0	0	127,949	0	0	0	0	0	0	0	0	1,675	530,803

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Sources: IEA (2011b) and UNSD (2011a).

Table 3.7 Central and West Asia Summary Table, 1990–2009

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Indigenous Production (ktoe)																				
Coal	–	–	–	–	49,333	39,895	36,864	34,518	33,863	28,857	36,444	37,344	35,038	39,555	41,188	41,413	45,265	46,154	51,850	47,377
Oil	–	–	–	–	42,155	44,228	47,563	52,104	56,378	63,335	68,218	75,338	83,547	89,411	97,214	104,005	116,940	129,830	136,272	146,926
Gas	–	–	–	–	88,966	92,127	92,609	80,896	80,727	92,989	113,265	117,456	122,031	132,209	138,266	146,431	150,399	164,011	173,178	148,676
Hydro	–	–	–	–	6,895	6,241	6,138	5,901	5,918	5,877	5,804	5,842	6,399	7,280	7,272	7,755	7,803	7,394	7,307	7,031
Nuclear	–	–	–	–	133	205	696	517	488	646	1,043	1,115	1,048	980	1,302	1,355	1,284	1,467	1,063	1,404
Geothermal	–	–	–	–	0	0	0	0	0	0	6	10	10	10	10	10	14	16	14	44
Solar	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wind	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Biomass	–	–	–	–	21,568	22,522	23,257	23,548	23,971	24,532	25,088	25,698	26,323	26,927	27,532	27,927	28,530	29,193	29,859	30,075
Others	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	45	43	40
Total	–	–	–	–	209,050	205,218	207,127	197,484	201,344	216,236	249,868	262,803	274,395	296,371	312,783	328,896	350,235	378,110	399,585	381,573
Primary Energy Supply (ktoe)																				
Coal	–	–	–	–	39,997	32,530	29,574	25,129	25,377	23,928	23,387	24,905	25,991	28,509	33,606	33,978	36,634	39,863	41,153	38,073
Oil	–	–	–	–	49,671	45,723	46,091	46,452	46,971	45,030	46,242	42,163	43,978	42,692	45,592	42,571	49,429	52,349	49,734	51,124
Gas	–	–	–	–	78,339	77,912	74,473	74,122	79,344	83,957	84,082	86,443	90,850	96,044	99,844	103,787	109,994	115,485	121,201	115,334
Hydro	–	–	–	–	6,895	6,241	6,138	5,901	5,918	5,877	5,804	5,842	6,399	7,280	7,272	7,755	7,803	7,394	7,307	7,031
Nuclear	–	–	–	–	133	205	696	517	488	646	1,043	1,115	1,048	980	1,302	1,355	1,284	1,467	1,063	1,404
Geothermal	–	–	–	–	0	0	0	0	0	0	6	10	10	10	10	10	14	16	14	44
Solar	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wind	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Biomass	–	–	–	–	21,571	22,525	23,260	23,551	23,974	24,535	25,091	25,701	26,326	26,930	27,535	27,930	28,533	29,196	29,862	30,075
Others	–	–	–	–	689	396	323	107	266	124	204	122	93	-166	-380	-174	-99	-220	-9	-253
Total	–	–	–	–	197,295	185,532	180,556	175,779	182,338	184,098	185,859	186,301	194,694	202,278	214,780	217,213	233,592	245,549	250,325	242,832
Final Energy Consumption by Sector (ktoe)																				
Industry	–	–	–	–	36,652	40,362	35,582	32,330	34,870	33,442	33,354	35,233	35,300	38,730	42,025	46,416	45,500	47,133	46,903	45,082
Transport	–	–	–	–	15,779	16,233	17,679	16,400	17,097	16,971	19,055	18,947	19,569	20,611	21,192	21,427	21,817	24,985	26,120	24,727
Residential	–	–	–	–	28,531	39,704	41,775	42,973	45,711	46,827	48,485	49,319	51,350	52,101	52,994	53,441	55,380	56,074	59,798	58,806
Commercial	–	–	–	–	6,539	8,561	6,695	8,675	8,777	10,273	8,581	8,403	8,459	9,208	9,334	9,675	10,124	12,054	11,944	11,459
Others	–	–	–	–	60,361	37,911	35,267	32,463	32,188	31,256	23,372	21,309	21,946	23,056	23,681	25,022	27,378	31,122	34,075	30,300
Total	–	–	–	–	147,861	142,771	136,998	132,841	138,642	138,769	132,848	133,212	136,624	143,706	149,226	155,981	160,199	171,368	178,839	170,374

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Table 3.7 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Final Energy Consumption by Type (ktoe)																				
Coal	–	–	–	–	14,711	13,719	12,251	10,473	10,116	8,758	6,462	8,160	6,702	8,489	10,739	11,980	9,728	12,095	12,177	12,219
Oil	–	–	–	–	32,093	29,968	29,377	28,861	30,456	28,912	28,773	27,505	27,636	29,722	30,302	30,736	30,538	33,229	34,141	31,825
Gas	–	–	–	–	49,346	48,999	45,951	45,973	49,712	52,399	48,734	47,419	49,987	51,151	52,518	54,773	60,194	64,729	70,644	64,694
Electricity	–	–	–	–	16,404	15,765	15,224	14,473	14,413	14,777	15,234	15,580	15,918	16,964	17,555	19,753	21,037	20,985	20,919	20,631
Heat	–	–	–	–	14,167	12,265	11,375	9,960	10,430	9,859	9,031	9,332	10,551	10,957	11,097	11,343	10,710	11,685	11,662	11,476
Biomass	–	–	–	–	21,140	22,055	22,820	23,101	23,515	24,064	24,609	25,207	25,821	26,413	27,006	27,387	27,978	28,629	29,283	29,485
Others	–	–	–	–	0	0	0	0	0	0	5	10	10	10	10	10	14	16	14	44
Total	–	–	–	–	147,861	142,771	136,998	132,841	138,642	138,769	132,848	133,212	136,624	143,706	149,226	155,981	160,199	171,368	178,839	170,374
Power Generation (GWh)																				
Thermal	–	–	–	–	162,547	168,041	161,583	158,091	158,617	158,888	167,667	176,845	177,066	183,477	193,342	197,577	210,750	215,314	212,167	213,166
Hydro	–	–	–	–	80,199	72,587	71,384	68,622	68,801	68,339	67,488	67,934	74,397	84,668	84,555	90,191	90,731	85,985	84,952	81,755
Nuclear	–	–	–	–	511	787	2,670	1,982	1,873	2,477	4,002	4,278	4,022	3,758	4,996	5,200	4,928	5,630	4,079	5,388
Geothermal	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
Solar	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wind	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	3	2	6
Others	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	–	–	–	–	243,257	241,415	235,637	228,695	229,291	229,704	239,157	249,057	255,485	271,903	282,893	292,968	306,409	306,932	301,202	300,315
Loss and Own Use of Electricity (GWh)																				
Transmission and Distribution Losses	–	–	–	–	38,001	40,599	41,681	40,423	44,945	42,422	40,992	43,015	45,123	45,078	46,011	47,398	47,086	45,203	44,670	43,942
Own Use	–	–	–	–	15,337	16,535	15,558	14,535	13,442	11,942	16,953	18,000	18,058	19,047	19,174	8,930	8,628	9,151	7,442	7,860
Total	–	–	–	–	53,338	57,134	57,239	54,958	58,387	54,364	57,945	61,015	63,182	64,124	65,186	56,328	55,714	54,354	52,112	51,802
Fuel Input for Power Generation (ktoe)																				
Coal	–	–	–	–	12,086	7,299	6,655	5,437	5,587	5,610	7,075	5,735	7,405	8,256	8,442	7,540	12,604	10,231	10,947	10,197
Oil	–	–	–	–	11,165	11,176	11,361	11,901	11,357	11,594	11,982	9,738	9,459	6,517	6,691	7,550	11,230	10,569	9,212	9,795
Gas	–	–	–	–	19,086	19,170	17,574	17,574	18,431	19,967	22,901	25,860	25,585	28,441	29,714	30,400	30,196	30,516	29,834	30,192
Total	–	–	–	–	42,337	37,646	35,590	34,912	35,376	37,171	41,958	41,334	42,449	43,214	44,847	45,490	54,029	51,316	49,993	50,183
CO_2 Emissions (kt C)																				
Coal	–	–	–	–	43,065	34,861	31,777	26,683	26,931	25,218	23,774	24,809	26,612	30,118	33,694	34,462	36,254	40,398	41,433	39,656
Oil	–	–	–	–	37,454	36,194	35,700	35,631	36,642	35,606	36,169	33,220	32,878	32,288	32,557	33,395	36,612	37,580	38,161	36,672
Gas	–	–	–	–	47,863	47,067	44,529	43,857	48,013	50,603	51,426	52,813	55,531	59,073	61,357	64,087	68,273	71,890	74,399	70,584
Total	–	–	–	–	128,383	118,122	112,006	106,172	111,586	111,426	111,368	110,843	115,020	121,479	127,608	131,944	141,139	149,868	153,993	146,913

continued on next page

Table 3.7 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Macroeconomic Indicators																				
Population (thousand)	196,626	201,346	205,887	210,247	214,409	218,618	223,008	227,573	232,160	236,749	241,139	245,383	249,473	253,519	257,674	262,028	266,530	271,162	276,062	281,152
Urban Population, %	35.1	35.1	35.1	35.1	35.0	35.0	35.0	35.0	35.1	35.2	35.2	35.4	35.6	35.8	36.0	36.2	36.5	36.8	37.1	37.4
GDP (constant 2000 $ million)	122,325	119,005	113,397	107,661	103,791	105,630	109,010	110,864	113,477	117,753	124,094	130,118	138,986	148,508	160,898	176,019	192,005	209,193	216,324	225,329
GDP (current $ million)	107,692	109,635	103,877	102,717	98,776	106,950	111,424	113,596	114,842	110,936	121,381	125,512	130,267	152,504	187,373	225,279	284,311	352,658	440,073	416,181
GDP (constant 2005 PPP $ million)	452,619	438,533	414,893	394,110	378,978	379,889	392,089	399,265	408,719	424,723	449,346	473,513	515,100	551,179	597,536	653,973	715,071	777,962	810,028	843,775
GDP/capita (constant 2000 $)	622	591	551	512	484	483	489	487	489	497	515	530	557	586	624	672	720	771	784	801
GDP/capita (current $)	606	603	560	543	513	545	557	557	553	524	564	511	522	602	727	860	1,067	1,301	1,594	1,480
GDP – Manufacturing (% of GDP)	15.0	15.7	14.8	14.8	14.0	13.6	13.5	13.4	13.6	13.5	13.2	13.8	13.7	13.7	14.1	14.5	14.4	14.3	14.3	13.3
Car Ownership (car/1,000 persons)	7	7	7	6	6	7	9	10	10	10	10	21	26	26	27	28	30	30	30	30
Basic Energy Indicators																				
TPES/capita (toe/person)	–	–	–	–	0.92	0.85	0.81	0.77	0.79	0.78	0.77	0.76	0.78	0.80	0.83	0.83	0.88	0.91	0.91	0.98
TFEC/capita (toe/person)	–	–	–	–	0.69	0.65	0.61	0.58	0.60	0.59	0.55	0.54	0.55	0.57	0.58	0.60	0.60	0.63	0.65	0.69
TPES/GDP (toe/constant 2000 $ million)	–	–	–	–	1,901	1,756	1,656	1,586	1,607	1,563	1,498	1,432	1,401	1,362	1,335	1,234	1,217	1,174	1,157	1,119
TFEC/GDP (toe/constant 2000 $ million)	–	–	–	–	1,425	1,352	1,257	1,198	1,222	1,178	1,071	1,024	983	968	927	886	834	819	827	785
Import Dependency (%)	–	–	–	–	–6.0	–10.6	–14.7	–12.3	–10.4	–17.5	–34.4	–41.1	–40.9	–46.5	–45.6	–51.4	–49.9	–54.0	–59.6	–57.1
Oil Import Dependency (%)	–	–	–	–	15.1	3.3	–3.2	–12.2	–20.0	–40.6	–47.5	–78.7	–90.0	–109.4	–113.2	–144.3	–136.6	–148.0	–174.0	–187.4
Electricity/capita (kWh/person)	–	–	–	–	890	839	794	740	722	726	735	738	742	778	792	877	918	900	881	969
CO_2 Intensity (t C/constant 2000 $ million)	–	–	–	–	1,237	1,118	1,027	958	983	946	897	852	828	818	793	750	735	716	712	652
CO_2/capita (t C)	–	–	–	–	0.60	0.54	0.50	0.47	0.48	0.47	0.46	0.45	0.46	0.48	0.50	0.50	0.53	0.55	0.56	0.52
CO_2/TPES (t C/toe)	–	–	–	–	0.65	0.64	0.62	0.60	0.61	0.61	0.60	0.59	0.59	0.60	0.59	0.61	0.60	0.61	0.62	0.60

– = no data or not applicable, CO_2 = carbon dioxide, GDP = gross domestic product, GWh = gigawatt-hour, kt C = thousand tons of carbon equivalent, ktoe = thousand tons of oil equivalent, kWh = kilowatt-hour, PPP = purchasing power parity, t C = ton of carbon equivalent, TFEC = total final energy consumption, toe = ton of oil equivalent, TPES = total primary energy supply.

Notes:

1. Figures may not add up to total because of rounding.
2. Afghanistan was excluded in the calculation of basic energy indicators for 2009 because of unavailability of energy data.

Sources: ADB (2011), APERC estimates, IEA (2011b), JAMA (2012), UNSD (2011a), and World Bank.

3.1 Afghanistan

Country Profile (2009)		Energy Reserves (year-end 2008)	
Total Surface Area (square kilometer)	652,230	Coal (million ton) - Recoverable	66.0
Population (thousand)	33,438	Gas (trillion cubic feet) - Proven	1.8
GDP (constant 2000 $ billion)	8.4	Oil (billion barrels) - Proven	–
Electrification Rate (%)	15.5		

– = no data or not applicable.

Sources: ADB (2011 and 2012), IEA (2011c), World Bank, and WEC (2010).

2009 Energy Supply and Demand Flow (ktoe)

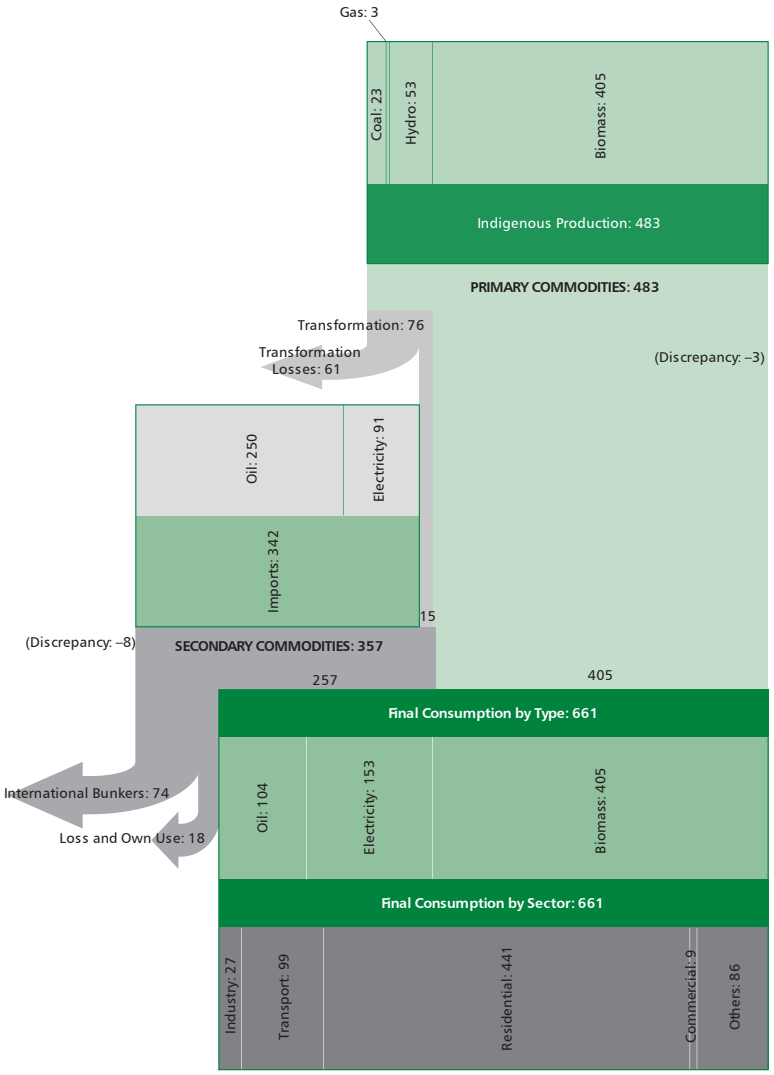


Table 3.1.1 Key Data and Economic Profile

	1990	1995	2000	2005	2008
Socioeconomic Data					
Population (thousand)	19,024	22,476	25,951	29,905	32,518
GDP (constant 2000 $ billion)	3.6	3.2	2.7	6.8	7.2
GDP (constant 2005 PPP $ billion)	–	–	–	22.4	28.6
GDP/capita (constant 2000 $)	190	144	105	227	221
GDP/capita (constant 2005 PPP $)	–	–	–	748	879

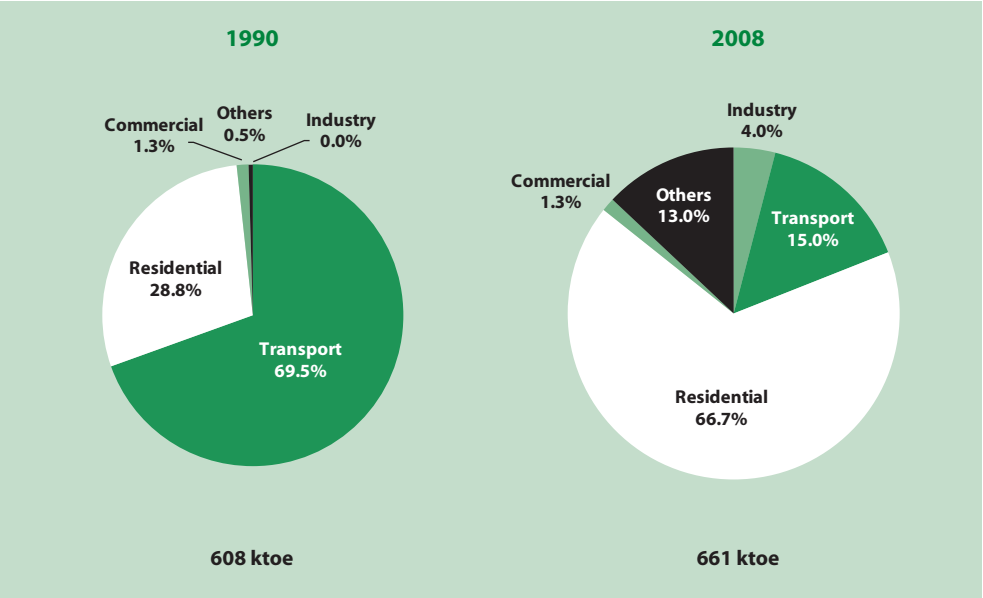
– = no data or not applicable, GDP = gross domestic product, PPP = purchasing power parity.
Sources: ADB (2011) and World Bank.

Table 3.1.2 Energy Supply and Demand

	1990	1995	2000	2005	2008
Primary Energy Supply (ktoe)					
Indigenous Production	564	457	499	463	483
Net Imports	660	318	147	153	267
Total PES	1,224	775	646	617	751
Coal	99	4	1	23	23
Oil	668	308	139	144	176
Gas	213	167	119	2	3
Biomass	178	246	335	387	405
Others	66	50	53	60	144
TPES/capita (toe)	0.06	0.03	0.02	0.02	0.02
TPES/GDP (toe/constant 2005 PPP $ million)	–	–	–	28	26
Final Energy Consumption (ktoe)					
Industry	0	28	20	25	27
Transportation	423	136	61	49	99
Other Sectors	186	233	371	442	536
Total FEC	608	397	453	516	661
Coal	0	0	0	0	0
Oil	423	136	65	55	104
Gas	0	0	0	0	0
Electricity	35	54	53	75	153
Biomass	151	207	335	387	405
Others	0	0	0	0	0

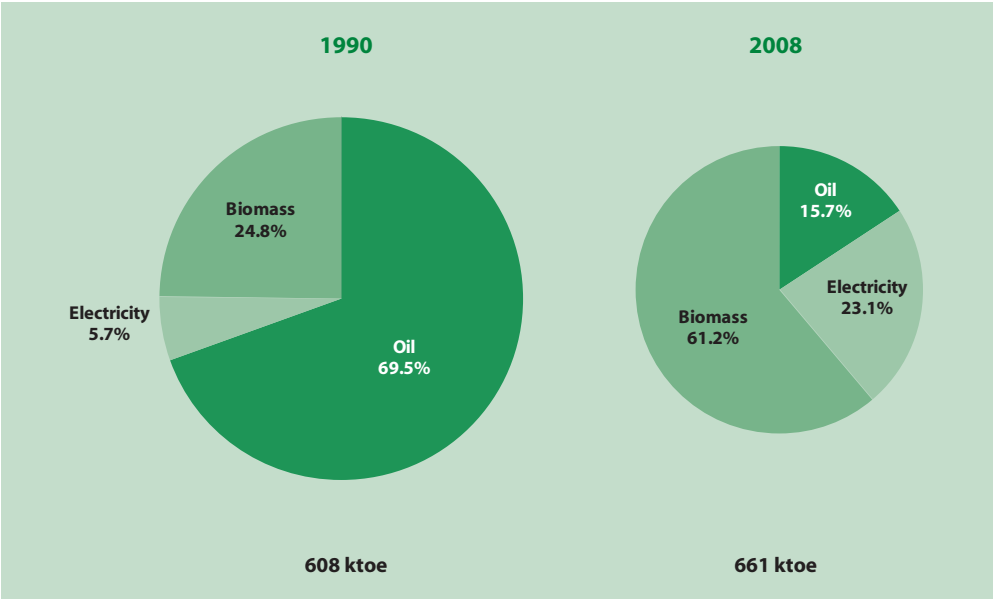
– = no data or not applicable, FEC = final energy consumption, GDP = gross domestic product, ktoe = thousand tons of oil equivalent, PES = primary energy supply, PPP = purchasing power parity, toe = ton of oil equivalent, TPES = total primary energy supply.
Source: UNSD (2011a).

Figure 3.1.1 Final Energy Consumption by Sector, 1990 and 2008



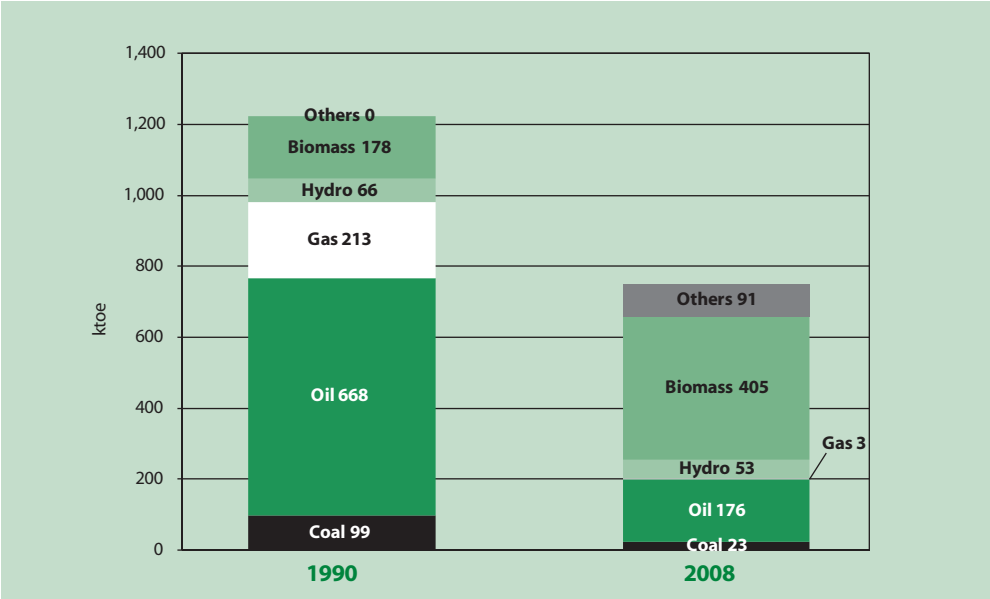
ktoe = thousand tons of oil equivalent.
Source: UNSD (2011a).

Figure 3.1.2 Final Energy Consumption by Type of Energy, 1990 and 2008



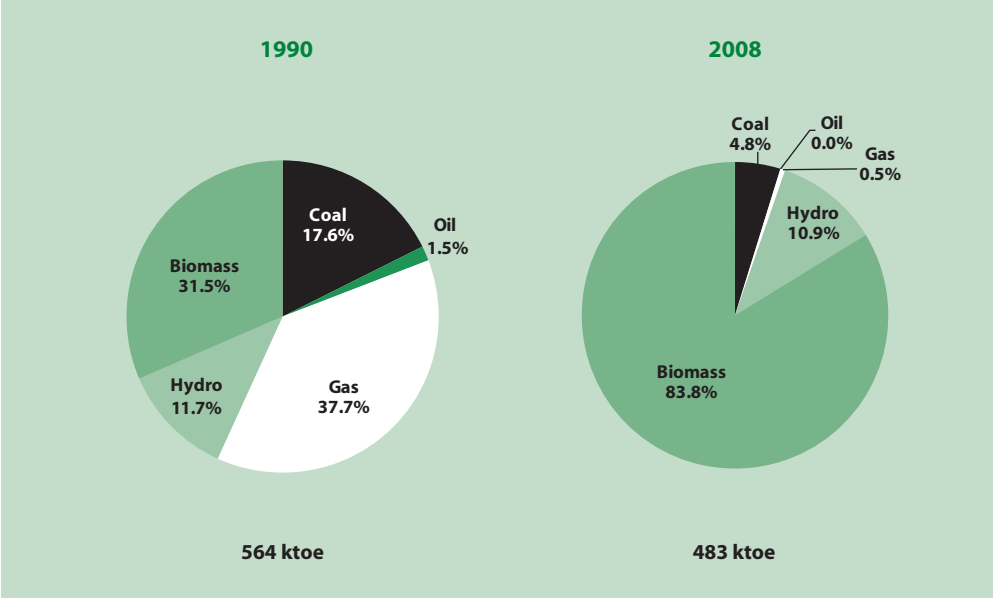
ktoe = thousand tons of oil equivalent.
Source: UNSD (2011a).

Figure 3.1.3 Total Primary Energy Supply, 1990 and 2008



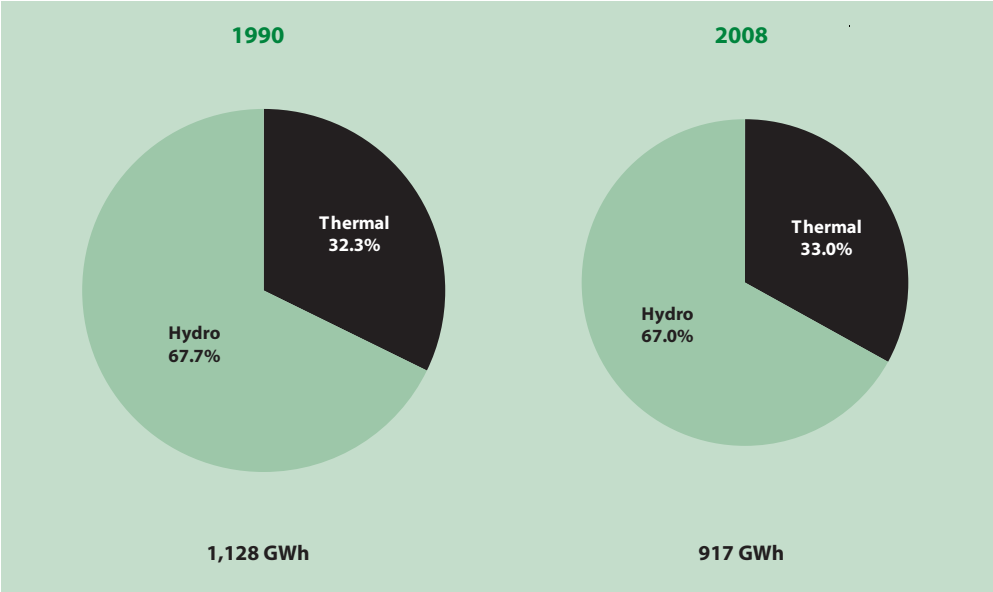
ktoe = thousand tons of oil equivalent.
Source: UNSD (2011a).

Figure 3.1.4 Indigenous Energy Production, 1990 and 2008



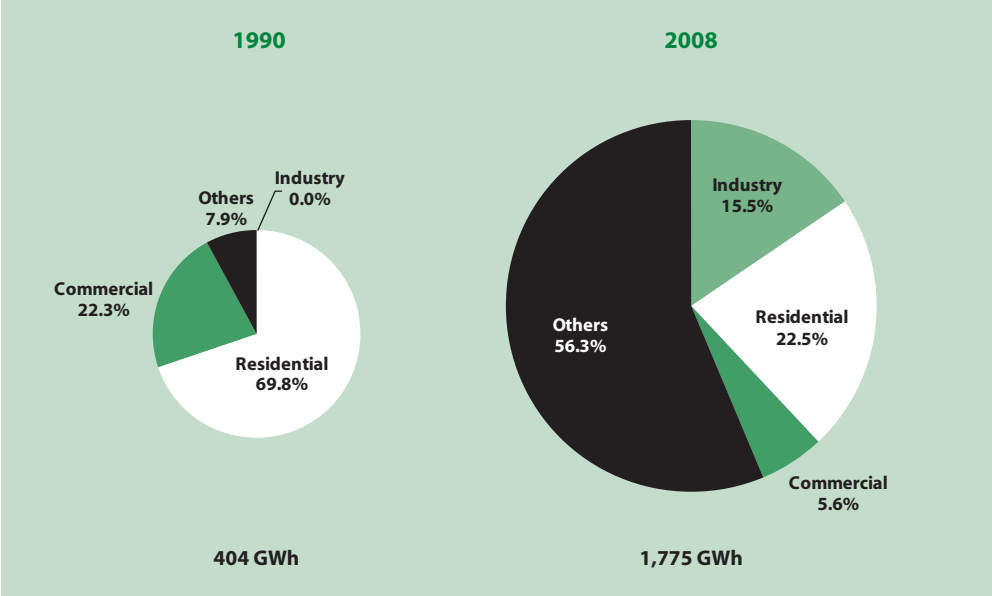
ktoe = thousand tons of oil equivalent.
Source: UNSD (2011a).

Figure 3.1.5 Electricity Generation by Plant Type, 1990 and 2008



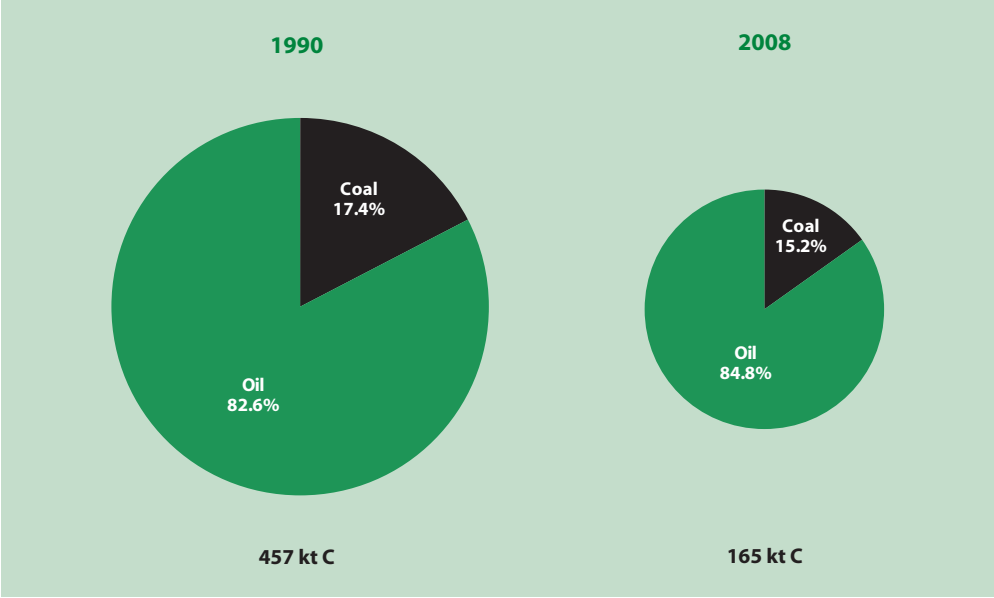
GWh = gigawatt-hour.
Source: UNSD (2011a).

Figure 3.1.6 Electricity Consumption by Sector, 1990 and 2008



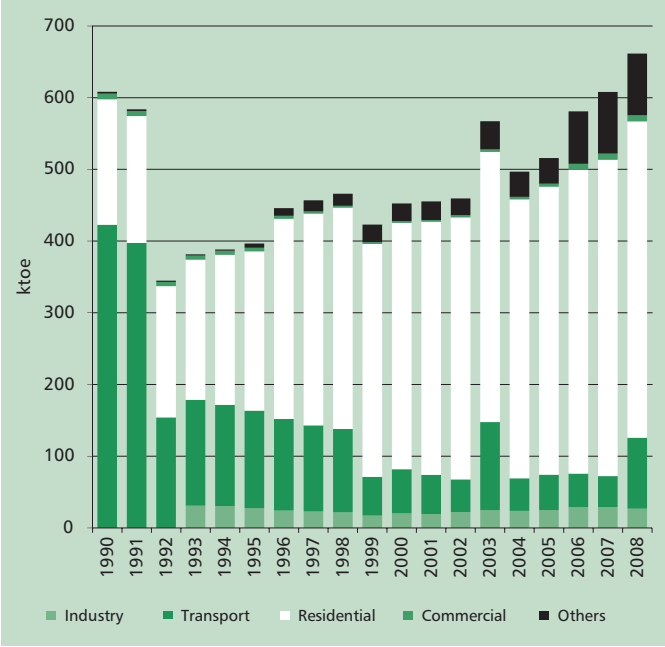
GWh = gigawatt-hour.
Sources: UNSD (2011a).

Figure 3.1.7 Carbon Dioxide Emissions from Fuel Combustion, 1990 and 2008



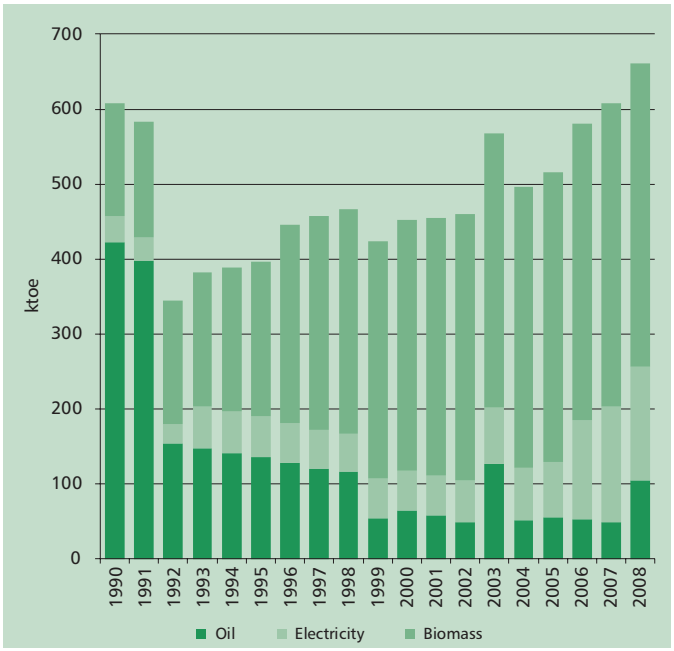
kt C = thousand tons of carbon equivalent.
Source: APERC estimates.

Figure 3.1.8 Final Energy Consumption by Sector, 1990–2008



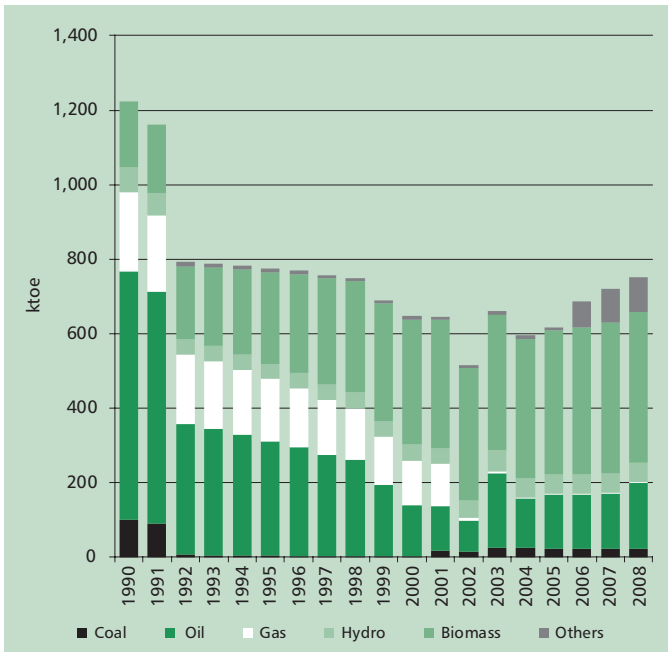
ktoe = thousand tons of oil equivalent
Source: UNSD (2011a).

Figure 3.1.9 Final Energy Consumption by Type, 1990–2008



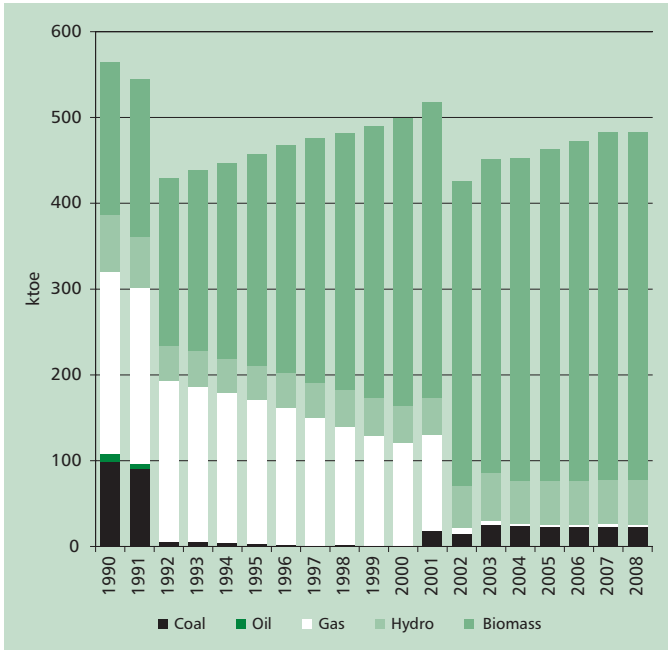
ktoe = thousand tons of oil equivalent.
Source: UNSD (2011a).

Figure 3.1.10 Total Primary Energy Supply, 1990–2008



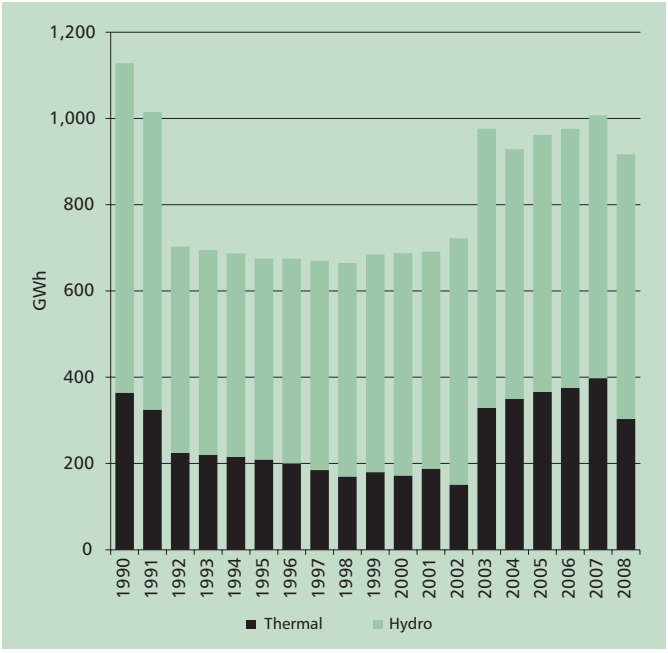
ktoe = thousand tons of oil equivalent.
Source: UNSD (2011a).

Figure 3.1.11 Indigenous Energy Production, 1990–2008



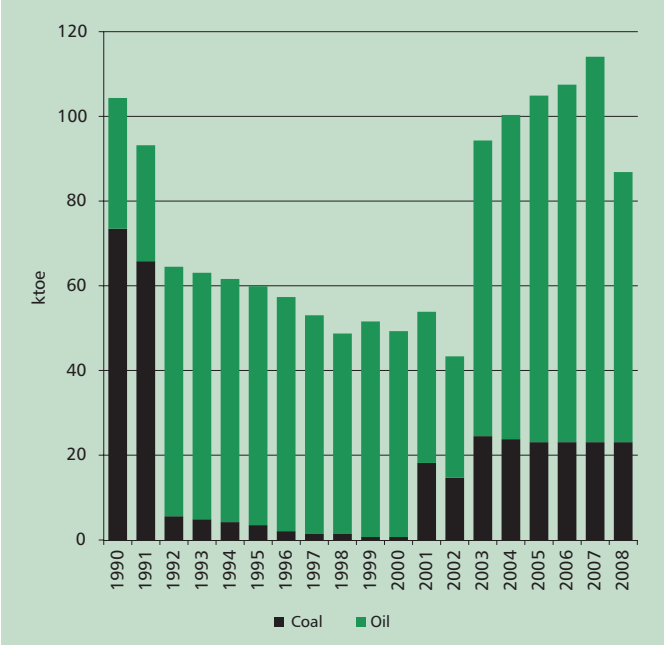
ktoe = thousand tons of oil equivalent.
Source: UNSD (2011a).

Figure 3.1.12 Electricity Generation by Source, 1990–2008



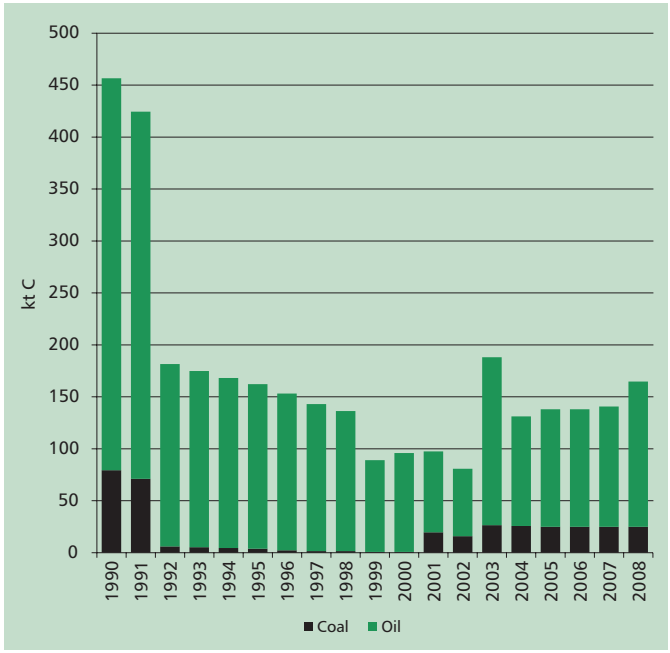
GWh = gigawatt-hour.
Source: UNSD (2011a).

Figure 3.1.13 Fuel Input for Electricity Generation, 1990–2008



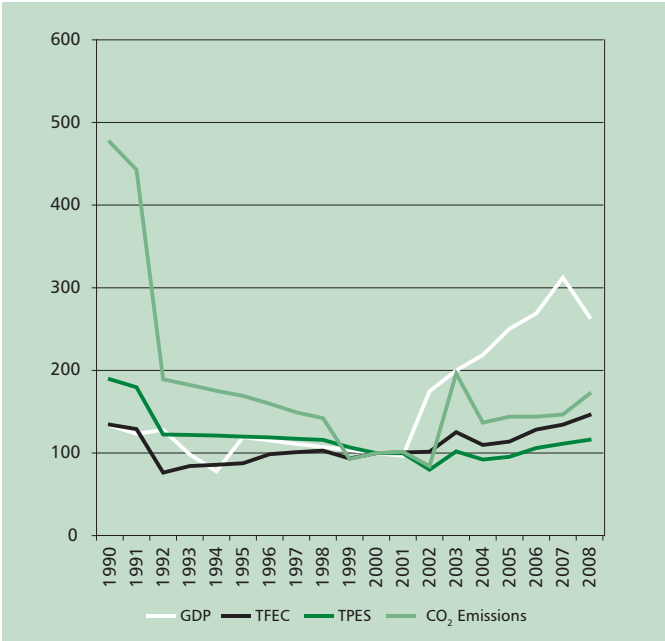
ktoe = thousand tons of oil equivalent.
Sources: APERC estimates, and UNSD (2011a).

Figure 3.1.14 Carbon Dioxide Emissions from Fuel Combustion, 1990–2008



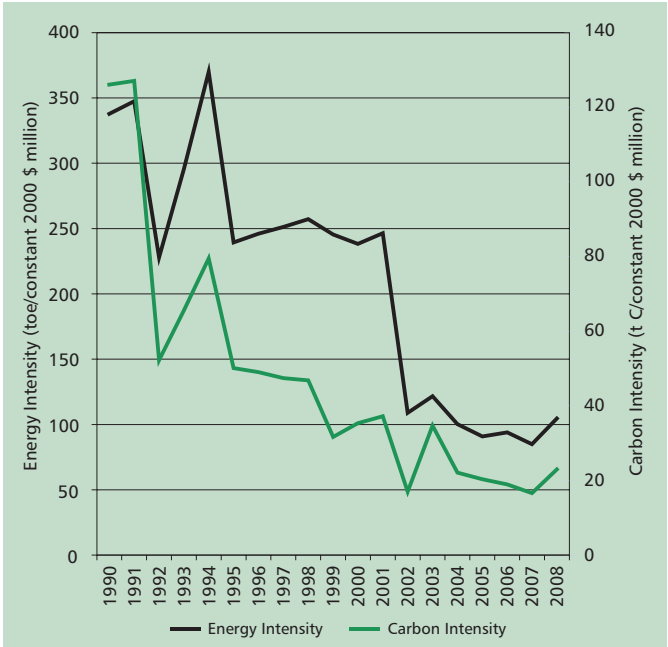
kt C = thousand tons of carbon equivalent.
Source: APERC estimates.

Figure 3.1.15 Growth of GDP, TFEC, TPES, and CO_2 Emissions (indexed to year 2000), 1990–2008



CO_2 = carbon dioxide, GDP = gross domestic product, TFEC = total final energy consumption, TPES = total primary energy supply.
Note: Indices are measured relative to the base year 2000 (2000 = 100).
Source: APERC estimates.

Figure 3.1.16 Energy and Carbon Intensities, 1990–2008



t C = ton of carbon equivalent , toe = ton of oil equivalent.
Source: APERC estimates.

Notes:

It could be noted that Afghanistan's total primary energy supply (TPES) from 1990 to 2008 has decreased at an average annual rate of 2.7%, although the rate of decrease declined considerably to 0.3% from 1992 to 2008. In contrast, total final energy consumption (TFEC) increased at an average annual rate of 0.5% from1990 to 2008.

The main reason for these diverging TPES and TFEC growth rates could be the change in the composition of the TFEC mix from an oil-dominated mix in 1990 to a biomass-dominated mix in 2008. The use of biomass is less efficient as compared to using petroleum products such as liquefied petroleum gas (LPG) or kerosene.[9] This means that on an energy quantity basis, the same amount of energy service requires more biomass as compared to using LPG and kerosene. A study carried out by the Center for Energy Studies of the Tribhuvan University in Nepal showed that the overall efficiency of wood-fuelled stove is only 22.8% efficient compared to the 53.6% for LPG and 49.5% for kerosene.

It could therefore be concluded that the shift from oil-dominated TFEC mix to biomass-dominated TFEC mix in Afghanistan is the reason why TFEC grew faster than the TPES in the country from 1990 to 2008.

[9] Center for Energy Studies, Institute of Engineering, Tribhuvan University (2001).

Table 3.1.3 Afghanistan Energy Balance Table, 2005

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	23	0	0	0	0	0	0	0	0	0	2	51	0	0	0	0	387	0	0	0	463
2.	Imports	0	0	0	212	40	2	91	1	0	77	0	0	0	0	0	0	0	0	9	0	221
3.	Exports	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.	International Bunkers	0	0	0	–67	0	0	0	0	0	–67	0	0	0	0	0	0	0	0	0	0	–67
5.	Stock Changes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6.	Total Primary Energy Supply	23	0	0	144	40	2	91	1	0	10	2	51	0	0	0	0	387	0	9	0	617
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	–23	0	0	–82	0	0	–82	0	0	0	0	–51	0	0	0	0	0	0	83	0	–73
8.1	Power Generation	–23	0	0	–82	0	0	–82	0	0	0	0	–51	0	0	0	0	0	0	83	0	–73
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–17	0	–17
10.	Discrepancy	0	0	0	–8	0	0	0	–1	0	–7	–2	0	0	0	0	0	0	0	0	0	–10
11.	Total Final Energy Consumption	0	0	0	55	40	2	10	0	0	3	0	0	0	0	0	0	387	0	75	0	516
12.	Industry Sector	0	0	0	3	0	0	0	0	0	3	0	0	0	0	0	0	0	0	22	0	25
13.	Transport Sector	0	0	0	49	40	0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	49
14.	Other Sectors	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	387	0	53	0	442
14.1	Residential and Commercial	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	387	0	17	0	406
14.1.1	Commerce and Public Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	4
14.1.2	Residential	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	387	0	13	0	402
14.2	Non-Specified Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	36	0	36
15.	Non-Energy Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16.	Electricity Output (GWh)	81	0	0	285	0	0	285	0	0	0	0	596	0	0	0	0	0	0	0	0	962
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.
Note: Figures may not add up to total because of rounding.
Source: UNSD (2011a).

Table 3.1.4 Afghanistan Energy Balance Table, 2006

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	23	0	0	0	0	0	0	0	0	0	2	52	0	0	0	0	396	0	0	0	473
2.	Imports	0	0	0	212	40	2	91	1	0	77	0	0	0	0	0	0	0	0	68	0	280
3.	Exports	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.	International Bunkers	0	0	0	–67	0	0	0	0	0	–67	0	0	0	0	0	0	0	0	0	0	–67
5.	Stock Changes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6.	Total Primary Energy Supply	23	0	0	144	40	2	91	1	0	10	2	52	0	0	0	0	396	0	68	0	685
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	–23	0	0	–84	0	0	–84	0	0	0	0	–52	0	0	0	0	0	0	84	0	–75
8.1	Power Generation	–23	0	0	–84	0	0	–84	0	0	0	0	–52	0	0	0	0	0	0	84	0	–75
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–17	0	–17
10.	Discrepancy	0	0	0	–8	0	0	0	–1	0	–7	–2	0	0	0	0	0	0	0	–1	0	–12
11.	Total Final Energy Consumption	0	0	0	52	40	2	7	0	0	3	0	0	0	0	0	0	396	0	133	0	581
12.	Industry Sector	0	0	0	3	0	0	0	0	0	3	0	0	0	0	0	0	0	0	26	0	29
13.	Transport Sector	0	0	0	47	40	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	47
14.	Other Sectors	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	396	0	107	0	505
14.1	Residential and Commercial	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	396	0	34	0	432
14.1.1	Commerce and Public Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9	0	9
14.1.2	Residential	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	396	0	26	0	423
14.2	Non-Specified Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	73	0	73
15.	Non-Energy Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16.	Electricity Output (GWh)	81	0	0	294	0	0	294	0	0	0	0	601	0	0	0	0	0	0	0	0	976
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Source: UNSD (2011a).

Table 3.1.5 Afghanistan Energy Balance Table, 2007

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	23	0	0	0	0	0	0	0	0	0	3	52	0	0	0	0	405	0	0	0	483
2.	Imports	0	0	0	217	41	2	93	1	0	79	0	0	0	0	0	0	0	0	89	0	306
3.	Exports	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.	International Bunkers	0	0	0	–69	0	0	0	0	0	–69	0	0	0	0	0	0	0	0	0	0	–69
5.	Stock Changes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6.	Total Primary Energy Supply	23	0	0	148	41	2	93	1	0	10	3	52	0	0	0	0	405	0	89	0	719
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	–23	0	0	–91	0	0	–91	0	0	0	0	–52	0	0	0	0	0	0	87	0	–80
8.1	Power Generation	–23	0	0	–91	0	0	–91	0	0	0	0	–52	0	0	0	0	0	0	87	0	–80
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–17	0	–17
10.	Discrepancy	0	0	0	–8	0	0	0	–1	0	–7	–3	0	0	0	0	0	0	0	–3	0	–14
11.	Total Final Energy Consumption	0	0	0	48	41	2	2	0	0	3	0	0	0	0	0	0	405	0	155	0	608
12.	Industry Sector	0	0	0	3	0	0	0	0	0	3	0	0	0	0	0	0	0	0	26	0	29
13.	Transport Sector	0	0	0	43	41	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	43
14.	Other Sectors	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	405	0	129	0	536
14.1	Residential and Commercial	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	405	0	43	0	450
14.1.1	Commerce and Public Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9	0	9
14.1.2	Residential	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	405	0	34	0	441
14.2	Non-Specified Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	86	0	86
15.	Non-Energy Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16.	Electricity Output (GWh)	81	0	0	317	0	0	317	0	0	0	0	609	0	0	0	0	0	0	0	0	1,007
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.
Note: Figures may not add up to total because of rounding.
Source: UNSD (2011a).

Table 3.1.6 Afghanistan Energy Balance Table, 2008

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	23	0	0	0	0	0	0	0	0	0	3	53	0	0	0	0	405	0	0	0	483
2.	Imports	0	0	0	250	41	2	122	1	0	84	0	0	0	0	0	0	0	0	91	0	342
3.	Exports	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.	International Bunkers	0	0	0	–74	0	0	0	0	0	–74	0	0	0	0	0	0	0	0	0	0	–74
5.	Stock Changes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6.	Total Primary Energy Supply	23	0	0	176	41	2	122	1	0	10	3	53	0	0	0	0	405	0	91	0	751
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	–23	0	0	–64	0	0	–64	0	0	0	0	–53	0	0	0	0	0	0	79	0	–61
8.1	Power Generation	–23	0	0	–64	0	0	–64	0	0	0	0	–53	0	0	0	0	0	0	79	0	–61
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–18	0	–18
10.	Discrepancy	0	0	0	–8	0	0	0	–1	0	–7	–3	0	0	0	0	0	0	0	0	0	–11
11.	Total Final Energy Consumption	0	0	0	104	41	2	58	0	0	3	0	0	0	0	0	0	405	0	153	0	661
12.	Industry Sector	0	0	0	3	0	0	0	0	0	3	0	0	0	0	0	0	0	0	24	0	27
13.	Transport Sector	0	0	0	99	41	0	58	0	0	0	0	0	0	0	0	0	0	0	0	0	99
14.	Other Sectors	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	405	0	129	0	536
14.1	Residential and Commercial	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	405	0	43	0	450
14.1.1	Commerce and Public Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9	0	9
14.1.2	Residential	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	405	0	34	0	441
14.2	Non-Specified Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	86	0	86
15.	Non-Energy Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16.	Electricity Output (GWh)	81	0	0	222	0	0	222	0	0	0	0	614	0	0	0	0	0	0	0	0	917
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Source: UNSD (2011a).

Table 3.1.7 Afghanistan Summary Table, 1990–2009

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Indigenous Production (ktoe)																				
Coal	99	90	6	5	4	4	2	1	1	1	1	18	15	25	24	23	23	23	23	–
Oil	9	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Gas	213	205	187	182	174	167	160	148	139	129	119	112	7	6	3	2	2	3	3	–
Hydro	66	59	41	41	41	40	41	42	43	43	44	43	49	56	50	51	52	52	53	–
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Geothermal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Solar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Wind	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Biomass	178	183	196	211	228	246	265	285	299	316	335	345	355	365	376	387	396	405	405	–
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Total	564	544	430	438	447	457	468	476	481	489	499	518	425	451	452	463	473	483	483	–
Primary Energy Supply (ktoe)																				
Coal	99	90	6	5	4	4	2	1	1	1	1	18	15	25	24	23	23	23	23	–
Oil	668	623	351	339	324	308	291	273	259	192	139	119	82	200	134	144	144	148	176	–
Gas	213	205	187	182	174	167	160	148	139	129	119	112	7	6	3	2	2	3	3	–
Hydro	66	59	41	41	41	40	41	42	43	43	44	43	49	56	50	51	52	52	53	–
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Geothermal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Solar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Wind	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Biomass	178	183	196	211	228	246	265	285	299	316	335	345	355	365	376	387	396	405	405	–
Others	0	0	11	11	11	10	9	9	8	8	8	8	9	9	9	9	68	89	91	–
Total	1,224	1,161	792	788	782	775	769	758	749	690	646	645	516	660	595	617	685	719	751	–
Final Energy Consumption by Sector (ktoe)																				
Industry	0	0	0	31	31	28	24	23	22	17	20	19	22	25	24	25	29	29	27	–
Transport	423	398	154	148	141	136	128	120	116	54	61	54	46	123	46	49	47	43	99	–
Residential	175	177	183	196	209	222	279	295	309	325	344	353	365	377	389	402	423	441	441	–
Commercial	8	7	6	6	6	5	4	3	3	2	2	2	3	3	3	4	9	9	9	–
Others	3	2	2	2	2	6	11	16	17	25	25	26	23	39	35	36	73	86	86	–
Total	608	584	345	382	388	397	446	457	466	423	453	455	459	567	497	516	581	608	661	–

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Table 3.1.7 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Final Energy Consumption by Type (ktoe)																				
Coal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Oil	423	398	154	148	141	136	128	120	116	54	65	58	49	126	51	55	52	48	104	–
Gas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Electricity	35	31	25	56	55	54	53	52	51	53	53	53	56	76	71	75	133	155	153	–
Heat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Biomass	151	155	166	178	192	207	265	285	299	316	335	345	355	365	376	387	396	405	405	–
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Total	608	584	345	382	388	397	446	457	466	423	453	455	459	567	497	516	581	608	661	–
Power Generation (GWh)																				
Thermal	364	325	225	220	215	209	200	185	170	180	172	188	151	329	350	366	375	398	303	–
Hydro	764	690	478	475	472	466	475	485	495	505	516	503	571	647	579	596	601	609	614	–
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Geothermal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Solar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Wind	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Total	1,128	1,015	703	695	687	675	675	670	665	685	688	691	722	976	929	962	976	1,007	917	–
Loss and Own Use of Electricity (GWh)																				
Transmission and Distribution Losses	231	215	175	175	175	169	169	167	166	166	166	166	170	194	209	200	202	203	205	–
Own Use	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Total	231	215	175	175	175	169	169	167	166	166	166	166	170	194	209	200	202	203	205	–
Fuel Input for Power Generation (ktoe)																				
Coal	74	66	6	5	4	4	2	1	1	1	1	18	15	25	24	23	23	23	23	–
Oil	31	27	59	58	57	56	55	52	47	51	49	36	29	70	77	82	84	91	64	–
Gas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Total	104	93	65	63	62	60	57	53	49	52	49	54	43	94	100	105	108	114	87	–
CO_2 Emissions (kt C)																				
Coal	79	71	6	5	5	4	2	2	2	1	1	20	16	26	26	25	25	25	25	–
Oil	377	353	175	169	164	158	151	142	135	88	95	78	65	162	105	113	113	116	140	–
Gas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Total	457	424	181	175	168	162	153	143	136	89	96	97	81	188	131	138	138	141	165	–

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Table 3.1.7 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Macroeconomic Indicators																				
Population (thousand)	19,024	19,669	20,336	21,025	21,738	22,476	23,131	23,806	24,501	25,215	25,951	26,697	27,466	28,256	29,069	29,905	30,752	31,622	32,518	33,438
Urban Population, %	18.3	18.6	18.9	19.2	19.5	19.8	20.1	20.4	20.7	21.0	21.3	21.6	21.9	22.3	22.6	22.9	23.3	23.7	24.0	24.4
GDP (constant 2000 $ million)	3,622	3,341	3,475	2,665	2,115	3,236	3,124	3,016	2,911	2,810	2,713	2,618	4,741	5,420	5,932	6,793	7,295	8,475	7,173	8,413
GDP (current $ million)	–	–	–	–	–	–	–	–	–	–	–	2,462	4,339	4,766	5,704	6,815	7,722	9,707	11,940	14,214
GDP (constant 2005 PPP $ million)	–	–	–	–	–	–	–	–	–	–	–	–	15,616	17,851	19,536	22,372	24,875	27,644	28,584	34,415
GDP/capita (constant 2000 $)	190	170	171	127	97	144	135	127	119	111	105	98	173	192	204	227	237	268	221	252
GDP/capita (current $)	–	–	–	–	–	–	–	–	–	–	–	92	158	169	196	228	251	307	367	425
GDP – Manufacturing (% of GDP)	27.8	26.5	15.4	13 .1	10 .0	6.5	8 .0	9.9	12.4	15.3	18.9	21 .2	14.8	12.6	14 .0	14.6	15.1	13.6	13.7	12.2
Car Ownership (car/1,000 persons)	3	3	3	3	3	3	3	3	3	2	2	2	2	2	2	2	2	2	2	2
Basic Energy Indicators																				
TPES/capita (toe/person)	0.06	0.06	0.04	0.04	0.04	0.03	0.03	0.03	0.03	0.03	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	–
TFEC/capita (toe/person)	0.03	0.03	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	–
TPES/GDP (toe/constant 2000 $ million)	338	347	228	296	370	239	246	251	257	245	238	246	109	122	100	91	94	85	105	–
TFEC/GDP (toe/constant 2000 $ million)	168	175	99	143	184	123	143	152	160	151	167	174	97	105	84	76	80	72	92	–
Import Dependency (%)	53.9	53.1	45.8	44.4	42.9	41.1	39.1	37.1	35.7	29.1	22.8	19.7	17.6	31.7	24.0	24.9	31.0	32.9	35.6	–
Oil Import Dependency (%)	98.7	99.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	–
Electricity/capita (kWh/ person)	21	18	14	31	29	28	27	25	24	24	24	23	24	31	28	29	50	57	55	–
CO_2 Intensity (t C/constant 2000 $ million)	126	127	52	66	79	50	49	47	47	32	35	37	17	35	22	20	19	17	23	–
CO_2/capita (t C)	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.01	–
CO_2/TPES (t C/toe)	0.37	0.37	0.23	0.22	0.21	0.21	0.20	0.19	0.18	0.13	0.15	0.15	0.16	0.29	0.22	0.22	0.20	0.20	0.22	–

– = no data or not applicable, CO_2 = carbon dioxide, GDP = gross domestic product, GWh = gigawatt–hour, kt C = thousand tons of carbon equivalent, ktoe = thousand tons of oil equivalent, kWh = kilowatt–hour, PPP = purchasing power parity, t C = ton of carbon equivalent, TFEC = total final energy consumption, toe = ton of oil equivalent,

TPES = total primary energy supply.

Note: Figures may not add up to total because of rounding.

Sources: ADB, (2011), APERC estimates, JAMA (2012), UNSD (2011a), and World Bank.

3.2 Armenia

Country Profile (2009)		Energy Reserves (year-end 2008)	
Total Surface Area (square kilometer)	29,740	Coal (million ton) - Recoverable	163.0
Population (thousand)	3,085	Gas (trillion cubic feet) - Proven	5.8
GDP (constant 2000 $ billion)	4.0	Oil (billion barrel) - Proven	–
Electrification Rate (%)	–		

– = no data or not applicable, GDP = gross domestic product.

Note: The latest available data on electrification rate is for the year 2005, which is 99.8%.

Sources: ADB (2012), World Bank, and WEC (2010).

2009 Energy Supply and Demand Flow (ktoe)

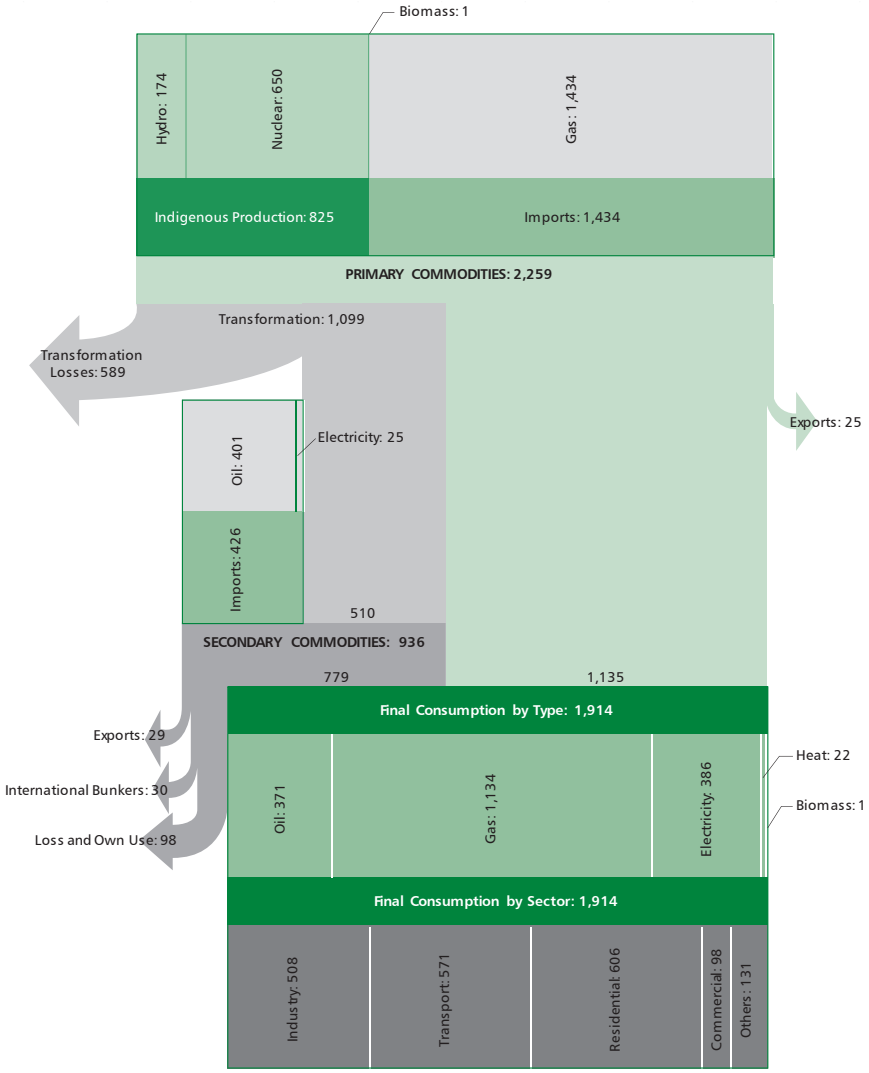


Table 3.2.1 Key Data and Economic Profile

	1990	1995	2000	2005	2009
Socioeconomic Data					
Population (thousand)	3,545	3,223	3,076	3,066	3,085
GDP (constant 2000 $ billion)	2.8	1.5	1.9	3.4	4.0
GDP (constant 2005 PPP $ billion)	10.4	5.5	7.1	12.6	14.8
GDP/capita (constant 2000 $)	795	462	621	1,109	1,302
GDP/capita (constant 2005 PPP $)	2,938	1,706	2,295	4,096	4,811

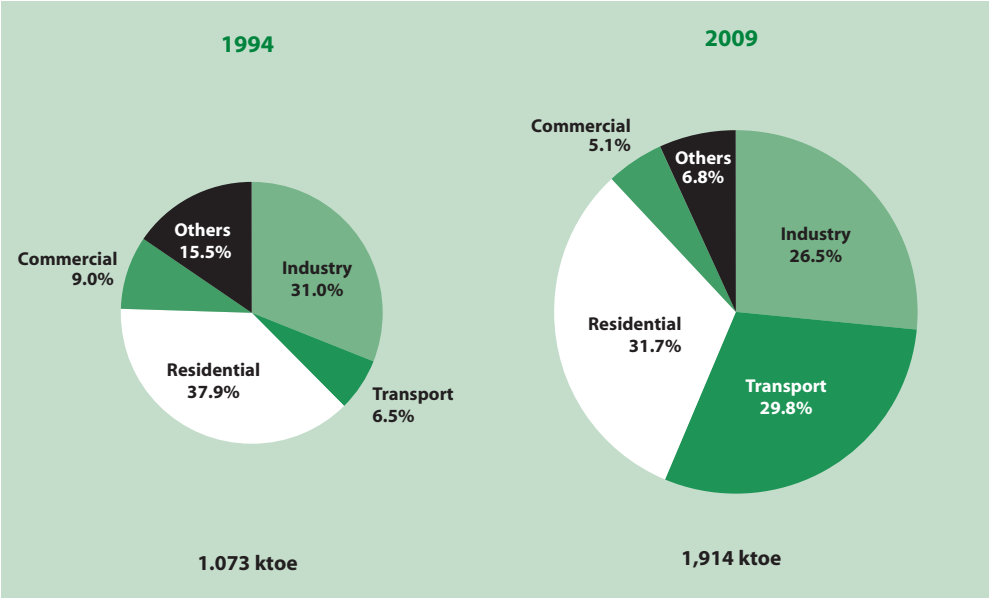
GDP = gross domestic product, PPP = purchasing power parity.
Source: World Bank.

Table 3.2.2 Energy Supply and Demand

	1990	1995	2000	2005	2009
Primary Energy Supply (ktoe)					
Indigenous Production	–	245	632	861	825
Net Imports	–	1,386	1,371	1,643	1,776
Total PES	–	1,631	2,003	2,504	2,601
Coal	–	1	0	0	0
Oil	–	241	291	372	371
Gas	–	1,143	1,120	1,338	1,409
Biomass	–	1	1	1	1
Others	–	245	591	793	820
TPES/capita (toe)	–	0.51	0.65	0.82	0.84
TPES/GDP (toe/constant 2005 PPP $ million)	–	297	284	199	175
Final Energy Consumption (ktoe)					
Industry	–	313	398	682	508
Transportation	–	55	208	251	571
Other Sectors	–	766	490	772	835
Total FEC	–	1,134	1,096	1,705	1,914
Coal	–	1	0	0	0
Oil	–	194	291	372	371
Gas	–	615	439	933	1,134
Electricity	–	262	309	358	386
Biomass	–	1	1	1	1
Others	–	61	56	41	22

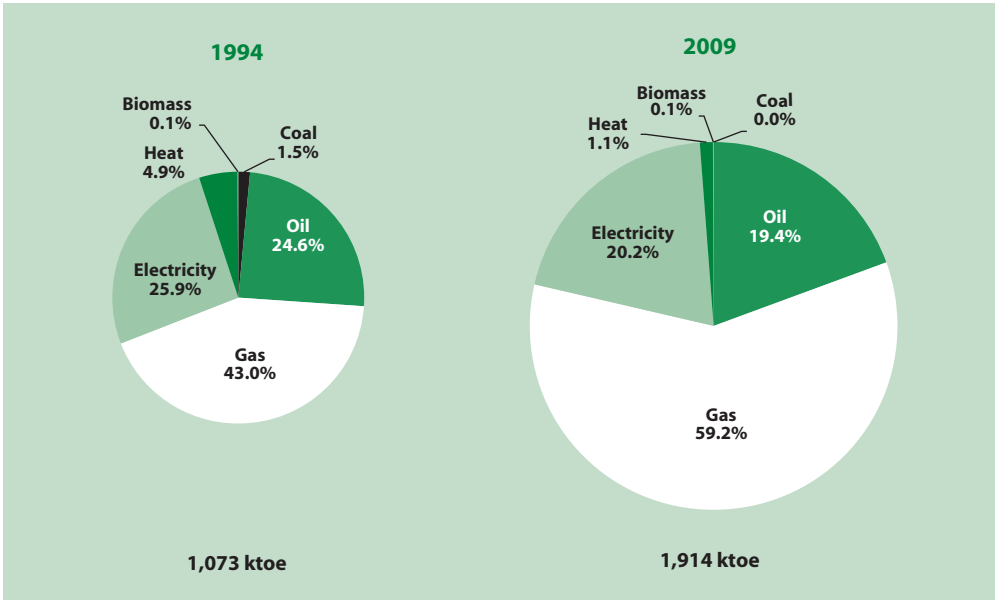
– = no data or not applicable, FEC = final energy consumption, GDP = gross domestic product, ktoe = thousand tons of oil equivalent, PES = primary energy supply, PPP = purchasing power parity, toe = ton of oil equivalent, TPES = total primary energy supply.
Source: IEA (2011b).

Figure 3.2.1 Final Energy Consumption by Sector, 1994 and 2009



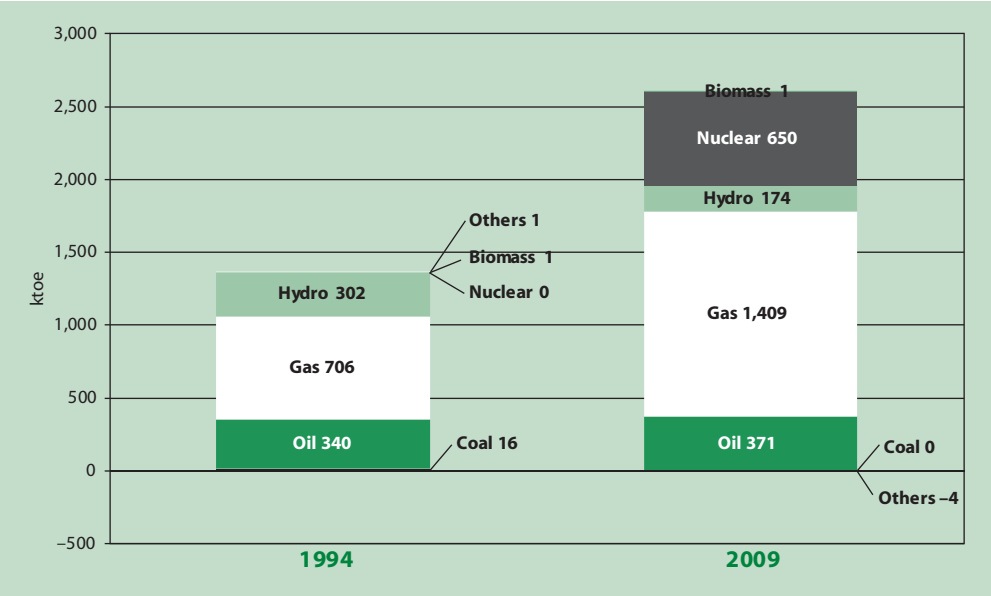
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 3.2.2 Final Energy Consumption by Type of Energy, 1994 and 2009



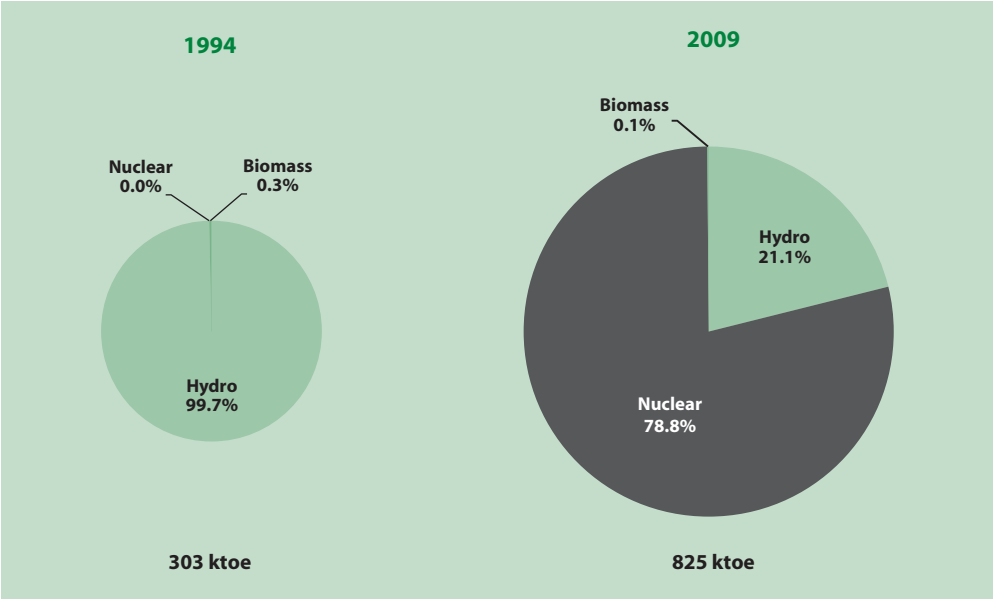
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 3.2.3 Total Primary Energy Supply, 1994 and 2009



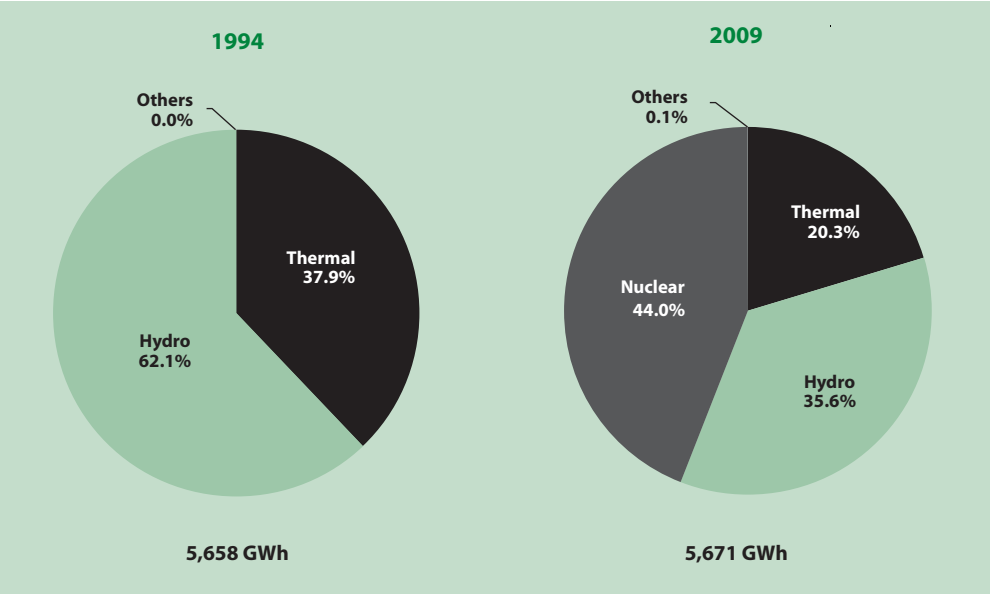
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 3.2.4 Indigenous Energy Production, 1994 and 2009



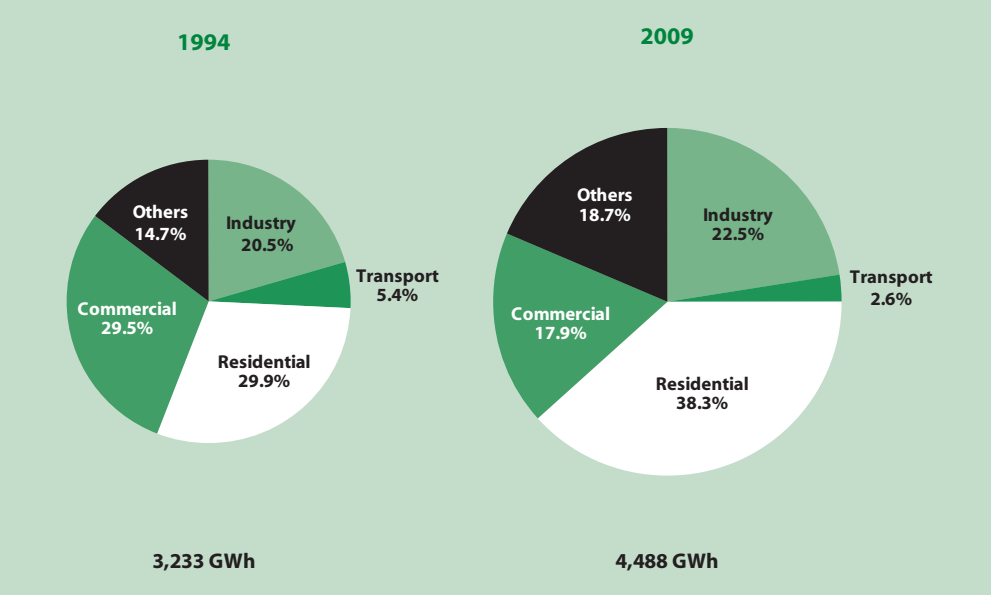
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 3.2.5 Electricity Generation by Plant Type, 1994 and 2009



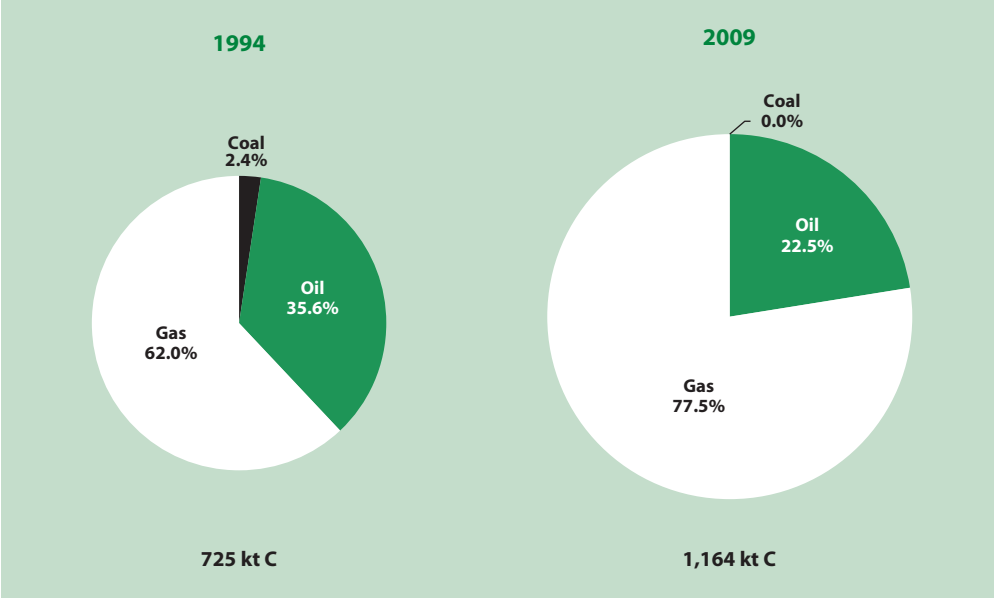
GWh = gigawatt-hour.
Source: IEA (2011b).

Figure 3.2.6 Electricity Consumption by Sector, 1994 and 2009



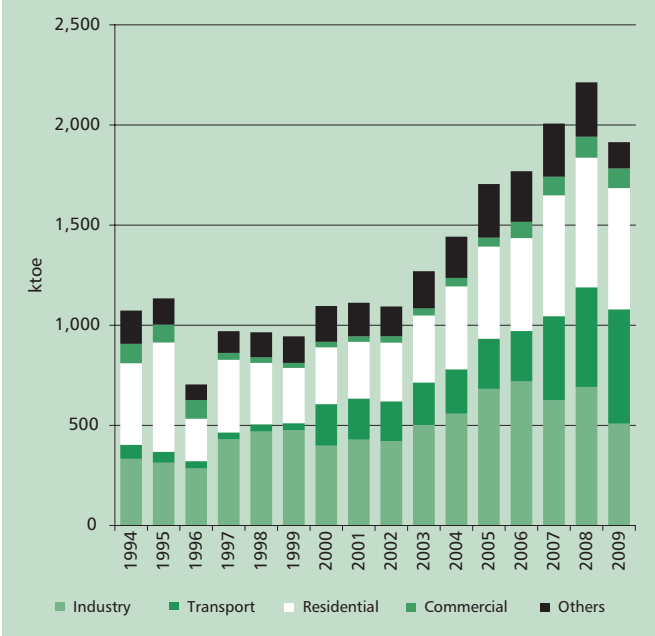
GWh = gigawatt-hour.
Source: IEA (2011b).

Figure 3.2.7 Carbon Dioxide Emissions from Fuel Combustion, 1994 and 2009



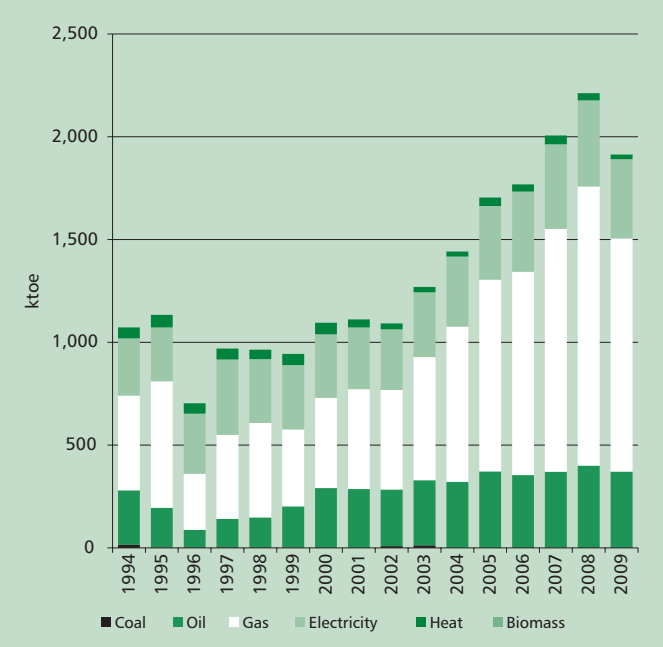
kt C = thousand tons of carbon equivalent.
Source: APERC estimates.

Figure 3.2.8 Final Energy Consumption by Sector, 1994–2009



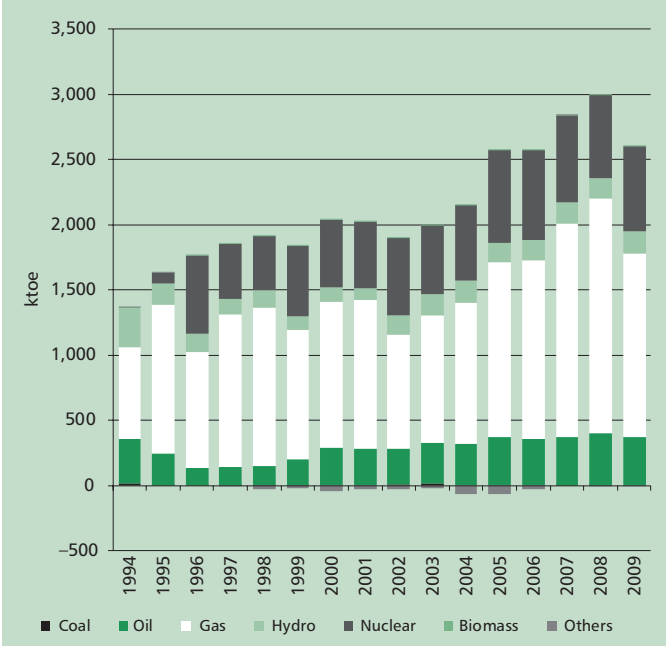
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 3.2.9 Final Energy Consumption by Type, 1994–2009



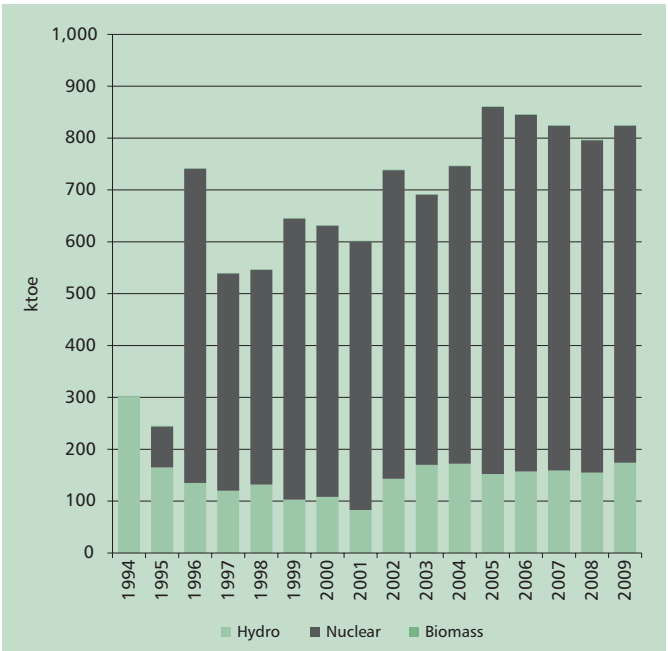
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 3.2.10 Total Primary Energy Supply, 1994–2009



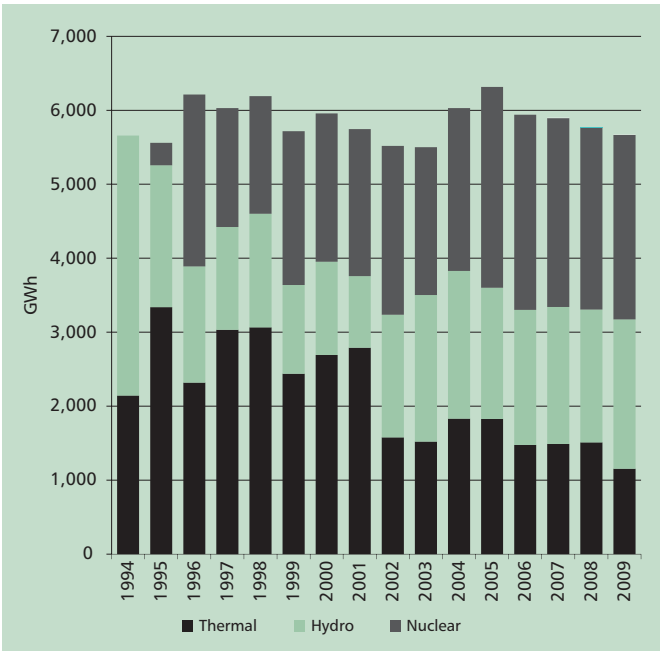
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 3.2.11 Indigenous Energy Production, 1994–2009



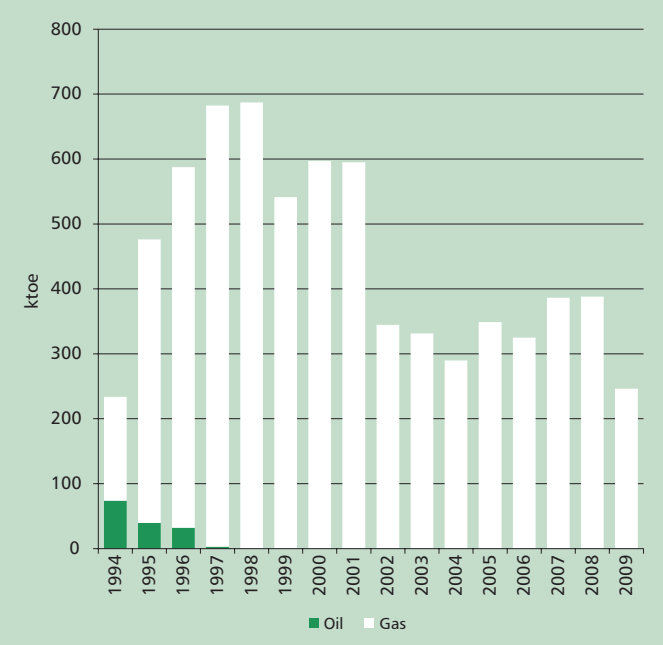
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 3.2.12 Electricity Generation by Source, 1994–2009



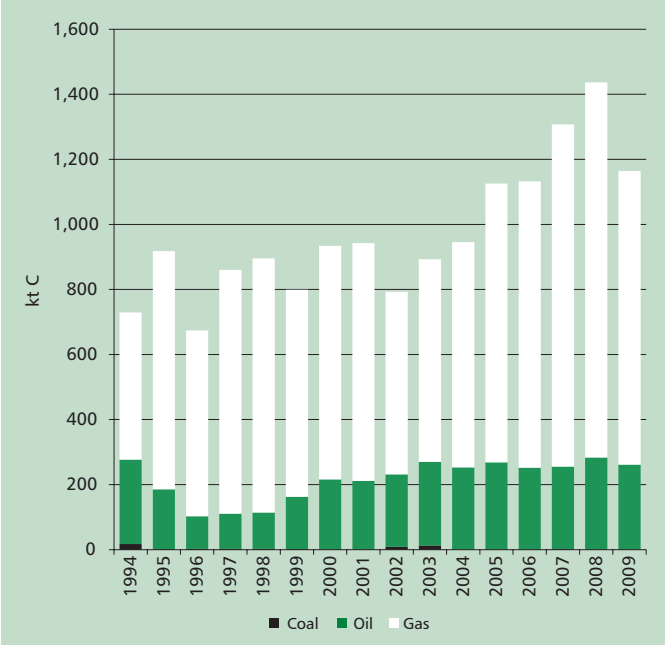
GWh = gigawatt-hour.
Source: IEA (2011b).

Figure 3.2.13 Fuel Input for Electricity Generation, 1994–2009



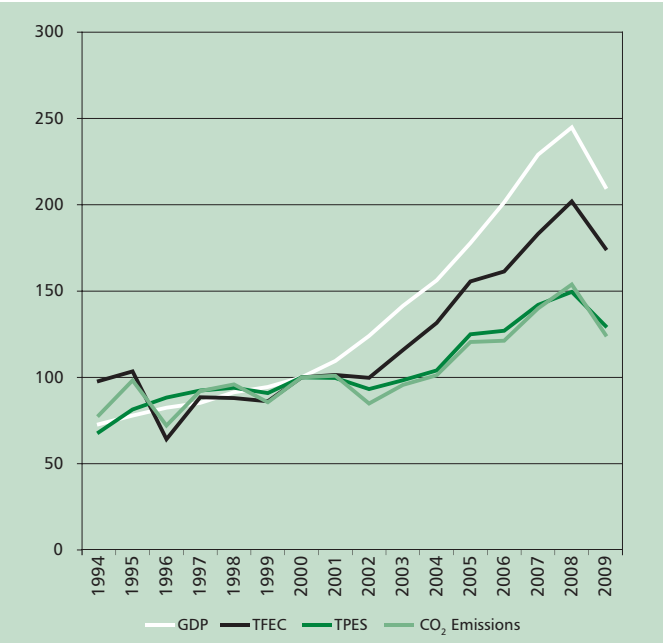
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 3.2.14 Carbon Dioxide Emissions from Fuel Combustion, 1994–2009



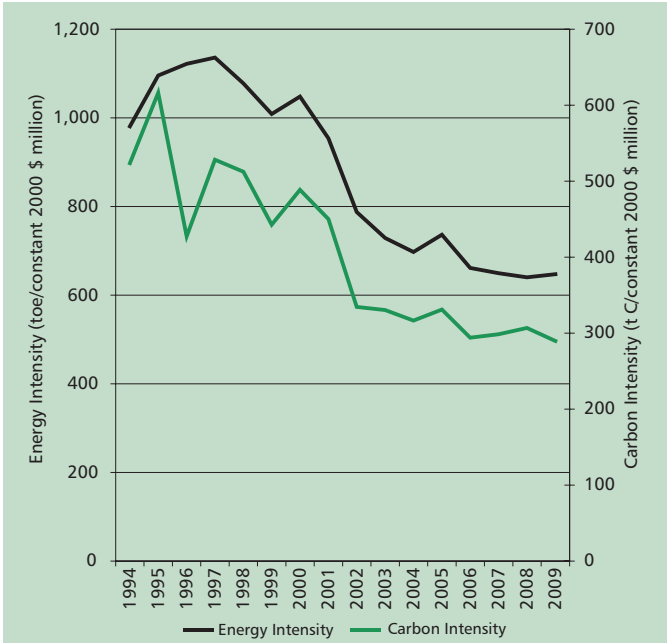
kt C = thousand tons of carbon equivalent.
Source: APERC estimates.

Figure 3.2.15 Growth of GDP, TFEC, TPES, and CO_2 Emissions (indexed to year 2000), 1994–2009



CO_2 = carbon dioxide, GDP = gross domestic product, TFEC = total final energy consumption, TPES = total primary energy supply.
Note: Indices are measured relative to the base year 2000 (2000 = 100).
Source: APERC estimates.

Figure 3.2.16 Energy and Carbon Intensities, 1994–2009



t C = ton of carbon equivalent, toe = ton of oil equivalent.
Source: APERC estimates.

Table 3.2.3 Armenia Energy Balance Table, 2006

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	0	0	0	0	0	0	0	0	0	0	0	157	688	0	0	0	1	0	0	0	846
2.	Imports	0	0	0	394	181	0	115	0	16	82	1,390	0	0	0	0	0	0	0	30	0	1,814
3.	Exports	0	0	0	0	0	0	0	0	0	0	–18	0	0	0	0	0	0	0	–57	0	–75
4.	International Bunkers	0	0	0	–40	0	0	0	0	0	–40	0	0	0	0	0	0	0	0	0	0	–40
5.	Stock Changes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6.	Total Primary Energy Supply	0	0	0	354	181	0	115	0	16	42	1,372	157	688	0	0	0	1	0	–27	0	2,545
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	0	0	0	0	0	0	0	0	0	0	–385	–157	–688	0	0	0	0	0	511	48	–671
8.1	Power Generation	0	0	0	0	0	0	0	0	0	0	–385	–157	–688	0	0	0	0	0	511	48	–671
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–95	–13	–108
10.	Discrepancy	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	1	0	3
11.	Total Final Energy Consumption	0	0	0	354	181	0	115	0	16	42	989	0	0	0	0	0	1	0	390	35	1,769
12.	Industry Sector	0	0	0	0	0	0	0	0	0	0	612	0	0	0	0	0	0	0	89	19	720
13.	Transport Sector	0	0	0	181	181	0	0	0	0	0	60	0	0	0	0	0	0	0	10	0	251
14.	Other Sectors	0	0	0	131	0	0	115	0	16	0	317	0	0	0	0	0	1	0	291	16	756
14.1	Residential and Commercial	0	0	0	0	0	0	0	0	0	0	317	0	0	0	0	0	0	0	212	16	545
14.1.1	Commerce and Public Services	0	0	0	0	0	0	0	0	0	0	16	0	0	0	0	0	0	0	65	0	81
14.1.2	Residential	0	0	0	0	0	0	0	0	0	0	301	0	0	0	0	0	0	0	147	16	464
14.2	Non-Specified Others	0	0	0	131	0	0	115	0	16	0	0	0	0	0	0	0	1	0	79	0	211
15.	Non-Energy Use	0	0	0	42	0	0	0	0	0	42	0	0	0	0	0	0	0	0	0	0	42
16.	Electricity Output (GWh)	0	0	0	0	0	0	0	0	0	0	1,476	1,825	2,640	0	0	0	0	0	0	0	5,941
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	2,010	0	0	0	0	0	0	0	0	0	2,010

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.
Note: Figures may not add up to total because of rounding.
Source: IEA (2011b).

Table 3.2.4 Armenia Energy Balance Table, 2007

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	0	0	0	0	0	0	0	0	0	0	0	159	665	0	0	0	1	0	0	0	825
2.	Imports	1	0	0	427	178	0	123	0	13	113	1,664	0	0	0	0	0	0	0	34	0	2,126
3.	Exports	0	0	0	0	0	0	0	0	0	0	–21	0	0	0	0	0	0	0	–28	0	–49
4.	International Bunkers	0	0	0	–58	0	0	0	0	0	–58	0	0	0	0	0	0	0	0	0	0	–58
5.	Stock Changes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6.	Total Primary Energy Supply	1	0	0	369	178	0	123	0	13	55	1,643	159	665	0	0	0	1	0	6	0	2,844
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	0	0	0	0	0	0	0	0	0	0	–460	–159	–665	0	0	0	0	0	507	59	–718
8.1	Power Generation	0	0	0	0	0	0	0	0	0	0	–460	–159	–665	0	0	0	0	0	507	59	–718
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–95	–16	–111
10.	Discrepancy	0	0	0	0	0	0	0	0	0	0	–1	0	0	0	0	0	0	0	–7	0	–8
11.	Total Final Energy Consumption	1	0	0	369	178	0	123	0	13	55	1,182	0	0	0	0	0	1	0	411	43	2,007
12.	Industry Sector	0	0	0	0	0	0	0	0	0	0	498	0	0	0	0	0	0	0	104	23	625
13.	Transport Sector	0	0	0	178	178	0	0	0	0	0	231	0	0	0	0	0	0	0	11	0	420
14.	Other Sectors	1	0	0	136	0	0	123	0	13	0	453	0	0	0	0	0	1	0	296	20	907
14.1	Residential and Commercial	1	0	0	0	0	0	0	0	0	0	453	0	0	0	0	0	0	0	223	20	697
14.1.1	Commerce and Public Services	0	0	0	0	0	0	0	0	0	0	22	0	0	0	0	0	0	0	71	0	93
14.1.2	Residential	1	0	0	0	0	0	0	0	0	0	431	0	0	0	0	0	0	0	152	20	604
14.2	Non-Specified Others	0	0	0	136	0	0	123	0	13	0	0	0	0	0	0	0	1	0	73	0	210
15.	Non-Energy Use	0	0	0	55	0	0	0	0	0	55	0	0	0	0	0	0	0	0	0	0	55
16.	Electricity Output (GWh)	0	0	0	0	0	0	0	0	0	0	1,489	1,853	2,553	0	0	3	0	0	0	0	5,898
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	2,470	0	0	0	0	0	0	0	0	0	2,470

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Source: IEA (2011b).

Table 3.2.5 Armenia Energy Balance Table, 2008

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	0	0	0	0	0	0	0	0	0	0	0	155	641	0	0	0	1	0	0	0	797
2.	Imports	1	0	0	458	208	0	131	1	10	108	1,826	0	0	0	0	0	0	0	29	0	2,314
3.	Exports	0	0	0	0	0	0	0	0	0	0	–26	0	0	0	0	0	0	0	–31	0	–57
4.	International Bunkers	0	0	0	–58	0	0	0	0	0	–58	0	0	0	0	0	0	0	0	0	0	–58
5.	Stock Changes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6.	Total Primary Energy Supply	1	0	0	400	208	0	131	1	10	50	1,800	155	641	0	0	0	1	0	–2	0	2,996
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	0	0	0	0	0	0	0	0	0	0	–443	–155	–641	0	0	0	0	0	496	44	–699
8.1	Power Generation	0	0	0	0	0	0	0	0	0	0	–443	–155	–641	0	0	0	0	0	496	44	–699
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–94	–9	–103
10.	Discrepancy	–1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	19	0	19
11.	Total Final Energy Consumption	0	0	0	400	208	0	131	1	10	50	1,358	0	0	0	0	0	1	0	419	35	2,213
12.	Industry Sector	0	0	0	0	0	0	0	0	0	0	572	0	0	0	0	0	0	0	101	19	692
13.	Transport Sector	0	0	0	208	208	0	0	0	0	0	279	0	0	0	0	0	0	0	10	0	497
14.	Other Sectors	0	0	0	142	0	0	131	1	10	0	507	0	0	0	0	0	1	0	308	16	974
14.1	Residential and Commercial	0	0	0	0	0	0	0	0	0	0	507	0	0	0	0	0	0	0	229	16	752
14.1.1	Commerce and Public Services	0	0	0	0	0	0	0	0	0	0	29	0	0	0	0	0	0	0	75	0	104
14.1.2	Residential	0	0	0	0	0	0	0	0	0	0	478	0	0	0	0	0	0	0	154	16	648
14.2	Non-Specified Others	0	0	0	142	0	0	131	1	10	0	0	0	0	0	0	0	1	0	79	0	222
15.	Non-Energy Use	0	0	0	50	0	0	0	0	0	50	0	0	0	0	0	0	0	0	0	0	50
16.	Electricity Output (GWh)	0	0	0	0	0	0	0	0	0	0	1,510	1,797	2,461	2	0	2	0	0	0	0	5,772
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	1,842	0	0	0	0	0	0	0	0	0	1,842

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.
Note: Figures may not add up to total because of rounding.
Source: IEA (2011b).

Table 3.2.6 Armenia Energy Balance Table, 2009

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	0	0	0	0	0	0	0	0	0	0	0	174	650	0	0	0	1	0	0	0	825
2.	Imports	0	0	0	401	193	0	120	1	9	78	1,434	0	0	0	0	0	0	0	25	0	1,860
3.	Exports	0	0	0	0	0	0	0	0	0	0	–25	0	0	0	0	0	0	0	–29	0	–54
4.	International Bunkers	0	0	0	–30	0	0	0	0	0	–30	0	0	0	0	0	0	0	0	0	0	–30
5.	Stock Changes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6.	Total Primary Energy Supply	0	0	0	371	193	0	120	1	9	48	1,409	174	650	0	0	0	1	0	–4	0	2,601
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	0	0	0	0	0	0	0	0	0	0	–275	–174	–650	0	0	0	0	0	487	23	–589
8.1	Power Generation	0	0	0	0	0	0	0	0	0	0	–275	–174	–650	0	0	0	0	0	487	23	–589
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–97	–1	–98
10.	Discrepancy	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11.	Total Final Energy Consumption	0	0	0	371	193	0	120	1	9	48	1,134	0	0	0	0	0	1	0	386	22	1,914
12.	Industry Sector	0	0	0	0	0	0	0	0	0	0	409	0	0	0	0	0	0	0	87	12	508
13.	Transport Sector	0	0	0	313	193	0	120	0	0	0	248	0	0	0	0	0	0	0	10	0	571
14.	Other Sectors	0	0	0	10	0	0	0	1	9	0	477	0	0	0	0	0	1	0	289	10	787
14.1	Residential and Commercial	0	0	0	0	0	0	0	0	0	0	477	0	0	0	0	0	0	0	217	10	704
14.1.1	Commerce and Public Services	0	0	0	0	0	0	0	0	0	0	29	0	0	0	0	0	0	0	69	0	98
14.1.2	Residential	0	0	0	0	0	0	0	0	0	0	448	0	0	0	0	0	0	0	148	10	606
14.2	Non-Specified Others	0	0	0	10	0	0	0	1	9	0	0	0	0	0	0	0	1	0	72	0	83
15.	Non-Energy Use	0	0	0	48	0	0	0	0	0	48	0	0	0	0	0	0	0	0	0	0	48
16.	Electricity Output (GWh)	0	0	0	0	0	0	0	0	0	0	1,154	2,019	2,494	0	0	4	0	0	0	0	5,671
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	963	0	0	0	0	0	0	0	0	0	963

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Source: IEA (2011b).

Table 3.2.7 Armenia Summary Table, 1990–2009

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Indigenous Production (ktoe)																				
Coal	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Oil	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gas	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hydro	–	–	–	–	302	165	135	120	132	103	108	83	143	170	172	152	157	159	155	174
Nuclear	–	–	–	–	0	79	606	419	414	542	523	518	595	521	574	708	688	665	641	650
Geothermal	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Solar	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wind	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Biomass	–	–	–	–	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Others	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	–	–	–	–	303	245	742	540	547	646	632	602	739	692	747	861	846	825	797	825
Primary Energy Supply (ktoe)																				
Coal	–	–	–	–	16	1	2	2	2	1	0	0	8	12	0	0	0	1	1	0
Oil	–	–	–	–	340	241	133	142	146	201	291	286	276	317	321	372	354	369	400	371
Gas	–	–	–	–	706	1,143	891	1,171	1,219	994	1,120	1,141	875	973	1,080	1,338	1,372	1,643	1,800	1,409
Hydro	–	–	–	–	302	165	135	120	132	103	108	83	143	170	172	152	157	159	155	174
Nuclear	–	–	–	–	0	79	606	419	414	542	523	518	595	521	574	708	688	665	641	650
Geothermal	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Solar	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wind	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Biomass	–	–	–	–	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Others	–	–	–	–	1	1	0	–5	–31	–21	–40	–32	–31	–24	–65	–67	–27	6	–2	–4
Total	–	–	–	–	1,366	1,631	1,768	1,850	1,883	1,821	2,003	1,997	1,867	1,970	2,083	2,504	2,545	2,844	2,996	2,601
Final Energy Consumption by Sector (ktoe)																				
Industry	–	–	–	–	333	313	285	430	469	476	398	429	422	502	558	682	720	625	692	508
Transport	–	–	–	–	70	55	36	35	36	35	208	205	198	212	222	251	251	420	497	571
Residential	–	–	–	–	407	546	212	362	307	276	284	283	293	335	414	460	464	604	648	606
Commercial	–	–	–	–	97	89	93	35	28	25	27	27	32	35	42	44	81	93	104	98
Others	–	–	–	–	166	131	78	108	125	132	179	168	148	186	206	268	253	265	272	131
Total	–	–	–	–	1,073	1,134	704	970	965	944	1,096	1,112	1,093	1,270	1,442	1,705	1,769	2,007	2,213	1,914

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Table 3.2.7 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Final Energy Consumption by Type (ktoe)																				
Coal	–	–	–	–	16	1	2	2	2	1	0	0	8	12	0	0	0	1	0	0
Oil	–	–	–	–	264	194	85	139	146	201	291	286	276	317	321	372	354	369	400	371
Gas	–	–	–	–	461	615	273	409	459	374	439	486	484	599	755	933	989	1,182	1,358	1,134
Electricity	–	–	–	–	278	262	293	366	311	313	309	300	295	315	341	358	390	411	419	386
Heat	–	–	–	–	53	61	50	53	46	54	56	39	29	26	24	41	35	43	35	22
Biomass	–	–	–	–	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Others	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	–	–	–	–	1,073	1,134	704	970	965	944	1,096	1,112	1,093	1,270	1,442	1,705	1,769	2,007	2,213	1,914
Power Generation (GWh)																				
Thermal	–	–	–	–	2,144	3,338	2,318	3,032	3,065	2,439	2,692	2,790	1,579	1,521	1,831	1,828	1,476	1,489	1,510	1,154
Hydro	–	–	–	–	3,514	1,919	1,572	1,390	1,537	1,200	1,261	968	1,658	1,982	1,998	1,773	1,825	1,853	1,797	2,019
Nuclear	–	–	–	–	0	304	2,324	1,607	1,589	2,078	2,005	1,987	2,282	1,998	2,201	2,716	2,640	2,553	2,461	2,494
Geothermal	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
Solar	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wind	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	3	2	4
Others	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	–	–	–	–	5,658	5,561	6,214	6,029	6,191	5,717	5,958	5,745	5,519	5,501	6,030	6,317	5,941	5,898	5,772	5,671
Loss and Own Use of Electricity (GWh)																				
Transmission and Distribution Losses	–	–	–	–	2,244	2,198	2,349	1,244	1,767	1,442	1,512	1,500	1,419	1,244	953	1,000	779	779	895	837
Own Use	–	–	–	–	198	326	453	453	453	395	395	395	337	314	349	372	326	326	198	291
Total	–	–	–	–	2,442	2,523	2,802	1,698	2,221	1,837	1,907	1,895	1,756	1,558	1,302	1,372	1,105	1,105	1,093	1,128
Fuel Input for Power Generation (ktoe)																				
Coal	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Oil	–	–	–	–	74	40	32	3	0	0	0	0	0	0	0	0	0	0	0	0
Gas	–	–	–	–	160	437	556	680	687	541	597	595	345	332	290	349	325	386	388	246
Total	–	–	–	–	234	476	588	683	687	541	597	595	345	332	290	349	325	386	388	246
CO_2 Emissions (kt C)																				
Coal	–	–	–	–	17	1	2	2	2	1	0	0	9	13	0	0	0	1	0	0
Oil	–	–	–	–	260	184	101	108	112	161	216	212	223	257	253	268	252	254	283	262
Gas	–	–	–	–	452	732	571	749	782	637	718	731	561	623	692	857	880	1,052	1,153	903
Total	–	–	–	–	729	918	674	860	896	799	934	943	793	893	945	1,125	1,132	1,307	1,437	1,164

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Table 3.2.7 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Macroeconomic Indicators																				
Population (thousand)	3,545	3,512	3,450	3,370	3,291	3,223	3,172	3,135	3,109	3,091	3,076	3,066	3,061	3,061	3,063	3,066	3,070	3,074	3,079	3,085
Urban Population, %	67.5	67.3	67.0	66.8	66.5	66.3	66.1	65.8	65.6	65.3	65.1	64.9	64.7	64.5	64.3	64.1	64.0	63.9	63.9	63.8
GDP (constant 2000 $ million)	2,819	2,490	1,449	1,321	1,393	1,489	1,576	1,629	1,747	1,805	1,912	2,094	2,370	2,703	2,986	3,400	3,849	4,378	4,680	4,018
GDP (current $ million)	2,257	2,069	1,273	1,201	1,315	1,468	1,597	1,639	1,894	1,845	1,912	2,118	2,376	2,807	3,577	4,900	6,384	9,206	11,662	8,648
GDP (constant 2005 PPP $ million)	10,414	9,196	5,352	4,881	5,144	5,499	5,822	6,015	6,454	6,667	7,061	7,736	8,756	9,985	11,030	12,559	14,217	16,172	17,288	14,841
GDP/capita (constant 2000 $)	795	709	420	392	423	462	497	519	562	584	621	683	774	883	975	1,109	1,254	1,424	1,520	1,302
GDP/capita (current $)	637	589	369	356	400	456	503	523	609	597	621	691	776	917	1,168	1,598	2,080	2,995	3,787	2,803
GDP – Manufacturing (% of GDP)	21.4	23 .3	16 .1	19 .3	20 .0	19.2	18 .3	18 .0	16 .4	16.7	16.8	17.0	17 .0	16.6	15 .2	15.5	14.7	12.5	11.9	13.6
Car Ownership (car/1,000 persons)	–	–	–	–	–	–	–	–	–	–	–	82	121	121	121	121	121	121	121	121
Basic Energy Indicators																				
TPES/capita (toe/person)	–	–	–	–	0.42	0.51	0.56	0.59	0.61	0.59	0.65	0.65	0.61	0.64	0.68	0.82	0.83	0.93	0.97	0.84
TFEC/capita (toe/person)	–	–	–	–	0.33	0.35	0.22	0.31	0.31	0.31	0.36	0.36	0.36	0.41	0.47	0.56	0.58	0.65	0.72	0.62
TPES/GDP (toe/constant 2000 $ million)	–	–	–	–	981	1,095	1,122	1,136	1,078	1,009	1,048	954	788	729	698	736	661	650	640	647
TFEC/GDP (toe/constant 2000 $ million)	–	–	–	–	770	762	447	596	552	523	573	531	461	470	483	501	460	458	473	476
Import Dependency (%)	–	–	–	–	77.8	85.0	58.0	70.8	71.0	64.5	68.4	69.9	60.4	64.9	64.1	65.6	66.8	71.0	73.4	68.3
Oil Import Dependency (%)	–	–	–	–	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Electricity/capita (kWh/ person)	–	–	–	–	983	945	1,074	1,358	1,163	1,178	1,168	1,138	1,121	1,197	1,295	1,358	1,478	1,555	1,583	1,455
CO_2 Intensity (t C/constant 2000 $ million)	–	–	–	–	524	616	427	528	513	443	489	450	334	330	317	331	294	299	307	290
CO_2/capita (t C)	–	–	–	–	0.22	0.28	0.21	0.27	0.29	0.26	0.30	0.31	0.26	0.29	0.31	0.37	0.37	0.43	0.47	0.38
CO_2/TPES (t C/toe)	–	–	–	–	0.53	0.56	0.38	0.46	0.48	0.44	0.47	0.47	0.42	0.45	0.45	0.45	0.44	0.46	0.48	0.45

– = no data or not applicable, CO_2 = carbon dioxide, GDP = gross domestic product, GWh = gigawatt–hour, kt C = thousand tons of carbon equivalent, ktoe = thousand tons of oil equivalent, kWh = kilowatt–hour, PPP = purchasing power parity, t C = ton of carbon equivalent, TFEC = total final energy consumption, toe = ton of oil equivalent, TPES = total primary energy supply.

Note: Figures may not add up to total because of rounding.

Sources: APERC estimates, IEA (2011b), JAMA (2012), and World Bank.

3.3 Azerbaijan

Country Profile (2009)		Energy Reserves (year-end 2008)	
Total Surface Area (square kilometer)	86,600	Coal (million ton) - Recoverable	–
Population (thousand)	8,947	Gas (trillion cubic feet) - Proven	48.0
GDP (constant 2000 $ billion)	20.2	Oil (billion barrel) - Proven	7,000.0
Electrification Rate (%)	100.0		

– = no data or not applicable, GDP = gross domestic product.

Sources ADB (2012), ADB estimates, World Bank, and WEC (2010).

2009 Energy Supply and Demand Flow (ktoe)

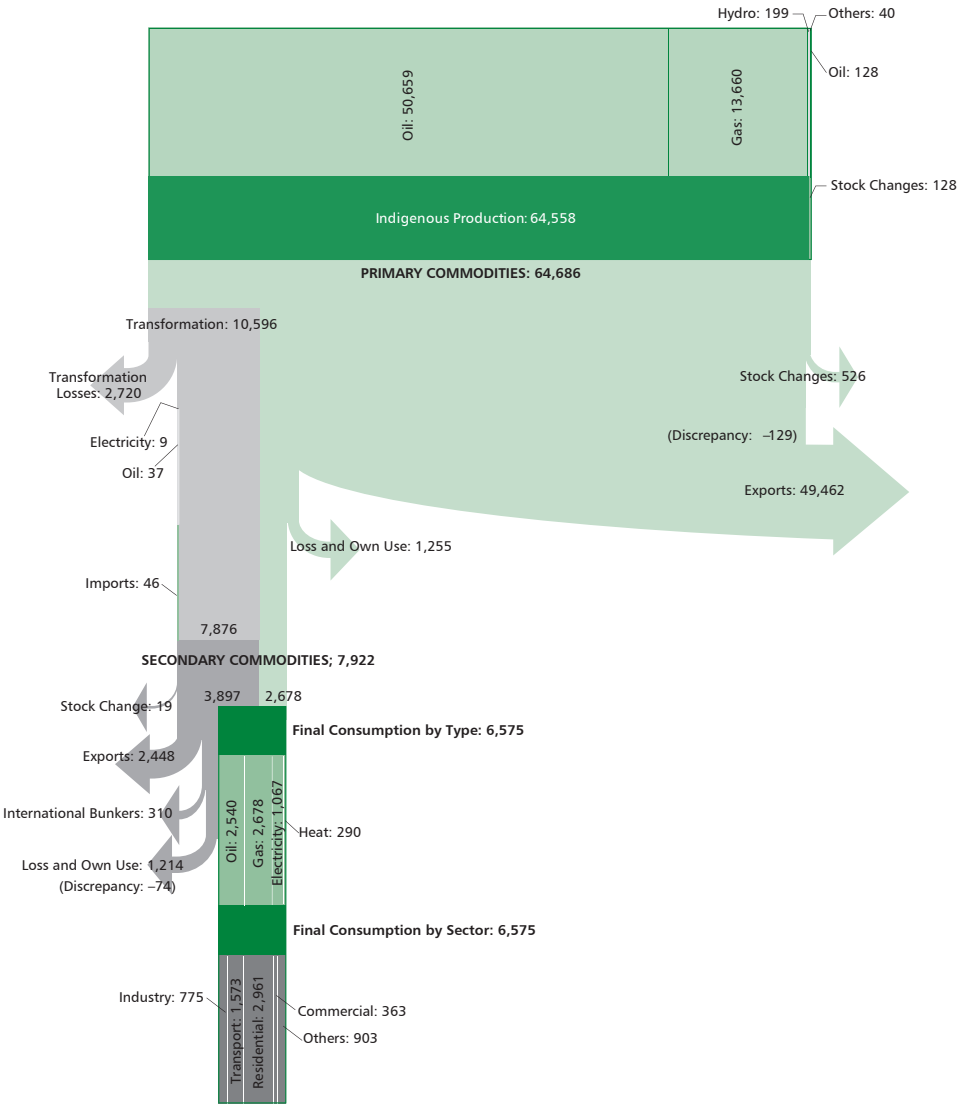


Table 3.3.1 Key Data and Economic Profile

	1990	1995	2000	2005	2009
Socioeconomic Data					
Population (thousand)	7,159	7,685	8,049	8,392	8,947
GDP (constant 2000 $ billion)	9.0	3.7	5.3	9.9	20.2
GDP (constant 2005 PPP $ billion)	34.0	14.2	20.0	37.7	76.9
GDP/capita (constant 2000 $)	1,251	488	655	1,183	2,260
GDP/capita (constant 2005 PPP $)	4,754	1,854	2,490	4,496	8,590

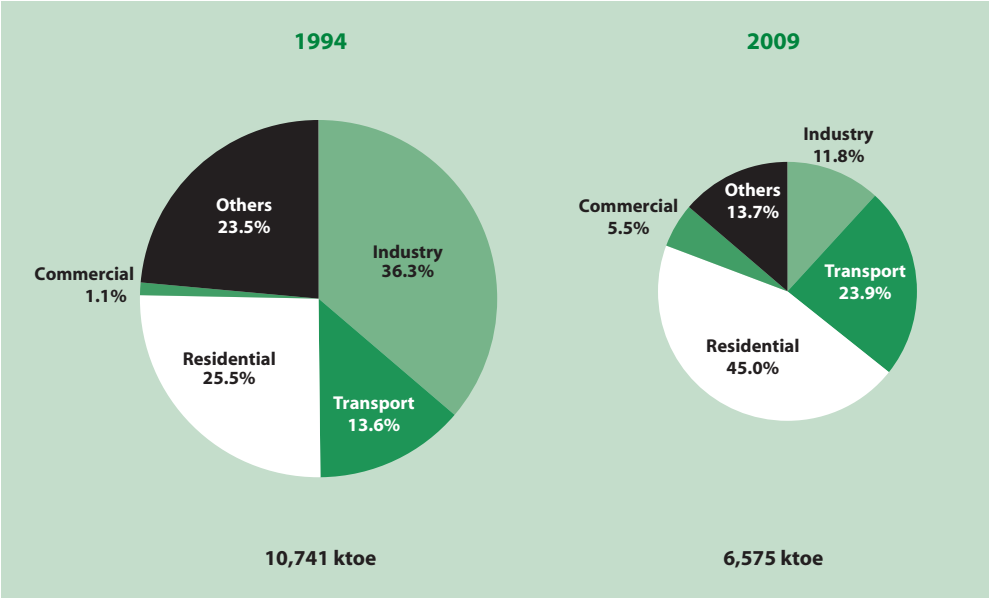
GDP = gross domestic product, PPP = purchasing power parity.
Source: World Bank.

Table 3.3.2 Energy Supply and Demand

	1990	1995	2000	2005	2009
Primary Energy Supply (ktoe)					
Indigenous Production	–	14,726	18,962	27,229	64,558
Net Imports	–	–1,960	–7,526	–13,357	–52,591
Total PES	–	12,766	11,436	13,872	11,967
Coal	–	3	0	0	0
Oil	–	6,777	6,256	5,410	3,527
Gas	–	5,813	5,001	8,095	8,225
Biomass	–	5	5	5	0
Others	–	168	174	362	215
TPES/capita (toe)	–	1.66	1.42	1.65	1.34
TPES/GDP (toe/constant 2005 PPP $ million)	–	896	571	368	156
Final Energy Consumption (ktoe)					
Industry	–	3,275	1,989	1,745	775
Transportation	–	1,116	743	1,798	1,573
Other Sectors	–	4,437	3,970	4,622	4,227
Total FEC	–	8,828	6,702	8,165	6,575
Coal	–	3	0	0	0
Oil	–	2,292	1,776	2,861	2,540
Gas	–	4,387	3,239	3,214	2,678
Electricity	–	1,167	1,282	1,565	1,067
Biomass	–	4	4	4	0
Others	–	975	401	521	290

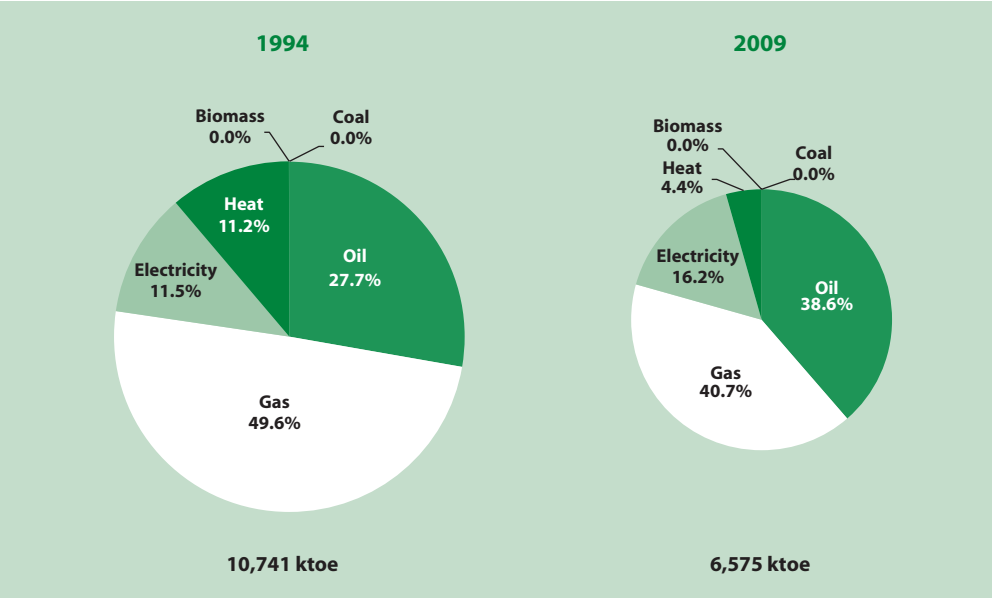
– = no data or not applicable, FEC = final energy consumption, GDP = gross domestic product, ktoe = thousand tons of oil equivalent, PES = primary energy supply, PPP = purchasing power parity, toe = ton of oil equivalent, TPES = total primary energy supply.
Source: IEA (2011b).

Figure 3.3.1 Final Energy Consumption by Sector, 1994 and 2009



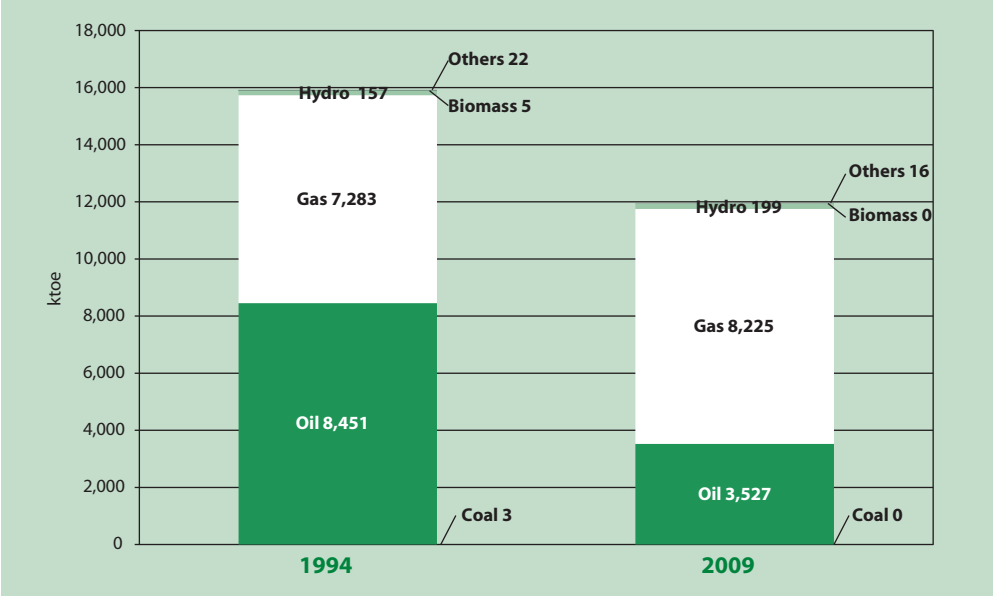
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 3.3.2 Final Energy Consumption by Type of Energy, 1994 and 2009



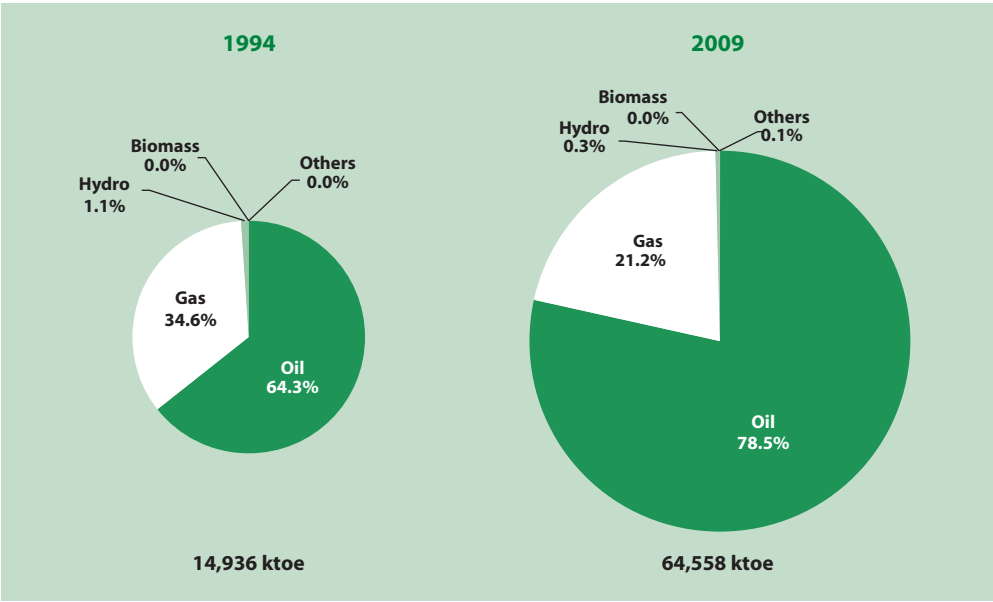
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 3.3.3 Total Primary Energy Supply, 1994 and 2009



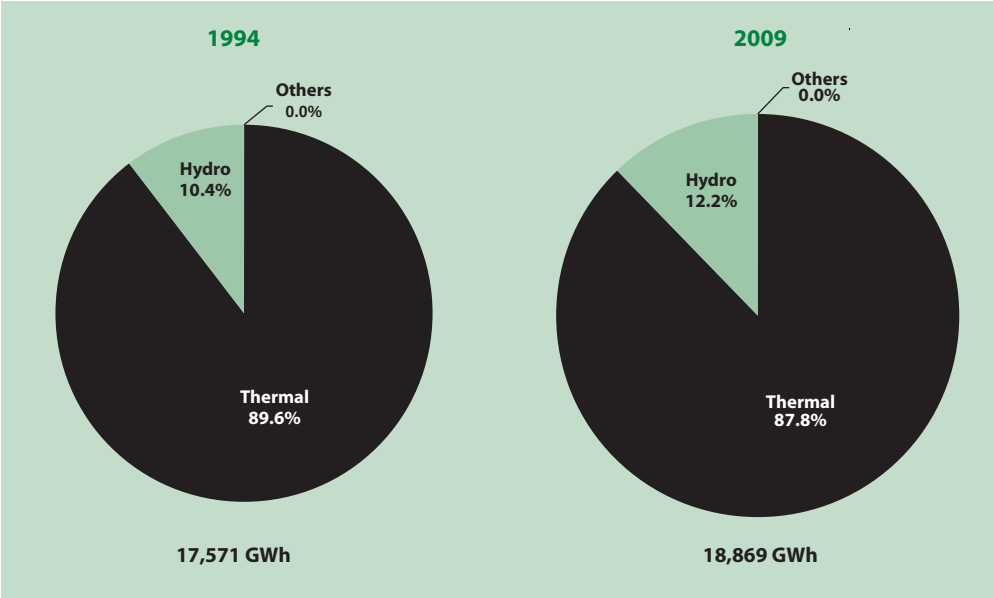
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 3.3.4 Indigenous Energy Production, 1994 and 2009



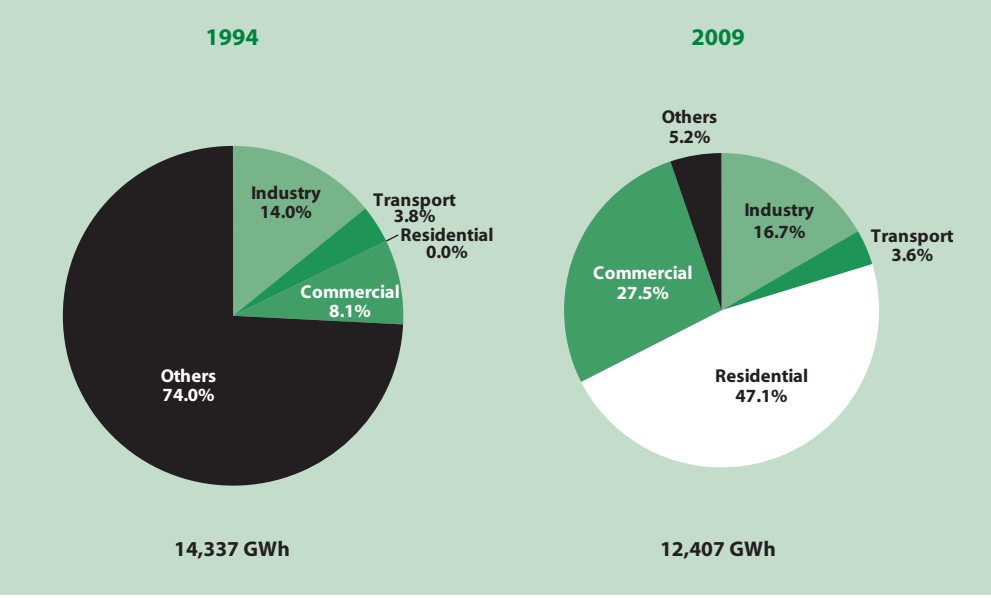
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 3.3.5 Electricity Generation by Plant Type, 1994 and 2009



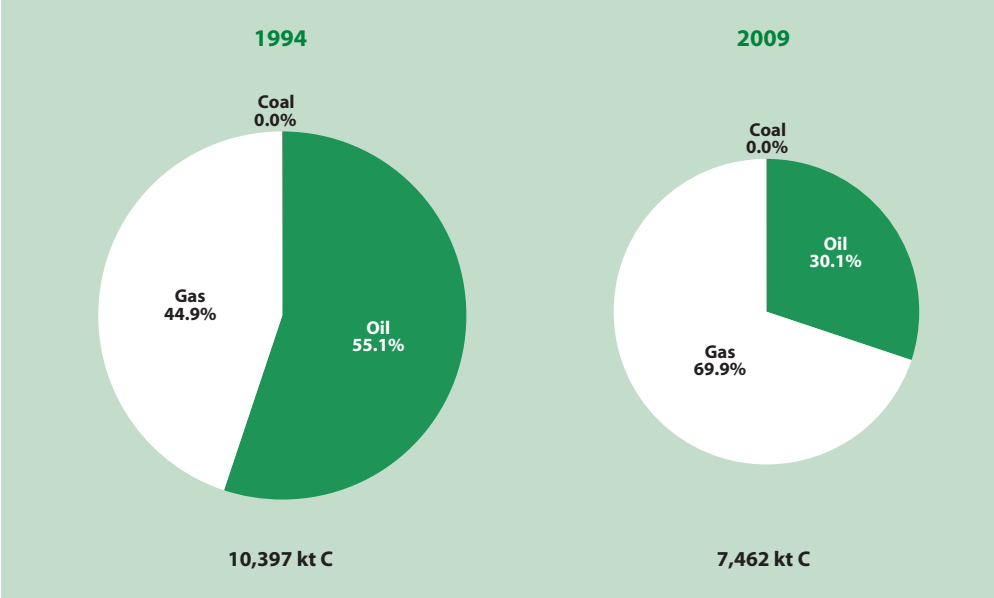
GWh = gigawatt-hour.
Source: IEA (2011b).

Figure 3.3.6 Electricity Consumption by Sector, 1994 and 2009



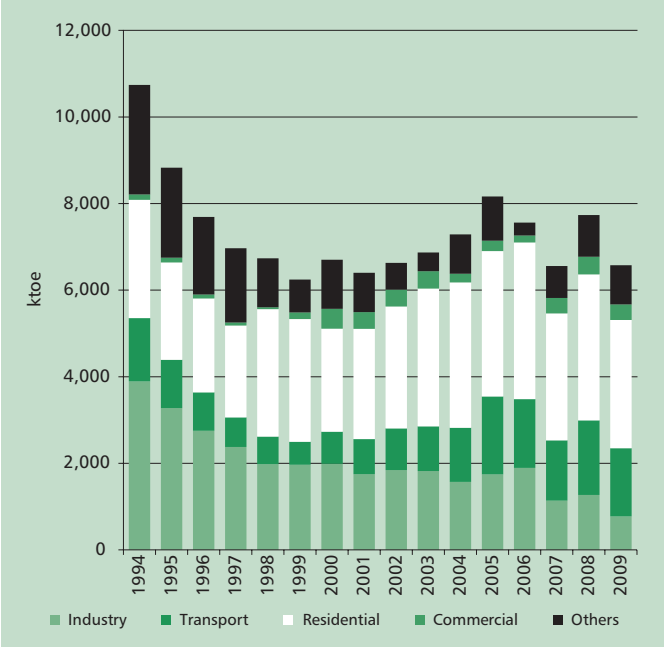
GWh = gigawatt-hour.
Source: IEA (2011b).

Figure 3.3.7 Carbon Dioxide Emissions from Fuel Combustion, 1994 and 2009



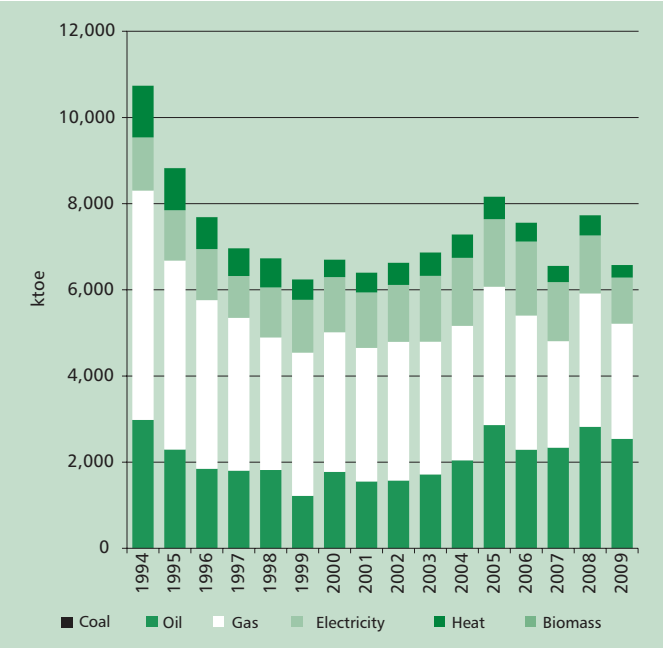
kt C = thousand tons of carbon equivalent.
Source: APERC estimates.

Figure 3.3.8 Final Energy Consumption by Sector, 1994–2009



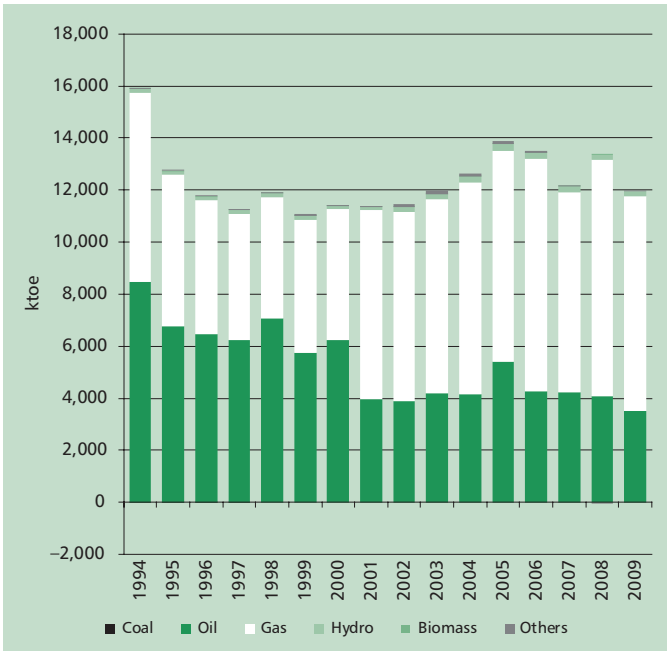
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 3.3.9 Final Energy Consumption by Type, 1994–2009



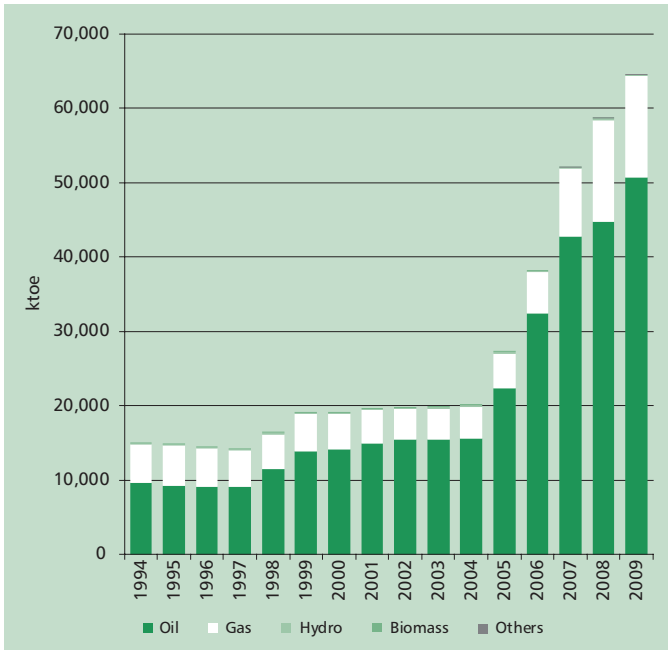
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 3.3.10 Total Primary Energy Supply, 1994–2008



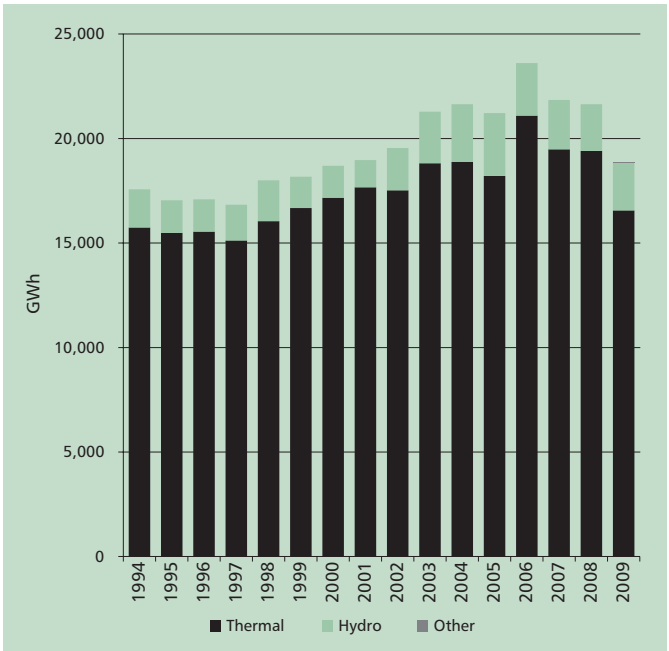
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 3.3.11 Indigenous Energy Production, 1994–2009



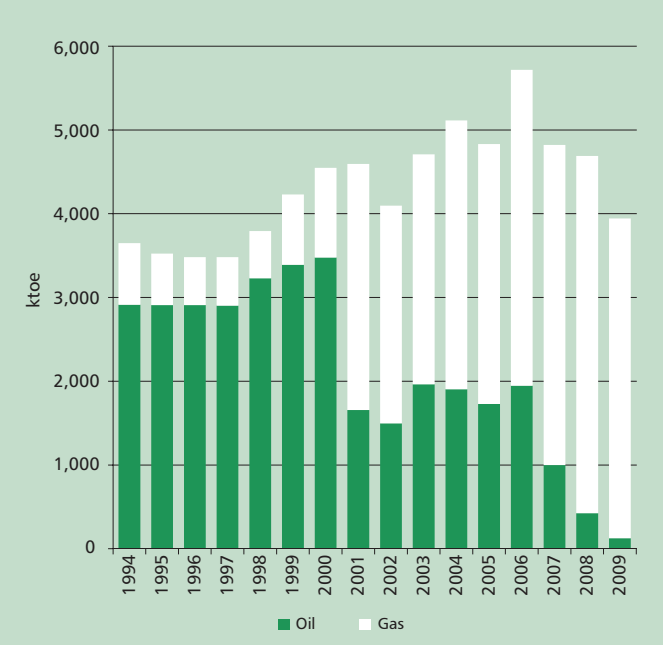
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 3.3.12 Electricity Generation by Source, 1994–2009



GWh = gigawatt-hour.
Source: IEA (2011b).

Figure 3.3.13 Fuel Input for Electricity Generation, 1994–2009

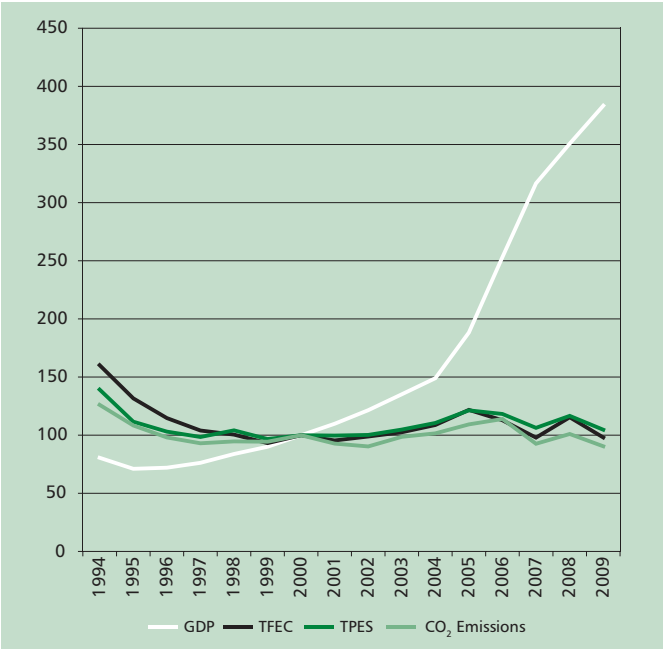


ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 3.3.14 Carbon Dioxide Emissions from Fuel Combustion, 1994–2009

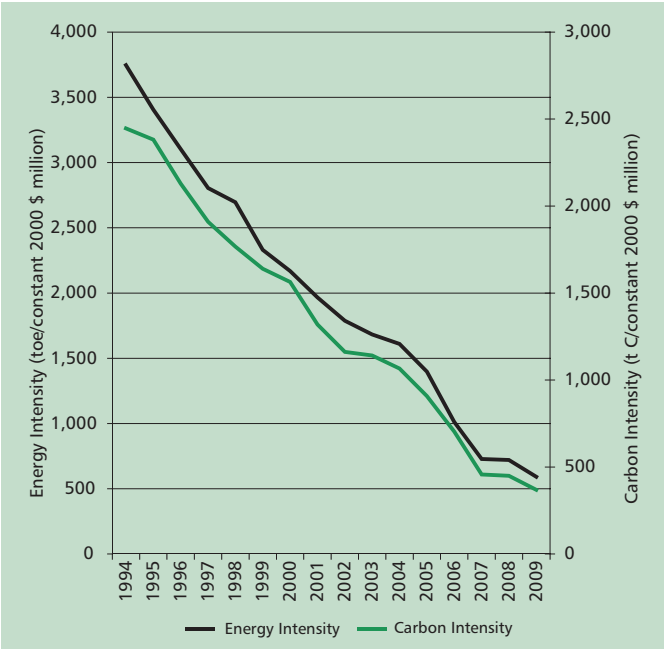
kt C = thousand tons of carbon equivalent.
Source: APERC estimates.

Figure 3.3.15 Growth of GDP, TFEC, TPES, and CO_2 Emissions (indexed to year 2000), 1994–2009



CO_2 = carbon dioxide, GDP = gross domestic product, TFEC = total final energy consumption, TPES = total primary energy supply.
Note: Indices are measured relative to the base year 2000 (2000 = 100).
Source: APERC estimates.

Figure 3.3.16 Energy and Carbon Intensities, 1994–2009



t C = ton of carbon equivalent, toe = ton of oil equivalent.
Source: APERC estimates.

Table 3.3.3 Azerbaijan Energy Balance Table, 2006

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	0	0	32,427	0	0	0	0	0	0	0	5,482	217	0	0	0	0	2	0	0	0	38,128
2.	Imports	0	0	0	146	1	0	27	99	0	19	3,716	0	0	0	0	0	3	0	152	0	4,017
3.	Exports	0	0	–24,944	–3,148	–354	0	–1,440	–884	–51	–419	–54	0	0	0	0	0	0	0	–76	0	–28,222
4.	International Bunkers	0	0	0	–500	0	0	0	0	0	–500	0	0	0	0	0	0	0	0	0	0	–500
5.	Stock Changes	0	0	201	92	16	0	24	48	–1	5	–201	0	0	0	0	0	0	0	0	0	92
6.	Total Primary Energy Supply	0	0	7,684	–3,410	–337	0	–1,389	–737	–52	–895	8,943	217	0	0	0	0	5	0	76	0	13,515
7.	Transfers	0	0	637	–568	0	0	0	–568	0	0	0	0	0	0	0	0	0	0	0	0	69
8.	Total Transformation Sector	0	0	–8,159	5,863	1,096	45	2,133	730	214	1,645	–4,379	–217	0	0	0	0	0	0	2,031	560	–4,301
8.1	Power Generation	0	0	0	–2,040	0	0	0	–2,040	0	0	–4,379	–217	0	0	0	0	0	0	2,031	560	–4,045
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	–8,159	7,903	1,096	45	2,133	2,770	214	1,645	0	0	0	0	0	0	0	0	0	0	–256
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	0	0	0	–174	0	0	0	0	0	–174	–1,448	0	0	0	0	0	0	0	–391	–126	–2,139
10.	Discrepancy	0	0	–162	579	–1	0	0	575	1	4	–1	0	0	0	0	0	–1	0	0	1	416
11.	Total Final Energy Consumption	0	0	0	2,290	758	45	744	0	163	580	3,115	0	0	0	0	0	4	0	1,716	435	7,560
12.	Industry Sector	0	0	0	480	1	15	45	0	10	409	705	0	0	0	0	0	0	0	334	377	1,896
13.	Transport Sector	0	0	0	1,520	757	0	677	0	86	0	11	0	0	0	0	0	0	0	56	0	1,587
14.	Other Sectors	0	0	0	119	0	30	22	0	67	0	2,399	0	0	0	0	0	4	0	1,326	58	3,906
14.1	Residential and Commercial	0	0	0	96	0	29	0	0	67	0	2,363	0	0	0	0	0	0	0	1,281	38	3,778
14.1.1	Commerce and Public Services	0	0	0	29	0	29	0	0	0	0	25	0	0	0	0	0	0	0	95	11	160
14.1.2	Residential	0	0	0	67	0	0	0	0	67	0	2,338	0	0	0	0	0	0	0	1,186	27	3,618
14.2	Non-Specified Others	0	0	0	23	0	1	22	0	0	0	36	0	0	0	0	0	4	0	45	20	128
15.	Non-Energy Use	0	0	0	171	0	0	0	0	0	171	0	0	0	0	0	0	0	0	0	0	171
16.	Electricity Output (GWh)	0	0	0	6,110	0	0	0	0	0	0	14,983	2,518	0	0	0	0	0	0	0	0	23,611
17.	Heat Output (TJ)	0	0	0	3,140	0	0	0	0	0	0	20,306	0	0	0	0	0	0	0	0	0	23,446

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.
Note: Figures may not add up to total because of rounding.
Source: IEA (2011b).

Table 3.3.4 Azerbaijan Energy Balance Table, 2007

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	0	0	42,804	0	0	0	0	0	0	0	9,064	203	0	0	0	0	2	0	0	45	52,118
2.	Imports	0	0	0	74	1	0	11	38	0	24	0	0	0	0	0	0	3	0	47	0	124
3.	Exports	0	0	–34,954	–3,151	–350	0	–1,432	–837	–51	–481	–1,526	0	0	0	0	0	0	0	–68	0	–39,699
4.	International Bunkers	0	0	0	–391	0	0	0	0	0	–391	0	0	0	0	0	0	0	0	0	0	–391
5.	Stock Changes	0	0	–10	–134	–4	2	–46	–89	2	1	155	0	0	0	0	0	0	0	0	0	11
6.	Total Primary Energy Supply	0	0	7,840	–3,602	–353	2	–1,467	–888	–49	–847	7,693	203	0	0	0	0	5	0	–21	45	12,163
7.	Transfers	0	0	1,039	–962	0	0	0	–582	0	–380	0	0	0	0	0	0	0	0	0	0	77
8.	Total Transformation Sector	0	0	–8,631	7,363	1,188	38	2,141	1,800	205	1,991	–4,394	–203	0	0	0	0	0	0	1,878	455	–3,532
8.1	Power Generation	0	0	0	–1,022	0	0	–5	–1,017	0	0	–4,369	–203	0	0	0	0	0	0	1,878	455	–3,261
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	–25	0	0	0	0	0	0	0	0	0	–25
8.3	Refineries	0	0	–8,631	8,385	1,188	38	2,146	2,817	205	1,991	0	0	0	0	0	0	0	0	0	0	–246
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	0	0	0	–363	0	0	–26	–130	0	–207	–813	0	0	0	0	0	0	0	–475	–127	–1,778
10.	Discrepancy	0	0	–248	–97	–9	–1	–10	–7	–2	–68	–16	0	0	0	0	0	–1	0	–10	0	–372
11.	Total Final Energy Consumption	0	0	0	2,339	826	39	638	193	154	489	2,470	0	0	0	0	0	4	0	1,372	373	6,558
12.	Industry Sector	0	0	0	250	6	27	34	181	2	0	307	0	0	0	0	0	0	0	255	325	1,137
13.	Transport Sector	0	0	0	1,350	816	0	407	3	54	70	0	0	0	0	0	0	0	0	42	0	1,392
14.	Other Sectors	0	0	0	319	4	12	197	9	97	0	2,117	0	0	0	0	0	4	0	1,075	48	3,563
14.1	Residential and Commercial	0	0	0	118	2	6	17	1	92	0	2,102	0	0	0	0	0	0	0	1,023	48	3,291
14.1.1	Commerce and Public Services	0	0	0	5	0	0	0	1	4	0	25	0	0	0	0	0	0	0	306	19	355
14.1.2	Residential	0	0	0	113	2	6	17	0	88	0	2,077	0	0	0	0	0	0	0	717	29	2,936
14.2	Non-Specified Others	0	0	0	201	2	6	180	8	5	0	15	0	0	0	0	0	4	0	52	0	272
15.	Non-Energy Use	0	0	0	420	0	0	0	0	1	419	46	0	0	0	0	0	0	0	0	0	466
16.	Electricity Output (GWh)	0	0	0	3,884	0	0	14	3,870	0	0	15,599	2,362	0	0	0	0	0	0	0	0	21,845
17.	Heat Output (TJ)	0	0	0	795	0	0	42	754	0	0	18,254	0	0	0	0	0	0	0	0	1,884	20,934

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Source: IEA (2011b).

Table 3.3.5 Azerbaijan Energy Balance Table, 2008

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	0	0	44,727	0	0	0	0	0	0	0	13,670	192	0	0	0	0	2	0	0	43	58,634
2.	Imports	0	0	0	73	0	0	40	4	0	29	0	0	0	0	0	0	3	0	19	0	95
3.	Exports	0	0	–37,042	–3,116	–391	0	–1,640	–557	–109	–419	–4,402	0	0	0	0	0	0	0	–70	0	–44,630
4.	International Bunkers	0	0	0	–441	0	0	0	0	0	–441	0	0	0	0	0	0	0	0	0	0	–441
5.	Stock Changes	0	0	–87	–41	4	–2	–24	30	–10	–39	–190	0	0	0	0	0	0	0	0	0	–318
6.	Total Primary Energy Supply	0	0	7,598	–3,525	–387	–2	–1,624	–523	–119	–870	9,078	192	0	0	0	0	5	0	–51	43	13,340
7.	Transfers	0	0	699	–653	0	0	0	–332	0	–321	0	0	0	0	0	0	0	0	0	0	46
8.	Total Transformation Sector	0	0	–8,149	7,528	1,387	49	2,563	1,114	223	2,192	–4,975	–192	0	0	0	0	0	0	1,862	540	–3,386
8.1	Power Generation	0	0	0	–444	0	0	–6	–438	0	0	–4,922	–192	0	0	0	0	0	0	1,862	540	–3,156
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	–53	0	0	0	0	0	0	0	0	0	–53
8.3	Refineries	0	0	–8,149	7,972	1,387	49	2,569	1,552	223	2,192	0	0	0	0	0	0	0	0	0	0	–177
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	0	0	0	–473	0	0	–24	–108	0	–341	–984	0	0	0	0	0	0	0	–454	–112	–2,023
10.	Discrepancy	0	0	–148	–54	–8	–1	–28	–10	3	–10	–25	0	0	0	0	0	–1	0	–11	–2	–241
11.	Total Final Energy Consumption	0	0	0	2,823	992	46	887	141	107	650	3,094	0	0	0	0	0	4	0	1,346	469	7,736
12.	Industry Sector	0	0	0	181	1	28	23	128	1	0	411	0	0	0	0	0	0	0	273	403	1,268
13.	Transport Sector	0	0	0	1,683	988	0	618	5	12	60	0	0	0	0	0	0	0	0	42	0	1,725
14.	Other Sectors	0	0	0	361	3	10	246	8	94	0	2,632	0	0	0	0	0	4	0	1,031	66	4,094
14.1	Residential and Commercial	0	0	0	120	1	8	17	1	93	0	2,618	0	0	0	0	0	0	0	976	66	3,780
14.1.1	Commerce and Public Services	0	0	0	3	0	0	1	1	1	0	38	0	0	0	0	0	0	0	336	33	410
14.1.2	Residential	0	0	0	117	1	8	16	0	92	0	2,580	0	0	0	0	0	0	0	640	33	3,370
14.2	Non-Specified Others	0	0	0	241	2	2	229	7	1	0	14	0	0	0	0	0	4	0	55	0	314
15.	Non-Energy Use	0	0	0	598	0	8	0	0	0	590	51	0	0	0	0	0	0	0	0	0	649
16.	Electricity Output (GWh)	0	0	0	1,689	0	0	8	1,681	0	0	17,722	2,232	0	0	0	0	0	0	0	0	21,643
17.	Heat Output (TJ)	0	0	0	628	0	0	42	586	0	0	21,981	0	0	0	0	0	0	0	0	1,800	24,409

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.
Note: Figures may not add up to total because of rounding.
Source: IEA (2011b).

Table 3.3.6 Azerbaijan Energy Balance Table, 2009

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	0	0	50,659	0	0	0	0	0	0	0	13,660	199	0	0	0	0	0	0	0	40	64,558
2.	Imports	0	0	0	37	0	0	8	0	0	29	0	0	0	0	0	0	0	0	9	0	46
3.	Exports	0	0	–44,553	–2,415	–239	0	–1,605	–32	–122	–417	–4,909	0	0	0	0	0	0	0	–33	0	–51,910
4.	International Bunkers	0	0	0	–310	0	0	0	0	0	–310	0	0	0	0	0	0	0	0	0	0	–310
5.	Stock Changes	0	0	128	–19	–12	2	–9	12	5	–17	–526	0	0	0	0	0	0	0	0	0	–417
6.	Total Primary Energy Supply	0	0	6,234	–2,707	–251	2	–1,606	–20	–117	–715	8,225	199	0	0	0	0	0	0	–24	40	11,967
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	0	0	–6,126	5,916	1,298	7	2,405	138	212	1,856	–4,271	–199	0	0	0	0	0	0	1,623	337	–2,720
8.1	Power Generation	0	0	0	–131	0	0	–3	–128	0	0	–4,233	–199	0	0	0	0	0	0	1,623	337	–2,603
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	–38	0	0	0	0	0	0	0	0	0	–38
8.3	Refineries	0	0	–6,126	6,047	1,298	7	2,408	266	212	1,856	0	0	0	0	0	0	0	0	0	0	–79
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	0	0	0	–601	0	0	–10	–29	0	–562	–1,255	0	0	0	0	0	0	0	–526	–87	–2,469
10.	Discrepancy	0	0	–108	–68	–16	0	–36	–8	6	–14	–21	0	0	0	0	0	0	0	–6	0	–203
11.	Total Final Energy Consumption	0	0	0	2,540	1,031	9	753	81	101	565	2,678	0	0	0	0	0	0	0	1,067	290	6,575
12.	Industry Sector	0	0	0	106	0	4	26	75	1	0	273	0	0	0	0	0	0	0	178	218	775
13.	Transport Sector	0	0	0	1,535	1,029	0	409	1	32	64	0	0	0	0	0	0	0	0	38	0	1,573
14.	Other Sectors	0	0	0	393	2	5	318	5	63	0	2,378	0	0	0	0	0	0	0	851	72	3,694
14.1	Residential and Commercial	0	0	0	84	1	3	16	1	63	0	2,372	0	0	0	0	0	0	0	796	72	3,324
14.1.1	Commerce and Public Services	0	0	0	5	0	0	4	1	0	0	30	0	0	0	0	0	0	0	293	35	363
14.1.2	Residential	0	0	0	79	1	3	12	0	63	0	2,342	0	0	0	0	0	0	0	503	37	2,961
14.2	Non-Specified Others	0	0	0	309	1	2	302	4	0	0	6	0	0	0	0	0	0	0	55	0	370
15.	Non-Energy Use	0	0	0	506	0	0	0	0	5	501	27	0	0	0	0	0	0	0	0	0	533
16.	Electricity Output (GWh)	0	0	0	497	0	0	8	489	0	0	16,061	2,309	0	0	0	2	0	0	0	0	18,869
17.	Heat Output (TJ)	0	0	0	209	0	0	0	209	0	0	13,900	0	0	0	0	0	0	0	0	1,675	15,784

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Source: IEA (2011b).

Table 3.3.7 Azerbaijan Summary Table, 1990–2009

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Indigenous Production (ktoe)																				
Coal	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Oil	–	–	–	–	9,609	9,207	9,144	9,115	11,480	13,875	14,086	14,983	15,409	15,457	15,626	22,324	32,427	42,804	44,727	50,659
Gas	–	–	–	–	5,168	5,383	5,108	4,832	4,685	5,029	4,742	4,484	4,168	4,155	4,189	4,644	5,482	9,064	13,670	13,660
Hydro	–	–	–	–	157	134	132	147	168	130	132	112	174	212	237	259	217	203	192	199
Nuclear	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Geothermal	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Solar	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wind	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Biomass	–	–	–	–	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	0
Others	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	45	43	40
Total	–	–	–	–	14,936	14,726	14,386	14,096	16,335	19,036	18,962	19,581	19,753	19,826	20,054	27,229	38,128	52,118	58,634	64,558
Primary Energy Supply (ktoe)																				
Coal	–	–	–	–	3	3	3	3	0	0	0	0	0	0	0	0	0	0	0	0
Oil	–	–	–	–	8,451	6,777	6,480	6,243	7,087	5,760	6,256	3,980	3,897	4,189	4,151	5,410	4,274	4,238	4,073	3,527
Gas	–	–	–	–	7,283	5,813	5,127	4,832	4,630	5,106	5,001	7,241	7,261	7,450	8,136	8,095	8,943	7,693	9,078	8,225
Hydro	–	–	–	–	157	134	132	147	168	130	132	112	174	212	237	259	217	203	192	199
Nuclear	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Geothermal	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Solar	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wind	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Biomass	–	–	–	–	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	0
Others	–	–	–	–	22	34	38	37	21	65	42	58	124	134	117	103	76	24	-8	16
Total	–	–	–	–	15,921	12,766	11,785	11,267	11,911	11,066	11,436	11,396	11,461	11,990	12,646	13,872	13,515	12,163	13,340	11,967
Final Energy Consumption by Sector (ktoe)																				
Industry	–	–	–	–	3,894	3,275	2,752	2,378	1,982	1,967	1,989	1,750	1,844	1,821	1,571	1,745	1,896	1,137	1,268	775
Transport	–	–	–	–	1,459	1,116	887	682	635	529	743	810	963	1,034	1,252	1,798	1,587	1,392	1,725	1,573
Residential	–	–	–	–	2,736	2,250	2,170	2,125	2,944	2,838	2,379	2,546	2,817	3,183	3,357	3,361	3,618	2,936	3,370	2,961
Commercial	–	–	–	–	123	109	91	66	43	150	459	388	389	398	198	239	160	355	410	363
Others	–	–	–	–	2,529	2,078	1,791	1,716	1,133	760	1,132	907	617	433	910	1,022	299	738	963	903
Total	–	–	–	–	10,741	8,828	7,691	6,967	6,737	6,244	6,702	6,401	6,630	6,869	7,288	8,165	7,560	6,558	7,736	6,575

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Table 3.3.7 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Final Energy Consumption by Type (ktoe)																				
Coal	–	–	–	–	4	3	3	3	0	0	0	0	0	0	0	0	0	0	0	0
Oil	–	–	–	–	2,977	2,292	1,844	1,802	1,819	1,220	1,776	1,552	1,574	1,717	2,043	2,861	2,290	2,339	2,823	2,540
Gas	–	–	–	–	5,325	4,387	3,916	3,546	3,079	3,325	3,239	3,100	3,222	3,081	3,121	3,214	3,115	2,470	3,094	2,678
Electricity	–	–	–	–	1,233	1,167	1,183	970	1,159	1,223	1,282	1,287	1,319	1,525	1,577	1,565	1,716	1,372	1,346	1,067
Heat	–	–	–	–	1,198	975	741	642	676	472	401	458	511	542	543	521	435	373	469	290
Biomass	–	–	–	–	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	0
Others	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	–	–	–	–	10,741	8,828	7,691	6,967	6,737	6,244	6,702	6,401	6,630	6,869	7,288	8,165	7,560	6,558	7,736	6,575
Power Generation (GWh)																				
Thermal	–	–	–	–	15,742	15,488	15,550	15,124	16,047	16,671	17,165	17,668	17,523	18,816	18,888	18,209	21,093	19,483	19,411	16,558
Hydro	–	–	–	–	1,829	1,556	1,538	1,712	1,951	1,506	1,534	1,301	2,020	2,469	2,755	3,009	2,518	2,362	2,232	2,309
Nuclear	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Geothermal	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Solar	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wind	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Others	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	–	–	–	–	17,571	17,044	17,088	16,836	17,998	18,177	18,699	18,969	19,543	21,285	21,643	21,218	23,611	21,845	21,643	18,869
Loss and Own Use of Electricity (GWh)																				
Transmission and Distribution Losses	–	–	–	–	2,302	2,779	2,721	3,105	2,151	2,791	2,767	2,558	3,814	3,453	2,767	2,221	3,174	3,430	3,163	4,105
Own Use	–	–	–	–	1,174	1,105	1,047	1,012	977	1,023	1,116	1,140	953	988	988	1,163	547	1,070	1,047	826
Total	–	–	–	–	3,477	3,884	3,767	4,116	3,128	3,814	3,884	3,698	4,767	4,442	3,756	3,384	3,721	4,500	4,209	4,930
Fuel Input for Power Generation (ktoe)																				
Coal	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Oil	–	–	–	–	2,914	2,909	2,908	2,903	3,229	3,390	3,477	1,656	1,497	1,963	1,904	1,728	1,946	998	425	125
Gas	–	–	–	–	736	616	573	579	566	841	1,071	2,939	2,599	2,746	3,209	3,105	3,773	3,824	4,266	3,818
Total	–	–	–	–	3,650	3,525	3,482	3,482	3,794	4,231	4,548	4,595	4,096	4,710	5,113	4,833	5,719	4,822	4,691	3,943
CO_2 Emissions (kt C)																				
Coal	–	–	–	–	4	3	3	3	0	0	0	0	0	0	0	0	0	0	0	0
Oil	–	–	–	–	5,728	5,202	4,794	4,575	4,842	4,510	5,040	3,008	2,797	3,360	3,410	4,080	3,662	2,761	2,591	2,249
Gas	–	–	–	–	4,665	3,724	3,285	3,095	2,966	3,271	3,203	4,638	4,652	4,772	4,964	4,930	5,728	4,872	5,733	5,214
Total	–	–	–	–	10,397	8,929	8,082	7,673	7,808	7,781	8,243	7,646	7,449	8,133	8,374	9,010	9,390	7,633	8,323	7,462

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Table 3.3.7 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Macroeconomic Indicators																				
Population (thousand)	7,159	7,271	7,382	7,495	7,597	7,685	7,763	7,838	7,913	7,983	8,049	8,111	8,172	8,234	8,306	8,392	8,485	8,581	8,763	8,947
Urban Population, %	53.7	53.4	53.1	52.8	52.5	52.2	52.0	51.8	51.6	51.4	51.2	51.3	51.3	51.4	51.4	51.5	51.6	51.8	51.9	52.1
GDP (constant 2000 $ million)	8,954	8,891	6,882	5,292	4,250	3,748	3,797	4,017	4,419	4,746	5,273	5,795	6,409	7,127	7,854	9,927	13,352	16,696	18,499	20,220
GDP (current $ million)	8,858	8,792	4,991	3,973	3,314	3,052	3,177	3,963	4,446	4,581	5,273	5,708	6,236	7,276	8,681	13,245	20,982	33,049	48,852	44,291
GDP (constant 2005 PPP $ million)	34,033	33,795	26,157	20,115	16,152	14,246	14,432	15,269	16,796	18,038	20,041	22,025	24,359	27,088	29,850	37,731	50,748	63,460	70,314	76,853
GDP/capita (constant 2000 $)	1,251	1,223	932	706	559	488	489	513	558	594	655	714	784	866	945	1,183	1,574	1,946	2,111	2,260
GDP/capita (current $)	1,237	1,209	676	530	436	397	409	506	562	574	655	704	763	884	1,045	1,578	2,473	3,851	5,575	4,950
GDP – Manufacturing (% of GDP)	21.2	21.0	21 .1	22.1	19.6	17.8	15.7	15.0	12.0	10.2	5.3	5.0	4.9	5.0	5.0	4.6	3.8	3.3	3.2	2.6
Car Ownership (car/1,000 persons)	–	–	–	–	–	–	–	–	–	–	–	38	56	60	68	73	74	77	79	81
Basic Energy Indicators																				
TPES/capita (toe/person)	–	–	–	–	2.10	1.66	1.52	1.44	1.51	1.39	1.42	1.40	1.40	1.46	1.52	1.65	1.59	1.42	1.52	1.34
TFEC/capita (toe/person)	–	–	–	–	1.41	1.15	0.99	0.89	0.85	0.78	0.83	0.79	0.81	0.83	0.88	0.97	0.89	0.76	0.88	0.73
TPES/GDP (toe/constant 2000 $ million)	–	–	–	–	3,746	3,406	3,104	2,805	2,696	2,332	2,169	1,967	1,788	1,682	1,610	1,397	1,012	728	721	592
TFEC/GDP (toe/constant 2000 $ million)	–	–	–	–	2,528	2,355	2,026	1,734	1,525	1,316	1,271	1,105	1,035	964	928	823	566	393	418	325
Import Dependency (%)	–	–	–	–	6.2	–15.4	–22.1	–25.1	–37.1	–72.0	–65.8	–71.8	–72.3	–65.4	–58.6	–96.3	–182.1	–328.5	–339.5	–439.5
Oil Import Dependency (%)	–	–	–	–	–13.7	–35.9	–41.1	–46.0	–62.0	–140.9	–125.2	–276.5	–295.4	–269.0	–276.4	–312.6	–658.7	–910.0	–998.1	–1,336.3
Electricity/capita (kWh/ person)	–	–	–	–	1,888	1,766	1,772	1,439	1,703	1,782	1,852	1,845	1,877	2,154	2,208	2,169	2,352	1,859	1,786	1,387
CO_2 Intensity (t C/constant 2000 $ million)	–	–	–	–	2,447	2,382	2,129	1,910	1,767	1,640	1,563	1,320	1,162	1,141	1,066	908	703	457	450	369
CO_2/capita (t C)	–	–	–	–	1.37	1.16	1.04	0.98	0.99	0.97	1.02	0.94	0.91	0.99	1.01	1.07	1.11	0.89	0.95	0.83
CO_2/TPES (t C/toe)	–	–	–	–	0.65	0.70	0.69	0.68	0.66	0.70	0.72	0.67	0.65	0.68	0.66	0.65	0.69	0.63	0.62	0.62

– = no data or not applicable, CO_2 = carbon dioxide, GDP = gross domestic product, GWh = gigawatt–hour, kt C = thousand tons of carbon equivalent, ktoe = thousand tons of oil equivalent, kWh = kilowatt–hour, PPP = purchasing power parity, t C = ton of carbon equivalent, TFEC = total final energy consumption, toe = ton of oil equivalent, TPES = total primary energy supply.

Note: Figures may not add up to total because of rounding.

Sources: APERC estimates, IEA (2011b), JAMA (2012), and World Bank.

3.4 Georgia

Country Profile (2009)		Energy Reserves (year-end 2008)	
Total Surface Area (square kilometer)	69,700	Coal (million ton) - Recoverable	201.0
Population (thousand)	4,411	Gas (trillion cubic feet) - Proven	0.3
GDP (constant 2000 $ billion)	5.3	Oil (billion barrel) - Proven	35.0
Electrification Rate (%)	–		

– = no data or not applicable, GDP = gross domestic product.

Note: The latest available data on electrification rate is for the year 2002, which is 99.9%.

Sources ADB (2012), ADB estimates, World Bank, and WEC (2010).

2009 Energy Supply and Demand Flow (ktoe)

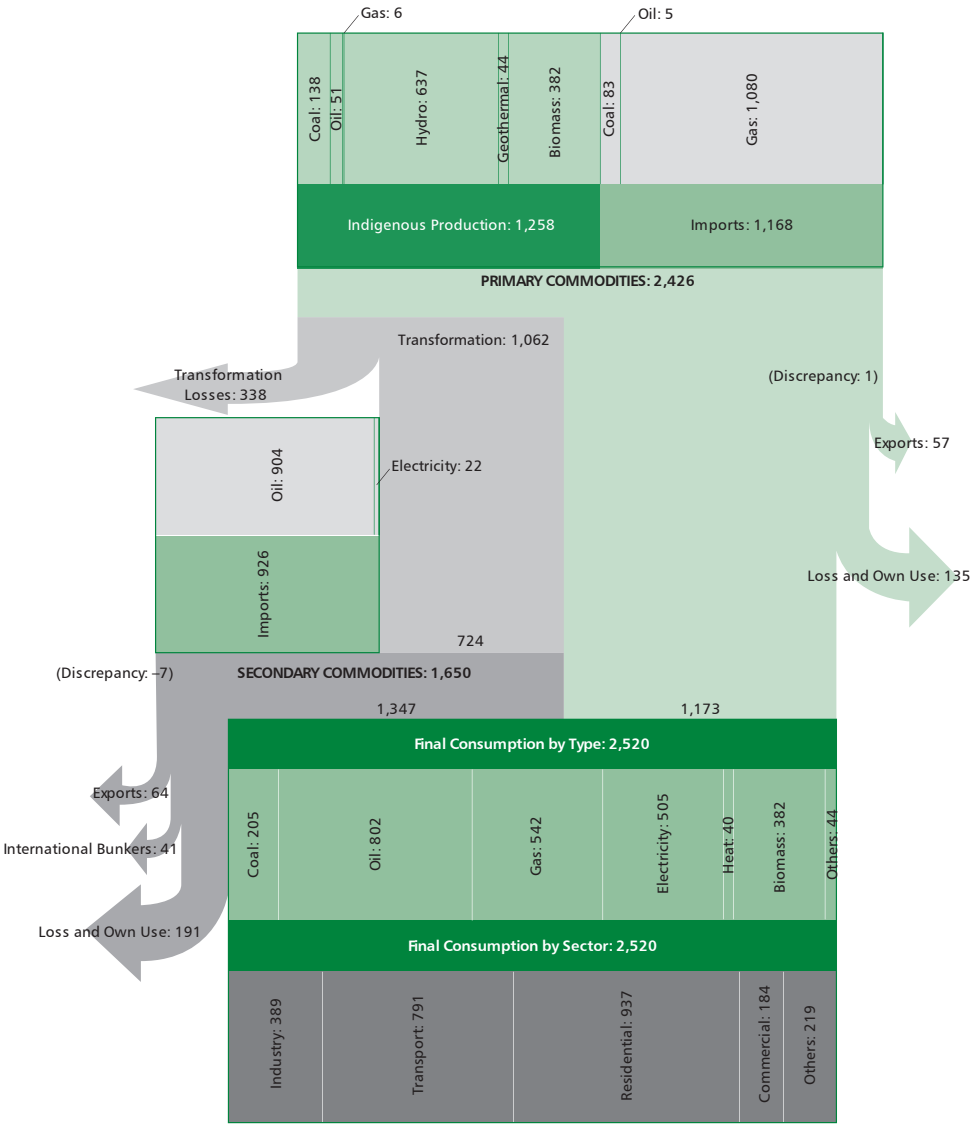


Table 3.4.1 Key Data and Economic Profile

	1990	1995	2000	2005	2009
Socioeconomic Data					
Population (thousand)	4,802	4,734	4,418	4,361	4,411
GDP (constant 2000 $ billion)	8.2	2.3	3.1	4.4	5.3
GDP (constant 2005 PPP $ billion)	29.5	8.3	11.1	15.7	19.1
GDP/capita (constant 2000 $)	1,698	487	692	999	1,194
GDP/capita (constant 2005 PPP $)	6,138	1,759	2,502	3,611	4,319

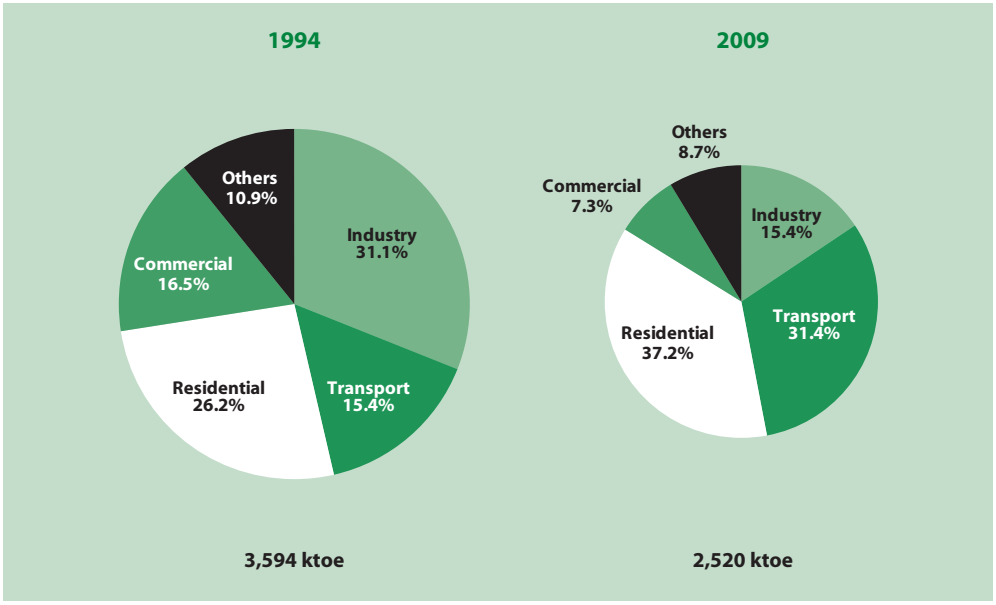
GDP = gross domestic product, PPP = purchasing power parity.
Source: World Bank.

Table 3.4.2 Energy Supply and Demand

	1990	1995	2000	2005	2009
Primary Energy Supply (ktoe)					
Indigenous Production	–	1,200	1,326	980	1,258
Net Imports	–	2,531	1,545	1,862	1,932
Total PES	–	3,731	2,871	2,842	3,190
Coal	–	27	15	11	205
Oil	–	1,558	727	759	878
Gas	–	965	953	1,061	1,086
Biomass	–	674	645	349	382
Others	–	507	531	662	639
TPES/capita (toe)	–	0.79	0.65	0.65	0.72
TPES/GDP (toe/constant 2005 PPP $ million)	–	448	260	180	167
Final Energy Consumption (ktoe)					
Industry	–	444	374	205	389
Transportation	–	373	359	547	791
Other Sectors	–	1,430	1,567	1,467	1,340
Total FEC	–	2,247	2,300	2,219	2,520
Coal	–	21	11	10	205
Oil	–	657	635	700	802
Gas	–	306	463	569	542
Electricity	–	568	541	531	505
Biomass	–	674	645	349	382
Others	–	21	5	60	84

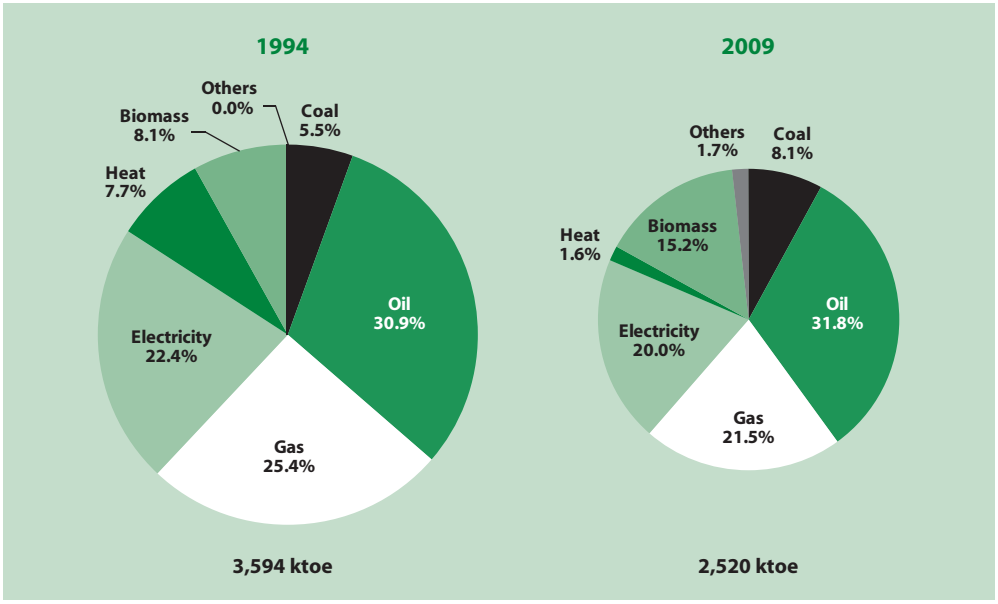
– = no data or not applicable, FEC = final energy consumption, GDP = gross domestic product, ktoe = thousand tons of oil equivalent, PES = primary energy supply, PPP = purchasing power parity, toe = ton of oil equivalent, TPES = total primary energy supply.
Source: IEA (2011b).

Figure 3.4.1 Final Energy Consumption by Sector, 1994 and 2009



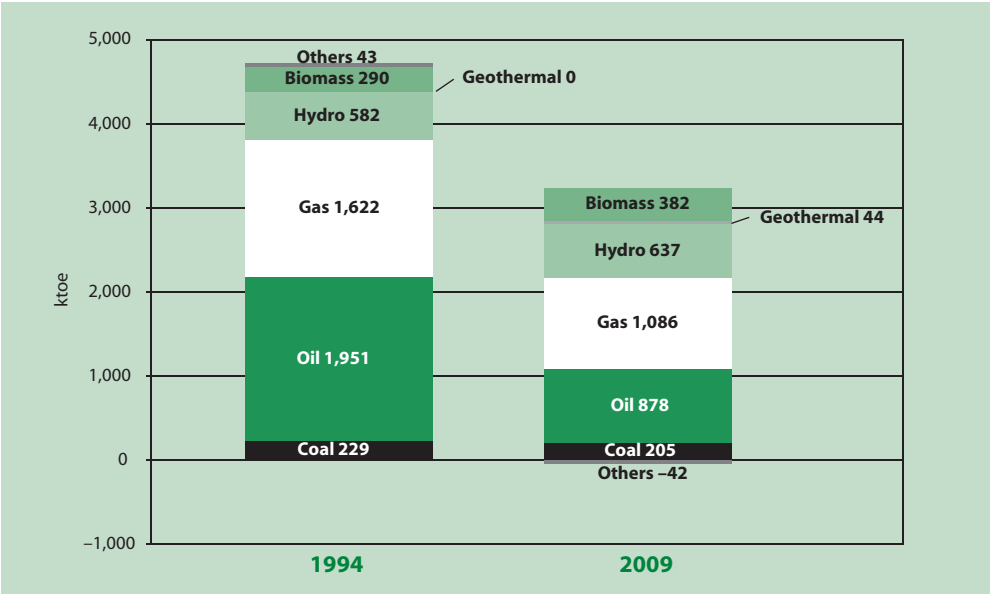
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 3.4.2 Final Energy Consumption by Type of Energy, 1994 and 2009



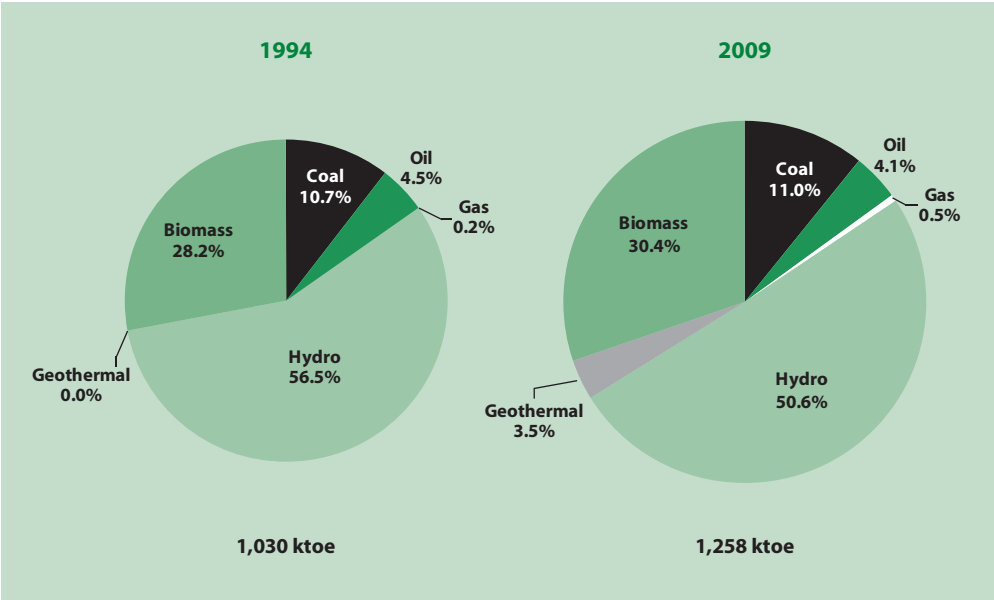
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 3.4.3 Total Primary Energy Supply, 1994 and 2009



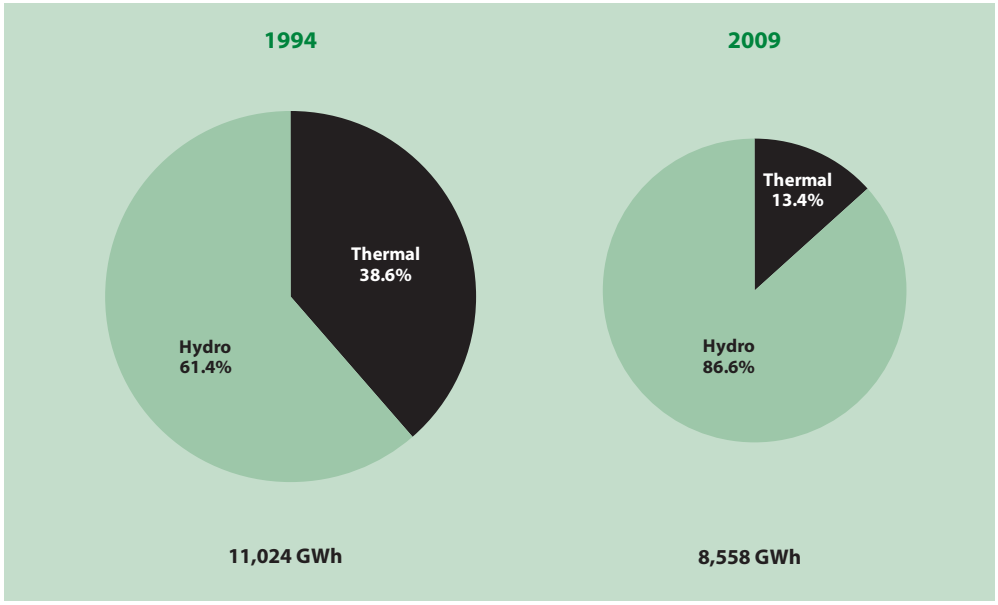
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 3.4.4 Indigenous Energy Production, 1994 and 2009



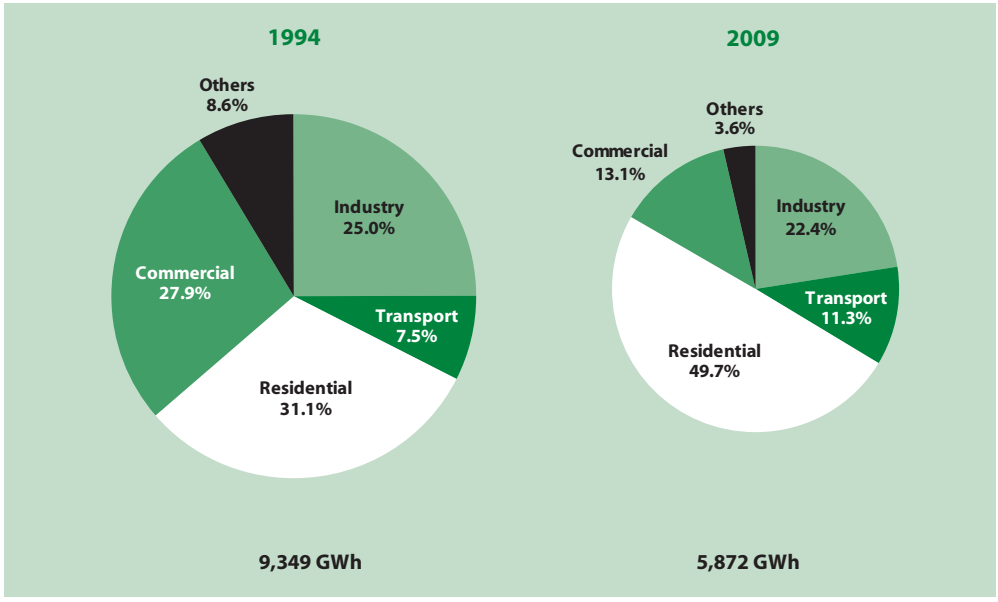
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 3.4.5 Electricity Generation by Plant Type, 1994 and 2009



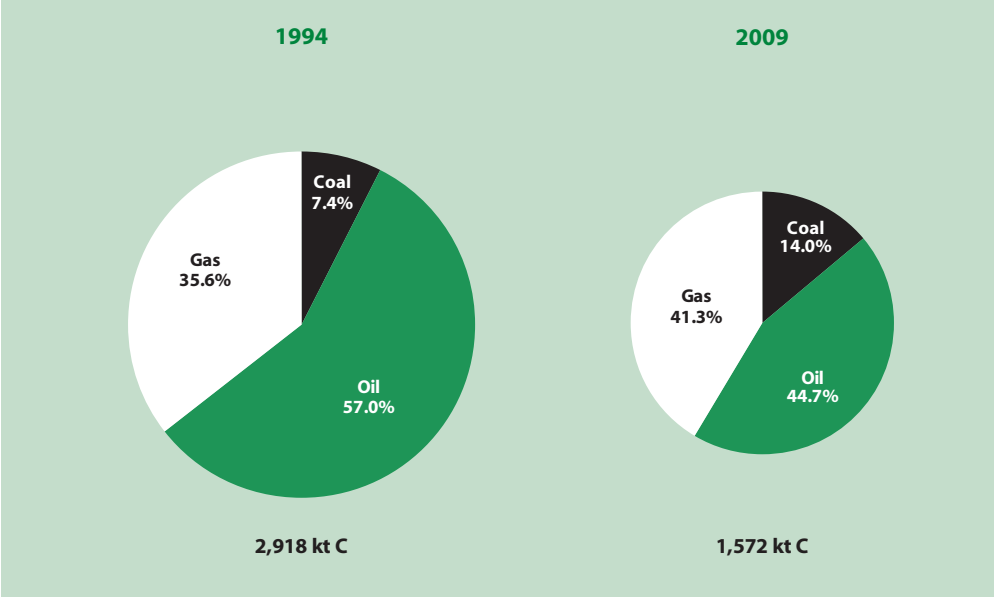
GWh = gigawatt-hour.
Source: IEA (2011b).

Figure 3.4.6 Electricity Consumption by Sector, 1994 and 2009



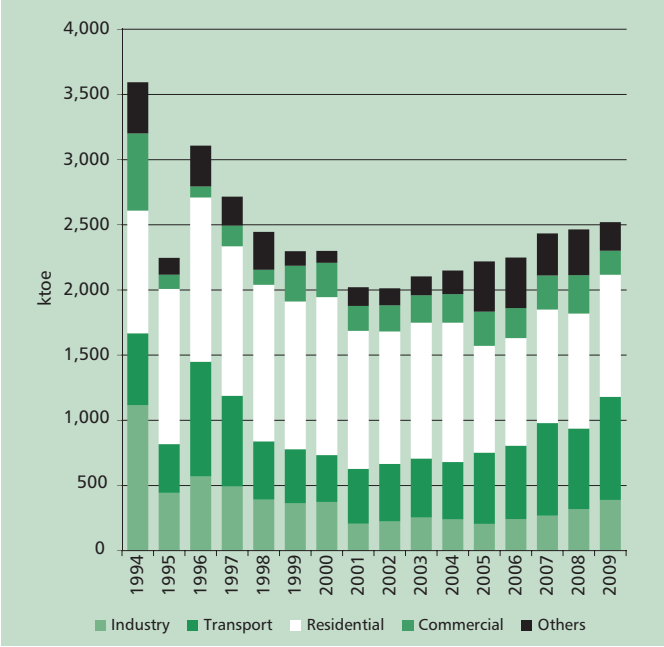
GWh = gigawatt-hour.
Source: IEA (2011b).

Figure 3.4.7 Carbon Dioxide Emissions from Fuel Combustion, 1994 and 2009



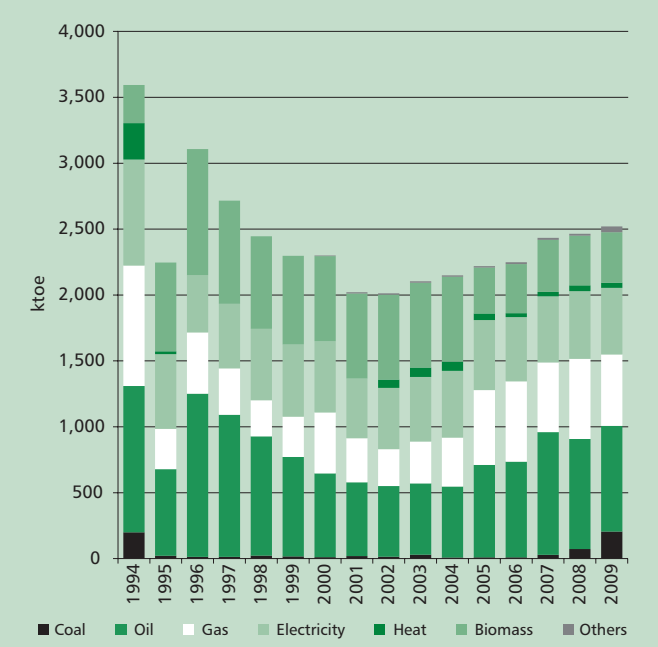
kt C = thousand tons of carbon equivalent.
Source: APERC estimates.

Figure 3.4.8 Final Energy Consumption by Sector, 1994–2009



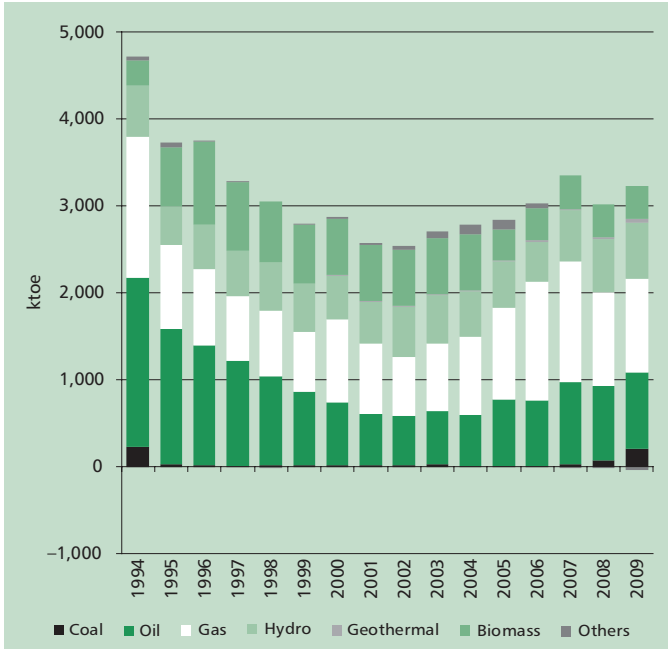
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 3.4.9 Final Energy Consumption by Type, 1994–2009



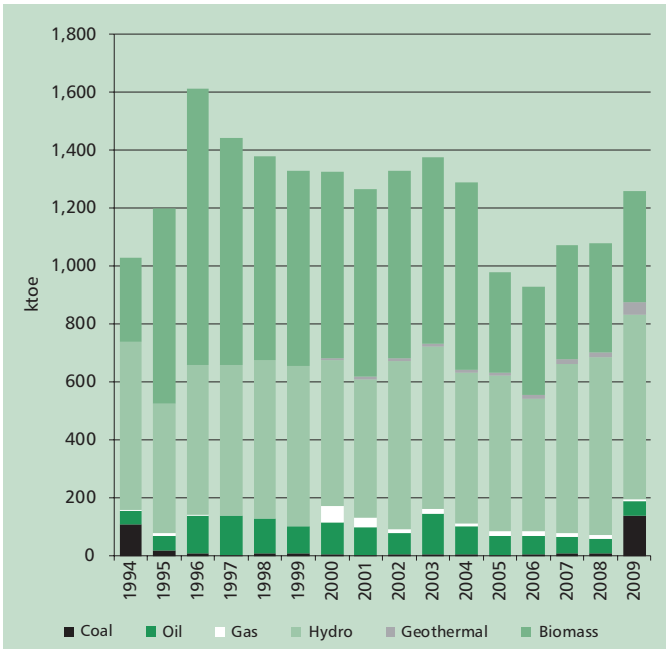
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 3.4.10 Total Primary Energy Supply, 1990–2009



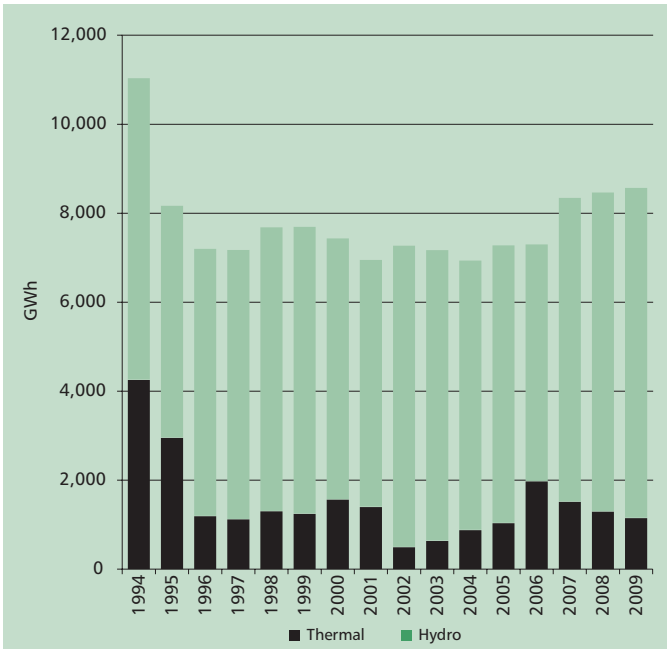
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 3.4.11 Indigenous Energy Production, 1994–2009



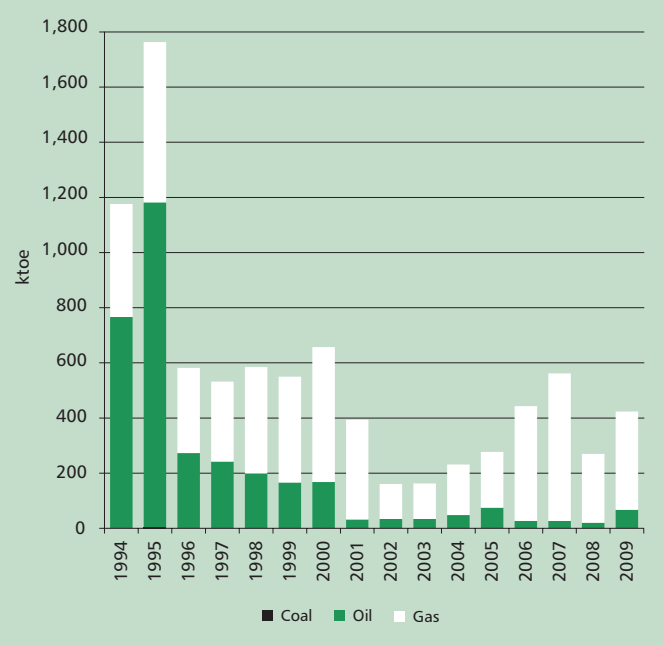
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 3.4.12 Electricity Generation by Source, 1994–2009



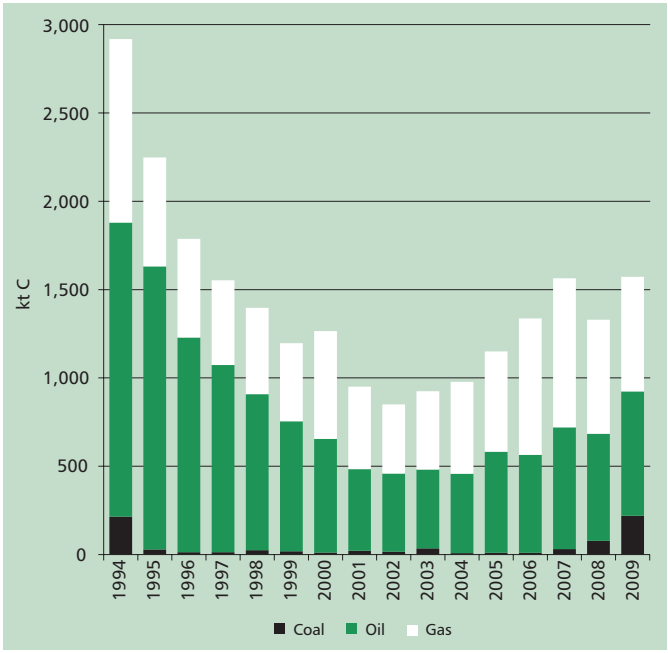
GWh = gigawatt-hour.
Source: IEA (2011b).

Figure 3.4.13 Fuel Input for Electricity Generation, 1994–2009



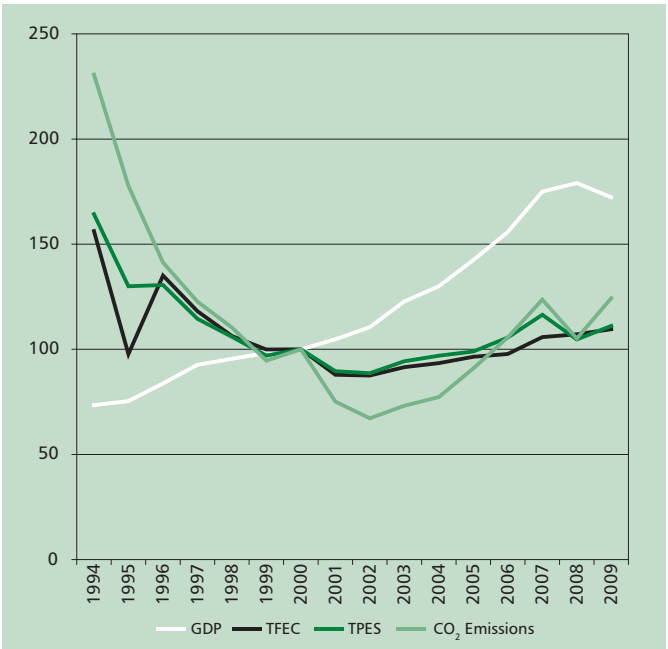
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 3.4.14 Carbon Dioxide Emissions from Fuel Combustion, 1994–2009



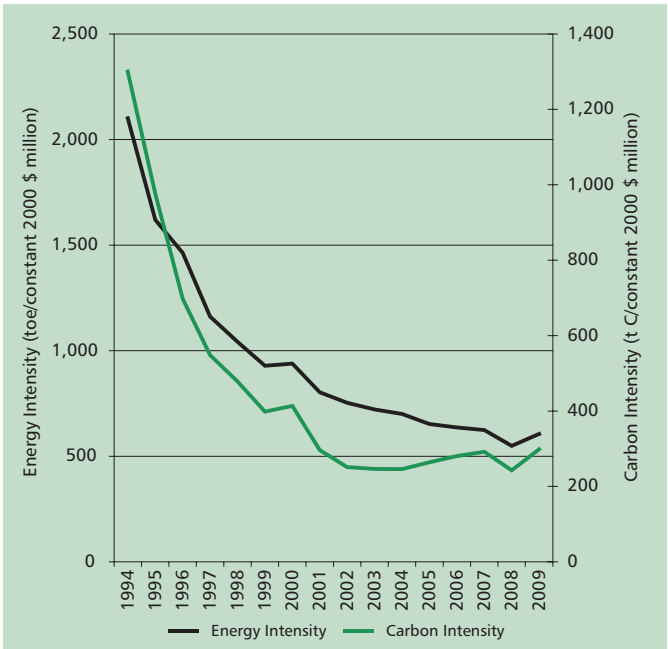
kt C = thousand tons of carbon equivalent.
Source: APERC estimates.

Figure 3.4.15 Growth of GDP, TFEC, TPES, and CO_2 Emissions (indexed to year 2000), 1994–2009



CO_2 = carbon dioxide, GDP = gross domestic product, TFEC = total final energy consumption, TPES = total primary energy supply.
Note: Indices are measured relative to the base year 2000 (2000 = 100).
Source: APERC estimates.

Figure 3.4.16 Energy and Carbon Intensities, 1994–2009



t C = ton of carbon equivalent, toe = ton of oil equivalent.
Source: APERC estimates.

Table 3.4.3 Georgia Energy Balance Table, 2006

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	5	0	64	0	0	0	0	0	0	0	15	457	0	14	0	0	373	0	0	0	928
2.	Imports	4	0	8	783	345	27	250	11	46	104	1,365	0	0	0	0	0	0	0	65	0	2,225
3.	Exports	0	0	–53	–15	0	0	0	0	–15	0	0	0	0	0	0	0	0	0	–12	0	–80
4.	International Bunkers	0	0	0	–38	0	0	0	0	0	–38	0	0	0	0	0	0	0	0	0	0	–38
5.	Stock Changes	0	0	0	0	0	0	0	0	0	0	–3	0	0	0	0	0	0	0	0	0	–3
6.	Total Primary Energy Supply	9	0	19	730	345	27	250	11	31	66	1,377	457	0	14	0	0	373	0	53	0	3,032
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	0	0	–13	–16	0	0	–20	4	0	0	–457	–457	0	0	0	0	0	0	627	33	–283
8.1	Power Generation	0	0	0	–27	0	0	–20	0	0	–7	–457	–457	0	0	0	0	0	0	627	33	–281
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	–13	11	0	0	0	4	0	7	0	0	0	0	0	0	0	0	0	0	–2
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	0	0	–6	0	0	0	0	0	0	0	–312	0	0	0	0	0	0	0	–186	–6	–510
10.	Discrepancy	1	0	0	12	0	0	0	0	0	12	1	0	0	0	0	0	0	0	–7	3	10
11.	Total Final Energy Consumption	10	0	0	726	345	27	230	15	31	78	609	0	0	14	0	0	373	0	487	30	2,249
12.	Industry Sector	5	0	0	18	0	0	2	15	0	1	150	0	0	0	0	0	0	0	58	11	242
13.	Transport Sector	0	0	0	513	345	0	168	0	0	0	22	0	0	0	0	0	0	0	28	0	563
14.	Other Sectors	5	0	0	118	0	27	60	0	31	0	263	0	0	14	0	0	373	0	401	19	1,193
14.1	Residential and Commercial	5	0	0	62	0	27	4	0	31	0	206	0	0	14	0	0	353	0	401	15	1,056
14.1.1	Commerce and Public Services	0	0	0	2	0	0	2	0	0	0	25	0	0	6	0	0	24	0	167	6	230
14.1.2	Residential	5	0	0	60	0	27	2	0	31	0	181	0	0	8	0	0	329	0	234	9	826
14.2	Non-Specified Others	0	0	0	56	0	0	56	0	0	0	57	0	0	0	0	0	20	0	0	4	137
15.	Non-Energy Use	0	0	0	77	0	0	0	0	0	77	174	0	0	0	0	0	0	0	0	0	251
16.	Electricity Output (GWh)	0	0	0	24	0	0	12	0	0	12	1,948	5,315	0	0	0	0	0	0	0	0	7,287
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	1,382	0	0	0	0	0	0	0	0	0	1,382

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.
Note: Figures may not add up to total because of rounding.
Source: IEA (2011b).

Table 3.4.4 Georgia Energy Balance Table, 2007

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	8	0	57	0	0	0	0	0	0	0	13	586	0	16	0	0	394	0	0	0	1,074
2.	Imports	20	0	14	971	430	27	312	14	58	130	1,379	0	0	0	0	0	0	0	37	0	2,421
3.	Exports	0	0	–31	–15	0	0	0	0	–15	0	0	0	0	0	0	0	0	0	–54	0	–100
4.	International Bunkers	0	0	0	–48	0	0	0	0	0	–48	0	0	0	0	0	0	0	0	0	0	–48
5.	Stock Changes	0	0	2	0	0	0	0	0	0	0	–7	0	0	0	0	0	0	0	0	0	–5
6.	Total Primary Energy Supply	28	0	42	908	430	27	312	14	43	82	1,385	586	0	16	0	0	394	0	–17	0	3,342
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	0	0	–42	9	0	0	–20	12	0	17	–582	–586	0	0	0	0	0	0	716	38	–447
8.1	Power Generation	0	0	0	–27	0	0	–20	0	0	–7	–582	–586	0	0	0	0	0	0	716	38	–441
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	–42	36	0	0	0	12	0	24	0	0	0	0	0	0	0	0	0	0	–6
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	0	0	0	0	0	0	0	0	0	0	–274	0	0	0	0	0	0	0	–188	–7	–469
10.	Discrepancy	0	0	0	15	0	0	2	1	0	12	0	0	0	0	0	0	0	0	–10	3	8
11.	Total Final Energy Consumption	28	0	0	932	430	27	294	27	43	111	529	0	0	16	0	0	394	0	501	34	2,434
12.	Industry Sector	1	0	0	30	0	0	2	27	0	1	164	0	0	0	0	0	0	0	60	13	268
13.	Transport Sector	11	0	0	645	430	0	215	0	0	0	25	0	0	0	0	0	0	0	29	0	710
14.	Other Sectors	16	0	0	147	0	27	77	0	43	0	271	0	0	16	0	0	394	0	412	21	1,277
14.1	Residential and Commercial	8	0	0	76	0	27	6	0	43	0	216	0	0	16	0	0	389	0	412	16	1,133
14.1.1	Commerce and Public Services	3	0	0	3	0	0	3	0	0	0	28	0	0	9	0	0	40	0	172	6	261
14.1.2	Residential	5	0	0	73	0	27	3	0	43	0	188	0	0	7	0	0	349	0	240	10	872
14.2	Non-Specified Others	8	0	0	71	0	0	71	0	0	0	55	0	0	0	0	0	5	0	0	5	144
15.	Non-Energy Use	0	0	0	110	0	0	0	0	0	110	69	0	0	0	0	0	0	0	0	0	179
16.	Electricity Output (GWh)	0	0	0	24	0	0	12	0	0	12	1,490	6,818	0	0	0	0	0	0	0	0	8,332
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	1,591	0	0	0	0	0	0	0	0	0	1,591

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Source: IEA (2011b).

Table 3.4.5 Georgia Energy Balance Table, 2008

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	7	0	53	0	0	0	0	0	0	0	11	616	0	14	0	0	378	0	0	0	1,079
2.	Imports	64	0	43	840	369	27	268	12	52	112	1,063	0	0	0	0	0	0	0	48	0	2,058
3.	Exports	0	0	–35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–58	0	–93
4.	International Bunkers	0	0	0	–41	0	0	0	0	0	–41	0	0	0	0	0	0	0	0	0	0	–41
5.	Stock Changes	0	0	–3	0	0	0	0	0	0	0	7	0	0	0	0	0	0	0	0	0	4
6.	Total Primary Energy Supply	71	0	58	799	369	27	268	12	52	71	1,081	616	0	14	0	0	378	0	–10	0	3,007
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	0	0	–58	27	0	0	–20	16	0	31	–311	–616	0	0	0	0	0	0	727	49	–182
8.1	Power Generation	0	0	0	–20	0	0	–20	0	0	0	–311	–616	0	0	0	0	0	0	727	49	–171
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	–58	47	0	0	0	16	0	31	0	0	0	0	0	0	0	0	0	0	–11
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	0	0	0	0	0	0	0	0	0	0	–162	0	0	0	0	0	0	0	–194	–8	–364
10.	Discrepancy	1	0	0	9	0	0	2	1	0	6	1	0	0	0	0	0	0	0	–10	3	4
11.	Total Final Energy Consumption	72	0	0	835	369	27	250	29	52	108	609	0	0	14	0	0	378	0	513	44	2,465
12.	Industry Sector	27	0	0	32	0	0	2	29	0	1	179	0	0	0	0	0	0	0	61	19	318
13.	Transport Sector	15	0	0	546	369	0	177	0	0	0	28	0	0	0	0	0	0	0	30	0	619
14.	Other Sectors	30	0	0	150	0	27	71	0	52	0	329	0	0	14	0	0	378	0	422	25	1,348
14.1	Residential and Commercial	19	0	0	85	0	27	6	0	52	0	247	0	0	14	0	0	373	0	422	17	1,177
14.1.1	Commerce and Public Services	11	0	0	3	0	0	3	0	0	0	54	0	0	2	0	0	42	0	176	7	295
14.1.2	Residential	8	0	0	82	0	27	3	0	52	0	193	0	0	12	0	0	331	0	246	10	882
14.2	Non-Specified Others	11	0	0	65	0	0	65	0	0	0	82	0	0	0	0	0	5	0	0	8	171
15.	Non-Energy Use	0	0	0	107	0	0	0	0	0	107	73	0	0	0	0	0	0	0	0	0	180
16.	Electricity Output (GWh)	0	0	0	12	0	0	12	0	0	0	1,279	7,162	0	0	0	0	0	0	0	0	8,453
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	2,052	0	0	0	0	0	0	0	0	0	2,052

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.
Note: Figures may not add up to total because of rounding.
Source: IEA (2011b).

Table 3.4.6 Georgia Energy Balance Table, 2009

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	138	0	51	0	0	0	0	0	0	0	6	637	0	44	0	0	382	0	0	0	1,258
2.	Imports	83	0	5	904	368	27	387	29	52	41	1,080	0	0	0	0	0	0	0	22	0	2,094
3.	Exports	–16	0	–41	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–64	0	–121
4.	International Bunkers	0	0	0	–41	0	0	0	0	0	–41	0	0	0	0	0	0	0	0	0	0	–41
5.	Stock Changes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6.	Total Primary Energy Supply	205	0	15	863	368	27	387	29	52	0	1,086	637	0	44	0	0	382	0	–42	0	3,190
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	0	0	–15	–55	0	0	–67	5	0	7	–410	–637	0	0	0	0	0	0	736	43	–338
8.1	Power Generation	0	0	0	–67	0	0	–67	0	0	0	–410	–637	0	0	0	0	0	0	736	43	–335
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	–15	12	0	0	0	5	0	7	0	0	0	0	0	0	0	0	0	0	–3
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	0	0	0	0	0	0	0	0	0	0	–135	0	0	0	0	0	0	0	–185	–6	–326
10.	Discrepancy	0	0	0	–6	0	0	–1	–5	0	0	1	0	0	0	0	0	0	0	–4	3	–6
11.	Total Final Energy Consumption	205	0	0	802	368	27	319	29	52	7	542	0	0	44	0	0	382	0	505	40	2,520
12.	Industry Sector	45	0	0	29	0	0	0	29	0	0	181	0	0	0	0	0	0	0	113	21	389
13.	Transport Sector	36	0	0	677	368	0	309	0	0	0	21	0	0	0	0	0	0	0	57	0	791
14.	Other Sectors	124	0	0	89	0	27	10	0	52	0	267	0	0	44	0	0	382	0	335	19	1,260
14.1	Residential and Commercial	74	0	0	89	0	27	10	0	52	0	217	0	0	44	0	0	368	0	317	12	1,121
14.1.1	Commerce and Public Services	56	0	0	0	0	0	0	0	0	0	16	0	0	6	0	0	38	0	66	2	184
14.1.2	Residential	18	0	0	89	0	27	10	0	52	0	201	0	0	38	0	0	330	0	251	10	937
14.2	Non-Specified Others	50	0	0	0	0	0	0	0	0	0	50	0	0	0	0	0	14	0	18	7	139
15.	Non-Energy Use	0	0	0	7	0	0	0	0	0	7	73	0	0	0	0	0	0	0	0	0	80
16.	Electricity Output (GWh)	0	0	0	39	0	0	39	0	0	0	1,107	7,412	0	0	0	0	0	0	0	0	8,558
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	1,800	0	0	0	0	0	0	0	0	0	1,800

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Source: IEA (2011b).

Table 3.4.7 Georgia Summary Table, 1990–2009

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Indigenous Production (ktoe)																				
Coal	–	–	–	–	110	20	10	3	9	10	4	1	4	5	5	3	5	8	7	138
Oil	–	–	–	–	46	50	129	135	120	91	111	99	74	141	98	67	64	57	53	51
Gas	–	–	–	–	2	9	3	0	0	0	56	33	14	15	10	15	15	13	11	6
Hydro	–	–	–	–	582	447	516	520	548	554	504	477	582	561	520	536	457	586	616	637
Nuclear	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Geothermal	–	–	–	–	0	0	0	0	0	0	6	10	10	10	10	10	14	16	14	44
Solar	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wind	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Biomass	–	–	–	–	290	674	956	784	702	674	645	645	645	645	645	349	373	394	378	382
Others	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	–	–	–	–	1,030	1,200	1,614	1,442	1,379	1,329	1,326	1,265	1,329	1,377	1,288	980	928	1,074	1,079	1,258
Primary Energy Supply (ktoe)																				
Coal	–	–	–	–	229	27	13	10	22	17	15	15	14	30	9	11	9	28	71	205
Oil	–	–	–	–	1,951	1,558	1,387	1,210	1,016	847	727	591	570	613	586	759	749	950	857	878
Gas	–	–	–	–	1,622	965	871	748	762	690	953	812	679	771	903	1,061	1,377	1,385	1,081	1,086
Hydro	–	–	–	–	582	447	516	520	548	554	504	477	582	561	520	536	457	586	616	637
Nuclear	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Geothermal	–	–	–	–	0	0	0	0	0	0	6	10	10	10	10	10	14	16	14	44
Solar	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wind	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Biomass	–	–	–	–	290	674	956	784	702	674	645	645	645	645	645	349	373	394	378	382
Others	–	–	–	–	43	60	6	16	–8	5	21	23	45	78	110	116	53	–17	–10	–42
Total	–	–	–	–	4,717	3,731	3,749	3,288	3,042	2,787	2,871	2,573	2,545	2,708	2,783	2,842	3,032	3,342	3,007	3,190
Final Energy Consumption by Sector (ktoe)																				
Industry	–	–	–	–	1,116	444	569	492	391	363	374	206	224	254	240	205	242	268	318	389
Transport	–	–	–	–	552	373	881	697	448	415	359	422	442	453	440	547	563	710	619	791
Residential	–	–	–	–	941	1,191	1,260	1,146	1,201	1,134	1,212	1,059	1,016	1,042	1,070	819	826	872	882	937
Commercial	–	–	–	–	592	109	84	159	115	274	264	191	200	211	218	263	230	261	295	184
Others	–	–	–	–	393	130	313	222	291	112	91	143	131	144	181	385	388	323	351	219
Total	–	–	–	–	3,594	2,247	3,107	2,716	2,446	2,298	2,300	2,021	2,013	2,104	2,149	2,219	2,249	2,434	2,465	2,520

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Table 3.4.7 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Final Energy Consumption by Type (ktoe)																				
Coal	–	–	–	–	199	21	13	13	23	17	11	19	14	30	8	10	10	28	72	205
Oil	–	–	–	–	1,111	657	1,238	1,078	904	754	635	560	537	541	539	700	726	932	835	802
Gas	–	–	–	–	914	306	465	352	275	306	463	334	279	317	371	569	609	529	609	542
Electricity	–	–	–	–	804	568	435	490	542	548	541	453	465	490	506	531	487	501	513	505
Heat	–	–	–	–	276	21	0	0	0	0	0	0	63	71	70	50	30	34	44	40
Biomass	–	–	–	–	290	674	956	783	702	673	645	645	645	645	645	349	373	394	378	382
Others	–	–	–	–	0	0	0	0	0	0	5	10	10	10	10	10	14	16	14	44
Total	–	–	–	–	3,594	2,247	3,107	2,716	2,446	2,298	2,300	2,021	2,013	2,104	2,149	2,219	2,249	2,434	2,465	2,520
Power Generation (GWh)																				
Thermal	–	–	–	–	4,252	2,951	1,187	1,116	1,299	1,241	1,564	1,395	490	634	875	1,031	1,972	1,514	1,291	1,146
Hydro	–	–	–	–	6,772	5,203	6,000	6,047	6,372	6,442	5,860	5,542	6,767	6,526	6,049	6,236	5,315	6,818	7,162	7,412
Nuclear	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Geothermal	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Solar	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wind	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Others	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	–	–	–	–	11,024	8,154	7,187	7,163	7,671	7,683	7,424	6,937	7,257	7,160	6,924	7,267	7,287	8,332	8,453	8,558
Loss and Own Use of Electricity (GWh)																				
Transmission and Distribution Losses	–	–	–	–	1,907	1,907	2,093	1,558	1,128	1,244	1,244	849	1,209	1,163	1,081	1,140	1,035	1,070	1,093	1,081
Own Use	–	–	–	–	267	337	105	93	140	140	128	174	186	23	93	81	116	81	105	360
Total	–	–	–	–	2,174	2,244	2,198	1,651	1,267	1,384	1,372	1,023	1,395	1,186	1,174	1,221	1,151	1,151	1,198	1,442
Fuel Input for Power Generation (ktoe)																				
Coal	–	–	–	–	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Oil	–	–	–	–	767	1,177	273	242	199	166	168	32	34	34	48	75	27	27	20	67
Gas	–	–	–	–	410	582	309	290	386	384	489	362	127	129	183	202	416	535	250	356
Total	–	–	–	–	1,176	1,763	582	532	585	550	657	394	161	163	231	277	443	562	270	423
CO_2 Emissions (kt C)																				
Coal	–	–	–	–	215	29	14	14	25	18	12	22	17	36	9	11	11	31	78	220
Oil	–	–	–	–	1,664	1,602	1,215	1,059	884	736	643	461	442	445	449	572	554	689	606	703
Gas	–	–	–	–	1,039	617	558	479	488	442	610	468	391	444	520	568	772	843	646	649
Total	–	–	–	–	2,918	2,248	1,787	1,552	1,397	1,197	1,265	951	850	925	978	1,150	1,337	1,564	1,330	1,572

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Table 3.4.7 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Macroeconomic Indicators																				
Population (thousand)	4,802	4,836	4,874	4,911	4,862	4,734	4,616	4,532	4,487	4,453	4,418	4,386	4,357	4,329	4,318	4,361	4,398	4,388	4,384	4,411
Urban Population, %	55.1	54.9	54.6	54.4	54.1	53.9	53.7	53.4	53.2	52.9	52.7	52.7	52.6	52.6	52.5	52.5	52.6	52.7	52.7	52.8
GDP (constant 2000 $ million)	8,152	6,432	3,544	2,505	2,245	2,303	2,561	2,831	2,919	3,002	3,057	3,204	3,380	3,754	3,973	4,355	4,763	5,351	5,475	5,269
GDP (current $ million)	7,738	6,337	3,691	2,701	2,514	2,694	3,095	3,511	3,614	2,800	3,057	3,219	3,396	3,991	5,126	6,411	7,745	10,173	12,795	10,767
GDP (constant 2005 PPP $ million)	29,475	23,256	12,814	9,060	8,117	8,328	9,261	10,235	10,553	10,856	11,056	11,587	12,221	13,573	14,368	15,747	17,224	19,350	19,798	19,051
GDP/capita (constant 2000 $)	1,698	1,330	727	510	462	487	555	625	650	674	692	731	776	867	920	999	1,083	1,219	1,249	1,194
GDP/capita (current $)	1,611	1,310	757	550	517	569	670	775	805	629	692	734	779	922	1,187	1,470	1,761	2,318	2,919	2,441
GDP – Manufacturing (% of GDP)	14.9	17.3	8 .4	5.2	5.3	6.2	10.8	10.2	9.0	8.4	8.5	7.9	9.0	8.9	9.4	9.8	10.9	11 .1	10.5	10.2
Car Ownership (car/1,000 persons)	–	–	–	–	–	–	–	–	–	–	–	57	69	75	77	77	77	80	81	81
Basic Energy Indicators																				
TPES/capita (toe/person)	–	–	–	–	0.97	0.79	0.81	0.73	0.68	0.63	0.65	0.59	0.58	0.63	0.64	0.65	0.69	0.76	0.69	0.72
TFEC/capita (toe/person)	–	–	–	–	0.74	0.47	0.67	0.60	0.55	0.52	0.52	0.46	0.46	0.49	0.50	0.51	0.51	0.55	0.56	0.57
TPES/GDP (toe/constant 2000 $ million)	–	–	–	–	2,101	1,620	1,464	1,162	1,042	928	939	803	753	721	700	653	637	625	549	605
TFEC/GDP (toe/constant 2000 $ million)	–	–	–	–	1,601	976	1,213	960	838	765	752	631	596	561	541	510	472	455	450	478
Import Dependency (%)	–	–	–	–	78.2	67.8	56.9	56.1	54.7	52.3	53.8	50.8	47.8	49.2	53.7	65.5	69.4	67.9	64.1	60.6
Oil Import Dependency (%)	–	–	–	–	97.6	96.8	90.7	88.8	88.2	89.3	84.7	83.2	87.0	77.0	83.3	91.2	91.5	94.0	93.8	94.2
Electricity/capita (kWh/ person)	–	–	–	–	1,923	1,395	1,096	1,258	1,405	1,431	1,424	1,201	1,241	1,316	1,363	1,416	1,288	1,328	1,361	1,332
CO_2 Intensity (t C/constant 2000 $ million)	–	–	–	–	1,300	976	698	548	479	399	414	297	251	246	246	264	281	292	243	298
CO_2/capita (t C)	–	–	–	–	0.60	0.47	0.39	0.34	0.31	0.27	0.29	0.22	0.20	0.21	0.23	0.26	0.30	0.36	0.30	0.36
CO_2/TPES (t C/toe)	–	–	–	–	0.62	0.60	0.48	0.47	0.46	0.43	0.44	0.37	0.33	0.34	0.35	0.40	0.44	0.47	0.44	0.49

– = no data or not applicable, CO_2 = carbon dioxide, GDP = gross domestic product, GWh = gigawatt–hour, kt C = thousand tons of carbon equivalent, ktoe = thousand tons of oil equivalent, kWh = kilowatt–hour, PPP = purchasing power parity, t C = ton of carbon equivalent, TFEC = total final energy consumption, toe = ton of oil equivalent, TPES = total primary energy supply.

Note: Figures may not add up to total because of rounding.

Sources: APERC estimates, IEA (2011b), JAMA (2012), and World Bank.

3.5 Kazakhstan

Country Profile (2009)		Energy Reserves (year-end 2008)	
Total Surface Area (square kilometer)	2,724,900	Coal (million ton) - Recoverable	33,600.0
Population (thousand)	15,925	Gas (trillion cubic feet) - Proven	105.9
GDP (constant 2000 $ billion)	37.8	Oil (billion barrel) - Proven	22,762.0
Electrification Rate (%)	95.0		

GDP = gross domestic product.

Sources: ADB (2012), ADB estimates, World Bank, and WEC (2010).

2009 Energy Supply and Demand Flow (ktoe)

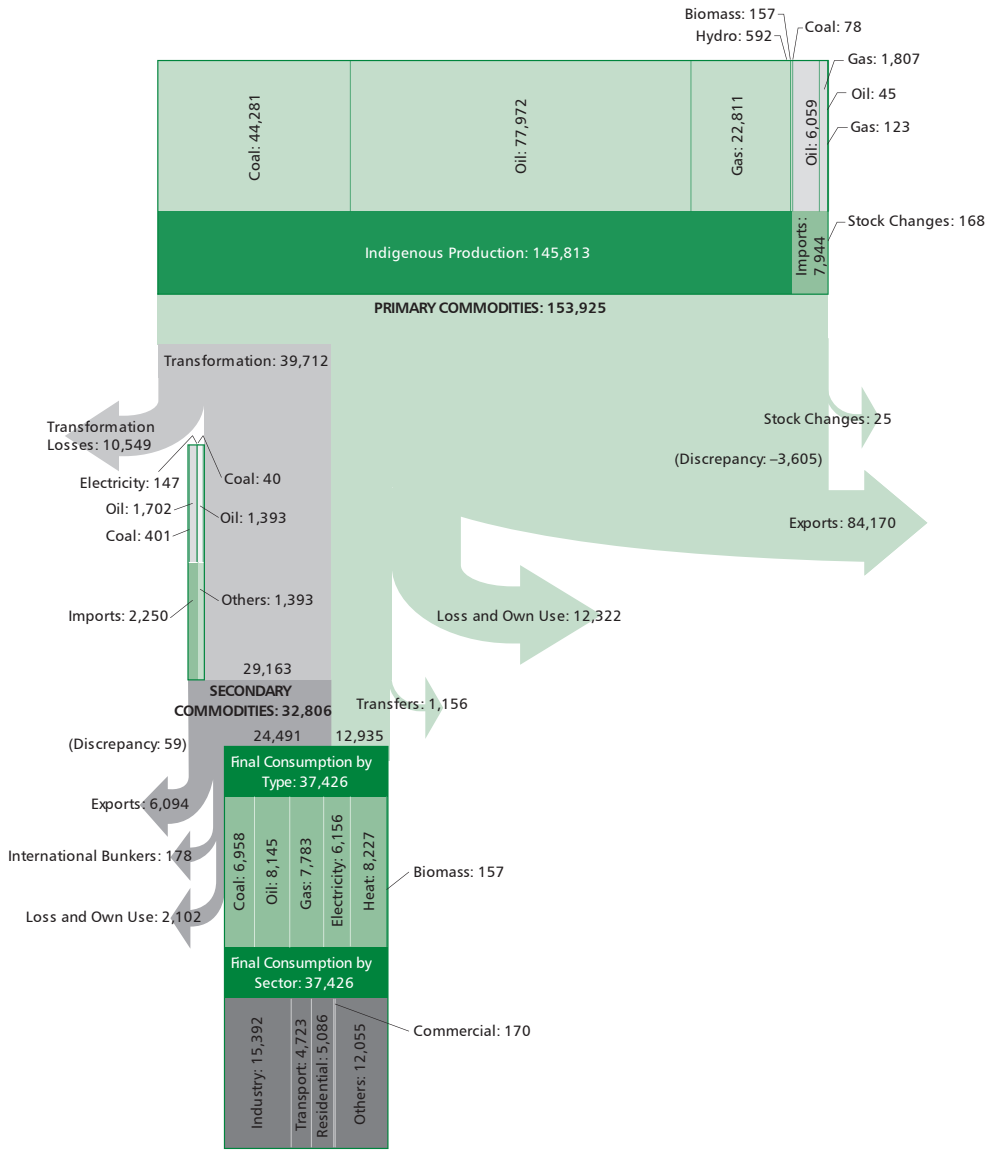


Table 3.5.1 Key Data and Economic Profile

	1990	1995	2000	2005	2009
Socioeconomic Data					
Population (thousand)	16,348	15,816	14,884	15,147	15,925
GDP (constant 2000 $ billion)	26.3	16.2	18.3	30.0	37.8
GDP (constant 2005 PPP $ billion)	115.9	71.2	80.5	131.8	166.1
GDP/capita (constant 2000 $)	1,612	1,023	1,229	1,978	2,371
GDP/capita (constant 2005 PPP $)	7,089	4,499	5,406	8,699	10,427

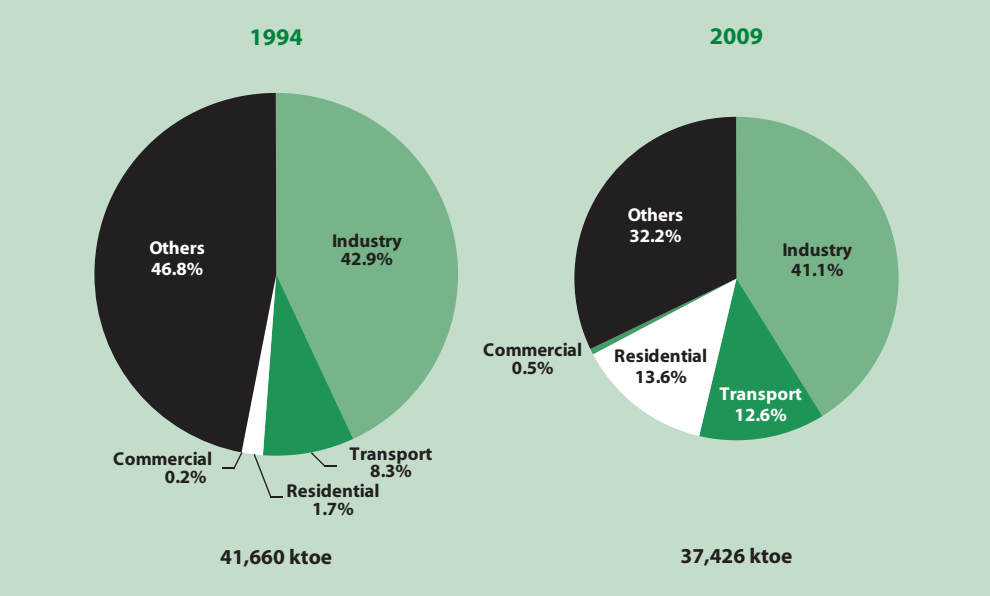
GDP = gross domestic product, PPP = purchasing power parity.
Source: World Bank.

Table 3.5.2 Energy Supply and Demand

	1990	1995	2000	2005	2009
Primary Energy Supply (ktoe)					
Indigenous Production	–	63,469	77,909	117,365	145,813
Net Imports	–	–11,493	–42,331	–66,627	–79,981
Total PES	–	51,976	35,578	50,738	65,832
Coal	–	28,920	19,763	28,492	31,555
Oil	–	11,517	8,262	9,046	14,393
Gas	–	10,108	6,572	12,457	19,193
Biomass	–	79	73	78	157
Others	–	1,352	908	665	534
TPES/capita (toe)	–	3.29	2.39	3.35	4.13
TPES/GDP (toe/constant 2005 PPP $ million)	–	730	442	385	396
Final Energy Consumption (ktoe)					
Industry	–	17,483	10,047	17,593	15,392
Transportation	–	3,438	3,386	3,637	4,723
Other Sectors	–	19,413	8,774	11,489	17,311
Total FEC	–	40,334	22,207	32,719	37,426
Coal	–	11,682	4,453	8,009	6,958
Oil	–	8,732	6,377	7,791	8,145
Gas	–	7,117	2,674	3,670	7,783
Electricity	–	4,438	3,027	5,227	6,156
Biomass	–	79	73	78	157
Others	–	8,286	5,603	7,944	8,227

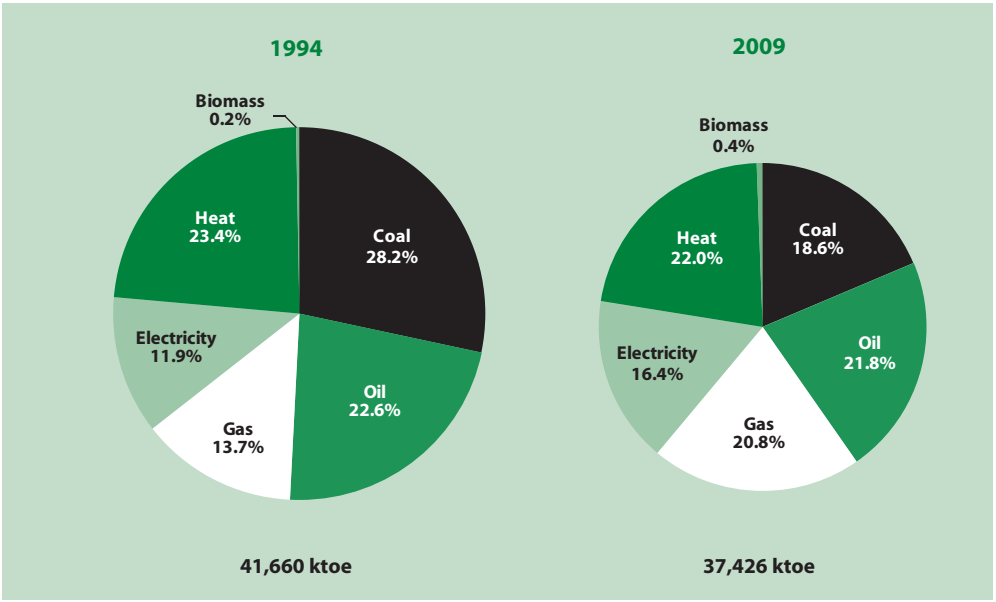
– = no data or not applicable, FEC = final energy consumption, GDP = gross domestic product, ktoe = thousand tons of oil equivalent, PES = primary energy supply, PPP = purchasing power parity, toe = ton of oil equivalent, TPES = total primary energy supply.
Source: IEA (2011b).

Figure 3.5.1 Final Energy Consumption by Sector, 1994 and 2009



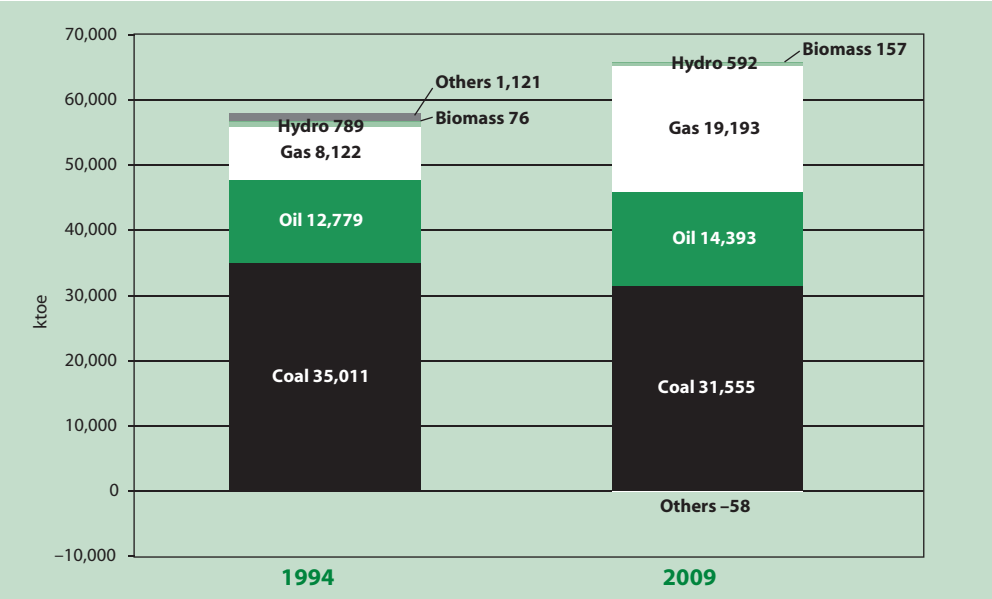
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 3.5.2 Final Energy Consumption by Type of Energy, 1994 and 2009



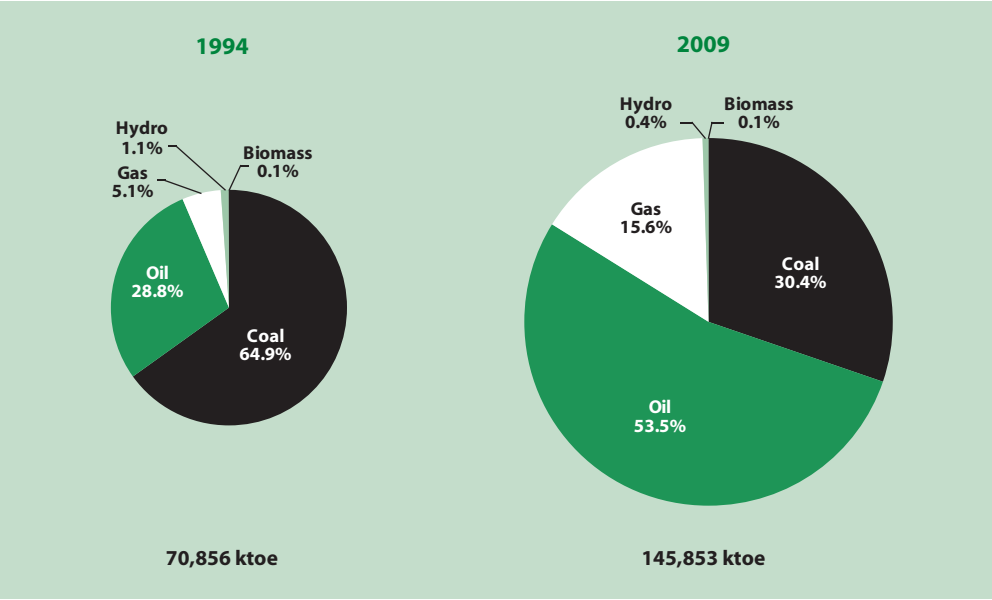
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 3.5.3 Total Primary Energy Supply, 1994 and 2009



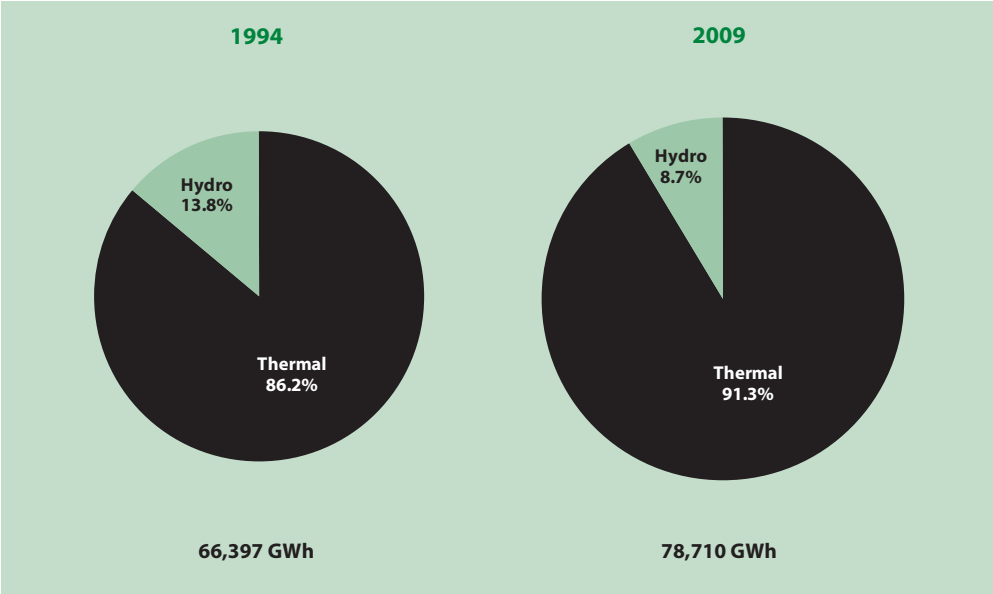
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 3.5.4 Indigenous Energy Production, 1994 and 2009



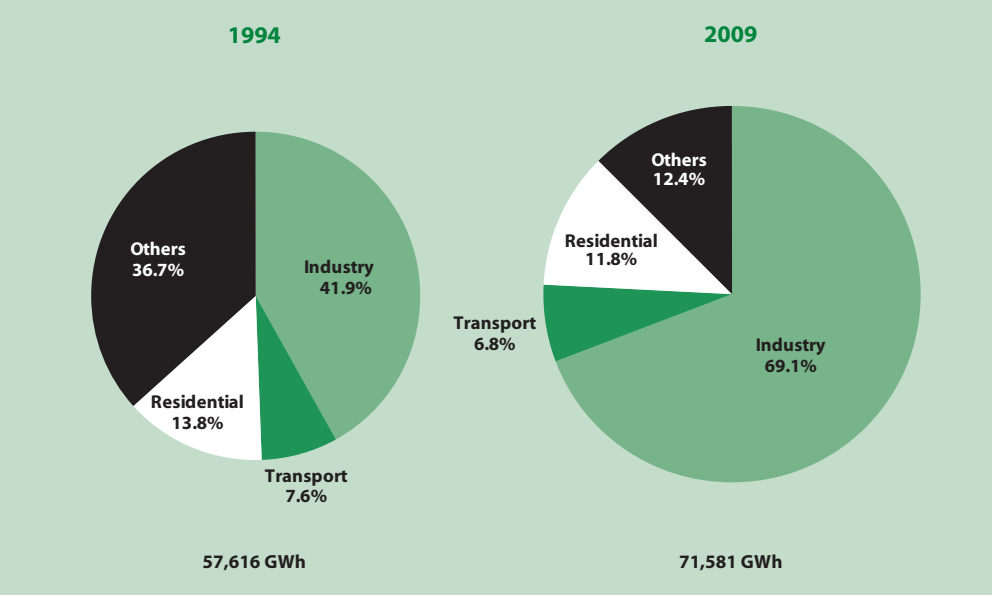
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 3.5.5 Electricity Generation by Plant Type, 1994 and 2009



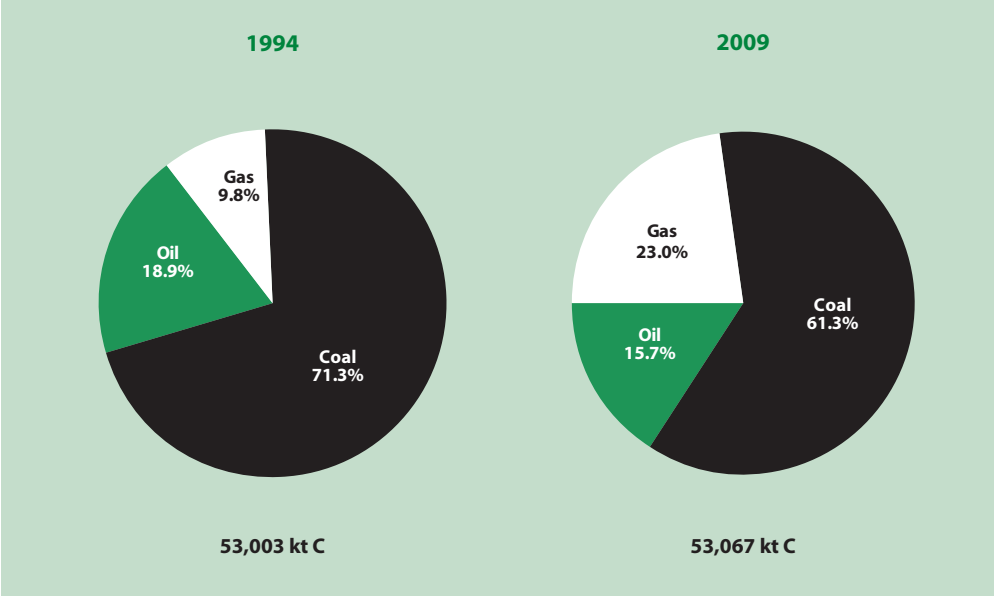
GWh = gigawatt-hour.
Source: IEA (2011b).

Figure 3.5.6 Electricity Consumption by Sector, 1994 and 2009



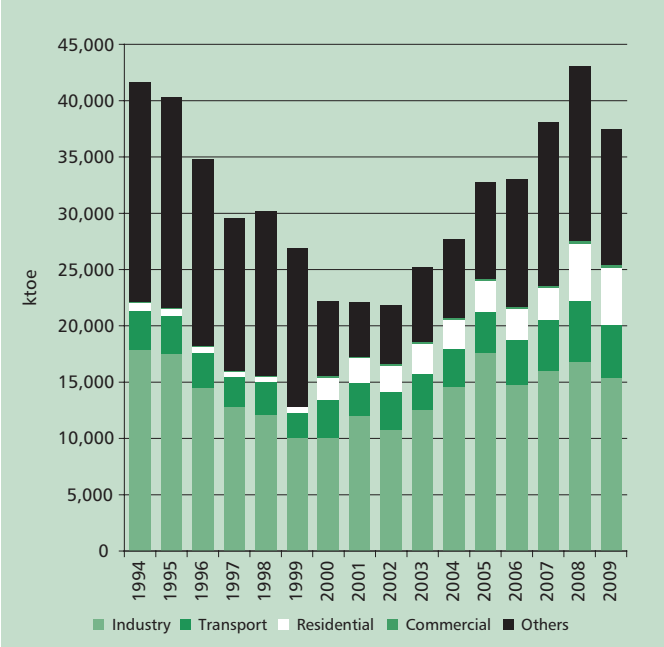
GWh = gigawatt-hour.
Source: IEA (2011b).

Figure 3.5.7 Carbon Dioxide Emissions from Fuel Combustion, 1994 and 2009



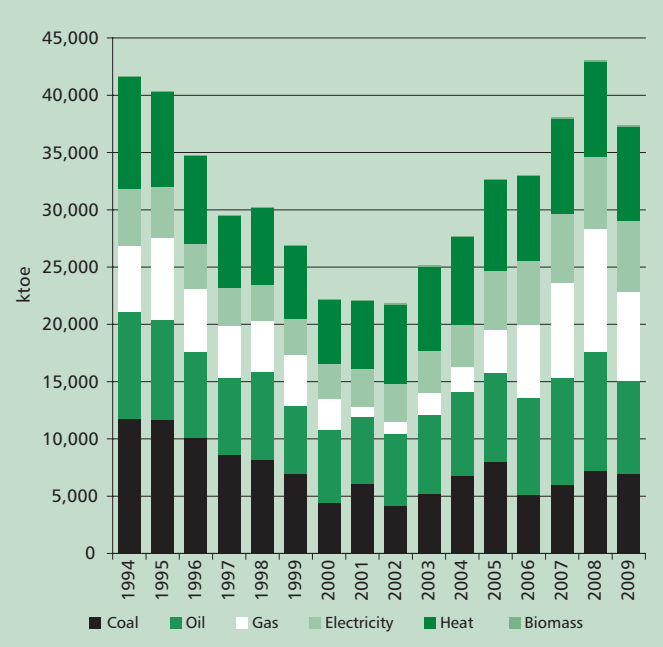
kt C = thousand tons of carbon equivalent.
Source: APERC estimates.

Figure 3.5.8 Final Energy Consumption by Sector, 1994–2009



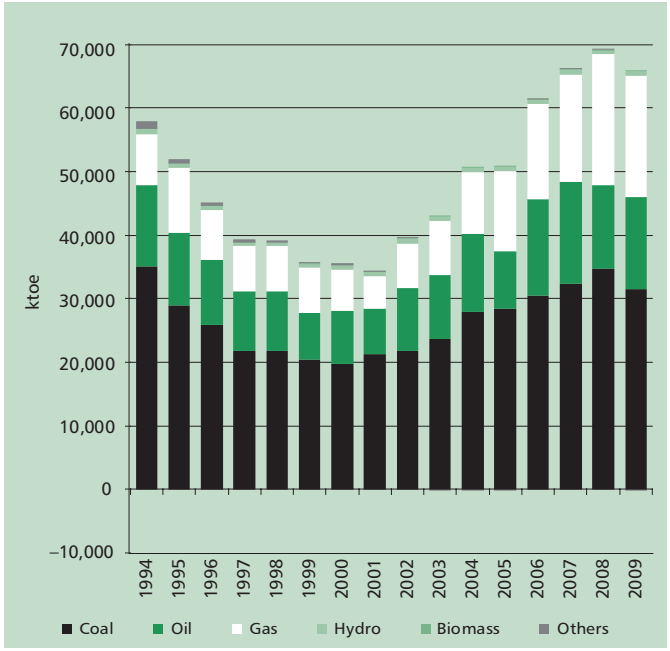
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 3.5.9 Final Energy Consumption by Type, 1994–2009



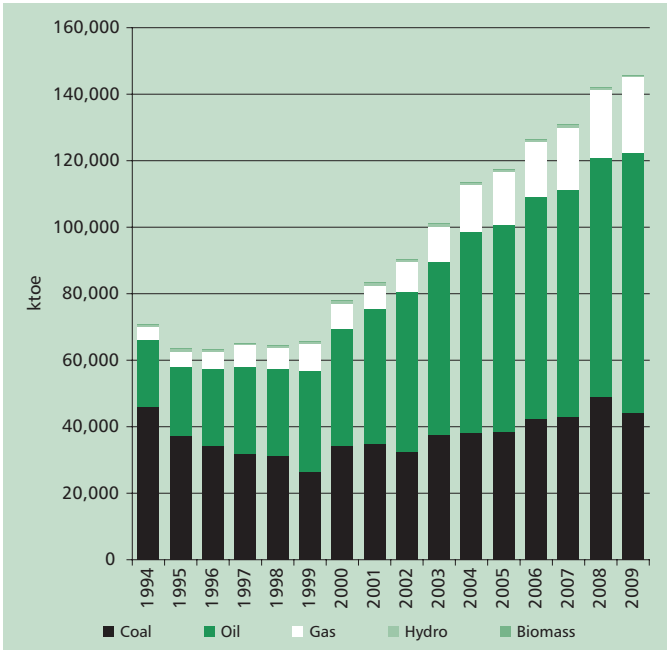
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 3.5.10 Total Primary Energy Supply, 1990–2009



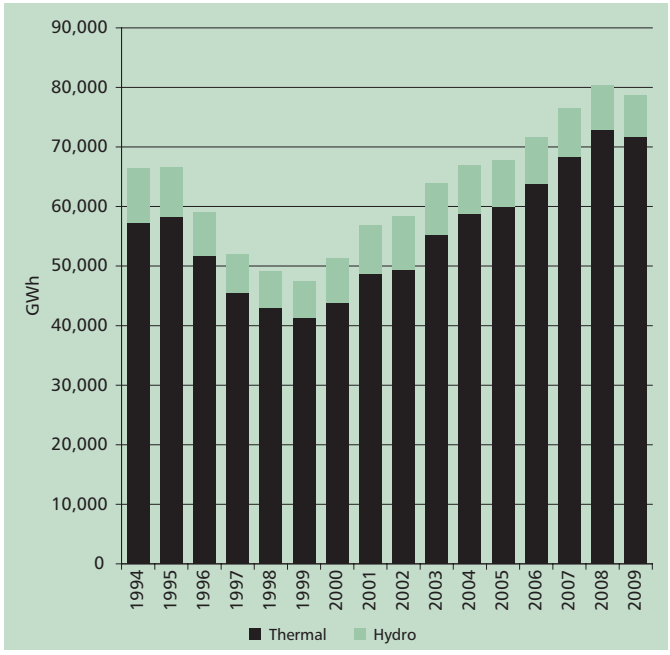
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 3.5.11 Indigenous Energy Production, 1994–2009



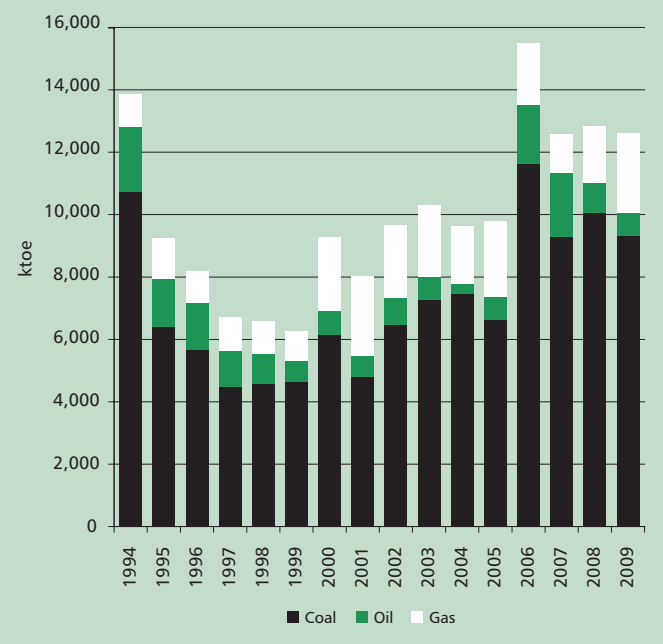
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 3.5.12 Electricity Generation by Source, 1994–2009



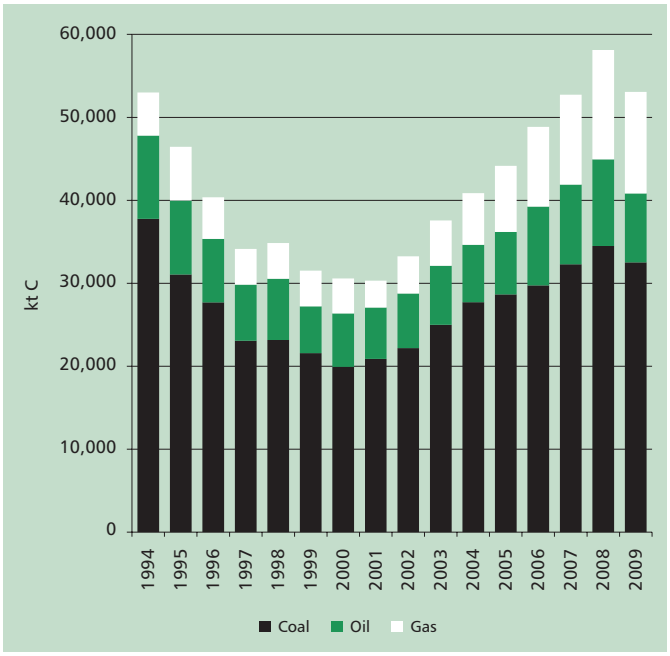
GWh = gigawatt-hour.
Source: IEA (2011b).

Figure 3.5.13 Fuel Input for Electricity Generation, 1994–2009



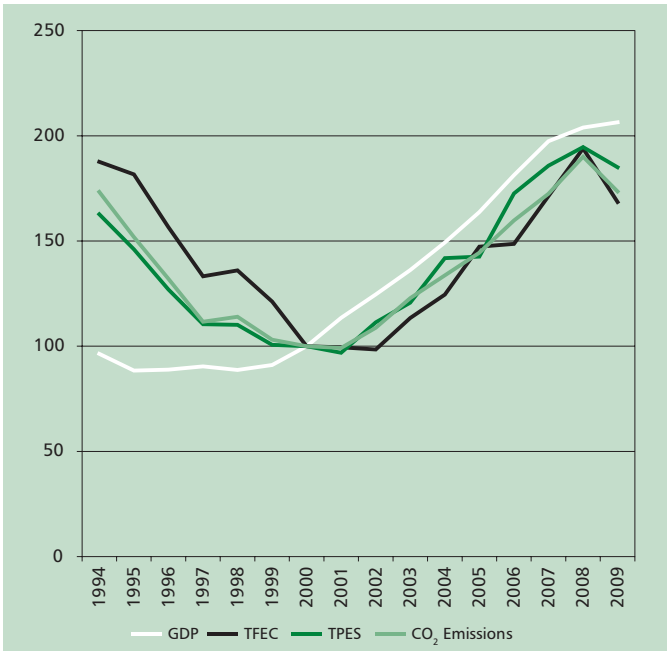
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 3.5.14 Carbon Dioxide Emissions from Fuel Combustion, 1994–2009



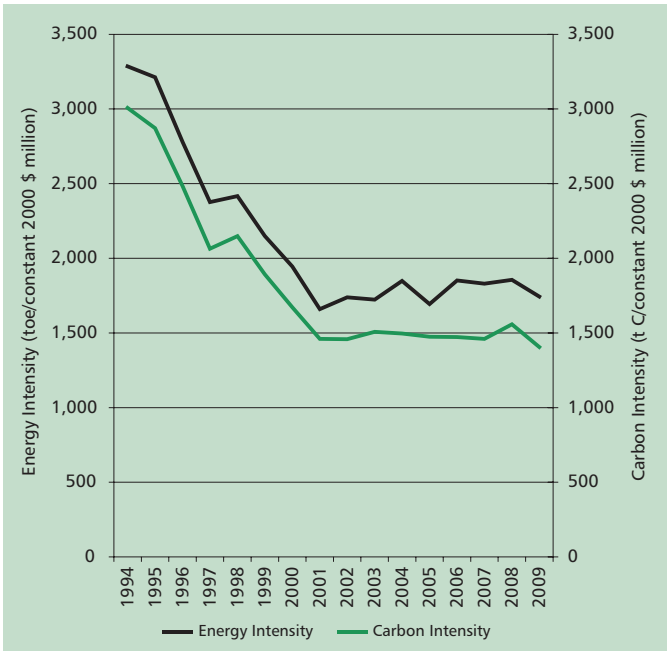
kt C = thousand tons of carbon equivalent.
Source: APERC estimates.

Figure 3.5.15 Growth of GDP, TFEC, TPES, and CO_2 Emissions (indexed to year 2000), 1994–2009



CO_2 = carbon dioxide, GDP = gross domestic product, TFEC = total final energy consumption, TPES = total primary energy supply.
Note: Indices are measured relative to the base year 2000 (2000 = 100).
Source: APERC estimates.

Figure 3.5.16 Energy and Carbon Intensities, 1994–2009



t C = ton of carbon equivalent, toe = ton of oil equivalent.
Source: APERC estimates.

Table 3.5.3 Kazakhstan Energy Balance Table, 2006

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	42,463	0	66,574	0	0	0	0	0	0	0	16,717	668	0	0	0	0	61	0	0	0	126,483
2.	Imports	244	521	6,471	1,786	740	68	409	53	4	512	10,481	0	0	0	0	0	0	0	340	0	19,843
3.	Exports	–12,782	–6	–55,884	–3,517	–211	–17	–1,635	–679	–951	–24	–11,813	0	0	0	0	0	0	0	–321	0	–84,323
4.	International Bunkers	0	0	0	–177	0	0	0	0	0	–177	0	0	0	0	0	0	0	0	0	0	–177
5.	Stock Changes	122	–20	163	–290	–99	0	–76	–88	–26	–1	–402	0	0	0	0	0	0	0	0	0	–427
6.	Total Primary Energy Supply	30,047	495	17,324	–2,198	430	51	–1,302	–714	–973	310	14,983	668	0	0	0	0	61	0	19	0	61,399
7.	Transfers	0	0	–738	810	0	0	0	0	810	0	0	0	0	0	0	0	0	0	0	0	72
8.	Total Transformation Sector	–26,299	1,627	–13,476	10,456	2,464	147	4,136	2,460	405	844	–1,966	–668	0	0	0	0	0	0	6,162	8,336	–15,828
8.1	Power Generation	–22,064	0	–1,144	–724	0	0	0	–724	0	0	–1,966	–668	0	0	0	0	0	0	6,162	8,336	–12,068
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	–12,332	11,180	2,464	147	4,136	3,184	405	844	0	0	0	0	0	0	0	0	0	0	–1,152
8.4	Coal Transformation	–4,235	1,627	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–2,608
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	–815	0	–853	–508	–22	0	–117	–18	–1	–350	–6,641	0	0	0	0	0	0	0	–572	–1,000	–10,389
10.	Discrepancy	–2	16	–2,257	–5	0	–1	–7	2	0	1	–1	0	0	0	0	0	0	0	1	–1	–2,249
11.	Total Final Energy Consumption	2,931	2,138	0	8,555	2,872	197	2,710	1,730	241	805	6,375	0	0	0	0	0	61	0	5,610	7,335	33,005
12.	Industry Sector	2,792	1,609	0	2,778	0	0	1,145	1,633	0	0	0	0	0	0	0	0	0	0	4,019	3,587	14,785
13.	Transport Sector	0	0	0	3,585	2,868	0	598	17	0	102	0	0	0	0	0	0	0	0	339	88	4,012
14.	Other Sectors	0	49	0	1,742	0	197	936	76	241	292	6,375	0	0	0	0	0	61	0	1,252	3,660	13,139
14.1	Residential and Commercial	0	49	0	353	0	0	296	57	0	0	0	0	0	0	0	0	0	0	699	1,782	2,883
14.1.1	Commerce and Public Services	0	0	0	172	0	0	115	57	0	0	0	0	0	0	0	0	0	0	0	0	172
14.1.2	Residential	0	49	0	181	0	0	181	0	0	0	0	0	0	0	0	0	0	0	699	1,782	2,711
14.2	Non-Specified Others	0	0	0	1,389	0	197	640	19	241	292	6,375	0	0	0	0	0	61	0	553	1,878	10,256
15.	Non-Energy Use	139	480	0	450	4	0	31	4	0	411	0	0	0	0	0	0	0	0	0	0	1,069
16.	Electricity Output (GWh)	49,369	0	0	6,517	0	0	0	0	0	0	8,003	7,768	0	0	0	0	0	0	0	0	71,657
17.	Heat Output (TJ)	349,054	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	349,054

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.
Note: Figures may not add up to total because of rounding.
Source: IEA (2011b).

Table 3.5.4 Kazakhstan Energy Balance Table, 2007

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	43,006	0	68,255	0	0	0	0	0	0	0	18,732	703	0	0	0	0	94	0	0	0	130,790
2.	Imports	102	552	7,085	2,488	718	84	477	182	68	959	5,351	0	0	0	0	0	0	0	291	0	15,869
3.	Exports	–11,597	–44	–57,892	–3,964	–249	0	–1,761	–876	–1,065	–13	–6,517	0	0	0	0	0	0	0	–284	0	–80,298
4.	International Bunkers	0	0	0	–236	0	0	0	0	0	–236	0	0	0	0	0	0	0	0	0	0	–236
5.	Stock Changes	385	–4	128	128	63	0	52	9	12	–8	–661	0	0	0	0	0	0	0	0	0	–24
6.	Total Primary Energy Supply	31,896	504	17,576	–1,584	532	84	–1,232	–685	–985	702	16,905	703	0	0	0	0	94	0	7	0	66,101
7.	Transfers	0	0	–842	924	0	0	0	0	924	0	0	0	0	0	0	0	0	0	0	0	82
8.	Total Transformation Sector	–24,850	1,755	–12,753	10,491	2,767	181	4,459	1,724	463	897	–1,240	–703	0	0	0	0	0	0	6,588	9,339	–11,373
8.1	Power Generation	–20,972	0	–1,286	–745	0	0	0	–745	0	0	–1,240	–703	0	0	0	0	0	0	6,588	9,339	–9,019
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	–11,467	11,236	2,767	181	4,459	2,469	463	897	0	0	0	0	0	0	0	0	0	0	–231
8.4	Coal Transformation	–3,878	1,755	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–2,123
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	–3,355	0	–496	–387	–16	0	–33	–3	–3	–332	–7,333	0	0	0	0	0	0	0	–618	–1,020	–13,209
10.	Discrepancy	–1	26	–3,485	–93	0	0	–129	29	0	7	0	0	0	0	0	0	0	0	–1	0	–3,554
11.	Total Final Energy Consumption	3,690	2,285	0	9,351	3,283	265	3,065	1,065	399	1,274	8,332	0	0	0	0	0	94	0	5,976	8,319	38,047
12.	Industry Sector	3,570	1,762	0	2,314	0	0	1,351	963	0	0	0	0	0	0	0	0	0	0	4,254	4,068	15,968
13.	Transport Sector	0	0	0	4,116	3,278	0	709	14	0	115	0	0	0	0	0	0	0	0	370	100	4,586
14.	Other Sectors	0	0	0	2,173	0	265	988	79	399	442	8,332	0	0	0	0	0	94	0	1,352	4,151	16,102
14.1	Residential and Commercial	0	0	0	285	0	0	226	59	0	0	0	0	0	0	0	0	0	0	707	2,021	3,013
14.1.1	Commerce and Public Services	0	0	0	196	0	0	137	59	0	0	0	0	0	0	0	0	0	0	0	0	196
14.1.2	Residential	0	0	0	89	0	0	89	0	0	0	0	0	0	0	0	0	0	0	707	2,021	2,817
14.2	Non-Specified Others	0	0	0	1,888	0	265	762	20	399	442	8,332	0	0	0	0	0	94	0	645	2,130	13,089
15.	Non-Energy Use	120	523	0	748	5	0	17	9	0	717	0	0	0	0	0	0	0	0	0	0	1,391
16.	Electricity Output (GWh)	56,291	0	0	7,088	0	0	0	0	0	0	5,048	8,171	0	0	0	0	0	0	0	0	76,598
17.	Heat Output (TJ)	391,089	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	391,089

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Source: IEA (2011b).

Table 3.5.5 Kazakhstan Energy Balance Table, 2008

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	48,846	0	71,871	0	0	0	0	0	0	0	20,699	642	0	0	0	0	164	0	0	0	142,222
2.	Imports	80	461	3,203	2,460	1,091	59	612	132	26	540	5,197	0	0	0	0	0	0	0	238	0	11,639
3.	Exports	–14,523	–141	–60,774	–4,056	–163	–2	–1,651	–1,095	–1,140	–5	–5,230	0	0	0	0	0	0	0	–214	0	–84,938
4.	International Bunkers	0	0	0	–221	0	0	0	0	0	–221	0	0	0	0	0	0	0	0	0	0	–221
5.	Stock Changes	–13	–13	231	372	391	0	112	–123	–11	3	–33	0	0	0	0	0	0	0	0	0	544
6.	Total Primary Energy Supply	34,390	307	14,531	–1,445	1,319	57	–927	–1,086	–1,125	317	20,633	642	0	0	0	0	164	0	24	0	69,246
7.	Transfers	0	0	–895	982	0	0	0	0	982	0	0	0	0	0	0	0	0	0	0	0	87
8.	Total Transformation Sector	–26,034	1,612	–12,361	11,076	2,633	188	4,646	2,234	491	884	–1,820	–642	0	0	0	0	0	0	6,909	9,463	–11,797
8.1	Power Generation	–21,892	0	–120	–827	0	0	0	–827	0	0	–1,820	–642	0	0	0	0	0	0	6,909	9,463	–8,929
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	–12,241	11,903	2,633	188	4,646	3,061	491	884	0	0	0	0	0	0	0	0	0	0	–338
8.4	Coal Transformation	–4,142	1,613	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–2,529
8.5.	Other Transformation	0	–1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–1
9.	Loss and Own Use	–3,017	0	–1,277	–506	–27	0	–32	–7	–5	–435	–8,065	0	0	0	0	0	0	0	–612	–1,196	–14,673
10.	Discrepancy	–55	74	2	200	–1	–1	78	122	0	2	0	0	0	0	0	0	0	0	–1	0	220
11.	Total Final Energy Consumption	5,284	1,993	0	10,307	3,924	244	3,765	1,263	343	768	10,748	0	0	0	0	0	164	0	6,320	8,267	43,083
12.	Industry Sector	4,162	1,504	0	2,663	0	0	1,553	1,110	0	0	0	0	0	0	0	0	0	0	4,444	4,043	16,816
13.	Transport Sector	0	0	0	4,882	3,922	0	813	18	0	129	0	0	0	0	0	0	0	0	423	99	5,404
14.	Other Sectors	1,085	0	0	2,311	0	244	1,358	125	343	241	10,690	0	0	0	0	0	164	0	1,453	4,125	19,828
14.1	Residential and Commercial	1,085	0	0	642	0	0	371	93	178	0	909	0	0	0	0	0	0	0	716	2,009	5,361
14.1.1	Commerce and Public Services	0	0	0	271	0	0	178	93	0	0	0	0	0	0	0	0	0	0	0	0	271
14.1.2	Residential	1,085	0	0	371	0	0	193	0	178	0	909	0	0	0	0	0	0	0	716	2,009	5,090
14.2	Non-Specified Others	0	0	0	1,669	0	244	987	32	165	241	9,781	0	0	0	0	0	164	0	737	2,116	14,467
15.	Non-Energy Use	37	489	0	451	2	0	41	10	0	398	58	0	0	0	0	0	0	0	0	0	1,035
16.	Electricity Output (GWh)	62,154	0	0	3,304	0	0	0	0	0	0	7,409	7,460	0	0	0	0	0	0	0	0	80,327
17.	Heat Output (TJ)	396,322	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	396,322

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.
Note: Figures may not add up to total because of rounding.
Source: IEA (2011b).

Table 3.5.6 Kazakhstan Energy Balance Table, 2009

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	44,281	0	77,972	0	0	0	0	0	0	0	22,811	592	0	0	0	0	157	0	0	0	145,813
2.	Imports	78	401	6,059	1,702	930	33	256	16	10	457	1,807	0	0	0	0	0	0	0	147	0	10,194
3.	Exports	–13,200	–20	–65,422	–5,869	–162	–10	–1,802	–2,207	–1,544	–144	–5,548	0	0	0	0	0	0	0	–205	0	–90,264
4.	International Bunkers	0	0	0	–178	0	0	0	0	0	–178	0	0	0	0	0	0	0	0	0	0	–178
5.	Stock Changes	–25	40	45	84	–4	0	8	96	–2	–14	123	0	0	0	0	0	0	0	0	0	267
6.	Total Primary Energy Supply	31,134	421	18,654	–4,261	764	23	–1,538	–2,095	–1,536	121	19,193	592	0	0	0	0	157	0	–58	0	65,832
7.	Transfers	0	0	–1,156	1,269	0	0	0	0	1,269	0	0	0	0	0	0	0	0	0	0	0	113
8.	Total Transformation Sector	–23,919	1,531	–12,662	11,527	2,746	175	4,482	2,675	634	815	–2,539	–592	0	0	0	0	0	0	6,769	9,336	–10,549
8.1	Power Generation	–21,006	0	–288	–441	0	0	0	–441	0	0	–2,539	–592	0	0	0	0	0	0	6,769	9,336	–8,761
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	–12,374	11,968	2,746	175	4,482	3,116	634	815	0	0	0	0	0	0	0	0	0	0	–406
8.4	Coal Transformation	–2,913	1,531	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–1,382
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	–2,248	–26	–1,204	–412	–8	0	–75	0	–4	–325	–8,870	0	0	0	0	0	0	0	–555	–1,109	–14,424
10.	Discrepancy	28	37	–3,632	22	0	–1	6	21	–1	–3	–1	0	0	0	0	0	0	0	0	0	–3,546
11.	Total Final Energy Consumption	4,995	1,963	0	8,145	3,502	197	2,875	601	362	608	7,783	0	0	0	0	0	157	0	6,156	8,227	37,426
12.	Industry Sector	3,896	1,572	0	1,749	0	0	1,218	531	0	0	0	0	0	0	0	0	0	0	4,254	3,921	15,392
13.	Transport Sector	0	0	0	4,206	3,469	0	638	9	0	90	0	0	0	0	0	0	0	0	416	101	4,723
14.	Other Sectors	1,064	0	0	1,767	0	197	1,008	52	362	148	7,681	0	0	0	0	0	157	0	1,486	4,205	16,360
14.1	Residential and Commercial	1,064	0	0	498	0	0	279	39	180	0	921	0	0	0	0	0	0	0	725	2,048	5,256
14.1.1	Commerce and Public Services	0	0	0	170	0	0	131	39	0	0	0	0	0	0	0	0	0	0	0	0	170
14.1.2	Residential	1,064	0	0	328	0	0	148	0	180	0	921	0	0	0	0	0	0	0	725	2,048	5,086
14.2	Non-Specified Others	0	0	0	1,269	0	197	729	13	182	148	6,760	0	0	0	0	0	157	0	761	2,157	11,104
15.	Non-Energy Use	35	391	0	423	33	0	11	9	0	370	102	0	0	0	0	0	0	0	0	0	951
16.	Electricity Output (GWh)	58,949	0	0	2,546	0	0	0	0	0	0	10,336	6,879	0	0	0	0	0	0	0	0	78,710
17.	Heat Output (TJ)	390,963	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	390,963

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Source: IEA (2011b).

Table 3.5.7 Kazakhstan Summary Table, 1990–2009

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Indigenous Production (ktoe)																				
Coal	–	–	–	–	45,981	37,147	34,270	32,009	31,271	26,371	34,129	34,859	32,559	37,370	38,245	38,284	42,463	43,006	48,846	44,281
Oil	–	–	–	–	20,374	20,734	23,067	25,897	26,066	30,266	35,439	40,739	48,074	52,327	60,495	62,503	66,574	68,255	71,871	77,972
Gas	–	–	–	–	3,636	4,793	5,286	6,574	6,439	8,341	7,620	6,943	8,940	10,517	14,005	15,824	16,717	18,732	20,699	22,811
Hydro	–	–	–	–	789	716	630	559	528	527	648	695	765	742	693	676	668	703	642	592
Nuclear	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Geothermal	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Solar	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wind	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Biomass	–	–	–	–	76	79	74	74	73	73	73	87	101	80	44	78	61	94	164	157
Others	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	–	–	–	–	70,856	63,469	63,327	65,113	64,377	65,578	77,909	83,323	90,439	101,036	113,482	117,365	126,483	130,790	142,222	145,813
Primary Energy Supply (ktoe)																				
Coal	–	–	–	–	35,011	28,920	25,850	21,711	21,823	20,474	19,763	21,219	21,783	23,651	27,847	28,492	30,542	32,400	34,697	31,555
Oil	–	–	–	–	12,779	11,517	10,217	9,507	9,409	7,249	8,262	7,268	9,954	10,061	12,344	9,046	15,126	15,992	13,086	14,393
Gas	–	–	–	–	8,122	10,108	7,841	7,038	7,043	7,232	6,572	5,038	6,986	8,529	9,735	12,457	14,983	16,905	20,633	19,193
Hydro	–	–	–	–	789	716	630	559	528	527	648	695	765	742	693	676	668	703	642	592
Nuclear	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Geothermal	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Solar	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wind	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Biomass	–	–	–	–	76	79	74	74	73	73	73	87	101	80	44	78	61	94	164	157
Others	–	–	–	–	1,121	636	567	405	328	258	260	154	34	–126	–187	–11	19	7	24	–58
Total	–	–	–	–	57,898	51,976	45,179	39,294	39,204	35,813	35,578	34,461	39,623	42,937	50,476	50,738	61,399	66,101	69,246	65,832
Final Energy Consumption by Sector (ktoe)																				
Industry	–	–	–	–	17,886	17,483	14,518	12,795	12,074	10,056	10,047	11,996	10,776	12,545	14,594	17,593	14,785	15,968	16,816	15,392
Transport	–	–	–	–	3,461	3,438	3,098	2,666	2,973	2,257	3,386	3,002	3,333	3,181	3,390	3,637	4,012	4,586	5,404	4,723
Residential	–	–	–	–	721	583	522	468	465	471	1,994	2,133	2,374	2,672	2,590	2,792	2,711	2,817	5,090	5,086
Commercial	–	–	–	–	86	95	59	60	67	54	137	130	139	154	132	156	172	196	271	170
Others	–	–	–	–	19,506	18,735	16,579	13,597	14,633	14,086	6,643	4,823	5,233	6,624	6,952	8,541	11,325	14,480	15,502	12,055
Total	–	–	–	–	41,660	40,334	34,776	29,586	30,212	26,924	22,207	22,084	21,855	25,176	27,658	32,719	33,005	38,047	43,083	37,426

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Table 3.5.7 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Final Energy Consumption by Type (ktoe)																				
Coal	–	–	–	–	11,748	11,682	10,115	8,657	8,185	6,919	4,453	6,025	4,149	5,237	6,830	8,009	5,069	5,975	7,277	6,958
Oil	–	–	–	–	9,399	8,732	7,479	6,669	7,665	5,908	6,377	5,933	6,336	6,871	7,256	7,791	8,555	9,351	10,307	8,145
Gas	–	–	–	–	5,719	7,117	5,520	4,529	4,491	4,550	2,674	823	969	1,965	2,183	3,670	6,375	8,332	10,748	7,783
Electricity	–	–	–	–	4,955	4,438	3,932	3,343	3,110	3,143	3,027	3,347	3,394	3,608	3,719	5,227	5,610	5,976	6,320	6,156
Heat	–	–	–	–	9,763	8,286	7,656	6,314	6,688	6,331	5,603	5,869	6,906	7,415	7,626	7,944	7,335	8,319	8,267	8,227
Biomass	–	–	–	–	76	79	74	74	73	73	73	87	101	80	44	78	61	94	164	157
Others	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	–	–	–	–	41,660	40,334	34,776	29,586	30,212	26,924	22,207	22,084	21,855	25,176	27,658	32,719	33,005	38,047	43,083	37,426
Power Generation (GWh)																				
Thermal	–	–	–	–	57,218	58,330	51,707	45,501	43,004	41,366	43,793	48,776	49,452	55,241	58,888	59,991	63,889	68,427	72,867	71,831
Hydro	–	–	–	–	9,179	8,331	7,331	6,499	6,141	6,132	7,531	8,081	8,890	8,625	8,057	7,856	7,768	8,171	7,460	6,879
Nuclear	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Geothermal	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Solar	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wind	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Others	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	–	–	–	–	66,397	66,661	59,038	52,000	49,145	47,498	51,324	56,857	58,342	63,866	66,945	67,847	71,657	76,598	80,327	78,710
Loss and Own Use of Electricity (GWh)																				
Transmission and Distribution Losses	–	–	–	–	9,558	10,140	8,977	8,035	8,512	8,116	7,163	6,477	5,860	6,209	6,837	6,942	6,651	7,186	7,116	6,453
Own Use	–	–	–	–	8,465	9,070	8,023	7,198	5,977	4,209	8,640	9,558	9,651	10,256	10,581	–	–	–	–	–
Total	–	–	–	–	18,023	19,209	17,000	15,233	14,488	12,326	15,802	16,035	15,512	16,465	17,419	6,942	6,651	7,186	7,116	6,453
Fuel Input for Power Generation (ktoe)																				
Coal	–	–	–	–	10,730	6,390	5,666	4,466	4,566	4,660	6,151	4,790	6,462	7,262	7,461	6,616	11,643	9,296	10,060	9,334
Oil	–	–	–	–	2,086	1,566	1,523	1,174	951	648	765	689	880	744	338	753	1,868	2,031	947	729
Gas	–	–	–	–	1,048	1,304	1,012	1,074	1,058	942	2,365	2,539	2,320	2,277	1,841	2,415	1,966	1,240	1,820	2,539
Total	–	–	–	–	13,864	9,260	8,201	6,714	6,575	6,250	9,281	8,018	9,662	10,283	9,640	9,784	15,477	12,567	12,827	12,602
CO_2 Emissions (kt C)																				
Coal	–	–	–	–	37,774	31,061	27,704	23,069	23,162	21,571	19,927	20,878	22,176	24,990	27,713	28,654	29,743	32,290	34,490	32,523
Oil	–	–	–	–	10,026	8,913	7,647	6,766	7,388	5,651	6,440	6,208	6,593	7,113	6,919	7,527	9,509	9,612	10,457	8,315
Gas	–	–	–	–	5,203	6,475	5,022	4,301	4,305	4,306	4,211	3,227	4,475	5,464	6,235	7,980	9,597	10,829	13,180	12,229
Total	–	–	–	–	53,003	46,449	40,373	34,137	34,855	31,528	30,577	30,313	33,244	37,567	40,868	44,161	48,849	52,731	58,127	53,067

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Table 3.5.7 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Macroeconomic Indicators																				
Population (thousand)	16,348	16,451	16,439	16,330	16,095	15,816	15,578	15,334	15,071	14,928	14,884	14,858	14,859	14,909	15,013	15,147	15,308	15,484	15,674	15,925
Urban Population, %	56.3	56.2	56.1	56.1	56.0	55.9	56.0	56.1	56.1	56.2	56.3	56.5	56.6	56.8	56.9	57.1	57.4	57.7	57.9	58.2
GDP (constant 2000 $ million)	26,348	23,450	22,207	20,164	17,623	16,178	16,259	16,536	16,221	16,659	18,292	20,761	22,796	24,916	27,308	29,957	33,162	36,114	37,305	37,753
GDP (current $ million)	26,933	24,881	24,907	23,409	21,251	20,374	21,035	22,166	22,135	16,871	18,292	22,153	24,637	30,834	43,152	57,124	81,004	104,853	133,442	115,306
GDP (constant 2005 PPP $ million)	115,893	103,145	97,678	88,692	77,517	71,160	71,516	72,732	71,350	73,276	80,457	91,319	100,268	109,593	120,114	131,765	145,864	158,846	164,088	166,057
GDP/capita (constant 2000 $)	1,612	1,425	1,351	1,235	1,095	1,023	1,044	1,078	1,076	1,116	1,229	1,397	1,534	1,671	1,819	1,978	2,166	2,332	2,380	2,371
GDP/capita (current $)	1,647	1,512	1,515	1,433	1,320	1,288	1,350	1,446	1,469	1,130	1,229	1,491	1,658	2,068	2,874	3,771	5,292	6,772	8,514	7,241
GDP – Manufacturing (% of GDP)	13.2	15.8	15.0	16.8	15.1	15.5	15.5	16.2	16.0	15.9	16.5	16.5	16.2	16.0	16.1	15.7	15.3	15.1	14.2	13 .6
Car Ownership (car/1,000 persons)	–	–	–	–	–	–	–	–	–	–	–	67	91	96	99	116	139	144	149	147
Basic Energy Indicators																				
TPES/capita (toe/person)	–	–	–	–	3.60	3.29	2.90	2.56	2.60	2.40	2.39	2.32	2.67	2.88	3.36	3.35	4.01	4.27	4.42	4.13
TFEC/capita (toe/person)	–	–	–	–	2.59	2.55	2.23	1.93	2.00	1.80	1.49	1.49	1.47	1.69	1.84	2.16	2.16	2.46	2.75	2.35
TPES/GDP (toe/constant 2000 $ million)	–	–	–	–	3,285	3,213	2,779	2,376	2,417	2,150	1,945	1,660	1,738	1,723	1,848	1,694	1,851	1,830	1,856	1,744
TFEC/GDP (toe/constant 2000 $ million)	–	–	–	–	2,364	2,493	2,139	1,789	1,862	1,616	1,214	1,064	959	1,010	1,013	1,092	995	1,054	1,155	991
Import Dependency (%)	–	–	–	–	–22.4	–22.1	–40.2	–65.7	–64.2	–83.1	–119.0	–141.8	–128.2	–135.3	–124.8	–131.3	–106.0	–97.9	–105.4	–121.5
Oil Import Dependency (%)	–	–	–	–	–59.4	–80.0	–125.8	–172.4	–177.0	–317.5	–328.9	–460.5	–383.0	–420.1	–390.1	–590.9	–340.1	–326.8	–449.2	–441.7
Electricity/capita (kWh/person)	–	–	–	–	3,580	3,263	2,936	2,536	2,400	2,449	2,365	2,620	2,656	2,814	2,881	4,013	4,262	4,489	4,689	4,496
CO_2 Intensity (t C/constant 2000 $ million)	–	–	–	–	3,008	2,871	2,483	2,064	2,149	1,893	1,672	1,460	1,458	1,508	1,497	1,474	1,473	1,460	1,558	1,406
CO_2/capita (t C)	–	–	–	–	3.29	2.94	2.59	2.23	2.31	2.11	2.05	2.04	2.24	2.52	2.72	2.92	3.19	3.41	3.71	3.33
CO_2/TPES (t C/toe)	–	–	–	–	0.92	0.89	0.89	0.87	0.89	0.88	0.86	0.88	0.84	0.87	0.81	0.87	0.80	0.80	0.84	0.81

– = no data or not applicable, CO_2 = carbon dioxide, GDP = gross domestic product, GWh = gigawatt–hour, kt C = thousand tons of carbon equivalent, ktoe = thousand tons of oil equivalent, kWh = kilowatt–hour, PPP = purchasing power parity, t C = ton of carbon equivalent, TFEC = total final energy consumption, toe = ton of oil equivalent, TPES = total primary energy supply.

Note: Figures may not add up to total because of rounding.

Sources: APERC estimates, IEA (2011b), JAMA (2012), and World Bank.

3.6 Kyrgyz Republic

Country Profile (2009)		Energy Reserves (year-end 2008)	
Total Surface Area (square kilometer)	199,940	Coal (million ton) - Recoverable	812.0
Population (thousand)	5,321	Gas (trillion cubic feet) - Proven	0.2
GDP (constant 2000 $ billion)	2.1	Oil (billion barrel) - Proven	40.0
Electrification Rate (%)	100.0		

GDP = gross domestic product.

Sources: ADB (2012), ADB estimates, World Bank, and WEC (2010).

2009 Energy Supply and Demand Flow (ktoe)

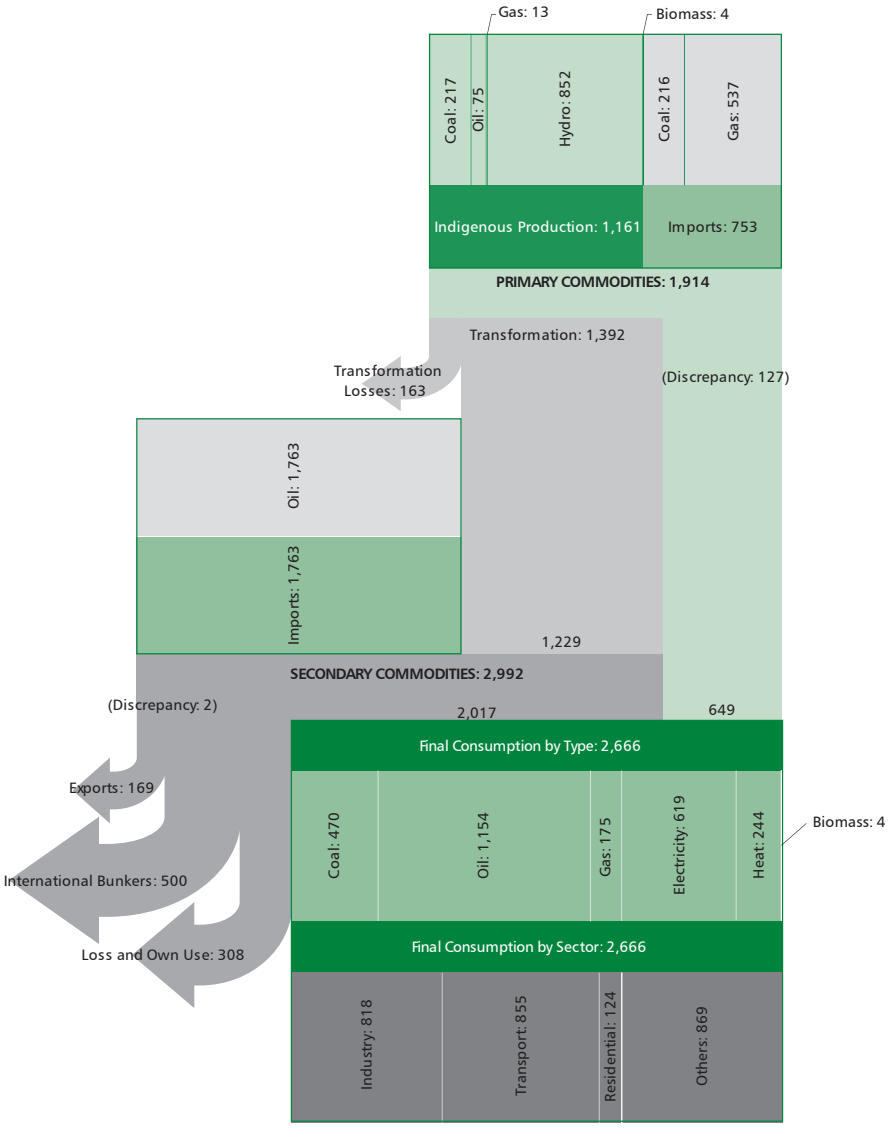


Table 3.6.1 Key Data and Economic Profile

	1990	1995	2000	2005	2009
Socioeconomic Data					
Population (thousand)	4,423	4,590	4,915	5,144	5,321
GDP (constant 2000 $ billion)	2.1	1.0	1.4	1.6	2.1
GDP (constant 2005 PPP $ billion)	11.1	5.6	7.4	8.9	11.1
GDP/capita (constant 2000 $)	465	227	279	321	387
GDP/capita (constant 2005 PPP $)	2,505	1,224	1,501	1,728	2,084

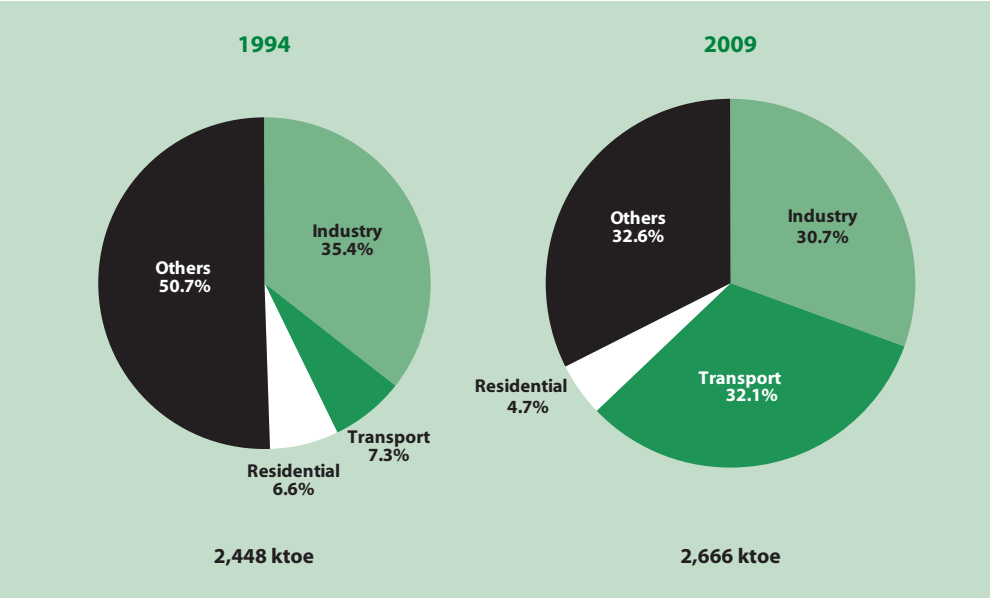
GDP = gross domestic product, PPP = purchasing power parity.
Source: World Bank.

Table 3.6.2 Energy Supply and Demand

	1990	1995	2000	2005	2009
Primary Energy Supply (ktoe)					
Indigenous Production	–	1,258	1,443	1,447	1,161
Net Imports	–	1,126	959	1,212	1,847
Total PES	–	2,384	2,402	2,659	3,008
Coal	–	324	486	553	433
Oil	–	477	404	490	1,197
Gas	–	740	574	617	550
Biomass	–	4	4	4	4
Others	–	839	934	995	824
TPES/capita (toe)	–	0.52	0.49	0.52	0.57
TPES/GDP (toe/constant 2005 PPP $ million)	–	424	325	299	271
Final Energy Consumption (ktoe)					
Industry	–	464	462	672	818
Transportation	–	388	294	411	855
Other Sectors	–	928	1,050	1,020	993
Total FEC	–	1,780	1,806	2,103	2,666
Coal	–	134	223	397	470
Oil	–	477	399	492	1,154
Gas	–	124	163	231	175
Electricity	–	789	780	804	619
Biomass	–	4	4	4	4
Others	–	252	237	175	244

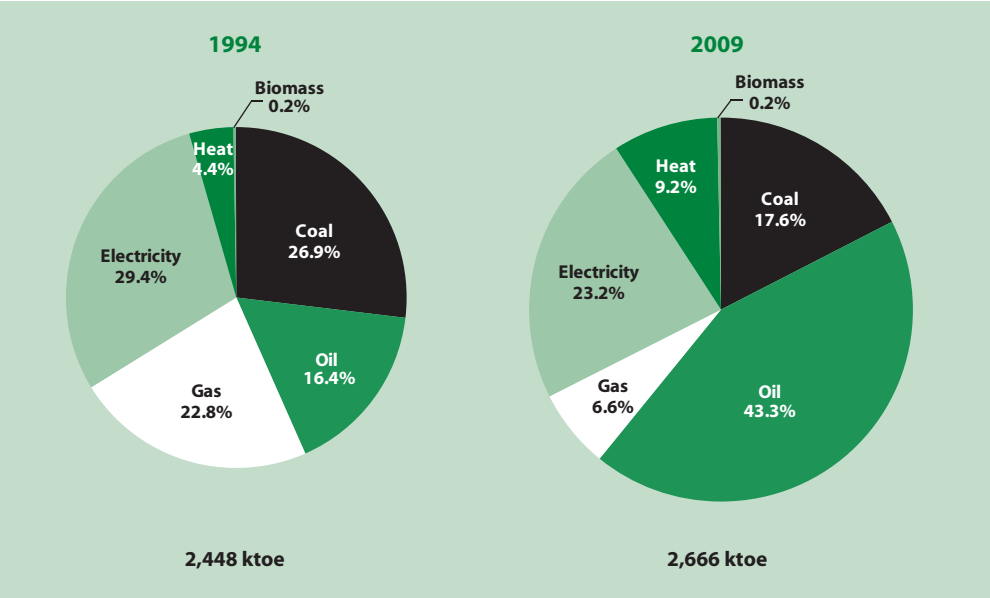
– = no data or not applicable, FEC = final energy consumption, GDP = gross domestic product, ktoe = thousand tons of oil equivalent, PES = primary energy supply, PPP = purchasing power parity, toe = ton of oil equivalent, TPES = total primary energy supply.
Source: IEA (2011b).

Figure 3.6.1 Final Energy Consumption by Sector, 1994 and 2009



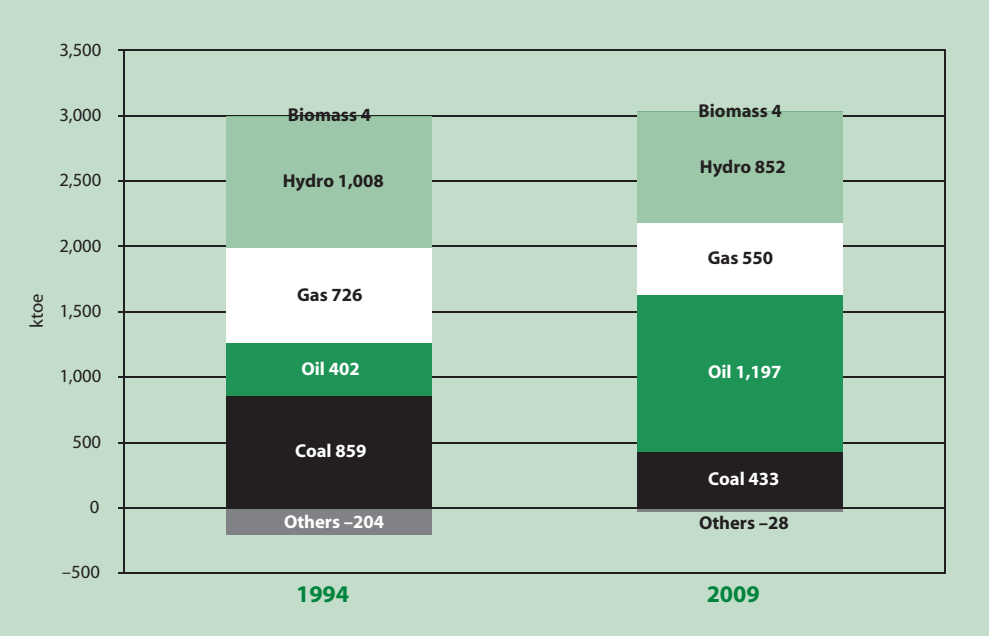
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 3.6.2 Final Energy Consumption by Type of Energy, 1994 and 2009



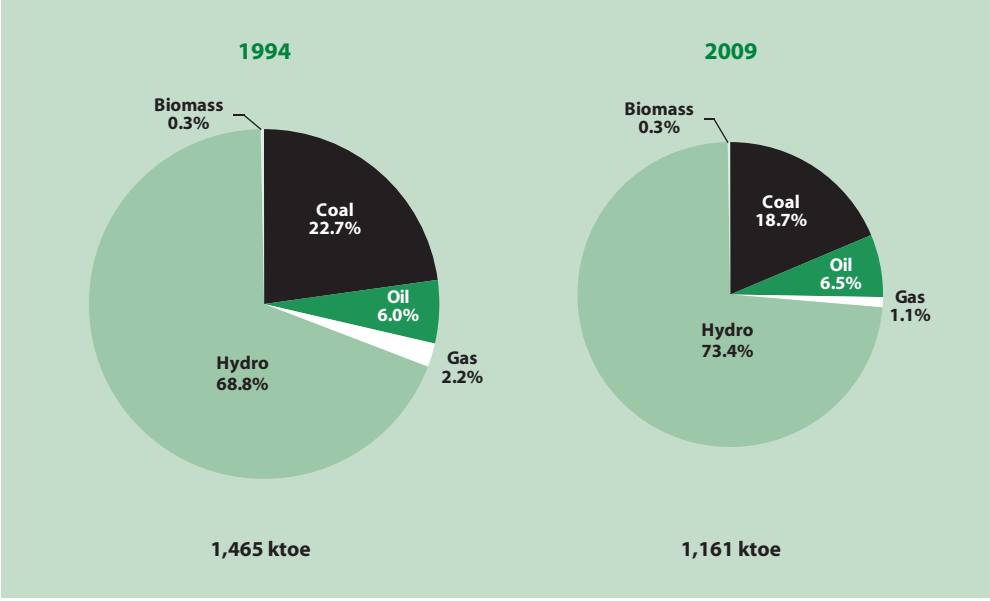
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 3.6.3 Total Primary Energy Supply, 1994 and 2009



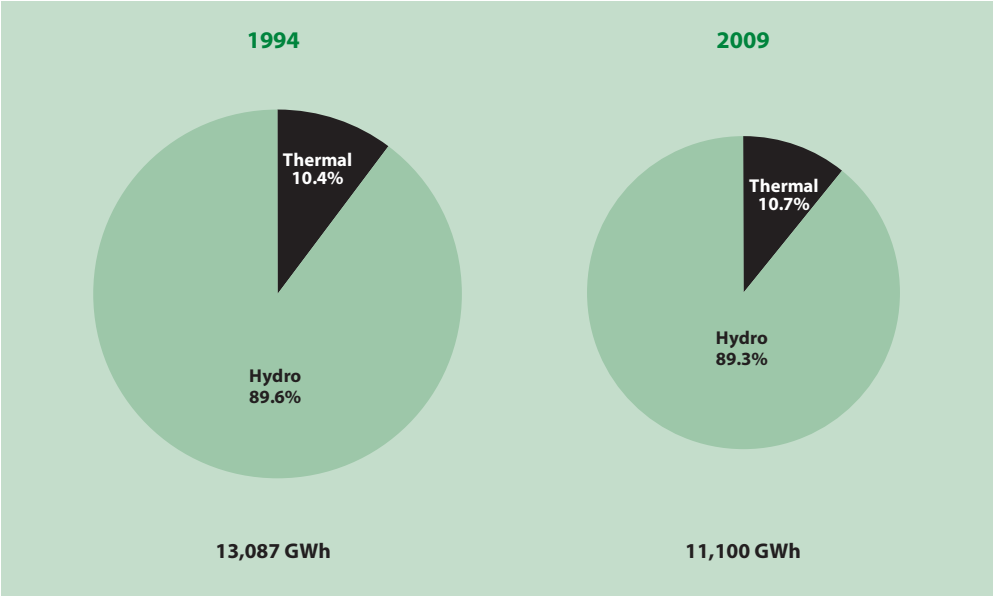
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 3.6.4 Indigenous Energy Production, 1994 and 2009



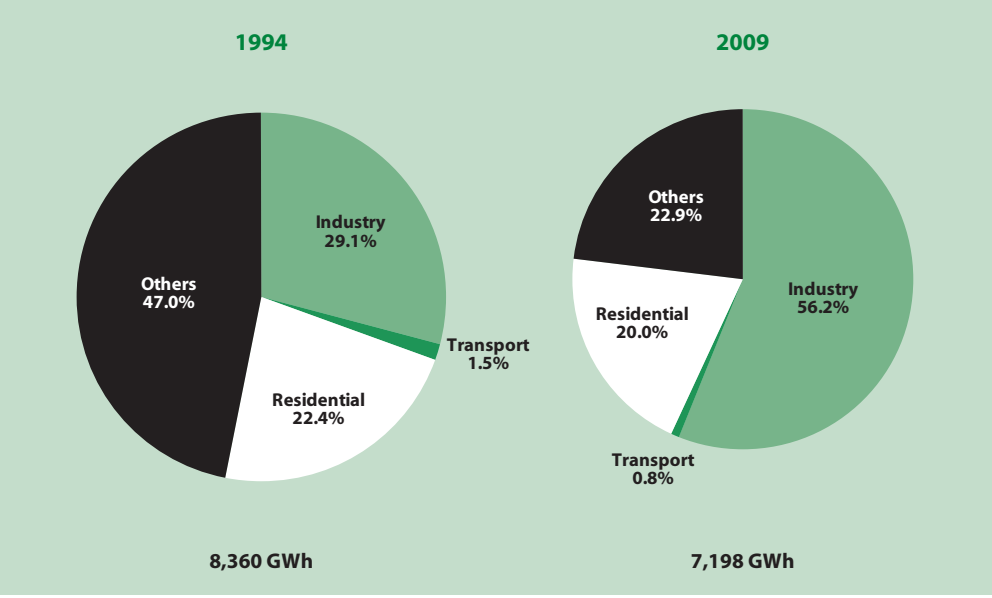
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 3.6.5 Electricity Generation by Plant Type, 1994 and 2009



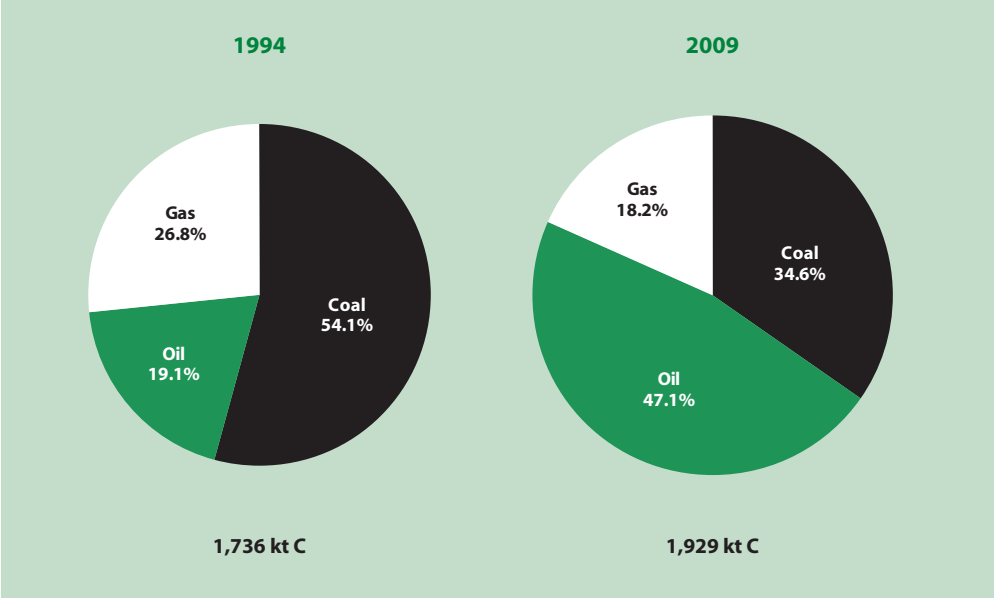
GWh = gigawatt-hour.
Source: IEA (2011b).

Figure 3.6.6 Electricity Consumption by Sector, 1994 and 2009



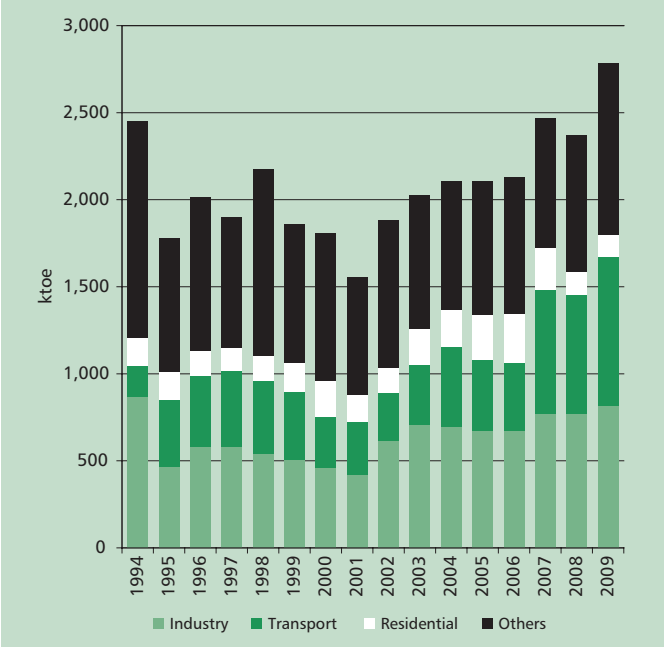
GWh = gigawatt-hour.
Source: IEA (2011b).

Figure 3.6.7 Carbon Dioxide Emissions from Fuel Combustion, 1994 and 2009



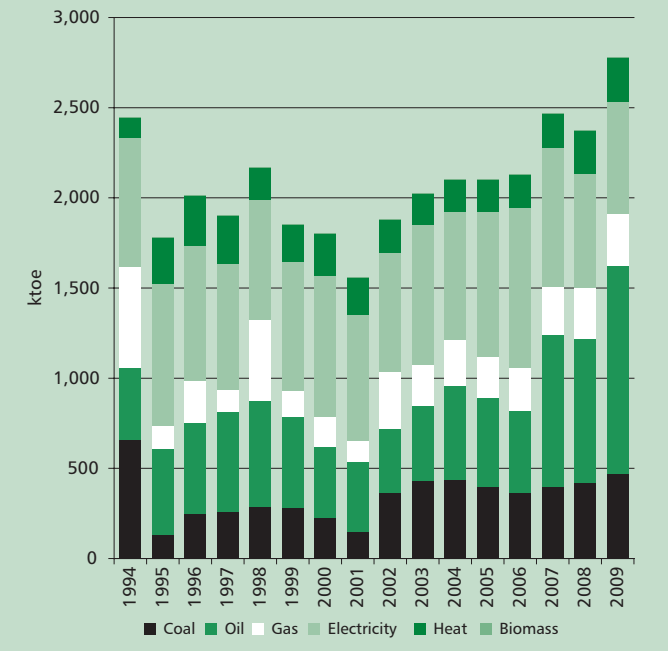
kt C = thousand tons of carbon equivalent.
Source: APERC estimates.

Figure 3.6.8 Final Energy Consumption by Sector, 1994–2009



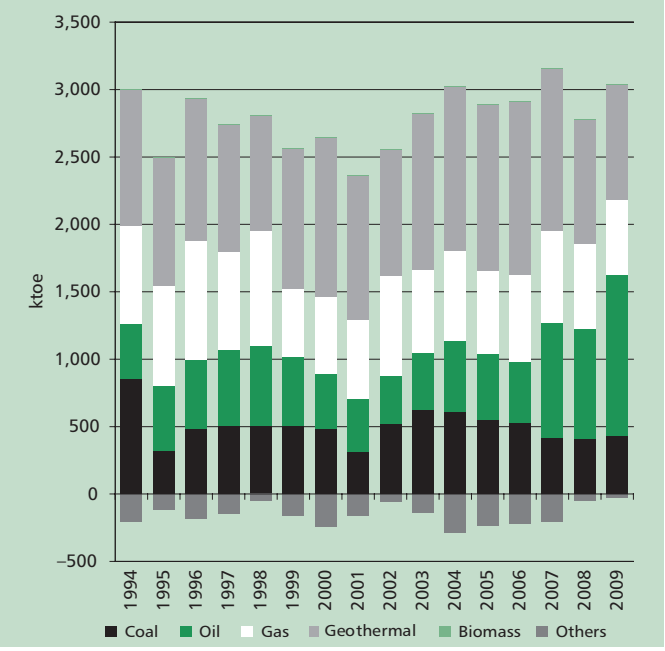
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 3.6.9 Final Energy Consumption by Type, 1994–2009



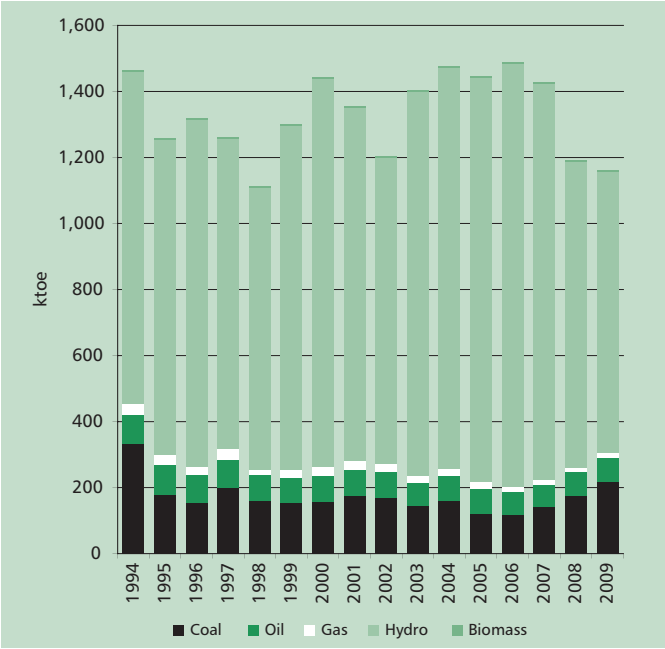
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 3.6.10 Total Primary Energy Supply, 1994–2009



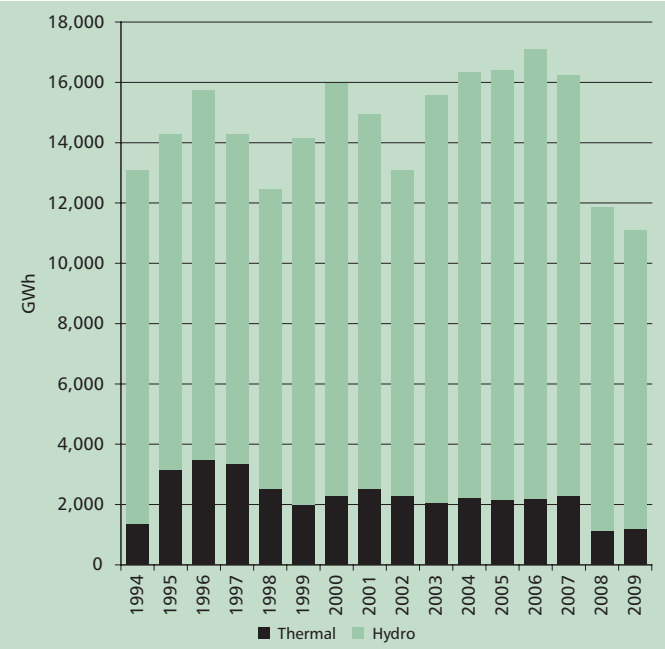
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 3.6.11 Indigenous Energy Production, 1994–2009



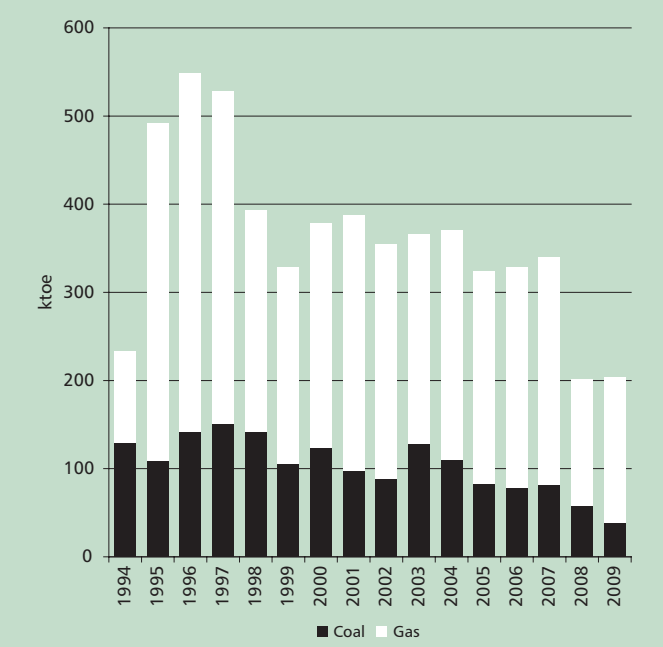
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 3.6.12 Electricity Generation by Source, 1994–2009



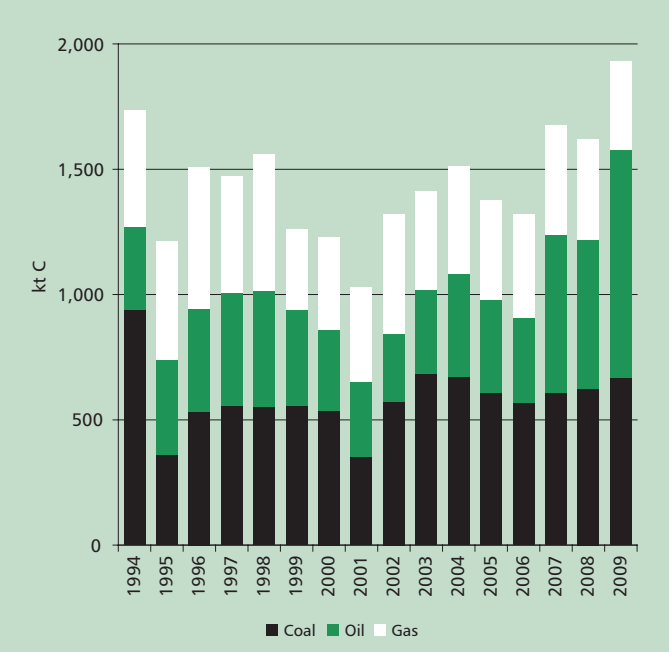
GWh = gigawatt-hour.
Source: IEA (2011b).

Figure 3.6.13 Fuel Input for Electricity Generation, 1994–2009



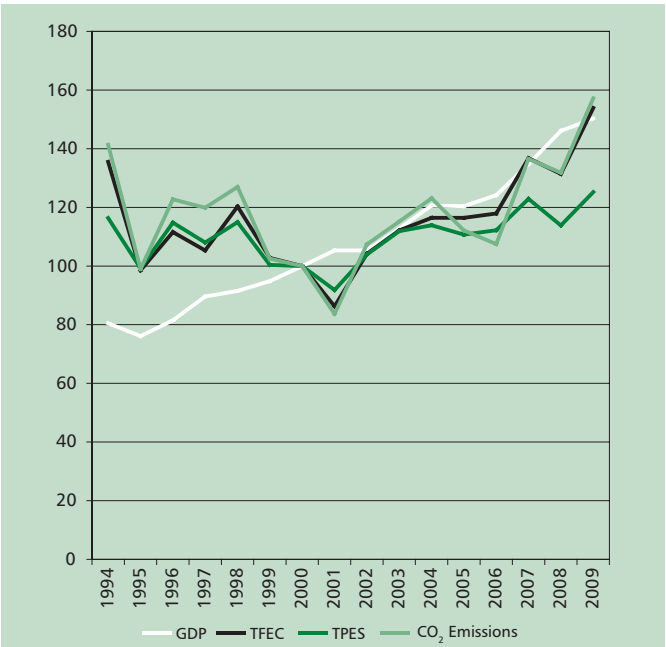
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 3.6.14 Carbon Dioxide Emissions from Fuel Combustion, 1994–2009



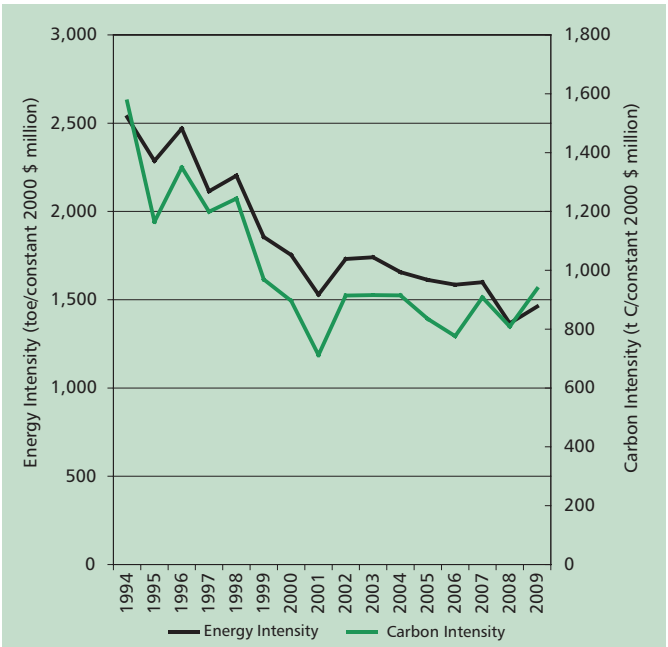
kt C = thousand tons of carbon equivalent.
Source: APERC estimates.

Figure 3.6.15 Growth of GDP, TFEC, TPES, and CO_2 Emissions (indexed to year 2000), 1994–2009



CO_2 = carbon dioxide, GDP = gross domestic product, TFEC = total final energy consumption, TPES = total primary energy supply.
Note: Indices are measured relative to the base year 2000 (2000 = 100).
Source: APERC estimates.

Figure 3.6.16 Energy and Carbon Intensities, 1994–2009



t C = ton of carbon equivalent, toe = ton of oil equivalent.
Source: APERC estimates.

Table 3.6.3 Kyrgyz Republic Energy Balance Table, 2006

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	117	0	71	0	0	0	0	0	0	0	16	1,280	0	0	0	0	4	0	0	0	1,488
2.	Imports	412	0	0	789	231	0	100	16	0	442	629	0	0	0	0	0	0	0	0	0	1,830
3.	Exports	0	0	0	–89	0	0	0	0	0	–89	0	0	0	0	0	0	0	0	–217	0	–306
4.	International Bunkers	0	0	0	–317	0	0	0	0	0	–317	0	0	0	0	0	0	0	0	0	0	–317
5.	Stock Changes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6.	Total Primary Energy Supply	529	0	71	383	231	0	100	16	0	36	645	1,280	0	0	0	0	4	0	–217	0	2,695
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	–147	0	–71	69	11	0	32	26	0	0	–404	–1,280	0	0	0	0	0	0	1,469	178	–186
8.1	Power Generation	–147	0	0	0	0	0	0	0	0	0	–404	–1,280	0	0	0	0	0	0	1,469	178	–184
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	–71	69	11	0	32	26	0	0	0	0	0	0	0	0	0	0	0	0	–2
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–362	0	–362
10.	Discrepancy	–14	0	0	–2	0	0	–1	0	0	–1	–1	0	0	0	0	0	0	0	0	0	–17
11.	Total Final Energy Consumption	368	0	0	450	242	0	131	42	0	35	240	0	0	0	0	0	4	0	890	178	2,130
12.	Industry Sector	368	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	306	0	674
13.	Transport Sector	0	0	0	373	242	0	131	0	0	0	6	0	0	0	0	0	0	0	10	0	389
14.	Other Sectors	0	0	0	42	0	0	0	42	0	0	234	0	0	0	0	0	4	0	574	178	1,032
14.1	Residential and Commercial	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	280	0	280
14.1.1	Commerce and Public Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14.1.2	Residential	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	280	0	280
14.2	Non-Specified Others	0	0	0	42	0	0	0	42	0	0	234	0	0	0	0	0	4	0	294	178	752
15.	Non-Energy Use	0	0	0	35	0	0	0	0	0	35	0	0	0	0	0	0	0	0	0	0	35
16.	Electricity Output (GWh)	563	0	0	0	0	0	0	0	0	0	1,632	14,887	0	0	0	0	0	0	0	0	17,082
17.	Heat Output (TJ)	2,303	0	0	0	0	0	0	0	0	0	5,150	0	0	0	0	0	0	0	0	0	7,453

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.
Note: Figures may not add up to total because of rounding.
Source: IEA (2011b).

Table 3.6.4 Kyrgyz Republic Energy Balance Table, 2007

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	141	0	69	0	0	0	0	0	0	0	13	1,200	0	0	0	0	4	0	0	0	1,427
2.	Imports	279	0	58	1,259	457	0	294	15	0	493	669	0	0	0	0	0	0	0	0	0	2,265
3.	Exports	0	0	0	–207	0	0	–115	0	0	–92	0	0	0	0	0	0	0	0	–205	0	–412
4.	International Bunkers	0	0	0	–328	0	0	0	0	0	–328	0	0	0	0	0	0	0	0	0	0	–328
5.	Stock Changes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6.	Total Primary Energy Supply	420	0	127	724	457	0	179	15	0	73	682	1,200	0	0	0	0	4	0	–205	0	2,952
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	–154	0	–128	122	15	0	53	54	0	0	–421	–1,200	0	0	0	0	0	0	1,397	188	–196
8.1	Power Generation	–154	0	0	0	0	0	0	0	0	0	–421	–1,200	0	0	0	0	0	0	1,397	188	–190
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	–128	122	15	0	53	54	0	0	0	0	0	0	0	0	0	0	0	0	–6
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–417	0	–417
10.	Discrepancy	132	0	1	0	0	0	0	0	0	0	–1	0	0	0	0	0	0	0	–1	0	131
11.	Total Final Energy Consumption	398	0	0	846	472	0	232	69	0	73	260	0	0	0	0	0	4	0	774	188	2,470
12.	Industry Sector	398	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	369	0	767
13.	Transport Sector	0	0	0	704	472	0	232	0	0	0	6	0	0	0	0	0	0	0	6	0	716
14.	Other Sectors	0	0	0	69	0	0	0	69	0	0	254	0	0	0	0	0	4	0	399	188	914
14.1	Residential and Commercial	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	241	0	241
14.1.1	Commerce and Public Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14.1.2	Residential	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	241	0	241
14.2	Non-Specified Others	0	0	0	69	0	0	0	69	0	0	254	0	0	0	0	0	4	0	158	188	673
15.	Non-Energy Use	0	0	0	73	0	0	0	0	0	73	0	0	0	0	0	0	0	0	0	0	73
16.	Electricity Output (GWh)	587	0	0	0	0	0	0	0	0	0	1,702	13,948	0	0	0	0	0	0	0	0	16,237
17.	Heat Output (TJ)	2,428	0	0	0	0	0	0	0	0	0	5,443	0	0	0	0	0	0	0	0	0	7,871

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Source: IEA (2011b).

Table 3.6.5 Kyrgyz Republic Energy Balance Table, 2008

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	177	0	71	0	0	0	0	0	0	0	14	924	0	0	0	0	4	0	0	0	1,190
2.	Imports	248	0	127	1,361	535	0	197	40	0	589	610	0	0	0	0	0	0	0	1	0	2,347
3.	Exports	–14	0	–53	–283	–57	0	–77	–35	0	–114	0	0	0	0	0	0	0	0	–47	0	–397
4.	International Bunkers	0	0	0	–405	0	0	0	0	0	–405	0	0	0	0	0	0	0	0	0	0	–405
5.	Stock Changes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6.	Total Primary Energy Supply	411	0	145	673	478	0	120	5	0	70	624	924	0	0	0	0	4	0	–46	0	2,735
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	–148	0	–138	131	14	0	61	56	0	0	–344	–924	0	0	0	0	0	0	1,022	233	–168
8.1	Power Generation	–148	0	0	0	0	0	0	0	0	0	–344	–924	0	0	0	0	0	0	1,022	233	–161
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	–138	131	14	0	61	56	0	0	0	0	0	0	0	0	0	0	0	0	–7
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–340	0	–340
10.	Discrepancy	154	0	–7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–1	0	146
11.	Total Final Energy Consumption	417	0	0	804	492	0	181	61	0	70	280	0	0	0	0	0	4	0	635	233	2,373
12.	Industry Sector	417	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	353	0	770
13.	Transport Sector	0	0	0	673	492	0	181	0	0	0	6	0	0	0	0	0	0	0	5	0	684
14.	Other Sectors	0	0	0	61	0	0	0	61	0	0	274	0	0	0	0	0	4	0	277	233	849
14.1	Residential and Commercial	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	133	0	133
14.1.1	Commerce and Public Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14.1.2	Residential	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	133	0	133
14.2	Non-Specified Others	0	0	0	61	0	0	0	61	0	0	274	0	0	0	0	0	4	0	144	233	716
15.	Non-Energy Use	0	0	0	70	0	0	0	0	0	70	0	0	0	0	0	0	0	0	0	0	70
16.	Electricity Output (GWh)	292	0	0	0	0	0	0	0	0	0	845	10,740	0	0	0	0	0	0	0	0	11,877
17.	Heat Output (TJ)	3,014	0	0	0	0	0	0	0	0	0	6,699	0	0	0	0	0	0	0	0	0	9,713

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.
Note: Figures may not add up to total because of rounding.
Source: IEA (2011b).

Table 3.6.6 Kyrgyz Republic Energy Balance Table, 2009

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	217	0	75	0	0	0	0	0	0	0	13	852	0	0	0	0	4	0	0	0	1,161
2.	Imports	216	0	0	1,763	273	0	549	229	0	712	537	0	0	0	0	0	0	0	0	0	2,516
3.	Exports	0	0	0	–141	0	0	0	0	0	–141	0	0	0	0	0	0	0	0	–28	0	–169
4.	International Bunkers	0	0	0	–500	0	0	0	0	0	–500	0	0	0	0	0	0	0	0	0	0	–500
5.	Stock Changes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6.	Total Primary Energy Supply	433	0	75	1,122	273	0	549	229	0	71	550	852	0	0	0	0	4	0	–28	0	3,008
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	–134	0	–31	31	11	0	10	10	0	0	–375	–852	0	0	0	0	0	0	954	244	–163
8.1	Power Generation	–134	0	0	0	0	0	0	0	0	0	–375	–852	0	0	0	0	0	0	954	244	–163
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	–31	31	11	0	10	10	0	0	0	0	0	0	0	0	0	0	0	0	0
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–308	0	–308
10.	Discrepancy	171	0	–44	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	129
11.	Total Final Energy Consumption	470	0	0	1,154	284	0	560	239	0	71	175	0	0	0	0	0	4	0	619	244	2,666
12.	Industry Sector	470	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	348	0	818
13.	Transport Sector	0	0	0	844	284	0	560	0	0	0	6	0	0	0	0	0	0	0	5	0	855
14.	Other Sectors	0	0	0	239	0	0	0	239	0	0	169	0	0	0	0	0	4	0	266	244	922
14.1	Residential and Commercial	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	124	0	124
14.1.1	Commerce and Public Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14.1.2	Residential	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	124	0	124
14.2	Non-Specified Others	0	0	0	239	0	0	0	239	0	0	169	0	0	0	0	0	4	0	142	244	798
15.	Non-Energy Use	0	0	0	71	0	0	0	0	0	71	0	0	0	0	0	0	0	0	0	0	71
16.	Electricity Output (GWh)	306	0	0	0	0	0	0	0	0	0	884	9,910	0	0	0	0	0	0	0	0	11,100
17.	Heat Output (TJ)	3,182	0	0	0	0	0	0	0	0	0	7,034	0	0	0	0	0	0	0	0	0	10,216

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Source: IEA (2011b).

Table 3.6.7 Kyrgyz Republic Summary Table, 1990–2009

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Indigenous Production (ktoe)																				
Coal	–	–	–	–	333	179	155	199	161	155	158	177	171	145	161	122	117	141	177	217
Oil	–	–	–	–	88	89	84	85	78	77	77	76	76	69	74	74	71	69	71	75
Gas	–	–	–	–	32	30	22	34	15	21	27	28	25	23	24	21	16	13	14	13
Hydro	–	–	–	–	1,008	956	1,054	940	855	1,044	1,177	1,069	928	1,162	1,212	1,226	1,280	1,200	924	852
Nuclear	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Geothermal	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Solar	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wind	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Biomass	–	–	–	–	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Others	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	–	–	–	–	1,465	1,258	1,319	1,262	1,113	1,301	1,443	1,354	1,204	1,403	1,475	1,447	1,488	1,427	1,190	1,161
Primary Energy Supply (ktoe)																				
Coal	–	–	–	–	859	324	484	508	503	507	486	319	519	624	609	553	529	420	411	433
Oil	–	–	–	–	402	477	511	563	598	510	404	386	360	423	528	490	454	851	818	1,197
Gas	–	–	–	–	726	740	883	727	853	503	574	586	743	613	669	617	645	682	624	550
Hydro	–	–	–	–	1,008	956	1,054	940	855	1,044	1,177	1,069	928	1,162	1,212	1,226	1,280	1,200	924	852
Nuclear	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Geothermal	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Solar	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wind	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Biomass	–	–	–	–	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Others	–	–	–	–	–204	–117	–178	–147	–52	–157	–243	–158	–58	–139	–286	–231	–217	–205	–46	–28
Total	–	–	–	–	2,795	2,384	2,758	2,595	2,761	2,411	2,402	2,206	2,496	2,687	2,736	2,659	2,695	2,952	2,735	3,008
Final Energy Consumption by Sector (ktoe)																				
Industry	–	–	–	–	867	464	580	581	539	505	462	420	616	710	698	672	674	767	770	818
Transport	–	–	–	–	179	388	408	434	423	391	294	305	272	342	456	411	389	716	684	855
Residential	–	–	–	–	161	164	146	136	138	167	202	156	148	208	214	254	280	241	133	124
Commercial	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Others	–	–	–	–	1,241	764	881	751	1,073	793	848	677	845	765	735	766	787	746	786	869
Total	–	–	–	–	2,448	1,780	2,015	1,902	2,173	1,856	1,806	1,558	1,881	2,025	2,103	2,103	2,130	2,470	2,373	2,666

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Table 3.6.7 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Final Energy Consumption by Type (ktoe)																				
Coal	–	–	–	–	658	134	246	257	286	281	223	149	364	430	438	397	368	398	417	470
Oil	–	–	–	–	402	477	509	556	588	504	399	387	357	418	524	492	450	846	804	1,154
Gas	–	–	–	–	557	124	228	120	448	143	163	119	314	229	250	231	240	260	280	175
Electricity	–	–	–	–	719	789	753	703	664	719	780	699	659	774	711	804	890	774	635	619
Heat	–	–	–	–	108	252	275	262	183	205	237	200	183	170	176	175	178	188	233	244
Biomass	–	–	–	–	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Others	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	–	–	–	–	2,448	1,780	2,015	1,902	2,173	1,856	1,806	1,558	1,881	2,025	2,103	2,103	2,130	2,470	2,373	2,666
Power Generation (GWh)																				
Thermal	–	–	–	–	1,363	3,167	3,474	3,351	2,512	1,993	2,300	2,506	2,299	2,060	2,218	2,156	2,195	2,289	1,137	1,190
Hydro	–	–	–	–	11,724	11,118	12,255	10,934	9,943	12,142	13,683	12,430	10,787	13,516	14,094	14,259	14,887	13,948	10,740	9,910
Nuclear	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Geothermal	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Solar	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wind	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Others	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	–	–	–	–	13,087	14,285	15,729	14,285	12,455	14,135	15,983	14,936	13,086	15,576	16,312	16,415	17,082	16,237	11,877	11,100
Loss and Own Use of Electricity (GWh)																				
Transmission and Distribution Losses	–	–	–	–	2,151	3,453	4,570	4,116	3,826	3,616	3,791	4,674	4,430	4,116	4,570	4,256	4,093	4,581	3,698	3,326
Own Use	–	–	–	–	198	198	291	209	209	174	93	186	221	709	35	–	–	–	–	–
Total	–	–	–	–	2,349	3,651	4,860	4,326	4,035	3,791	3,884	4,860	4,651	4,826	4,605	4,256	4,093	4,581	3,698	3,326
Fuel Input for Power Generation (ktoe)																				
Coal	–	–	–	–	130	109	142	152	142	106	124	98	89	128	110	83	78	82	58	39
Oil	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gas	–	–	–	–	104	382	406	377	251	223	255	290	267	238	260	241	250	259	144	165
Total	–	–	–	–	234	491	548	529	393	329	379	387	355	366	370	323	329	340	202	204
CO_2 Emissions (kt C)																				
Coal	–	–	–	–	940	358	532	557	554	557	535	354	571	684	671	608	568	609	623	668
Oil	–	–	–	–	331	383	410	449	459	380	325	298	271	337	412	372	339	631	596	909
Gas	–	–	–	–	464	474	566	466	546	322	368	375	476	393	429	396	413	436	400	352
Total	–	–	–	–	1,736	1,215	1,507	1,472	1,559	1,259	1,228	1,027	1,318	1,414	1,511	1,377	1,320	1,676	1,619	1,929

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Table 3.6.7 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Macroeconomic Indicators																				
Population (thousand)	4,423	4,495	4,546	4,543	4,540	4,590	4,657	4,725	4,797	4,865	4,915	4,955	4,993	5,039	5,093	5,144	5,192	5,235	5,278	5,321
Urban Population, %	37.8	37.5	37.2	36.9	36.6	36.3	36.1	35.9	35.8	35.6	35.4	35.5	35.6	35.6	35.7	35.8	36.0	36.1	36.3	36.4
GDP (constant 2000 $ million)	2,057	1,895	1,632	1,380	1,103	1,043	1,117	1,227	1,253	1,299	1,370	1,443	1,442	1,544	1,652	1,649	1,700	1,846	2,001	2,059
GDP (current $ million)	2,674	2,571	2,317	2,028	1,681	1,661	1,828	1,768	1,646	1,249	1,370	1,525	1,606	1,919	2,212	2,460	2,834	3,803	5,140	4,690
GDP (constant 2005 PPP $ million)	11,081	10,211	8,793	7,434	5,941	5,618	6,016	6,613	6,753	7,000	7,380	7,773	7,771	8,318	8,902	8,887	9,162	9,945	10,781	11,092
GDP/capita (constant 2000 $)	465	422	359	304	243	227	240	260	261	267	279	291	289	306	324	321	328	353	379	387
GDP/capita (current $)	605	572	510	446	370	362	392	374	343	257	279	308	322	381	434	478	546	726	974	881
GDP – Manufacturing (% of GDP)	24.8	26.9	23.2	21 .1	16.9	13.4	13.1	19.1	20 .2	18.3	18 .1	18.7	16.7	18.4	17.6	14.6	12.2	11.9	13.4	11.8
Car Ownership (car/1,000 persons)	–	–	–	–	–	–	–	–	–	–	–	38	48	44	44	45	45	46	46	46
Basic Energy Indicators																				
TPES/capita (toe/person)	–	–	–	–	0.62	0.52	0.59	0.55	0.58	0.50	0.49	0.45	0.50	0.53	0.54	0.52	0.52	0.56	0.52	0.57
TFEC/capita (toe/person)	–	–	–	–	0.54	0.39	0.43	0.40	0.45	0.38	0.37	0.31	0.38	0.40	0.41	0.41	0.41	0.47	0.45	0.50
TPES/GDP (toe/constant 2000 $ million)	–	–	–	–	2,535	2,286	2,470	2,114	2,203	1,856	1,754	1,529	1,731	1,741	1,656	1,612	1,585	1,599	1,367	1,461
TFEC/GDP (toe/constant 2000 $ million)	–	–	–	–	2,220	1,707	1,805	1,550	1,734	1,429	1,319	1,080	1,304	1,312	1,273	1,275	1,253	1,338	1,186	1,295
Import Dependency (%)	–	–	–	–	47.6	47.2	52.2	51.4	59.7	46.0	39.9	38.6	51.8	47.8	46.1	45.6	44.8	51.7	56.5	61.4
Oil Import Dependency (%)	–	–	–	–	78.1	81.3	83.6	84.9	87.0	84.9	80.9	80.3	78.9	83.7	86.0	84.9	84.4	91.9	91.3	93.7
Electricity/capita (kWh/ person)	–	–	–	–	1,842	1,999	1,880	1,730	1,610	1,719	1,846	1,641	1,535	1,787	1,624	1,818	1,994	1,720	1,399	1,353
CO_2 Intensity (t C/constant 2000 $ million)	–	–	–	–	1,574	1,165	1,350	1,199	1,244	969	896	712	914	916	915	835	776	908	809	937
CO_2/capita (t C)	–	–	–	–	0.38	0.26	0.32	0.31	0.33	0.26	0.25	0.21	0.26	0.28	0.30	0.27	0.25	0.32	0.31	0.36
CO_2/TPES (t C/toe)	–	–	–	–	0.62	0.51	0.55	0.57	0.56	0.52	0.51	0.47	0.53	0.53	0.55	0.52	0.49	0.57	0.59	0.64

– = no data or not applicable, CO_2 = carbon dioxide, GDP = gross domestic product, GWh = gigawatt–hour, kt C = thousand tons of carbon equivalent, ktoe = thousand tons of oil equivalent, kWh = kilowatt–hour, PPP = purchasing power parity, t C = ton of carbon equivalent, TFEC = total final energy consumption, toe = ton of oil equivalent, TPES = total primary energy supply.

Note: Figures may not add up to total because of rounding.

Sources: APERC estimates, IEA (2011b), JAMA (2012), and World Bank.

3.7 Pakistan

Country Profile (2009)		Energy Reserves (year-end 2008)	
Total Surface Area (square kilometer)	796,100	Coal (million ton) - Recoverable	2,070.0
Population (thousand)	170,494	Gas (trillion cubic feet) - Proven	29.7
GDP (constant 2000 $ billion)	111.4	Oil (billion barrel) - Proven	313.0
Electrification Rate (%)	62.4		

GDP = gross domestic product.

Sources: ADB (2012), IEA (2011c), World Bank, and WEC (2010).

2009 Energy Supply and Demand Flow (ktoe)

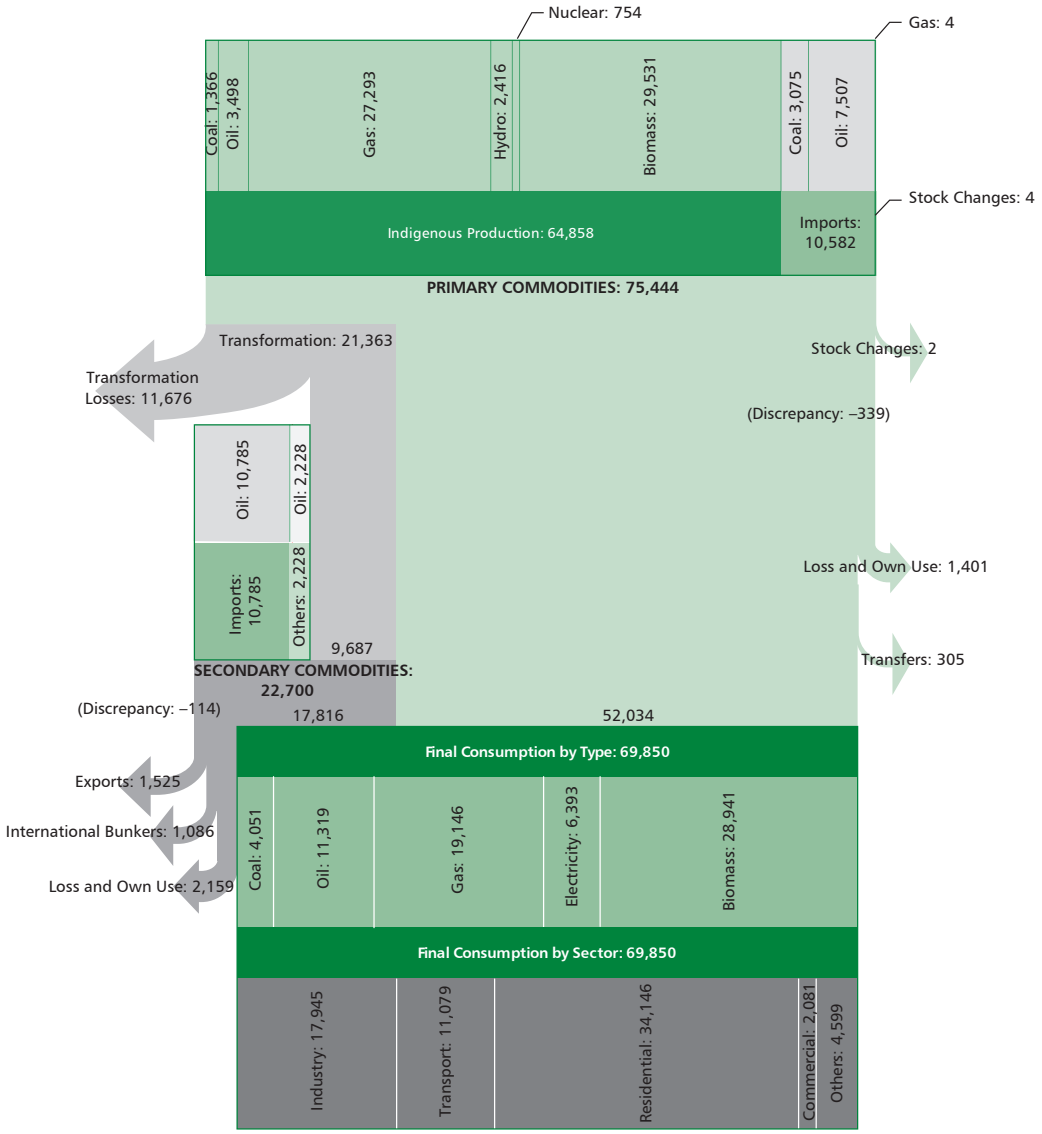


Table 3.7.1 Key Data and Economic Profile

	1990	1995	2000	2005	2009
Socioeconomic Data					
Population (thousand)	111,845	127,347	144,522	158,645	170,494
GDP (constant 2000 $ billion)	50.2	63.0	74.0	94.4	111.4
GDP (constant 2005 PPP $ billion)	181.2	227.2	266.7	340.3	401.9
GDP/capita (constant 2000 $)	449	495	512	595	654
GDP/capita (constant 2005 PPP $)	1,620	1,784	1,845	2,145	2,357

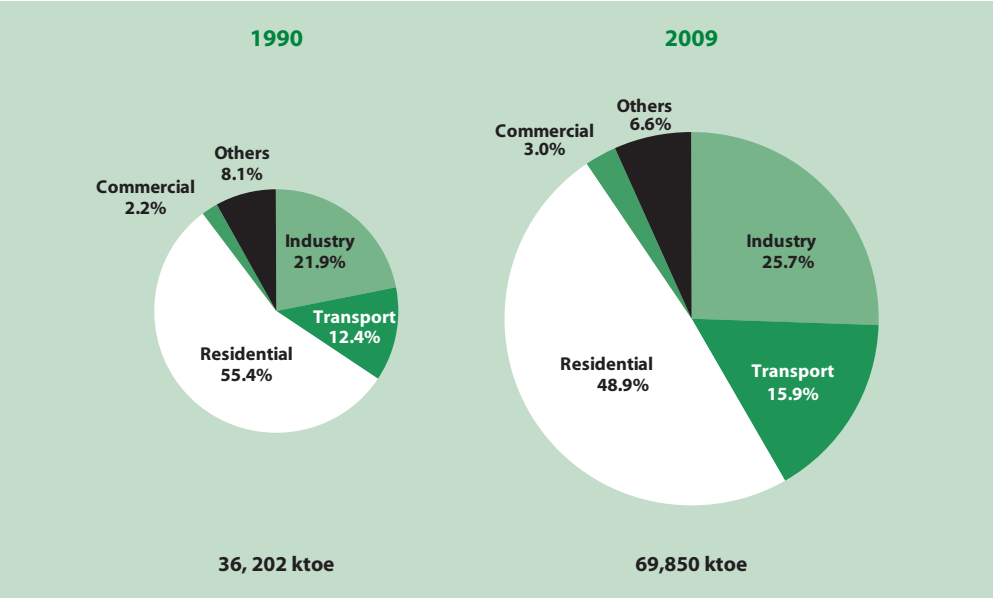
GDP = gross domestic product, PPP = purchasing power parity.
Source: World Bank.

Table 3.7.2 Energy Supply and Demand

	1990	1995	2000	2005	2009
Primary Energy Supply (ktoe)					
Indigenous Production	34,176	41,046	46,919	61,474	64,858
Net Imports	8,651	12,532	16,605	14,698	20,663
Total PES	42,827	53,578	63,524	76,172	85,521
Coal	1,958	2,168	1,862	3,732	4,441
Oil	10,493	14,613	18,968	16,394	21,082
Gas	10,077	13,159	16,667	25,639	27,297
Biomass	18,767	21,516	24,028	27,106	29,531
Others	1,532	2,122	1,999	3,301	3,170
TPES/capita (toe)	0.38	0.42	0.44	0.48	0.50
TPES/GDP (toe/constant 2005 PPP $ million)	236	236	238	224	213
Final Energy Consumption (ktoe)					
Industry	7,933	10,497	11,155	16,639	17,945
Transportation	4,498	6,594	8,228	8,919	11,079
Other Sectors	23,771	27,349	31,560	36,705	40,826
Total FEC	36,202	44,440	50,943	62,263	69,850
Coal	1,522	1,538	1,375	3,284	4,051
Oil	7,750	10,014	11,666	11,391	11,319
Gas	6,009	8,196	10,177	15,210	19,146
Electricity	2,475	3,606	4,178	5,814	6,393
Biomass	18,446	21,086	23,547	26,564	28,941
Others	0	0	0	0	0

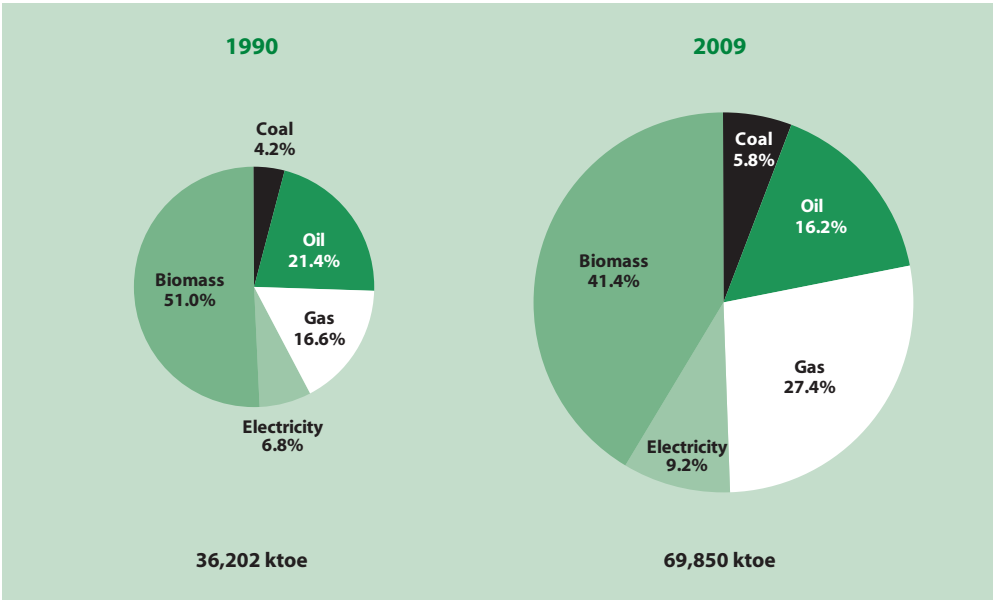
FEC = final energy consumption, GDP = gross domestic product, ktoe = thousand tons of oil equivalent, PES = primary energy supply, PPP = purchasing power parity, toe = ton of oil equivalent, TPES = total primary energy supply.
Source: IEA (2011b).

Figure 3.7.1 Final Energy Consumption by Sector, 1990 and 2009



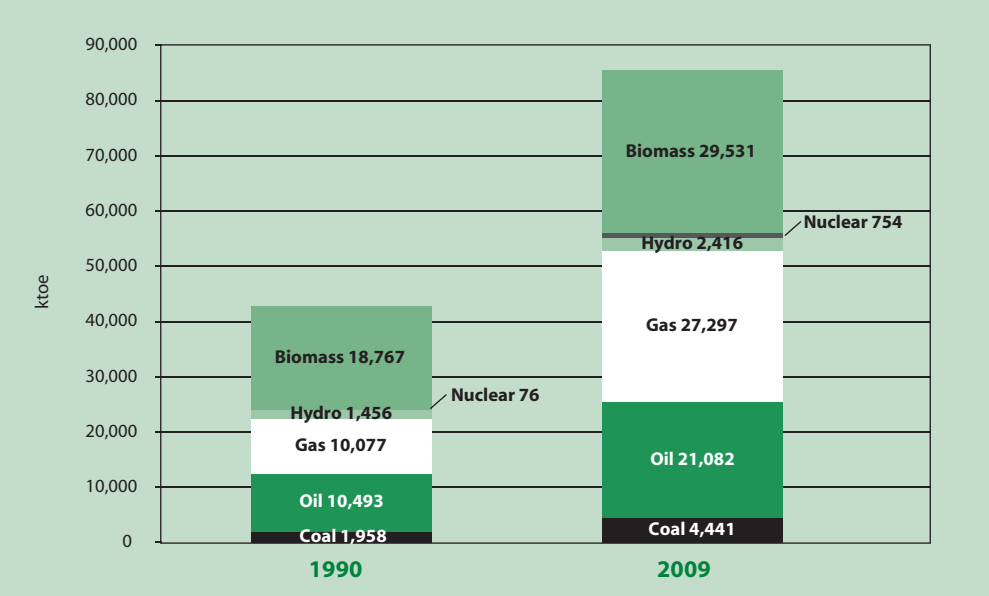
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 3.7.2 Final Energy Consumption by Type of Energy, 1990 and 2009



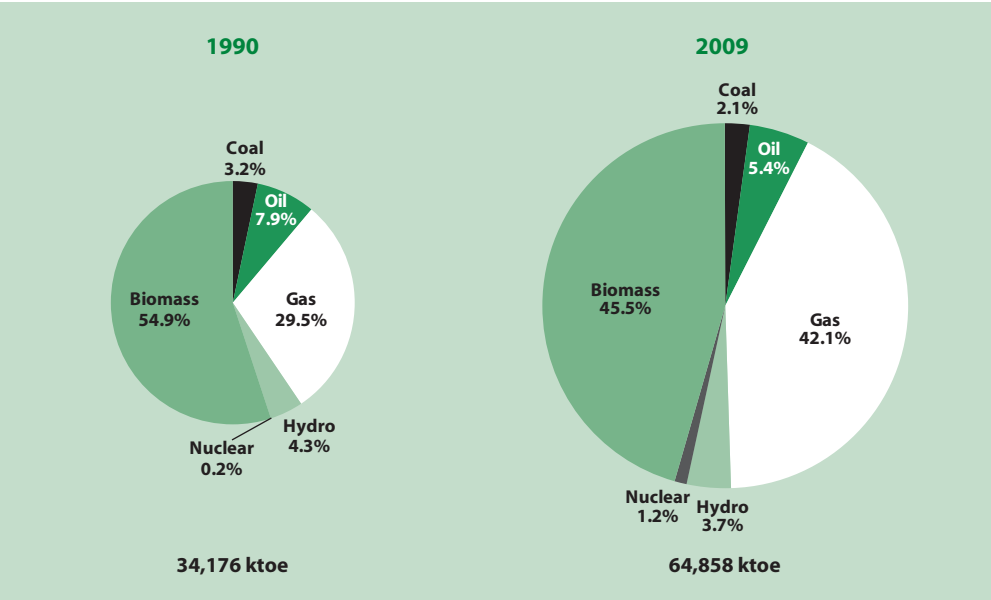
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 3.7.3 Total Primary Energy Supply, 1990 and 2009



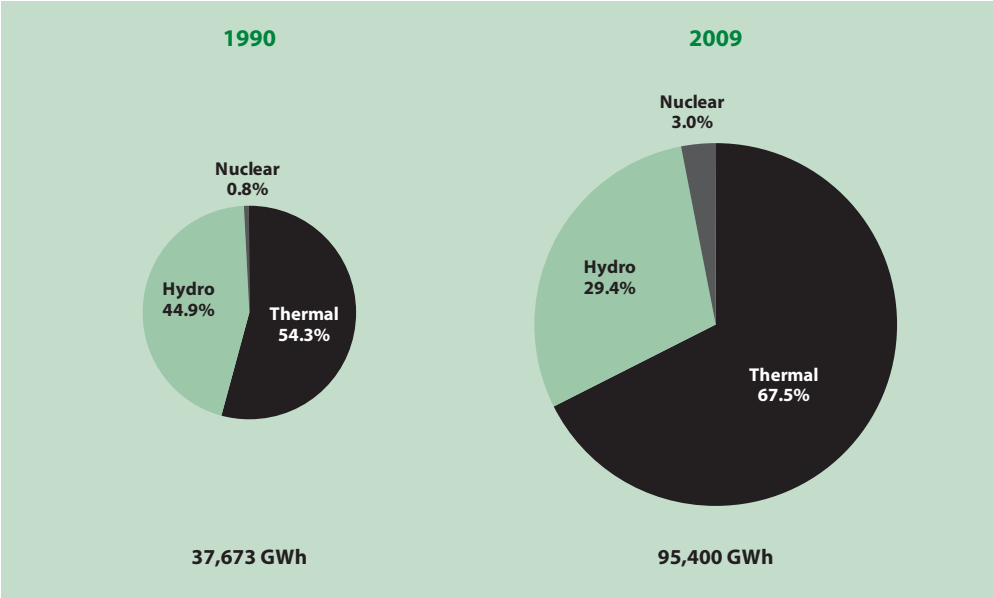
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 3.7.4 Indigenous Energy Production, 1990 and 2009



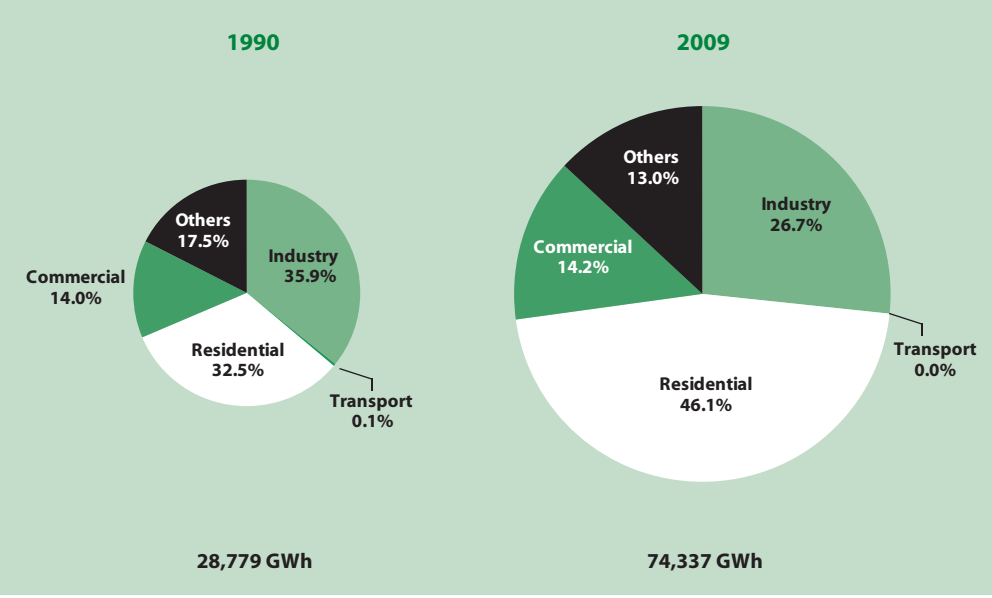
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 3.7.5 Electricity Generation by Plant Type, 1990 and 2009



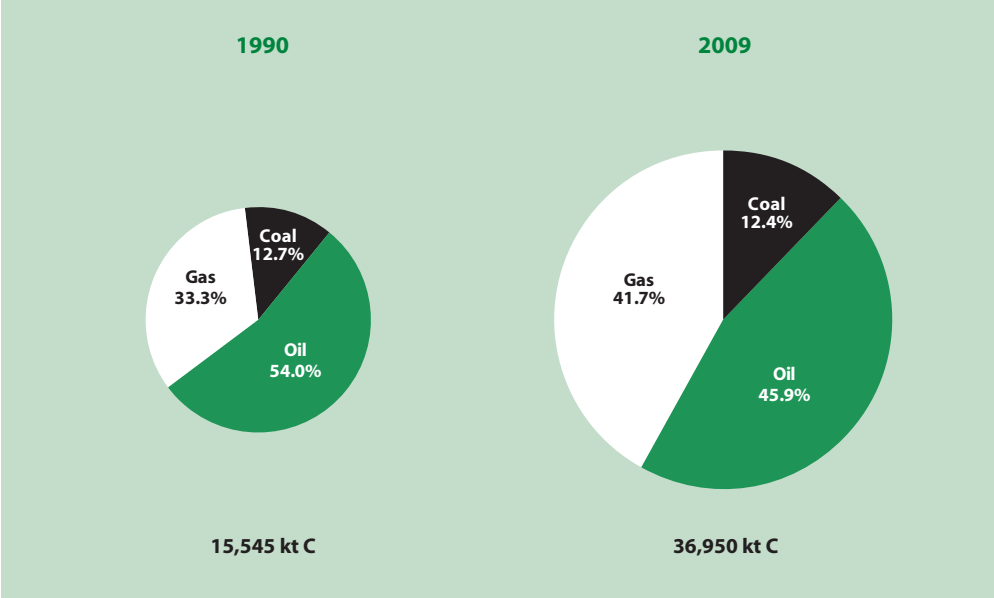
GWh = gigawatt-hour.
Source: IEA (2011b).

Figure 3.7.6 Electricity Consumption by Sector, 1990 and 2009



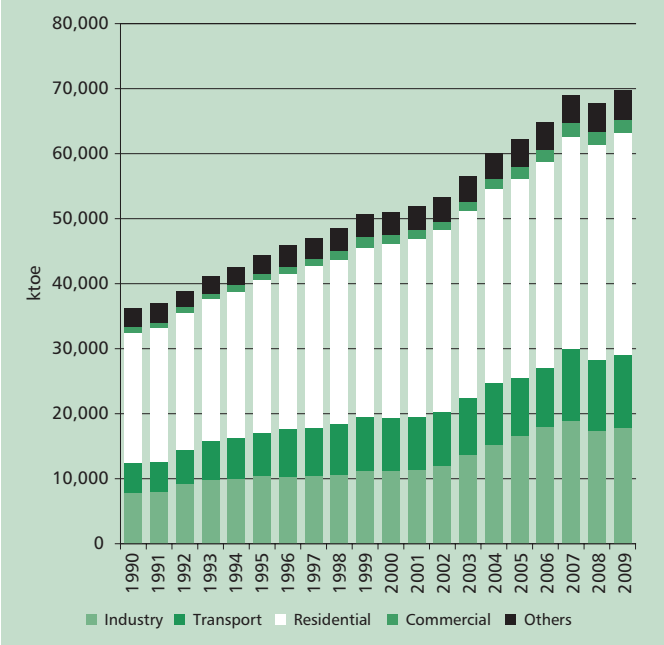
GWh = gigawatt-hour.
Source: IEA (2011b).

Figure 3.7.7 Carbon Dioxide Emissions from Fuel Combustion, 1990 and 2009



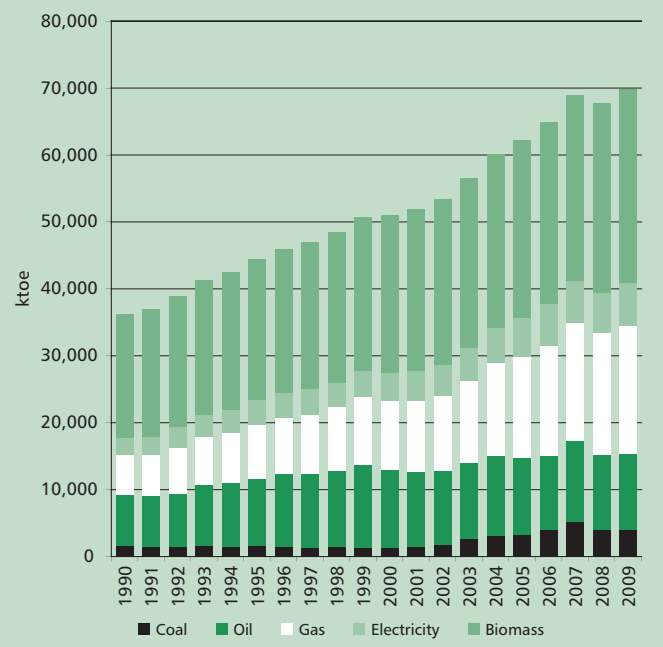
kt C = thousand tons of carbon equivalent.
Source: APERC estimates.

Figure 3.7.8 Final Energy Consumption by Sector, 1990–2009



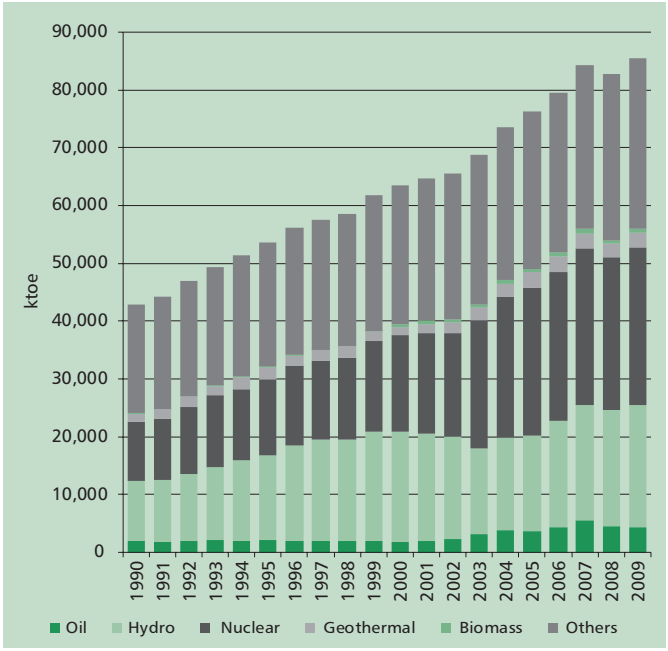
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 3.7.9 Final Energy Consumption by Type, 1990–2009



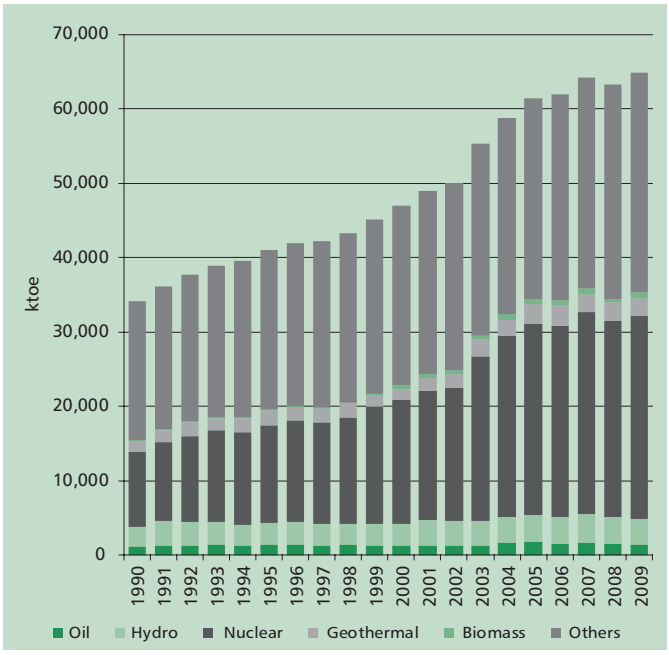
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 3.7.10 Total Primary Energy Supply, 1990–2009



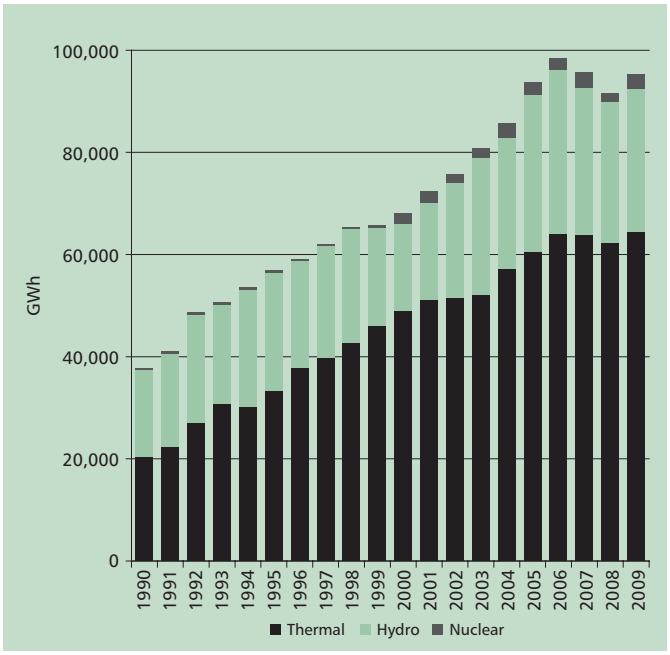
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 3.7.11 Indigenous Energy Production, 1990–2009



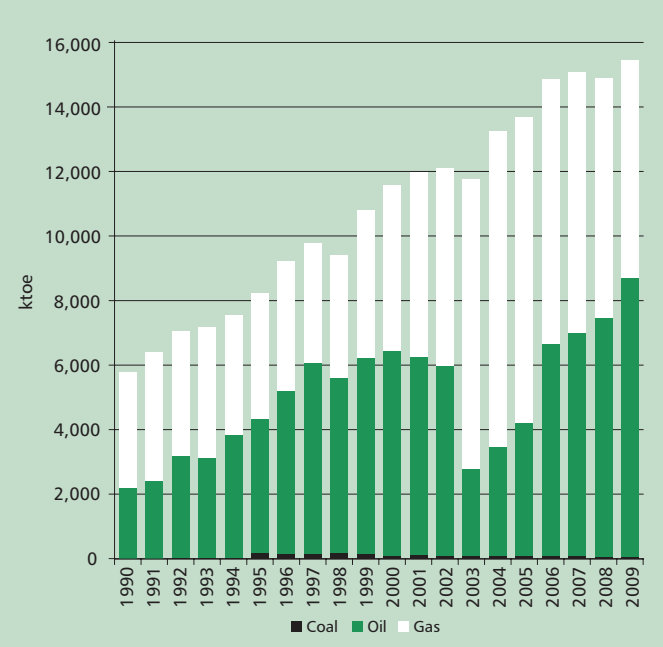
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 3.7.12 Electricity Generation by Source, 1990–2009



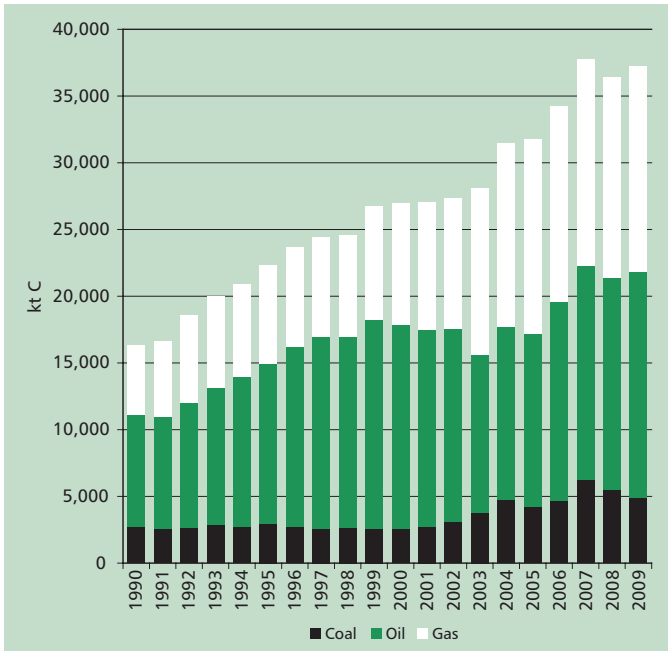
GWh = gigawatt-hour.
Source: IEA (2011b).

Figure 3.7.13 Fuel Input for Electricity Generation, 1990–2009



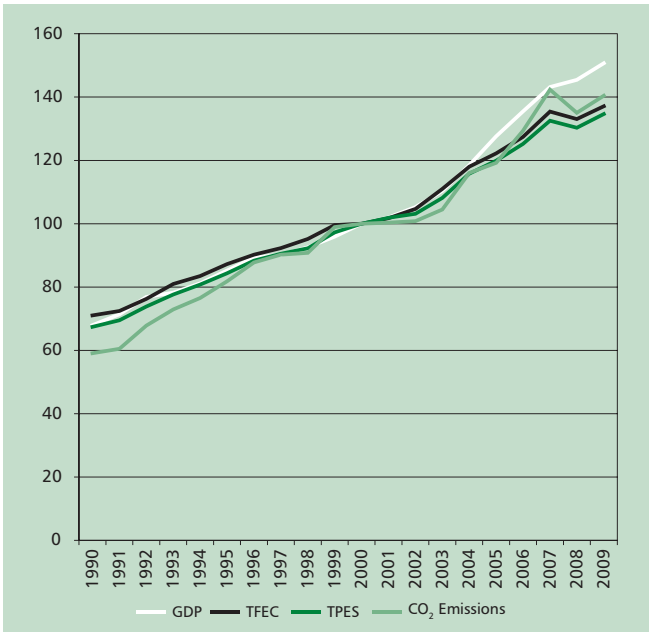
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 3.7.14 Carbon Dioxide Emissions from Fuel Combustion, 1990–2009



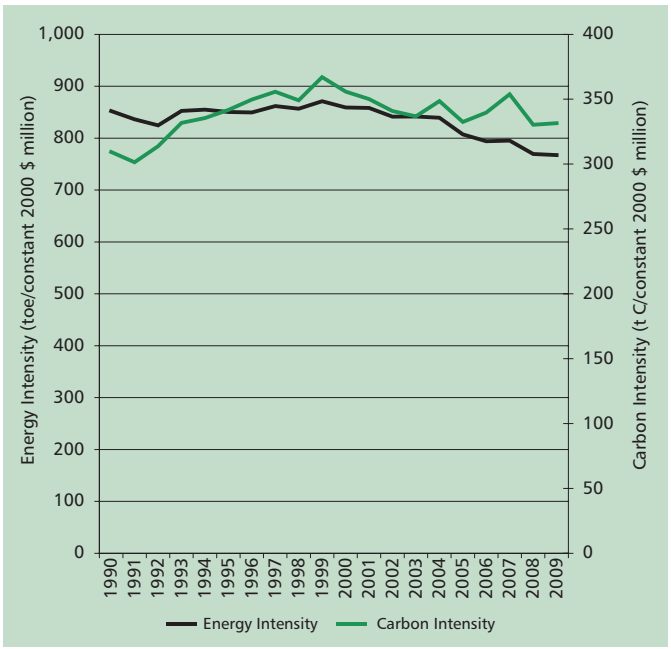
kt C = thousand tons of carbon equivalent.
Source: APERC estimates.

Figure 3.7.15 Growth of GDP, TFEC, TPES, and CO_2 Emissions (indexed to year 2000), 1990–2009



CO_2 = carbon dioxide, GDP = gross domestic product, TFEC = total final energy consumption, TPES = total primary energy supply.
Note: Indices are measured relative to the base year 2000 (2000 = 100).
Source: APERC estimates.

Figure 3.7.16 Energy and Carbon Intensities, 1990–2009



t C = ton of carbon equivalent, toe = ton of oil equivalent.
Source: APERC estimates.

Table 3.7.3 Pakistan Energy Balance Table, 2006

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	1,471	0	3,694	0	0	0	0	0	0	0	25,703	2,748	596	0	0	0	27,693	0	0	0	61,905
2.	Imports	2,807	0	8,558	8,461	0	0	4,183	4,206	72	0	0	0	0	0	0	0	0	0	0	0	19,826
3.	Exports	0	0	0	–1,431	–95	0	–35	0	0	–1,301	0	0	0	0	0	0	0	0	0	0	–1,431
4.	International Bunkers	0	0	0	–1,019	0	0	–19	–83	0	–917	0	0	0	0	0	0	0	0	0	0	–1,019
5.	Stock Changes	0	0	–1	266	10	4	83	150	0	19	3	0	0	0	0	0	0	0	0	0	268
6.	Total Primary Energy Supply	4,278	0	12,251	6,277	–85	4	4,212	4,273	72	–2,199	25,706	2,748	596	0	0	0	27,693	0	0	0	79,549
7.	Transfers	0	0	–380	403	0	0	0	0	403	0	0	0	0	0	0	0	0	0	0	0	23
8.	Total Transformation Sector	–297	76	–11,582	4,783	1,303	214	3,518	–3,421	230	2,939	–8,208	–2,748	–596	0	0	0	–554	0	8,458	0	–10,668
8.1	Power Generation	–92	0	0	–6,581	0	0	–44	–6,537	0	0	–8,208	–2,748	–596	0	0	0	0	0	8,458	0	–9,767
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	–11,582	11,364	1,303	214	3,562	3,116	230	2,939	0	0	0	0	0	0	0	0	0	0	–218
8.4	Coal Transformation	–205	76	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–129
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–554	0	0	0	–554
9.	Loss and Own Use	0	0	0	–397	0	0	0	–178	0	–219	–1,042	0	0	0	0	0	0	0	–2,205	0	–3,644
10.	Discrepancy	–109	0	–289	46	0	1	0	1	–1	45	0	0	0	0	0	0	0	0	1	0	–351
11.	Total Final Energy Consumption	3,872	76	0	11,112	1,218	219	7,730	675	704	566	16,456	0	0	0	0	0	27,139	0	6,254	0	64,909
12.	Industry Sector	3,871	76	0	1,616	0	87	867	662	0	0	7,540	0	0	0	0	0	3,012	0	1,812	0	17,927
13.	Transport Sector	0	0	0	7,888	1,218	0	6,661	9	0	0	1,255	0	0	0	0	0	0	0	1	0	9,144
14.	Other Sectors	1	0	0	1,042	0	132	202	4	704	0	4,821	0	0	0	0	0	24,127	0	4,441	0	34,432
14.1	Residential and Commercial	1	0	0	884	0	132	100	4	648	0	4,821	0	0	0	0	0	24,127	0	3,738	0	33,571
14.1.1	Commerce and Public Services	0	0	0	333	0	22	100	4	207	0	697	0	0	0	0	0	0	0	871	0	1,901
14.1.2	Residential	1	0	0	551	0	110	0	0	441	0	4,124	0	0	0	0	0	24,127	0	2,867	0	31,670
14.2	Non-Specified Others	0	0	0	158	0	0	102	0	56	0	0	0	0	0	0	0	0	0	703	0	861
15.	Non-Energy Use	0	0	0	566	0	0	0	0	0	566	2,840	0	0	0	0	0	0	0	0	0	3,406
16.	Electricity Output (GWh)	136	0	0	28,162	0	0	0	0	0	28,162	35,811	31,953	2,288	0	0	0	0	0	0	0	98,350
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.
Note: Figures may not add up to total because of rounding.
Source: IEA (2011b).

Table 3.7.4 Pakistan Energy Balance Table, 2007

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	1,678	0	3,819	0	0	0	0	0	0	0	27,150	2,469	802	0	0	0	28,293	0	0	0	64,211
2.	Imports	3,952	0	8,808	9,075	136	0	4,747	4,166	26	0	0	0	0	0	0	0	0	0	0	0	21,835
3.	Exports	0	0	0	–1,419	–44	0	–21	0	0	–1,354	0	0	0	0	0	0	0	0	0	0	–1,419
4.	International Bunkers	0	0	0	–895	0	0	–13	–117	0	–765	0	0	0	0	0	0	0	0	0	0	–895
5.	Stock Changes	0	0	–1	469	29	9	177	187	0	67	1	0	0	0	0	0	0	0	0	0	469
6.	Total Primary Energy Supply	5,630	0	12,626	7,230	121	9	4,890	4,236	26	–2,052	27,151	2,469	802	0	0	0	28,293	0	0	0	84,201
7.	Transfers	0	0	–372	394	0	0	0	0	394	0	0	0	0	0	0	0	0	0	0	0	22
8.	Total Transformation Sector	–399	113	–12,084	4,921	1,431	226	3,725	–3,514	233	2,820	–8,068	–2,469	–802	0	0	0	–566	0	8,230	0	–11,124
8.1	Power Generation	–92	0	0	–6,926	0	0	–168	–6,758	0	0	–8,068	–2,469	–802	0	0	0	0	0	8,230	0	–10,127
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	–12,084	11,847	1,431	226	3,893	3,244	233	2,820	0	0	0	0	0	0	0	0	0	0	–237
8.4	Coal Transformation	–307	113	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–194
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–566	0	0	0	–566
9.	Loss and Own Use	0	0	0	–413	0	0	0	–184	0	–229	–1,367	0	0	0	0	0	0	0	–1,917	0	–3,697
10.	Discrepancy	–127	0	–170	–112	0	1	0	0	0	–113	–1	0	0	0	0	0	0	0	1	0	–409
11.	Total Final Energy Consumption	5,104	113	0	12,020	1,552	236	8,615	538	653	426	17,715	0	0	0	0	0	27,727	0	6,314	0	68,993
12.	Industry Sector	5,103	113	0	1,076	0	90	463	523	0	0	7,837	0	0	0	0	0	3,077	0	1,783	0	18,989
13.	Transport Sector	0	0	0	9,479	1,552	0	7,921	6	0	0	1,601	0	0	0	0	0	0	0	1	0	11,081
14.	Other Sectors	1	0	0	1,039	0	146	231	9	653	0	5,289	0	0	0	0	0	24,650	0	4,530	0	35,509
14.1	Residential and Commercial	1	0	0	883	0	146	116	9	612	0	5,289	0	0	0	0	0	24,650	0	3,801	0	34,624
14.1.1	Commerce and Public Services	0	0	0	355	0	21	116	9	209	0	754	0	0	0	0	0	0	0	902	0	2,011
14.1.2	Residential	1	0	0	528	0	125	0	0	403	0	4,535	0	0	0	0	0	24,650	0	2,899	0	32,613
14.2	Non-Specified Others	0	0	0	156	0	0	115	0	41	0	0	0	0	0	0	0	0	0	729	0	885
15.	Non-Energy Use	0	0	0	426	0	0	0	0	0	426	2,988	0	0	0	0	0	0	0	0	0	3,414
16.	Electricity Output (GWh)	136	0	0	30,848	0	0	0	0	0	30,848	32,923	28,707	3,077	0	0	0	0	0	0	0	95,691
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Source: IEA (2011b).

Table 3.7.5 Pakistan Energy Balance Table, 2008

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	1,541	0	3,553	0	0	0	0	0	0	0	26,451	2,389	422	0	0	0	28,905	0	0	0	63,261
2.	Imports	3,068	0	8,511	9,914	266	0	4,628	4,955	65	0	0	0	0	0	0	0	0	0	0	0	21,493
3.	Exports	0	0	0	–1,281	–3	0	–65	–1	0	–1,212	0	0	0	0	0	0	0	0	0	0	–1,281
4.	International Bunkers	0	0	0	–973	0	0	–40	–129	0	–804	0	0	0	0	0	0	0	0	0	0	–973
5.	Stock Changes	0	0	–2	273	–16	4	–6	76	0	215	3	0	0	0	0	0	0	0	0	0	274
6.	Total Primary Energy Supply	4,609	0	12,062	7,933	247	4	4,517	4,901	65	–1,801	26,454	2,389	422	0	0	0	28,905	0	0	0	82,774
7.	Transfers	0	0	–318	337	0	0	0	0	337	0	0	0	0	0	0	0	0	0	0	0	19
8.	Total Transformation Sector	–851	290	–11,184	3,426	1,377	181	3,355	–4,208	214	2,507	–7,438	–2,389	–422	0	0	0	–578	0	7,880	0	–11,266
8.1	Power Generation	–62	0	0	–7,401	0	0	–174	–7,227	0	0	–7,438	–2,389	–422	0	0	0	0	0	7,880	0	–9,832
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	–11,184	10,827	1,377	181	3,529	3,019	214	2,507	0	0	0	0	0	0	0	0	0	0	–357
8.4	Coal Transformation	–789	290	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–499
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–578	0	0	0	–578
9.	Loss and Own Use	0	0	0	–380	0	0	0	–170	0	–210	–795	0	0	0	0	0	0	0	–1,828	0	–3,003
10.	Discrepancy	–85	0	–560	–105	0	0	–1	0	1	–105	0	0	0	0	0	0	0	0	–1	0	–751
11.	Total Final Energy Consumption	3,673	290	0	11,211	1,624	185	7,871	523	617	391	18,221	0	0	0	0	0	28,327	0	6,051	0	67,773
12.	Industry Sector	3,672	290	0	971	0	54	408	509	0	0	7,684	0	0	0	0	0	3,144	0	1,662	0	17,423
13.	Transport Sector	0	0	0	8,872	1,624	0	7,241	7	0	0	1,961	0	0	0	0	0	0	0	0	0	10,833
14.	Other Sectors	1	0	0	977	0	131	222	7	617	0	5,549	0	0	0	0	0	25,183	0	4,389	0	36,099
14.1	Residential and Commercial	1	0	0	840	0	131	148	7	554	0	5,549	0	0	0	0	0	25,183	0	3,633	0	35,206
14.1.1	Commerce and Public Services	0	0	0	387	0	31	148	7	201	0	790	0	0	0	0	0	0	0	857	0	2,034
14.1.2	Residential	1	0	0	453	0	100	0	0	353	0	4,759	0	0	0	0	0	25,183	0	2,776	0	33,172
14.2	Non-Specified Others	0	0	0	137	0	0	74	0	63	0	0	0	0	0	0	0	0	0	756	0	893
15.	Non-Energy Use	0	0	0	391	0	0	0	0	0	391	3,027	0	0	0	0	0	0	0	0	0	3,418
16.	Electricity Output (GWh)	113	0	0	32,433	0	0	0	0	0	32,433	29,678	27,784	1,618	0	0	0	0	0	0	0	91,626
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.
Note: Figures may not add up to total because of rounding.
Source: IEA (2011b).

Table 3.7.6 Pakistan Energy Balance Table, 2009

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	1,366	0	3,498	0	0	0	0	0	0	0	27,293	2,416	754	0	0	0	29,531	0	0	0	64,858
2.	Imports	3,075	0	7,507	10,785	617	0	4,628	5,466	74	0	0	0	0	0	0	0	0	0	0	0	21,367
3.	Exports	0	0	0	–1,525	–4	0	–133	–13	0	–1,375	0	0	0	0	0	0	0	0	0	0	–1,525
4.	International Bunkers	0	0	0	–1,086	0	0	–39	–190	0	–857	0	0	0	0	0	0	0	0	0	0	–1,086
5.	Stock Changes	0	0	–2	1,905	15	27	–115	1,436	0	542	4	0	0	0	0	0	0	0	0	0	1,907
6.	Total Primary Energy Supply	4,441	0	11,003	10,079	628	27	4,341	6,699	74	–1,690	27,297	2,416	754	0	0	0	29,531	0	0	0	85,521
7.	Transfers	0	0	–305	323	0	0	0	0	323	0	0	0	0	0	0	0	0	0	0	0	18
8.	Total Transformation Sector	–355	104	–10,496	1,378	1,432	143	3,120	–5,923	203	2,403	–6,751	–2,416	–754	0	0	0	–591	0	8,205	0	–11,676
8.1	Power Generation	–71	0	0	–8,623	0	0	–263	–8,360	0	0	–6,751	–2,416	–754	0	0	0	0	0	8,205	0	–10,410
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	–10,496	10,001	1,432	143	3,383	2,437	203	2,403	0	0	0	0	0	0	0	0	0	0	–495
8.4	Coal Transformation	–284	104	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–180
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–591	0	0	0	–591
9.	Loss and Own Use	0	0	0	–349	0	0	0	–156	0	–193	–1,401	0	0	0	0	0	0	0	–1,810	0	–3,560
10.	Discrepancy	–139	0	–202	–112	0	0	1	0	0	–113	1	0	0	0	0	0	1	0	–2	0	–453
11.	Total Final Energy Consumption	3,947	104	0	11,319	2,060	170	7,462	620	600	407	19,146	0	0	0	0	0	28,941	0	6,393	0	69,850
12.	Industry Sector	3,947	104	0	980	0	49	476	455	0	0	7,997	0	0	0	0	0	3,212	0	1,705	0	17,945
13.	Transport Sector	0	0	0	8,878	2,060	0	6,814	4	0	0	2,201	0	0	0	0	0	0	0	0	0	11,079
14.	Other Sectors	0	0	0	1,054	0	121	172	161	600	0	5,698	0	0	0	0	0	25,729	0	4,688	0	37,169
14.1	Residential and Commercial	0	0	0	945	0	121	111	161	552	0	5,698	0	0	0	0	0	25,729	0	3,855	0	36,227
14.1.1	Commerce and Public Services	0	0	0	352	0	28	111	4	209	0	821	0	0	0	0	0	0	0	908	0	2,081
14.1.2	Residential	0	0	0	593	0	93	0	157	343	0	4,877	0	0	0	0	0	25,729	0	2,947	0	34,146
14.2	Non-Specified Others	0	0	0	109	0	0	61	0	48	0	0	0	0	0	0	0	0	0	833	0	942
15.	Non-Energy Use	0	0	0	407	0	0	0	0	0	407	3,250	0	0	0	0	0	0	0	0	0	3,657
16.	Electricity Output (GWh)	116	0	0	36,218	0	0	0	0	0	36,218	28,079	28,093	2,894	0	0	0	0	0	0	0	95,400
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Source: IEA (2011b).

Table 3.7.7 Pakistan Summary Table, 1990–2009

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Indigenous Production (ktoe)																				
Coal	1,097	1,221	1,238	1,412	1,216	1,454	1,420	1,262	1,384	1,266	1,237	1,331	1,316	1,321	1,730	1,856	1,471	1,678	1,541	1,366
Oil	2,703	3,328	3,182	3,067	2,864	2,800	3,015	2,924	2,861	2,907	2,990	3,390	3,313	3,207	3,445	3,574	3,694	3,819	3,553	3,498
Gas	10,077	10,642	11,537	12,279	12,376	13,154	13,707	13,631	14,190	15,716	16,665	17,416	17,840	22,146	24,257	25,637	25,703	27,150	26,451	27,293
Hydro	1,456	1,574	1,816	1,671	1,966	1,996	1,794	1,897	1,931	1,659	1,479	1,629	1,922	2,317	2,208	2,654	2,748	2,469	2,389	2,416
Nuclear	76	100	152	130	133	126	90	98	74	104	520	597	453	459	728	647	596	802	422	754
Geothermal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Solar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wind	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Biomass	18,767	19,306	19,797	20,400	20,967	21,516	21,955	22,398	22,890	23,462	24,028	24,614	25,215	25,830	26,460	27,106	27,693	28,293	28,905	29,531
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	34,176	36,171	37,722	38,959	39,522	41,046	41,981	42,210	43,330	45,114	46,919	48,977	50,059	55,280	58,828	61,474	61,905	64,211	63,261	64,858
Primary Energy Supply (ktoe)																				
Coal	1,958	1,860	1,924	2,132	1,937	2,168	1,973	1,894	1,983	1,896	1,862	2,042	2,356	3,161	3,911	3,732	4,278	5,630	4,609	4,441
Oil	10,493	10,670	11,666	12,675	13,932	14,613	16,588	17,576	17,541	18,938	18,968	18,425	17,711	14,784	15,985	16,394	18,528	19,856	19,995	21,082
Gas	10,077	10,642	11,537	12,313	12,384	13,159	13,710	13,634	14,192	15,718	16,667	17,419	17,848	22,152	24,264	25,639	25,706	27,151	26,454	27,297
Hydro	1,456	1,574	1,816	1,671	1,966	1,996	1,794	1,897	1,931	1,659	1,479	1,629	1,922	2,317	2,208	2,654	2,748	2,469	2,389	2,416
Nuclear	76	100	152	130	133	126	90	98	74	104	520	597	453	459	728	647	596	802	422	754
Geothermal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Solar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wind	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Biomass	18,767	19,306	19,797	20,400	20,967	21,516	21,955	22,398	22,890	23,462	24,028	24,614	25,215	25,830	26,460	27,106	27,693	28,293	28,905	29,531
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	42,827	44,152	46,892	49,321	51,319	53,578	56,110	57,497	58,611	61,777	63,524	64,726	65,505	68,703	73,556	76,172	79,549	84,201	82,774	85,521
Final Energy Consumption by Sector (ktoe)																				
Industry	7,933	7,968	9,278	9,846	9,952	10,497	10,364	10,394	10,702	11,137	11,155	11,378	11,982	13,686	15,265	16,639	17,927	18,989	17,423	17,945
Transport	4,498	4,665	5,256	6,005	6,344	6,594	7,287	7,467	7,847	8,298	8,228	8,228	8,346	8,799	9,520	8,919	9,144	11,081	10,833	11,079
Residential	20,044	20,535	20,962	21,726	22,522	23,458	23,905	24,801	25,236	26,100	26,750	27,276	27,990	28,721	29,794	30,612	31,670	32,613	33,172	34,146
Commercial	806	818	909	933	962	1,051	1,156	1,203	1,236	1,670	1,294	1,351	1,259	1,384	1,536	1,789	1,901	2,011	2,034	2,081
Others	2,921	2,930	2,433	2,734	2,734	2,840	3,253	3,164	3,458	3,528	3,516	3,604	3,755	3,945	4,012	4,304	4,267	4,299	4,311	4,599
Total	36,202	36,916	38,838	41,244	42,514	44,440	45,965	47,029	48,479	50,733	50,943	51,837	53,332	56,535	60,127	62,263	64,909	68,993	67,773	69,850

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Table 3.7.7 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Final Energy Consumption by Type (ktoe)																				
Coal	1,522	1,443	1,476	1,631	1,459	1,538	1,499	1,339	1,417	1,341	1,375	1,535	1,764	2,665	3,159	3,284	3,948	5,217	3,963	4,051
Oil	7,750	7,670	7,986	9,081	9,514	10,014	10,893	10,990	11,481	12,359	11,666	11,151	11,054	11,334	11,901	11,391	11,112	12,020	11,211	11,319
Gas	6,009	6,112	6,777	7,266	7,560	8,196	8,367	8,916	9,426	10,121	10,177	10,677	11,274	12,277	13,860	15,210	16,456	17,715	18,221	19,146
Electricity	2,475	2,715	3,139	3,214	3,408	3,606	3,690	3,834	3,723	3,919	4,178	4,353	4,529	4,945	5,275	5,814	6,254	6,314	6,051	6,393
Heat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Biomass	18,446	18,976	19,460	20,052	20,573	21,086	21,516	21,950	22,432	22,993	23,547	24,121	24,711	25,314	25,932	26,564	27,139	27,727	28,327	28,941
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	36,202	36,916	38,838	41,244	42,514	44,440	45,965	47,029	48,479	50,733	50,943	51,837	53,332	56,535	60,127	62,263	64,909	68,993	67,773	69,850
Power Generation (GWh)																				
Thermal	20,455	22,388	27,116	30,713	30,186	33,268	37,921	39,720	42,695	46,093	48,934	51,198	51,613	52,126	57,233	60,486	64,109	63,907	62,224	64,413
Hydro	16,925	18,303	21,112	19,436	22,858	23,206	20,858	22,060	22,449	19,288	17,194	18,941	22,351	26,944	25,671	30,862	31,953	28,707	27,784	28,093
Nuclear	293	385	582	497	511	483	346	375	284	399	1,997	2,291	1,740	1,760	2,795	2,484	2,288	3,077	1,618	2,894
Geothermal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Solar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wind	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	37,673	41,076	48,810	50,646	53,555	56,957	59,125	62,155	65,428	65,780	68,125	72,430	75,704	80,830	85,699	93,832	98,350	95,691	91,626	95,400
Loss and Own Use of Electricity (GWh)																				
Transmission and Distribution Losses	7,802	8,151	10,837	11,547	12,198	12,988	13,849	15,302	19,895	17,558	16,547	18,884	20,047	20,302	21,070	22,767	22,012	18,605	19,186	18,791
Own Use	1,081	1,349	1,488	1,721	1,744	2,035	2,360	2,291	2,233	2,640	3,000	2,930	3,012	3,047	3,302	3,465	3,628	3,686	2,070	2,256
Total	8,884	9,500	12,326	13,267	13,942	15,023	16,209	17,593	22,128	20,198	19,547	21,814	23,058	23,349	24,372	26,233	25,640	22,291	21,256	21,047
Fuel Input for Power Generation (ktoe)																				
Coal	18	11	18	20	18	179	158	156	186	156	93	114	97	98	93	77	92	92	62	71
Oil	2,170	2,402	3,179	3,107	3,836	4,159	5,045	5,919	5,403	6,085	6,341	6,160	5,883	2,678	3,373	4,120	6,581	6,926	7,401	8,623
Gas	3,591	3,981	3,852	4,051	3,691	3,884	4,025	3,696	3,804	4,564	5,128	5,711	6,118	8,990	9,790	9,479	8,208	8,068	7,438	6,751
Total	5,779	6,394	7,049	7,178	7,545	8,222	9,228	9,771	9,393	10,805	11,562	11,985	12,098	11,766	13,256	13,676	14,881	15,086	14,901	15,445
CO_2 Emissions (kt C)																				
Coal	1,967	1,842	1,910	2,065	1,899	2,163	2,091	1,888	1,993	1,889	1,855	2,043	2,327	3,209	3,889	3,821	4,467	5,880	4,681	4,592
Oil	8,396	8,449	9,392	10,252	11,300	11,984	13,533	14,387	14,292	15,641	15,352	14,831	14,445	11,823	12,902	12,972	14,920	16,103	15,841	16,953
Gas	5,183	5,624	6,538	6,877	6,941	7,380	7,476	7,463	7,605	8,506	9,108	9,529	9,763	12,461	13,754	14,578	14,648	15,478	15,007	15,405
Total	15,545	15,915	17,840	19,194	20,139	21,528	23,100	23,737	23,890	26,035	26,315	26,404	26,535	27,493	30,545	31,371	34,035	37,461	35,529	36,950

continued on next page

Table 3.7.7 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Macroeconomic Indicators																				
Population (thousand)	111,845	114,970	118,010	121,030	124,122	127,347	130,737	134,256	137,808	141,261	144,522	147,558	150,407	153,140	155,860	158,645	161,513	164,446	167,442	170,494
Urban Population, %	30.6	30.8	31.1	31.3	31.6	31.8	32.1	32.4	32.6	32.9	33.2	33.5	33.9	34.2	34.6	34.9	35.3	35.7	36.2	36.6
GDP (constant 2000 $ million)	50,249	52,792	56,860	57,860	60,022	63,001	66,054	66,725	68,426	70,931	73,952	75,418	77,850	81,623	87,638	94,357	100,186	105,880	107,570	111,437
GDP (current $ million)	40,010	45,452	48,635	51,478	51,895	60,636	63,320	62,433	62,192	62,974	73,952	72,310	72,307	83,245	97,978	109,600	127,500	143,171	163,892	161,819
GDP (constant 2005 PPP $ million)	181,203	190,375	205,045	208,649	216,447	227,189	238,200	240,616	246,752	255,784	266,680	271,967	280,737	294,342	316,031	340,262	361,282	381,814	387,908	401,854
GDP/capita (constant 2000 $)	449	459	482	478	484	495	505	497	497	502	512	511	518	533	562	595	620	644	642	654
GDP/capita (current $)	358	395	412	425	418	476	484	465	451	446	512	490	481	544	629	691	789	871	979	949
GDP – Manufacturing (% of GDP)	13.8	13.6	13.6	13.9	14.0	13.7	13.5	13.4	14.0	14.0	13.7	14.6	14.8	15.1	16.0	17.2	17.6	18.0	18.6	17.3
Car Ownership (car/1,000 persons)	8	8	8	6	6	8	10	11	11	11	11	11	13	13	13	13	13	13	13	13
Basic Energy Indicators																				
TPES/capita (toe/person)	0.38	0.38	0.40	0.41	0.41	0.42	0.43	0.43	0.43	0.44	0.44	0.44	0.44	0.45	0.47	0.48	0.49	0.51	0.49	0.50
TFEC/capita (toe/person)	0.32	0.32	0.33	0.34	0.34	0.35	0.35	0.35	0.35	0.36	0.35	0.35	0.35	0.37	0.39	0.39	0.40	0.42	0.40	0.41
TPES/GDP (toe/constant 2000 $ million)	852	836	825	852	855	850	849	862	857	871	859	858	841	842	839	807	794	795	769	767
TFEC/GDP (toe/constant 2000 $ million)	720	699	683	713	708	705	696	705	708	715	689	687	685	693	686	660	648	652	630	627
Import Dependency (%)	20.2	18.1	19.6	21.0	23.0	23.4	25.2	26.6	26.1	27.0	26.1	24.3	23.6	19.5	20.0	19.3	22.2	23.7	23.6	24.2
Oil Import Dependency (%)	74.2	68.8	72.7	75.8	79.4	80.8	81.8	83.4	83.7	84.6	84.2	81.6	81.3	78.3	78.4	78.2	80.1	80.8	82.2	83.4
Electricity/capita (kWh/person)	257	275	309	309	319	329	328	332	314	323	336	343	350	376	394	426	450	447	420	436
CO_2 Intensity (t C/constant 2000 $ million)	309	301	314	332	336	342	350	356	349	367	356	350	341	337	349	332	340	354	330	332
CO_2/capita (t C)	0.14	0.14	0.15	0.16	0.16	0.17	0.18	0.18	0.17	0.18	0.18	0.18	0.18	0.18	0.20	0.20	0.21	0.23	0.21	0.22
CO_2/TPES (t C/toe)	0.36	0.36	0.38	0.39	0.39	0.40	0.41	0.41	0.41	0.42	0.41	0.41	0.41	0.40	0.42	0.41	0.43	0.44	0.43	0.43

CO_2 = carbon dioxide, GDP = gross domestic product, GWh = gigawatt–hour, kt C = thousand tons of carbon equivalent, ktoe = thousand tons of oil equivalent, kWh = kilowatt–hour, PPP = purchasing power parity, t C = ton of carbon equivalent, TFEC = total final energy consumption, toe = ton of oil equivalent, TPES = total primary energy supply.

Note: Figures may not add up to total because of rounding.

Sources: APERC estimates, IEA (2011b), JAMA (2012), and World Bank.

3.8 Tajikistan

Country Profile (2009)		Energy Reserves (year-end 2008)	
Total Surface Area (square kilometer)	142,550	Coal (million ton) - Recoverable	375.0
Population (thousand)	6,783	Gas (trillion cubic feet) - Proven	0.2
GDP (constant 2000 $ billion)	1.9	Oil (billion barrel) - Proven	12.0
Electrification Rate (%)	–		

– = no data or not applicable, GDP = gross domestic product.

Note: The latest available data on electrification rate is for the year 2003, which is 99.3%.

Sources: ADB (2012), ADB estimates, World Bank, and WEC (2010).

2009 Energy Supply and Demand Flow (ktoe)

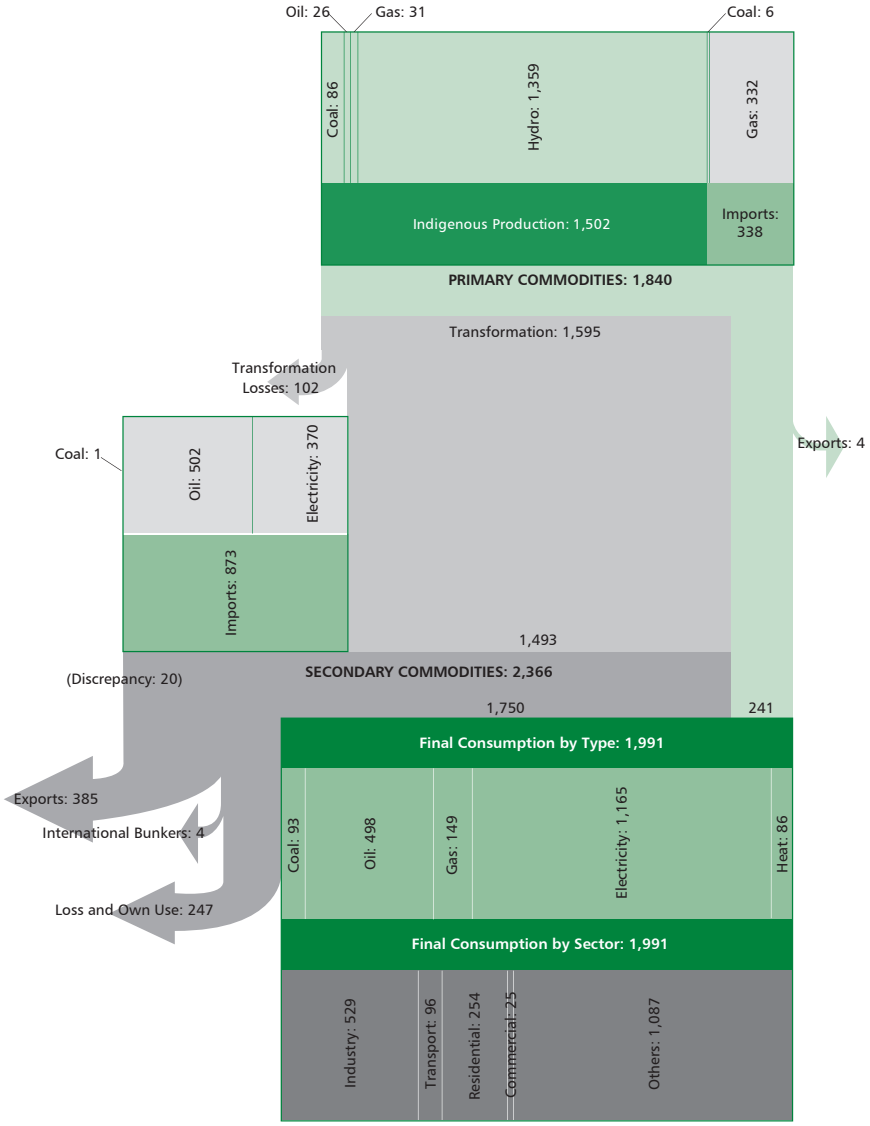


Table 3.8.1 Key Data and Economic Profile

	1990	1995	2000	2005	2009
Socioeconomic Data					
Population (thousand)	5,303	5,775	6,173	6,453	6,783
GDP (constant 2000 $ billion)	2.3	0.9	0.9	1.4	1.9
GDP (constant 2005 PPP $ billion)	15.7	6.0	6.0	9.7	12.9
GDP/capita (constant 2000 $)	426	149	139	216	273
GDP/capita (constant 2005 PPP $)	2,961	1,034	969	1,500	1,895

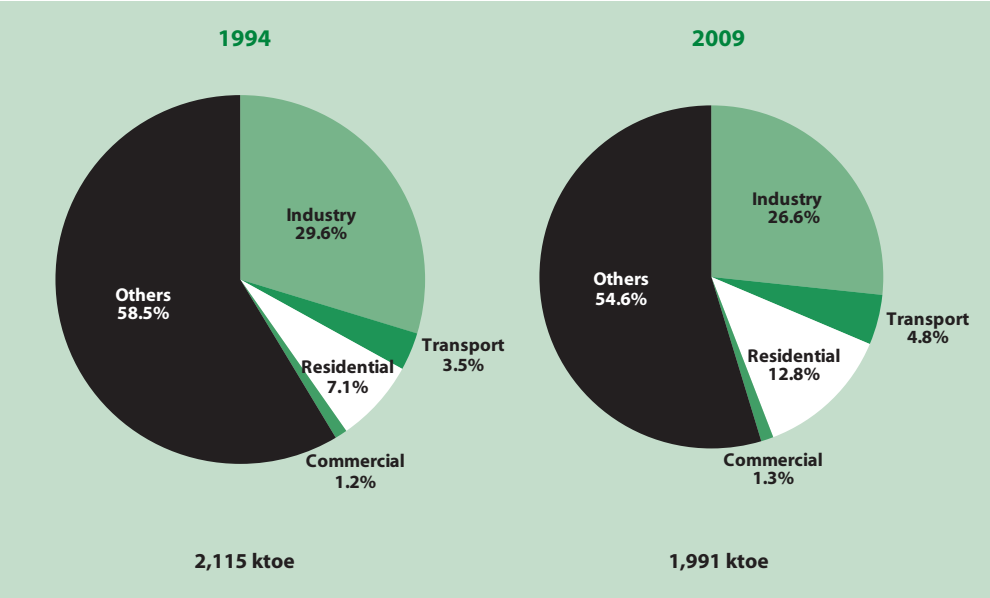
GDP = gross domestic product, PPP = purchasing power parity.
Source: World Bank.

Table 3.8.2 Energy Supply and Demand

	1990	1995	2000	2005	2009
Primary Energy Supply (ktoe)					
Indigenous Production	–	1,328	1,265	1,545	1,502
Net Imports	–	897	885	805	818
Total PES	–	2,225	2,150	2,350	2,320
Coal	–	15	13	46	93
Oil	–	388	189	286	500
Gas	–	510	627	537	363
Biomass	–	0	0	0	0
Others	–	1,312	1,321	1,481	1,364
TPES/capita (toe)	–	0.39	0.35	0.36	0.34
TPES/GDP (toe/constant 2005 PPP $ million)	–	373	360	243	180
Final Energy Consumption (ktoe)					
Industry	–	593	462	566	529
Transportation	–	69	19	53	96
Other Sectors	–	1,275	1,323	1,335	1,366
Total FEC	–	1,937	1,804	1,954	1,991
Coal	–	15	13	46	93
Oil	–	386	189	284	498
Gas	–	270	384	285	149
Electricity	–	1,192	1,142	1,248	1,165
Biomass	–	0	0	0	0
Others	–	74	76	91	86

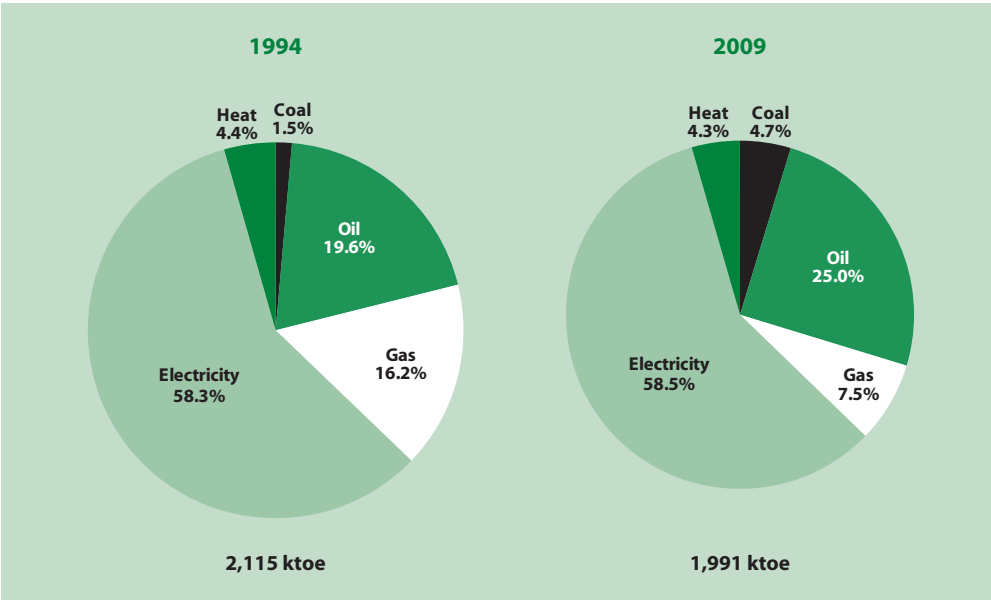
– = no data or not applicable, FEC = final energy consumption, GDP = gross domestic product, ktoe = thousand tons of oil equivalent, PES = primary energy supply, PPP = purchasing power parity, toe = ton of oil equivalent, TPES = total primary energy supply.
Source: IEA (2011b).

Figure 3.8.1 Final Energy Consumption by Sector, 1994 and 2009



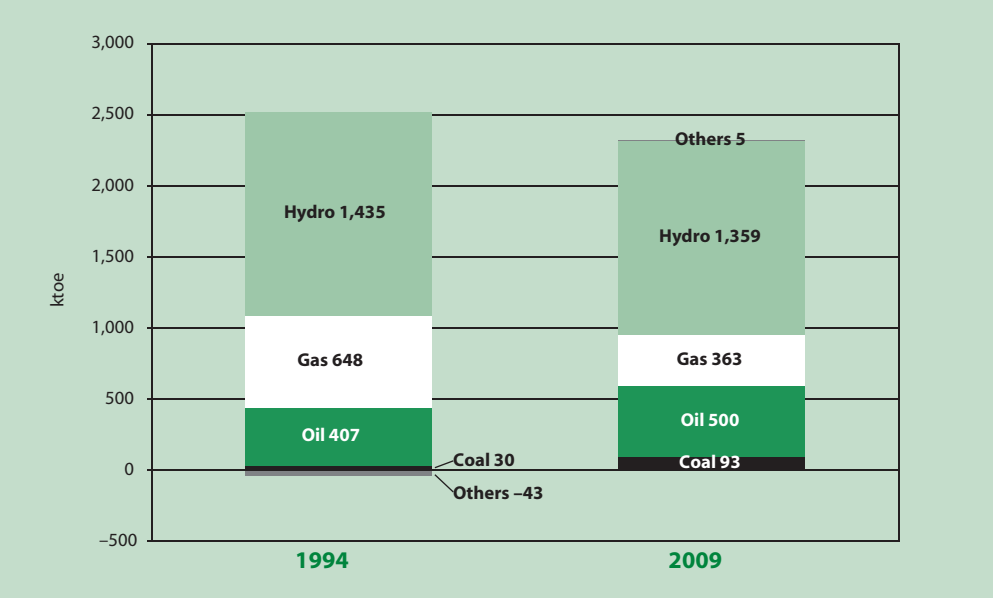
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 3.8.2 Final Energy Consumption by Type of Energy, 1994 and 2009



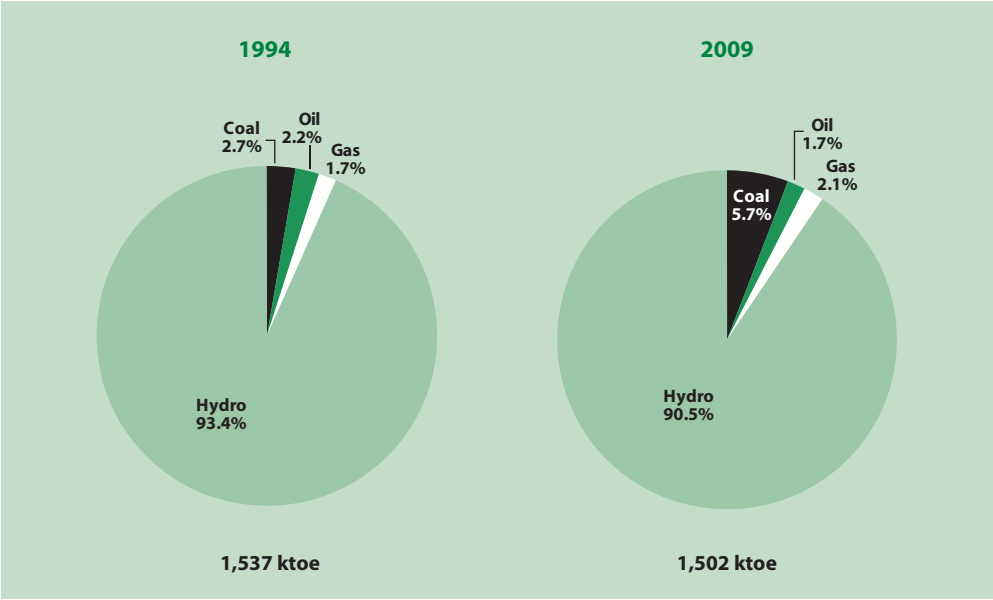
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 3.8.3 Total Primary Energy Supply, 1994 and 2009



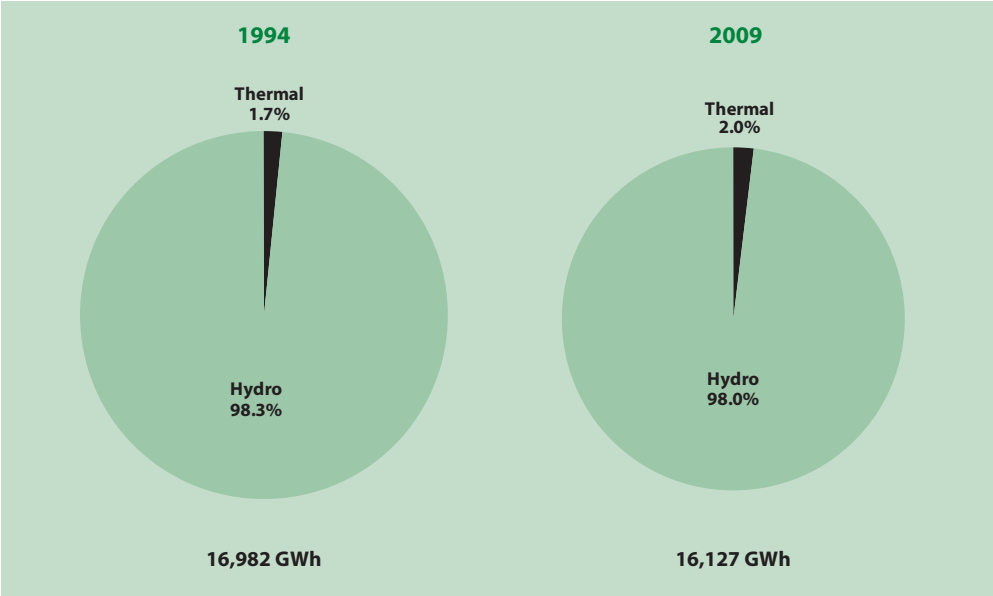
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 3.8.4 Indigenous Energy Production, 1994 and 2009



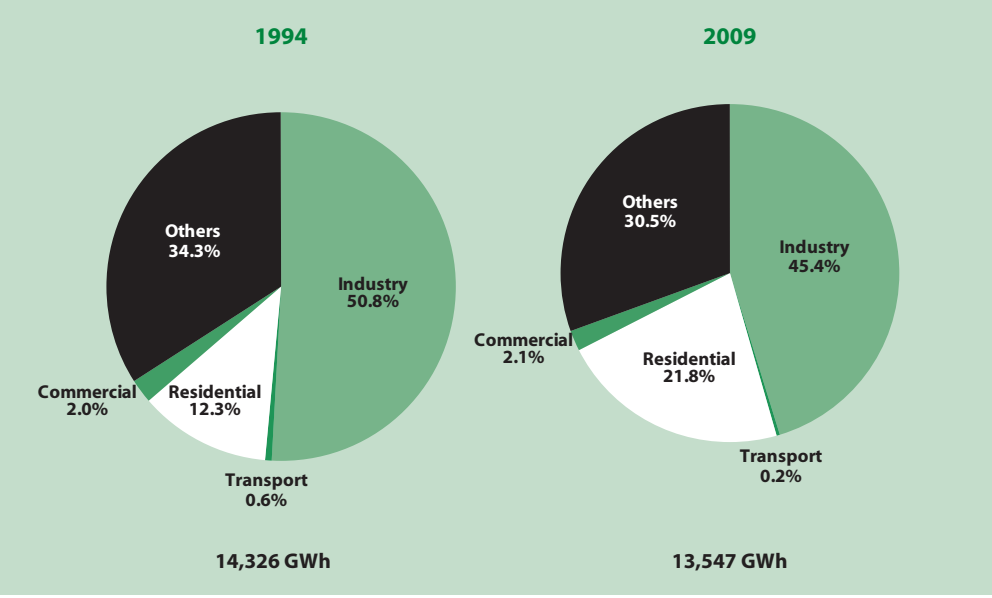
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 3.8.5 Electricity Generation by Plant Type, 1994 and 2009



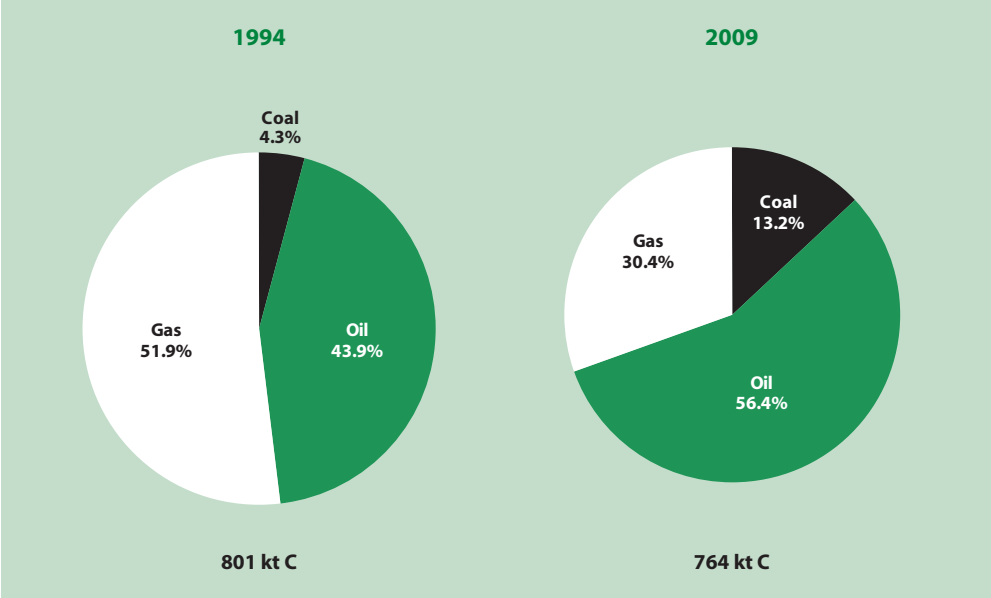
GWh = gigawatt-hour.
Source: IEA (2011b).

Figure 3.8.6 Electricity Consumption by Sector, 1994 and 2009



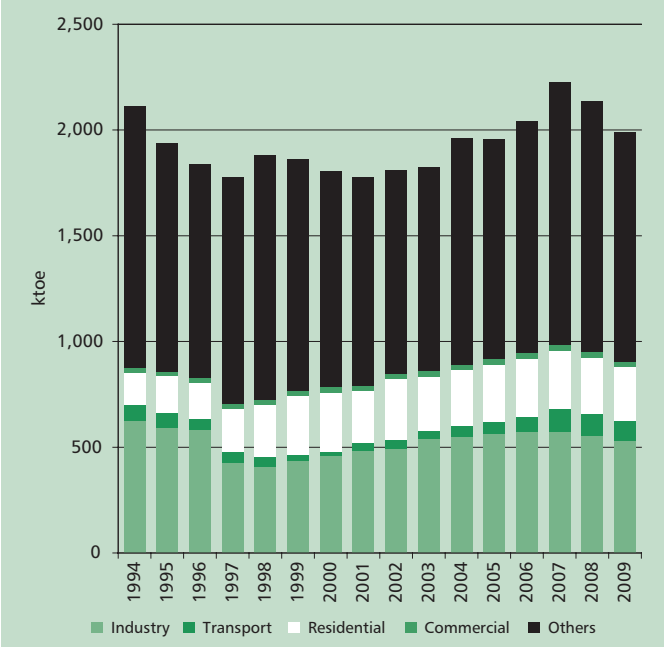
GWh = gigawatt-hour.
Source: IEA (2011b).

Figure 3.8.7 Carbon Dioxide Emissions from Fuel Combustion, 1994 and 2009



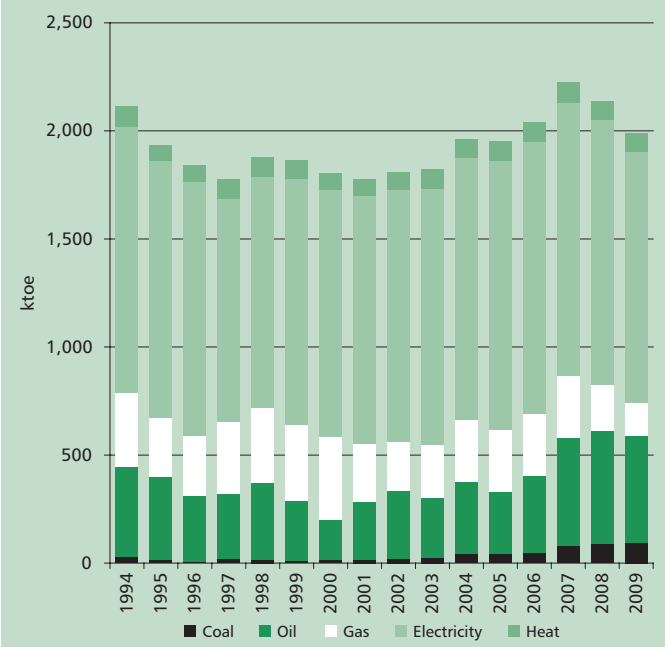
kt C = thousand tons of carbon equivalent.
Source: APERC estimates.

Figure 3.8.8 Final Energy Consumption by Sector, 1994–2009



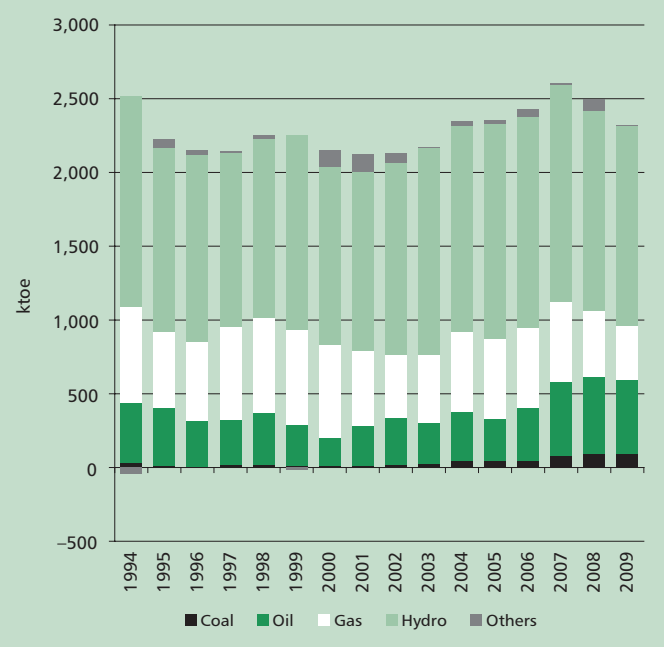
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 3.8.9 Final Energy Consumption by Type, 1994–2009



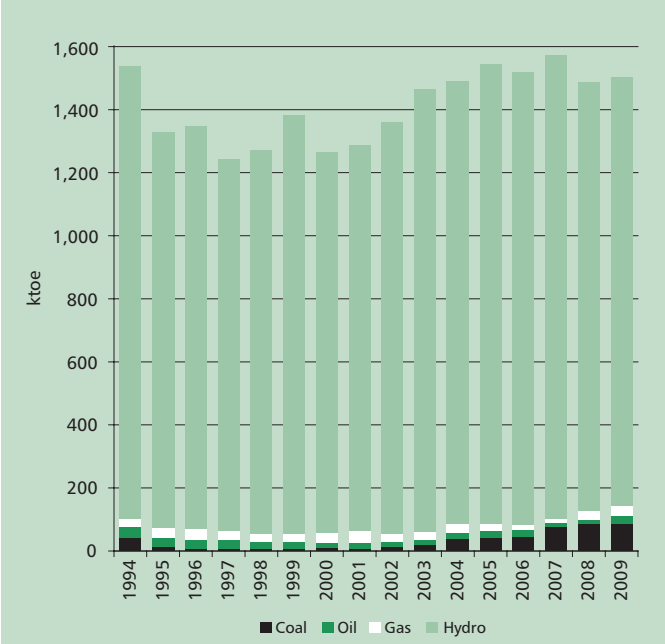
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 3.8.10 Total Primary Energy Supply, 1994–2009



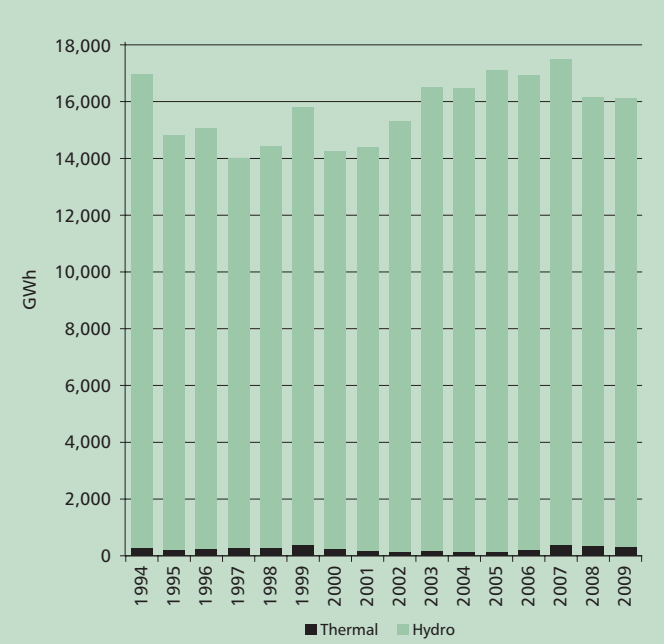
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 3.8.11 Indigenous Energy Production, 1994–2009



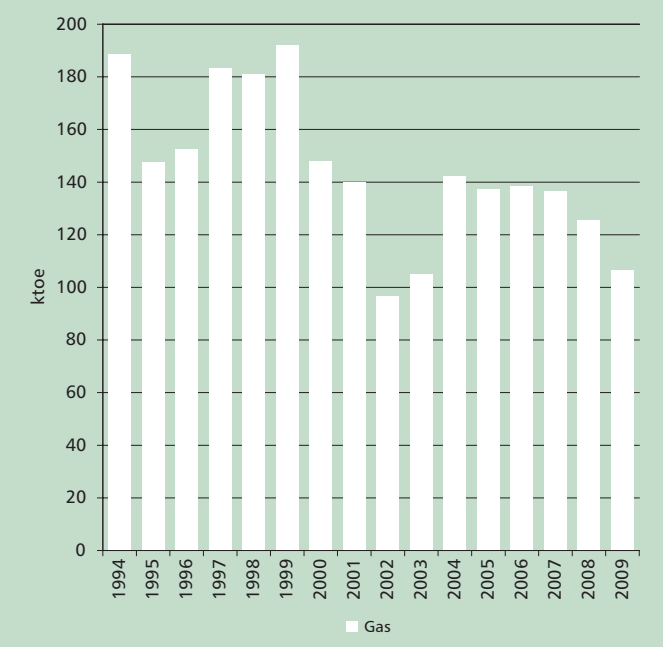
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 3.8.12 Electricity Generation by Source, 1994–2009



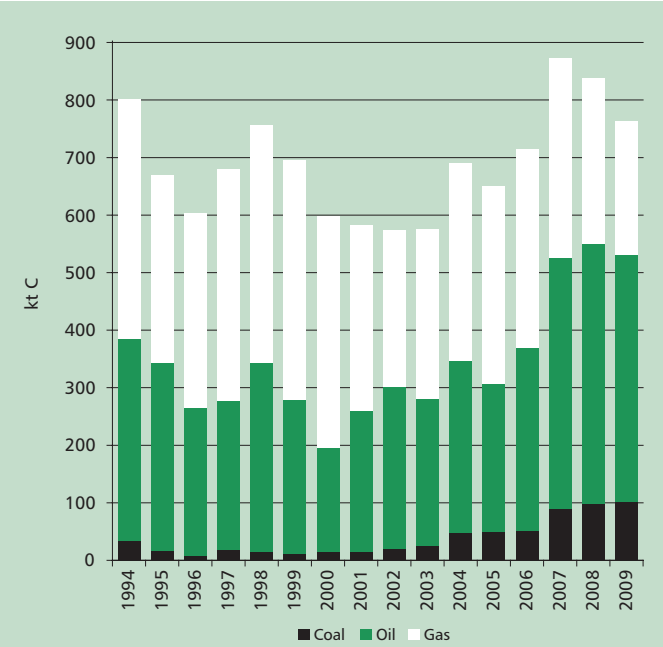
GWh = gigawatt-hour.
Source: IEA (2011b).

Figure 3.8.13 Fuel Input for Electricity Generation, 1994–2009



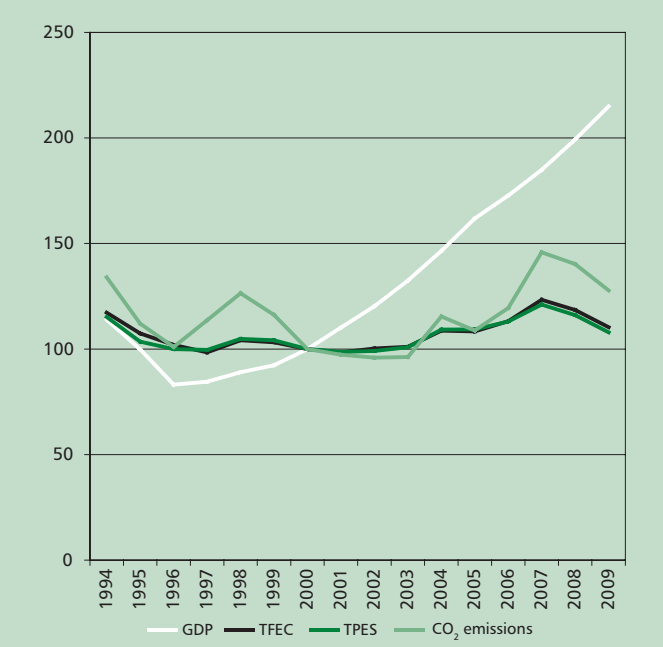
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 3.8.14 Carbon Dioxide Emissions from Fuel Combustion, 1994–2009



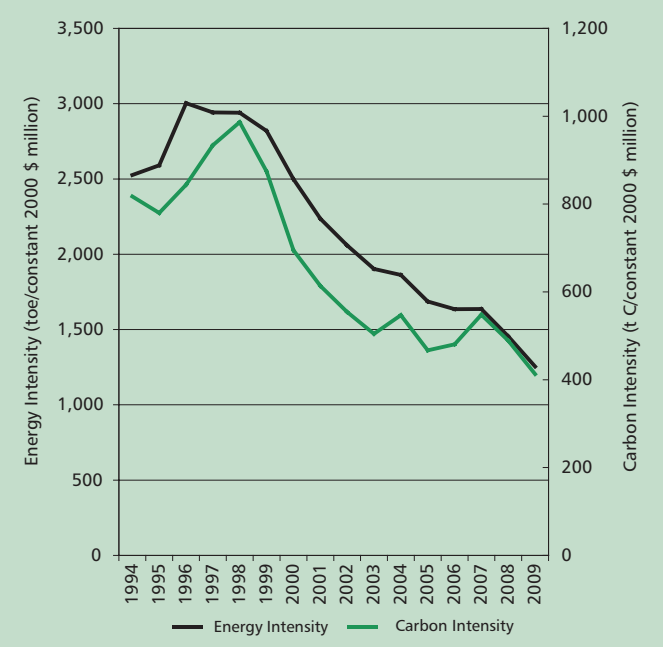
kt C = thousand tons of carbon equivalent.
Source: APERC estimates.

Figure 3.8.15 Growth of GDP, TFEC, TPES, and CO_2 Emissions (indexed to year 2000), 1994–2009



CO_2 = carbon dioxide, GDP = gross domestic product, TFEC = total final energy consumption, TPES = total primary energy supply.
Note: Indices are measured relative to the base year 2000 (2000 = 100).
Source: APERC estimates.

Figure 3.8.16 Energy and Carbon Intensities, 1994–2009



t C = ton of carbon equivalent, toe = ton of oil equivalent.
Source: APERC estimates.

Table 3.8.3 Tajikistan Energy Balance Table, 2006

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	44	0	24	0	0	0	0	0	0	0	14	1,436	0	0	0	0	0	0	0	0	1,518
2.	Imports	3	1	0	360	57	0	121	65	8	109	523	0	0	0	0	0	0	0	416	0	1,303
3.	Exports	0	0	–5	–17	0	0	0	0	0	–17	0	0	0	0	0	0	0	0	–364	0	–386
4.	International Bunkers	0	0	0	–4	0	0	0	0	0	–4	0	0	0	0	0	0	0	0	0	0	–4
5.	Stock Changes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6.	Total Primary Energy Supply	47	1	19	339	57	0	121	65	8	88	537	1,436	0	0	0	0	0	0	52	0	2,431
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	0	0	–19	17	0	0	0	0	0	17	–251	–1,436	0	0	0	0	0	0	1,456	90	–143
8.1	Power Generation	0	0	0	0	0	0	0	0	0	0	–251	–1,436	0	0	0	0	0	0	1,456	90	–141
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	–19	17	0	0	0	0	0	17	0	0	0	0	0	0	0	0	0	0	–2
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–251	0	–251
10.	Discrepancy	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	5
11.	Total Final Energy Consumption	47	1	0	356	57	0	121	65	8	105	286	0	0	0	0	0	0	0	1,262	90	2,042
12.	Industry Sector	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	573	0	573
13.	Transport Sector	0	0	0	57	57	0	0	0	0	0	11	0	0	0	0	0	0	0	2	0	70
14.	Other Sectors	47	1	0	298	0	0	121	65	8	104	275	0	0	0	0	0	0	0	687	90	1,398
14.1	Residential and Commercial	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	302	0	302
14.1.1	Commerce and Public Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	27	0	27
14.1.2	Residential	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	275	0	275
14.2	Non-Specified Others	47	1	0	298	0	0	121	65	8	104	275	0	0	0	0	0	0	0	385	90	1,096
15.	Non-Energy Use	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
16.	Electricity Output (GWh)	0	0	0	0	0	0	0	0	0	0	234	16,701	0	0	0	0	0	0	0	0	16,935
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	3,768	0	0	0	0	0	0	0	0	0	3,768

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.
Note: Figures may not add up to total because of rounding.
Source: IEA (2011b).

Table 3.8.4 Tajikistan Energy Balance Table, 2007

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	78	0	12	0	0	0	0	0	0	0	12	1,472	0	0	0	0	0	0	0	0	1,574
2.	Imports	4	1	0	500	92	0	193	97	8	110	529	0	0	0	0	0	0	0	375	0	1,409
3.	Exports	0	0	–2	–8	0	0	0	0	0	–8	0	0	0	0	0	0	0	0	–366	0	–376
4.	International Bunkers	0	0	0	–4	0	0	0	0	0	–4	0	0	0	0	0	0	0	0	0	0	–4
5.	Stock Changes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6.	Total Primary Energy Supply	82	1	10	488	92	0	193	97	8	98	541	1,472	0	0	0	0	0	0	9	0	2,603
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	0	0	–10	8	0	0	0	0	0	8	–253	–1,472	0	0	0	0	0	0	1,505	93	–129
8.1	Power Generation	0	0	0	0	0	0	0	0	0	0	–253	–1,472	0	0	0	0	0	0	1,505	93	–127
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	–10	8	0	0	0	0	0	8	0	0	0	0	0	0	0	0	0	0	–2
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–269	0	–269
10.	Discrepancy	0	0	0	0	0	0	0	0	0	0	–1	0	0	0	0	0	0	0	21	0	20
11.	Total Final Energy Consumption	82	1	0	496	92	0	193	97	8	106	287	0	0	0	0	0	0	0	1,266	93	2,225
12.	Industry Sector	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	575	0	575
13.	Transport Sector	0	0	0	92	92	0	0	0	0	0	11	0	0	0	0	0	0	0	2	0	105
14.	Other Sectors	82	1	0	403	0	0	193	97	8	105	276	0	0	0	0	0	0	0	689	93	1,544
14.1	Residential and Commercial	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	303	0	303
14.1.1	Commerce and Public Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	27	0	27
14.1.2	Residential	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	276	0	276
14.2	Non-Specified Others	82	1	0	403	0	0	193	97	8	105	276	0	0	0	0	0	0	0	386	93	1,241
15.	Non-Energy Use	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
16.	Electricity Output (GWh)	0	0	0	0	0	0	0	0	0	0	380	17,114	0	0	0	0	0	0	0	0	17,494
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	3,894	0	0	0	0	0	0	0	0	0	3,894

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Source: IEA (2011b).

Table 3.8.5 Tajikistan Energy Balance Table, 2008

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	86	0	14	0	0	0	0	0	0	0	29	1,359	0	0	0	0	0	0	0	0	1,488
2.	Imports	5	1	0	524	89	0	208	125	8	94	419	0	0	0	0	0	0	0	456	0	1,405
3.	Exports	–1	0	–2	–11	0	0	0	0	0	–11	0	0	0	0	0	0	0	0	–380	0	–394
4.	International Bunkers	0	0	0	–4	0	0	0	0	0	–4	0	0	0	0	0	0	0	0	0	0	–4
5.	Stock Changes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6.	Total Primary Energy Supply	90	1	12	509	89	0	208	125	8	79	448	1,359	0	0	0	0	0	0	76	0	2,495
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	0	0	–12	11	0	0	0	0	0	11	–233	–1,359	0	0	0	0	0	0	1,389	86	–118
8.1	Power Generation	0	0	0	0	0	0	0	0	0	0	–233	–1,359	0	0	0	0	0	0	1,389	86	–117
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	–12	11	0	0	0	0	0	11	0	0	0	0	0	0	0	0	0	0	–1
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–260	0	–260
10.	Discrepancy	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	0	20
11.	Total Final Energy Consumption	90	1	0	520	89	0	208	125	8	90	215	0	0	0	0	0	0	0	1,225	86	2,137
12.	Industry Sector	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	556	0	556
13.	Transport Sector	0	0	0	89	89	0	0	0	0	0	11	0	0	0	0	0	0	0	2	0	102
14.	Other Sectors	90	1	0	430	0	0	208	125	8	89	204	0	0	0	0	0	0	0	667	86	1,478
14.1	Residential and Commercial	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	293	0	293
14.1.1	Commerce and Public Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	26	0	26
14.1.2	Residential	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	267	0	267
14.2	Non-Specified Others	90	1	0	430	0	0	208	125	8	89	204	0	0	0	0	0	0	0	374	86	1,185
15.	Non-Energy Use	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
16.	Electricity Output (GWh)	0	0	0	0	0	0	0	0	0	0	347	15,800	0	0	0	0	0	0	0	0	16,147
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	3,601	0	0	0	0	0	0	0	0	0	3,601

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.
Note: Figures may not add up to total because of rounding.
Source: IEA (2011b).

Table 3.8.6 Tajikistan Energy Balance Table, 2009

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	86	0	26	0	0	0	0	0	0	0	31	1,359	0	0	0	0	0	0	0	0	1,502
2.	Imports	6	1	0	502	83	0	219	109	8	83	332	0	0	0	0	0	0	0	370	0	1,211
3.	Exports	0	0	–4	–20	0	0	0	0	0	–20	0	0	0	0	0	0	0	0	–365	0	–389
4.	International Bunkers	0	0	0	–4	0	0	0	0	0	–4	0	0	0	0	0	0	0	0	0	0	–4
5.	Stock Changes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6.	Total Primary Energy Supply	92	1	22	478	83	0	219	109	8	59	363	1,359	0	0	0	0	0	0	5	0	2,320
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	0	0	–22	20	0	0	0	0	0	20	–214	–1,359	0	0	0	0	0	0	1,387	86	–102
8.1	Power Generation	0	0	0	0	0	0	0	0	0	0	–214	–1,359	0	0	0	0	0	0	1,387	86	–100
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	–22	20	0	0	0	0	0	20	0	0	0	0	0	0	0	0	0	0	–2
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–247	0	–247
10.	Discrepancy	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	0	20
11.	Total Final Energy Consumption	92	1	0	498	83	0	219	109	8	79	149	0	0	0	0	0	0	0	1,165	86	1,991
12.	Industry Sector	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	529	0	529
13.	Transport Sector	0	0	0	83	83	0	0	0	0	0	11	0	0	0	0	0	0	0	2	0	96
14.	Other Sectors	92	1	0	414	0	0	219	109	8	78	138	0	0	0	0	0	0	0	634	86	1,365
14.1	Residential and Commercial	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	279	0	279
14.1.1	Commerce and Public Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25	0	25
14.1.2	Residential	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	254	0	254
14.2	Non-Specified Others	92	1	0	414	0	0	219	109	8	78	138	0	0	0	0	0	0	0	355	86	1,086
15.	Non-Energy Use	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
16.	Electricity Output (GWh)	0	0	0	0	0	0	0	0	0	0	327	15,800	0	0	0	0	0	0	0	0	16,127
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	3,601	0	0	0	0	0	0	0	0	0	3,601

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Source: IEA (2011b).

Table 3.8.7 Tajikistan Summary Table, 1990–2009

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Indigenous Production (ktoe)																				
Coal	–	–	–	–	42	15	7	7	8	8	9	9	15	19	40	42	44	78	86	86
Oil	–	–	–	–	34	27	27	27	20	20	18	16	16	16	19	22	24	12	14	26
Gas	–	–	–	–	26	31	38	31	25	28	32	41	26	26	28	22	14	12	29	31
Hydro	–	–	–	–	1,435	1,255	1,275	1,179	1,217	1,327	1,206	1,222	1,304	1,405	1,405	1,459	1,436	1,472	1,359	1,359
Nuclear	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Geothermal	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Solar	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wind	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Biomass	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Others	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	–	–	–	–	1,537	1,328	1,347	1,244	1,270	1,383	1,265	1,288	1,361	1,466	1,492	1,545	1,518	1,574	1,488	1,502
Primary Energy Supply (ktoe)																				
Coal	–	–	–	–	30	15	7	17	15	11	13	13	19	24	44	46	48	83	91	93
Oil	–	–	–	–	407	388	311	306	356	278	189	268	316	279	334	286	358	498	521	500
Gas	–	–	–	–	648	510	528	630	644	640	627	502	424	460	536	537	537	541	448	363
Hydro	–	–	–	–	1,435	1,255	1,275	1,179	1,217	1,327	1,206	1,222	1,304	1,405	1,405	1,459	1,436	1,472	1,359	1,359
Nuclear	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Geothermal	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Solar	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wind	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Biomass	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Others	–	–	–	–	–43	57	28	9	21	–16	115	116	68	1	30	22	52	9	76	5
Total	–	–	–	–	2,477	2,225	2,149	2,141	2,253	2,240	2,150	2,121	2,131	2,169	2,349	2,350	2,431	2,603	2,495	2,320
Final Energy Consumption by Sector (ktoe)																				
Industry	–	–	–	–	626	593	582	427	408	437	462	485	494	539	550	566	573	575	556	529
Transport	–	–	–	–	75	69	54	53	46	27	19	35	44	38	51	53	70	105	102	96
Residential	–	–	–	–	151	173	170	204	248	279	280	247	284	259	264	272	275	276	267	254
Commercial	–	–	–	–	25	23	23	20	21	25	24	24	25	25	26	27	27	27	26	25
Others	–	–	–	–	1,238	1,079	1,010	1,072	1,156	1,094	1,019	985	962	962	1,070	1,036	1,097	1,242	1,186	1,087
Total	–	–	–	–	2,115	1,937	1,839	1,776	1,879	1,862	1,804	1,776	1,809	1,823	1,961	1,954	2,042	2,225	2,137	1,991

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Table 3.8.7 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Final Energy Consumption by Type (ktoe)																				
Coal	–	–	–	–	31	15	7	17	14	10	13	14	19	24	44	46	48	83	91	93
Oil	–	–	–	–	415	386	305	305	356	277	189	268	315	278	333	284	356	496	520	498
Gas	–	–	–	–	343	270	279	333	349	353	384	268	225	245	285	285	286	287	215	149
Electricity	–	–	–	–	1,232	1,192	1,171	1,031	1,068	1,138	1,142	1,150	1,169	1,188	1,212	1,248	1,262	1,266	1,225	1,165
Heat	–	–	–	–	94	74	77	90	92	84	76	76	81	88	87	91	90	93	86	86
Biomass	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Others	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	–	–	–	–	2,115	1,937	1,839	1,776	1,879	1,862	1,804	1,776	1,809	1,823	1,961	1,954	2,042	2,225	2,137	1,991
Power Generation (GWh)																				
Thermal	–	–	–	–	291	229	237	292	273	370	222	176	138	173	152	123	234	380	347	327
Hydro	–	–	–	–	16,691	14,596	14,825	13,713	14,149	15,427	14,025	14,206	15,164	16,336	16,339	16,967	16,701	17,114	15,800	15,800
Nuclear	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Geothermal	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Solar	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wind	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Others	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	–	–	–	–	16,982	14,825	15,062	14,005	14,422	15,797	14,247	14,382	15,302	16,509	16,491	17,090	16,935	17,494	16,147	16,127
Loss and Own Use of Electricity (GWh)																				
Transmission and Distribution Losses	–	–	–	–	2,151	1,616	1,767	1,953	2,093	2,221	2,140	2,186	2,326	2,523	2,453	2,744	2,744	2,953	2,860	2,721
Own Use	–	–	–	–	–	–	–	93	105	93	93	93	93	93	93	93	93	93	93	93
Total	–	–	–	–	2,151	1,616	1,767	2,047	2,198	2,314	2,233	2,279	2,419	2,616	2,547	2,837	2,837	3,047	2,953	2,814
Fuel Input for Power Generation (ktoe)																				
Coal	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Oil	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gas	–	–	–	–	189	148	153	184	181	192	148	140	97	105	142	137	139	137	126	107
Total	–	–	–	–	189	148	153	184	181	192	148	140	97	105	142	137	139	137	126	107
CO_2 Emissions (kt C)																				
Coal	–	–	–	–	34	16	8	19	15	11	14	15	21	26	48	50	52	90	99	101
Oil	–	–	–	–	351	327	258	258	327	267	182	244	282	254	299	257	318	436	453	431
Gas	–	–	–	–	416	327	338	403	413	416	402	322	271	295	343	343	344	346	287	233
Total	–	–	–	–	801	670	604	680	756	695	598	582	574	575	690	651	714	872	838	764

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Table 3.8.7 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Macroeconomic Indicators																				
Population (thousand)	5,303	5,419	5,519	5,608	5,692	5,775	5,860	5,945	6,028	6,104	6,173	6,233	6,286	6,337	6,391	6,453	6,525	6,604	6,691	6,783
Urban Population, %	31.7	31.1	30.6	30.0	29.5	28.9	28.4	27.9	27.5	27.0	26.5	26.5	26.5	26.4	26.4	26.4	26.4	26.4	26.5	26.5
GDP (constant 2000 $ million)	2,260	2,099	1,490	1,246	981	859	716	728	766	795	861	948	1,035	1,140	1,261	1,393	1,487	1,591	1,715	1,850
GDP (current $ million)	2,629	2,536	1,909	1,647	1,346	1,232	1,044	922	1,320	1,087	861	1,081	1,221	1,554	2,076	2,312	2,830	3,719	5,161	4,978
GDP (constant 2005 PPP $ million)	15,702	14,587	10,357	8,658	6,814	5,969	4,972	5,057	5,325	5,522	5,980	6,590	7,190	7,923	8,763	9,682	10,330	11,053	11,916	12,857
GDP/capita (constant 2000 $)	426	387	270	222	172	149	122	122	127	130	139	152	165	180	197	216	228	241	256	273
GDP/capita (current $)	496	468	346	294	236	213	178	155	219	178	139	173	194	245	325	358	434	563	771	734
GDP – Manufacturing (% of GDP)	34.3	36.2	39.1	38.5	33.5	33.1	30 .2	29 .1	29.9	30.3	30.8	31.5	32.4	32.3	32.5	31.4	31.8	31.5	30.9	30.4
Car Ownership (car/1,000 persons)	–	–	–	–	–	–	–	–	–	–	–	23	27	29	29	30	30	30	31	30
Basic Energy Indicators																				
TPES/capita (toe/person)	–	–	–	–	0.44	0.39	0.37	0.36	0.37	0.37	0.35	0.34	0.34	0.34	0.37	0.36	0.37	0.39	0.37	0.34
TFEC/capita (toe/person)	–	–	–	–	0.37	0.34	0.31	0.30	0.31	0.31	0.29	0.28	0.29	0.29	0.31	0.30	0.31	0.34	0.32	0.29
TPES/GDP (toe/constant 2000 $ million)	–	–	–	–	2,526	2,590	3,003	2,942	2,940	2,819	2,498	2,237	2,060	1,902	1,863	1,687	1,635	1,636	1,455	1,254
TFEC/GDP (toe/constant 2000 $ million)	–	–	–	–	2,157	2,255	2,570	2,441	2,452	2,343	2,096	1,873	1,748	1,599	1,555	1,402	1,374	1,399	1,246	1,076
Import Dependency (%)	–	–	–	–	37.9	40.3	37.3	41.9	43.6	38.3	41.2	39.3	36.1	32.4	36.5	34.3	37.6	39.5	40.4	35.3
Oil Import Dependency (%)	–	–	–	–	91.6	93.0	91.3	91.2	94.4	92.8	90.5	94.0	94.9	94.3	94.3	92.3	93.3	97.6	97.3	94.8
Electricity/capita (kWh/ person)	–	–	–	–	2,517	2,400	2,324	2,017	2,061	2,168	2,152	2,146	2,163	2,180	2,205	2,249	2,249	2,229	2,129	1,997
CO_2 Intensity (t C/constant 2000 $ million)	–	–	–	–	817	780	844	934	986	874	695	614	554	505	547	467	480	548	489	413
CO_2/capita (t C)	–	–	–	–	0.14	0.12	0.10	0.11	0.13	0.11	0.10	0.09	0.09	0.09	0.11	0.10	0.11	0.13	0.13	0.11
CO_2/TPES (t C/toe)	–	–	–	–	0.32	0.30	0.28	0.32	0.34	0.31	0.28	0.27	0.27	0.27	0.29	0.28	0.29	0.33	0.34	0.33

– = no data or not applicable, CO_2 = carbon dioxide, GDP = gross domestic product, GWh = gigawatt–hour, kt C = thousand tons of carbon equivalent, ktoe = thousand tons of oil equivalent, kWh = kilowatt–hour, PPP = purchasing power parity, t C = ton of carbon equivalent, TFEC = total final energy consumption, toe = ton of oil equivalent, TPES = total primary energy supply.

Note: Figures may not add up to total because of rounding.

Sources: APERC estimates, IEA (2011b), JAMA (2012), and World Bank.

3.9 Turkmenistan

Country Profile (2009)		Energy Reserves (year-end 2008)	
Total Surface Area (square kilometer)	488,100	Coal (million ton) - Recoverable	–
Population (thousand)	4,980	Gas (trillion cubic feet) - Proven	296.6
GDP (constant 2000 $ billion)	9.5	Oil (billion barrel) - Proven	600.0
Electrification Rate (%)	100.0		

– = no data or not applicable, GDP = gross domestic product.

Sources: ADB (2012), ADB estimates, World Bank, and WEC (2010).

2009 Energy Supply and Demand Flow (ktoe)

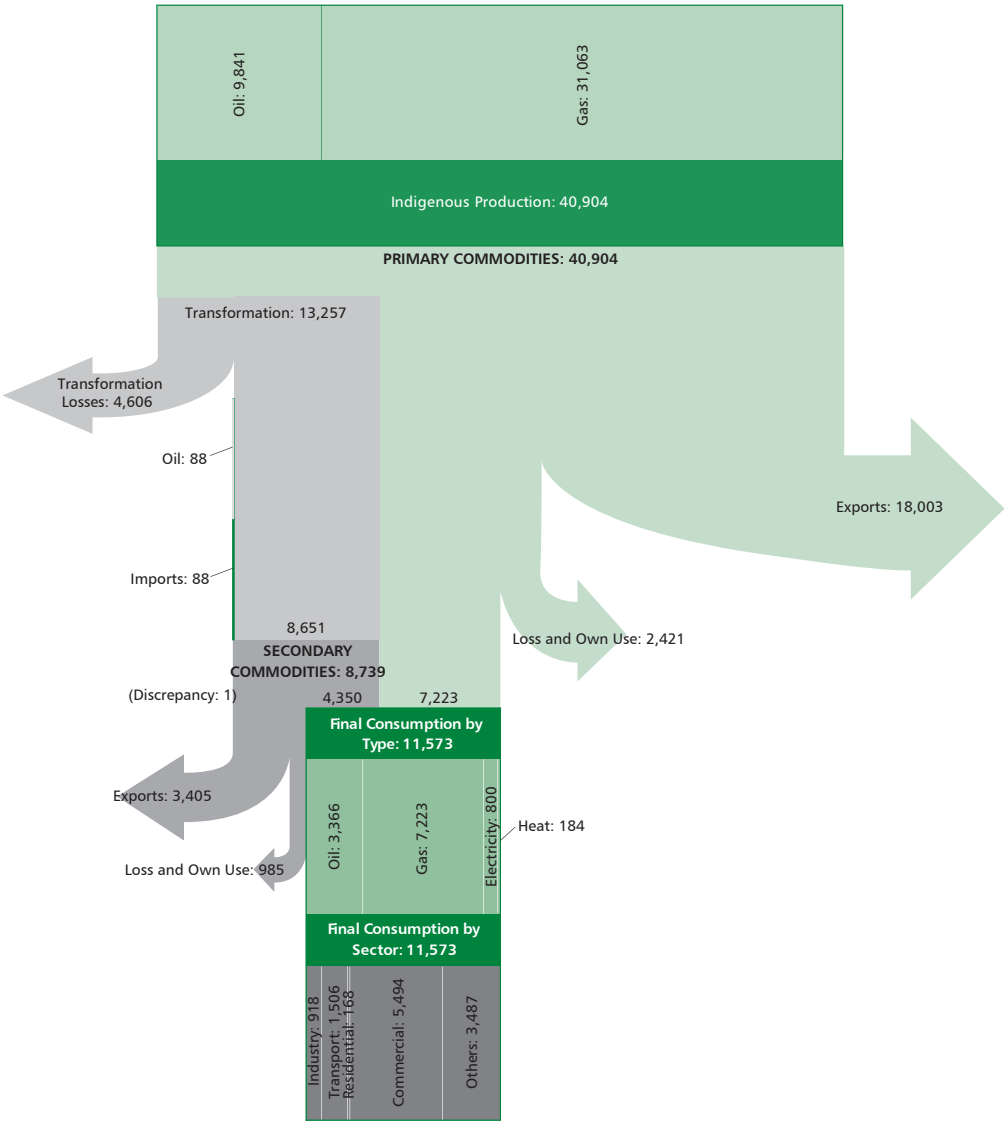


Table 3.9.1 Key Data and Economic Profile

	1990	1995	2000	2005	2009
Socioeconomic Data					
Population (thousand)	3,668	4,188	4,501	4,748	4,980
GDP (constant 2000 $ billion)	3.8	2.4	2.9	6.3	9.5
GDP (constant 2005 PPP $ billion)	13.8	8.6	10.5	22.6	34.3
GDP/capita (constant 2000 $)	1,042	569	645	1,323	1,912
GDP/capita (constant 2005 PPP $)	3,749	2,047	2,322	4,762	6,881

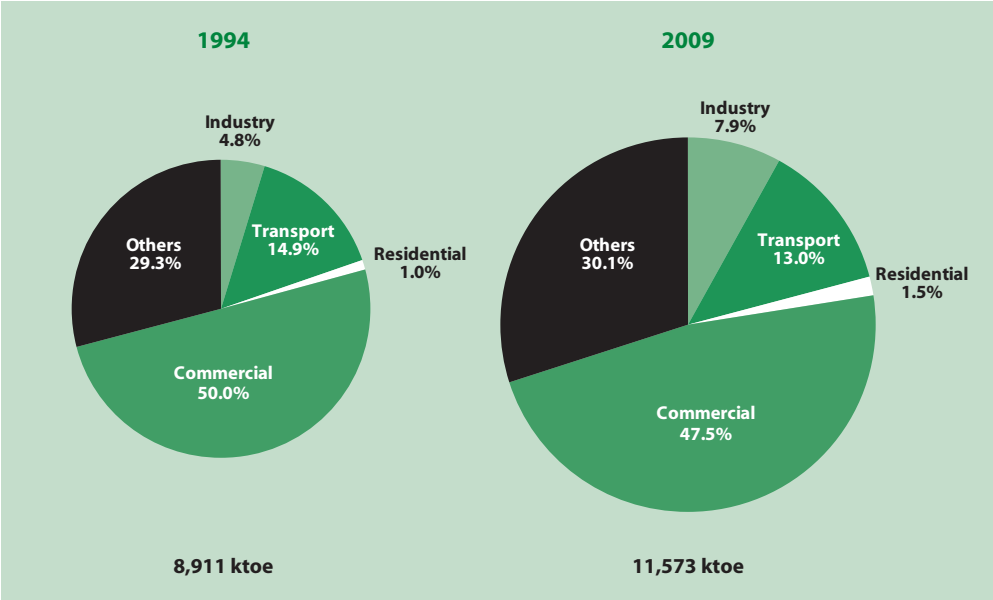
GDP = gross domestic product, PPP = purchasing power parity.
Source: World Bank.

Table 3.9.2 Energy Supply and Demand

	1990	1995	2000	2005	2009
Primary Energy Supply (ktoe)					
Indigenous Production	–	32,835	45,968	61,137	40,904
Net Imports	–	–18,939	–31,461	–42,627	–21,320
Total PES	–	13,896	14,507	18,510	19,584
Coal	–	0	0	0	0
Oil	–	2,866	3,677	4,369	4,649
Gas	–	11,204	10,899	14,249	15,070
Biomass	–	0	0	0	0
Others	–	–174	–69	–108	–135
TPES/capita (toe)	–	3.32	3.22	3.90	3.93
TPES/GDP (toe/constant 2005 PPP $ million)	–	1,621	1,388	819	572
Final Energy Consumption (ktoe)					
Industry	–	440	459	594	918
Transportation	–	1,251	1,858	2,401	1,506
Other Sectors	–	7,252	5,945	7,381	9,149
Total FEC	–	8,943	8,262	10,376	11,573
Coal	–	0	0	0	0
Oil	–	2,293	2,666	3,131	3,366
Gas	–	6,221	4,981	6,455	7,223
Electricity	–	429	502	642	800
Biomass	–	0	0	0	0
Others	–	0	113	148	184

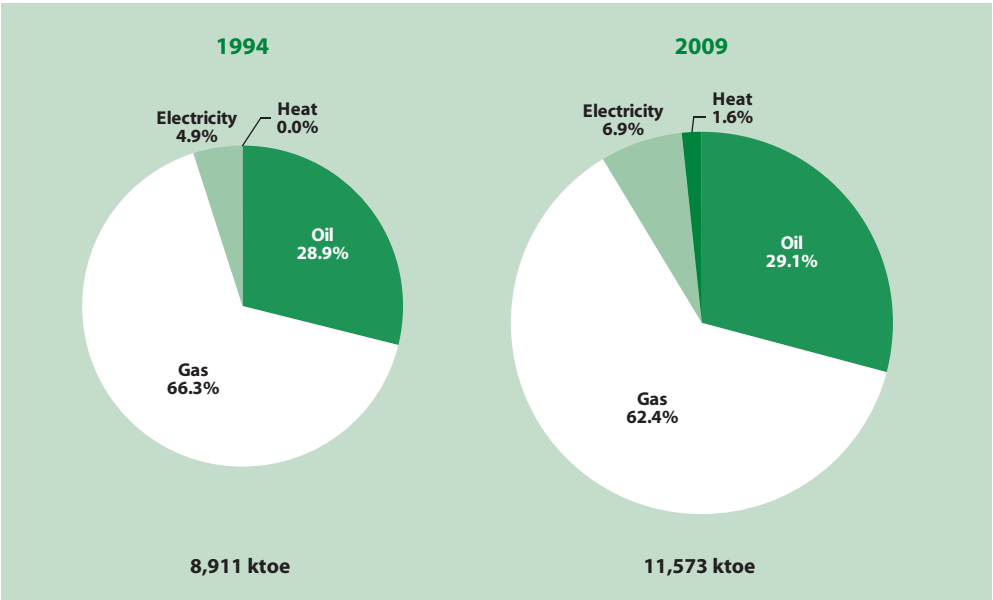
– = no data or not applicable, FEC = final energy consumption, GDP = gross domestic product, ktoe = thousand tons of oil equivalent, PES = primary energy supply, PPP = purchasing power parity, toe = ton of oil equivalent, TPES = total primary energy supply.
Source: IEA (2011b).

Figure 3.9.1 Final Energy Consumption by Sector, 1994 and 2009



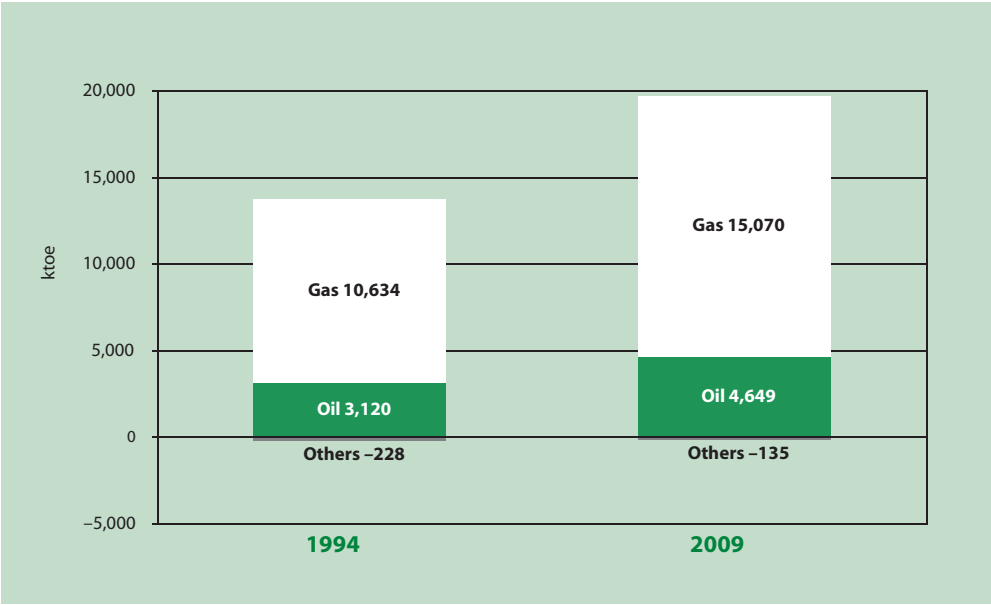
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 3.9.2 Final Energy Consumption by Type of Energy, 1994 and 2009



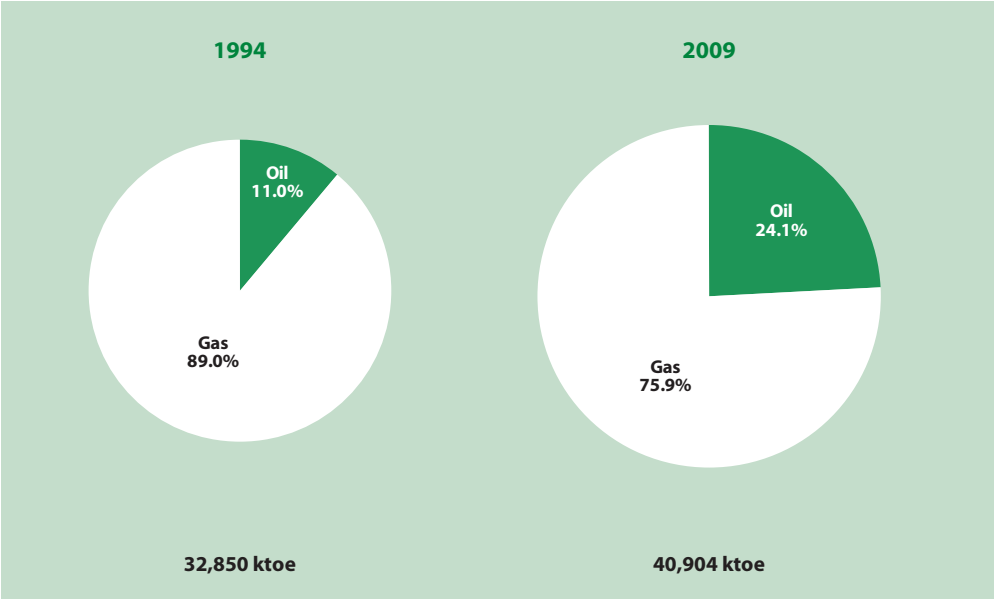
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 3.9.3 Total Primary Energy Supply, 1994 and 2009



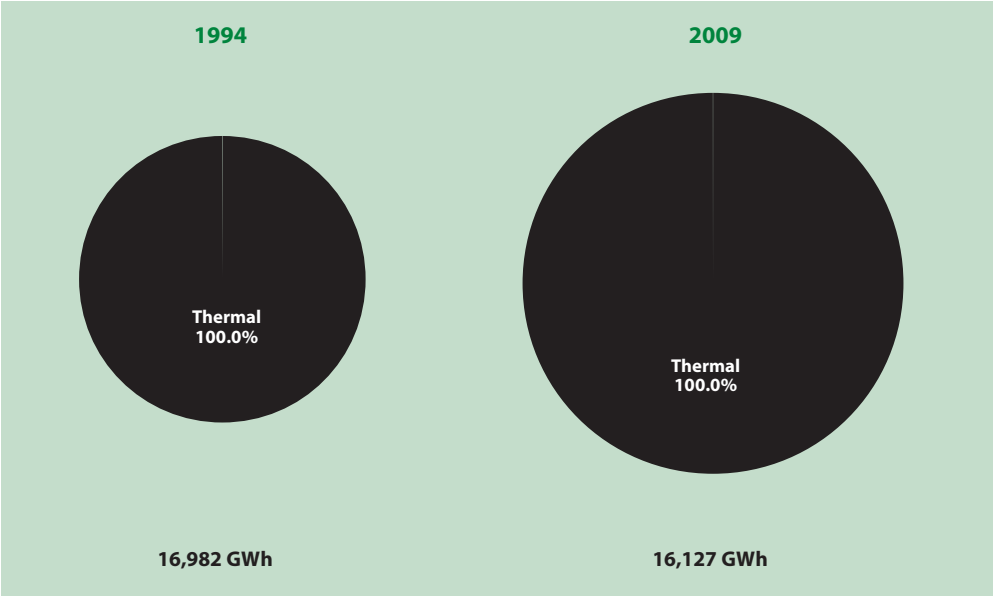
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 3.9.4 Indigenous Energy Production, 1994 and 2009



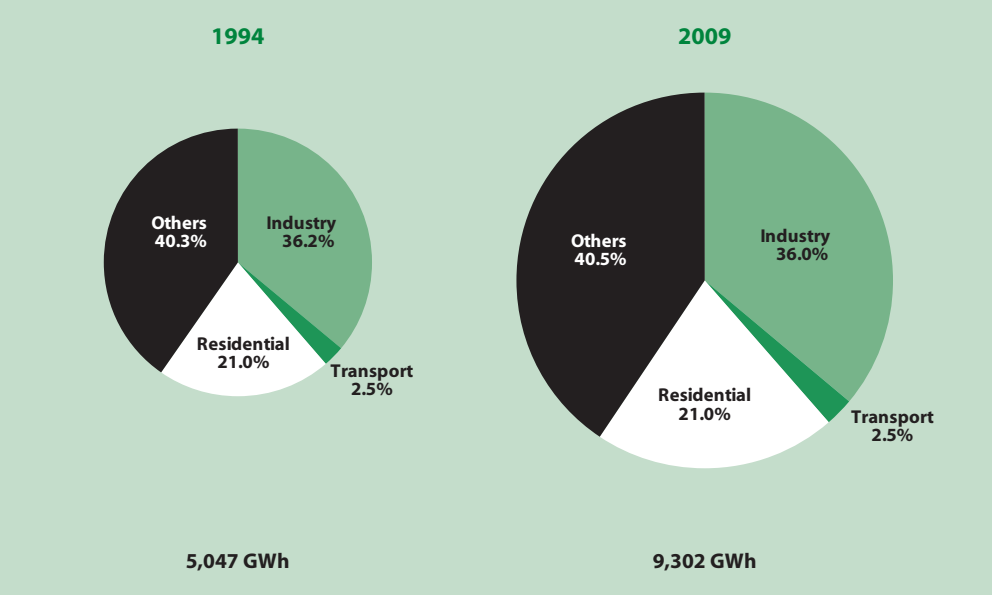
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 3.9.5 Electricity Generation by Plant Type, 1994 and 2009



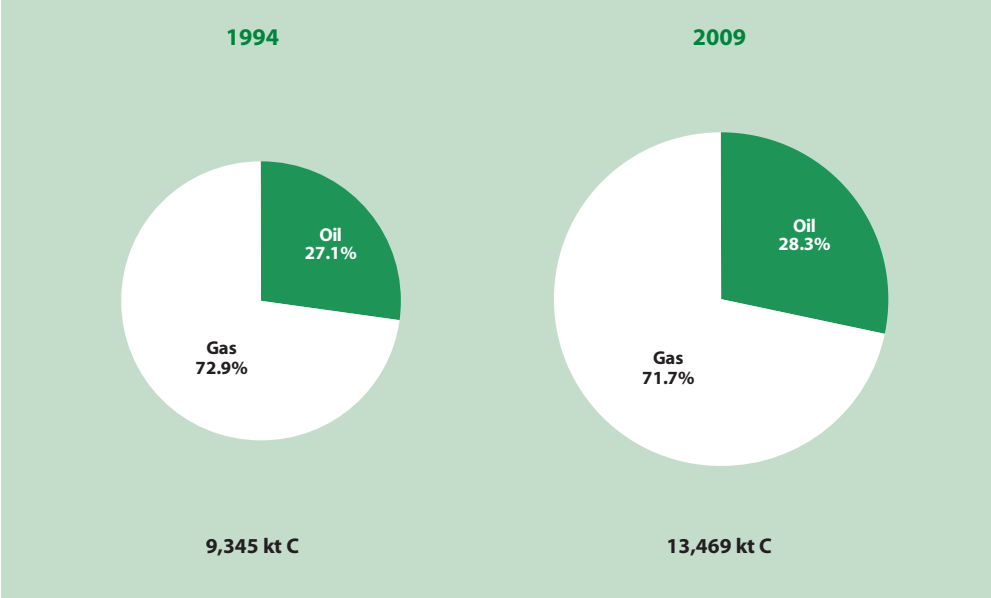
GWh = gigawatt-hour.
Source: IEA (2011b).

Figure 3.9.6 Electricity Consumption by Sector, 1994 and 2009



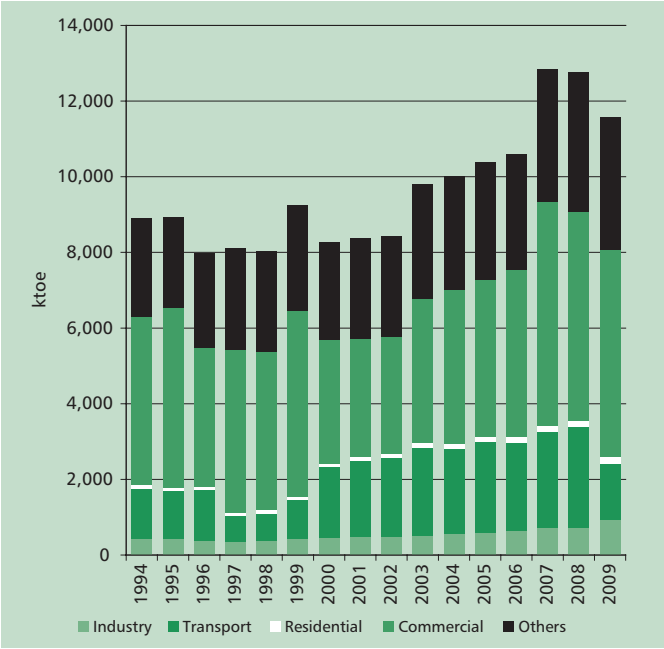
GWh = gigawatt-hour.
Source: IEA (2011b).

Figure 3.9.7 Carbon Dioxide Emissions from Fuel Combustion, 1994 and 2009



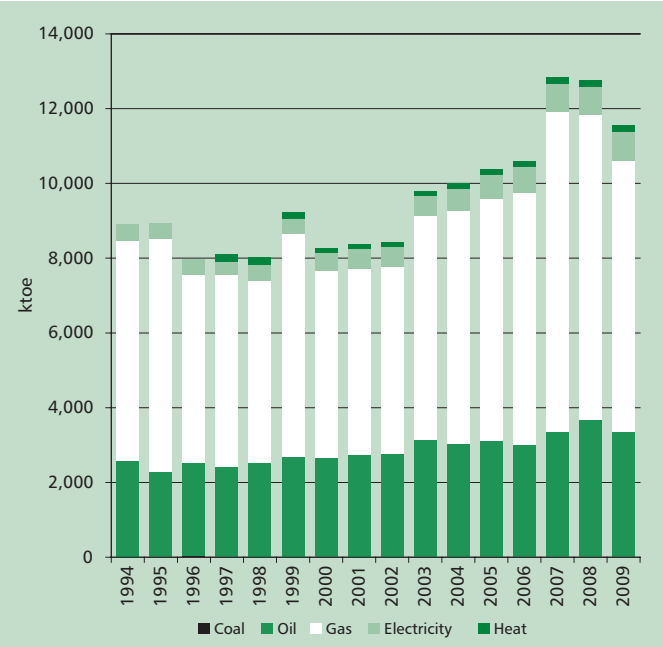
kt C = thousand tons of carbon equivalent.
Source: APERC estimates.

Figure 3.9.8 Final Energy Consumption by Sector, 1994–2009



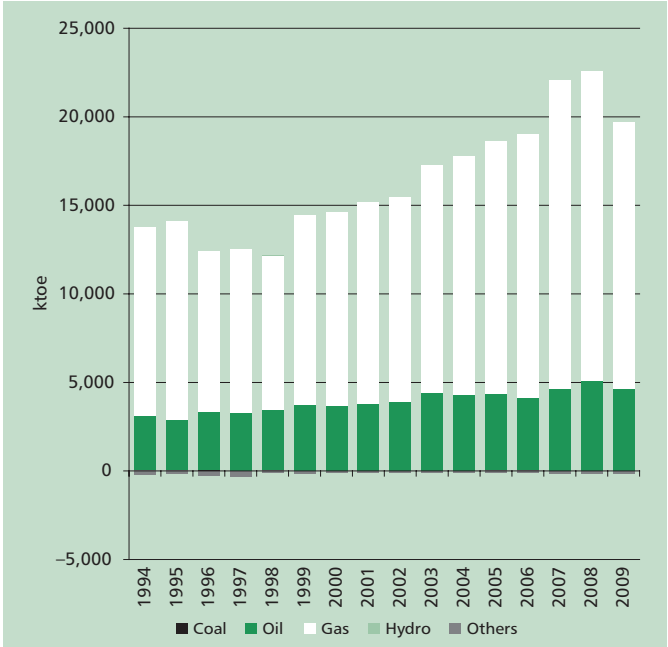
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 3.9.9 Final Energy Consumption by Type, 1994–2009



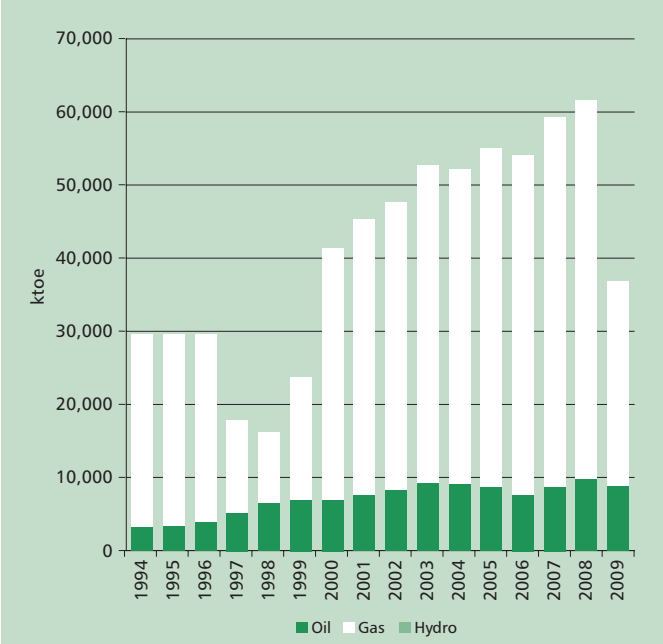
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 3.9.10 Total Primary Energy Supply, 1990–2009



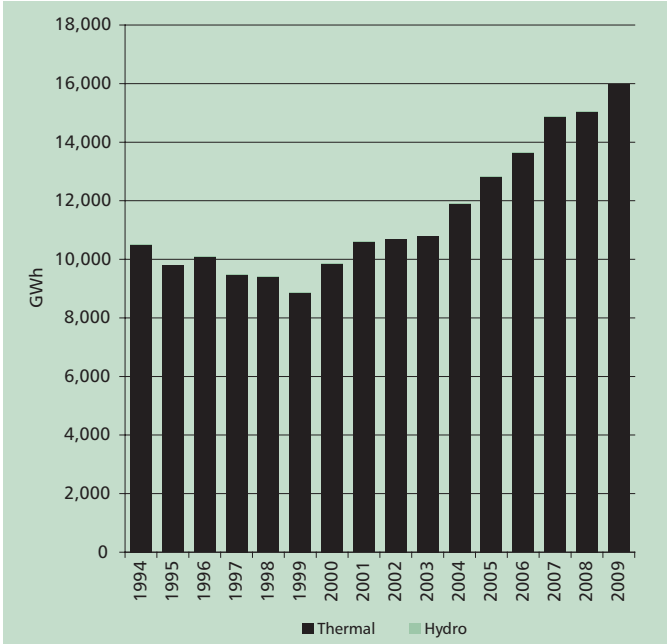
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 3.9.11 Indigenous Energy Production, 1994–2009



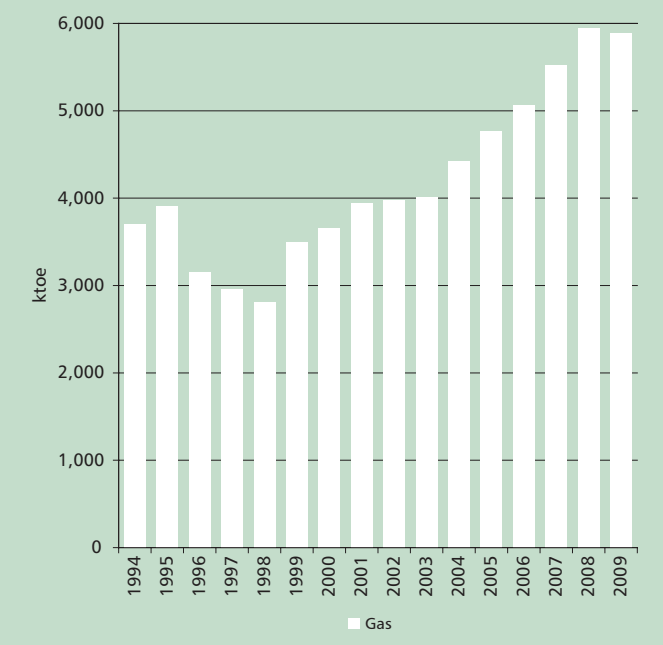
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 3.9.12 Electricity Generation by Source, 1994–2009



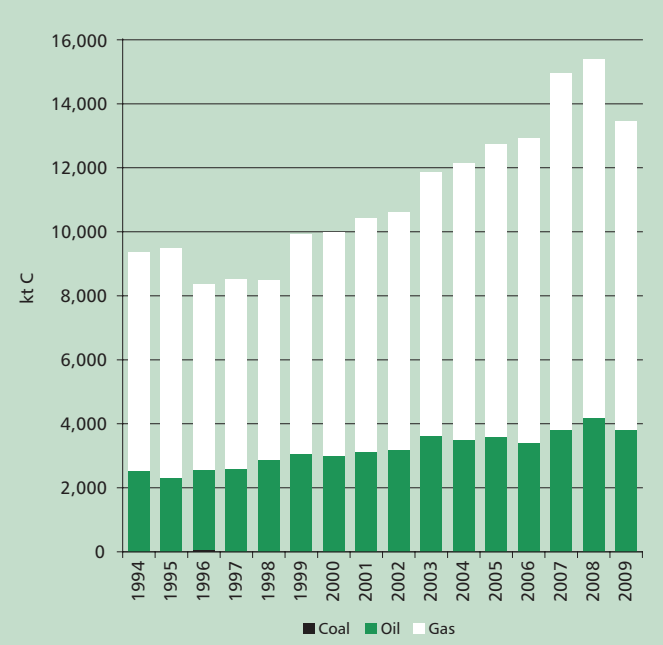
GWh = gigawatt-hour.
Source: IEA (2011b).

Figure 3.9.13 Fuel Input for Electricity Generation, 1994–2009



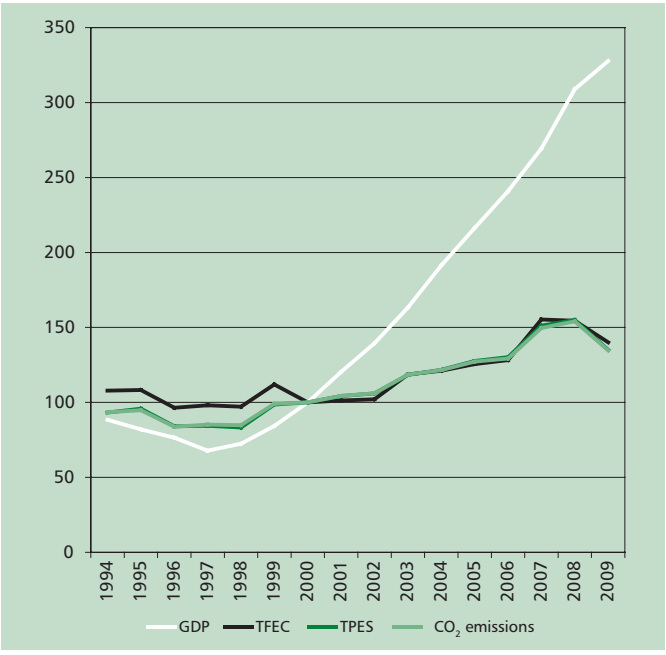
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 3.9.14 Carbon Dioxide Emissions from Fuel Combustion, 1994–2009



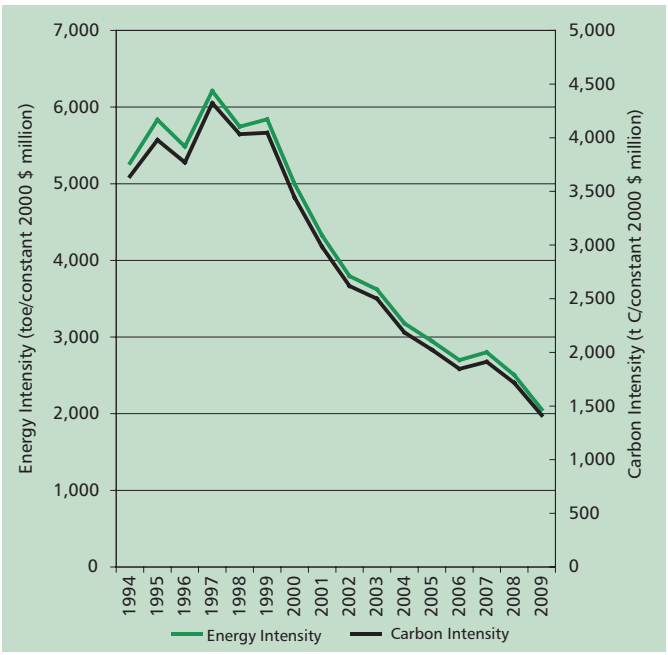
kt C = thousand tons of carbon equivalent.
Source: APERC estimates.

Figure 3.9.15 Growth of GDP, TFEC, TPES, and CO_2 Emissions (indexed to year 2000), 1994–2009



CO_2 = carbon dioxide, GDP = gross domestic product, TFEC = total final energy consumption, TPES = total primary energy supply.
Note: Indices are measured relative to the base year 2000 (2000 = 100).
Source: APERC estimates.

Figure 3.9.16 Energy and Carbon Intensities, 1994–2009



t C = ton of carbon equivalent, toe = ton of oil equivalent.
Source: APERC estimates.

Table 3.9.3 Turkmenistan Energy Balance Table, 2006

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	0	0	8,489	0	0	0	0	0	0	0	51,500	0	0	0	0	0	0	0	0	0	59,989
2.	Imports	0	0	0	88	0	0	0	0	88	0	0	0	0	0	0	0	0	0	0	0	88
3.	Exports	0	0	–1,507	–2,925	–562	0	–1,613	–750	0	0	–36,641	0	0	0	0	0	0	0	–115	0	–41,188
4.	International Bunkers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5.	Stock Changes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6.	Total Primary Energy Supply	0	0	6,982	–2,837	–562	0	–1,613	–750	88	0	14,859	0	0	0	0	0	0	0	–115	0	18,889
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	0	0	–6,382	6,343	1,329	0	2,556	1,667	0	791	–5,267	0	0	0	0	0	0	0	1,174	157	–3,975
8.1	Power Generation	0	0	0	0	0	0	0	0	0	0	–5,267	0	0	0	0	0	0	0	1,174	157	–3,936
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	–6,382	6,343	1,329	0	2,556	1,667	0	791	0	0	0	0	0	0	0	0	0	0	–39
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	0	0	–600	–487	0	0	0	0	0	–487	–2,860	0	0	0	0	0	0	0	–376	0	–4,323
10.	Discrepancy	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
11.	Total Final Energy Consumption	0	0	0	3,019	767	0	943	917	88	304	6,733	0	0	0	0	0	0	0	683	157	10,592
12.	Industry Sector	0	0	0	0	0	0	0	0	0	0	378	0	0	0	0	0	0	0	246	0	624
13.	Transport Sector	0	0	0	767	767	0	0	0	0	0	1,570	0	0	0	0	0	0	0	17	0	2,354
14.	Other Sectors	0	0	0	2,252	0	0	943	917	88	304	4,785	0	0	0	0	0	0	0	420	157	7,614
14.1	Residential and Commercial	0	0	0	0	0	0	0	0	0	0	4,407	0	0	0	0	0	0	0	143	0	4,550
14.1.1	Commerce and Public Services	0	0	0	0	0	0	0	0	0	0	4,407	0	0	0	0	0	0	0	0	0	4,407
14.1.2	Residential	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	143	0	143
14.2	Non-Specified Others	0	0	0	2,252	0	0	943	917	88	304	378	0	0	0	0	0	0	0	277	157	3,064
15.	Non-Energy Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16.	Electricity Output (GWh)	0	0	0	0	0	0	0	0	0	0	13,647	3	0	0	0	0	0	0	0	0	13,650
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	6,573	0	0	0	0	0	0	0	0	0	6,573

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.
Note: Figures may not add up to total because of rounding.
Source: IEA (2011b).

Table 3.9.4 Turkmenistan Energy Balance Table, 2007

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	0	0	9,733	0	0	0	0	0	0	0	56,084	0	0	0	0	0	0	0	0	0	65,817
2.	Imports	0	0	0	88	0	0	0	0	88	0	0	0	0	0	0	0	0	0	0	0	88
3.	Exports	0	0	–1,909	–3,270	–628	0	–1,803	–839	0	0	–38,676	0	0	0	0	0	0	0	–126	0	–43,981
4.	International Bunkers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5.	Stock Changes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6.	Total Primary Energy Supply	0	0	7,824	–3,182	–628	0	–1,803	–839	88	0	17,408	0	0	0	0	0	0	0	–126	0	21,924
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	0	0	–7,135	7,093	1,486	0	2,858	1,864	0	885	–5,742	0	0	0	0	0	0	0	1,279	172	–4,333
8.1	Power Generation	0	0	0	0	0	0	0	0	0	0	–5,742	0	0	0	0	0	0	0	1,279	172	–4,291
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	–7,135	7,093	1,486	0	2,858	1,864	0	885	0	0	0	0	0	0	0	0	0	0	–42
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	0	0	–688	–545	0	0	0	0	0	–545	–3,114	0	0	0	0	0	0	0	–410	0	–4,757
10.	Discrepancy	0	0	–1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
11.	Total Final Energy Consumption	0	0	0	3,366	858	0	1,055	1,025	88	340	8,552	0	0	0	0	0	0	0	744	172	12,834
12.	Industry Sector	0	0	0	0	0	0	0	0	0	0	443	0	0	0	0	0	0	0	268	0	711
13.	Transport Sector	0	0	0	858	858	0	0	0	0	0	1,658	0	0	0	0	0	0	0	19	0	2,535
14.	Other Sectors	0	0	0	2,508	0	0	1,055	1,025	88	340	6,451	0	0	0	0	0	0	0	457	172	9,588
14.1	Residential and Commercial	0	0	0	0	0	0	0	0	0	0	5,942	0	0	0	0	0	0	0	156	0	6,098
14.1.1	Commerce and Public Services	0	0	0	0	0	0	0	0	0	0	5,942	0	0	0	0	0	0	0	0	0	5,942
14.1.2	Residential	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	156	0	156
14.2	Non-Specified Others	0	0	0	2,508	0	0	1,055	1,025	88	340	509	0	0	0	0	0	0	0	301	172	3,490
15.	Non-Energy Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16.	Electricity Output (GWh)	0	0	0	0	0	0	0	0	0	0	14,877	3	0	0	0	0	0	0	0	0	14,880
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	7,201	0	0	0	0	0	0	0	0	0	7,201

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Source: IEA (2011b).

Table 3.9.5 Turkmenistan Energy Balance Table, 2008

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	0	0	11,007	0	0	0	0	0	0	0	57,404	0	0	0	0	0	0	0	0	0	68,411
2.	Imports	0	0	0	88	0	0	0	0	88	0	0	0	0	0	0	0	0	0	0	0	88
3.	Exports	0	0	–2,412	–3,582	–688	0	–1,975	–919	0	0	–39,898	0	0	0	0	0	0	0	–127	0	–46,019
4.	International Bunkers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5.	Stock Changes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6.	Total Primary Energy Supply	0	0	8,595	–3,494	–688	0	–1,975	–919	88	0	17,506	0	0	0	0	0	0	0	–127	0	22,480
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	0	0	–7,817	7,771	1,628	0	3,131	2,042	0	970	–6,160	0	0	0	0	0	0	0	1,293	173	–4,740
8.1	Power Generation	0	0	0	0	0	0	0	0	0	0	–6,160	0	0	0	0	0	0	0	1,293	173	–4,694
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	–7,817	7,771	1,628	0	3,131	2,042	0	970	0	0	0	0	0	0	0	0	0	0	–46
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	0	0	–778	–597	0	0	0	0	0	–597	–3,187	0	0	0	0	0	0	0	–414	0	–4,976
10.	Discrepancy	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
11.	Total Final Energy Consumption	0	0	0	3,680	940	0	1,156	1,123	88	373	8,159	0	0	0	0	0	0	0	753	173	12,765
12.	Industry Sector	0	0	0	0	0	0	0	0	0	0	446	0	0	0	0	0	0	0	271	0	717
13.	Transport Sector	0	0	0	940	940	0	0	0	0	0	1,710	0	0	0	0	0	0	0	19	0	2,669
14.	Other Sectors	0	0	0	2,740	0	0	1,156	1,123	88	373	6,003	0	0	0	0	0	0	0	463	173	9,379
14.1	Residential and Commercial	0	0	0	0	0	0	0	0	0	0	5,529	0	0	0	0	0	0	0	158	0	5,687
14.1.1	Commerce and Public Services	0	0	0	0	0	0	0	0	0	0	5,529	0	0	0	0	0	0	0	0	0	5,529
14.1.2	Residential	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	158	0	158
14.2	Non-Specified Others	0	0	0	2,740	0	0	1,156	1,123	88	373	474	0	0	0	0	0	0	0	305	173	3,692
15.	Non-Energy Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16.	Electricity Output (GWh)	0	0	0	0	0	0	0	0	0	0	15,037	3	0	0	0	0	0	0	0	0	15,040
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	7,243	0	0	0	0	0	0	0	0	0	7,243

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.
Note: Figures may not add up to total because of rounding.
Source: IEA (2011b).

Table 3.9.6 Turkmenistan Energy Balance Table, 2009

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	0	0	9,841	0	0	0	0	0	0	0	31,063	0	0	0	0	0	0	0	0	0	40,904
2.	Imports	0	0	0	88	0	0	0	0	88	0	0	0	0	0	0	0	0	0	0	0	88
3.	Exports	0	0	–2,010	–3,270	–628	0	–1,803	–839	0	0	–15,993	0	0	0	0	0	0	0	–135	0	–21,408
4.	International Bunkers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5.	Stock Changes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6.	Total Primary Energy Supply	0	0	7,831	–3,182	–628	0	–1,803	–839	88	0	15,070	0	0	0	0	0	0	0	–135	0	19,584
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	0	0	–7,135	7,093	1,486	0	2,858	1,864	0	885	–6,122	0	0	0	0	0	0	0	1,374	184	–4,606
8.1	Power Generation	0	0	0	0	0	0	0	0	0	0	–6,122	0	0	0	0	0	0	0	1,374	184	–4,564
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	–7,135	7,093	1,486	0	2,858	1,864	0	885	0	0	0	0	0	0	0	0	0	0	–42
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	0	0	–696	–545	0	0	0	0	0	–545	–1,725	0	0	0	0	0	0	0	–440	0	–3,406
10.	Discrepancy	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
11.	Total Final Energy Consumption	0	0	0	3,366	858	0	1,055	1,025	88	340	7,223	0	0	0	0	0	0	0	800	184	11,573
12.	Industry Sector	0	0	0	0	0	0	0	0	0	0	630	0	0	0	0	0	0	0	288	0	918
13.	Transport Sector	0	0	0	858	858	0	0	0	0	0	628	0	0	0	0	0	0	0	20	0	1,506
14.	Other Sectors	0	0	0	2,508	0	0	1,055	1,025	88	340	5,965	0	0	0	0	0	0	0	492	184	9,149
14.1	Residential and Commercial	0	0	0	0	0	0	0	0	0	0	5,494	0	0	0	0	0	0	0	168	0	5,662
14.1.1	Commerce and Public Services	0	0	0	0	0	0	0	0	0	0	5,494	0	0	0	0	0	0	0	0	0	5,494
14.1.2	Residential	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	168	0	168
14.2	Non-Specified Others	0	0	0	2,508	0	0	1,055	1,025	88	340	471	0	0	0	0	0	0	0	324	184	3,487
15.	Non-Energy Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16.	Electricity Output (GWh)	0	0	0	0	0	0	0	0	0	0	15,977	3	0	0	0	0	0	0	0	0	15,980
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	7,704	0	0	0	0	0	0	0	0	0	7,704

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Source: IEA (2011b).

Table 3.9.7 Turkmenistan Summary Table, 1990–2009

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Indigenous Production (ktoe)																				
Coal	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Oil	–	–	–	–	3,613	3,763	4,352	5,769	7,374	7,743	7,766	8,620	9,300	10,381	10,139	9,840	8,489	9,733	11,007	9,841
Gas	–	–	–	–	29,237	29,072	28,503	14,031	10,740	18,588	38,202	41,770	43,562	48,170	47,690	51,297	51,500	56,084	57,404	31,063
Hydro	–	–	–	–	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
Nuclear	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Geothermal	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Solar	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wind	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Biomass	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Others	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	–	–	–	–	32,850	32,835	32,855	19,800	18,115	26,331	45,968	50,390	52,862	58,551	57,829	61,137	59,989	65,817	68,411	40,904
Primary Energy Supply (ktoe)																				
Coal	–	–	–	–	0	0	44	0	0	0	0	0	0	0	0	0	0	0	0	0
Oil	–	–	–	–	3,120	2,866	3,328	3,291	3,443	3,717	3,677	3,812	3,898	4,432	4,276	4,369	4,145	4,642	5,101	4,649
Gas	–	–	–	–	10,634	11,204	9,059	9,246	8,752	10,711	10,899	11,399	11,563	12,832	13,492	14,249	14,859	17,408	17,506	15,070
Hydro	–	–	–	–	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
Nuclear	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Geothermal	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Solar	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wind	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Biomass	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Others	–	–	–	–	–228	–174	–241	–297	–112	–120	–69	–90	–91	–92	–101	–108	–115	–126	–127	–135
Total	–	–	–	–	13,526	13,896	12,190	12,240	12,084	14,308	14,507	15,121	15,370	17,172	17,667	18,510	18,889	21,924	22,480	19,584
Final Energy Consumption by Sector (ktoe)																				
Industry	–	–	–	–	428	440	377	356	385	422	459	481	487	522	559	594	624	711	717	918
Transport	–	–	–	–	1,326	1,251	1,351	678	718	1,033	1,858	2,008	2,085	2,329	2,251	2,401	2,354	2,535	2,669	1,506
Residential	–	–	–	–	91	90	85	70	95	87	105	111	112	113	125	135	143	156	158	168
Commercial	–	–	–	–	4,455	4,762	3,653	4,325	4,180	4,915	3,254	3,126	3,085	3,822	4,085	4,148	4,407	5,942	5,529	5,494
Others	–	–	–	–	2,611	2,400	2,505	2,675	2,649	2,792	2,586	2,643	2,665	3,018	2,989	3,098	3,064	3,490	3,692	3,487
Total	–	–	–	–	8,911	8,943	7,971	8,104	8,027	9,249	8,262	8,369	8,434	9,804	10,009	10,376	10,592	12,834	12,765	11,573

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Table 3.9.7 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Final Energy Consumption by Type (ktoe)																				
Coal	–	–	–	–	0	0	44	0	0	0	0	0	0	0	0	0	0	0	0	0
Oil	–	–	–	–	2,572	2,293	2,494	2,424	2,523	2,702	2,666	2,731	2,762	3,149	3,031	3,131	3,019	3,366	3,680	3,366
Gas	–	–	–	–	5,905	6,221	5,030	5,136	4,860	5,947	4,981	4,986	5,014	5,991	6,245	6,455	6,733	8,552	8,159	7,223
Electricity	–	–	–	–	434	429	403	335	449	414	502	530	535	540	596	642	683	744	753	800
Heat	–	–	–	–	0	0	0	209	195	186	113	122	123	124	137	148	157	172	173	184
Biomass	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Others	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	–	–	–	–	8,911	8,943	7,971	8,104	8,027	9,249	8,262	8,369	8,434	9,804	10,009	10,376	10,592	12,834	12,765	11,573
Power Generation (GWh)																				
Thermal	–	–	–	–	10,492	9,796	10,095	9,493	9,410	8,855	9,840	10,607	10,697	10,797	11,917	12,817	13,647	14,877	15,037	15,977
Hydro	–	–	–	–	4	4	5	5	6	5	5	3	3	3	3	3	3	3	3	3
Nuclear	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Geothermal	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Solar	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wind	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Others	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	–	–	–	–	10,496	9,800	10,100	9,498	9,416	8,860	9,845	10,610	10,700	10,800	11,920	12,820	13,650	14,880	15,040	15,980
Loss and Own Use of Electricity (GWh)																				
Transmission and Distribution Losses	–	–	–	–	977	1,209	1,128	930	1,256	1,151	1,407	1,477	1,500	1,512	1,663	1,791	1,907	2,081	2,105	2,233
Own Use	–	–	–	–	663	651	616	500	674	616	756	791	802	814	895	965	1,023	1,116	1,128	1,198
Total	–	–	–	–	1,640	1,860	1,744	1,430	1,930	1,767	2,163	2,267	2,302	2,326	2,558	2,756	2,930	3,198	3,233	3,430
Fuel Input for Power Generation (ktoe)																				
Coal	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Oil	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gas	–	–	–	–	3,705	3,904	3,156	2,958	2,806	3,500	3,656	3,942	3,974	4,011	4,428	4,762	5,071	5,527	5,944	5,892
Total	–	–	–	–	3,705	3,904	3,156	2,958	2,806	3,500	3,656	3,942	3,974	4,011	4,428	4,762	5,071	5,527	5,944	5,892
CO_2 Emissions (kt C)																				
Coal	–	–	–	–	0	0	48	0	0	0	0	0	0	0	0	0	0	0	0	0
Oil	–	–	–	–	2,533	2,299	2,526	2,598	2,875	3,049	3,016	3,129	3,199	3,638	3,508	3,588	3,400	3,809	4,188	3,816
Gas	–	–	–	–	6,813	7,178	5,803	5,922	5,607	6,861	6,982	7,302	7,406	8,220	8,643	9,128	9,519	11,152	11,214	9,654
Total	–	–	–	–	9,345	9,476	8,377	8,520	8,482	9,911	9,998	10,431	10,605	11,858	12,151	12,716	12,919	14,961	15,402	13,469

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Table 3.9.7 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Macroeconomic Indicators																				
Population (thousand)	3,668	3,772	3,882	3,992	4,096	4,188	4,268	4,336	4,395	4,449	4,501	4,552	4,600	4,648	4,697	4,748	4,802	4,859	4,918	4,980
Urban Population, %	45.1	45.1	45.2	45.2	45.3	45.3	45.4	45.5	45.6	45.7	45.8	46.1	46.4	46.7	47.0	47.3	47.7	48.2	48.6	49.1
GDP (constant 2000 $ million)	3,821	3,641	3,448	3,104	2,567	2,382	2,222	1,971	2,103	2,449	2,905	3,498	4,051	4,743	5,559	6,282	6,998	7,824	8,974	9,521
GDP (current $ million)	3,232	3,197	3,201	3,179	2,561	2,482	2,379	2,450	2,606	2,451	2,905	3,535	4,462	5,977	6,838	8,104	10,278	12,664	19,272	18,651
GDP (constant 2005 PPP $ million)	13,751	13,105	12,411	11,170	9,237	8,572	7,998	7,094	7,569	8,815	10,454	12,589	14,578	17,071	20,008	22,609	25,186	28,158	32,297	34,267
GDP/capita (constant 2000 $)	1,042	965	888	777	627	569	521	455	479	550	645	768	881	1,021	1,184	1,323	1,457	1,610	1,825	1,912
GDP/capita (current $)	881	848	824	796	625	593	558	565	593	551	645	777	970	1,286	1,456	1,707	2,140	2,606	3,918	3,745
GDP – Manufacturing (% of GDP)	6.9	7.2	18.5	13.3	10.9	15.3	17.9	10.9	9.5	9.9	9.8	8.6	6.9	6.0	5.3	5.1	5.0	5.2	7.2	7.2
Car Ownership (car/1,000 persons)	–	–	–	–	–	–	–	–	–	–	–	20	22	22	22	22	22	22	22	22
Basic Energy Indicators																				
TPES/capita (toe/person)	–	–	–	–	3.30	3.32	2.86	2.82	2.75	3.22	3.22	3.32	3.34	3.69	3.76	3.90	3.93	4.51	4.57	3.93
TFEC/capita (toe/person)	–	–	–	–	2.18	2.14	1.87	1.87	1.83	2.08	1.84	1.84	1.83	2.11	2.13	2.19	2.21	2.64	2.60	2.32
TPES/GDP (toe/constant 2000 $ million)	–	–	–	–	5,270	5,834	5,486	6,210	5,746	5,842	4,994	4,323	3,794	3,620	3,178	2,947	2,699	2,802	2,505	2,057
TFEC/GDP (toe/constant 2000 $ million)	–	–	–	–	3,472	3,755	3,587	4,111	3,817	3,776	2,844	2,393	2,082	2,067	1,800	1,652	1,514	1,640	1,422	1,215
Import Dependency (%)	–	–	–	–	–142.9	–136.3	–169.5	–61.8	–49.9	–84.0	–216.9	–233.2	–243.9	–241.0	–227.3	–230.3	–217.6	–200.2	–204.3	–108.9
Oil Import Dependency (%)	–	–	–	–	–15.8	–31.3	–30.8	–75.3	–114.2	–108.3	–111.2	–126.1	–138.6	–134.2	–137.1	–125.2	–104.8	–109.7	–115.8	–111.7
Electricity/capita (kWh/ person)	–	–	–	–	1,232	1,191	1,098	899	1,188	1,082	1,297	1,354	1,353	1,351	1,476	1,573	1,654	1,781	1,781	1,868
CO_2 Intensity (t C/constant 2000 $ million)	–	–	–	–	3,641	3,979	3,770	4,322	4,033	4,046	3,442	2,982	2,618	2,500	2,186	2,024	1,846	1,912	1,716	1,415
CO_2/capita (t C)	–	–	–	–	2.28	2.26	1.96	1.96	1.93	2.23	2.22	2.29	2.31	2.55	2.59	2.68	2.69	3.08	3.13	2.70
CO_2/TPES (t C/toe)	–	–	–	–	0.69	0.68	0.69	0.70	0.70	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.68	0.68	0.69	0.69

– = no data or not applicable, CO_2 = carbon dioxide, GDP = gross domestic product, GWh = gigawatt–hour, kt C = thousand tons of carbon equivalent, ktoe = thousand tons of oil equivalent, kWh = kilowatt–hour, PPP = purchasing power parity, t C = ton of carbon equivalent, TFEC = total final energy consumption, toe = ton of oil equivalent, TPES = total primary energy supply.

Note: Figures may not add up to total because of rounding.

Sources: APERC estimates, IEA (2011b), JAMA (2012), and World Bank.

3.10 Uzbekistan

Country Profile (2009)		Energy Reserves (year-end 2008)	
Total Surface Area (square kilometer)	447,400	Coal (million ton) - Recoverable	1,900.0
Population (thousand)	27,767	Gas (trillion cubic feet) - Proven	61.6
GDP (constant 2000 $ billion)	24.8	Oil (billion barrel) - Proven	594.0
Electrification Rate (%)	–		

– = no data or not applicable, GDP = gross domestic product.

Note: The latest available data on electrification rate is for the year 2002, which is 99.7%.

Sources: ADB (2012), ADB estimates, World Bank, and WEC (2010).

2009 Energy Supply and Demand Flow (ktoe)

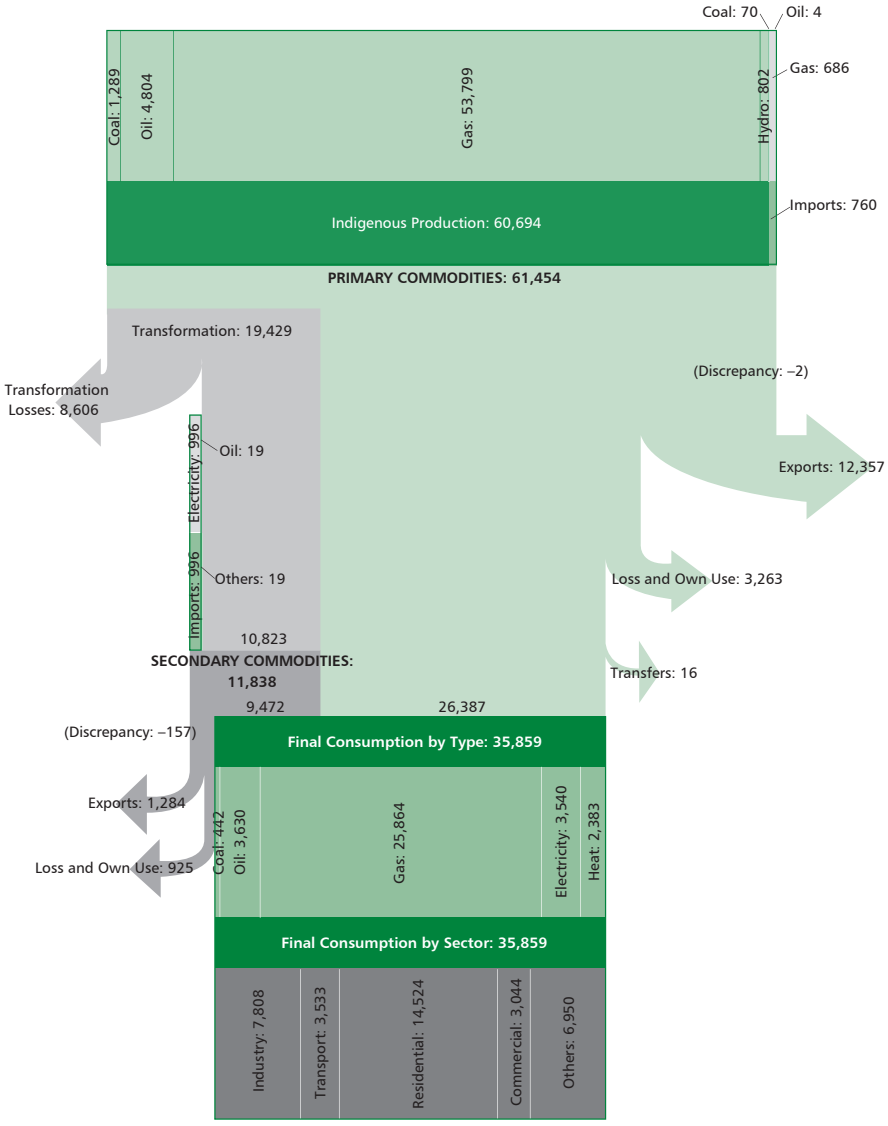


Table 3.10.1 Key Data and Economic Profile

	1990	1995	2000	2005	2009
Socioeconomic Data					
Population (thousand)	20,510	22,785	24,650	26,167	27,767
GDP (constant 2000 $ billion)	14.0	11.4	13.8	17.9	24.8
GDP (constant 2005 PPP $ billion)	41.1	33.3	40.2	52.4	72.5
GDP/capita (constant 2000 $)	685	500	558	684	893
GDP/capita (constant 2005 PPP $)	2,002	1,462	1,632	2,001	2,611

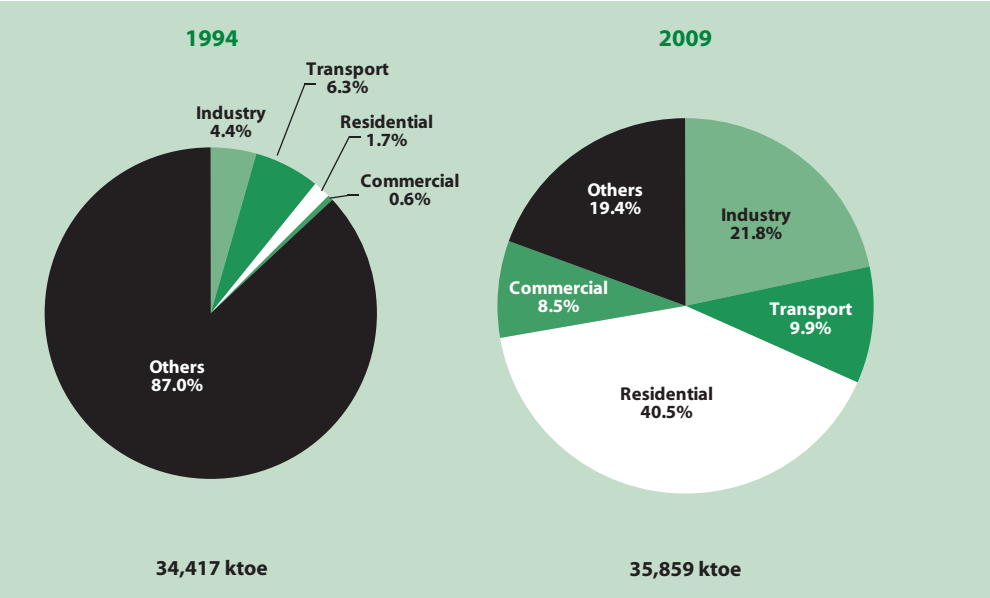
GDP = gross domestic product, PPP = purchasing power parity.
Source: World Bank.

Table 3.10.2 Energy Supply and Demand

	1990	1995	2000	2005	2009
Primary Energy Supply (ktoe)					
Indigenous Production	–	48,654	54,945	56,395	60,694
Net Imports	–	–6,084	–4,203	–9,446	–11,885
Total PES	–	42,570	50,742	46,949	48,809
Coal	–	1,068	1,247	1,121	1,346
Oil	–	6,978	7,329	5,301	4,527
Gas	–	34,103	41,550	39,792	42,141
Biomass	–	0	0	0	0
Others	–	421	616	735	795
TPES/capita (toe)	–	1.87	2.06	1.79	1.76
TPES/GDP (toe/constant 2005 PPP $ million)	–	1,278	1,261	897	673
Final Energy Consumption (ktoe)					
Industry	–	6,825	7,988	7,695	7,808
Transportation	–	2,813	3,899	3,361	3,533
Other Sectors	–	23,093	25,388	22,905	24,518
Total FEC	–	32,731	37,275	33,961	35,859
Coal	–	325	387	234	442
Oil	–	4,787	4,709	3,659	3,630
Gas	–	21,763	26,214	24,206	25,864
Electricity	–	3,260	3,420	3,489	3,540
Biomass	–	0	0	0	0
Others	–	2,596	2,545	2,373	2,383

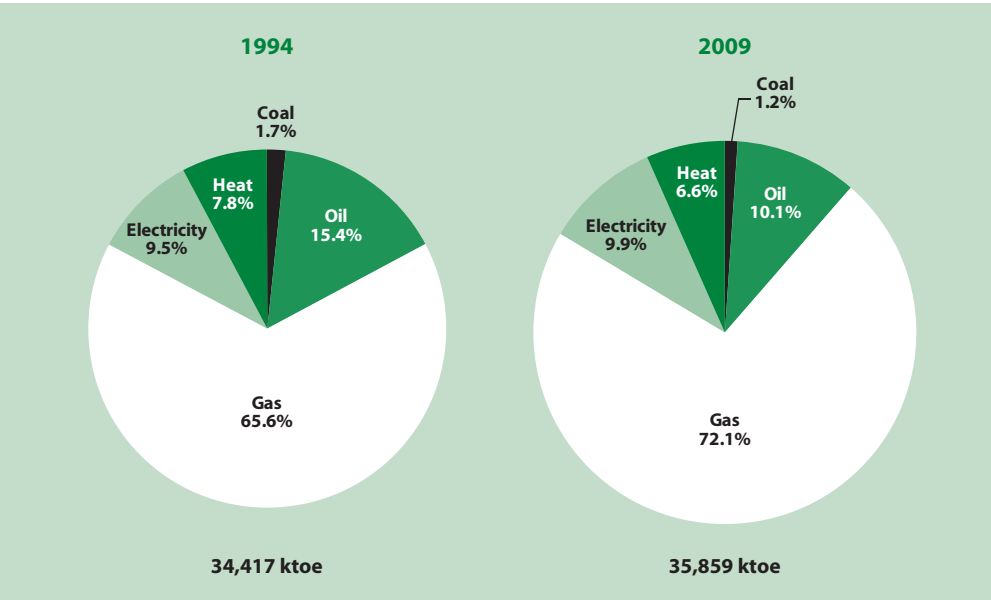
– = no data or not applicable, FEC = final energy consumption, GDP = gross domestic product, ktoe = thousand tons of oil equivalent, PES = primary energy supply, PPP = purchasing power parity, toe = ton of oil equivalent, TPES = total primary energy supply.
Source: IEA (2011b).

Figure 3.10.1 Final Energy Consumption by Sector, 1994 and 2009



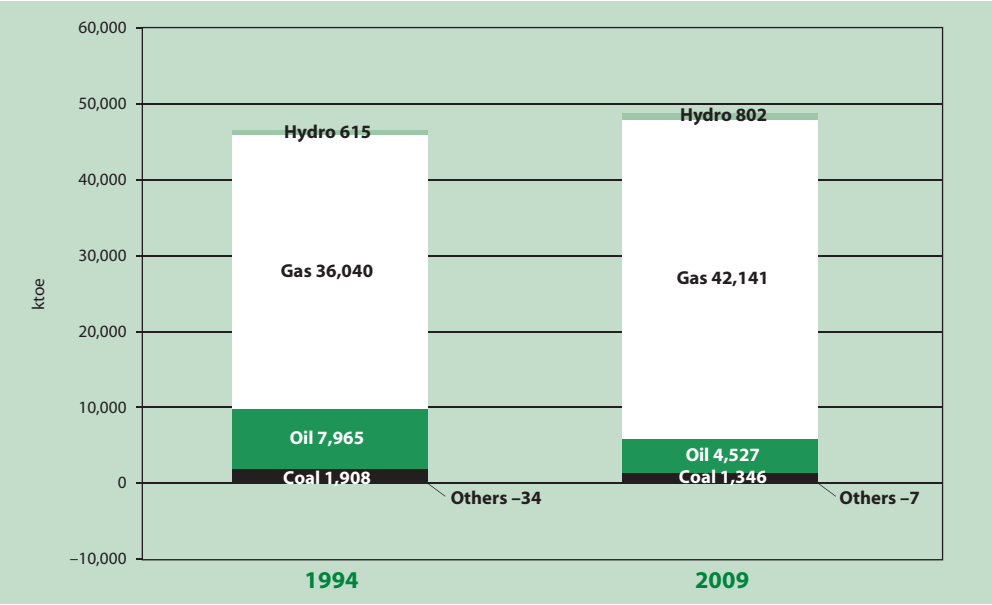
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 3.10.2 Final Energy Consumption by Type of Energy, 1994 and 2009



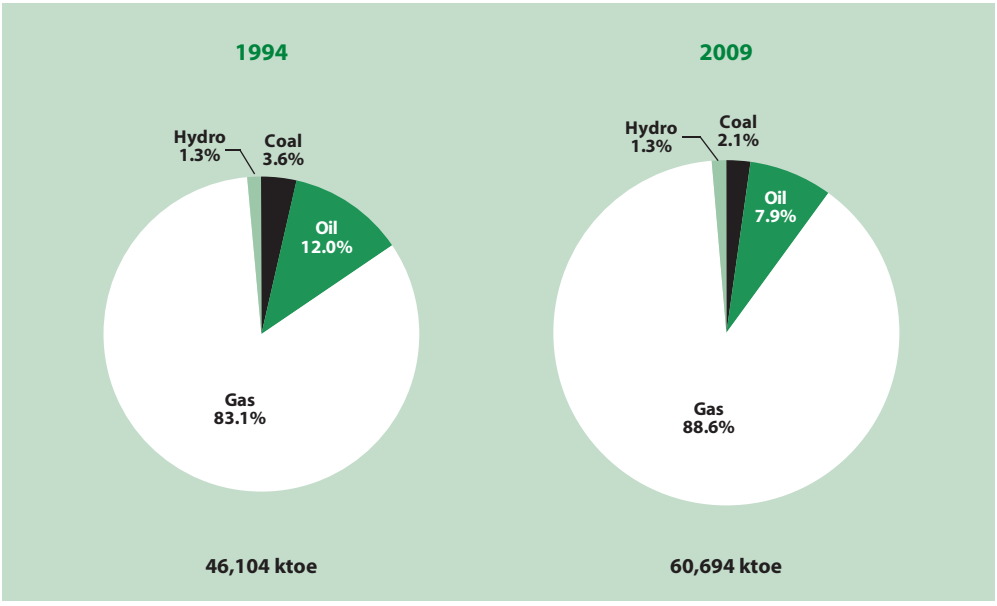
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 3.10.3 Total Primary Energy Supply, 1994 and 2009



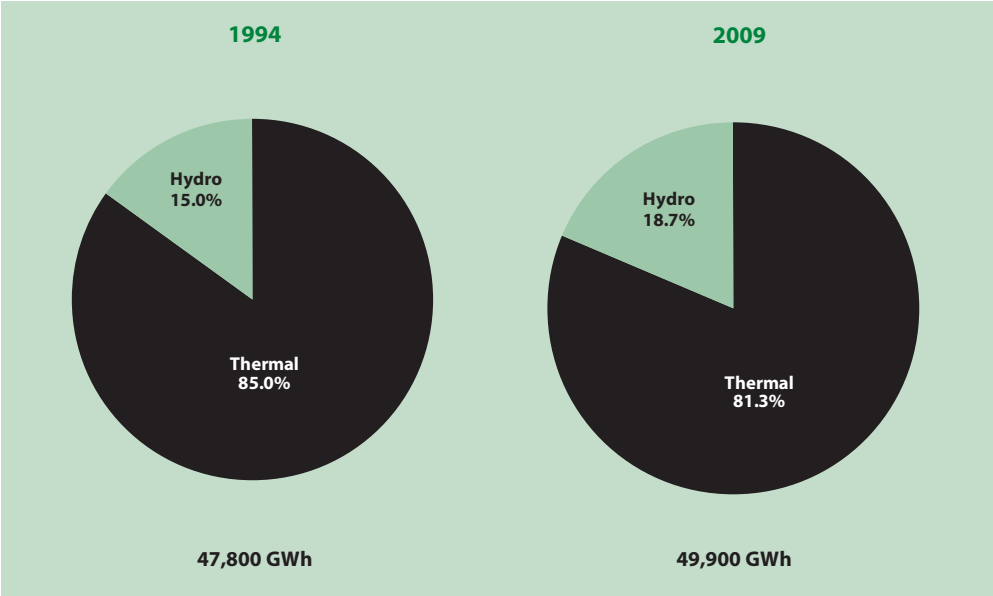
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 3.10.4 Indigenous Energy Production, 1994 and 2009



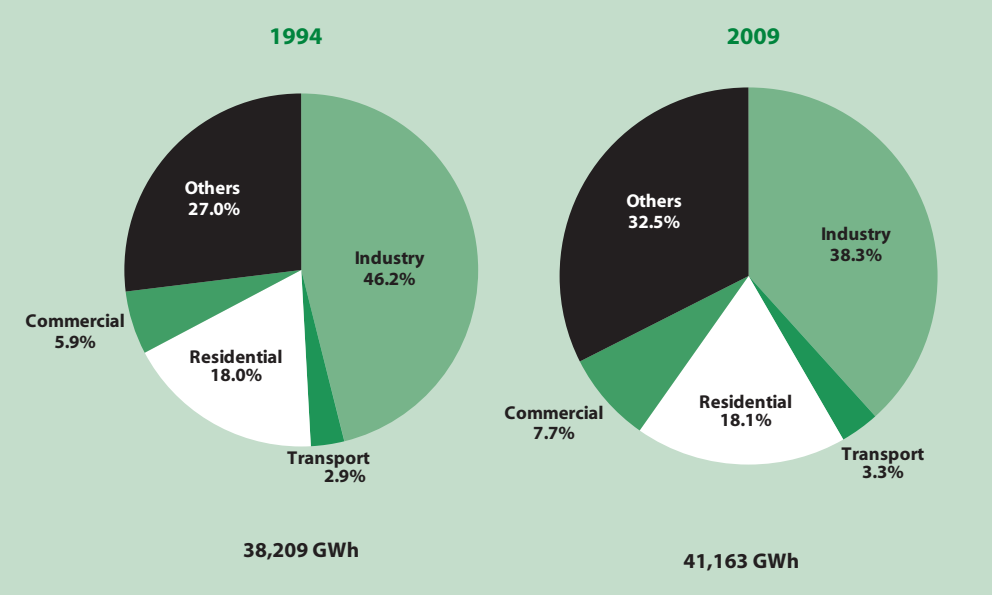
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 3.10.5 Electricity Generation by Plant Type, 1994 and 2009



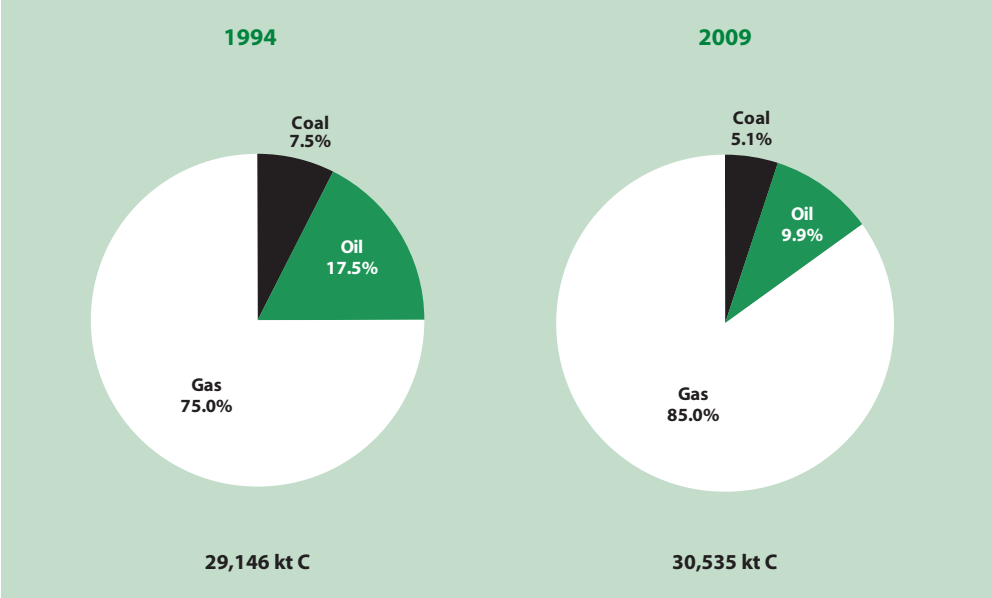
GWh = gigawatt-hour.
Source: IEA (2011b).

Figure 3.10.6 Electricity Consumption by Sector, 1994 and 2009



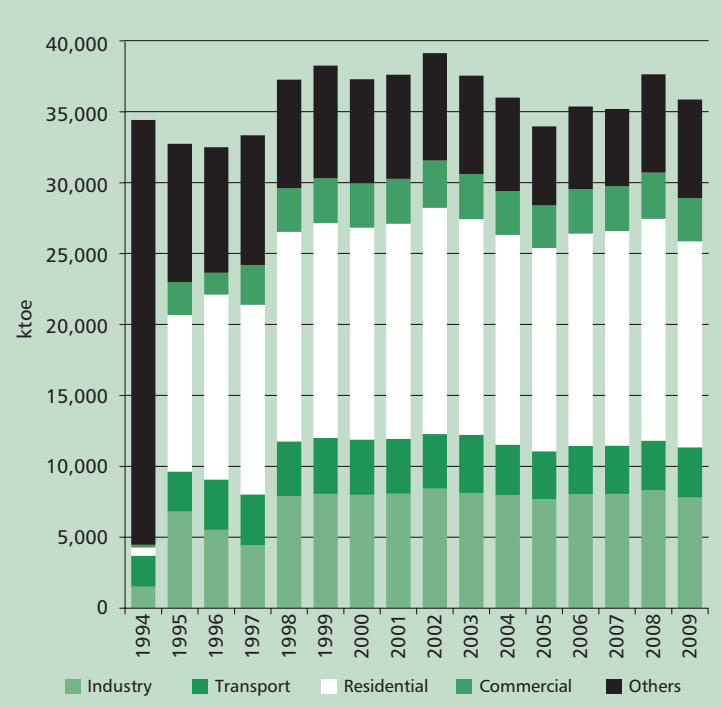
GWh = gigawatt-hour.
Source: IEA (2011b).

Figure 3.10.7 Carbon Dioxide Emissions from Fuel Combustion, 1994 and 2009



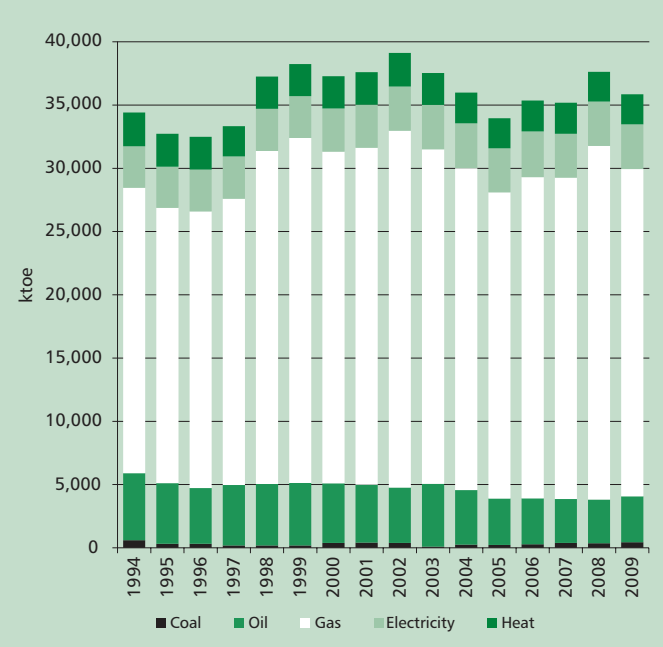
kt C = thousand tons of carbon equivalent.
Source: APERC estimates.

Figure 3.10.8 Final Energy Consumption by Sector, 1994–2009



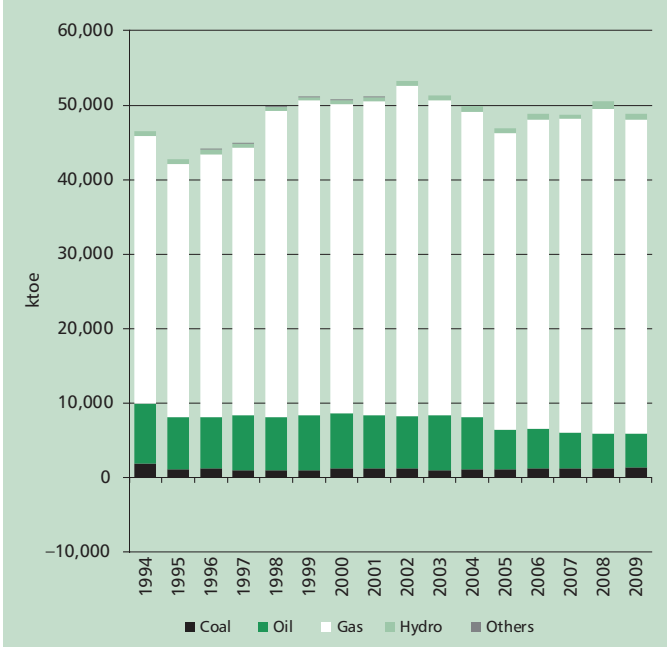
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 3.10.9 Final Energy Consumption by Type, 1994–2009



ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 3.10.10 Total Primary Energy Supply, 1994–2009

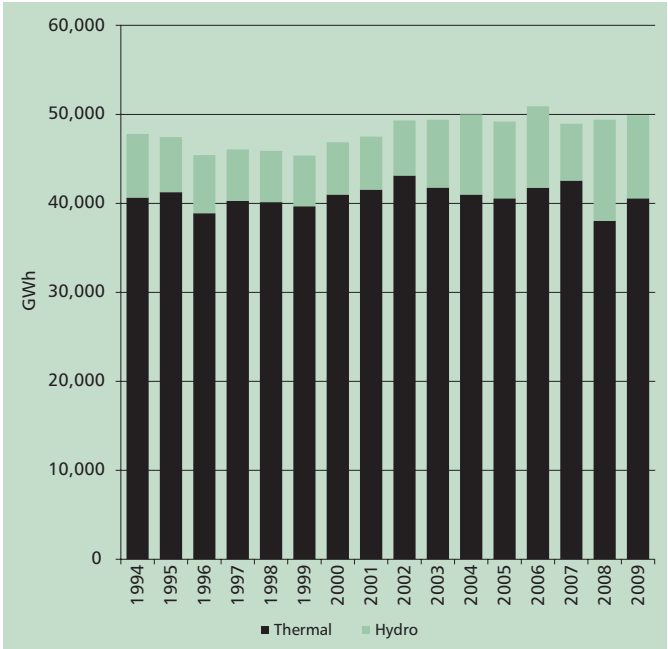


ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 3.10.11 Indigenous Energy Production, 1994–2009

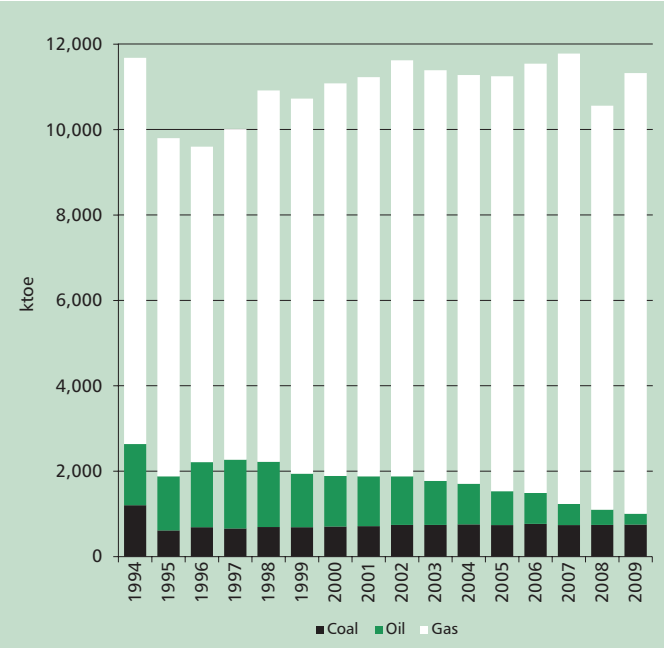
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 3.10.12 Electricity Generation by Source, 1994–2009



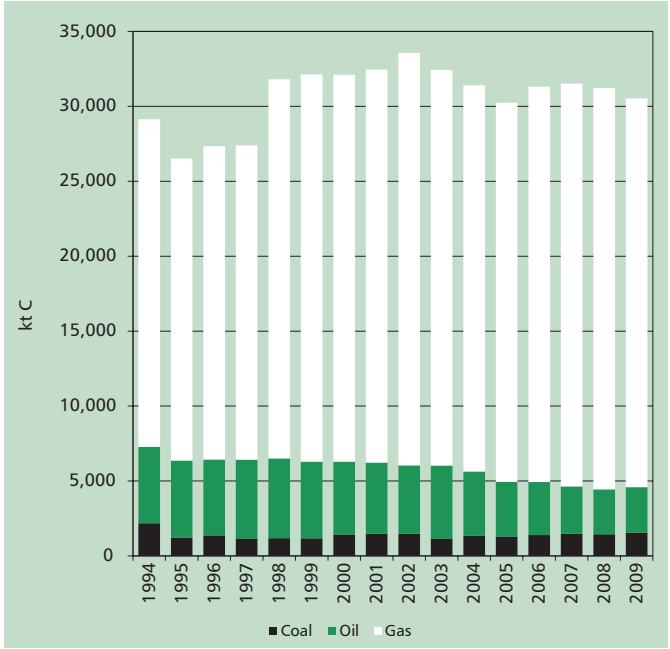
GWh = gigawatt-hour.
Source: IEA (2011b).

Figure 3.10.13 Fuel Input for Electricity Generation, 1994–2009



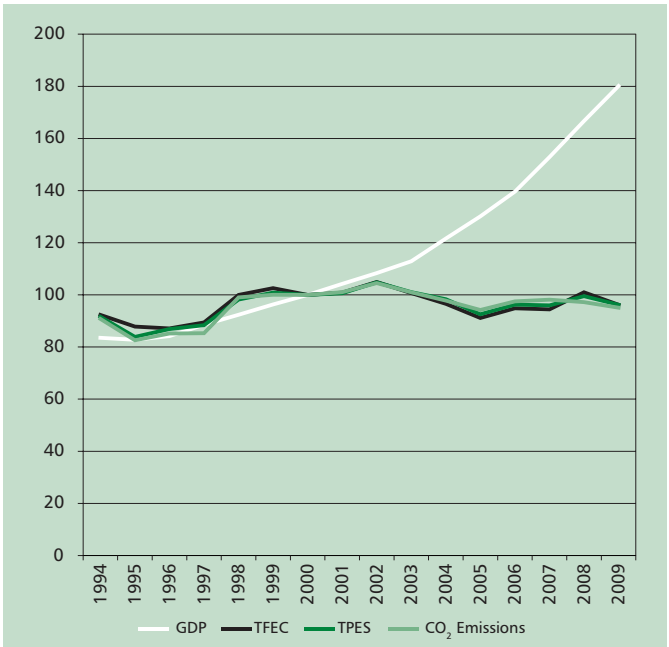
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 3.10.14 Carbon Dioxide Emissions from Fuel Combustion, 1994–2009



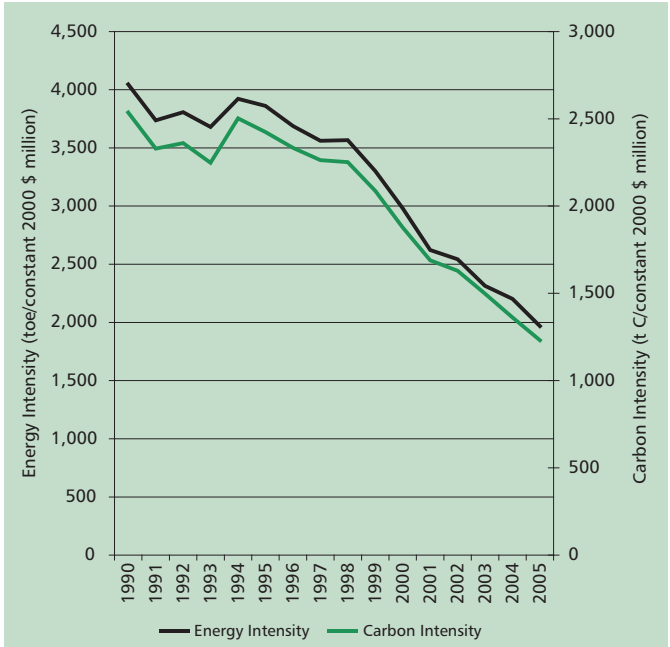
kt C = thousand tons of carbon equivalent.
Source: APERC estimates.

Figure 3.10.15 Growth of GDP, TFEC, TPES, and CO_2 Emissions (indexed to year 2000), 1994–2009



CO_2 = carbon dioxide, GDP = gross domestic product, TFEC = total final energy consumption, TPES = total primary energy supply.
Note: Indices are measured relative to the base year 2000 (2000 = 100).
Source: APERC estimates.

Figure 3.10.16 Energy and Carbon Intensities, 1994–2009



t C = ton of carbon equivalent, toe = ton of oil equivalent.
Source: APERC estimates.

Table 3.10.3 Uzbekistan Energy Balance Table, 2006

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	1,142	0	5,597	0	0	0	0	0	0	0	50,950	788	0	0	0	0	0	0	0	0	58,477
2.	Imports	74	0	4	0	0	0	0	0	0	0	893	0	0	0	0	0	0	0	1,016	0	1,987
3.	Exports	–11	0	0	–304	–32	0	–198	0	0	–74	–10,273	0	0	0	0	0	0	0	–1,024	0	–11,612
4.	International Bunkers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5.	Stock Changes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6.	Total Primary Energy Supply	1,205	0	5,601	–304	–32	0	–198	0	0	–74	41,570	788	0	0	0	0	0	0	–8	0	48,852
7.	Transfers	0	0	–19	21	0	0	0	0	21	0	0	0	0	0	0	0	0	0	0	0	2
8.	Total Transformation Sector	–905	0	–5,411	4,131	1,442	77	1,457	122	9	1,024	–12,775	–788	0	0	0	0	0	0	4,379	2,449	–8,920
8.1	Power Generation	–905	0	0	–922	0	–9	–3	–910	0	0	–12,775	–788	0	0	0	0	0	0	4,379	2,449	–8,562
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	–5,411	5,053	1,442	86	1,460	1,032	9	1,024	0	0	0	0	0	0	0	0	0	0	–358
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	–14	0	–77	–215	0	0	0	–14	0	–201	–3,405	0	0	0	0	0	0	0	–760	0	–4,471
10.	Discrepancy	–1	0	1	–104	0	–1	–1	–102	0	0	1	0	0	0	0	0	0	0	1	1	–101
11.	Total Final Energy Consumption	285	0	95	3,529	1,410	76	1,258	6	30	749	25,391	0	0	0	0	0	0	0	3,612	2,450	35,362
12.	Industry Sector	104	0	0	232	64	15	122	3	0	28	6,310	0	0	0	0	0	0	0	1,384	0	8,030
13.	Transport Sector	0	0	0	1,894	1,309	0	343	0	9	233	1,387	0	0	0	0	0	0	0	119	0	3,400
14.	Other Sectors	181	0	0	926	37	61	793	3	21	11	17,293	0	0	0	0	0	0	0	2,109	2,450	22,959
14.1	Residential and Commercial	14	0	0	18	1	1	5	0	10	1	17,140	0	0	0	0	0	0	0	935	0	18,107
14.1.1	Commerce and Public Services	0	0	0	0	0	0	0	0	0	0	2,857	0	0	0	0	0	0	0	280	0	3,137
14.1.2	Residential	14	0	0	18	1	1	5	0	10	1	14,283	0	0	0	0	0	0	0	655	0	14,970
14.2	Non-Specified Others	167	0	0	908	36	60	788	3	11	10	153	0	0	0	0	0	0	0	1,174	2,450	4,852
15.	Non-Energy Use	0	0	95	477	0	0	0	0	0	477	401	0	0	0	0	0	0	0	0	0	973
16.	Electricity Output (GWh)	2,081	0	0	2,985	0	0	0	0	0	0	36,694	9,160	0	0	0	0	0	0	0	0	50,920
17.	Heat Output (TJ)	4,605	0	0	6,657	0	0	0	0	0	0	91,314	0	0	0	0	0	0	0	0	0	102,577

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.
Note: Figures may not add up to total because of rounding.
Source: IEA (2011b).

Table 3.10.4 Uzbekistan Energy Balance Table, 2007

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	1,220	0	5,081	0	0	0	0	0	0	0	52,940	550	0	0	0	0	0	0	0	0	59,791
2.	Imports	70	0	4	0	0	0	0	0	0	0	1,072	0	0	0	0	0	0	0	977	0	2,123
3.	Exports	–12	0	0	–280	–33	0	–180	0	0	–67	–11,938	0	0	0	0	0	0	0	–984	0	–13,214
4.	International Bunkers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5.	Stock Changes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6.	Total Primary Energy Supply	1,278	0	5,085	–280	–33	0	–180	0	0	–67	42,074	550	0	0	0	0	0	0	–7	0	48,700
7.	Transfers	0	0	–17	19	0	0	0	0	19	0	0	0	0	0	0	0	0	0	0	0	2
8.	Total Transformation Sector	–871	0	–4,911	3,901	1,484	70	1,324	85	8	930	–13,351	–550	0	0	0	0	0	0	4,210	2,464	–9,108
8.1	Power Generation	–871	0	0	–632	0	–8	–2	–622	0	0	–13,351	–550	0	0	0	0	0	0	4,210	2,464	–8,730
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	–4,911	4,533	1,484	78	1,326	707	8	930	0	0	0	0	0	0	0	0	0	0	–378
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	–14	0	–70	–192	0	0	0	–10	0	–182	–3,322	0	0	0	0	0	0	0	–731	0	–4,329
10.	Discrepancy	0	0	0	–73	0	–1	–1	–71	0	0	1	0	0	0	0	0	0	0	0	–1	–73
11.	Total Final Energy Consumption	393	0	87	3,375	1,451	69	1,143	4	27	681	25,402	0	0	0	0	0	0	0	3,472	2,463	35,192
12.	Industry Sector	129	0	0	219	66	14	111	2	0	26	6,386	0	0	0	0	0	0	0	1,330	0	8,064
13.	Transport Sector	0	0	0	1,879	1,347	0	313	0	7	212	1,404	0	0	0	0	0	0	0	114	0	3,397
14.	Other Sectors	264	0	0	844	38	55	719	2	20	10	17,502	0	0	0	0	0	0	0	2,028	2,463	23,101
14.1	Residential and Commercial	15	0	0	17	1	1	5	0	9	1	17,347	0	0	0	0	0	0	0	899	0	18,278
14.1.1	Commerce and Public Services	0	0	0	0	0	0	0	0	0	0	2,891	0	0	0	0	0	0	0	269	0	3,160
14.1.2	Residential	15	0	0	17	1	1	5	0	9	1	14,456	0	0	0	0	0	0	0	630	0	15,118
14.2	Non-Specified Others	249	0	0	827	37	54	714	2	11	9	155	0	0	0	0	0	0	0	1,129	2,463	4,823
15.	Non-Energy Use	0	0	87	433	0	0	0	0	0	433	110	0	0	0	0	0	0	0	0	0	630
16.	Electricity Output (GWh)	2,000	0	0	2,044	0	0	0	0	0	0	38,506	6,400	0	0	0	0	0	0	0	0	48,950
17.	Heat Output (TJ)	4,438	0	0	4,564	0	0	0	0	0	0	94,119	0	0	0	0	0	0	0	0	0	103,121

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Source: IEA (2011b).

Table 3.10.5 Uzbekistan Energy Balance Table, 2008

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	1,170	0	4,976	0	0	0	0	0	0	0	54,897	977	0	0	0	0	0	0	0	0	62,020
2.	Imports	91	0	4	0	0	0	0	0	0	0	858	0	0	0	0	0	0	0	986	0	1,939
3.	Exports	–11	0	0	–273	–34	0	–173	0	0	–66	–12,181	0	0	0	0	0	0	0	–993	0	–13,458
4.	International Bunkers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5.	Stock Changes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6.	Total Primary Energy Supply	1,250	0	4,980	–273	–34	0	–173	0	0	–66	43,574	977	0	0	0	0	0	0	–7	0	50,501
7.	Transfers	0	0	–17	19	0	0	0	0	19	0	0	0	0	0	0	0	0	0	0	0	2
8.	Total Transformation Sector	–878	0	–4,812	3,867	1,549	68	1,270	62	8	910	–12,173	–977	0	0	0	0	0	0	4,249	2,354	–8,370
8.1	Power Generation	–878	0	0	–451	0	–8	–2	–441	0	0	–12,173	–977	0	0	0	0	0	0	4,249	2,354	–7,876
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	–4,812	4,318	1,549	76	1,272	503	8	910	0	0	0	0	0	0	0	0	0	0	–494
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	–14	0	–68	–186	0	0	0	–7	0	–179	–3,440	0	0	0	0	0	0	0	–737	0	–4,445
10.	Discrepancy	–1	0	1	–54	0	–1	0	–52	–1	0	–1	0	0	0	0	0	0	0	–1	1	–55
11.	Total Final Energy Consumption	357	0	84	3,373	1,515	67	1,097	3	26	665	27,960	0	0	0	0	0	0	0	3,504	2,355	37,633
12.	Industry Sector	144	0	0	216	69	14	107	1	0	25	6,614	0	0	0	0	0	0	0	1,342	0	8,316
13.	Transport Sector	0	0	0	1,919	1,407	0	301	0	4	207	1,454	0	0	0	0	0	0	0	115	0	3,488
14.	Other Sectors	213	0	0	815	39	53	689	2	22	10	18,125	0	0	0	0	0	0	0	2,047	2,355	23,555
14.1	Residential and Commercial	14	0	0	17	1	1	5	0	9	1	17,965	0	0	0	0	0	0	0	907	0	18,903
14.1.1	Commerce and Public Services	0	0	0	0	0	0	0	0	0	0	2,994	0	0	0	0	0	0	0	272	0	3,266
14.1.2	Residential	14	0	0	17	1	1	5	0	9	1	14,971	0	0	0	0	0	0	0	635	0	15,637
14.2	Non-Specified Others	199	0	0	798	38	52	684	2	13	9	160	0	0	0	0	0	0	0	1,140	2,355	4,652
15.	Non-Energy Use	0	0	84	423	0	0	0	0	0	423	1,767	0	0	0	0	0	0	0	0	0	2,274
16.	Electricity Output (GWh)	2,018	0	0	1,456	0	0	0	0	0	0	34,566	11,360	0	0	0	0	0	0	0	0	49,400
17.	Heat Output (TJ)	4,480	0	0	3,224	0	0	0	0	0	0	90,895	0	0	0	0	0	0	0	0	0	98,599

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.
Note: Figures may not add up to total because of rounding.
Source: IEA (2011b).

Table 3.10.6 Uzbekistan Energy Balance Table, 2009

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	1,289	0	4,804	0	0	0	0	0	0	0	53,799	802	0	0	0	0	0	0	0	0	60,694
2.	Imports	70	0	4	0	0	0	0	0	0	0	686	0	0	0	0	0	0	0	996	0	1,756
3.	Exports	–13	0	0	–281	–37	0	–180	0	0	–64	–12,344	0	0	0	0	0	0	0	–1,003	0	–13,641
4.	International Bunkers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5.	Stock Changes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6.	Total Primary Energy Supply	1,346	0	4,808	–281	–37	0	–180	0	0	–64	42,141	802	0	0	0	0	0	0	–7	0	48,809
7.	Transfers	0	0	–16	19	0	0	0	0	18	1	0	0	0	0	0	0	0	0	0	0	3
8.	Total Transformation Sector	–888	0	–4,646	4,149	1,707	65	1,324	166	8	879	–13,093	–802	0	0	0	0	0	0	4,291	2,383	–8,606
8.1	Power Generation	–888	0	0	–320	0	–8	–1	–311	0	0	–13,093	–802	0	0	0	0	0	0	4,291	2,383	–8,429
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	–4,646	4,469	1,707	73	1,325	477	8	879	0	0	0	0	0	0	0	0	0	0	–177
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	–15	0	–65	–180	0	0	0	–7	0	–173	–3,183	0	0	0	0	0	0	0	–745	0	–4,188
10.	Discrepancy	–1	0	0	–158	0	–1	–1	–156	–1	1	–1	0	0	0	0	0	0	0	1	0	–159
11.	Total Final Energy Consumption	442	0	81	3,549	1,670	64	1,143	3	25	644	25,864	0	0	0	0	0	0	0	3,540	2,383	35,859
12.	Industry Sector	108	0	0	226	76	13	111	1	0	25	6,118	0	0	0	0	0	0	0	1,356	0	7,808
13.	Transport Sector	0	0	0	2,071	1,552	0	317	0	2	200	1,345	0	0	0	0	0	0	0	117	0	3,533
14.	Other Sectors	334	0	0	843	42	51	715	2	23	10	16,767	0	0	0	0	0	0	0	2,067	2,383	22,394
14.1	Residential and Commercial	16	0	0	17	1	1	5	0	9	1	16,619	0	0	0	0	0	0	0	916	0	17,568
14.1.1	Commerce and Public Services	0	0	0	0	0	0	0	0	0	0	2,770	0	0	0	0	0	0	0	274	0	3,044
14.1.2	Residential	16	0	0	17	1	1	5	0	9	1	13,849	0	0	0	0	0	0	0	642	0	14,524
14.2	Non-Specified Others	318	0	0	826	41	50	710	2	14	9	148	0	0	0	0	0	0	0	1,151	2,383	4,826
15.	Non-Energy Use	0	0	81	409	0	0	0	0	0	409	1,634	0	0	0	0	0	0	0	0	0	2,124
16.	Electricity Output (GWh)	2,038	0	0	1,037	0	0	0	0	0	0	37,495	9,330	0	0	0	0	0	0	0	0	49,900
17.	Heat Output (TJ)	4,522	0	0	2,303	0	0	0	0	0	0	92,947	0	0	0	0	0	0	0	0	0	99,771

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Source: IEA (2011b).

Table 3.10.7 Uzbekistan Summary Table, 1990–2009

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Indigenous Production (ktoe)																				
Coal	–	–	–	–	1,647	1,076	1,000	1,037	1,029	1,046	906	949	958	670	983	1,083	1,142	1,220	1,170	1,289
Oil	–	–	–	–	5,527	7,558	7,745	8,152	8,379	8,356	7,731	7,415	7,285	7,813	7,318	5,601	5,597	5,081	4,976	4,804
Gas	–	–	–	–	38,315	39,488	39,782	41,615	44,494	45,137	45,802	46,629	47,449	47,151	48,060	48,969	50,950	52,940	54,897	53,799
Hydro	–	–	–	–	615	532	561	497	495	490	506	512	532	655	775	742	788	550	977	802
Nuclear	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Geothermal	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Solar	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wind	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Biomass	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Others	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	–	–	–	–	46,104	48,654	49,088	51,301	54,397	55,029	54,945	55,505	56,224	56,289	57,136	56,395	58,477	59,791	62,020	60,694
Primary Energy Supply (ktoe)																				
Coal	–	–	–	–	1,908	1,068	1,196	983	1,028	1,021	1,247	1,279	1,277	982	1,162	1,121	1,205	1,278	1,250	1,346
Oil	–	–	–	–	7,965	6,978	6,845	7,341	7,116	7,338	7,329	7,028	6,914	7,394	6,933	5,301	5,297	4,805	4,707	4,527
Gas	–	–	–	–	36,040	34,103	35,403	35,948	41,110	42,234	41,550	42,193	44,464	42,258	41,026	39,792	41,570	42,074	43,574	42,141
Hydro	–	–	–	–	615	532	561	497	495	490	506	512	532	655	775	742	788	550	977	802
Nuclear	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Geothermal	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Solar	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wind	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Biomass	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Others	–	–	–	–	–34	–111	94	80	91	102	110	43	–7	–7	–7	–7	–8	–7	–7	–7
Total	–	–	–	–	46,494	42,570	44,099	44,849	49,840	51,185	50,742	51,055	53,180	51,282	49,889	46,949	48,852	48,700	50,501	48,809
Final Energy Consumption by Sector (ktoe)																				
Industry	–	–	–	–	1,519	6,825	5,531	4,454	7,898	8,062	7,988	8,069	8,433	8,126	7,966	7,695	8,030	8,064	8,316	7,808
Transport	–	–	–	–	2,172	2,813	3,549	3,568	3,855	3,932	3,899	3,878	3,840	4,100	3,564	3,361	3,400	3,397	3,488	3,533
Residential	–	–	–	–	592	11,027	13,026	13,366	14,768	15,150	14,935	15,155	15,951	15,191	14,777	14,334	14,970	15,118	15,637	14,524
Commercial	–	–	–	–	193	2,318	1,532	2,804	3,084	3,158	3,120	3,164	3,327	3,176	3,094	3,005	3,137	3,160	3,266	3,044
Others	–	–	–	–	29,941	9,748	8,846	9,142	7,653	7,934	7,333	7,333	7,567	6,940	6,591	5,566	5,825	5,453	6,926	6,950
Total	–	–	–	–	34,417	32,731	32,484	33,334	37,258	38,236	37,275	37,599	39,118	37,533	35,992	33,961	35,362	35,192	37,633	35,859

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Table 3.10.7 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Final Energy Consumption by Type (ktoe)																				
Coal	–	–	–	–	596	325	322	185	189	189	387	418	384	91	260	234	285	393	357	442
Oil	–	–	–	–	5,298	4,787	4,402	4,778	4,858	4,933	4,709	4,579	4,376	4,971	4,303	3,659	3,624	3,462	3,457	3,630
Gas	–	–	–	–	22,562	21,763	21,873	22,632	26,325	27,280	26,214	26,626	28,206	26,447	25,448	24,206	25,391	25,402	27,960	25,864
Electricity	–	–	–	–	3,286	3,260	3,311	3,349	3,336	3,307	3,420	3,408	3,497	3,503	3,547	3,489	3,612	3,472	3,504	3,540
Heat	–	–	–	–	2,675	2,596	2,576	2,390	2,550	2,527	2,545	2,568	2,655	2,521	2,434	2,373	2,450	2,463	2,355	2,383
Biomass	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Others	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	–	–	–	–	34,417	32,731	32,484	33,334	37,258	38,236	37,275	37,599	39,118	37,533	35,992	33,961	35,362	35,192	37,633	35,859
Power Generation (GWh)																				
Thermal	–	–	–	–	40,644	41,265	38,894	40,277	40,142	39,680	40,985	41,541	43,124	41,780	40,990	40,570	41,760	42,550	38,040	40,570
Hydro	–	–	–	–	7,156	6,188	6,525	5,777	5,758	5,692	5,879	5,959	6,186	7,620	9,010	8,630	9,160	6,400	11,360	9,330
Nuclear	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Geothermal	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Solar	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wind	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Others	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	–	–	–	–	47,800	47,453	45,419	46,054	45,900	45,372	46,864	47,500	49,310	49,400	50,000	49,200	50,920	48,950	49,400	49,900
Loss and Own Use of Electricity (GWh)																				
Transmission and Distribution Losses	–	–	–	–	4,337	4,140	4,058	4,012	4,151	4,116	4,256	4,244	4,349	4,360	4,407	4,337	4,488	4,314	4,349	4,395
Own Use	–	–	–	–	2,628	2,814	2,663	2,686	2,674	2,651	2,733	2,733	2,802	2,802	2,837	2,791	2,895	2,779	2,802	2,837
Total	–	–	–	–	6,965	6,953	6,721	6,698	6,826	6,767	6,988	6,977	7,151	7,163	7,244	7,128	7,384	7,093	7,151	7,233
Fuel Input for Power Generation (ktoe)																				
Coal	–	–	–	–	1,205	614	688	662	692	688	707	716	743	744	754	741	768	739	744	753
Oil	–	–	–	–	1,431	1,269	1,525	1,609	1,529	1,255	1,182	1,166	1,136	1,028	952	793	723	496	355	251
Gas	–	–	–	–	9,044	7,914	7,385	7,737	8,692	8,780	9,193	9,343	9,739	9,614	9,571	9,710	10,049	10,541	9,459	10,318
Total	–	–	–	–	11,679	9,797	9,597	10,007	10,912	10,722	11,082	11,226	11,618	11,386	11,277	11,244	11,540	11,775	10,558	11,322
CO_2 Emissions (kt C)																				
Coal	–	–	–	–	2,178	1,225	1,373	1,130	1,178	1,169	1,430	1,477	1,476	1,134	1,340	1,293	1,388	1,471	1,438	1,552
Oil	–	–	–	–	5,098	5,141	5,065	5,290	5,328	5,122	4,859	4,751	4,560	4,898	4,298	3,644	3,545	3,169	3,006	3,035
Gas	–	–	–	–	21,870	20,160	20,910	20,979	25,301	25,842	25,825	26,221	27,535	26,401	25,776	25,307	26,372	26,882	26,780	25,947
Total	–	–	–	–	29,146	26,526	27,349	27,398	31,808	32,133	32,114	32,449	33,571	32,432	31,415	30,244	31,305	31,522	31,224	30,535

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Table 3.10.7 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Macroeconomic Indicators																				
Population (thousand)	20,510	20,952	21,449	21,942	22,377	22,785	23,225	23,667	24,051	24,400	24,650	24,967	25,272	25,568	25,864	26,167	26,486	26,868	27,314	27,767
Urban Population, %	40.1	39.8	39.4	39.1	38.7	38.4	38.2	38.0	37.7	37.5	37.3	37.2	37.1	36.9	36.8	36.7	36.7	36.8	36.8	36.9
GDP (constant 2000 $ million)	14,044	13,975	12,409	12,124	11,494	11,390	11,584	12,186	12,710	13,257	13,760	14,338	14,912	15,538	16,735	17,906	19,213	21,038	22,932	24,789
GDP (current $ million)	13,361	13,800	12,954	13,100	12,899	13,350	13,949	14,745	14,989	17,078	13,760	11,401	9,688	10,134	12,030	14,308	17,031	22,311	27,918	32,817
GDP (constant 2005 PPP $ million)	41,065	40,863	36,287	35,452	33,608	33,306	33,872	35,634	37,166	38,764	40,237	41,927	43,604	45,435	48,934	52,359	56,181	61,519	67,055	72,487
GDP/capita (constant 2000 $)	685	667	579	553	514	500	499	515	528	543	558	574	590	608	647	684	725	783	840	893
GDP/capita (current $)	651	659	604	597	576	586	601	623	623	700	558	457	383	396	465	547	643	830	1,022	1,182
GDP – Manufacturing (% of GDP)	11.7	13.1	13.3	11.8	10.2	9.7	9.5	9.4	8.9	8.7	8 .3	8.3	8.0	7.8	7.4	7.0	6.7	6.3	6.0	5.8
Car Ownership (car/1,000 persons)	–	–	–	–	–	–	–	–	–	–	–	48	59	57	59	61	62	64	65	64
Basic Energy Indicators																				
TPES/capita (toe/person)	–	–	–	–	2.08	1.87	1.90	1.90	2.07	2.10	2.06	2.04	2.10	2.01	1.93	1.79	1.84	1.81	1.85	1.76
TFEC/capita (toe/person)	–	–	–	–	1.54	1.44	1.40	1.41	1.55	1.57	1.51	1.51	1.55	1.47	1.39	1.30	1.34	1.31	1.38	1.29
TPES/GDP (toe/constant 2000 $ million)	–	–	–	–	4,045	3,737	3,807	3,680	3,921	3,861	3,688	3,561	3,566	3,300	2,981	2,622	2,543	2,315	2,202	1,969
TFEC/GDP (toe/constant 2000 $ million)	–	–	–	–	2,994	2,874	2,804	2,735	2,931	2,884	2,709	2,622	2,623	2,416	2,151	1,897	1,841	1,673	1,641	1,447
Import Dependency (%)	–	–	–	–	0.8	–14.3	–11.3	–14.4	–9.1	–7.5	–8.3	–8.7	–5.7	–9.8	–14.5	–20.1	–19.7	–22.8	–22.8	–24.4
Oil Import Dependency (%)	–	–	–	–	30.6	–8.3	–13.1	–11.0	–17.7	–13.9	–5.5	–5.5	–5.4	–5.7	–5.6	–5.7	–5.7	–5.7	–5.7	–6.1
Electricity/capita (kWh/ person)	–	–	–	–	1,708	1,664	1,658	1,646	1,613	1,576	1,614	1,587	1,609	1,593	1,595	1,551	1,586	1,503	1,492	1,483
CO_2 Intensity (t C/constant 2000 $ million)	–	–	–	–	2,536	2,329	2,361	2,248	2,503	2,424	2,334	2,263	2,251	2,087	1,877	1,689	1,629	1,498	1,362	1,232
CO_2/capita (t C)	–	–	–	–	1.30	1.16	1.18	1.16	1.32	1.32	1.30	1.30	1.33	1.27	1.21	1.16	1.18	1.17	1.14	1.10
CO_2/TPES (t C/toe)	–	–	–	–	0.63	0.62	0.62	0.61	0.64	0.63	0.63	0.64	0.63	0.63	0.63	0.64	0.64	0.65	0.62	0.63

– = no data or not applicable, CO_2 = carbon dioxide, GDP = gross domestic product, GWh = gigawatt–hour, kt C = thousand tons of carbon equivalent, ktoe = thousand tons of oil equivalent, kWh = kilowatt–hour, PPP = purchasing power parity, t C = ton of carbon equivalent, TFEC = total final energy consumption, toe = ton of oil equivalent, TPES = total primary energy supply.

Note: Figures may not add up to total because of rounding.

Sources: APERC estimates, IEA (2011b), JAMA (2012), and World Bank.

Chapter 4

East Asia

East Asia

Regional Profile (2009)		Energy Reserves (year-end 2008)	
Total Surface Area (square kilometer)	11,298,277	Coal (million ton) - Recoverable	117,147.0
Population (thousand)	1,412,921	Gas (trillion cubic feet) - Proven	111.7
GDP (constant 2000 $ billion)	4,322.0	Oil (billion barrel) - Proven	18,071.0
Electrification Rate (%)	99.3		

GDP = gross domestic product.

Sources: ADB (2012), APERC estimates, [Taipei,China] Council for Economic Planning and Development (2011), World Bank, and WEC (2010).

2009 Energy Supply and Demand Flow (ktoe)

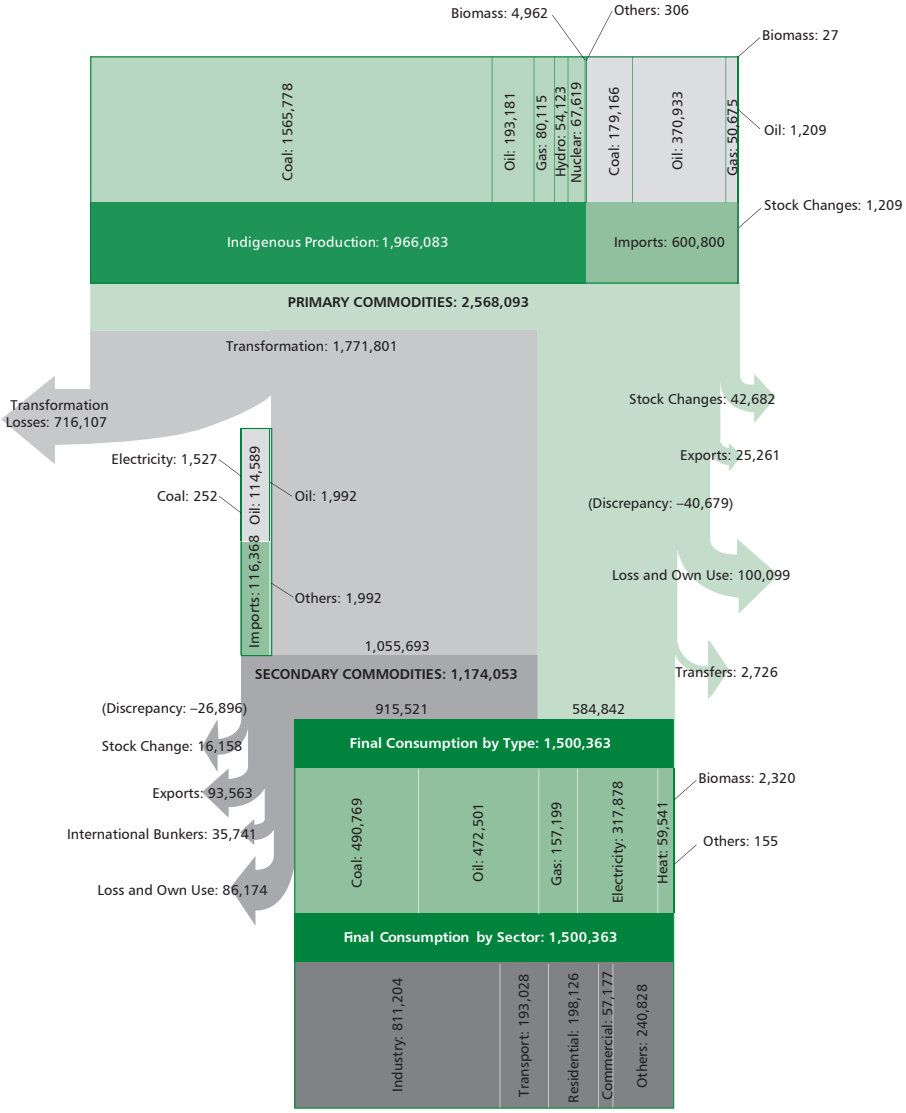


Table 4.1 Key Data and Economic Profile

	1990	1995	2000	2005	2009
Socioeconomic Data					
Population (thousand)	1,206,148	1,279,678	1,340,914	1,383,948	1,412,921
GDP (constant 2000 $ billion)	1,018.3	1,602.4	2,206.2	3,138.1	4,322.0
GDP (constant 2005 PPP $ billion)	2,128.2	3,472.4	4,910.5	7,258.0	10,395.6
GDP/capita (constant 2000 $)	844	1,252	1,645	2,267	3,059
GDP/capita (constant 2005 PPP $)	1,764	2,714	3,662	5,244	7,358

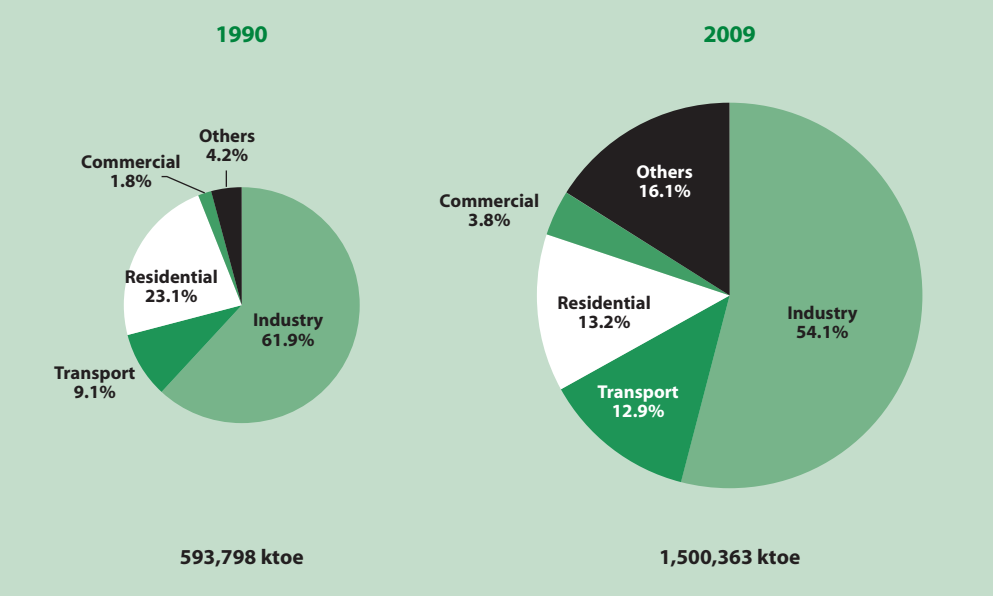
GDP = gross domestic product, PPP = purchasing power parity.
Sources: [Taipei,China] Council for Economic Planning and Development (2011), and World Bank.

Table 4.2 Energy Supply and Demand

	1990	1995	2000	2005	2009
Primary Energy Supply (ktoe)					
Indigenous Production	741,929	905,735	914,117	1,487,781	1,966,083
Net Imports	64,697	174,381	276,412	385,193	504,972
Total PES	806,626	1,080,115	1,190,528	1,872,975	2,471,056
Coal	556,771	709,809	706,629	1,219,605	1,680,019
Oil	193,703	288,488	368,027	461,049	535,281
Gas	18,696	28,690	47,015	84,588	129,011
Biomass	3,084	5,373	5,568	9,764	4,987
Others	34,373	47,756	63,289	97,968	121,757
TPES/capita (toe)	0.67	0.84	0.89	1.35	1.75
TPES/GDP (toe/constant 2005 PPP $ million)	379	311	242	258	238
Final Energy Consumption (ktoe)					
Industry	367,424	461,031	449,030	560,922	811,204
Transportation	53,740	75,427	104,925	149,530	193,028
Other Sectors	172,634	277,855	274,101	404,366	496,131
Total FEC	593,798	814,313	828,056	1,114,817	1,500,363
Coal	356,873	441,431	314,557	381,824	490,769
Oil	148,856	228,016	307,186	401,096	472,501
Gas	15,128	33,670	37,064	57,012	157,199
Electricity	68,928	86,455	130,310	220,967	317,878
Biomass	3,049	4,113	3,409	5,499	2,320
Others	963	20,628	35,529	48,419	59,696

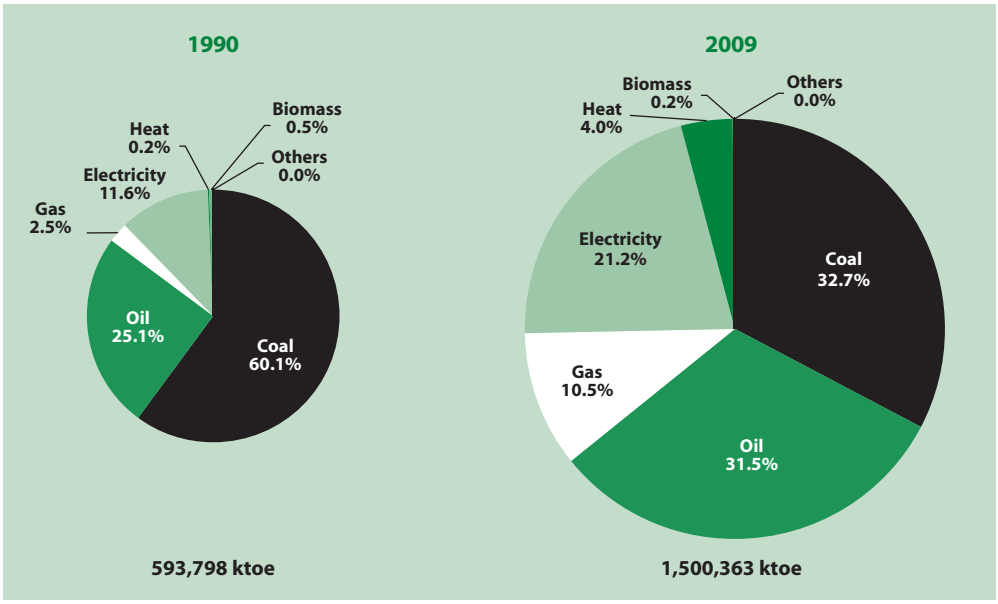
FEC = final energy consumption, GDP = gross domestic product, ktoe = thousand tons of oil equivalent, PES = primary energy supply, PPP = purchasing power parity, toe = ton of oil equivalent, TPES = total primary energy supply.
Source: APERC (APEC Energy Database), and IEA (2011b).

Figure 4.1 Final Energy Consumption by Sector, 1990 and 2009



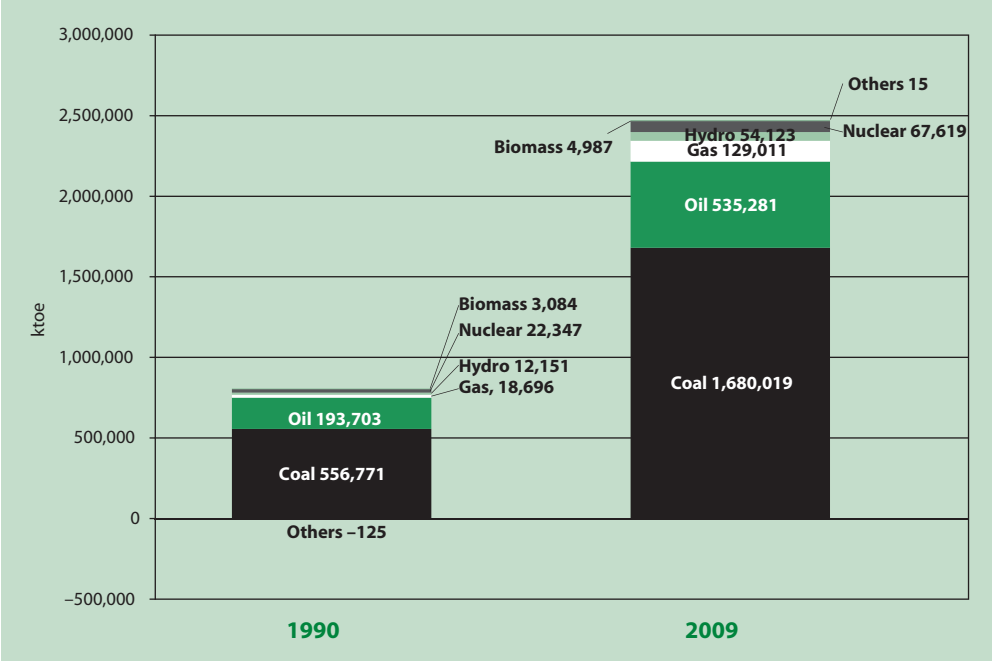
ktoe = thousand tons of oil equivalent.
Sources: APERC (APEC Energy Database), and IEA (2011b).

Figure 4.2 Final Energy Consumption by Type of Energy, 1990 and 2009



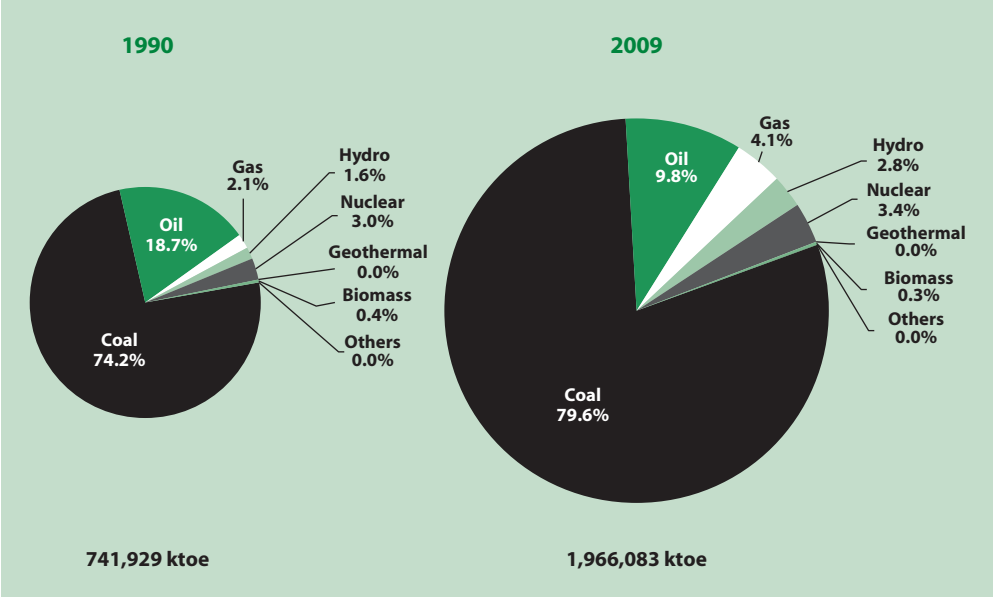
ktoe = thousand tons of oil equivalent.
Sources: APERC (APEC Energy Database), and IEA (2011b).

Figure 4.3 Total Primary Energy Supply, 1990 and 2009



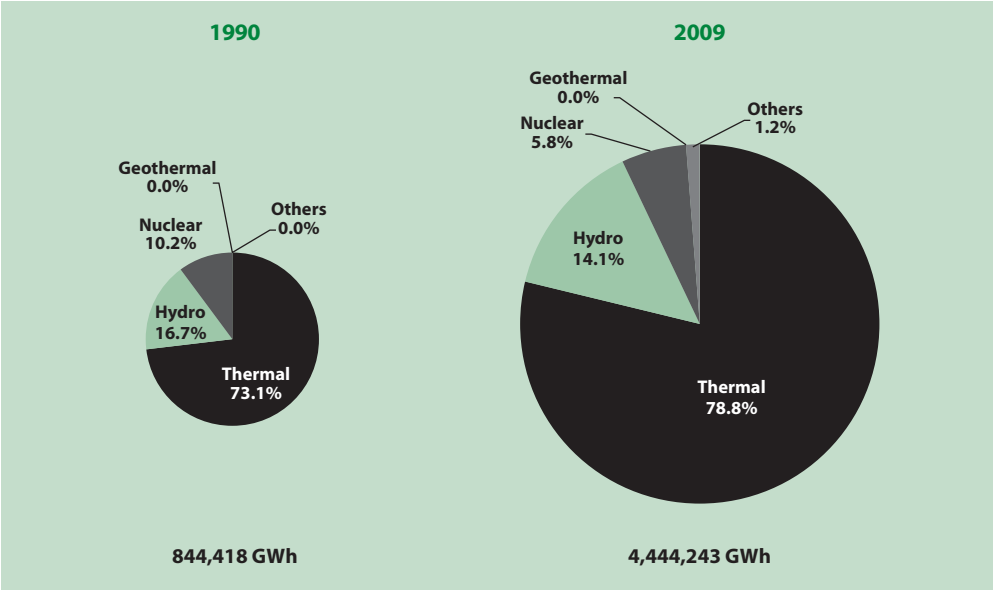
ktoe = thousand tons of oil equivalent.
Sources: APERC (APEC Energy Database), and IEA (2011b).

Figure 4.4 Indigenous Energy Production, 1990 and 2009



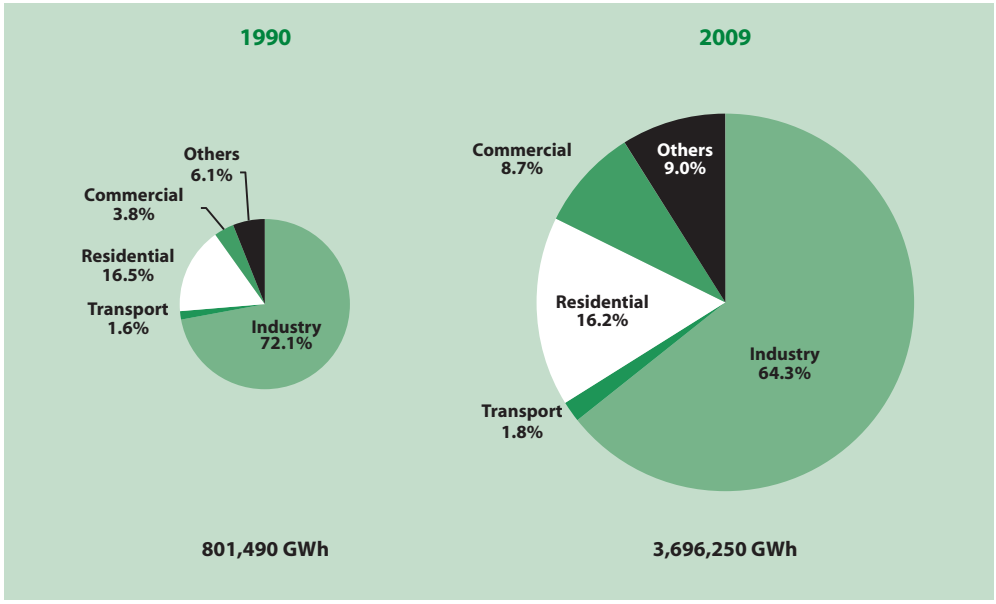
ktoe = thousand tons of oil equivalent.
Sources: APERC (APEC Energy Database), and IEA (2011b).

Figure 4.5 Electricity Generation by Plant Type, 1994 and 2009



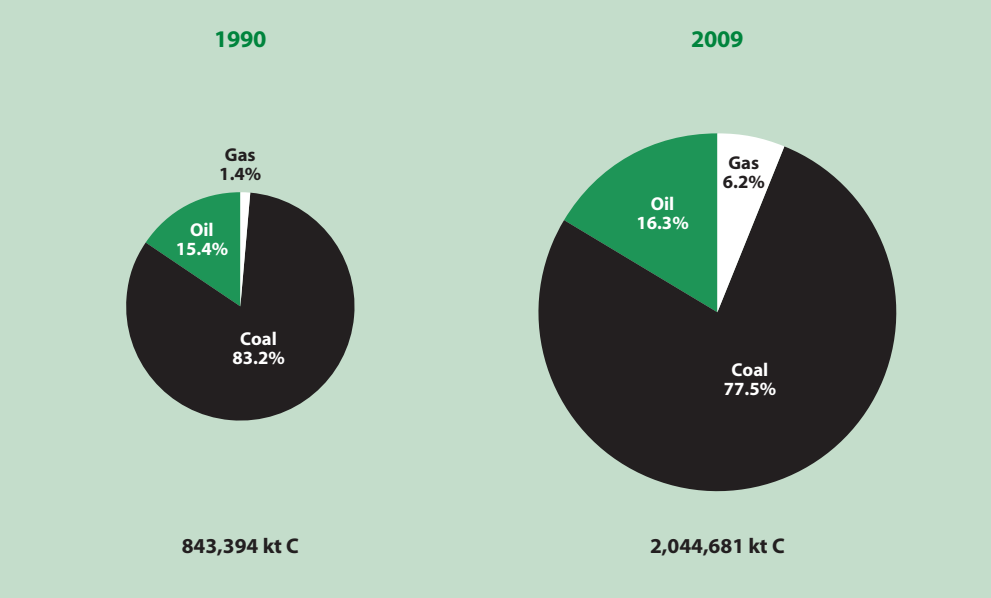
GWh = gigawatt-hour.
Sources: APERC (APEC Energy Database), and IEA (2011b).

Figure 4.6 Electricity Consumption by Sector, 1990 and 2009



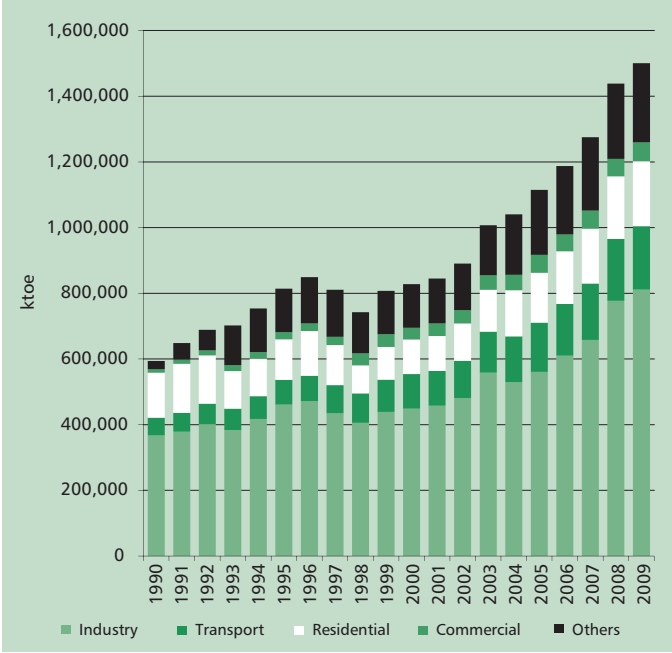
GWh = gigawatt-hour.
Sources: APERC (APEC Energy Database), and IEA (2011b).

Figure 4.7 Carbon Dioxide Emissions from Fuel Combustion, 1990 and 2009



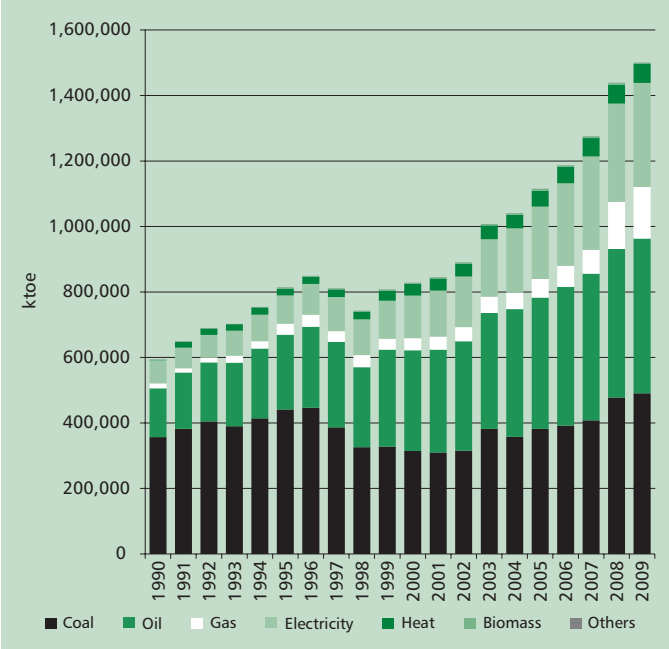
kt C = thousand tons of carbon equivalent.
Source: APERC estimates.

Figure 4.8 Final Energy Consumption by Sector, 1990–2009



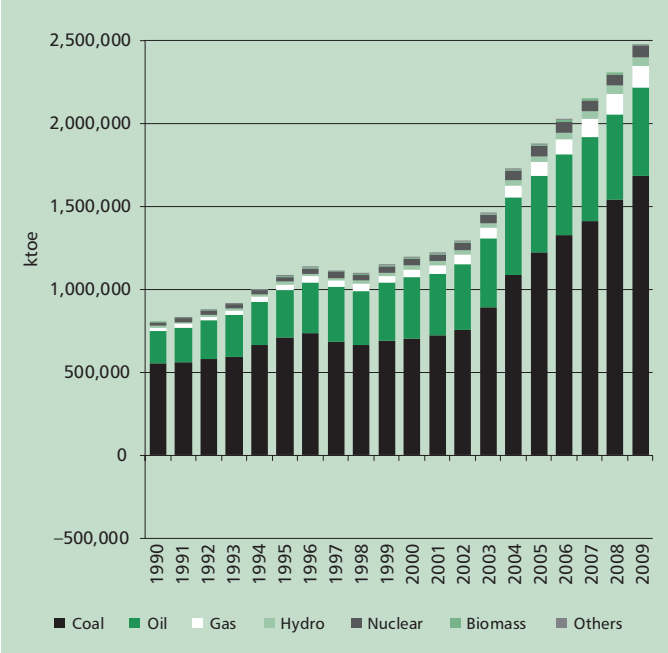
ktoe = thousand tons of oil equivalent.
Sources: APERC (APEC Energy Database), and IEA (2011b).

Figure 4.9 Final Energy Consumption by Type, 1990–2009



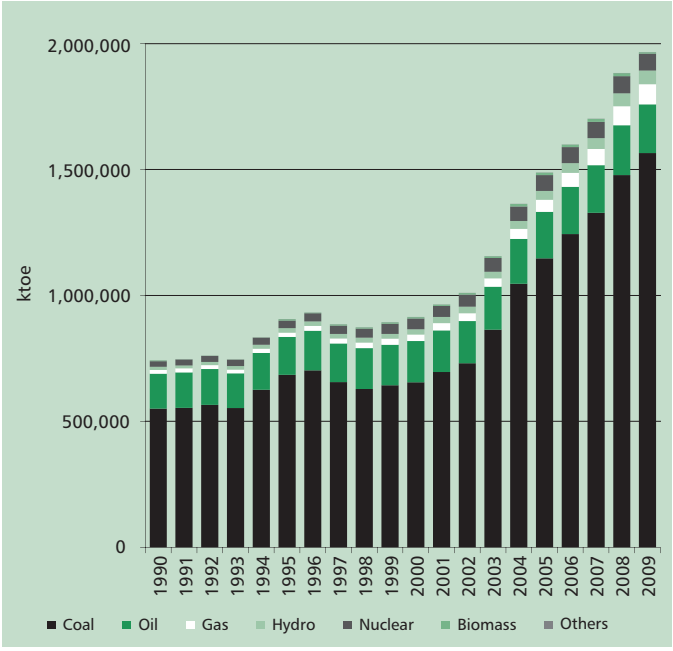
ktoe = thousand tons of oil equivalent.
Sources: APERC (APEC Energy Database), and IEA (2011b).

Figure 4.10 Total Primary Energy Supply, 1994–2009



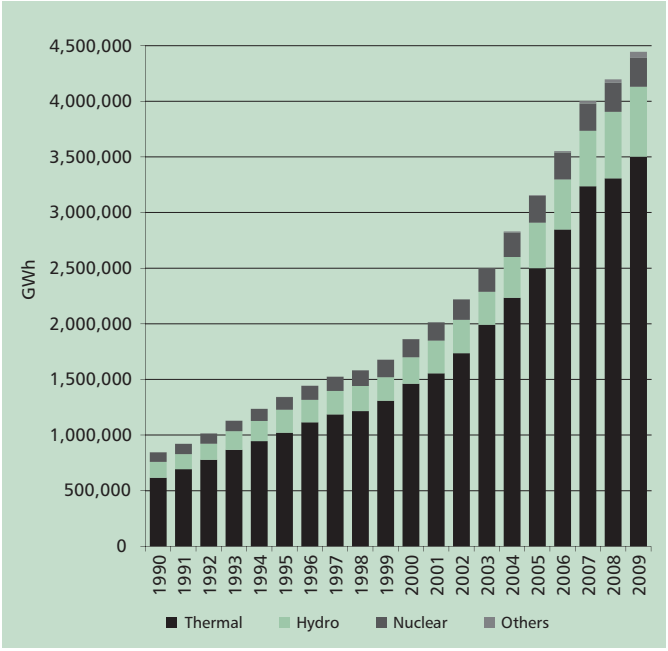
ktoe = thousand tons of oil equivalent.
Sources: APERC (APEC Energy Database), and IEA (2011b).

Figure 4.11 Indigenous Energy Production, 1990–2009



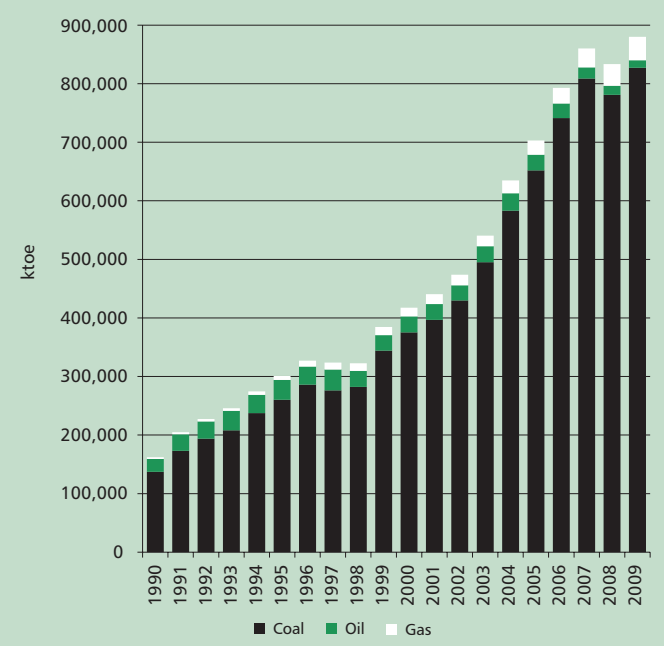
ktoe = thousand tons of oil equivalent.
Sources: APERC (APEC Energy Database), and IEA (2011b).

Figure 4.12 Electricity Generation by Source, 1990–2009



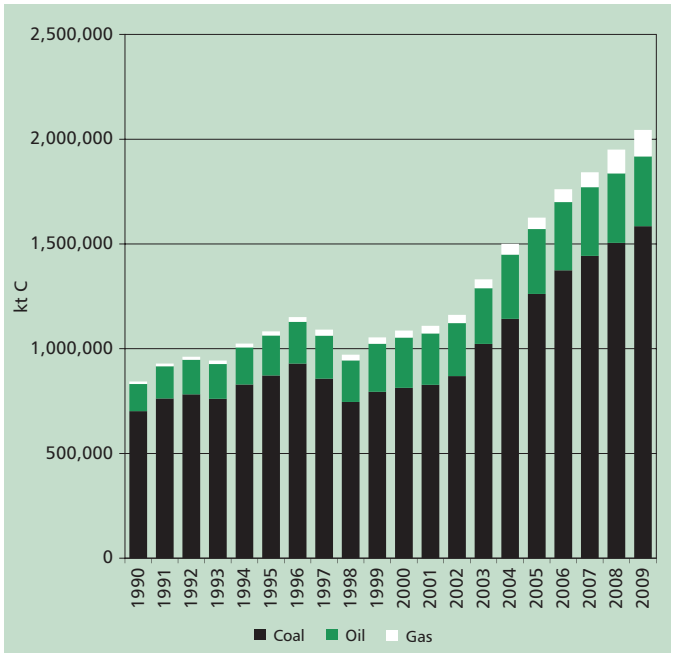
GWh = gigawatt-hour.
Sources: APERC (APEC Energy Database), and IEA (2011b).

Figure 4.13 Fuel Input for Electricity Generation, 1990–2009



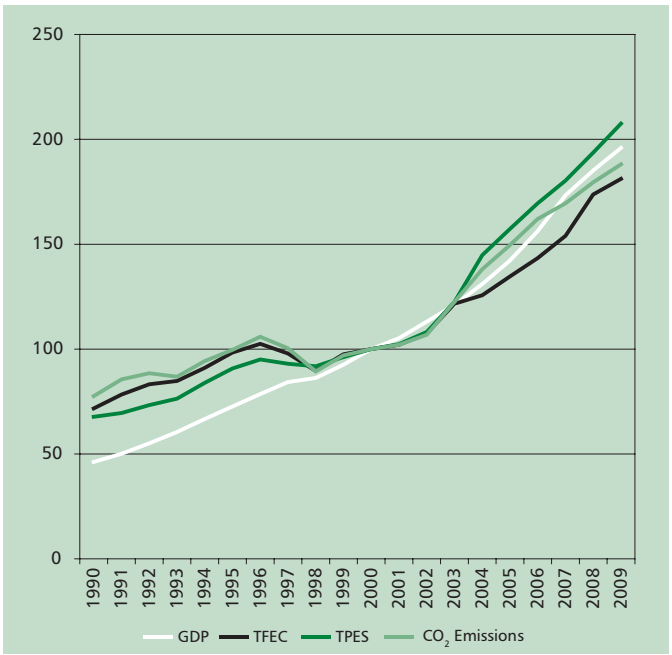
ktoe = thousand tons of oil equivalent.
Sources: APERC (APEC Energy Database), and IEA (2011b).

Figure 4.14 Carbon Dioxide Emissions from Fuel Combustion, 1990–2009



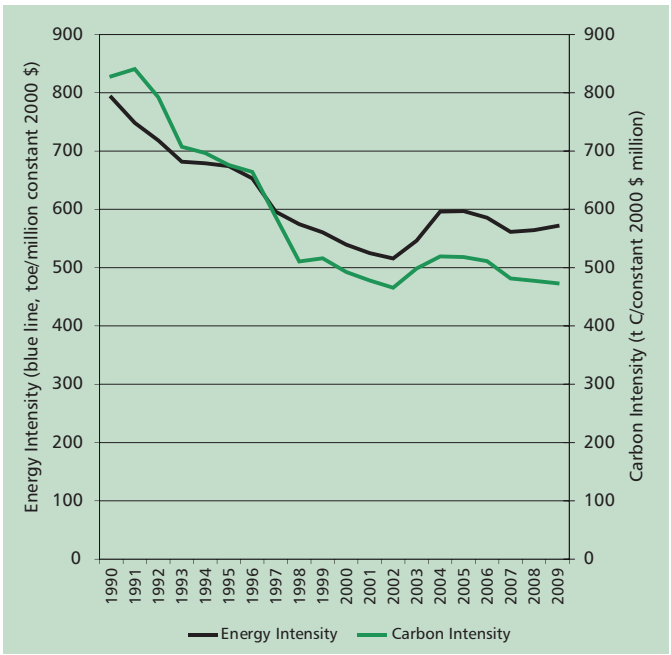
kt C = thousand tons of carbon equivalent.
Source: APERC estimates.

Figure 4.15 Growth of GDP, TFEC, TPES, and CO_2 Emissions (indexed to year 2000), 1990–2009



CO_2 = carbon dioxide, GDP = gross domestic product, TFEC = total final energy consumption, TPES = total primary energy supply.
Note: Indices are measured relative to the base year 2000 (2000 = 100).
Source: APERC estimates.

Figure 4.16 Energy and Carbon Intensities, 1990–2009



t C = ton of carbon equivalent , toe = ton of oil equivalent.
Source: APERC estimates.

Table 4.3 East Asia Energy Balance Table, 2006

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	1,244,149	0	187,494	0	0	0	0	0	0	0	55,318	38,612	63,446	0	3	36	10,038	131	0	0	1,599,228
2.	Imports	121,305	429	320,132	95,611	683	267	5,193	38,148	13,489	37,831	42,496	0	0	0	0	0	28	0	1,422	0	581,423
3.	Exports	–34,647	–9,864	–6,385	–70,515	–9,614	–690	–21,129	–12,627	–630	–25,825	–2,698	0	0	0	0	0	0	0	–1,447	0	–125,556
4.	International Bunkers	0	0	0	–34,232	0	0	–3,761	–18,665	0	–11,806	0	0	0	0	0	0	0	0	0	0	–34,232
5.	Stock Changes	6,055	–2,256	–2,890	–1,943	–277	–332	568	–1,705	–92	–107	–1,397	0	0	0	0	0	0	0	0	0	–2,432
6.	Total Primary Energy Supply	1,336,861	–11,691	498,351	–11,079	–9,208	–754	–19,128	5,150	12,767	93	93,719	38,612	63,446	0	3	36	10,066	131	–25	0	2,018,431
7.	Transfers	0	0	–2,085	4,626	5,582	–94	92	1,339	430	–2,722	0	0	0	0	0	0	0	0	0	0	2,541
8.	Total Transformation Sector	–972,343	96,740	–492,002	452,247	72,195	6,858	163,255	41,203	26,309	142,426	–20,305	–38,612	–63,446	0	–3	–36	–4,986	0	305,560	64,545	–672,641
8.1	Power Generation	–728,524	–14,944	–238	–27,490	–10	–142	–3,506	–19,150	–65	–4,616	–28,064	–38,612	–63,446	0	–3	–36	–4,908	0	305,560	64,545	–536,159
8.2	Gas Processing	–7,260	–1,605	0	–723	0	0	0	–134	0	–590	8,282	0	0	0	0	0	0	0	0	0	–1,306
8.3	Refineries	0	0	–491,813	480,474	72,205	7,001	166,761	60,487	26,374	147,647	0	0	0	0	0	0	0	0	0	0	–11,339
8.4	Coal Transformation	–236,559	113,289	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–123,270
8.5.	Other Transformation	0	0	48	–14	0	0	0	0	0	–14	–522	0	0	0	0	0	–78	0	0	0	–567
9.	Loss and Own Use	–73,373	–3,896	–7,684	–14,083	–689	–47	–3,268	–4,078	–1,485	–4,515	–9,099	0	0	0	0	0	–46	0	–53,108	–12,825	–174,114
10.	Discrepancy	21,836	–2,466	7,523	–11,954	1,140	–531	–52	–3,106	–1,519	–7,885	–362	0	0	0	0	0	–54	0	–68	–1,368	13,087
11.	Total Final Energy Consumption	312,981	78,687	4,103	419,757	69,019	5,431	140,899	40,508	36,502	127,398	63,954	0	0	0	0	0	4,979	131	252,359	50,353	1,187,304
12.	Industry Sector	218,123	57,132	2,816	100,536	5,821	773	19,262	27,547	5,602	41,533	29,685	0	0	0	0	0	4,542	1	164,311	32,755	609,901
13.	Transport Sector	4,800	6	0	147,444	43,738	104	79,528	10,146	5,401	8,528	1,209	0	0	0	0	0	0	0	4,393	0	157,852
14.	Other Sectors	70,122	8,755	0	92,562	19,306	4,461	41,792	1,654	23,112	2,237	29,641	0	0	0	0	0	438	131	83,655	17,598	302,901
14.1	Residential and Commercial	54,368	8,007	0	43,182	6,907	3,750	8,466	1,332	22,657	71	28,426	0	0	0	0	0	422	131	60,848	16,295	211,679
14.1.1	Commerce and Public Services	5,326	611	0	15,415	3,374	1,490	6,230	1,089	3,160	71	5,177	0	0	0	0	0	332	11	23,396	982	51,249
14.1.2	Residential	49,042	7,396	0	27,768	3,533	2,260	2,236	242	19,497	0	23,249	0	0	0	0	0	90	119	37,453	15,313	160,429
14.2	Non-Specified Others	15,753	748	0	49,380	12,399	711	33,326	323	455	2,166	1,214	0	0	0	0	0	16	0	22,807	1,303	91,222
15.	Non-Energy Use	19,935	12,794	1,287	79,214	155	94	318	1,161	2,386	75,100	3,420	0	0	0	0	0	0	0	0	0	116,650
16.	Electricity Output (GWh)	2,570,115	0	142,116	114	0	0	0	0	0	0	135,977	449,004	243,462	0	31	239	11,832	0	0	0	3,552,889
17.	Heat Output (TJ)	68,842	0	98,898	84	0	0	0	0	0	0	44,394	0	0	0	0	0	0	0	0	0	212,217

GWh = gigawatt–hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.
Note: Figures may not add up to total because of rounding.
Source: APERC (APEC Energy Database), and IEA (2011b).

Table 4.4 East Asia Energy Balance Table, 2007

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	1,328,168	0	188,891	0	0	0	0	0	0	0	65,151	42,884	64,005	0	6	70	11,772	135	0	0	1,701,084
2.	Imports	132,564	728	335,965	101,273	774	338	6,140	34,933	12,364	46,723	47,092	0	0	0	0	0	119	0	1,326	0	619,067
3.	Exports	−30,008	−10,442	−4,022	−76,149	−11,568	−165	−23,925	−11,273	−822	−28,395	−2,421	0	0	0	0	0	0	0	−1,601	0	−124,643
4.	International Bunkers	0	0	0	−35,799	0	0	−3,660	−19,251	0	−12,887	0	0	0	0	0	0	0	0	0	0	−35,799
5.	Stock Changes	−5,479	−4,683	−4,343	701	440	156	366	113	88	−462	849	0	0	0	0	0	0	0	0	0	−12,955
6.	Total Primary Energy Supply	1,425,246	−14,397	516,490	−9,974	−10,354	328	−21,079	4,522	11,630	4,979	110,671	42,884	64,005	0	6	70	11,891	135	−275	0	2,146,755
7.	Transfers	0	0	−1,860	552	5,510	−334	33	−2,225	666	−3,096	0	0	0	0	0	0	0	0	0	0	−1,308
8.	Total Transformation Sector	−1,051,169	112,663	−511,236	476,498	77,184	4,605	172,852	42,651	28,354	150,852	−26,417	−42,884	−64,005	0	−6	−70	−6,696	0	344,137	67,715	−701,470
8.1	Power Generation	−796,925	−13,824	−165	−22,154	−1	−111	−2,558	−14,936	−62	−4,485	−33,546	−42,884	−64,005	0	−6	−70	−6,501	0	344,137	67,715	−568,229
8.2	Gas Processing	−8,038	−1,823	0	−412	0	0	0	−50	0	−363	7,523	0	0	0	0	0	0	0	0	0	−2,749
8.3	Refineries	0	0	−511,161	499,137	77,185	4,717	175,411	57,637	28,415	155,771	0	0	0	0	0	0	0	0	0	0	−12,024
8.4	Coal Transformation	−246,206	128,309	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	−117,897
8.5.	Other Transformation	0	0	90	−73	0	−1	−1	0	0	−71	−394	0	0	0	0	0	−195	0	0	0	−571
9.	Loss and Own Use	−47,735	−5,972	−7,727	−13,594	−801	−71	−2,980	−3,929	−1,209	−4,603	−10,353	−1	0	0	0	0	−39	0	−57,358	−10,311	−153,090
10.	Discrepancy	−6,763	−3,809	8,464	−9,829	419	−143	−96	−387	259	−9,881	−1,144	1	0	0	0	0	−8	0	−846	−1,610	−15,543
11.	Total Final Energy Consumption	319,579	88,485	4,132	443,654	71,957	4,385	148,729	40,631	39,699	138,252	72,757	0	0	0	0	0	5,149	135	285,659	55,794	1,275,343
12.	Industry Sector	225,446	65,416	2,836	97,532	6,944	701	18,043	27,067	5,333	39,443	33,782	0	0	0	0	0	4,704	1	190,613	37,637	657,967
13.	Transport Sector	4,542	4	0	160,526	44,359	108	90,240	10,668	5,701	9,451	1,554	0	0	0	0	0	0	0	4,927	0	171,554
14.	Other Sectors	68,575	8,418	0	91,850	20,464	3,495	40,158	1,737	25,126	871	33,518	0	0	0	0	0	445	135	90,119	18,157	311,215
14.1	Residential and Commercial	52,533	7,681	0	47,185	8,139	3,117	9,678	1,385	24,635	231	32,017	0	0	0	0	0	429	135	65,617	16,597	222,192
14.1.1	Commerce and Public Services	5,145	664	0	16,686	3,665	1,241	7,059	1,163	3,327	231	5,772	0	0	0	0	0	345	16	25,150	1,081	54,860
14.1.2	Residential	47,387	7,017	0	30,499	4,474	1,875	2,619	222	21,308	0	26,245	0	0	0	0	0	83	119	40,467	15,516	167,333
14.2	Non-Specified Others	16,042	737	0	44,665	12,324	378	30,480	352	491	640	1,502	0	0	0	0	0	16	0	24,502	1,560	89,023
15.	Non-Energy Use	21,016	14,647	1,296	93,746	190	82	289	1,159	3,540	88,487	3,903	0	0	0	0	0	0	0	0	0	134,608
16.	Electricity Output (GWh)	2,947,652	0	129,063	150	0	0	0	0	0	0	159,078	498,656	245,606	0	70	376	20,728	0	0	0	4,001,379
17.	Heat Output (TJ)	65,992	0	105,208	167	0	0	0	0	0	0	48,072	0	0	0	0	0	0	0	0	0	219,439

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Source: APERC (APEC Energy Database), and IEA (2011b).

Table 4.5 East Asia Energy Balance Table, 2008

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	1,477,859	0	198,346	0	0	0	0	0	0	0	75,272	51,493	67,803	0	25	71	11,984	142	0	0	1,882,995
2.	Imports	132,179	757	345,608	104,921	2,772	292	9,822	31,529	11,103	49,404	52,147	0	0	0	0	0	31	0	1,319	0	636,961
3.	Exports	−26,832	−8,425	−4,626	−83,178	−10,334	−320	−27,989	−13,627	−1,208	−29,700	−3,021	0	0	0	0	0	−2	0	−1,738	0	−127,822
4.	International Bunkers	0	0	0	−32,008	0	0	−2,451	−15,990	0	−13,568	0	0	0	0	0	0	0	0	0	0	−32,008
5.	Stock Changes	−25,845	−7,452	−14,449	−5,022	−1,681	169	−3,438	−164	12	78	−1,985	0	0	0	0	0	0	0	0	0	−54,754
6.	Total Primary Energy Supply	1,557,361	−15,119	524,878	−15,287	−9,243	140	−24,055	1,749	9,907	6,214	122,413	51,493	67,803	0	25	71	12,013	142	−419	0	2,305,372
7.	Transfers	0	0	−2,583	−3,957	748	−186	−357	−2,000	550	−2,712	0	0	0	0	0	0	0	0	0	0	−6,540
8.	Total Transformation Sector	−1,085,531	88,326	−517,027	490,600	86,945	5,017	186,002	37,834	28,230	146,571	35,809	−51,492	−67,803	0	−24	−71	−6,344	0	361,028	67,563	−684,966
8.1	Power Generation	−816,976	−7,406	−98	−18,764	−1	−87	−2,099	−12,050	−74	−4,453	−39,966	−51,492	−67,803	0	−24	−71	−6,192	0	361,028	67,563	−580,201
8.2	Gas Processing	−7,087	−1,823	0	−371	0	0	0	−20	0	−351	75,775	0	0	0	0	0	0	0	0	0	66,494
8.3	Refineries	0	0	−517,093	509,789	86,947	5,104	188,101	49,905	28,304	151,428	0	0	0	0	0	0	0	0	0	0	−7,304
8.4	Coal Transformation	−261,468	97,554	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	−163,914
8.5.	Other Transformation	0	0	164	−54	0	0	0	0	0	−54	0	0	0	0	0	0	−152	0	0	0	−41
9.	Loss and Own Use	−65,792	−6,258	−8,996	−15,562	−766	−40	−5,008	−3,517	−1,042	−5,189	−14,218	−1	0	0	0	0	−45	0	−59,693	−9,108	−179,672
10.	Discrepancy	4,605	60	8,676	−7,176	360	−96	−8	2,085	−559	−8,958	−95	0	0	0	0	0	−16	0	−845	−821	4,387
11.	Total Final Energy Consumption	410,643	67,009	4,948	448,618	78,044	4,836	156,575	36,152	37,086	135,926	143,909	0	0	0	0	0	5,608	142	300,071	57,634	1,438,582
12.	Industry Sector	297,921	46,037	3,377	95,888	7,069	835	24,148	21,789	5,273	36,774	95,089	0	0	0	0	0	5,158	1	195,568	37,976	777,014
13.	Transport Sector	4,382	2	0	172,092	47,330	94	97,770	12,107	5,770	9,021	6,606	0	0	0	0	0	0	0	5,274	0	188,356
14.	Other Sectors	80,999	6,463	0	85,977	23,451	3,820	34,207	1,320	22,152	1,027	38,150	0	0	0	0	0	450	142	99,229	19,658	331,068
14.1	Residential and Commercial	64,124	5,955	0	45,395	10,242	3,428	8,884	1,056	21,558	226	36,197	0	0	0	0	0	434	142	73,712	18,017	243,976
14.1.1	Commerce and Public Services	10,618	180	0	8,480	1,434	1,470	2,362	855	2,133	226	5,707	0	0	0	0	0	365	21	26,437	1,204	53,011
14.1.2	Residential	53,506	5,776	0	36,915	8,808	1,958	6,523	201	19,425	0	30,490	0	0	0	0	0	69	121	47,276	16,813	190,966
14.2	Non-Specified Others	16,875	508	0	40,582	13,209	393	25,323	264	593	800	1,953	0	0	0	0	0	16	0	25,517	1,641	87,091
15.	Non-Energy Use	27,341	14,507	1,571	94,662	194	87	450	936	3,891	89,105	4,064	0	0	0	0	0	0	0	0	0	142,144
16.	Electricity Output (GWh)	3,033,276	0	109,843	160	0	0	0	0	0	0	163,610	598,744	260,179	0	285	436	31,277	0	0	0	4,197,810
17.	Heat Output (TJ)	1,455,997	0	113,314	126	0	0	0	0	0	0	97,982	0	0	0	0	0	0	0	0	0	1,667,419

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.
Note: Figures may not add up to total because of rounding.
Source: APERC (APEC Energy Database), and IEA (2011b).

Table 4.6 East Asia Energy Balance Table, 2009

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	1,565,778	0	193,181	0	0	0	0	0	0	0	80,115	54,123	67,619	0	49	101	4,962	155	0	0	1,966,083
2.	Imports	179,166	252	370,933	114,589	795	400	8,819	35,130	13,022	56,423	50,675	0	0	0	0	0	27	0	1,527	0	717,168
3.	Exports	–16,609	–25	–5,662	–91,720	–14,313	–724	–31,866	–13,668	–1,207	–29,941	–2,988	0	0	0	0	0	–2	0	–1,818	0	–118,824
4.	International Bunkers	0	0	0	–35,741	0	0	–5,524	–15,097	0	–15,120	0	0	0	0	0	0	0	0	0	0	–35,741
5.	Stock Changes	–33,277	–15,266	–9,405	–892	–226	14	–583	–722	203	422	1,209	0	0	0	0	0	0	0	0	0	–57,630
6.	Total Primary Energy Supply	1,695,058	–15,039	549,046	–13,764	–13,745	–310	–29,154	5,644	12,018	11,783	129,011	54,123	67,619	0	49	101	4,987	155	–291	0	2,471,056
7.	Transfers	0	0	–2,726	1,992	747	7	–263	–1,415	459	2,457	0	0	0	0	0	0	0	0	0	0	–734
8.	Total Transformation Sector	–1,145,126	90,616	–546,532	513,302	98,966	5,545	195,537	32,257	27,178	153,819	44,415	–54,121	–67,619	0	–49	–101	–2,667	0	382,223	69,552	–716,107
8.1	Power Generation	–865,643	–6,953	–64	–15,410	–1	–94	–1,692	–8,455	–13	–5,155	–42,976	–54,121	–67,619	0	–49	–101	–2,455	0	382,223	69,552	–603,617
8.2	Gas Processing	–6,645	–1,090	0	–291	0	0	0	–3	0	–288	87,391	0	0	0	0	0	0	0	0	0	79,365
8.3	Refineries	0	0	–546,702	529,047	98,967	5,639	197,229	40,715	27,191	159,306	0	0	0	0	0	0	0	0	0	0	–17,655
8.4	Coal Transformation	–272,838	98,660	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–174,178
8.5.	Other Transformation	0	0	234	–44	0	0	0	0	0	–44	0	0	0	0	0	0	–213	0	0	0	–23
9.	Loss and Own Use	–77,997	–5,686	–6,434	–14,129	–781	–39	–4,563	–3,067	–448	–5,231	–15,667	–2	0	0	0	0	0	0	–57,128	–9,231	–186,276
10.	Discrepancy	–50,152	–905	10,032	–18,284	–6,391	–284	–2,781	56	–957	–7,927	–559	0	0	0	0	0	0	0	–6,927	–780	–67,575
11.	Total Final Energy Consumption	421,782	68,987	3,385	469,116	78,796	4,919	158,777	33,474	38,250	154,900	157,199	0	0	0	0	0	2,320	155	317,878	59,541	1,500,363
12.	Industry Sector	305,873	47,859	2,298	101,001	8,290	671	23,333	18,284	5,297	45,125	109,312	0	0	0	0	0	1,778	1	204,396	38,686	811,204
13.	Transport Sector	4,221	1	0	174,653	45,683	81	99,852	13,180	5,917	9,941	8,493	0	0	0	0	0	0	0	5,660	0	193,028
14.	Other Sectors	83,411	5,816	0	89,047	24,601	4,101	35,168	1,273	22,800	1,103	39,395	0	0	0	0	0	541	154	107,822	20,855	347,041
14.1	Residential and Commercial	65,092	5,357	0	48,514	11,850	3,642	9,690	990	22,145	197	37,190	0	0	0	0	0	525	153	79,358	19,112	255,302
14.1.1	Commerce and Public Services	11,658	172	0	9,197	1,559	1,791	2,603	809	2,238	197	6,672	0	0	0	0	0	461	29	27,787	1,201	57,177
14.1.2	Residential	53,434	5,186	0	39,317	10,291	1,851	7,087	181	19,907	0	30,518	0	0	0	0	0	64	124	51,571	17,911	198,126
14.2	Non-Specified Others	18,320	459	0	40,533	12,752	459	25,478	283	656	906	2,204	0	0	0	0	0	16	0	28,464	1,743	91,739
15.	Non-Energy Use	28,277	15,311	1,088	104,414	222	65	424	737	4,236	98,731	0	0	0	0	0	0	0	0	0	0	149,090
16.	Electricity Output (GWh)	3,233,609	0	100,193	152	0	0	0	0	0	0	167,804	628,335	259,476	0	574	1,470	52,630	0	0	0	4,444,243
17.	Heat Output (TJ)	1,515,716	0	94,599	84	0	0	0	0	0	0	96,437	0	0	0	0	0	0	0	0	0	1,706,836

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Source: APERC (APEC Energy Database), and IEA (2011b).

Table 4.7 East Asia Summary Table, 1990–2009

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Indigenous Production (ktoe)																				
Coal	550,469	553,698	565,911	553,050	625,449	685,147	702,385	655,859	628,745	643,643	655,113	695,920	730,705	864,338	1,046,311	1,147,820	1,244,149	1,328,168	1,477,859	1,565,778
Oil	138,604	141,089	142,161	137,974	146,143	150,100	157,388	153,680	161,857	160,946	164,326	165,078	168,033	170,664	177,984	183,950	187,494	188,891	198,346	193,181
Gas	15,287	15,751	15,386	14,711	17,074	17,463	19,448	19,711	22,377	24,145	25,921	28,916	31,118	33,265	39,963	48,357	55,318	65,151	75,272	80,115
Hydro	12,151	11,630	12,373	14,371	15,574	17,630	17,396	18,148	19,331	18,202	20,380	25,170	25,778	25,592	31,474	35,270	38,612	42,884	51,493	54,123
Nuclear	22,347	23,874	23,687	24,521	28,031	30,013	32,850	33,298	36,645	40,767	42,793	43,025	47,896	55,226	57,508	62,502	63,446	64,005	67,803	67,619
Geothermal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Solar	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	3	6	25	49
Wind	0	0	0	0	0	0	0	0	0	1	1	1	1	2	6	19	36	70	71	101
Biomass	3,060	715	773	1,180	1,250	5,360	2,665	4,262	4,579	5,272	5,541	5,812	6,148	6,508	9,654	9,738	10,038	11,772	11,984	4,962
Others	10	11	13	14	17	22	32	46	44	42	42	37	35	33	121	125	131	135	142	155
Total	741,929	746,769	760,304	745,822	833,540	905,735	932,165	885,004	873,579	893,017	914,117	963,960	1,009,714	1,155,629	1,363,022	1,487,781	1,599,228	1,701,084	1,882,995	1,966,083
Primary Energy Supply (ktoe)																				
Coal	556,771	560,571	579,563	595,829	661,712	709,809	733,398	683,975	666,478	689,775	706,629	719,813	757,819	892,177	1,088,631	1,219,605	1,325,170	1,410,849	1,542,241	1,680,019
Oil	193,703	209,977	234,532	251,646	265,021	288,488	309,877	329,049	324,437	347,941	368,027	372,304	391,768	417,441	462,139	461,049	487,272	506,517	509,590	535,281
Gas	18,696	20,611	21,439	21,819	26,686	28,690	34,729	38,771	41,480	42,965	47,015	52,215	57,577	61,314	74,201	84,588	93,719	110,671	122,413	129,011
Hydro	12,151	11,630	12,373	14,371	15,574	17,630	17,396	18,148	19,331	18,202	20,380	25,170	25,778	25,592	31,474	35,270	38,612	42,884	51,493	54,123
Nuclear	22,347	23,874	23,687	24,521	28,031	30,013	32,850	33,298	36,645	40,767	42,793	43,025	47,896	55,226	57,508	62,502	63,446	64,005	67,803	67,619
Geothermal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Solar	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	3	6	25	49
Wind	0	0	0	0	0	0	0	0	0	1	1	1	1	2	6	19	36	70	71	101
Biomass	3,084	740	790	1,195	1,263	5,373	2,669	4,281	4,595	5,286	5,568	5,840	6,179	6,535	9,680	9,764	10,066	11,891	12,013	4,987
Others	–125	0	39	22	417	113	379	89	70	78	115	220	99	50	135	176	106	–139	–277	–136
Total	806,626	827,403	872,424	909,402	998,705	1,080,115	1,131,298	1,107,610	1,093,036	1,145,017	1,190,528	1,218,588	1,287,118	1,458,338	1,723,774	1,872,975	2,018,431	2,146,755	2,305,372	2,471,056
Final Energy Consumption by Sector (ktoe)																				
Industry	367,424	378,352	402,060	383,994	417,553	461,031	471,672	434,407	405,708	438,634	449,030	457,614	481,106	558,166	529,604	560,922	609,901	657,967	777,014	811,204
Transport	53,740	57,868	62,029	65,019	69,283	75,427	77,264	85,828	89,549	98,176	104,925	105,902	113,208	125,166	139,123	149,530	157,852	171,554	188,356	193,028
Residential	136,993	149,313	147,000	113,881	114,057	123,681	136,028	122,321	85,450	100,078	105,695	106,395	114,166	127,502	140,466	152,239	160,429	167,333	190,966	198,126
Commercial	10,805	12,753	14,991	18,125	19,894	21,466	23,486	24,762	36,348	38,580	35,553	38,509	40,123	44,152	47,148	54,231	51,249	54,860	53,011	57,177
Others	24,836	50,407	62,978	121,211	133,018	132,707	140,542	143,291	125,265	131,876	132,853	136,354	141,837	152,309	184,231	197,896	207,872	223,631	229,235	240,828
Total	593,798	648,692	689,058	702,230	753,805	814,313	848,993	810,608	742,320	807,343	828,056	844,773	890,440	1,007,295	1,040,572	1,114,817	1,187,304	1,275,343	1,438,582	1,500,363

continued on next page

Table 4.7 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Final Energy Consumption by Type (ktoe)																				
Coal	356,873	382,574	404,838	390,189	414,380	441,431	446,604	386,825	325,791	327,920	314,557	309,707	315,467	381,692	357,933	381,824	391,668	408,064	477,652	490,769
Oil	148,856	171,426	180,188	193,849	212,834	228,016	247,162	260,771	244,291	295,905	307,186	314,342	333,773	354,290	389,902	401,096	423,860	447,786	453,566	472,501
Gas	15,128	12,765	13,935	21,096	22,453	33,670	36,868	32,501	37,397	33,406	37,064	39,880	43,392	49,494	50,263	57,012	63,954	72,757	143,909	157,199
Electricity	68,928	63,374	69,885	76,786	81,044	86,455	93,680	104,676	108,799	116,264	130,310	140,375	154,477	175,757	196,419	220,967	252,359	285,659	300,071	317,878
Heat	953	17,838	19,449	19,512	22,258	20,606	22,397	23,310	23,963	30,610	35,487	36,978	39,762	42,293	41,043	48,294	50,353	55,794	57,634	59,541
Biomass	3,049	703	750	783	819	4,113	2,249	2,479	2,035	3,195	3,409	3,454	3,534	3,736	4,890	5,499	4,979	5,149	5,608	2,320
Others	10	11	13	14	17	22	32	46	44	42	42	37	35	33	121	125	131	135	142	155
Total	593,798	648,692	689,058	702,230	753,805	814,313	848,993	810,608	742,320	807,343	828,056	844,773	890,440	1,007,295	1,040,572	1,114,817	1,187,304	1,275,343	1,438,582	1,500,363
Power Generation (GWh)																				
Thermal	617,415	693,096	778,676	867,181	945,684	1,022,058	1,114,784	1,185,462	1,216,023	1,308,476	1,461,433	1,555,518	1,735,749	1,990,681	2,234,884	2,498,919	2,848,321	3,235,943	3,306,889	3,501,758
Hydro	141,249	135,229	143,874	167,104	181,099	204,934	202,211	210,953	224,707	211,588	236,894	292,573	299,645	297,479	365,980	410,115	449,004	498,656	598,744	628,335
Nuclear	85,753	91,611	90,895	94,096	107,564	115,178	126,051	127,773	140,613	156,429	164,204	165,091	183,783	211,904	220,674	239,839	243,462	245,606	260,179	259,476
Geothermal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Solar	1	1	2	2	2	2	3	3	4	5	5	6	7	8	10	15	31	70	285	574
Wind	0	0	0	1	1	0	0	1	2	6	17	13	15	25	47	130	239	376	436	1,470
Others	0	0	0	0	0	250	403	77	56	71	57	57	135	148	8,674	7,607	11,832	20,728	31,277	52,630
Total	844,418	919,937	1,013,447	1,128,384	1,234,350	1,342,422	1,443,452	1,524,269	1,581,405	1,676,575	1,862,610	2,013,258	2,219,334	2,500,245	2,830,269	3,156,625	3,552,889	4,001,379	4,197,810	4,444,243
Loss and Own Use of Electricity (GWh)																				
Transmission and Distribution Losses	3,959	3,071	2,821	8,483	7,949	9,350	10,981	11,433	13,019	10,580	13,032	12,695	14,485	11,520	157,011	156,207	215,038	226,976	235,130	243,080
Own Use	5,616	6,156	6,549	6,953	7,728	8,663	9,248	10,170	10,367	11,596	13,051	13,726	15,238	16,142	156,169	177,896	200,587	226,696	228,758	241,073
Total	9,574	9,227	9,369	15,435	15,677	18,013	20,229	21,603	23,386	22,175	26,084	26,420	29,724	27,663	313,179	334,102	415,625	453,672	463,887	484,153
Fuel Input for Power Generation (ktoe)																				
Coal	137,287	173,056	193,950	208,017	237,466	260,257	286,244	276,489	282,353	344,257	375,456	396,779	429,831	495,179	583,297	652,119	741,413	808,779	780,911	827,343
Oil	21,914	28,390	29,376	33,457	31,233	33,995	30,792	35,313	27,245	26,356	27,186	27,046	25,777	27,388	29,667	26,722	24,772	19,173	15,476	12,647
Gas	2,957	3,347	4,004	4,374	5,778	6,626	9,981	12,092	13,061	13,979	14,881	16,888	18,253	17,882	22,004	24,282	26,739	32,111	37,041	40,096
Total	162,159	204,793	227,330	245,848	274,477	300,877	327,017	323,894	322,659	384,591	417,522	440,712	473,861	540,449	634,968	703,122	792,924	860,062	833,428	880,087
CO_2 Emissions (kt C)																				
Coal	701,949	762,309	782,527	761,305	829,472	872,205	929,456	856,983	746,270	794,294	813,066	827,700	869,514	1,023,277	1,142,637	1,261,489	1,374,316	1,442,957	1,505,429	1,585,122
Oil	129,668	154,034	164,950	165,900	176,649	191,196	198,828	205,154	198,235	229,766	240,325	245,341	253,069	265,603	306,867	309,579	325,908	328,071	331,307	333,199
Gas	11,777	13,164	14,496	16,540	18,607	19,770	22,525	29,074	26,869	30,143	33,425	36,302	39,124	42,378	51,688	54,931	61,382	71,027	113,938	126,361
Total	843,394	929,507	961,973	943,745	1,024,728	1,083,172	1,150,810	1,091,211	971,373	1,054,203	1,086,815	1,109,342	1,161,707	1,331,258	1,501,192	1,625,999	1,761,606	1,842,055	1,950,673	2,044,681

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Table 4.7 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Macroeconomic Indicators																				
Population (thousand)	1,206,148	1,222,462	1,237,324	1,251,567	1,265,698	1,279,678	1,293,277	1,306,498	1,318,968	1,330,358	1,340,914	1,350,697	1,359,688	1,368,038	1,376,059	1,383,948	1,391,582	1,398,809	1,405,905	1,412,921
Urban Population, %	29.8	30.6	31.4	32.2	33.0	33.8	34.6	35.5	36.3	37.2	38.0	38.9	39.8	40.7	41.5	42.4	43.3	44.1	45.0	45.8
GDP (constant 2000 $ million)	1,018,333	1,105,731	1,214,653	1,333,999	1,470,903	1,602,353	1,732,463	1,858,944	1,902,314	2,042,563	2,206,207	2,321,149	2,495,889	2,670,339	2,890,935	3,138,051	3,446,954	3,824,791	4,086,007	4,321,991
GDP (current $ million)	863,572	971,418	1,075,762	1,152,842	1,373,910	1,657,726	1,861,628	1,909,153	1,818,626	2,000,361	2,210,901	2,280,987	2,494,524	2,759,688	3,177,587	3,639,451	4,233,665	5,152,558	6,058,277	6,428,731
GDP (constant 2005 PPP $ million)	2,128,223	2,315,976	2,569,746	2,851,125	3,168,312	3,472,444	3,772,036	4,065,197	4,221,939	4,540,858	4,910,507	5,218,624	5,643,661	6,093,021	6,630,535	7,258,027	8,043,494	9,012,772	9,715,037	10,395,636
GDP/capita (constant 2000 $)	844	905	982	1,066	1,162	1,252	1,340	1,423	1,442	1,535	1,645	1,718	1,836	1,952	2,101	2,267	2,477	2,734	2,906	3,059
GDP/capita (current $)	716	795	869	921	1,085	1,295	1,439	1,461	1,379	1,504	1,649	1,689	1,835	2,017	2,309	2,630	3,042	3,684	4,309	4,550
GDP – Manufacturing (% of GDP)	22.9	23.1	23.4	23.3	24.0	24.4	24.6	24.8	25.1	26.0	26.9	26.9	27.5	28.8	29.0	29.0	29.5	30.3	30.4	31.2
Car Ownership (car/1,000 persons)	10	12	13	15	17	19	20	22	22	24	26	28	30	33	36	39	43	48	54	62
Basic Energy Indicators																				
TPES/capita (toe/person)	0.67	0.68	0.71	0.73	0.79	0.84	0.87	0.85	0.83	0.86	0.89	0.90	0.95	1.07	1.25	1.35	1.45	1.53	1.64	1.75
TFEC/capita (toe/person)	0.49	0.53	0.56	0.56	0.60	0.64	0.66	0.62	0.56	0.61	0.62	0.63	0.65	0.74	0.76	0.81	0.85	0.91	1.02	1.06
TPES/GDP (toe/constant 2000 $ million)	792	748	718	682	679	674	653	596	575	561	540	525	516	546	596	597	586	561	564	572
TFEC/GDP (toe/constant 2000 $ million)	583	587	567	526	512	508	490	436	390	395	375	364	357	377	360	355	344	333	352	347
Import Dependency (%)	8.0	9.7	12.9	18.0	16.5	16.1	17.6	20.1	20.1	22.0	23.2	20.9	21.6	20.8	20.9	20.6	20.8	20.8	18.3	20.4
Oil Import Dependency (%)	28.4	32.8	39.4	45.2	44.9	48.0	49.2	53.3	50.1	53.7	55.3	55.7	57.1	59.1	61.5	60.1	61.5	62.7	61.1	63.9
Electricity/capita (kWh/ person)	665	603	657	714	745	786	842	932	959	1,016	1,130	1,209	1,321	1,494	1,660	1,857	2,109	2,375	2,482	2,617
CO_2 Intensity (t C/constant 2000 $ million)	828	841	792	707	697	676	664	587	511	516	493	478	465	499	519	518	511	482	477	473
CO_2/capita (t C)	0.70	0.76	0.78	0.75	0.81	0.85	0.89	0.84	0.74	0.79	0.81	0.82	0.85	0.97	1.09	1.17	1.27	1.32	1.39	1.45
CO_2/TPES (t C/toe)	1.05	1.12	1.10	1.04	1.03	1.00	1.02	0.99	0.89	0.92	0.91	0.91	0.90	0.91	0.87	0.87	0.87	0.86	0.85	0.83

CO_2 = carbon dioxide, GDP = gross domestic product, GWh = gigawatt-hour, kt C = thousand tons of carbon equivalent, ktoe = thousand tons of oil equivalent, kWh = kilowatt-hour, PPP = purchasing power parity, t C = ton of carbon equivalent, TFEC = total final energy consumption, toe = ton of oil equivalent, TPES = total primary energy supply.

Notes: Figures may not add up to total because of rounding

Sources: APERC (APEC Energy Database), IEA (2011b), JAMA (2012), [Taipei,China] Council for Economic Planning and Development (2011), and World Bank.

4.1 People's Republic of China

Country Profile (2009)		Energy Reserves (year-end 2008)	
Total Surface Area (square kilometer)	9,596,961	Coal (million ton) - Recoverable	114,500.0
Population (thousand)	1,331,380	Gas (trillion cubic feet) - Proven	109.1
GDP (billion constant 2000 $)	2,940.2	Oil (billion barrel) - Proven	18,052.0
Electrification Rate (%)	99.4		

GDP = gross domestic product.

Sources: ADB (2012), IEA (2011c), World Bank, and WEC (2010).

2009 Energy Supply and Demand Flow (ktoe)

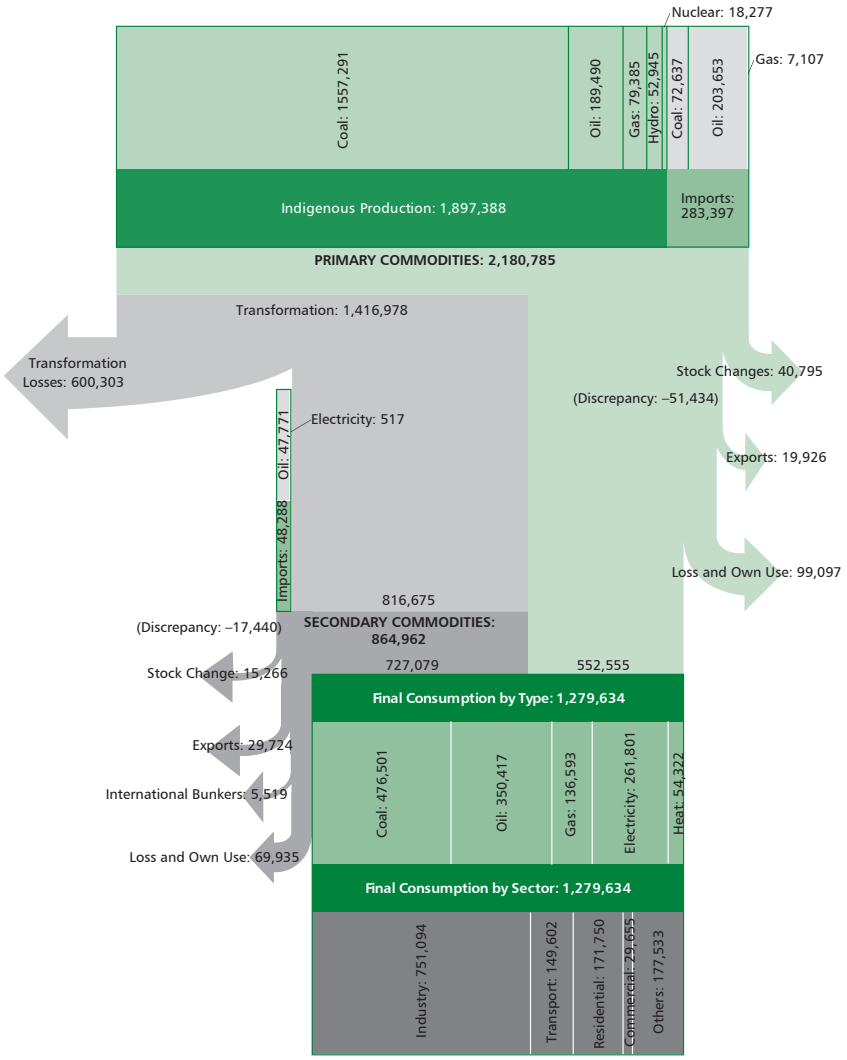


Table 4.1.1 Key Data and Economic Profile

	1990	1995	2000	2005	2009
Socioeconomic Data					
Population (thousand)	1,135,185	1,204,855	1,262,645	1,303,720	1,331,380
GDP (constant 2000 $ billion)	444.6	792.8	1,198.5	1,908.8	2,940.2
GDP (constant 2005 PPP $ billion)	1,249.5	2,228.0	3,368.1	5,364.3	8,262.9
GDP/capita (constant 2000 $)	392	658	949	1,464	2,208
GDP/capita (constant 2005 PPP $)	1,101	1,849	2,667	4,115	6,206

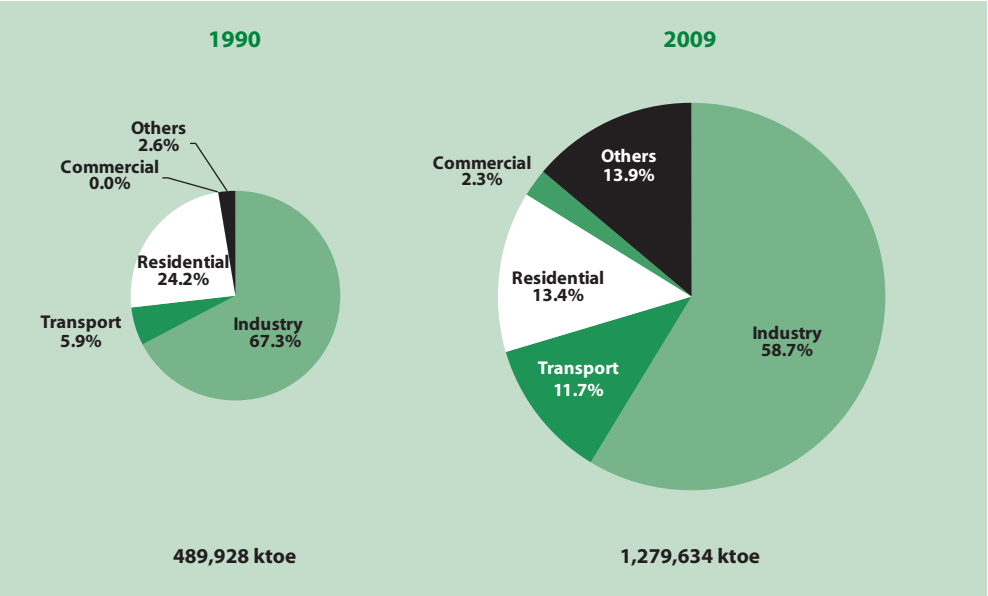
GDP = gross domestic product, PPP = purchasing power parity.
Sources: World Bank.

Table 4.1.2 Energy Supply and Demand

	1990	1995	2000	2005	2009
Primary Energy Supply (ktoe)					
Indigenous Production	705,811	871,184	865,531	1,426,025	1,897,388
Net Imports	–51,807	–13,185	39,644	113,334	220,455
Total PES	654,004	857,999	905,175	1,539,359	2,117,844
Coal	512,155	659,176	631,243	1,122,099	1,568,767
Oil	114,439	158,528	224,662	319,143	395,328
Gas	14,242	16,709	22,401	44,665	83,505
Biomass	2,268	4,312	4,089	5,996	0
Others	10,899	19,274	22,781	47,456	70,243
TPES/capita (toe)	0.58	0.71	0.72	1.18	1.59
TPES/GDP (toe/constant 2005 PPP $ million)	523	385	269	287	256
Final Energy Consumption (ktoe)					
Industry	329,825	409,970	379,343	497,451	751,094
Transportation	28,776	36,370	60,078	104,959	149,602
Other Sectors	131,327	214,340	195,255	301,228	378,938
Total FEC	489,928	660,681	634,676	903,638	1,279,634
Coal	338,239	425,458	296,805	367,076	476,501
Oil	84,065	124,639	189,483	281,565	350,417
Gas	13,205	27,667	24,087	38,454	136,593
Electricity	52,150	60,634	90,621	169,807	261,801
Biomass	2,268	3,151	2,080	3,658	0
Others	0	19,132	31,600	43,080	54,322

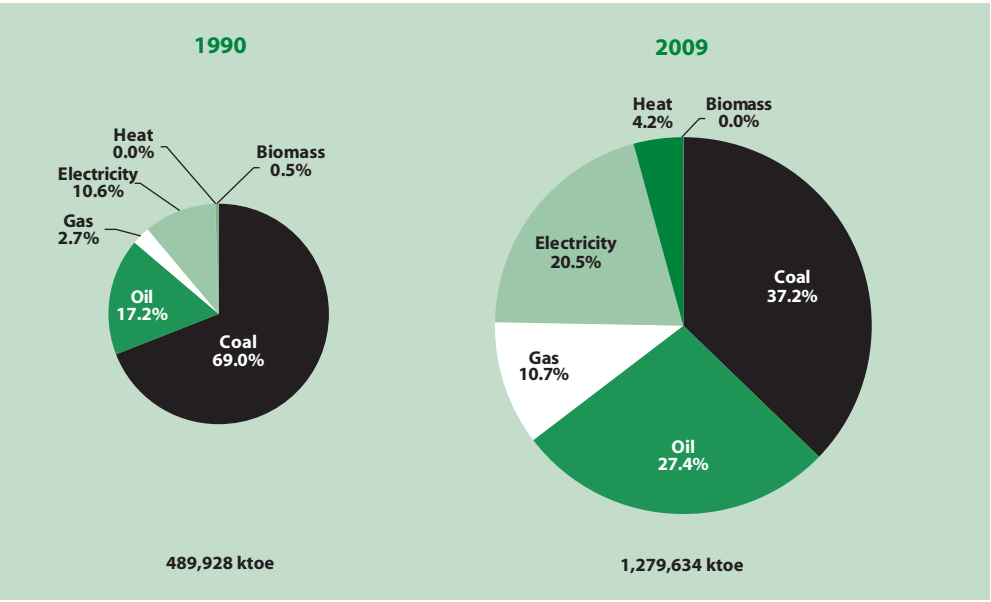
FEC = final energy consumption, GDP = gross domestic product, ktoe = thousand tons of oil equivalent, PES = primary energy supply, PPP = purchasing power parity, toe = ton of oil equivalent, TPES = total primary energy supply.
Source: APERC (APEC Energy Database).

Figure 4.1.1 Final Energy Consumption by Sector, 1990–2009



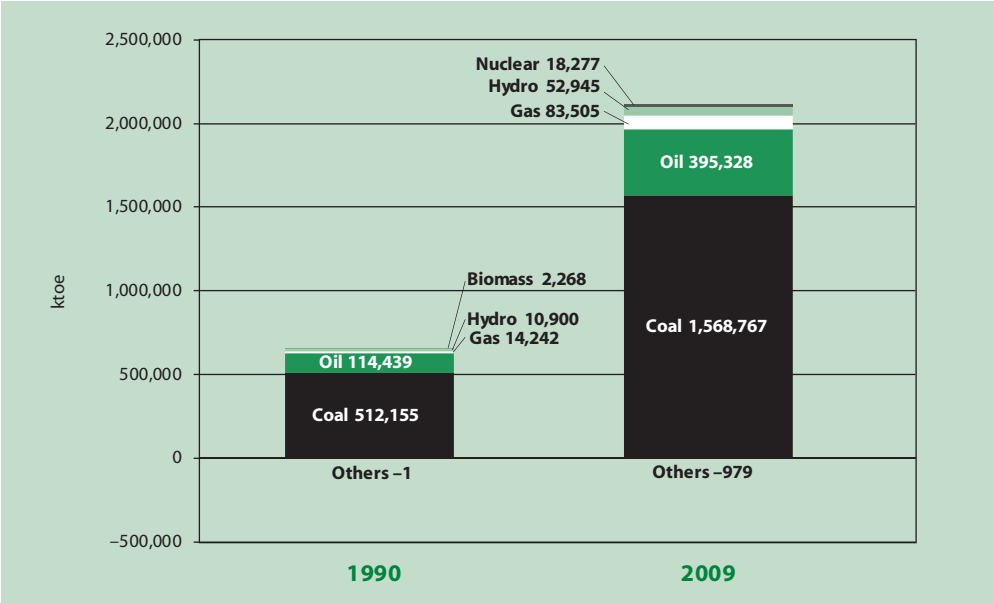
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 4.1.2 Final Energy Consumption by Type of Energy, 1990–2009



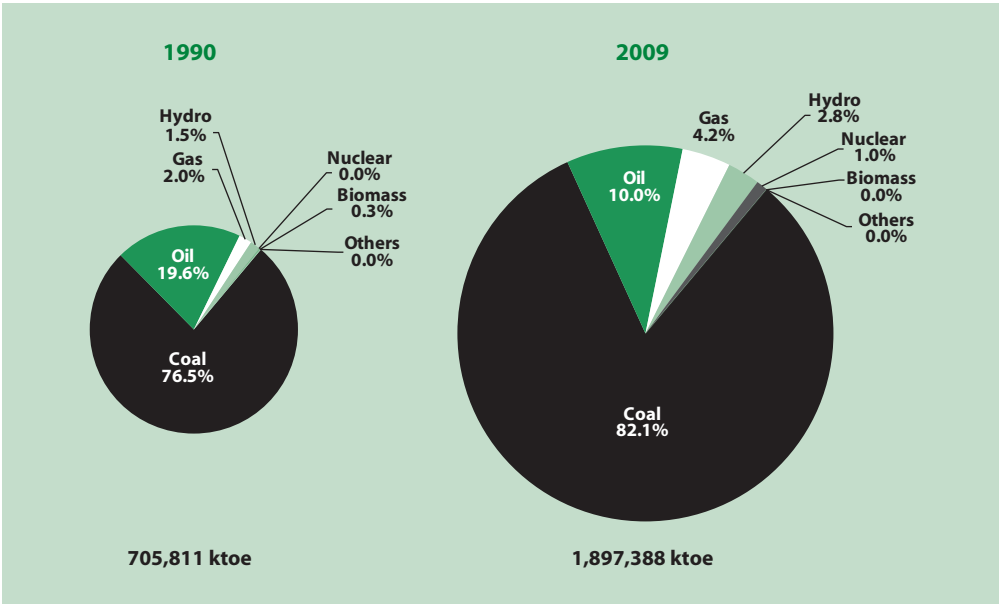
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 4.1.3 Total Primary Energy Supply, 1990 and 2009



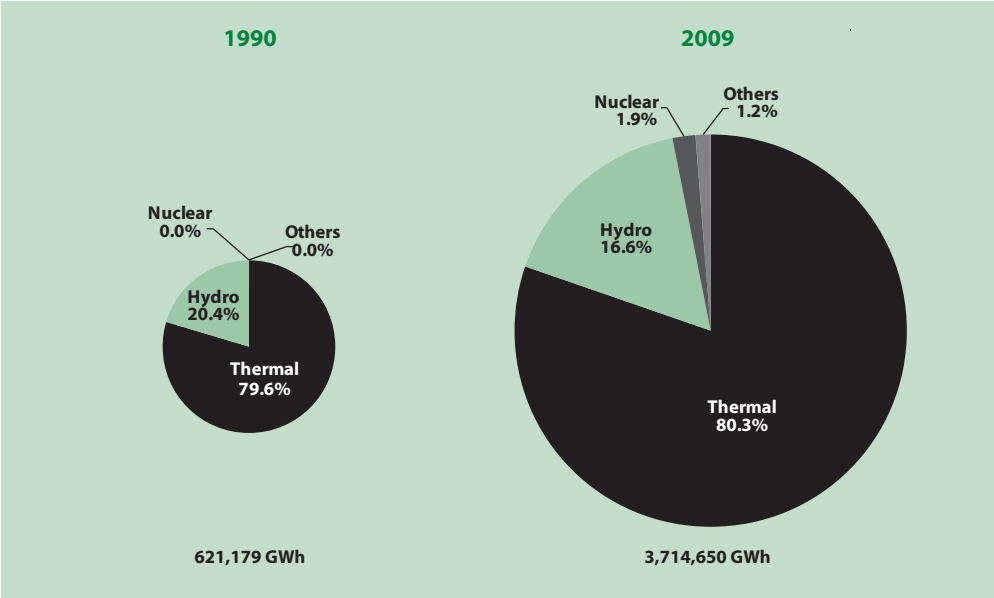
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 4.1.4 Indigenous Energy Production, 1990 and 2009



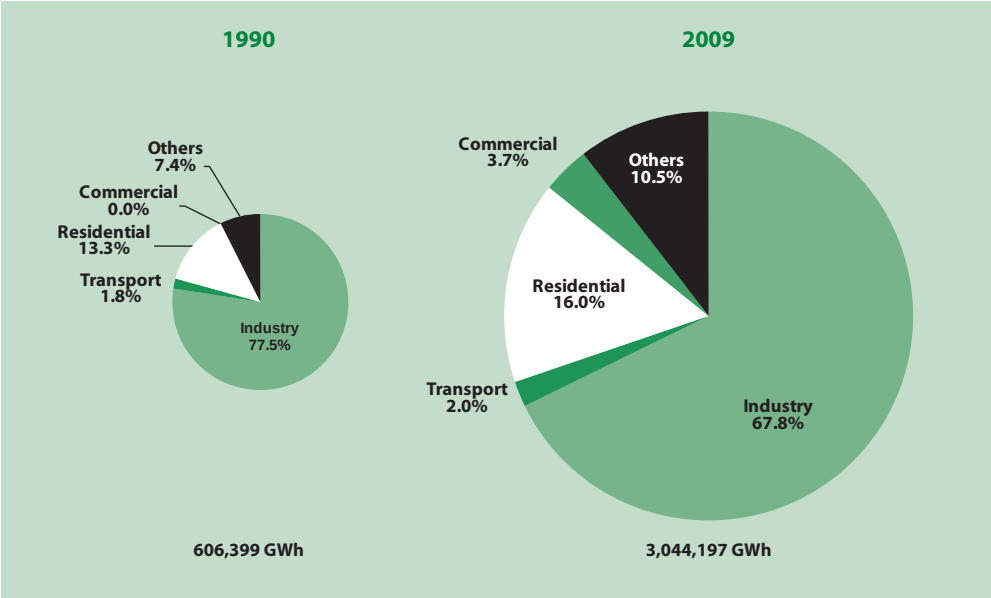
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 4.1.5 Electricity Generation by Plant Type, 1990 and 2009



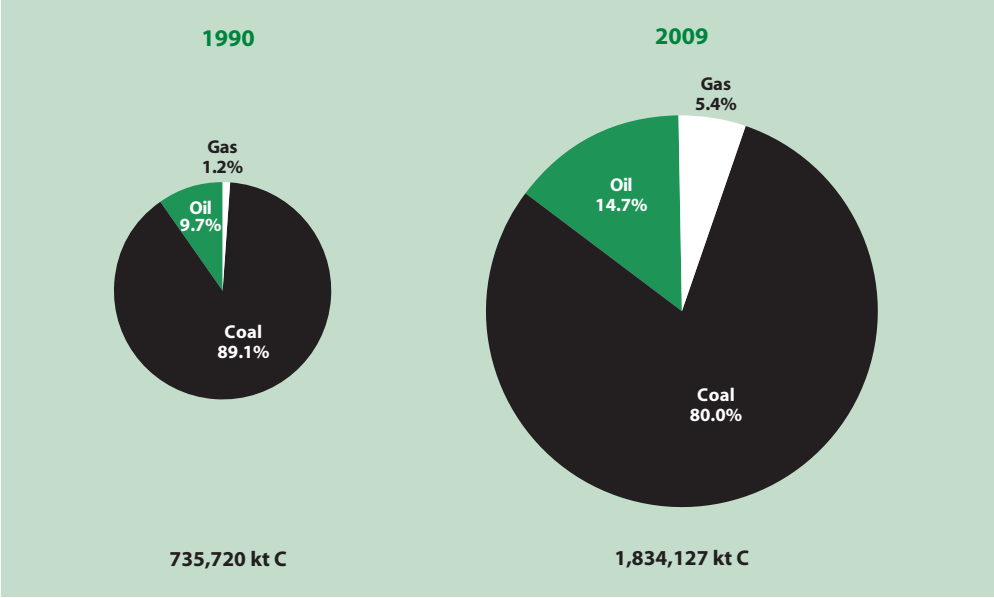
GWh = gigawatt-hour.
Source: APERC (APEC Energy Database).

Figure 4.1.6 Electricity Consumption by Sector, 1990 and 2009



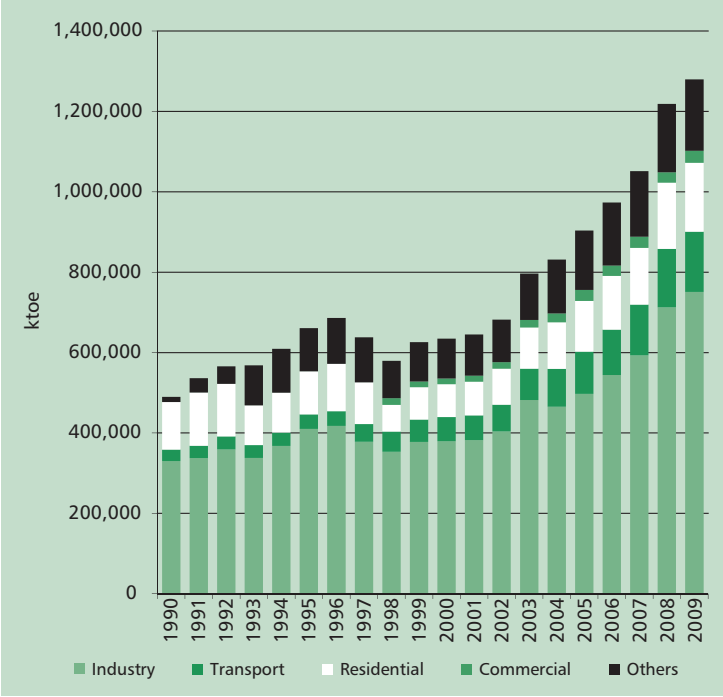
GWh = gigawatt-hour.
Source: APERC (APEC Energy Database).

Figure 4.1.7 Carbon Dioxide Emissions from Fuel Combustion, 1990 and 2009



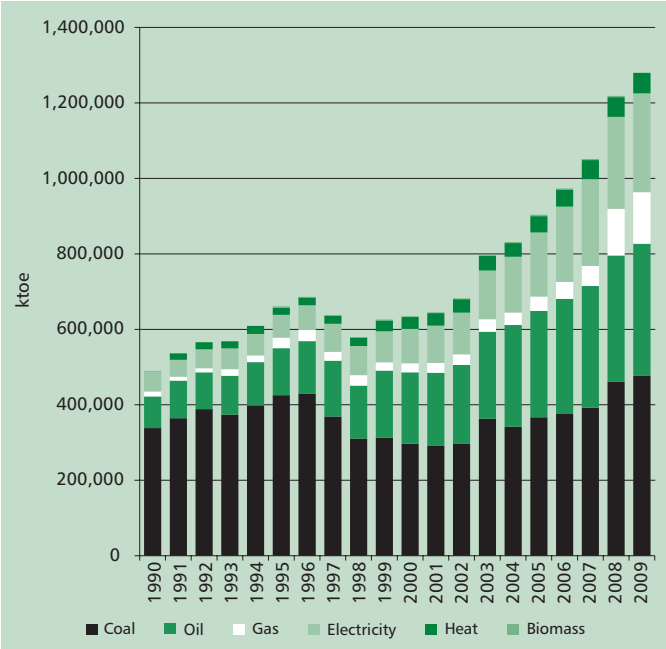
kt C = thousand tons of carbon equivalent.
Source: APERC estimates.

Figure 4.1.8 Final Energy Consumption by Sector, 1990–2009



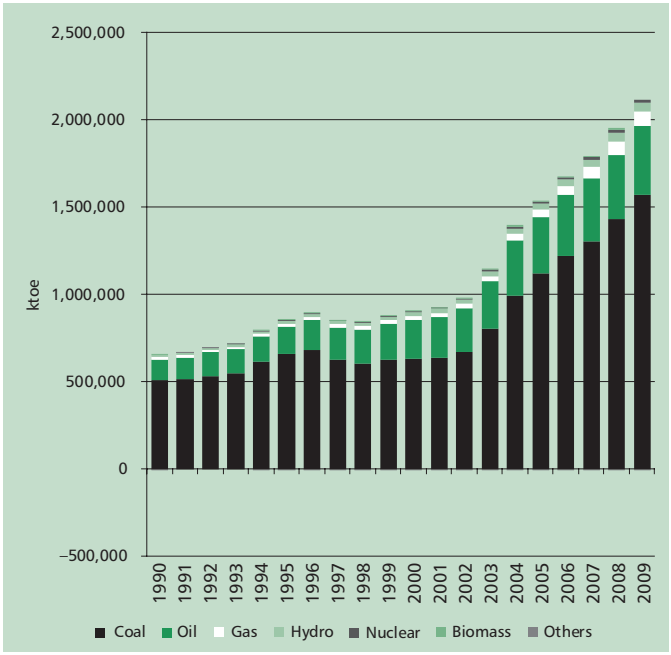
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 4.1.9 Final Energy Consumption by Type, 1990–2009



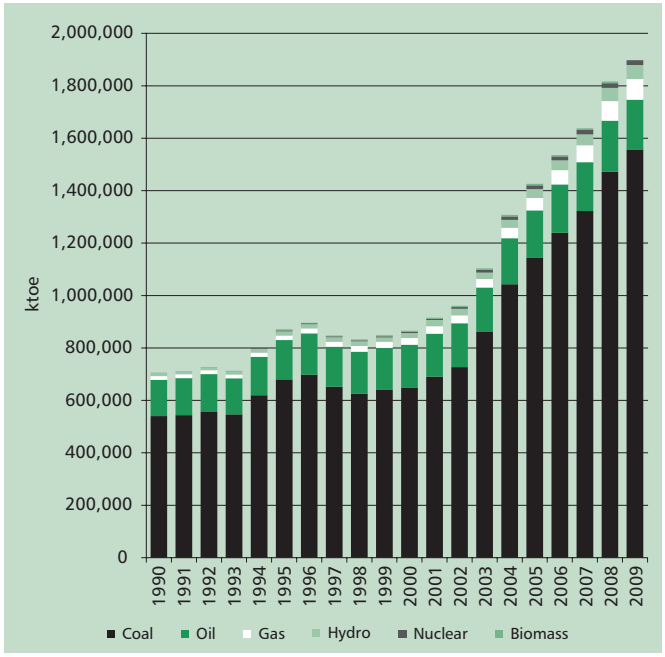
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database);.

Figure 4.1.10 Total Primary Energy Supply, 1990–2009



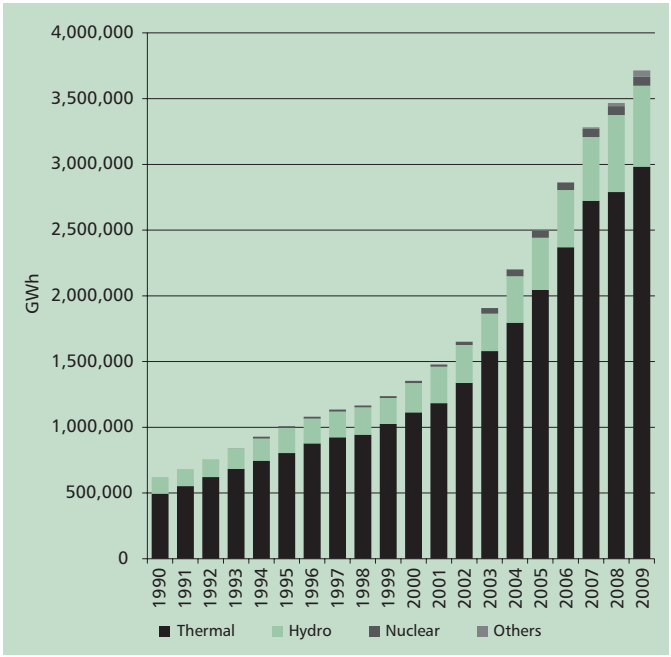
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database);.

Figure 4.1.11 Indigenous Energy Production, 1990–2009



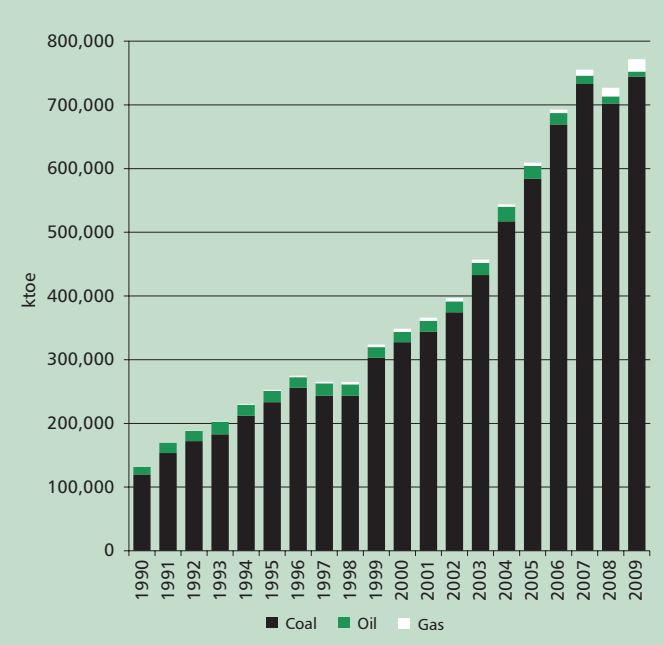
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database);.

Figure 4.1.12 Electricity Generation by Source, 1990–2009



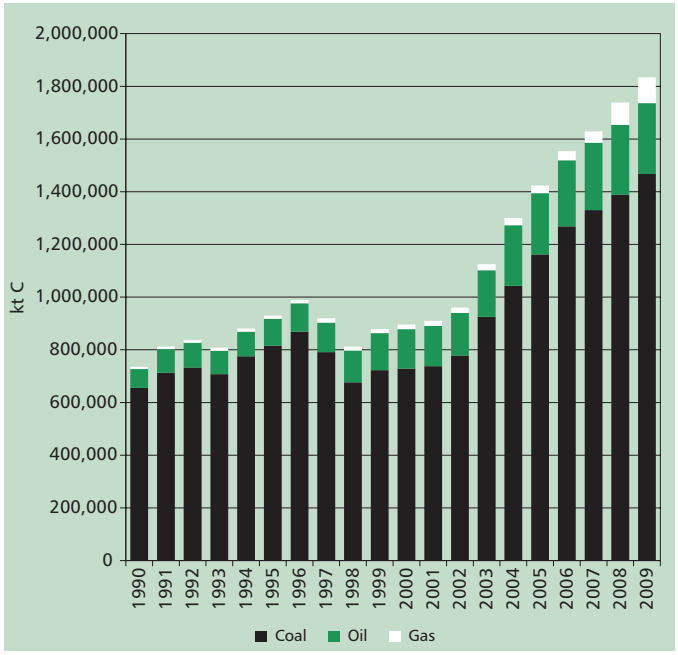
GWh = gigawatt-hour.
Source: APERC (APEC Energy Database);.

Figure 4.1.13 Fuel Input for Electricity Generation, 1990–2009



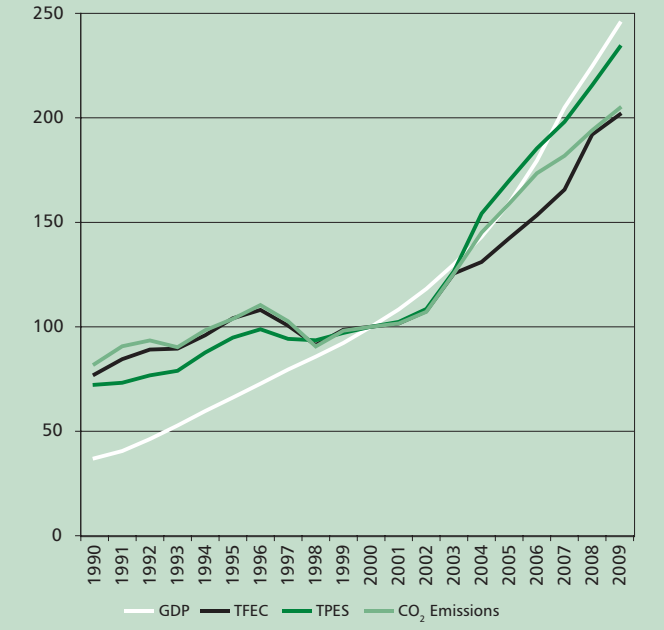
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 4.1.14 Carbon Dioxide Emissions from Fuel Combustion, 1990–2009



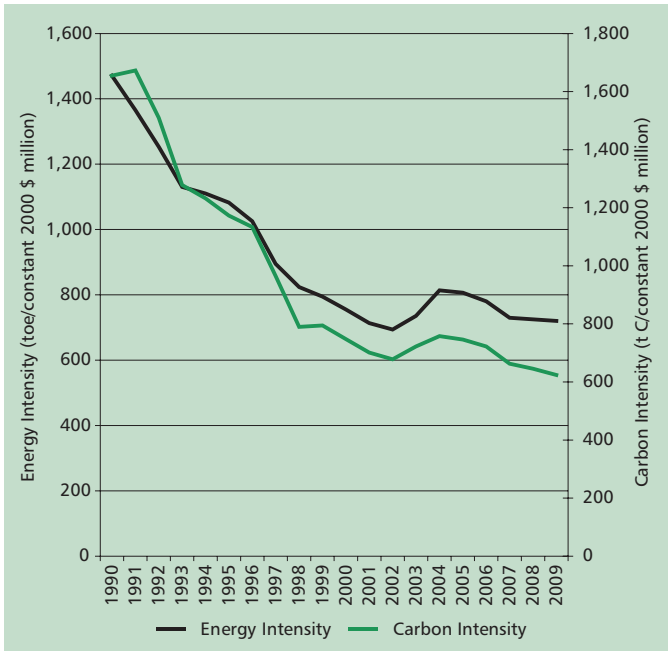
kt C = thousand tons of carbon equivalent.
Source: APERC estimates.

Figure 4.1.15 Growth of GDP, TFEC, TPES, and CO_2 Emissions (indexed to year 2000), 1990–2009



CO_2 = carbon dioxide, GDP = gross domestic product, TFEC = total final energy consumption, TPES = total primary energy supply.
Note: Indices are measured relative to the base year 2000 (2000 = 100).
Source: APERC estimates.

Figure 4.1.16 Energy and Carbon Intensities, 1990–2009



t C = ton of carbon equivalent , toe = ton of oil equivalent.
Source: APERC estimates.

Table 4.1.3 People's Republic of China Energy Balance Table, 2006

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	1,239,304	0	184,766	0	0	0	0	0	0	0	54,513	37,478	14,292	0	0	0	5,673	0	0	0	1,536,025
2.	Imports	23,048	0	145,175	44,985	0	200	719	27,993	6,427	9,646	88	0	0	0	0	0	0	0	463	0	213,760
3.	Exports	–33,144	–9,864	–6,337	–15,260	–3,520	–66	–791	–2,581	–181	–8,121	–2,698	0	0	0	0	0	0	0	–1,055	0	–68,359
4.	International Bunkers	0	0	0	–5,234	0	0	–255	–2,088	0	–2,891	0	0	0	0	0	0	0	0	0	0	–5,234
5.	Stock Changes	5,338	–2,256	–1,111	–9	–75	–7	975	–841	–16	–45	0	0	0	0	0	0	0	0	0	0	1,961
6.	Total Primary Energy Supply	1,234,546	–12,120	322,492	24,481	–3,595	126	648	22,484	6,230	–1,411	51,903	37,478	14,292	0	0	0	5,673	0	–592	0	1,678,153
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	–881,774	90,239	–310,698	283,070	56,177	1,457	116,787	6,840	20,879	80,930	2,374	–37,478	–14,292	0	0	0	–2,698	0	246,452	59,247	–565,556
8.1	Power Generation	–657,207	–12,043	–238	–17,577	–10	0	–3,190	–10,872	–65	–3,440	–5,482	–37,478	–14,292	0	0	0	–2,698	0	246,452	59,247	–441,315
8.2	Gas Processing	–7,260	–1,605	0	–134	0	0	0	–134	0	0	8,378	0	0	0	0	0	0	0	0	0	–620
8.3	Refineries	0	0	–310,460	300,781	56,187	1,457	119,976	17,847	20,944	84,370	0	0	0	0	0	0	0	0	0	0	–9,679
8.4	Coal Transformation	–217,308	103,888	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–113,420
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	–522	0	0	0	0	0	0	0	0	0	–522
9.	Loss and Own Use	–73,373	–3,074	–7,652	–6,540	–685	–35	–3,215	–750	–1,095	–760	–8,380	0	0	0	0	0	–46	0	–46,371	–12,677	–158,113
10.	Discrepancy	23,477	–2,336	–40	49	885	–355	–2	–34	–681	236	–835	0	0	0	0	0	–3	0	–71	–1,349	18,892
11.	Total Final Energy Consumption	302,877	72,710	4,103	301,060	52,781	1,193	114,218	28,540	25,332	78,995	45,062	0	0	0	0	0	2,926	0	199,419	45,221	973,376
12.	Industry Sector	208,325	52,258	2,816	85,486	5,814	404	17,658	17,607	4,722	39,281	24,399	0	0	0	0	0	2,926	0	138,215	29,697	544,123
13.	Transport Sector	4,758	6	0	103,592	27,549	92	58,519	9,419	638	7,374	757	0	0	0	0	0	0	0	4,019	0	113,132
14.	Other Sectors	69,868	7,651	0	79,024	19,262	639	37,723	353	19,274	1,772	16,487	0	0	0	0	0	0	0	57,184	15,524	245,737
14.1	Residential and Commercial	54,179	6,903	0	33,335	6,864	273	7,144	214	18,841	0	15,298	0	0	0	0	0	0	0	35,250	14,254	159,219
14.1.1	Commerce and Public Services	5,254	611	0	10,354	3,330	39	5,404	214	1,367	0	1,475	0	0	0	0	0	0	0	7,286	643	25,623
14.1.2	Residential	48,925	6,292	0	22,981	3,533	234	1,740	0	17,474	0	13,823	0	0	0	0	0	0	0	27,964	13,611	133,596
14.2	Non-Specified Others	15,688	748	0	45,688	12,399	366	30,580	138	434	1,772	1,189	0	0	0	0	0	0	0	21,934	1,270	86,518
15.	Non-Energy Use	19,926	12,794	1,287	32,959	155	58	318	1,161	699	30,568	3,420	0	0	0	0	0	0	0	0	0	70,385
16.	Electricity Output (GWh)	2,259,994	0	98,575	0	0	0	0	0	0	0	11,035	435,786	54,843	0	0	0	5,494	0	0	0	2,865,727
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.
Note: Figures may not add up to total because of rounding.
Source: APERC (APEC Energy Database).

Table 4.1.4 People's Republic of China Energy Balance Table, 2007

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	1,322,584	0	186,318	0	0	0	0	0	0	0	64,462	41,733	16,191	0	0	0	6,429	0	0	0	1,637,717
2.	Imports	30,633	0	163,160	42,412	0	251	1,654	24,171	4,865	11,472	3,743	0	0	0	0	0	0	0	366	0	240,314
3.	Exports	–27,908	–10,435	–3,884	–18,092	–4,662	0	–674	–3,797	–406	–8,552	–2,421	0	0	0	0	0	0	0	–1,253	0	–63,992
4.	International Bunkers	0	0	0	–6,555	0	0	–277	–2,516	0	–3,762	0	0	0	0	0	0	0	0	0	0	–6,555
5.	Stock Changes	–5,369	–4,675	–5,244	1,082	431	–3	558	149	–46	–7	0	0	0	0	0	0	0	0	0	0	–14,206
6.	Total Primary Energy Supply	1,319,940	–15,110	340,351	18,847	–4,231	247	1,261	18,007	4,413	–849	65,784	41,733	16,191	0	0	0	6,429	0	–887	0	1,793,278
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	–956,654	105,124	–328,491	306,020	60,150	795	123,703	12,652	23,275	85,445	–1,961	–41,733	–16,191	0	0	0	–3,462	0	282,214	62,199	–592,935
8.1	Power Generation	–722,018	–10,666	–165	–13,031	–1	0	–2,360	–6,971	–62	–3,637	–9,357	–41,733	–16,191	0	0	0	–3,462	0	282,214	62,199	–472,211
8.2	Gas Processing	–8,038	–1,823	0	–50	0	0	0	–50	0	0	7,791	0	0	0	0	0	0	0	0	0	–2,119
8.3	Refineries	0	0	–328,326	319,100	60,152	795	126,063	19,672	23,337	89,081	0	0	0	0	0	0	0	0	0	0	–9,226
8.4	Coal Transformation	–226,598	117,613	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–108,985
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	–394	0	0	0	0	0	0	0	0	0	–394
9.	Loss and Own Use	–46,849	–3,282	–7,693	–6,170	–799	–32	–2,909	–749	–982	–700	–9,661	0	0	0	0	0	–39	0	–51,319	–10,114	–135,127
10.	Discrepancy	–7,259	–3,440	–35	–434	392	–175	–36	–809	184	9	–916	0	0	0	0	0	–2	0	–58	–1,598	–13,741
11.	Total Final Energy Consumption	309,177	83,292	4,132	318,263	55,512	835	122,019	29,100	26,892	83,905	53,248	0	0	0	0	0	2,926	0	229,950	50,486	1,051,475
12.	Industry Sector	215,504	61,729	2,836	84,896	6,938	379	16,417	17,571	4,261	39,331	28,122	0	0	0	0	0	2,926	0	162,640	34,432	593,085
13.	Transport Sector	4,500	4	0	116,165	27,963	100	69,185	9,994	647	8,276	979	0	0	0	0	0	0	0	4,574	0	126,222
14.	Other Sectors	68,352	7,417	0	78,852	20,421	302	36,129	376	21,354	270	20,245	0	0	0	0	0	0	0	62,735	16,055	253,655
14.1	Residential and Commercial	52,376	6,680	0	37,724	8,097	251	8,254	248	20,874	0	18,747	0	0	0	0	0	0	0	39,152	14,528	169,206
14.1.1	Commerce and Public Services	5,117	664	0	11,660	3,623	50	6,160	248	1,579	0	1,931	0	0	0	0	0	0	0	7,996	740	28,109
14.1.2	Residential	47,258	6,016	0	26,064	4,474	201	2,094	0	19,295	0	16,816	0	0	0	0	0	0	0	31,155	13,788	141,097
14.2	Non-Specified Others	15,976	737	0	41,128	12,324	51	27,875	128	480	270	1,498	0	0	0	0	0	0	0	23,584	1,527	84,449
15.	Non-Energy Use	20,822	14,142	1,296	38,349	190	54	288	1,159	629	36,029	3,903	0	0	0	0	0	0	0	0	0	78,512
16.	Electricity Output (GWh)	2,610,927	0	87,647	0	0	0	0	0	0	0	24,360	485,264	62,130	0	0	0	11,226	0	0	0	3,281,554
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Source: APERC (APEC Energy Database).

Table 4.1.5 People's Republic of China Energy Balance Table, 2008

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	1,471,741	0	195,050	0	0	0	0	0	0	0	74,759	50,326	17,823	0	0	0	6,925	0	0	0	1,816,625
2.	Imports	24,770	0	178,885	46,171	1,995	236	6,369	21,861	3,111	12,599	4,286	0	0	0	0	0	0	0	330	0	254,443
3.	Exports	–24,125	–8,366	–4,238	–20,235	–2,042	–2	–643	–7,317	–814	–9,417	–3,021	0	0	0	0	0	0	0	–1,431	0	–61,416
4.	International Bunkers	0	0	0	–4,712	0	0	–178	–423	0	–4,111	0	0	0	0	0	0	0	0	0	0	–4,712
5.	Stock Changes	–24,768	–7,471	–14,712	–5,996	–1,957	2	–4,182	83	97	–39	0	0	0	0	0	0	0	0	0	0	–52,947
6.	Total Primary Energy Supply	1,447,619	–15,837	354,986	15,228	–2,004	236	1,367	14,203	2,394	–968	76,025	50,326	17,823	0	0	0	6,925	0	–1,101	0	1,951,993
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	–986,471	80,331	–341,051	319,368	64,461	886	134,885	10,981	22,903	85,252	61,374	–50,326	–17,823	0	0	0	–3,595	0	298,152	61,971	–578,070
8.1	Power Generation	–739,105	–4,146	–98	–11,963	–1	0	–1,888	–6,373	–74	–3,626	–14,743	–50,326	–17,823	0	0	0	–3,595	0	298,152	61,971	–481,677
8.2	Gas Processing	–7,087	–1,823	0	–20	0	0	0	–20	0	0	76,117	0	0	0	0	0	0	0	0	0	67,187
8.3	Refineries	0	0	–340,953	331,352	64,463	886	136,773	17,374	22,977	88,878	0	0	0	0	0	0	0	0	0	0	–9,602
8.4	Coal Transformation	–240,278	86,300	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–153,978
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	–65,110	–3,430	–8,963	–8,093	–764	–33	–4,949	–740	–875	–732	–13,363	0	0	0	0	0	–45	0	–53,208	–8,973	–161,184
10.	Discrepancy	4,442	29	–24	2,738	247	11	–145	2,389	56	179	–338	0	0	0	0	0	–16	0	–4	–810	6,017
11.	Total Final Energy Consumption	400,480	61,093	4,948	329,241	61,941	1,100	131,158	26,832	24,479	83,732	123,698	0	0	0	0	0	3,269	0	243,839	52,188	1,218,756
12.	Industry Sector	288,092	41,707	3,377	85,153	7,063	513	22,131	14,296	4,496	36,654	88,727	0	0	0	0	0	3,269	0	167,819	34,764	712,907
13.	Transport Sector	4,368	2	0	130,122	31,275	86	78,023	11,428	657	8,654	5,891	0	0	0	0	0	0	0	4,918	0	145,300
14.	Other Sectors	80,737	5,410	0	73,718	23,410	442	30,554	172	18,681	459	25,017	0	0	0	0	0	0	0	71,102	17,425	273,409
14.1	Residential and Commercial	63,924	4,902	0	36,306	10,201	345	7,597	63	18,100	0	23,069	0	0	0	0	0	0	0	46,556	15,815	190,573
14.1.1	Commerce and Public Services	10,558	180	0	3,844	1,393	214	1,558	63	616	0	1,982	0	0	0	0	0	0	0	8,750	814	26,128
14.1.2	Residential	53,366	4,723	0	32,461	8,808	131	6,039	0	17,484	0	21,087	0	0	0	0	0	0	0	37,806	15,001	164,445
14.2	Non-Specified Others	16,813	508	0	37,412	13,208	97	22,957	110	581	459	1,948	0	0	0	0	0	0	0	24,546	1,609	82,836
15.	Non-Energy Use	27,283	13,974	1,571	40,249	194	59	450	936	646	37,965	4,064	0	0	0	0	0	0	0	0	0	87,140
16.	Electricity Output (GWh)	2,684,666	0	79,895	0	0	0	0	0	0	0	25,517	585,187	68,394	0	0	0	23,223	0	0	0	3,466,882
17.	Heat Output (TJ)	1,381,628	0	26,386	0	0	0	0	0	0	0	40,856	0	0	0	0	0	0	0	0	0	1,448,870

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.
Note: Figures may not add up to total because of rounding.
Source: APERC (APEC Energy Database).

Table 4.1.6 People's Republic of China Energy Balance Table, 2009

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	1,557,291	0	189,490	0	0	0	0	0	0	0	79,385	52,945	18,277	0	0	0	0	0	0	0	1,897,388
2.	Imports	72,637	0	203,653	47,771	45	367	1,873	24,072	4,896	16,518	7,107	0	0	0	0	0	0	0	517	0	331,685
3.	Exports	–11,866	0	–5,073	–28,229	–4,940	–2	–4,597	–8,624	–1,019	–9,047	–2,988	0	0	0	0	0	0	0	–1,495	0	–49,650
4.	International Bunkers	0	0	0	–5,519	0	0	–196	–433	0	–4,890	0	0	0	0	0	0	0	0	0	0	–5,519
5.	Stock Changes	–34,029	–15,266	–6,765	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–56,060
6.	Total Primary Energy Supply	1,584,033	–15,266	381,305	14,023	–4,895	365	–2,920	15,015	3,878	2,581	83,505	52,945	18,277	0	0	0	0	0	–979	0	2,117,844
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	–1,042,567	83,308	–371,158	349,738	74,238	882	144,195	10,594	21,967	97,862	67,969	–52,945	–18,277	0	0	0	0	0	319,460	64,169	–600,303
8.1	Power Generation	–782,678	–4,266	–64	–8,902	–1	0	–1,548	–2,937	–13	–4,403	–20,621	–52,945	–18,277	0	0	0	0	0	319,460	64,169	–504,125
8.2	Gas Processing	–6,645	–1,090	0	–3	0	0	0	–3	0	0	88,590	0	0	0	0	0	0	0	0	0	80,852
8.3	Refineries	0	0	–371,094	358,643	74,239	882	145,743	13,534	21,980	102,265	0	0	0	0	0	0	0	0	0	0	–12,451
8.4	Coal Transformation	–253,244	88,664	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–164,579
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	–77,997	–3,125	–6,410	–6,931	–779	–32	–4,516	–468	–380	–756	–14,689	0	0	0	0	0	0	0	–50,815	–9,064	–169,032
10.	Discrepancy	–50,891	–994	–352	–9,798	–6,334	–69	–2,549	–276	–21	–549	–192	0	0	0	0	0	0	0	–5,866	–782	–68,874
11.	Total Final Energy Consumption	412,577	63,923	3,385	347,032	62,229	1,147	134,211	24,864	25,443	99,138	136,593	0	0	0	0	0	0	0	261,801	54,322	1,279,634
12.	Industry Sector	297,171	44,123	2,298	91,493	8,284	367	21,663	11,407	4,825	44,947	102,837	0	0	0	0	0	0	0	177,389	35,783	751,094
13.	Transport Sector	4,207	1	0	132,489	29,162	75	80,498	12,506	656	9,592	7,598	0	0	0	0	0	0	0	5,306	0	149,602
14.	Other Sectors	82,975	4,924	0	76,880	24,561	667	31,626	215	19,337	474	26,157	0	0	0	0	0	0	0	79,106	18,539	288,580
14.1	Residential and Commercial	64,874	4,464	0	39,608	11,810	497	8,513	81	18,706	0	23,956	0	0	0	0	0	0	0	51,677	16,826	201,405
14.1.1	Commerce and Public Services	11,657	172	0	4,512	1,519	300	1,854	81	758	0	2,725	0	0	0	0	0	0	0	9,776	813	29,655
14.1.2	Residential	53,217	4,293	0	35,095	10,291	197	6,660	0	17,948	0	21,231	0	0	0	0	0	0	0	41,901	16,013	171,750
14.2	Non-Specified Others	18,102	459	0	37,272	12,751	169	23,113	134	632	474	2,201	0	0	0	0	0	0	0	27,429	1,713	87,175
15.	Non-Energy Use	28,224	14,876	1,088	46,170	222	39	424	737	625	44,125	0	0	0	0	0	0	0	0	0	0	90,358
16.	Electricity Output (GWh)	2,871,333	0	71,480	0	0	0	0	0	0	0	39,967	615,640	70,134	0	0	0	46,096	0	0	0	3,714,650
17.	Heat Output (TJ)	1,429,788	0	27,306	0	0	0	0	0	0	0	42,280	0	0	0	0	0	0	0	0	0	1,499,374

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Source: APERC (APEC Energy Database).

Table 4.1.7 People's Republic of China Summary Table, 1990–2009

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Indigenous Production (ktoe)																				
Coal	539,952	543,714	558,201	546,580	619,963	680,379	698,364	652,103	625,013	640,013	649,618	690,774	727,295	861,017	1,043,000	1,143,269	1,239,304	1,322,584	1,471,741	1,557,291
Oil	138,448	140,995	142,100	137,918	146,085	150,047	157,337	152,707	161,003	160,003	163,003	163,962	167,003	169,603	175,873	181,353	184,766	186,318	195,050	189,490
Gas	14,242	14,961	14,700	14,048	16,347	16,709	18,726	19,023	21,673	23,459	25,323	28,236	30,407	32,599	39,268	47,429	54,513	64,462	74,759	79,385
Hydro	10,900	10,722	11,237	13,277	14,458	16,395	16,171	16,860	17,894	16,912	19,134	23,867	24,774	24,405	30,405	34,143	37,478	41,733	50,326	52,945
Nuclear	0	3	136	418	3,659	3,342	3,738	3,757	3,676	3,897	4,363	4,555	6,551	11,299	13,152	13,835	14,292	16,191	17,823	18,277
Geothermal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Solar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wind	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Biomass	2,268	0	0	368	478	4,312	1,744	3,268	3,508	4,087	4,089	4,313	4,510	4,629	6,073	5,996	5,673	6,429	6,925	0
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	705,811	710,394	726,374	712,609	800,991	871,184	896,080	847,718	832,767	848,372	865,531	915,708	960,541	1,103,552	1,307,772	1,426,025	1,536,025	1,637,717	1,816,625	1,897,388
Primary Energy Supply (ktoe)																				
Coal	512,155	514,217	534,114	546,118	612,647	659,176	680,165	625,917	605,570	626,350	631,243	638,607	672,493	801,611	993,835	1,122,099	1,222,426	1,304,830	1,431,782	1,568,767
Oil	114,439	122,760	134,159	139,734	146,158	158,528	173,916	184,665	195,038	207,780	224,662	230,206	247,174	273,756	315,746	319,143	346,973	359,197	370,214	395,328
Gas	14,242	14,961	14,700	14,048	16,347	16,709	18,726	19,023	21,673	20,315	22,401	25,407	27,425	30,855	36,996	44,665	51,903	65,784	76,025	83,505
Hydro	10,900	10,722	11,237	13,277	14,458	16,395	16,171	16,860	17,894	16,912	19,134	23,867	24,774	24,405	30,405	34,143	37,478	41,733	50,326	52,945
Nuclear	0	3	136	418	3,659	3,342	3,738	3,757	3,676	3,897	4,363	4,555	6,551	11,299	13,152	13,835	14,292	16,191	17,823	18,277
Geothermal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Solar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wind	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Biomass	2,268	0	0	368	478	4,312	1,744	3,268	3,508	4,087	4,089	4,313	4,510	4,629	6,073	5,996	5,673	6,429	6,925	0
Others	–1	245	444	377	–176	–463	–309	–612	–616	–755	–717	–722	–637	–633	–523	–523	–592	–887	–1,101	–979
Total	654,004	662,907	694,790	714,340	793,572	857,999	894,152	852,878	846,743	878,586	905,175	926,234	982,290	1,145,922	1,395,685	1,539,359	1,678,153	1,793,278	1,951,993	2,117,844
Final Energy Consumption by Sector (ktoe)																				
Industry	329,825	337,550	359,105	337,983	367,762	409,970	417,487	377,967	353,328	377,722	379,343	382,413	403,970	482,017	465,158	497,451	544,123	593,085	712,907	751,094
Transport	28,776	30,651	32,386	31,915	33,397	36,370	36,537	44,114	50,353	55,566	60,078	61,463	66,418	78,068	94,408	104,959	113,132	126,222	145,300	149,602
Residential	118,373	132,231	130,877	98,651	98,882	107,031	118,172	103,718	66,325	80,605	81,851	83,648	89,491	102,373	115,616	125,945	133,596	141,097	164,445	171,750
Commercial	0	0	0	0	0	0	0	0	16,630	14,025	14,140	14,921	16,098	18,939	22,109	27,440	25,623	28,109	26,128	29,655
Others	12,954	35,946	43,284	99,833	109,142	107,309	113,903	112,188	92,811	97,894	99,264	102,573	106,001	115,230	134,246	147,843	156,903	162,961	169,976	177,533
Total	489,928	536,378	565,652	568,381	609,183	660,681	686,099	637,987	579,448	625,812	634,676	645,019	681,977	796,628	831,538	903,638	973,376	1,051,475	1,218,756	1,279,634

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Table 4.1.7 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Final Energy Consumption by Type (ktoe)																				
Coal	338,239	364,514	388,670	374,110	398,588	425,458	429,922	369,001	310,382	312,663	296,805	290,807	296,290	363,069	341,921	367,076	375,586	392,470	461,573	476,501
Oil	84,065	99,542	97,320	102,873	114,359	124,639	138,886	147,781	140,343	177,809	189,483	193,886	209,398	230,537	269,497	281,565	305,163	322,395	334,189	350,417
Gas	13,205	10,271	10,824	17,243	17,781	27,667	29,429	23,602	27,964	22,041	24,087	26,316	28,015	33,213	33,274	38,454	45,062	53,248	123,698	136,593
Electricity	52,150	45,046	50,214	55,291	57,270	60,634	65,529	74,269	77,188	82,289	90,621	98,785	110,371	129,274	147,690	169,807	199,419	229,950	243,839	261,801
Heat	0	17,005	18,623	18,864	21,099	19,132	20,891	21,788	22,520	28,884	31,600	33,088	35,727	38,376	35,992	43,080	45,221	50,486	52,188	54,322
Biomass	2,268	0	0	0	86	3,151	1,443	1,546	1,050	2,125	2,080	2,138	2,176	2,159	3,164	3,658	2,926	2,926	3,269	0
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	489,928	536,378	565,652	568,381	609,183	660,681	686,099	637,987	579,448	625,812	634,676	645,019	681,977	796,628	831,538	903,638	973,376	1,051,475	1,218,756	1,279,634
Power Generation (GWh)																				
Thermal	494,479	552,460	621,470	683,878	745,927	804,315	877,713	924,071	944,099	1,025,704	1,114,186	1,183,425	1,338,136	1,580,361	1,795,588	2,045,018	2,369,604	2,722,934	2,790,078	2,982,780
Hydro	126,700	124,670	130,660	154,379	168,114	190,577	187,966	195,983	208,000	196,580	222,414	277,432	287,974	283,681	353,544	397,017	435,786	485,264	585,187	615,640
Nuclear	0	10	520	1,604	14,042	12,833	14,339	14,418	14,100	14,949	16,737	17,472	25,127	43,342	50,469	53,088	54,843	62,130	68,394	70,134
Geothermal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Solar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wind	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3,709	2,819	5,494	11,226	23,223	46,096
Total	621,179	677,140	752,650	839,861	928,083	1,007,725	1,080,018	1,134,472	1,166,199	1,237,233	1,353,337	1,478,329	1,651,237	1,907,384	2,203,310	2,497,942	2,865,727	3,281,554	3,466,882	3,714,650
Loss and Own Use of Electricity (GWh)																				
Transmission and Distribution Losses	–	–	–	–	–	–	–	–	–	–	–	–	–	–	142,060	142,060	185,883	206,171	213,788	225,822
Own Use	–	–	–	–	–	–	–	–	–	–	–	–	–	–	125,100	142,583	164,894	189,428	194,590	208,068
Total	–	–	–	–	–	–	–	–	–	–	–	–	–	–	267,160	284,643	350,777	395,599	408,378	433,890
Fuel Input for Power Generation (ktoe)																				
Coal	119,784	153,569	172,024	182,747	211,825	233,122	255,807	243,386	243,363	303,258	327,372	344,108	374,467	432,719	517,089	583,983	669,250	732,685	702,002	744,257
Oil	12,387	16,155	16,421	20,135	17,505	17,693	16,585	19,382	17,759	16,383	16,193	16,650	17,092	19,227	22,971	20,115	17,815	13,196	11,273	8,151
Gas	680	624	763	898	1,213	1,823	2,567	2,577	3,858	4,053	4,855	5,237	5,108	5,292	3,668	5,092	5,482	9,357	13,523	19,359
Total	132,851	170,348	189,208	203,779	230,542	252,637	274,959	265,345	264,980	323,693	348,420	365,995	396,667	457,237	543,728	609,190	692,546	755,238	726,798	771,767
CO_2 Emissions (kt C)																				
Coal	655,366	713,177	732,748	707,335	775,428	816,070	868,538	791,166	676,520	722,549	729,012	737,821	778,772	925,961	1,043,237	1,161,628	1,268,364	1,330,006	1,388,383	1,467,034
Oil	71,431	89,363	94,157	88,963	93,422	101,554	107,951	112,174	120,892	140,698	149,189	152,995	161,372	176,087	229,265	232,665	250,994	256,197	265,665	268,878
Gas	8,922	9,639	10,184	11,623	12,025	12,129	12,202	16,342	14,198	15,520	17,528	19,020	20,018	23,071	27,415	29,390	34,433	42,591	84,365	98,214
Total	735,720	812,178	837,089	807,920	880,876	929,753	988,691	919,682	811,610	878,767	895,729	909,837	960,162	1,125,119	1,299,917	1,423,682	1,553,791	1,628,794	1,738,413	1,834,127

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Table 4.1.7 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Macroeconomic Indicators																				
Population (thousand)	1,135,185	1,150,780	1,164,970	1,178,440	1,191,835	1,204,855	1,217,550	1,230,075	1,241,935	1,252,735	1,262,645	1,271,850	1,280,400	1,288,400	1,296,075	1,303,720	1,311,020	1,317,885	1,324,655	1,331,380
Urban Population, %	27.4	28.2	29.0	29.8	30.6	31.4	32.3	33.2	34.0	34.9	35.8	36.7	37.6	38.6	39.5	40.4	41.3	42.2	43.1	44.0
GDP (constant 2000 $ million)	444,599	485,502	554,443	632,065	714,865	792,786	872,064	953,166	1,027,513	1,105,604	1,198,475	1,297,948	1,416,062	1,557,668	1,714,992	1,908,786	2,151,202	2,456,673	2,692,514	2,940,225
GDP (current $ million)	356,937	379,469	422,661	440,501	559,225	728,007	856,085	952,653	1,019,459	1,083,278	1,198,475	1,324,807	1,453,828	1,640,959	1,931,644	2,256,903	2,712,951	3,494,056	4,521,827	4,991,256
GDP (constant 2005 PPP $ million)	1,249,453	1,364,402	1,558,147	1,776,288	2,008,982	2,227,961	2,450,757	2,678,677	2,887,614	3,107,073	3,368,067	3,647,616	3,979,550	4,377,504	4,819,632	5,364,251	6,045,511	6,903,973	7,566,755	8,262,896
GDP/capita (constant 2000 $)	392	422	476	536	600	658	716	775	827	883	949	1,021	1,106	1,209	1,323	1,464	1,641	1,864	2,033	2,208
GDP/capita (current $)	314	330	363	374	469	604	703	774	821	865	949	1,042	1,135	1,274	1,490	1,731	2,069	2,651	3,414	3,749
GDP – Manufacturing (% of GDP)	25.9	26.8	27.9	29.0	30.1	30.5	30.9	30.9	31.1	31.4	32.1	32.2	32.5	34.0	33.6	33.0	33.2	33.9	33.8	34.8
Car Ownership (car/1,000 persons)	5	5	6	7	8	9	9	10	11	12	13	14	16	18	21	24	28	33	38	47
Basic Energy Indicators																				
TPES/capita (toe/person)	0.58	0.58	0.60	0.61	0.67	0.71	0.73	0.69	0.68	0.70	0.72	0.73	0.77	0.89	1.08	1.18	1.28	1.36	1.47	1.59
TFEC/capita (toe/person)	0.43	0.47	0.49	0.48	0.51	0.55	0.56	0.52	0.47	0.50	0.50	0.51	0.53	0.62	0.64	0.69	0.74	0.80	0.92	0.96
TPES/GDP (toe/constant 2000 $ million)	1,471	1,365	1,253	1,130	1,110	1,082	1,025	895	824	795	755	714	694	736	814	806	780	730	725	720
TFEC/GDP (toe/constant 2000 $ million)	1,102	1,105	1,020	899	852	833	787	669	564	566	530	497	482	511	485	473	452	428	453	435
Import Dependency (%)	–7.9	–7.2	–4.5	0.2	–0.9	–1.5	–0.2	0.6	1.7	3.4	4.4	1.1	2.2	3.7	6.3	7.4	8.5	8.7	6.9	10.4
Oil Import Dependency (%)	–21.0	–14.9	–5.9	1.3	0.1	5.3	9.5	17.3	17.5	23.0	27.4	28.8	32.4	38.0	44.3	43.2	46.7	48.1	47.3	52.1
Electricity/capita (kWh/ person)	534	455	501	546	559	585	626	702	723	764	835	903	1,003	1,167	1,325	1,515	1,769	2,029	2,141	2,287
CO_2 Intensity (t C/constant 2000 $ million)	1,655	1,673	1,510	1,278	1,232	1,173	1,134	965	790	795	747	701	678	722	758	746	722	663	646	624
CO_2/capita (t C)	0.65	0.71	0.72	0.69	0.74	0.77	0.81	0.75	0.65	0.70	0.71	0.72	0.75	0.87	1.00	1.09	1.19	1.24	1.31	1.38
CO_2/TPES (t C/toe)	1.12	1.23	1.20	1.13	1.11	1.08	1.11	1.08	0.96	1.00	0.99	0.98	0.98	0.98	0.93	0.92	0.93	0.91	0.89	0.87

CO_2 = carbon dioxide, GDP = gross domestic product, GWh = gigawatt–hour, kt C = thousand tons of carbon equivalent, ktoe = thousand tons of oil equivalent, kWh = kilowatt–hour, PPP = purchasing power parity, t C = ton of carbon equivalent, TFEC = total final energy consumption, toe = ton of oil equivalent, TPES = total primary energy supply.

Note: Figures may not add up to total because of rounding.

Sources: APERC (APEC Energy Database), APERC estimates, JAMA (2012), and World Bank.

4.2 Hong Kong, China

Economy Profile (2009)		Energy Reserves (year-end 2008)	
Total Surface Area (square kilometer)	1,104	Coal (million ton) - Recoverable	–
Population (thousand)	7,004	Gas (trillion cubic feet) - Proven	–
GDP (billion constant 2000 $)	234.8	Oil (billion barrel) - Proven	–
Electrification Rate (%)	100.0		

– = no data or not applicable, GDP = gross domestic product.

Sources: ADB (2012), and World Bank.

2009 Energy Supply and Demand Flow (ktoe)

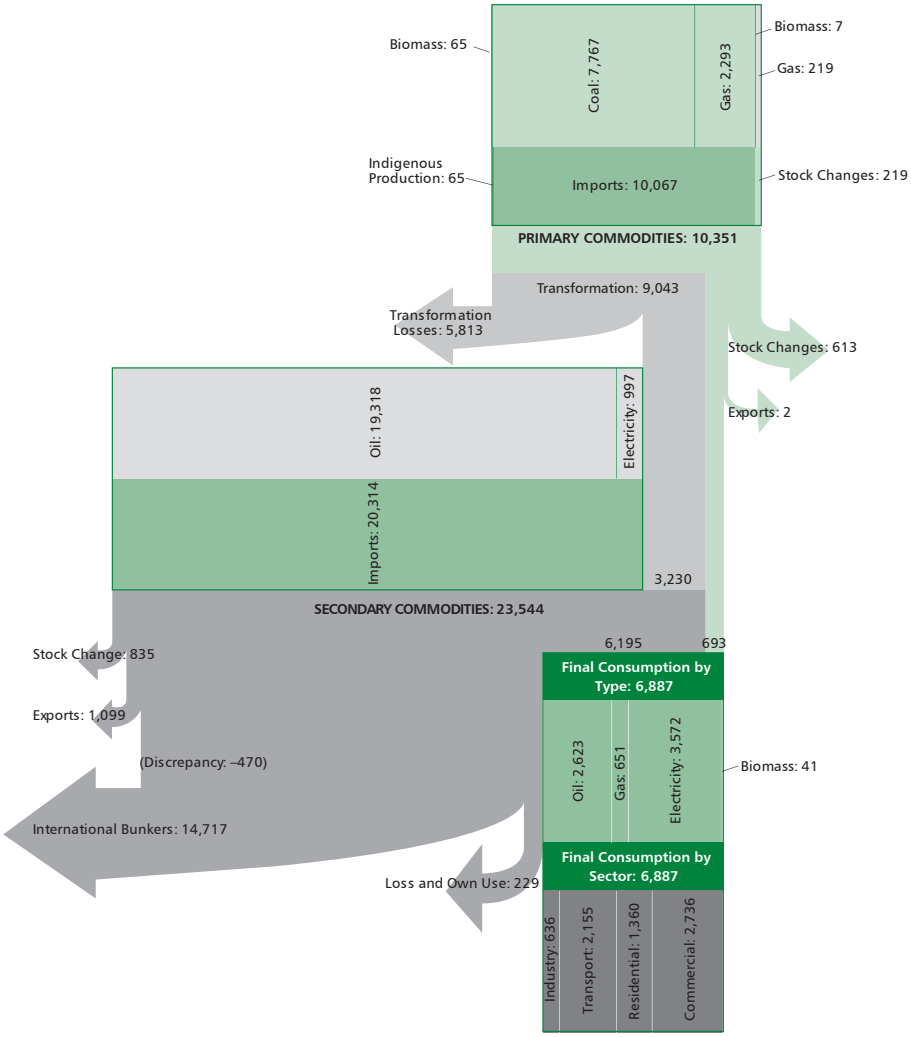


Table 4.2.1 Key Data and Economic Profile

	1990	1995	2000	2005	2009
Socioeconomic Data					
Population (thousand)	5,705	6,156	6,665	6,813	7,004
GDP (constant 2000 $ billion)	115.2	148.5	169.1	207.1	234.8
GDP (constant 2005 PPP $ billion)	135.2	174.3	198.5	243.1	275.6
GDP/capita (constant 2000 $)	20,188	24,123	25,374	30,395	33,526
GDP/capita (constant 2005 PPP $)	23,697	28,316	29,785	35,678	39,353

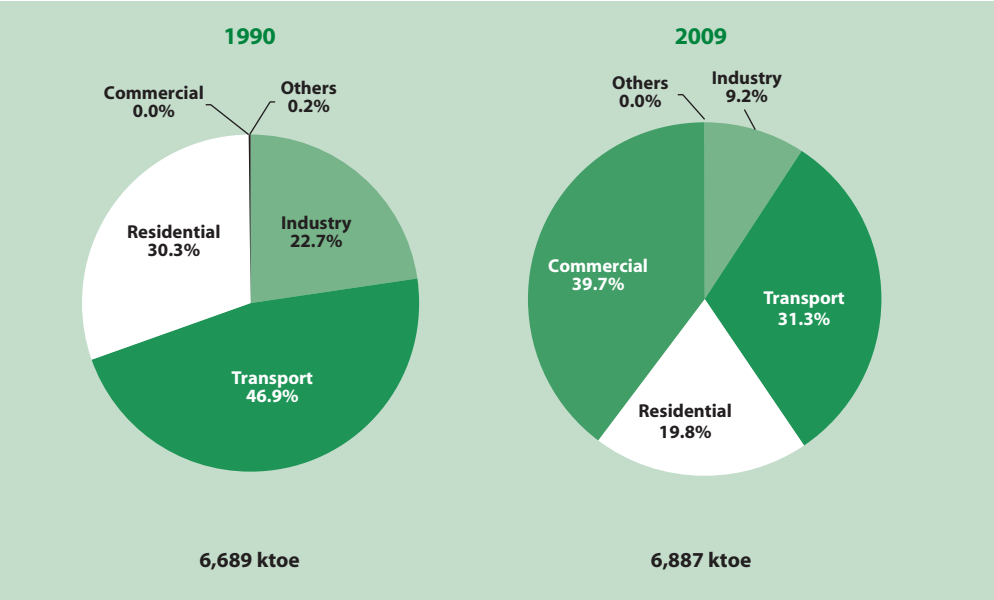
GDP = gross domestic product, PPP = purchasing power parity.
Sources: World Bank.

Table 4.2.2 Energy Supply and Demand

	1990	1995	2000	2005	2009
Primary Energy Supply (ktoe)					
Indigenous Production	0	0	0	81	65
Net Imports	10,643	13,250	15,094	14,013	13,335
Total PES	10,643	13,250	15,094	14,094	13,400
Coal	6,008	5,751	4,125	6,870	7,154
Oil	4,790	6,961	8,186	4,552	2,988
Gas	0	16	2,007	2,033	2,512
Biomass	0	0	0	81	69
Others	–155	521	776	559	676
TPES/capita (toe)	1.87	2.15	2.26	2.07	1.91
TPES/GDP (toe/constant 2005 PPP $ million)	79	76	76	58	49
Final Energy Consumption (ktoe)					
Industry	1,516	1,373	1,714	574	636
Transportation	3,136	5,132	6,088	2,334	2,155
Other Sectors	2,037	2,770	3,401	3,788	4,096
Total FEC	6,689	9,275	11,204	6,696	6,887
Coal	12	9	4	1	0
Oil	4,304	6,227	7,518	2,665	2,623
Gas	324	472	560	586	651
Electricity	2,049	2,567	3,121	3,444	3,572
Biomass	0	0	0	0	41
Others	0	0	0	0	0

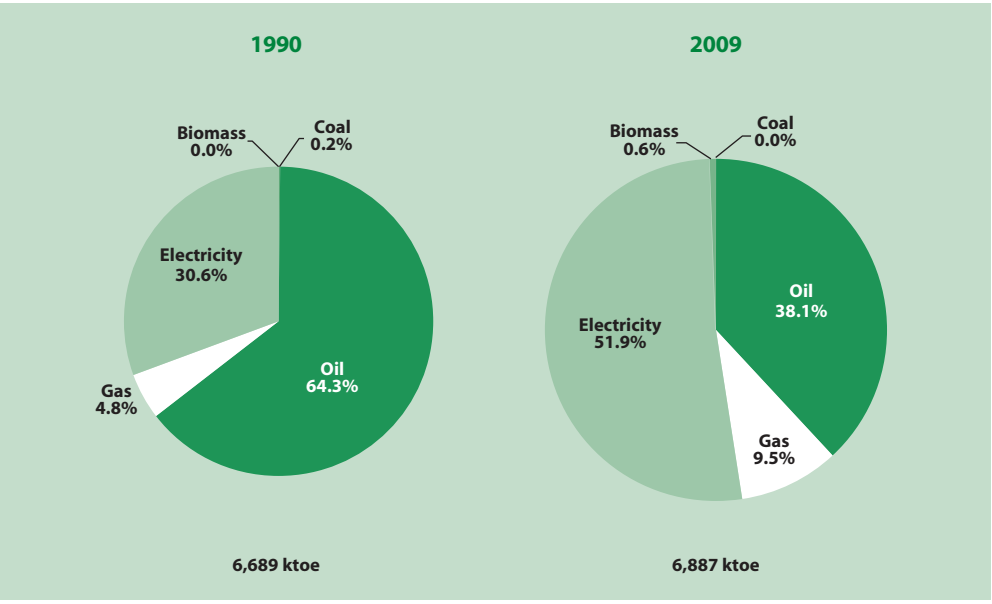
FEC = final energy consumption, GDP = gross domestic product, ktoe = thousand tons of oil equivalent, PES = primary energy supply, PPP = purchasing power parity, toe = ton of oil equivalent, TPES = total primary energy supply.
Source: APERC (APEC Energy Database).

Figure 4.2.1 Final Energy Consumption by Sector, 1990 and 2009



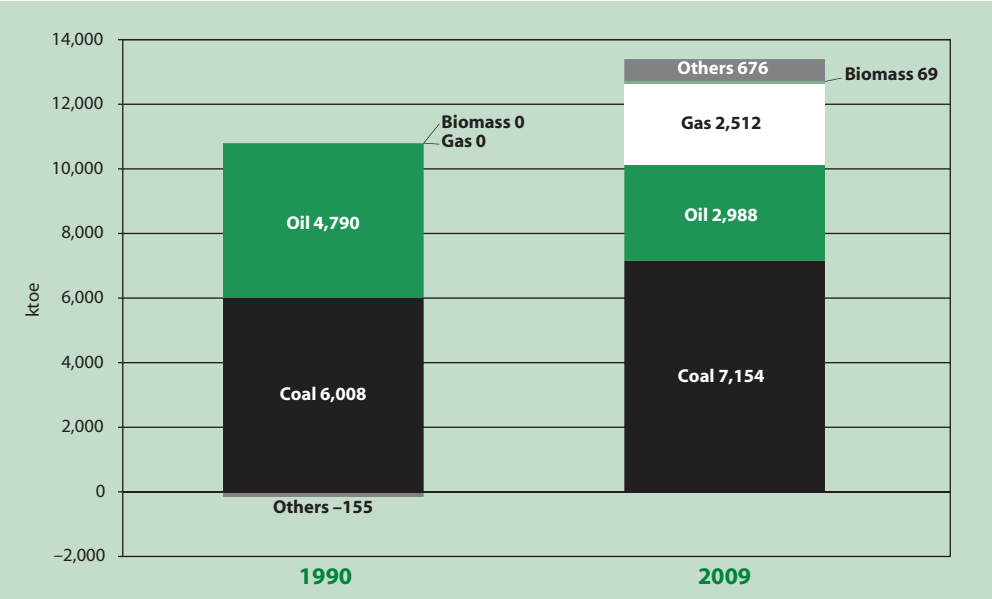
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 4.2.2 Final Energy Consumption by Type of Energy, 1990 and 2009



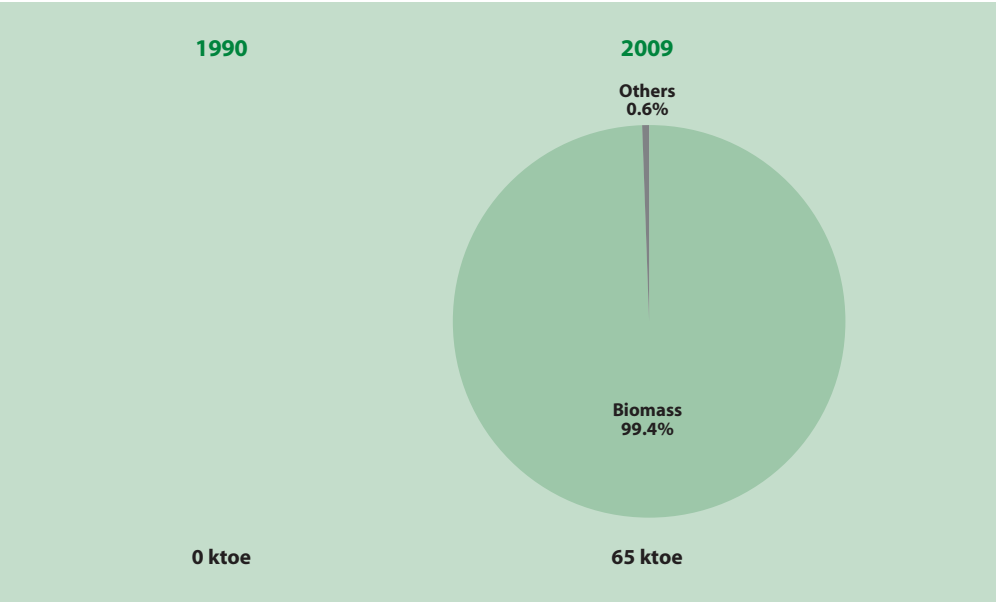
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 4.2.3 Total Primary Energy Supply, 1990 and 2009



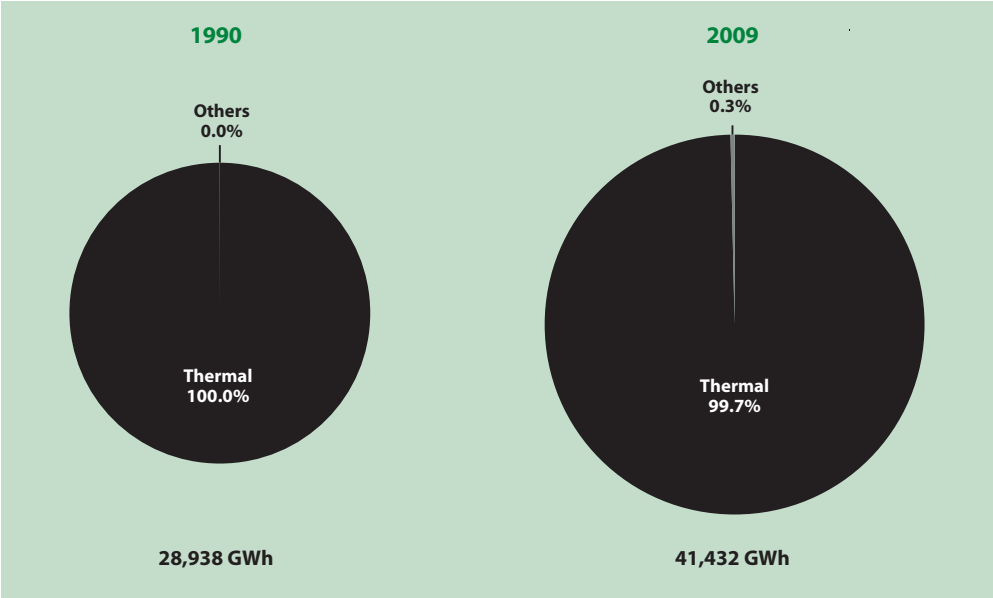
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 4.2.4 Indigenous Energy Production, 1990 and 2009



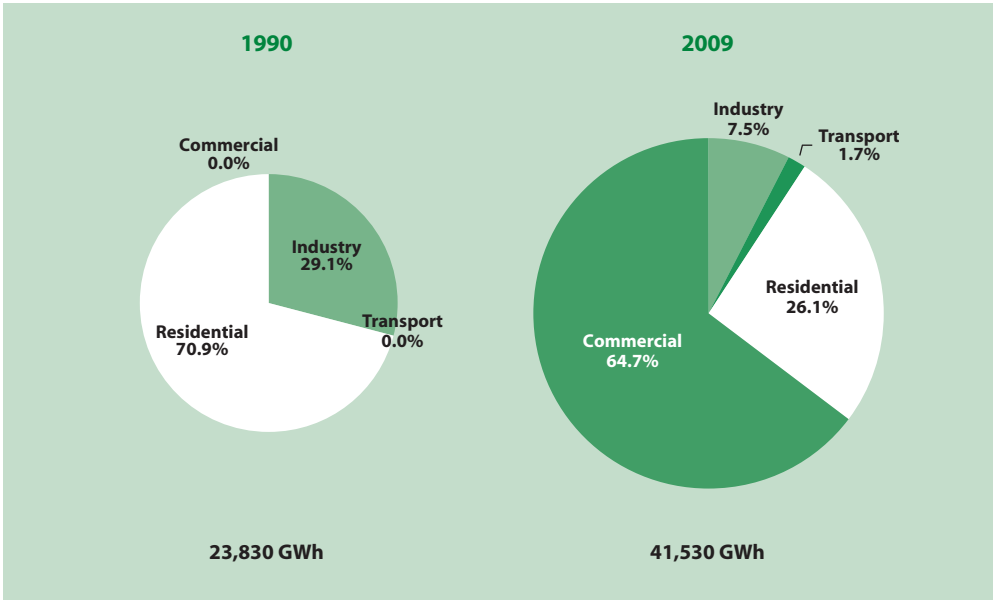
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 4.2.5 Electricity Generation by Plant Type, 1990 and 2009



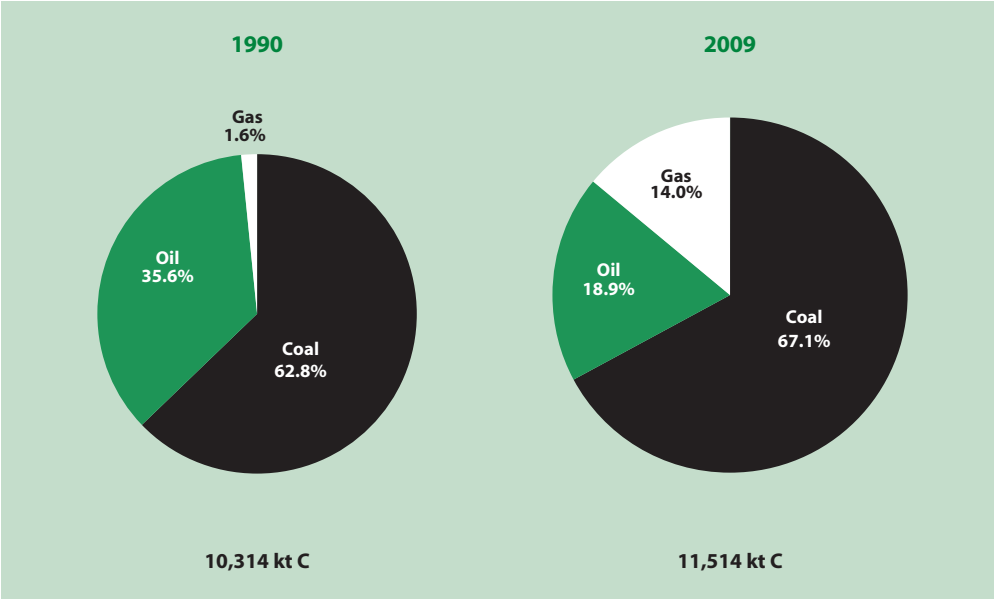
GWh = gigawatt-hour.
Source: APERC (APEC Energy Database).

Figure 4.2.6 Electricity Consumption by Sector, 1990 and 2009



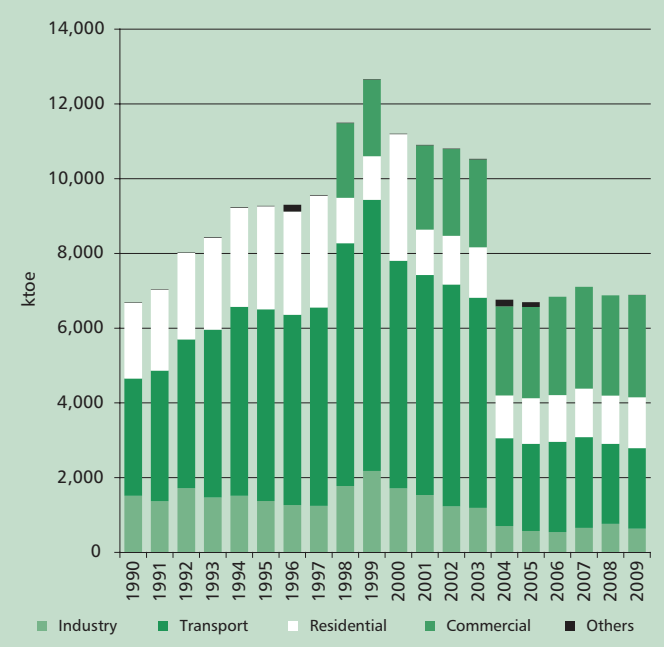
GWh = gigawatt-hour.
Source: APERC (APEC Energy Database).

Figure 4.2.7 Carbon Dioxide Emissions from Fuel Combustion, 1990 and 2009



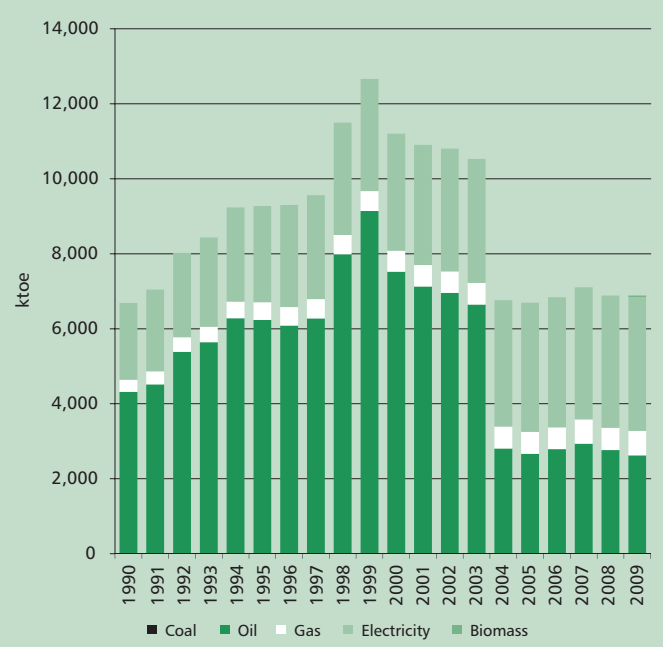
kt C = thousand tons of carbon equivalent.
Source: APERC estimates.

Figure 4.2.8 Final Energy Consumption by Sector, 1990–2009



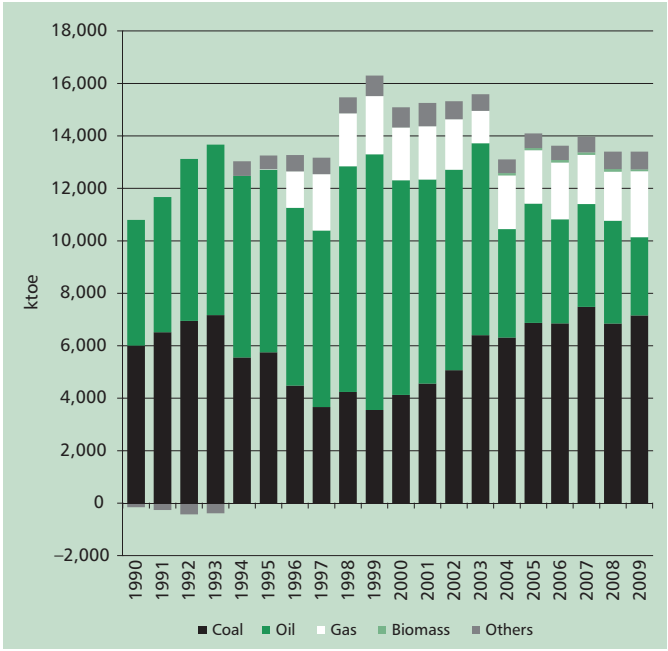
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 4.2.9 Final Energy Consumption by Type, 1990–2009



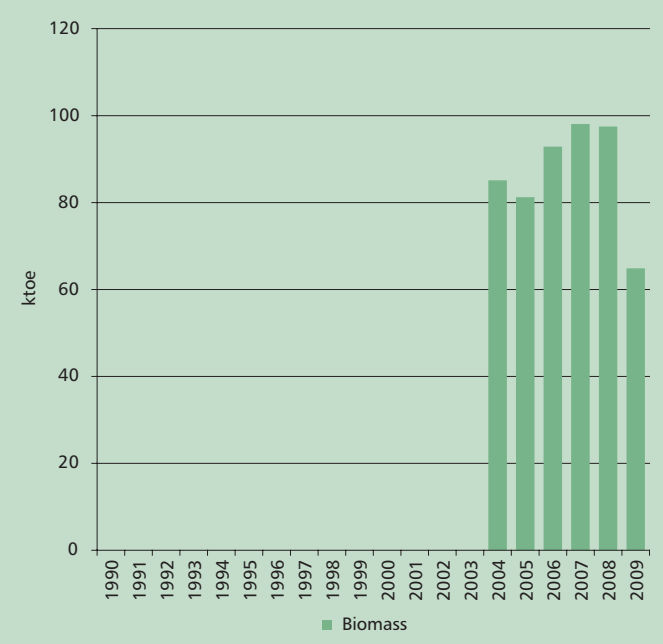
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 4.2.10 Total Primary Energy Supply, 1990–2009



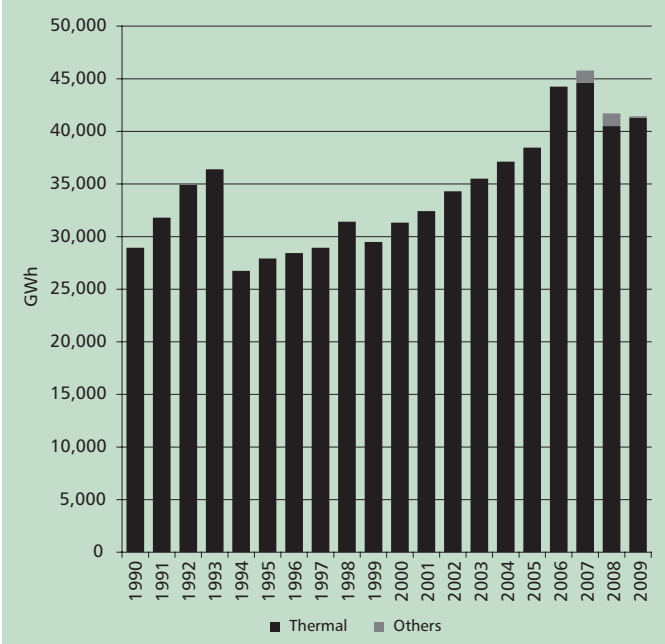
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 4.2.11 Indigenous Energy Production, 1990–2009



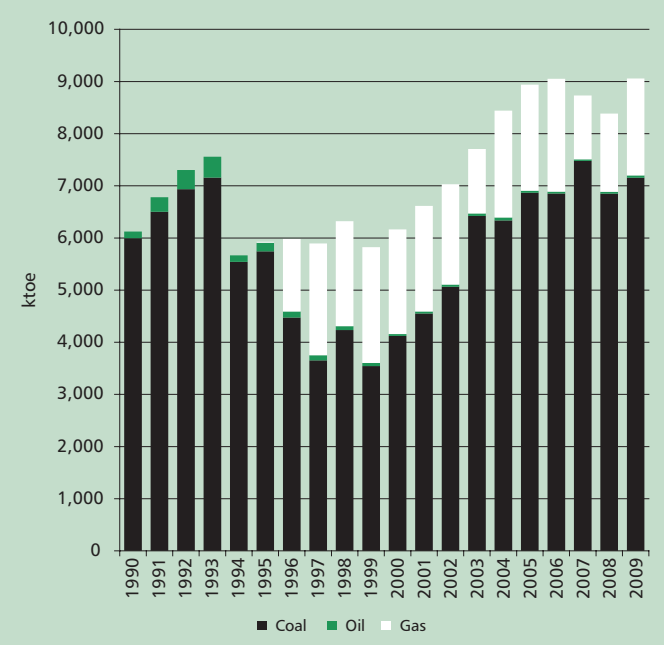
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 4.2.12 Electricity Generation by Source, 1990–2009



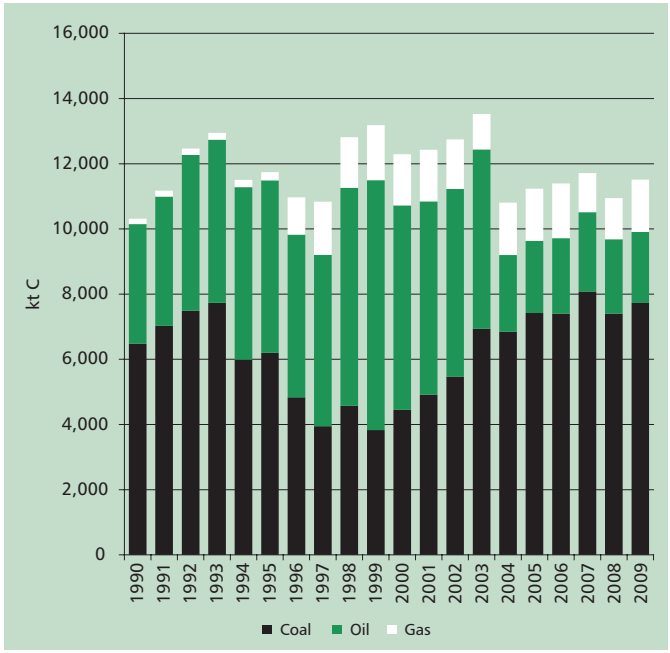
GWh = gigawatt-hour.
Source: APERC (APEC Energy Database).

Figure 4.2.13 Fuel Input for Electricity Generation, 1990–2009



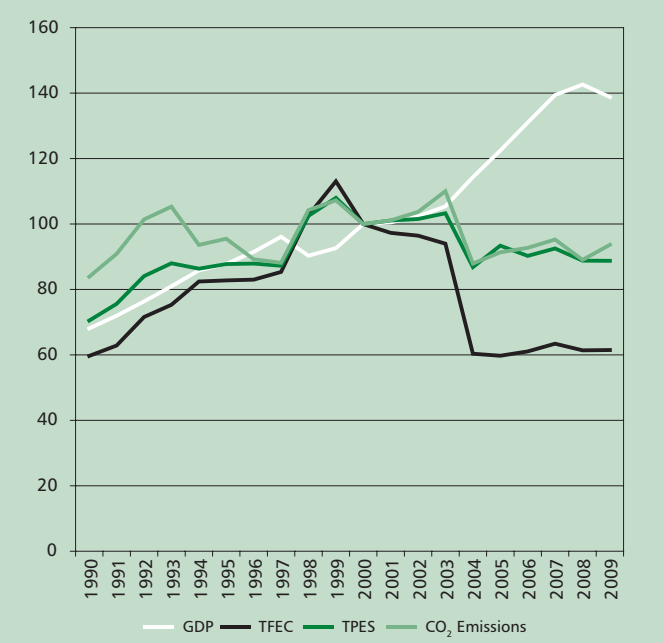
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 4.2.14 Carbon Dioxide Emissions from Fuel Combustion, 1990–2009



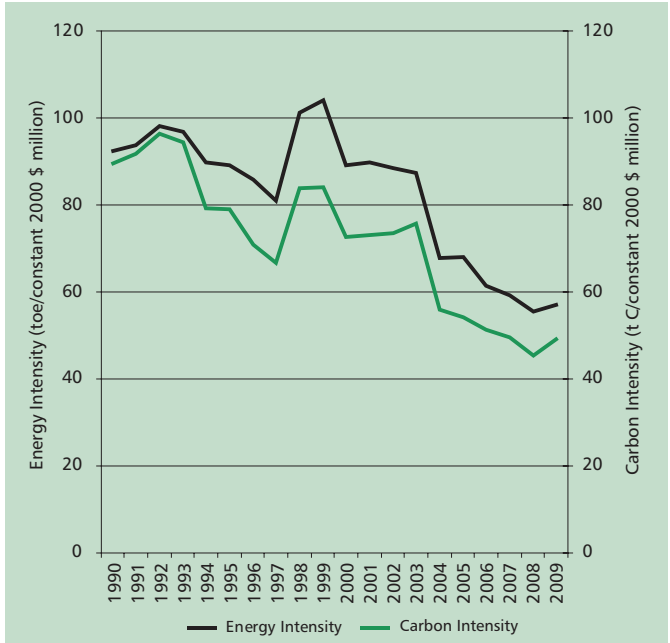
kt C = thousand tons of carbon equivalent.
Source: APERC estimates.

Figure 4.2.15 Growth of GDP, TFEC, TPES, and CO_2 Emissions (indexed to year 2000), 1990–2009



CO_2 = carbon dioxide, GDP = gross domestic product, TFEC = total final energy consumption, TPES = total primary energy supply.
Note: Indices are measured relative to the base year 2000 (2000 = 100).
Source: APERC estimates.

Figure 4.2.16 Energy and Carbon Intensities, 1990–2009



t C = ton of carbon equivalent , toe = ton of oil equivalent.
Source: APERC estimates.

Table 4.2.3 Hong Kong, China Energy Balance Table, 2006

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	93	0	0	0	93
2.	Imports	7,182	0	0	16,436	363	24	3,818	6,484	469	5,277	2,185	0	0	0	0	0	0	0	937	0	26,740
3.	Exports	0	0	0	–1,187	–33	0	–100	–827	0	–227	0	0	0	0	0	0	0	0	–389	0	–1,577
4.	International Bunkers	0	0	0	–11,089	0	0	–2,281	–5,048	0	–3,760	0	0	0	0	0	0	0	0	0	0	–11,089
5.	Stock Changes	–331	0	0	–188	5	0	129	–475	–10	162	–21	0	0	0	0	0	0	0	0	0	–540
6.	Total Primary Energy Supply	6,851	0	0	3,971	336	24	1,567	134	459	1,452	2,164	0	0	0	0	0	93	0	548	0	13,627
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	–6,851	0	0	–627	0	0	–7	–30	0	–590	–1,583	0	0	0	0	0	–46	0	3,806	0	–5,301
8.1	Power Generation	–6,851	0	0	–37	0	0	–7	–30	0	0	–2,164	0	0	0	0	0	–46	0	3,806	0	–5,293
8.2	Gas Processing	0	0	0	–590	0	0	0	0	0	–590	581	0	0	0	0	0	0	0	0	0	–8
8.3	Refineries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–885	0	–885
10.	Discrepancy	0	0	0	–554	94	0	209	0	0	–858	0	0	0	0	0	0	–46	0	0	0	–601
11.	Total Final Energy Consumption	0	0	0	2,790	430	24	1,769	104	459	5	581	0	0	0	0	0	0	0	3,469	0	6,840
12.	Industry Sector	0	0	0	191	0	0	88	104	0	0	19	0	0	0	0	0	0	0	335	0	546
13.	Transport Sector	0	0	0	2,355	430	0	1,590	0	330	5	0	0	0	0	0	0	0	0	58	0	2,414
14.	Other Sectors	0	0	0	243	0	24	91	0	128	0	562	0	0	0	0	0	0	0	3,076	0	3,880
14.1	Residential and Commercial	0	0	0	243	0	24	91	0	128	0	562	0	0	0	0	0	0	0	3,076	0	3,880
14.1.1	Commerce and Public Services	0	0	0	162	0	19	91	0	52	0	238	0	0	0	0	0	0	0	2,229	0	2,629
14.1.2	Residential	0	0	0	81	0	5	0	0	76	0	324	0	0	0	0	0	0	0	846	0	1,252
14.2	Non-Specified Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15.	Non-Energy Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16.	Electricity Output (GWh)	32,169	0	129	0	0	0	0	0	0	0	11,960	0	0	0	0	0	0	0	0	0	44,257
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.
Note: Figures may not add up to total because of rounding.
Source: APERC (APEC Energy Database).

Table 4.2.4 Hong Kong, China Energy Balance Table, 2007

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	98	0	0	0	98
2.	Imports	7,727	0	0	17,666	404	22	3,872	7,425	419	5,524	2,041	0	0	0	0	0	0	0	942	0	28,377
3.	Exports	–2	0	0	–960	–37	0	–127	–646	0	–150	0	0	0	0	0	0	0	0	–347	0	–1,309
4.	International Bunkers	0	0	0	–12,163	0	0	–2,127	–6,228	0	–3,808	0	0	0	0	0	0	0	0	0	0	–12,163
5.	Stock Changes	–245	0	0	–619	–11	0	–100	–280	44	–273	–172	0	0	0	0	0	0	0	0	0	–1,036
6.	Total Primary Energy Supply	7,480	0	0	3,924	356	22	1,518	272	464	1,294	1,870	0	0	0	0	0	98	0	595	0	13,968
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	–7,478	0	0	–393	0	0	–6	–24	0	–363	–827	0	0	0	0	0	–98	0	3,937	0	–4,858
8.1	Power Generation	–7,478	0	0	–30	0	0	–6	–24	0	0	–1,224	0	0	0	0	0	–98	0	3,937	0	–4,893
8.2	Gas Processing	0	0	0	–363	0	0	0	0	0	–363	397	0	0	0	0	0	0	0	0	0	35
8.3	Refineries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–921	0	–921
10.	Discrepancy	0	0	0	–597	100	0	229	0	0	–926	–397	0	0	0	0	0	0	0	–89	0	–1,083
11.	Total Final Energy Consumption	2	0	0	2,935	456	22	1,741	248	464	5	646	0	0	0	0	0	0	0	3,523	0	7,106
12.	Industry Sector	2	0	0	319	0	0	72	248	0	0	21	0	0	0	0	0	0	0	313	0	656
13.	Transport Sector	0	0	0	2,370	456	0	1,573	0	335	5	0	0	0	0	0	0	0	0	60	0	2,429
14.	Other Sectors	0	0	0	245	0	22	96	0	128	0	625	0	0	0	0	0	0	0	3,150	0	4,020
14.1	Residential and Commercial	0	0	0	245	0	22	96	0	128	0	625	0	0	0	0	0	0	0	3,150	0	4,020
14.1.1	Commerce and Public Services	0	0	0	171	0	20	96	0	56	0	270	0	0	0	0	0	0	0	2,280	0	2,722
14.1.2	Residential	0	0	0	74	0	1	0	0	73	0	354	0	0	0	0	0	0	0	870	0	1,299
14.2	Non-Specified Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15.	Non-Energy Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16.	Electricity Output (GWh)	37,316	0	112	0	0	0	0	0	0	0	7,214	0	0	0	0	0	1,141	0	0	0	45,783
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Source: APERC (APEC Energy Database).

Table 4.2.5 Hong Kong, China Energy Balance Table, 2008

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	98	0	0	0	98
2.	Imports	7,146	0	0	15,852	384	20	2,852	6,775	428	5,393	2,041	0	0	0	0	0	5	0	972	0	26,015
3.	Exports	0	0	0	–838	–36	0	–181	–439	0	–181	0	0	0	0	0	0	–2	0	–306	0	–1,146
4.	International Bunkers	0	0	0	–10,669	0	0	–1,222	–5,689	0	–3,758	0	0	0	0	0	0	0	0	0	0	–10,669
5.	Stock Changes	–296	0	0	–428	4	0	32	–256	46	–254	–171	0	0	0	0	0	0	0	0	0	–895
6.	Total Primary Energy Supply	6,850	0	0	3,917	352	20	1,481	391	474	1,199	1,870	0	0	0	0	0	100	0	666	0	13,402
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	–6,850	0	0	–387	0	0	–6	–30	0	–351	–1,277	0	0	0	0	0	–98	0	3,586	0	–5,025
8.1	Power Generation	–6,850	0	0	–36	0	0	–6	–30	0	0	–1,500	0	0	0	0	0	–98	0	3,586	0	–4,897
8.2	Gas Processing	0	0	0	–351	0	0	0	0	0	–351	223	0	0	0	0	0	0	0	0	0	–127
8.3	Refineries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–629	0	–629
10.	Discrepancy	0	0	0	–766	83	0	356	–361	0	–844	0	0	0	0	0	0	0	0	–103	0	–869
11.	Total Final Energy Consumption	0	0	0	2,764	435	20	1,831	0	474	5	593	0	0	0	0	0	3	0	3,520	0	6,879
12.	Industry Sector	0	0	0	453	0	0	453	0	0	0	19	0	0	0	0	0	0	0	291	0	764
13.	Transport Sector	0	0	0	2,084	435	0	1,289	0	355	5	0	0	0	0	0	0	0	0	60	0	2,144
14.	Other Sectors	0	0	0	227	0	20	88	0	118	0	573	0	0	0	0	0	3	0	3,169	0	3,971
14.1	Residential and Commercial	0	0	0	227	0	20	88	0	118	0	573	0	0	0	0	0	3	0	3,169	0	3,971
14.1.1	Commerce and Public Services	0	0	0	159	0	19	88	0	51	0	238	0	0	0	0	0	3	0	2,282	0	2,682
14.1.2	Residential	0	0	0	68	0	1	0	0	67	0	335	0	0	0	0	0	0	0	886	0	1,289
14.2	Non-Specified Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15.	Non-Energy Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16.	Electricity Output (GWh)	31,957	0	176	0	0	0	0	0	0	0	8,369	0	0	0	0	0	1,201	0	0	0	41,703
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.
Note: Figures may not add up to total because of rounding.
Source: APERC (APEC Energy Database).

Table 4.2.6 Hong Kong, China Energy Balance Table, 2009

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	65	0	0	0	65
2.	Imports	7,767	0	0	19,318	404	22	6,196	7,172	417	5,106	2,293	0	0	0	0	0	7	0	997	0	30,381
3.	Exports	0	0	0	–778	–27	0	–90	–527	–1	–133	0	0	0	0	0	0	–2	0	–321	0	–1,101
4.	International Bunkers	0	0	0	–14,717	0	0	–4,259	–5,689	0	–4,769	0	0	0	0	0	0	0	0	0	0	–14,717
5.	Stock Changes	–613	0	0	–835	–3	0	–52	–929	63	86	219	0	0	0	0	0	0	0	0	0	–1,229
6.	Total Primary Energy Supply	7,154	0	0	2,988	374	22	1,795	28	479	290	2,512	0	0	0	0	0	69	0	676	0	13,400
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	–7,154	0	0	–333	0	0	–17	–28	0	–288	–1,861	0	0	0	0	0	–28	0	3,563	0	–5,813
8.1	Power Generation	–7,154	0	0	–45	0	0	–17	–28	0	0	–1,861	0	0	0	0	0	–12	0	3,563	0	–5,509
8.2	Gas Processing	0	0	0	–288	0	0	0	0	0	–288	0	0	0	0	0	0	0	0	0	0	–288
8.3	Refineries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–16	0	0	0	–16
9.	Loss and Own Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–229	0	–229
10.	Discrepancy	0	0	0	–32	69	–1	–222	118	0	3	0	0	0	0	0	0	0	0	–438	0	–470
11.	Total Final Energy Consumption	0	0	0	2,623	443	22	1,557	118	479	5	651	0	0	0	0	0	41	0	3,572	0	6,887
12.	Industry Sector	0	0	0	308	0	0	189	118	0	0	22	0	0	0	0	0	37	0	270	0	636
13.	Transport Sector	0	0	0	2,095	443	0	1,280	0	368	5	0	0	0	0	0	0	0	0	60	0	2,155
14.	Other Sectors	0	0	0	220	0	22	87	0	111	0	630	0	0	0	0	0	4	0	3,242	0	4,096
14.1	Residential and Commercial	0	0	0	220	0	22	87	0	111	0	630	0	0	0	0	0	4	0	3,242	0	4,096
14.1.1	Commerce and Public Services	0	0	0	157	0	21	87	0	48	0	264	0	0	0	0	0	4	0	2,311	0	2,736
14.1.2	Residential	0	0	0	64	0	1	0	0	63	0	366	0	0	0	0	0	0	0	931	0	1,360
14.2	Non-Specified Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15.	Non-Energy Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16.	Electricity Output (GWh)	30,701	0	205	0	0	0	0	0	0	0	10,382	0	0	0	0	1	143	0	0	0	41,432
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Source: APERC (APEC Energy Database).

Table 4.2.7 Hong Kong, China Summary Table, 1990–2009

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Indigenous Production (ktoe)																				
Coal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Oil	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hydro	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Geothermal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Solar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wind	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Biomass	0	0	0	0	0	0	0	0	0	0	0	0	0	0	85	81	93	98	98	65
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	85	81	93	98	98	65
Primary Energy Supply (ktoe)																				
Coal	6,008	6,516	6,947	7,171	5,553	5,751	4,485	3,662	4,240	3,550	4,125	4,556	5,069	6,401	6,313	6,870	6,851	7,480	6,850	7,154
Oil	4,790	5,156	6,173	6,496	6,923	6,961	6,773	6,734	8,605	9,750	8,186	7,784	7,642	7,319	4,134	4,552	3,971	3,924	3,917	2,988
Gas	0	0	0	0	0	16	1,390	2,146	2,013	2,220	2,007	2,025	1,924	1,237	2,048	2,033	2,164	1,870	1,870	2,512
Hydro	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Geothermal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Solar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wind	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Biomass	0	0	0	0	0	0	0	0	0	0	0	0	0	0	85	81	93	98	100	69
Others	−155	−263	−427	−387	558	521	623	629	615	780	776	890	688	635	523	559	548	595	666	676
Total	10,643	11,409	12,694	13,280	13,035	13,250	13,272	13,170	15,472	16,299	15,094	15,256	15,323	15,592	13,103	14,094	13,627	13,968	13,402	13,400
Final Energy Consumption by Sector (ktoe)																				
Industry	1,516	1,370	1,720	1,468	1,516	1,373	1,265	1,245	1,776	2,179	1,714	1,535	1,235	1,192	704	574	546	656	764	636
Transport	3,136	3,494	3,980	4,493	5,058	5,132	5,097	5,309	6,497	7,256	6,088	5,889	5,936	5,626	2,353	2,334	2,414	2,429	2,144	2,155
Residential	2,025	2,167	2,312	2,456	2,645	2,754	2,757	2,995	1,219	1,168	3,389	1,216	1,301	1,348	1,143	1,220	1,252	1,299	1,289	1,360
Commercial	0	0	0	0	0	0	0	0	1,993	2,048	0	2,252	2,320	2,351	2,382	2,440	2,629	2,722	2,682	2,736
Others	12	12	11	19	17	16	183	15	13	13	12	13	14	15	182	128	0	0	0	0
Total	6,689	7,044	8,023	8,437	9,236	9,275	9,301	9,564	11,497	12,664	11,204	10,904	10,805	10,532	6,764	6,696	6,840	7,106	6,879	6,887

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Table 4.2.7 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Final Energy Consumption by Type (ktoe)																				
Coal	12	12	11	13	10	9	9	7	6	6	4	4	5	5	0	1	0	2	0	0
Oil	4,304	4,506	5,371	5,628	6,270	6,227	6,077	6,270	7,981	9,135	7,518	7,125	6,953	6,639	2,807	2,665	2,790	2,935	2,764	2,623
Gas	324	349	391	413	446	472	494	514	515	531	560	571	573	580	583	586	581	646	593	651
Electricity	2,049	2,177	2,249	2,384	2,509	2,567	2,720	2,772	2,996	2,992	3,121	3,204	3,275	3,306	3,373	3,444	3,469	3,523	3,520	3,572
Heat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Biomass	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	41
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	6,689	7,044	8,023	8,437	9,236	9,275	9,301	9,564	11,497	12,664	11,204	10,904	10,805	10,532	6,764	6,696	6,840	7,106	6,879	6,887
Power Generation (GWh)																				
Thermal	28,938	31,807	34,914	36,394	26,741	27,916	28,440	28,943	31,414	29,496	31,330	32,429	34,312	35,506	37,131	38,451	44,257	44,642	40,502	41,288
Hydro	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Geothermal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Solar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wind	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,141	1,201	143
Total	28,938	31,807	34,914	36,394	26,741	27,916	28,440	28,943	31,414	29,496	31,330	32,429	34,312	35,506	37,131	38,451	44,257	45,783	41,703	41,432
Loss and Own Use of Electricity (GWh)																				
Transmission and Distribution Losses	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1,680	–	4,648	5,018	4,805	–
Own Use	–	–	–	–	–	–	–	–	–	–	–	–	–	–	2,301	4,904	5,645	5,694	2,511	104
Total	–	–	–	–	–	–	–	–	–	–	–	–	–	–	3,981	4,904	10,292	10,712	7,316	104
Fuel Input for Power Generation (ktoe)																				
Coal	5,996	6,504	6,936	7,159	5,543	5,742	4,476	3,655	4,234	3,544	4,121	4,552	5,064	6,423	6,337	6,869	6,851	7,478	6,850	7,154
Oil	126	278	366	400	124	169	114	95	75	59	37	37	42	47	57	38	37	30	36	45
Gas	0	0	0	0	0	16	1,390	2,146	2,013	2,220	2,007	2,025	1,924	1,237	2,048	2,033	2,164	1,224	1,500	1,861
Total	6,122	6,782	7,303	7,558	5,667	5,927	5,979	5,895	6,322	5,823	6,164	6,615	7,030	7,707	8,442	8,939	9,053	8,732	8,386	9,060
CO_2 Emissions (kt C)																				
Coal	6,477	7,025	7,492	7,733	5,987	6,203	4,835	3,948	4,574	3,828	4,451	4,917	5,470	6,938	6,846	7,421	7,401	8,080	7,399	7,728
Oil	3,673	3,969	4,776	5,004	5,294	5,289	4,993	5,255	6,691	7,666	6,272	5,926	5,755	5,499	2,355	2,213	2,314	2,434	2,286	2,177
Gas	164	177	198	209	226	249	1,141	1,635	1,550	1,691	1,569	1,587	1,523	1,087	1,607	1,599	1,681	1,198	1,261	1,609
Total	10,314	11,171	12,467	12,945	11,507	11,741	10,968	10,837	12,815	13,184	12,292	12,430	12,747	13,524	10,808	11,232	11,396	11,712	10,946	11,514

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Table 4.2.7 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Macroeconomic Indicators																				
Population (thousand)	5,705	5,752	5,801	5,901	6,035	6,156	6,436	6,489	6,544	6,607	6,665	6,714	6,744	6,731	6,784	6,813	6,857	6,926	6,978	7,004
Urban Population, %	99.5	99.6	99.7	99.8	99.9	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
GDP (constant 2000 $ million)	115,163	121,721	129,137	136,941	145,176	148,505	154,732	162,556	152,759	156,664	169,121	169,962	173,091	178,294	193,390	207,086	221,623	235,783	241,221	234,803
GDP (current $ million)	76,887	88,833	104,002	119,958	135,542	144,230	158,966	176,312	166,909	163,283	169,121	166,593	163,781	158,572	165,886	177,772	189,932	207,087	215,366	209,283
GDP (constant 2005 PPP $ million)	135,180	142,878	151,584	160,744	170,410	174,318	181,627	190,811	179,312	183,895	198,517	199,504	203,177	209,285	227,004	243,081	260,145	276,766	283,149	275,616
GDP/capita (constant 2000 $)	20,188	21,161	22,263	23,206	24,054	24,123	24,044	25,050	23,345	23,714	25,374	25,313	25,666	26,489	28,509	30,395	32,320	34,044	34,570	33,526
GDP/capita (current $)	13,478	15,444	17,930	20,328	22,458	23,429	24,701	27,170	25,507	24,716	25,374	24,812	24,285	23,559	24,454	26,092	27,699	29,900	30,865	29,882
GDP – Manufacturing (% of GDP)	10.3	8.7	7.6	6.1	5.1	4.7	4.1	3.6	3.4	3.2	3.3	3.2	3.1	2.8	2.4	2.1	1.7	1.6	1.7	1.6
Car Ownership (car/1,000 persons)	66	70	78	81	82	78	76	79	80	71	74	69	81	98	104	104	105	106	107	108
Basic Energy Indicators																				
TPES/capita (toe/person)	1.87	1.98	2.19	2.25	2.16	2.15	2.06	2.03	2.36	2.47	2.26	2.27	2.27	2.32	1.93	2.07	1.99	2.02	1.92	1.91
TFEC/capita (toe/person)	1.17	1.22	1.38	1.43	1.53	1.51	1.45	1.47	1.76	1.92	1.68	1.62	1.60	1.56	1.00	0.98	1.00	1.03	0.99	0.98
TPES/GDP (toe/constant 2000 $ million)	92	94	98	97	90	89	86	81	101	104	89	90	89	87	68	68	61	59	56	57
TFEC/GDP (toe/constant 2000 $ million)	58	58	62	62	64	62	60	59	75	81	66	64	62	59	35	32	31	30	29	29
Import Dependency (%)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.4	99.4	99.3	99.3	99.3	99.5
Oil Import Dependency (%)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Electricity/capita (kWh/ person)	4,178	4,401	4,509	4,698	4,835	4,850	4,915	4,969	5,325	5,268	5,446	5,549	5,647	5,713	5,784	5,879	5,883	5,915	5,867	5,931
CO_2 Intensity (t C/constant 2000 $ million)	90	92	97	95	79	79	71	67	84	84	73	73	74	76	56	54	51	50	45	49
CO_2/capita (t C)	1.81	1.94	2.15	2.19	1.91	1.91	1.70	1.67	1.96	2.00	1.84	1.85	1.89	2.01	1.59	1.65	1.66	1.69	1.57	1.64
CO_2/TPES (t C/toe)	0.97	0.98	0.98	0.97	0.88	0.89	0.83	0.82	0.83	0.81	0.81	0.81	0.83	0.87	0.82	0.80	0.84	0.84	0.82	0.86

CO_2 = carbon dioxide, GDP = gross domestic product, GWh = gigawatt–hour, kt C = thousand tons of carbon equivalent, ktoe = thousand tons of oil equivalent, kWh = kilowatt–hour, PPP = purchasing power parity, t C = ton of carbon equivalent, TFEC = total final energy consumption, toe = ton of oil equivalent, TPES = total primary energy supply.

Note: Figures may not add up to total because of rounding.

Sources: APERC (APEC Energy Database), APERC estimates, JAMA (2012), and World Bank.

4.3 Republic of Korea

Country Profile (2009)		Energy Reserves (year-end 2008)	
Total Surface Area (square kilometer)	99,900	Coal (million ton) - Recoverable	126.0
Population (thousand)	48,747	Gas (trillion cubic feet) - Proven	0.1
GDP (billion constant 2000 $)	753.8	Oil (billion barrel) - Proven	2.0
Electrification Rate (%)	100.0		

GDP = gross domestic product.

Sources: ADB (2012), World Bank, and WEC (2010).

2009 Energy Supply and Demand Flow (ktoe)

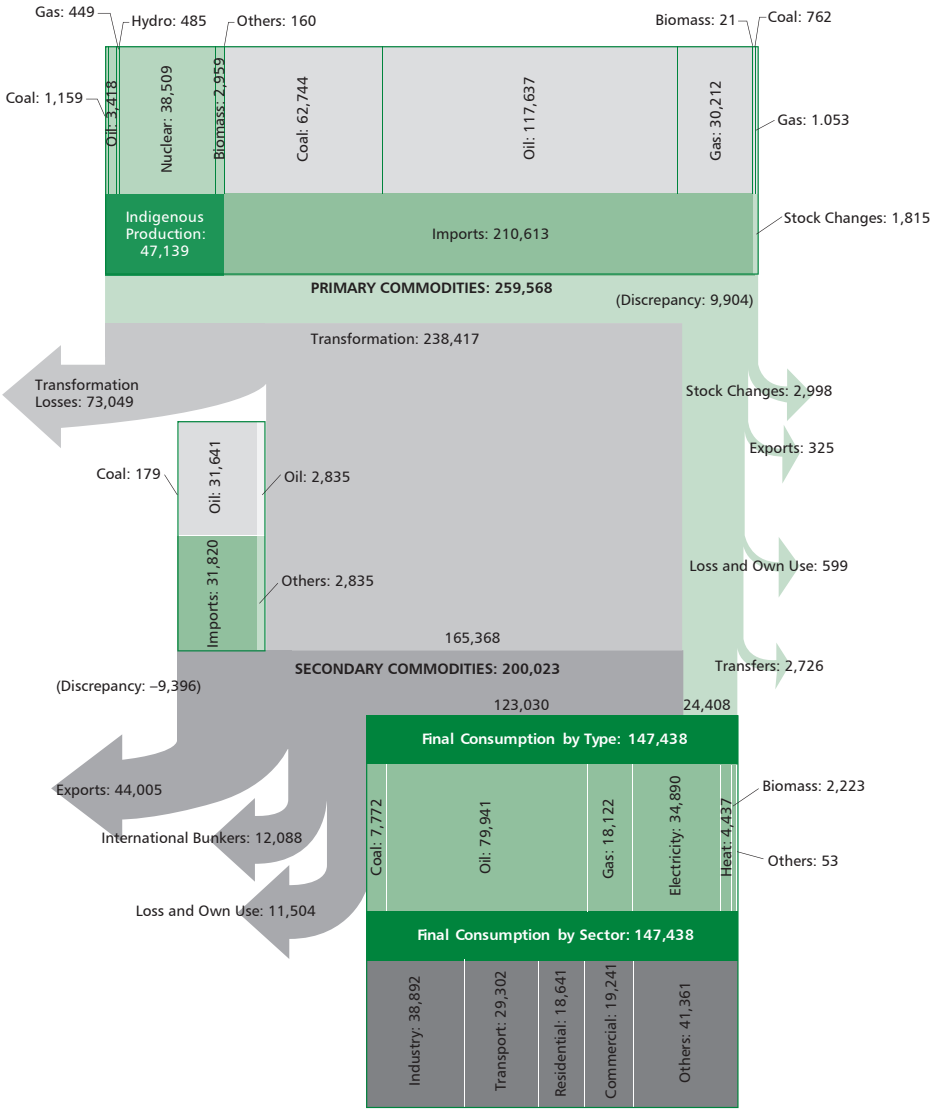


Table 4.3.1 Key Data and Economic Profile

	1990	1995	2000	2005	2009
Socioeconomic Data					
Population (thousand)	42,869	45,093	47,008	48,138	48,747
GDP (constant 2000 $ billion)	295.6	430.5	533.4	664.4	753.8
GDP (constant 2005 PPP $ billion)	488.0	710.7	880.5	1,096.7	1,244.3
GDP/capita (constant 2000 $)	6,895	9,548	11,347	13,802	15,463
GDP/capita (constant 2005 PPP $)	11,383	15,761	18,730	22,783	25,525

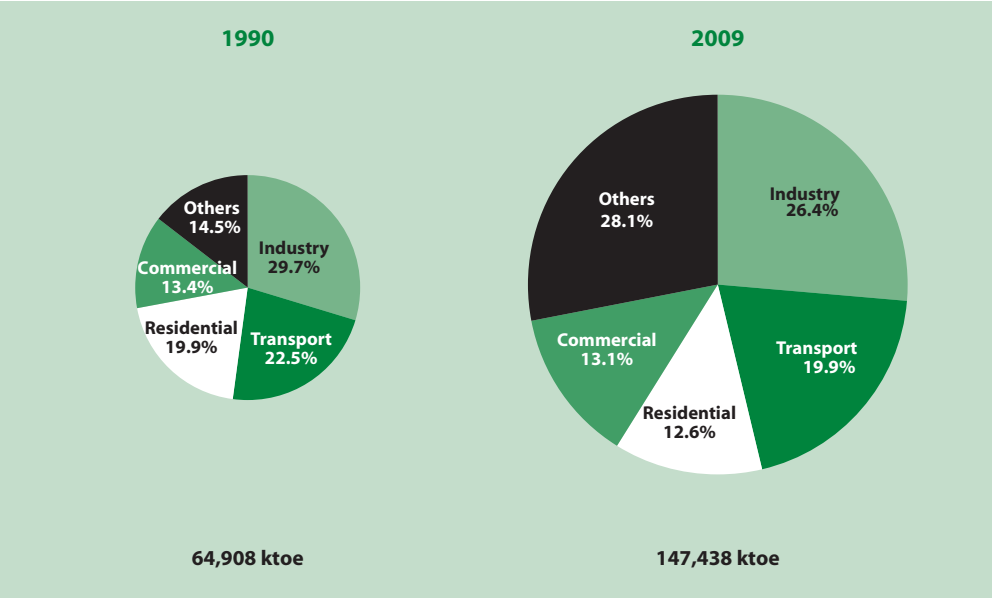
GDP = gross domestic product, PPP = purchasing power parity.
Sources: World Bank.

Table 4.3.2 Energy Supply and Demand

	1990	1995	2000	2005	2009
Primary Energy Supply (ktoe)					
Indigenous Production	22,622	21,382	35,193	45,103	47,139
Net Imports	70,465	123,609	153,721	167,266	184,868
Total PES	93,088	144,991	188,914	212,369	232,007
Coal	25,558	26,611	41,951	49,571	64,844
Oil	49,734	91,126	99,650	94,496	93,315
Gas	2,725	8,323	17,011	27,415	31,713
Biomass	731	969	1,379	2,141	2,980
Others	14,339	17,961	28,922	38,747	39,155
TPES/capita (toe)	2.17	3.22	4.02	4.41	4.76
TPES/GDP (toe/constant 2005 PPP $ million)	191	204	215	194	186
Final Energy Consumption (ktoe)					
Industry	19,262	28,906	38,108	38,610	38,892
Transportation	14,573	24,257	26,266	29,187	29,302
Other Sectors	31,073	51,521	62,738	72,663	79,244
Total FEC	64,908	104,684	127,112	140,460	147,438
Coal	11,717	7,407	9,071	7,747	7,772
Oil	43,661	77,543	79,877	79,650	79,941
Gas	674	3,996	10,928	15,986	18,122
Electricity	8,117	14,041	22,628	30,756	34,890
Biomass	729	908	1,274	1,786	2,223
Others	10	789	3,334	4,534	4,489

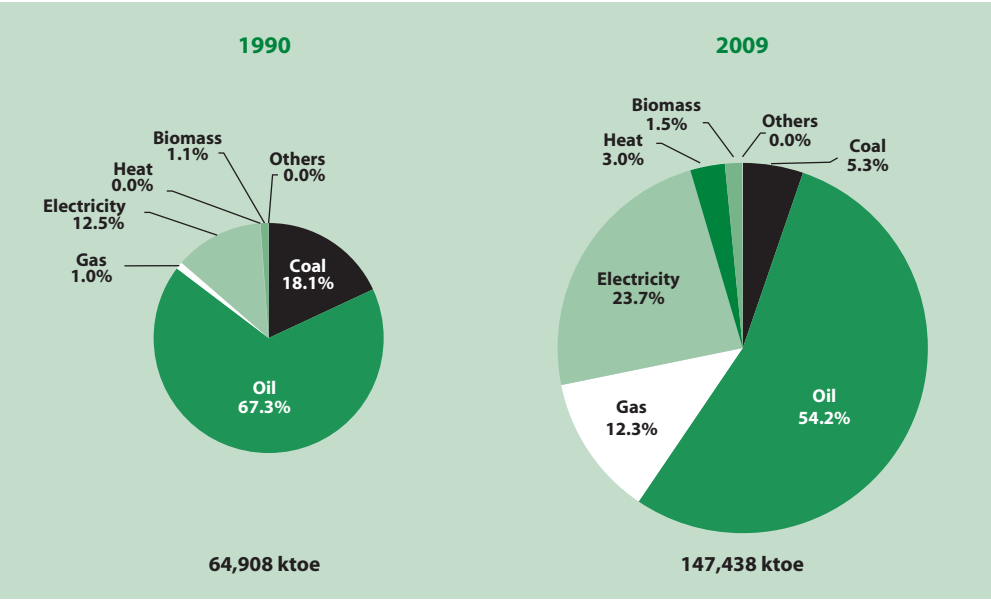
FEC = final energy consumption, GDP = gross domestic product, ktoe = thousand tons of oil equivalent, PES = primary energy supply, PPP = purchasing power parity, toe = ton of oil equivalent, TPES = total primary energy supply.
Source: APERC (APEC Energy Database).

Figure 4.3.1 Final Energy Consumption by Sector, 1990 and 2009



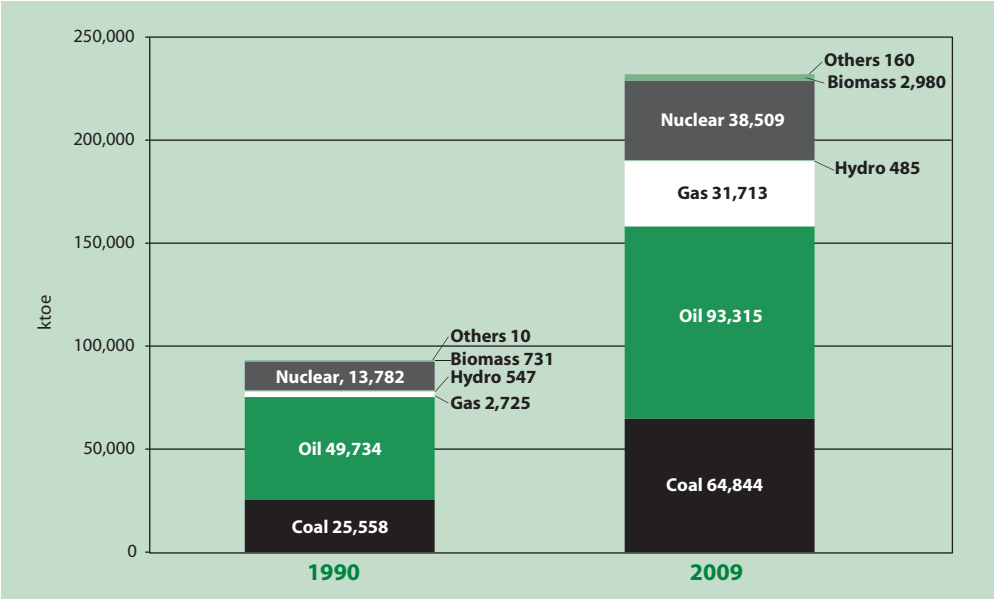
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 4.3.2 Final Energy Consumption by Type of Energy, 1990 and 2009



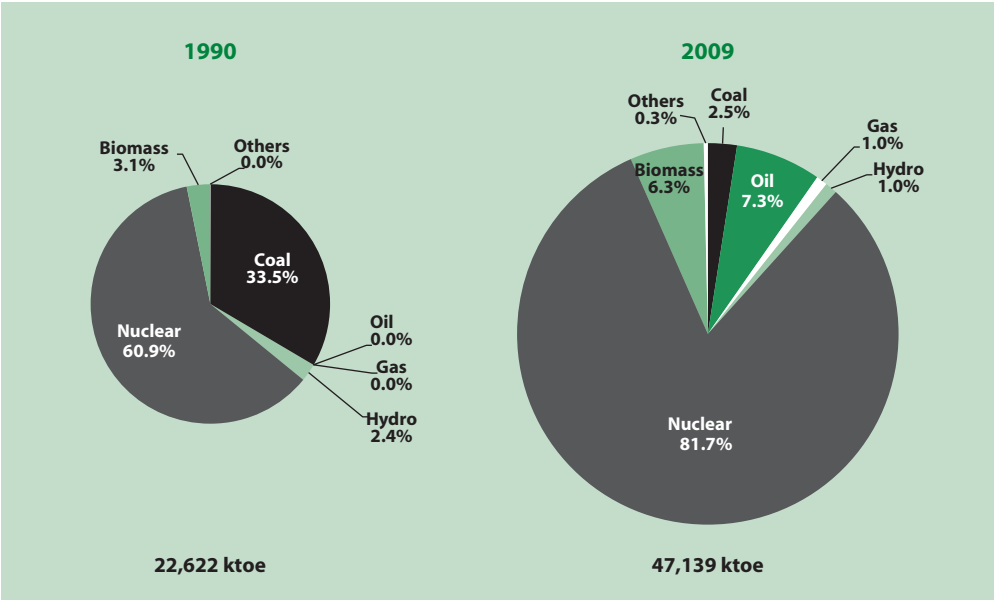
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 4.3.3 Total Primary Energy Supply, 1990 and 2009



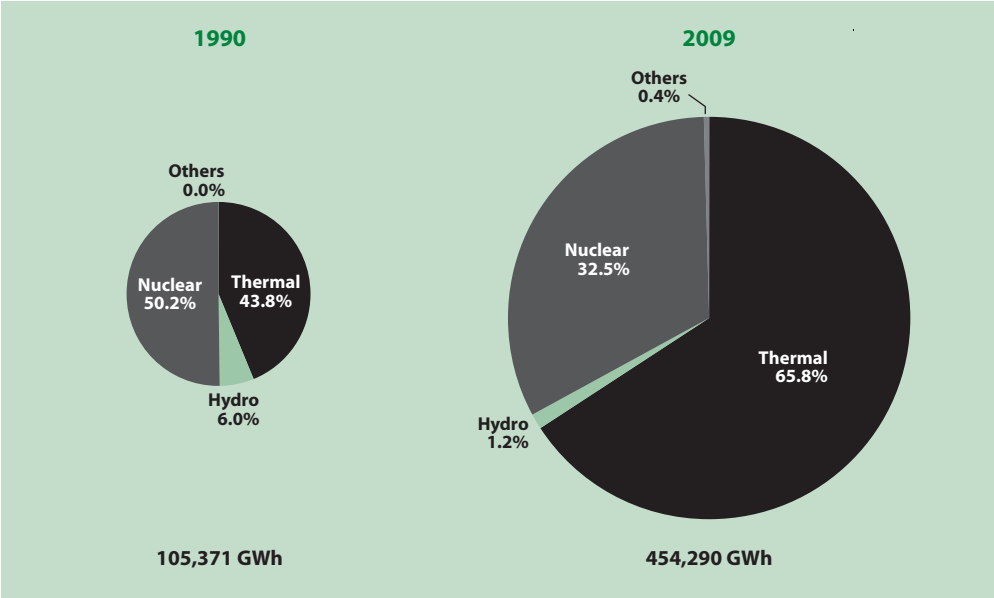
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 4.3.4 Indigenous Energy Production, 1990 and 2009



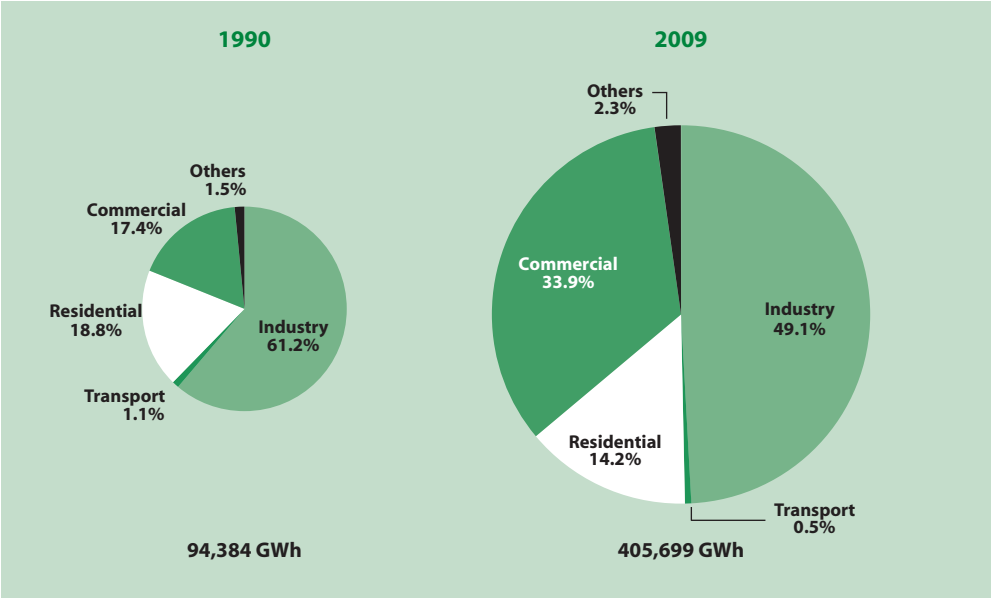
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 4.3.5 Electricity Generation by Plant Type, 1990 and 2009



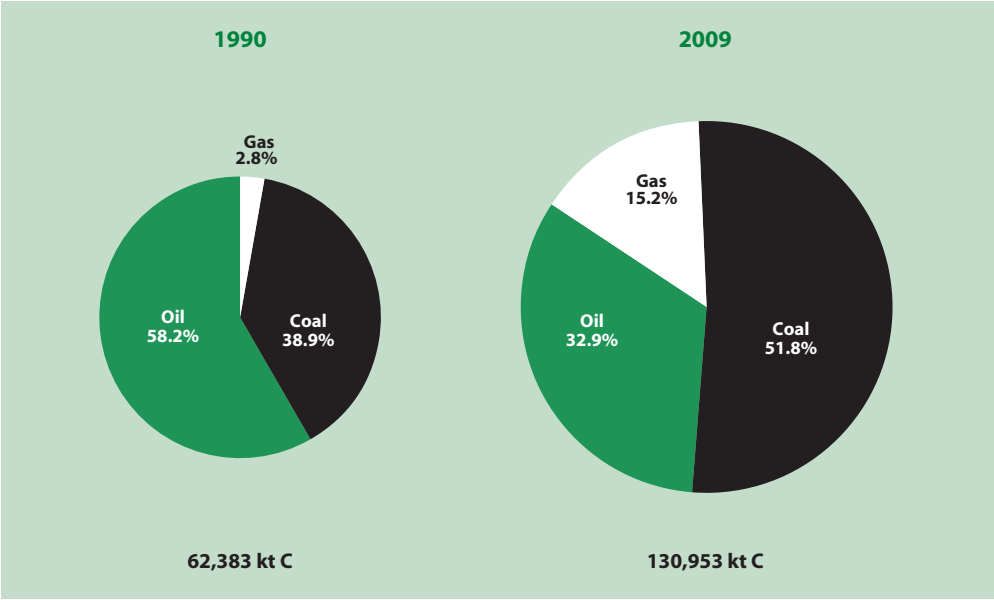
GWh = gigawatt-hour.
Source: APERC (APEC Energy Database).

Figure 4.3.6 Electricity Consumption by Sector, 1990 and 2009



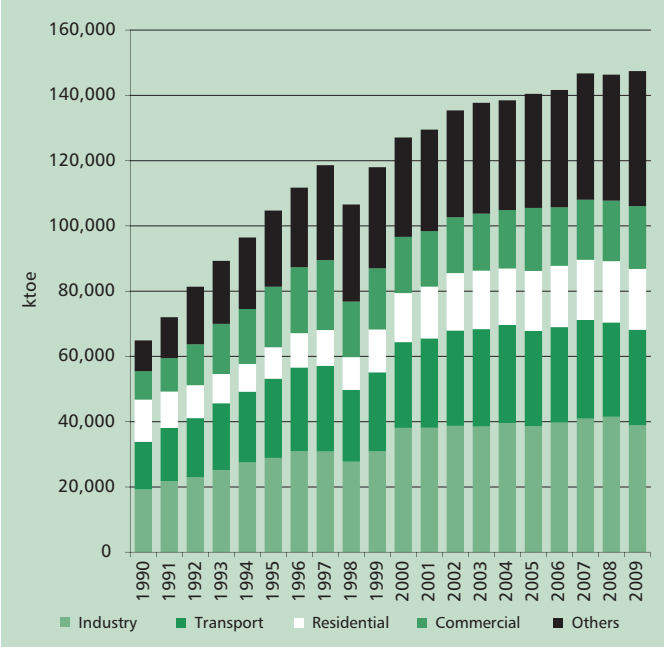
GWh = gigawatt-hour.
Source: APERC (APEC Energy Database).

Figure 4.3.7 Carbon Dioxide Emissions from Fuel Combustion, 1990 and 2009



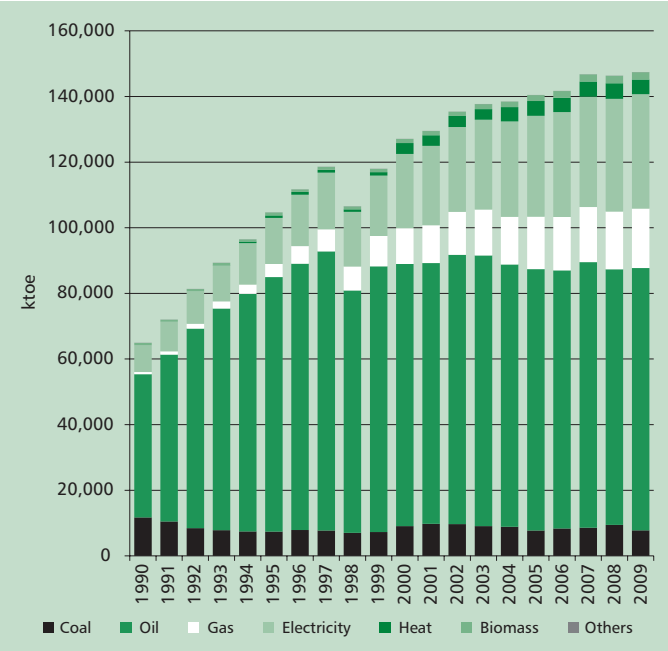
kt C = thousand tons of carbon equivalent.
Source: APERC estimates.

Figure 4.3.8 Final Energy Consumption by Sector, 1990–2009



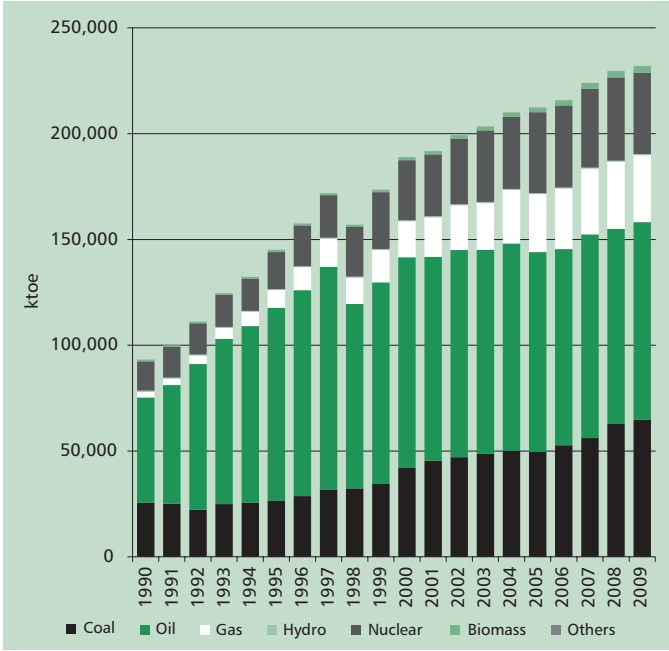
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 4.3.9 Final Energy Consumption by Type, 1990–2009



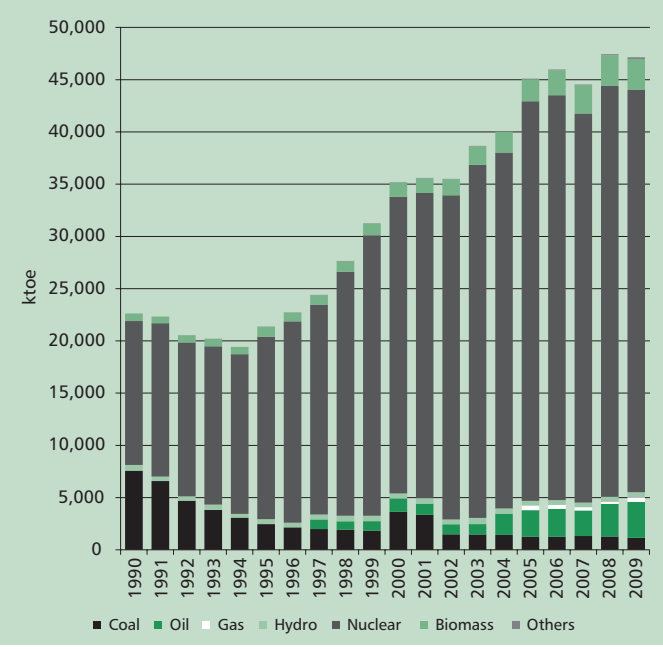
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 4.3.10 Total Primary Energy Supply, 1990–2009



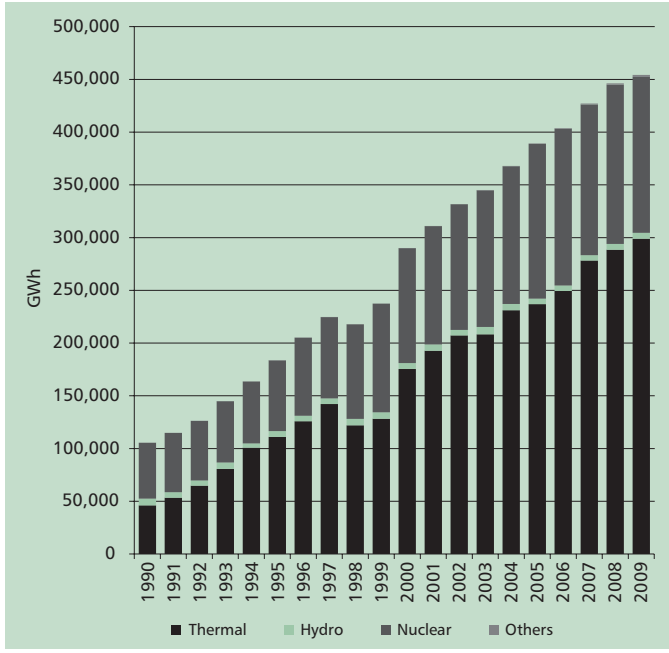
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 4.3.11 Indigenous Energy Production, 1990–2009



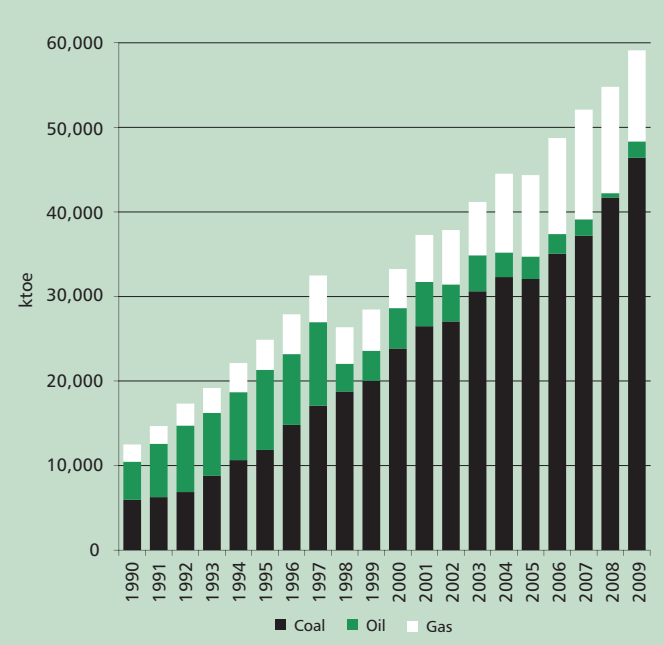
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 4.3.12 Electricity Generation by Source, 1990–2009



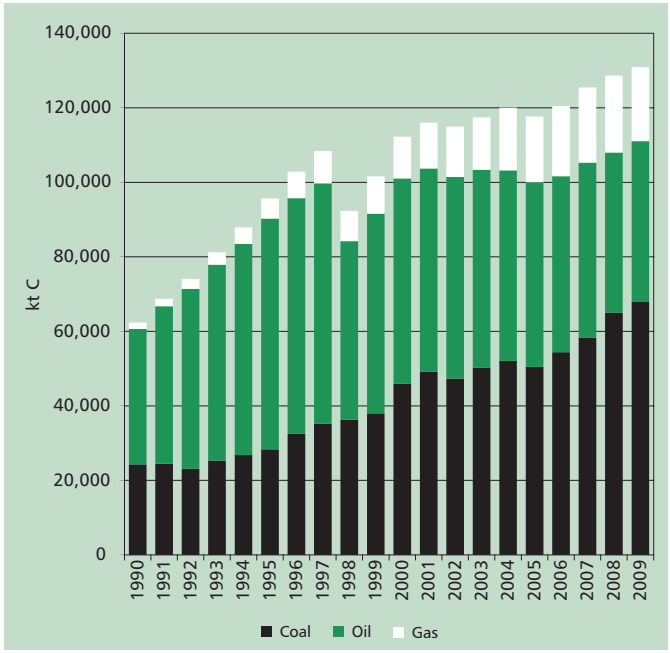
GWh = gigawatt-hour.
Source: APERC (APEC Energy Database).

Figure 4.3.13 Fuel Input for Electricity Generation, 1990–2009



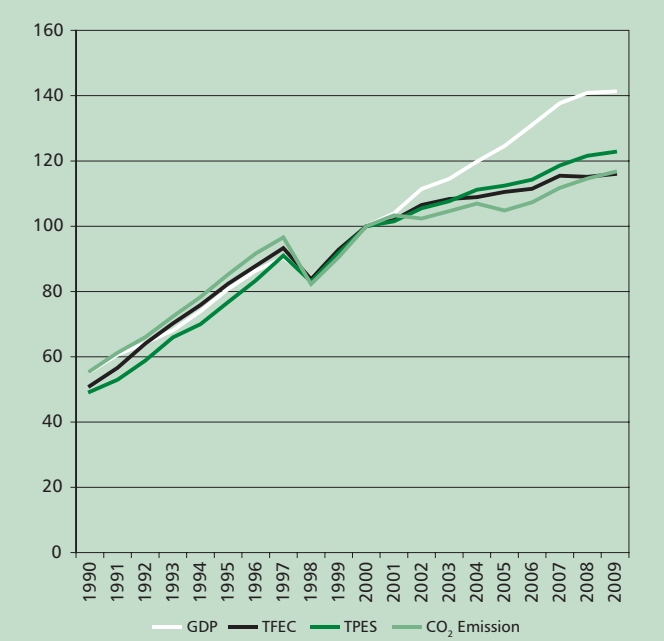
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 4.3.14 Carbon Dioxide Emissions from Fuel Combustion, 1990–2009



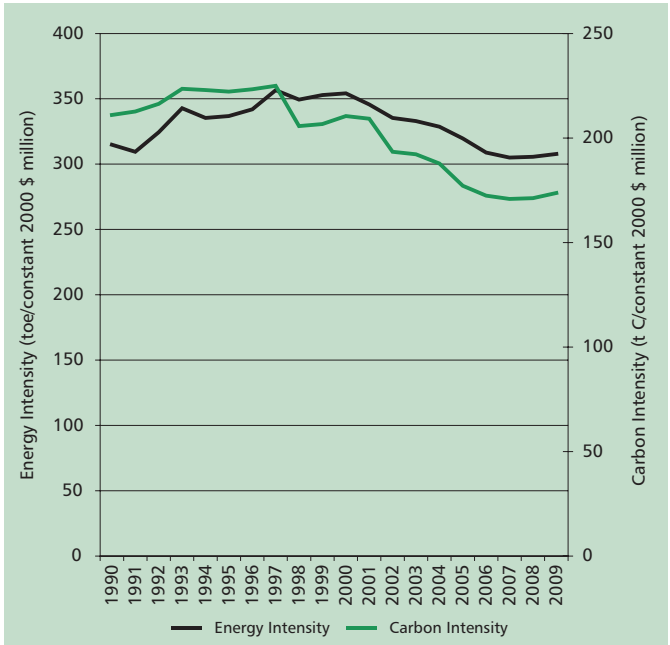
kt C = thousand tons of carbon equivalent.
Source: APERC estimates.

Figure 4.3.15 Growth of GDP, TFEC, TPES, and CO_2 Emissions (indexed to year 2000), 1990–2009



CO_2 = carbon dioxide, GDP = gross domestic product, TFEC = total final energy consumption, TPES = total primary energy supply.
Note: Indices are measured relative to the base year 2000 (2000 = 100).
Source: APERC estimates.

Figure 4.3.16 Energy and Carbon Intensities, 1990–2009



t C = ton of carbon equivalent , toe = ton of oil equivalent.
Source: APERC estimates.

Table 4.3.3 Republic of Korea Energy Balance Table, 2006

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	1,257	0	2,655	0	0	0	0	0	0	0	393	449	38,764	0	3	21	2,397	39	0	0	45,978
2.	Imports	50,203	204	122,758	22,346	0	44	262	1,343	5,321	15,377	29,550	0	0	0	0	0	28	0	0	0	225,089
3.	Exports	0	0	–2	–39,130	–2,479	–624	–12,411	–8,901	–75	–14,639	0	0	0	0	0	0	0	0	0	0	–39,132
4.	International Bunkers	0	0	0	–13,406	0	0	–1,032	–9,396	0	–2,978	0	0	0	0	0	0	0	0	0	0	–13,406
5.	Stock Changes	1,050	0	–1,485	–1,021	–82	–324	–376	–216	–32	9	–1,249	0	0	0	0	0	0	0	0	0	–2,705
6.	Total Primary Energy Supply	52,510	204	123,926	–31,211	–2,561	–904	–13,558	–17,169	5,213	–2,232	28,694	449	38,764	0	3	21	2,425	39	0	0	215,823
7.	Transfers	0	0	–2,085	2,290	687	–94	26	239	430	1,002	0	0	0	0	0	0	0	0	0	0	205
8.	Total Transformation Sector	–48,641	4,457	–129,061	120,911	9,276	5,401	32,976	26,841	3,530	42,888	–12,607	–449	–38,764	0	–3	–21	–422	0	34,746	4,513	–65,340
8.1	Power Generation	–33,768	–2,369	0	–5,276	0	–142	–27	–4,491	0	–615	–12,680	–449	–38,764	0	–3	–21	–391	0	34,746	4,513	–54,461
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	73	0	0	0	0	0	0	0	0	0	73
8.3	Refineries	0	0	–129,109	126,202	9,276	5,544	33,004	31,332	3,530	43,517	0	0	0	0	0	0	0	0	0	0	–2,907
8.4	Coal Transformation	–14,873	6,826	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–8,047
8.5.	Other Transformation	0	0	48	–14	0	0	0	0	0	–14	0	0	0	0	0	0	–31	0	0	0	3
9.	Loss and Own Use	0	–792	–33	–4,913	0	–12	–23	–2,494	0	–2,384	–415	0	0	0	0	0	0	0	–2,814	–91	–9,058
10.	Discrepancy	613	–1	7,252	–8,426	69	–191	18	–531	–574	–7,217	628	0	0	0	0	0	–5	0	4	–17	49
11.	Total Final Energy Consumption	4,482	3,868	0	78,651	7,471	4,200	19,439	6,885	8,598	32,057	16,300	0	0	0	0	0	1,997	39	31,936	4,405	141,680
12.	Industry Sector	4,482	2,764	0	7,367	0	363	1,165	5,565	169	106	4,366	0	0	0	0	0	1,616	1	16,294	2,856	39,746
13.	Transport Sector	0	0	0	28,558	7,471	11	15,218	504	4,377	977	452	0	0	0	0	0	0	0	218	0	29,228
14.	Other Sectors	0	1,104	0	10,482	0	3,790	3,057	817	2,365	453	11,482	0	0	0	0	0	382	39	15,425	1,549	40,462
14.1	Residential and Commercial	0	1,104	0	7,382	0	3,445	871	651	2,344	71	11,457	0	0	0	0	0	382	39	14,797	1,549	36,709
14.1.1	Commerce and Public Services	0	0	0	3,933	0	1,424	375	409	1,653	71	3,183	0	0	0	0	0	332	11	10,279	182	17,920
14.1.2	Residential	0	1,104	0	3,449	0	2,021	496	242	690	0	8,273	0	0	0	0	0	50	27	4,518	1,367	18,789
14.2	Non-Specified Others	0	0	0	3,100	0	345	2,186	166	22	382	25	0	0	0	0	0	0	0	627	0	3,753
15.	Non-Energy Use	0	0	0	32,244	0	36	0	0	1,687	30,521	0	0	0	0	0	0	0	0	0	0	32,244
16.	Electricity Output (GWh)	152,914	0	23,792	0	0	0	0	0	0	0	72,656	5,219	148,749	0	31	239	284	0	0	0	403,884
17.	Heat Output (TJ)	36,059	0	98,898	0	0	0	0	0	0	0	44,394	0	0	0	0	0	0	0	0	0	179,351

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.
Note: Figures may not add up to total because of rounding.
Source: APERC (APEC Energy Database).

Table 4.3.4 Republic of Korea Energy Balance Table, 2007

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	1,328	0	2,440	0	0	0	0	0	0	0	317	434	37,249	0	6	32	2,696	40	0	0	44,543
2.	Imports	54,117	358	120,849	24,364	0	66	214	892	5,774	17,419	29,915	0	0	0	0	0	29	0	0	0	229,633
3.	Exports	0	0	–27	–39,317	–1,903	–165	–14,055	–6,524	–51	–16,620	0	0	0	0	0	0	0	0	0	0	–39,344
4.	International Bunkers	0	0	0	–12,849	0	0	–1,066	–8,614	0	–3,169	0	0	0	0	0	0	0	0	0	0	–12,849
5.	Stock Changes	307	0	670	181	–14	160	–247	200	91	–9	899	0	0	0	0	0	0	0	0	0	2,057
6.	Total Primary Energy Supply	55,752	358	123,933	–27,621	–1,916	60	–15,155	–14,046	5,814	–2,378	31,131	434	37,249	0	6	32	2,725	40	0	0	224,040
7.	Transfers	0	0	–1,860	1,942	765	–334	64	105	466	876	0	0	0	0	0	0	0	0	0	0	82
8.	Total Transformation Sector	–51,217	5,304	–130,696	121,280	9,060	3,810	34,978	23,173	3,335	46,925	–14,312	–434	–37,249	0	–6	–32	–552	0	36,749	4,744	–66,422
8.1	Power Generation	–35,584	–2,614	0	–5,085	0	–111	–24	–4,669	0	–281	–14,390	–434	–37,249	0	–6	–32	–495	0	36,749	4,744	–54,397
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	78	0	0	0	0	0	0	0	0	0	78
8.3	Refineries	0	0	–130,786	126,438	9,060	3,922	35,003	27,842	3,335	47,277	0	0	0	0	0	0	0	0	0	0	–4,348
8.4	Coal Transformation	–15,633	7,918	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–7,715
8.5.	Other Transformation	0	0	90	–73	0	–1	–1	0	0	–71	0	0	0	0	0	0	–57	0	0	0	–40
9.	Loss and Own Use	0	–1,841	–35	–5,072	0	–39	–25	–2,467	–44	–2,496	–326	0	0	0	0	0	0	0	–3,060	–141	–10,474
10.	Discrepancy	245	0	8,657	–9,625	–104	18	–117	–373	83	–9,132	319	0	0	0	0	0	–6	0	–47	–13	–471
11.	Total Final Energy Consumption	4,779	3,821	0	80,904	7,804	3,516	19,745	6,391	9,653	33,795	16,812	0	0	0	0	0	2,167	40	33,642	4,590	146,756
12.	Industry Sector	4,779	2,438	0	6,982	0	321	1,173	4,976	400	112	4,710	0	0	0	0	0	1,778	1	17,245	2,998	40,931
13.	Transport Sector	0	0	0	29,435	7,804	8	15,440	487	4,656	1,040	576	0	0	0	0	0	0	0	211	0	30,222
14.	Other Sectors	0	1,001	0	9,949	0	3,159	3,131	928	2,299	432	11,527	0	0	0	0	0	389	40	16,185	1,592	40,682
14.1	Residential and Commercial	0	1,001	0	6,809	0	2,832	900	726	2,289	61	11,523	0	0	0	0	0	389	40	15,515	1,592	36,869
14.1.1	Commerce and Public Services	0	0	0	3,704	0	1,159	375	505	1,604	61	3,296	0	0	0	0	0	345	16	10,854	201	18,416
14.1.2	Residential	0	1,001	0	3,105	0	1,673	525	222	685	0	8,227	0	0	0	0	0	43	24	4,661	1,391	18,453
14.2	Non-Specified Others	0	0	0	3,139	0	327	2,230	201	10	370	4	0	0	0	0	0	0	0	670	0	3,813
15.	Non-Energy Use	0	382	0	34,538	0	28	1	0	2,298	32,212	0	0	0	0	0	0	0	0	0	0	34,920
16.	Electricity Output (GWh)	170,704	0	25,182	0	0	0	0	0	0	0	82,360	5,042	142,937	0	70	376	419	0	0	0	427,090
17.	Heat Output (TJ)	33,795	0	105,208	0	0	0	0	0	0	0	48,072	0	0	0	0	0	0	0	0	0	187,075

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Source: APERC (APEC Energy Database).

Table 4.3.5 Republic of Korea Energy Balance Table, 2008

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	1,276	0	3,120	0	0	0	0	0	0	0	195	478	39,340	0	24	37	2,925	44	0	0	47,439
2.	Imports	61,017	490	118,857	26,340	0	36	158	1,100	6,370	18,677	33,347	0	0	0	0	0	26	0	0	0	240,077
3.	Exports	0	0	−243	−44,712	−3,861	−319	−17,859	−5,396	−36	−17,241	0	0	0	0	0	0	0	0	0	0	−44,955
4.	International Bunkers	0	0	0	−12,938	0	0	−880	−8,252	0	−3,806	0	0	0	0	0	0	0	0	0	0	−12,938
5.	Stock Changes	−15	0	901	878	179	167	605	−12	−147	86	−1,723	0	0	0	0	0	0	0	0	0	41
6.	Total Primary Energy Supply	62,277	490	122,635	−30,432	−3,682	−116	−17,976	−12,560	6,186	−2,285	31,818	478	39,340	0	24	37	2,951	44	0	0	229,663
7.	Transfers	0	0	−2,583	2,705	762	−185	−15	176	598	1,369	0	0	0	0	0	0	0	0	0	0	121
8.	Total Transformation Sector	−57,323	5,925	−128,625	120,634	10,853	4,131	36,627	20,121	3,392	45,510	−14,088	−478	−39,340	0	−24	−37	−670	0	38,393	4,816	−70,819
8.1	Power Generation	−40,181	−2,782	0	−3,100	0	−87	−27	−2,640	0	−345	−14,289	−478	−39,340	0	−24	−37	−566	0	38,393	4,816	−57,588
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	201	0	0	0	0	0	0	0	0	0	201
8.3	Refineries	0	0	−128,789	123,787	10,853	4,218	36,654	22,761	3,392	45,908	0	0	0	0	0	0	0	0	0	0	−5,003
8.4	Coal Transformation	−17,142	8,707	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	−8,435
8.5.	Other Transformation	0	0	164	−54	0	0	0	0	0	−54	0	0	0	0	0	0	−105	0	0	0	6
9.	Loss and Own Use	0	−2,005	−33	−5,598	0	−6	−18	−2,265	−101	−3,207	−403	0	0	0	0	0	0	0	−3,918	−82	−12,039
10.	Discrepancy	67	0	8,606	−9,373	−74	−117	−158	−80	−613	−8,331	254	0	0	0	0	0	0	0	−109	−13	−567
11.	Total Final Energy Consumption	5,021	4,410	0	77,935	7,860	3,706	18,459	5,392	9,462	33,056	17,582	0	0	0	0	0	2,281	44	34,365	4,722	146,359
12.	Industry Sector	5,021	2,913	0	6,014	0	322	1,177	4,136	271	108	5,472	0	0	0	0	0	1,889	1	17,225	2,996	41,531
13.	Transport Sector	0	0	0	27,947	7,860	8	14,593	531	4,679	275	715	0	0	0	0	0	0	0	191	0	28,853
14.	Other Sectors	0	1,053	0	9,195	0	3,349	2,689	724	2,029	404	11,395	0	0	0	0	0	392	43	16,949	1,726	40,753
14.1	Residential and Commercial	0	1,053	0	6,522	0	3,054	801	588	2,017	63	11,389	0	0	0	0	0	392	43	16,228	1,726	37,353
14.1.1	Commerce and Public Services	0	0	0	3,372	0	1,228	317	387	1,377	63	3,153	0	0	0	0	0	362	21	11,393	257	18,557
14.1.2	Residential	0	1,053	0	3,150	0	1,826	483	201	639	0	8,237	0	0	0	0	0	29	22	4,836	1,469	18,796
14.2	Non-Specified Others	0	0	0	2,674	0	295	1,888	136	13	341	5	0	0	0	0	0	0	0	721	0	3,400
15.	Non-Energy Use	0	444	0	34,779	0	28	0	0	2,483	32,269	0	0	0	0	0	0	0	0	0	0	35,222
16.	Electricity Output (GWh)	191,761	0	15,351	0	0	0	0	0	0	0	81,332	5,563	150,958	0	285	436	549	0	0	0	446,235
17.	Heat Output (TJ)	42,005	0	86,928	0	0	0	0	0	0	0	57,126	0	0	0	0	0	0	0	0	0	186,059

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.
Note: Figures may not add up to total because of rounding.
Source: APERC (APEC Energy Database).

Table 4.3.6 Republic of Korea Energy Balance Table, 2009

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	1,159	0	3,418	0	0	0	0	0	0	0	449	485	38,509	0	49	59	2,959	53	0	0	47,139
2.	Imports	62,744	179	117,637	31,641	0	10	320	3,030	6,305	21,976	30,212	0	0	0	0	0	21	0	0	0	242,433
3.	Exports	0	0	–325	–44,005	–5,001	–722	–17,106	–3,948	–9	–17,219	0	0	0	0	0	0	0	0	0	0	–44,330
4.	International Bunkers	0	0	0	–12,088	0	0	–881	–7,517	0	–3,689	0	0	0	0	0	0	0	0	0	0	–12,088
5.	Stock Changes	762	0	–2,998	35	–167	13	–259	64	236	149	1,053	0	0	0	0	0	0	0	0	0	–1,147
6.	Total Primary Energy Supply	64,665	179	117,732	–24,417	–5,168	–699	–17,927	–8,371	6,532	1,216	31,713	485	38,509	0	49	59	2,980	53	0	0	232,007
7.	Transfers	0	0	–2,726	2,800	841	7	–5	47	513	1,398	0	0	0	0	0	0	0	0	0	0	74
8.	Total Transformation Sector	–61,173	5,435	–125,214	116,294	12,757	4,662	36,358	15,250	3,448	43,818	–12,170	–485	–38,509	0	–49	–59	–757	0	39,087	4,552	–73,049
8.1	Power Generation	–45,628	–2,306	0	–3,945	0	–94	–20	–3,543	0	–288	–12,394	–485	–38,509	0	–49	–59	–607	0	39,087	4,552	–60,344
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	224	0	0	0	0	0	0	0	0	0	224
8.3	Refineries	0	0	–125,448	120,283	12,757	4,757	36,379	18,793	3,448	44,150	0	0	0	0	0	0	0	0	0	0	–5,165
8.4	Coal Transformation	–15,545	7,741	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–7,804
8.5.	Other Transformation	0	0	234	–44	0	0	0	0	0	–44	0	0	0	0	0	0	–150	0	0	0	40
9.	Loss and Own Use	0	–1,852	–24	–5,321	0	–7	–19	–2,072	–25	–3,198	–574	0	0	0	0	0	0	0	–4,214	–117	–12,103
10.	Discrepancy	518	–1	10,233	–9,414	–217	–222	–129	–117	–930	–7,798	–846	0	0	0	0	0	0	0	17	2	508
11.	Total Final Energy Consumption	4,010	3,762	0	79,941	8,212	3,741	18,277	4,737	9,537	35,435	18,122	0	0	0	0	0	2,223	53	34,890	4,437	147,438
12.	Industry Sector	4,010	2,489	0	5,173	0	304	1,118	3,613	38	99	5,632	0	0	0	0	0	1,742	1	17,142	2,703	38,892
13.	Transport Sector	0	0	0	28,220	8,212	6	14,414	512	4,808	268	895	0	0	0	0	0	0	0	187	0	29,302
14.	Other Sectors	0	893	0	9,261	0	3,404	2,745	613	2,037	462	11,595	0	0	0	0	0	481	52	17,561	1,734	41,577
14.1	Residential and Commercial	0	893	0	6,357	0	3,114	716	483	2,013	30	11,591	0	0	0	0	0	481	52	16,775	1,734	37,883
14.1.1	Commerce and Public Services	0	0	0	3,425	0	1,461	289	302	1,342	30	3,324	0	0	0	0	0	457	29	11,814	193	19,241
14.1.2	Residential	0	893	0	2,932	0	1,653	427	181	671	0	8,267	0	0	0	0	0	24	23	4,961	1,541	18,641
14.2	Non-Specified Others	0	0	0	2,904	0	290	2,029	129	24	432	4	0	0	0	0	0	0	0	786	0	3,694
15.	Non-Energy Use	0	380	0	37,287	0	27	0	0	2,655	34,606	0	0	0	0	0	0	0	0	0	0	37,667
16.	Electricity Output (GWh)	208,864	0	19,811	0	0	0	0	0	0	0	70,278	5,641	147,771	0	566	685	674	0	0	0	454,290
17.	Heat Output (TJ)	51,178	0	67,293	0	0	0	0	0	0	0	54,157	0	0	0	0	0	0	0	0	0	172,628

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Source: APERC (APEC Energy Database).

Table 4.3.7 Republic of Korea Summary Table, 1990–2009

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Indigenous Production (ktoe)																				
Coal	7,576	6,580	4,699	3,812	3,085	2,465	2,154	1,983	1,924	1,845	3,638	3,353	1,477	1,468	1,421	1,261	1,257	1,328	1,276	1,159
Oil	0	0	0	0	0	0	0	929	808	892	1,281	1,072	967	997	2,041	2,541	2,655	2,440	3,120	3,418
Gas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	441	393	317	195	449
Hydro	547	434	418	517	352	471	447	465	525	522	482	514	457	594	506	446	449	434	478	485
Nuclear	13,782	14,675	14,732	15,151	15,284	17,468	19,265	20,089	23,373	26,858	28,396	29,222	31,038	33,793	34,064	38,251	38,764	37,249	39,340	38,509
Geothermal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Solar	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	3	6	24	49
Wind	0	0	0	0	0	0	0	0	0	1	1	1	1	2	4	11	21	32	37	59
Biomass	707	630	684	720	680	956	829	899	975	1,088	1,352	1,399	1,538	1,777	1,981	2,114	2,397	2,696	2,925	2,959
Others	10	11	13	14	17	22	32	46	44	42	42	37	35	33	37	37	39	40	44	53
Total	22,622	22,331	20,546	20,214	19,419	21,382	22,728	24,410	27,649	31,249	35,193	35,598	35,513	38,663	40,055	45,103	45,978	44,543	47,439	47,139
Primary Energy Supply (ktoe)																				
Coal	25,558	25,168	22,266	24,918	25,615	26,611	28,688	31,836	32,349	34,436	41,951	45,482	47,062	48,661	50,179	49,571	52,714	56,110	62,767	64,844
Oil	49,734	55,981	68,875	78,047	83,417	91,126	97,337	105,231	87,138	95,328	99,650	96,285	97,925	96,505	97,950	94,496	92,715	96,312	92,203	93,315
Gas	2,725	3,152	4,059	5,175	6,866	8,323	10,916	13,330	12,494	15,210	17,011	18,739	21,210	22,008	25,288	27,415	28,694	31,131	31,818	31,713
Hydro	547	434	418	517	352	471	447	465	525	522	482	514	457	594	506	446	449	434	478	485
Nuclear	13,782	14,675	14,732	15,151	15,284	17,468	19,265	20,089	23,373	26,858	28,396	29,222	31,038	33,793	34,064	38,251	38,764	37,249	39,340	38,509
Geothermal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Solar	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	3	6	24	49
Wind	0	0	0	0	0	0	0	0	0	1	1	1	1	2	4	11	21	32	37	59
Biomass	731	655	701	735	693	969	832	917	991	1,103	1,379	1,426	1,568	1,803	2,007	2,141	2,425	2,725	2,951	2,980
Others	10	11	13	14	17	22	32	46	44	42	42	37	35	33	37	37	39	40	44	53
Total	93,088	100,077	111,064	124,557	132,245	144,991	157,518	171,913	156,912	173,499	188,914	191,707	199,297	203,400	210,036	212,369	215,823	224,040	229,663	232,007
Final Energy Consumption by Sector (ktoe)																				
Industry	19,262	21,764	22,949	25,209	27,569	28,906	30,968	30,885	27,749	30,914	38,108	38,125	38,727	38,521	39,584	38,610	39,746	40,931	41,531	38,892
Transport	14,573	16,320	18,135	20,449	21,608	24,257	25,623	26,214	21,968	24,213	26,266	27,387	29,196	29,825	30,081	29,187	29,228	30,222	28,853	29,302
Residential	12,942	11,175	10,092	8,938	8,512	9,635	10,537	10,966	10,083	13,162	15,036	15,920	17,604	17,948	17,283	18,411	18,789	18,453	18,796	18,641
Commercial	8,693	10,251	12,562	15,380	16,855	18,544	20,228	21,450	16,994	18,738	17,237	16,981	17,132	17,480	17,914	19,286	17,920	18,416	18,557	19,241
Others	9,438	12,489	17,606	19,310	21,918	23,342	24,355	29,081	29,772	30,970	30,465	31,097	32,737	33,957	33,601	34,966	35,997	38,733	38,622	41,361
Total	64,908	71,999	81,343	89,285	96,462	104,684	111,711	118,596	106,566	117,996	127,112	129,509	135,395	137,729	138,463	140,460	141,680	146,756	146,359	147,438

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Table 4.3.7 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Final Energy Consumption by Type (ktoe)																				
Coal	11,717	10,505	8,450	7,846	7,440	7,407	7,873	7,748	7,013	7,263	9,071	9,753	9,687	9,063	8,869	7,747	8,350	8,600	9,431	7,772
Oil	43,661	50,827	60,803	67,550	72,389	77,543	81,186	85,058	73,886	81,002	79,877	79,481	82,069	82,486	79,968	79,650	78,651	80,904	77,935	79,941
Gas	674	1,028	1,469	2,161	2,867	3,996	5,335	6,750	7,292	9,228	10,928	11,521	13,097	14,013	14,514	15,986	16,300	16,812	17,582	18,122
Electricity	8,117	8,976	9,911	10,985	12,602	14,041	15,692	17,267	16,638	18,422	22,628	24,215	25,868	27,353	29,063	30,756	31,936	33,642	34,365	34,890
Heat	0	0	0	0	467	767	839	848	762	1,023	3,292	3,241	3,336	3,259	4,343	4,497	4,405	4,590	4,722	4,437
Biomass	729	651	697	729	679	908	752	879	930	1,016	1,274	1,261	1,303	1,521	1,670	1,786	1,997	2,167	2,281	2,223
Others	10	11	13	14	17	22	32	46	44	42	42	37	35	33	37	37	39	40	44	53
Total	64,908	71,999	81,343	89,285	96,462	104,684	111,711	118,596	106,566	117,996	127,112	129,509	135,395	137,729	138,463	140,460	141,680	146,756	146,359	147,438
Power Generation (GWh)																				
Thermal	46,122	53,457	64,775	80,667	100,764	111,098	125,851	142,132	122,036	128,265	175,437	192,724	207,215	208,337	231,142	236,937	249,362	278,246	288,444	298,953
Hydro	6,361	5,051	4,863	6,006	4,098	5,478	5,201	5,403	6,099	6,066	5,610	5,972	5,311	6,903	5,880	5,189	5,219	5,042	5,563	5,641
Nuclear	52,887	56,311	56,530	58,138	58,651	67,029	73,924	77,086	89,689	103,064	108,964	112,133	119,103	129,672	130,715	146,779	148,749	142,937	150,958	147,771
Geothermal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Solar	1	1	2	2	2	2	3	3	4	5	5	6	7	8	10	15	31	70	285	566
Wind	0	0	0	1	1	0	0	1	2	6	17	13	15	25	47	130	239	376	436	685
Others	0	0	0	0	0	250	403	77	56	71	57	57	135	148	253	221	284	419	549	674
Total	105,371	114,820	126,170	144,814	163,516	183,857	205,382	224,702	217,886	237,477	290,090	310,905	331,786	345,093	368,047	389,271	403,884	427,090	446,235	454,290
Loss and Own Use of Electricity (GWh)																				
Transmission and Distribution Losses	3,633	2,734	2,530	8,192	7,472	8,850	10,504	10,945	12,554	10,068	12,451	12,090	13,904	11,032	12,794	13,728	14,587	15,345	16,106	16,770
Own Use	5,081	5,586	5,979	6,476	7,135	8,070	8,667	9,577	9,774	10,991	12,435	13,086	14,587	15,526	15,437	16,595	15,816	16,946	17,767	19,526
Total	8,714	8,320	8,509	14,668	14,607	16,920	19,171	20,522	22,328	21,059	24,886	25,176	28,491	26,558	28,231	30,323	30,403	32,291	33,873	36,296
Fuel Input for Power Generation (ktoe)																				
Coal	5,955	6,276	6,877	8,819	10,639	11,854	14,827	17,091	18,768	20,038	23,856	26,482	27,048	30,617	32,307	32,066	35,060	37,190	41,709	46,406
Oil	4,512	6,295	7,852	7,409	8,048	9,455	8,351	9,862	3,277	3,550	4,762	5,239	4,375	4,264	2,899	2,652	2,324	1,944	504	1,936
Gas	2,037	2,106	2,603	2,946	3,436	3,577	4,723	5,524	4,314	4,860	4,626	5,548	6,439	6,290	9,313	9,640	11,355	12,955	12,584	10,777
Total	12,504	14,677	17,333	19,175	22,123	24,887	27,901	32,477	26,360	28,447	33,243	37,270	37,863	41,170	44,518	44,357	48,739	52,089	54,797	59,120
CO_2 Emissions (kt C)																				
Coal	24,292	24,491	23,100	25,317	26,807	28,334	32,526	35,193	36,295	37,993	45,926	49,169	47,313	50,192	52,070	50,459	54,428	58,368	65,047	67,896
Oil	36,336	42,239	48,300	52,579	56,656	61,940	63,206	64,551	47,931	53,613	55,134	54,562	54,122	53,177	51,153	49,562	47,218	46,922	42,938	43,141
Gas	1,755	2,031	2,673	3,326	4,451	5,392	7,150	8,701	8,144	9,994	11,198	12,286	13,504	14,070	16,804	17,649	18,830	20,196	20,674	19,916
Total	62,383	68,760	74,072	81,223	87,914	95,666	102,883	108,446	92,370	101,600	112,258	116,017	114,939	117,439	120,028	117,671	120,476	125,487	128,659	130,953

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Table 4.3.7 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Macroeconomic Indicators																				
Population (thousand)	42,869	43,268	43,663	44,056	44,453	45,093	45,525	45,954	46,287	46,617	47,008	47,357	47,622	47,859	48,039	48,138	48,297	48,456	48,607	48,747
Urban Population, %	73.8	74.7	75.6	76.4	77.3	78.2	78.5	78.8	79.0	79.3	79.6	79.8	80.1	80.3	80.6	80.8	81.0	81.2	81.5	81.7
GDP (constant 2000 $ million)	295,602	323,368	342,368	363,368	394,387	430,549	460,681	482,107	449,061	491,661	533,384	554,578	594,230	610,885	639,102	664,392	698,799	734,479	751,360	753,760
GDP (current $ million)	263,777	308,185	329,886	362,136	423,434	517,118	557,644	516,283	345,432	445,399	533,384	504,586	575,929	643,762	721,975	844,863	951,773	1,049,236	931,402	834,060
GDP (constant 2005 PPP $ million)	487,962	533,798	565,162	599,828	651,032	710,725	760,466	795,835	741,285	811,605	880,480	915,466	980,921	1,008,414	1,054,993	1,096,741	1,153,538	1,212,435	1,240,302	1,244,265
GDP/capita (constant 2000 $)	6,895	7,474	7,841	8,248	8,872	9,548	10,119	10,491	9,702	10,547	11,347	11,711	12,478	12,764	13,304	13,802	14,469	15,158	15,458	15,463
GDP/capita (current $)	6,153	7,123	7,555	8,220	9,525	11,468	12,249	11,235	7,463	9,554	11,347	10,655	12,094	13,451	15,029	17,551	19,707	21,653	19,162	17,110
GDP – Manufacturing (% of GDP)	20.9	20.9	20.5	20.3	20.9	21.3	21.2	21.3	21.0	23.4	25.2	24.8	25.2	25.8	27.2	27.8	28.5	29.1	29.2	28.7
Car Ownership (car/1,000 persons)	79	98	120	142	167	188	210	227	226	239	257	273	293	305	311	320	329	339	346	355
Basic Energy Indicators																				
TPES/capita (toe/person)	2.17	2.31	2.54	2.83	2.97	3.22	3.46	3.74	3.39	3.72	4.02	4.05	4.18	4.25	4.37	4.41	4.47	4.62	4.72	4.76
TFEC/capita (toe/person)	1.51	1.66	1.86	2.03	2.17	2.32	2.45	2.58	2.30	2.53	2.70	2.73	2.84	2.88	2.88	2.92	2.93	3.03	3.01	3.02
TPES/GDP (toe/constant 2000 $ million)	315	309	324	343	335	337	342	357	349	353	354	346	335	333	329	320	309	305	306	308
TFEC/GDP (toe/constant 2000 $ million)	220	223	238	246	245	243	242	246	237	240	238	234	228	225	217	211	203	200	195	196
Import Dependency (%)	75.7	77.7	81.5	83.8	85.3	85.3	85.6	85.8	82.4	82.0	81.4	81.4	82.2	81.0	80.9	78.8	78.7	80.1	79.3	79.7
Oil Import Dependency (%)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.1	99.1	99.1	98.7	98.9	99.0	99.0	97.9	97.3	97.1	97.5	96.6	96.3
Electricity/capita (kWh/ person)	2,202	2,413	2,640	2,900	3,297	3,621	4,009	4,370	4,181	4,596	5,598	5,947	6,317	6,647	7,036	7,431	7,690	8,075	8,222	8,324
CO_2 Intensity (t C/constant 2000 $ million)	211	213	216	224	223	222	223	225	206	207	210	209	193	192	188	177	172	171	171	174
CO_2/capita (t C)	1.46	1.59	1.70	1.84	1.98	2.12	2.26	2.36	2.00	2.18	2.39	2.45	2.41	2.45	2.50	2.44	2.49	2.59	2.65	2.69
CO_2/TPES (t C/toe)	0.67	0.69	0.67	0.65	0.66	0.66	0.65	0.63	0.59	0.59	0.59	0.61	0.58	0.58	0.57	0.55	0.56	0.56	0.56	0.56

CO_2 = carbon dioxide, GDP = gross domestic product, GWh = gigawatt–hour, kt C = thousand tons of carbon equivalent, ktoe = thousand tons of oil equivalent, kWh = kilowatt–hour, PPP = purchasing power parity, t C = ton of carbon equivalent, TFEC = total final energy consumption, toe = ton of oil equivalent, TPES = total primary energy supply.

Note: Figures may not add up to total because of rounding.

Sources: APERC (APEC Energy Database), APERC estimates, JAMA (2012), and World Bank.

4.4 Mongolia

Country Profile (2009)		Energy Reserves (year-end 2008)	
Total Surface Area (square kilometer)	1,564,120	Coal (million ton) - Recoverable	2,520.0
Population (thousand)	2,712	Gas (trillion cubic feet) - Proven	–
GDP (billion constant 2000 $)	2.0	Oil (billion barrel) - Proven	15.0
Electrification Rate (%)	67.0		

– = no data or not applicable, GDP = gross domestic product.

Sources: ADB (2012), IEA (2011c), World Bank, and WEC (2010).

2009 Energy Supply and Demand Flow (ktoe)

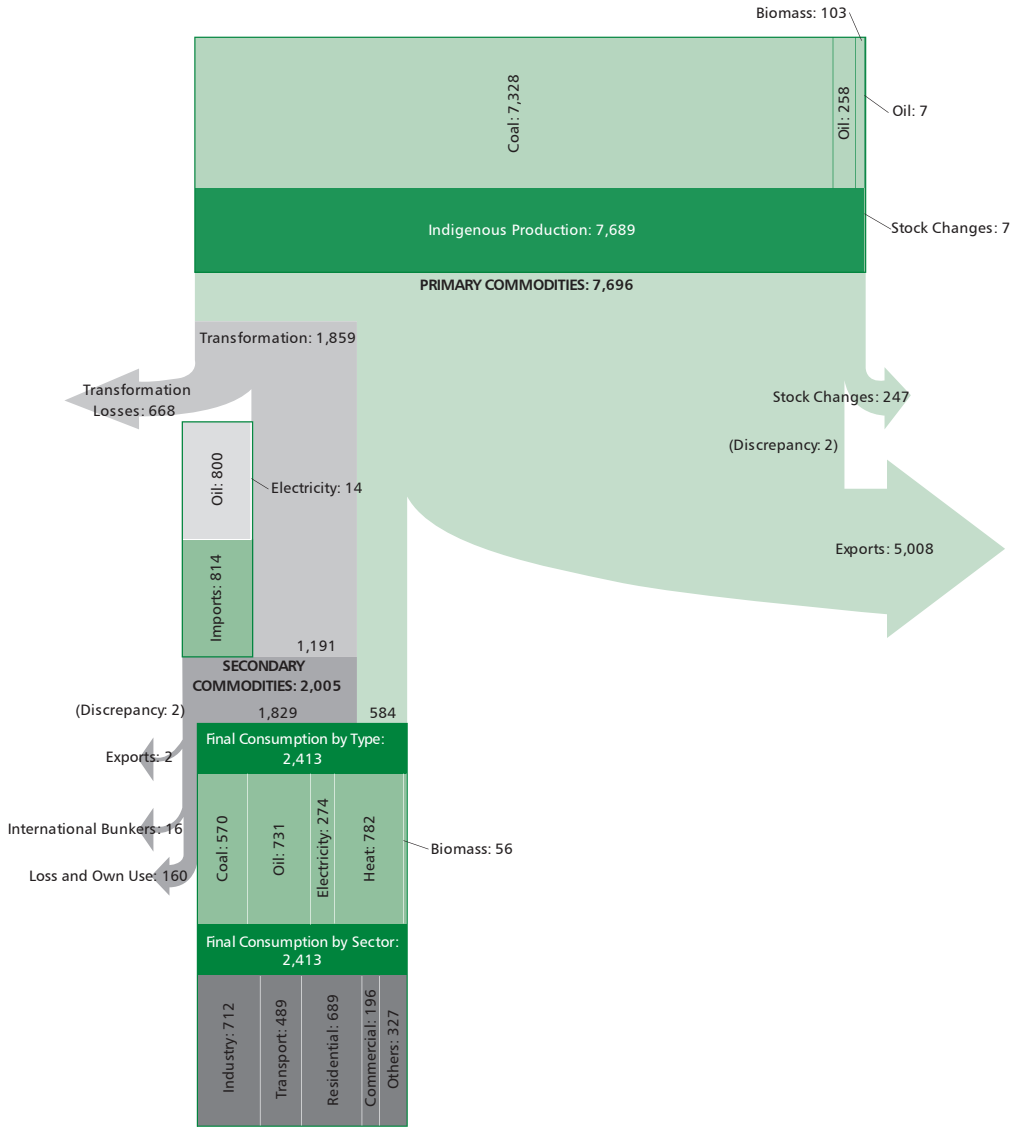


Table 4.4.1 Key Data and Economic Profile

	1990	1995	2000	2005	2009
Socioeconomic Data					
Population (thousand)	2,193	2,306	2,411	2,547	2,712
GDP (constant 2000 $ billion)	1.1	1.0	1.1	1.6	2.0
GDP (constant 2005 PPP $ billion)	5.3	4.7	5.3	7.3	9.4
GDP/capita (constant 2000 $)	520	431	471	611	739
GDP/capita (constant 2005 PPP $)	2,435	2,018	2,208	2,862	3,459

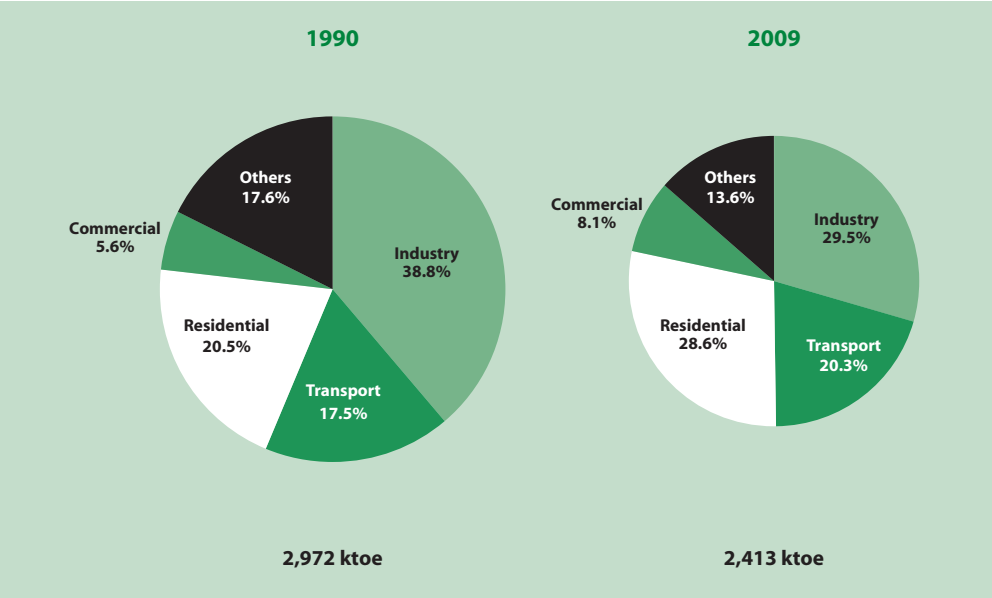
GDP = gross domestic product, PPP = purchasing power parity.
Sources: World Bank.

Table 4.4.2 Energy Supply and Demand

	1990	1995	2000	2005	2009
Primary Energy Supply (ktoe)					
Indigenous Production	2,748	2,256	1,917	3,420	7,689
Net Imports	667	449	448	-861	-4,452
Total PES	3,415	2,705	2,365	2,559	3,237
Coal	2,488	2,228	1,817	1,882	2,338
Oil	822	352	434	560	784
Gas	0	0	0	0	0
Biomass	85	92	100	103	103
Others	20	33	14	14	12
TPES/capita (toe)	1.56	1.17	0.98	1.00	1.19
TPES/GDP (toe/constant 2005 PPP $ million)	640	581	444	351	345
Final Energy Consumption (ktoe)					
Industry	1,153	836	472	549	712
Transportation	521	273	328	394	489
Other Sectors	1,298	802	706	875	1,212
Total FEC	2,972	1,911	1,506	1,818	2,413
Coal	1,002	676	286	294	570
Oil	720	306	401	524	731
Gas	0	0	0	0	0
Electricity	245	168	169	226	274
Biomass	52	54	55	56	56
Others	953	707	595	718	782

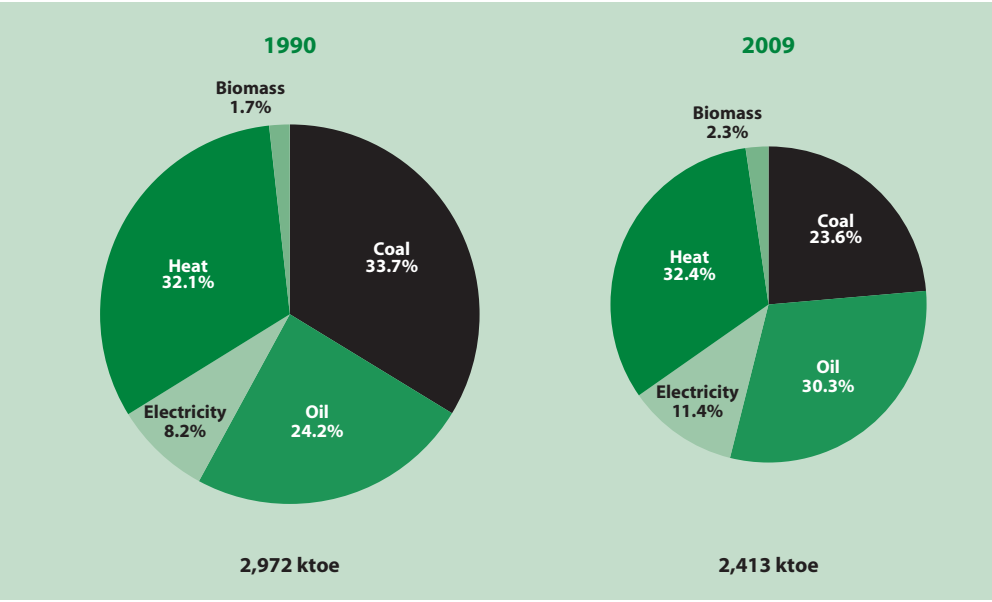
FEC = final energy consumption, GDP = gross domestic product, ktoe = thousand tons of oil equivalent, PES = primary energy supply, PPP = purchasing power parity, toe = ton of oil equivalent, TPES = total primary energy supply.
Source: IEA (2011b).

Figure 4.4.1 Final Energy Consumption by Sector, 1990 and 2009



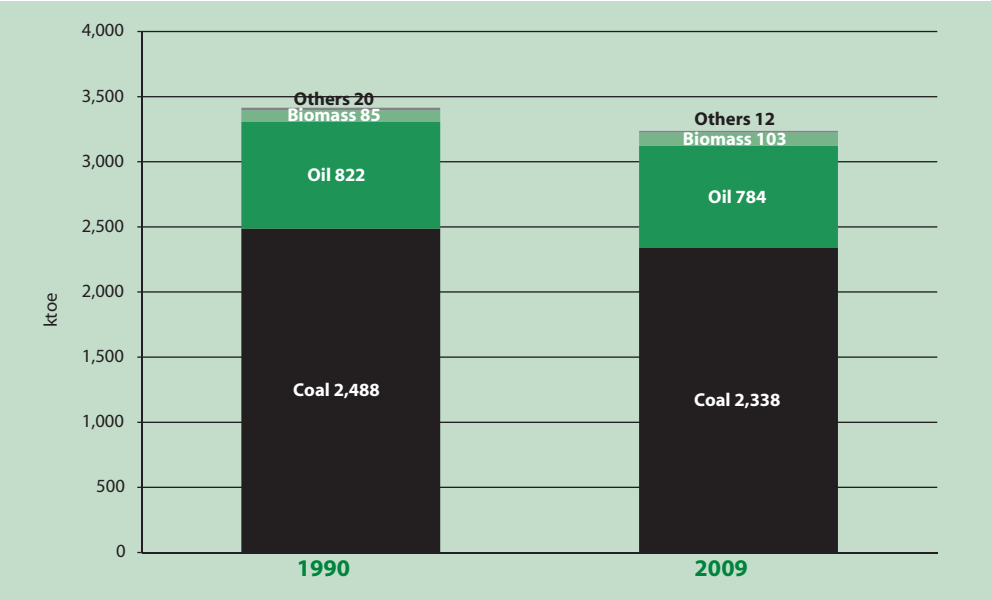
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 4.4.2 Final Energy Consumption by Type of Energy, 1990 and 2009



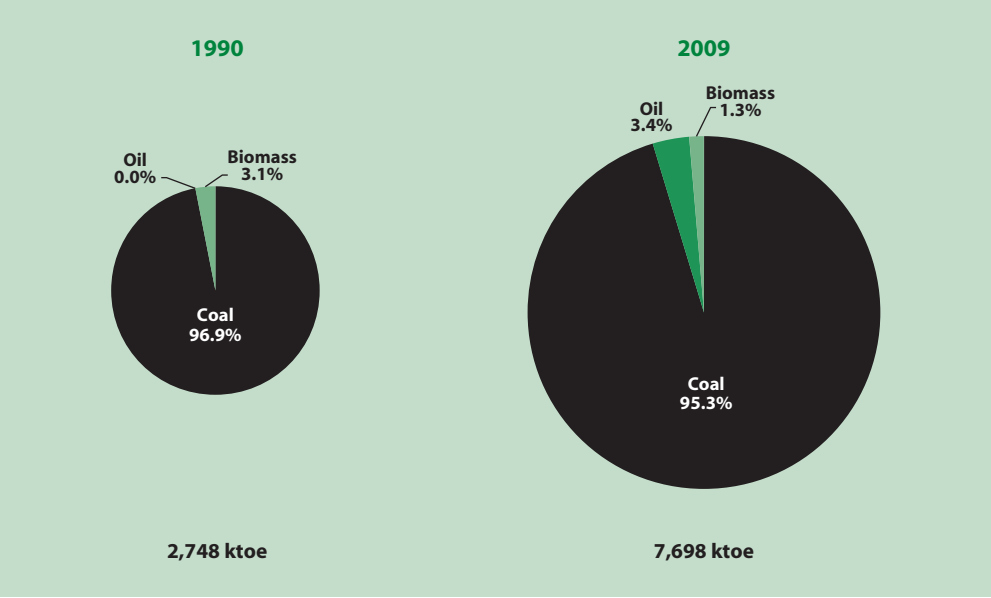
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 4.4.3 Total Primary Energy Supply, 1990 and 2009



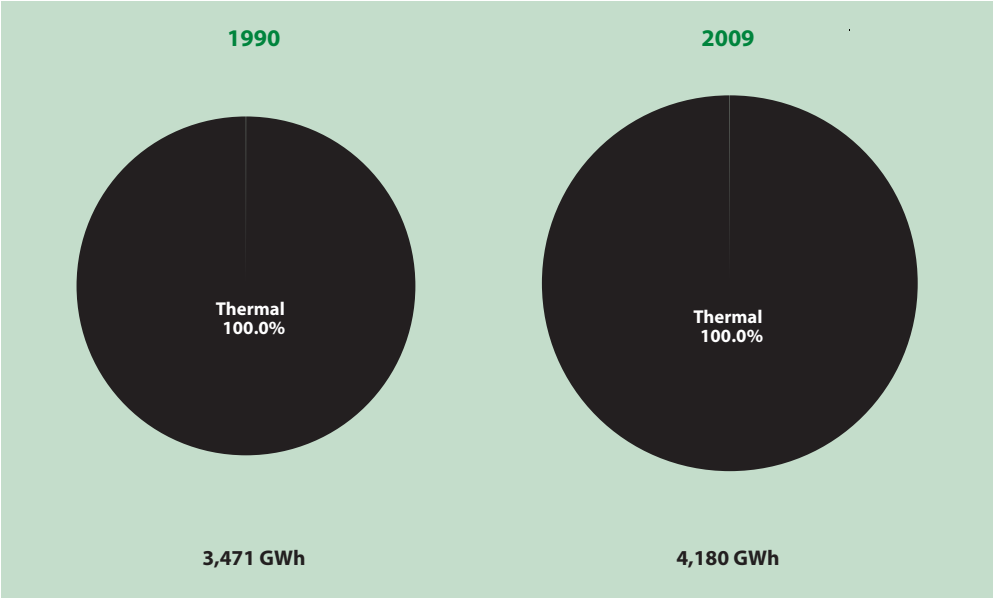
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 4.4.4 Indigenous Energy Production, 1990 and 2009



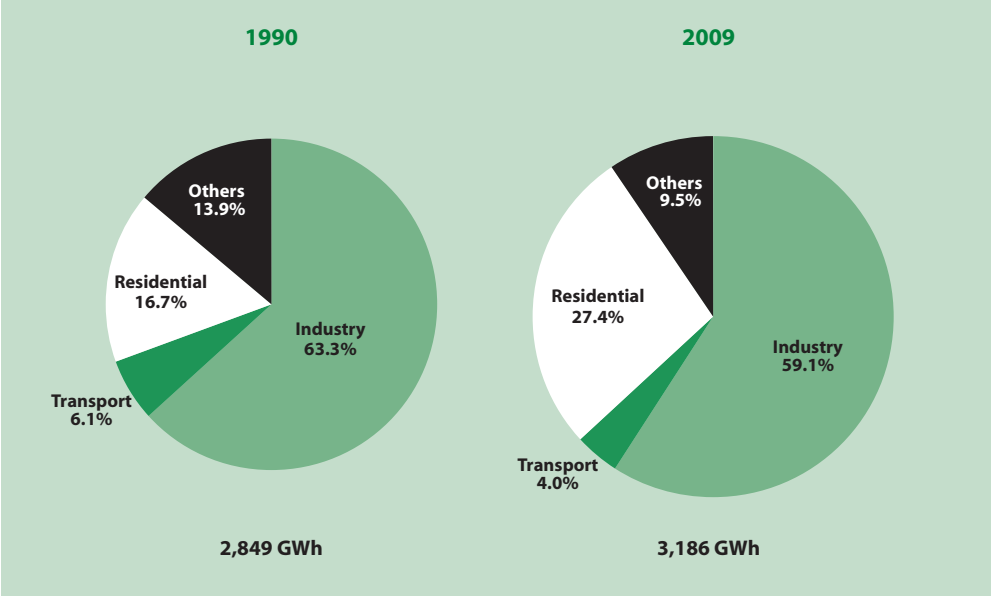
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 4.4.5 Electricity Generation by Plant Type, 1990 and 2009



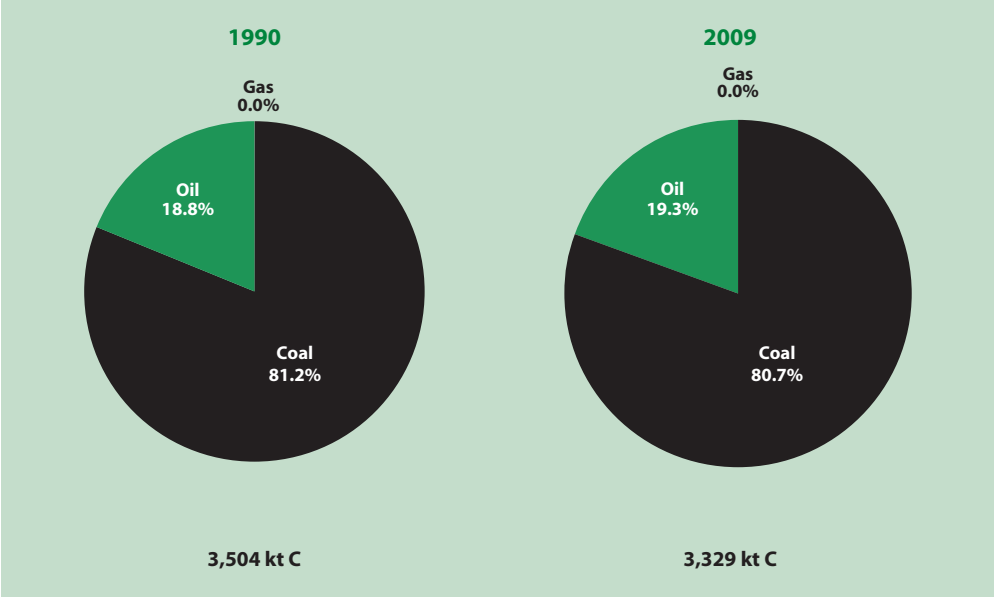
GWh = gigawatt-hour.
Source: IEA (2011b).

Figure 4.4.6 Electricity Consumption by Sector, 1990 and 2009



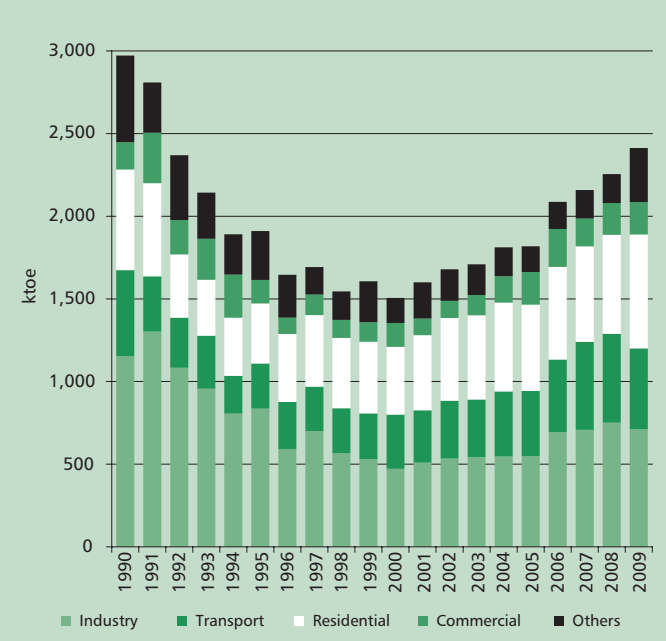
GWh = gigawatt-hour.
Sources: IEA (2011b).

Figure 4.4.7 Carbon Dioxide Emissions from Fuel Combustion, 1990 and 2009



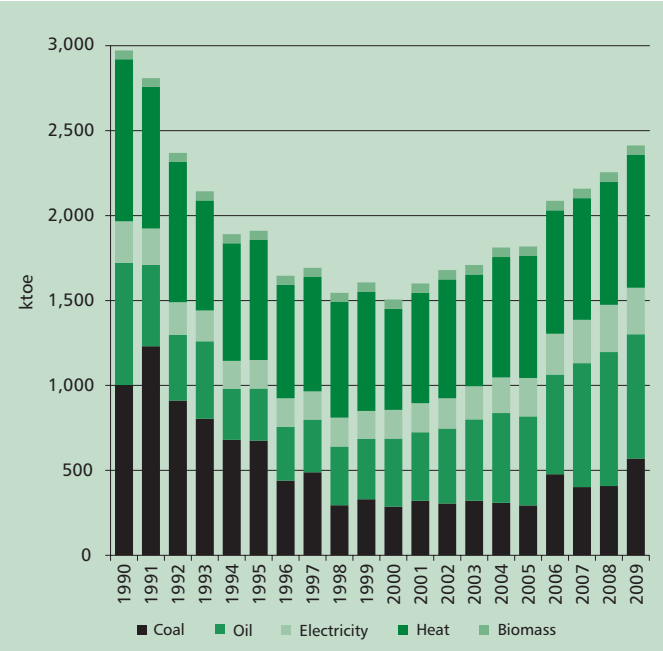
kt C = thousand tons of carbon equivalent.
Source: APERC estimates.

Figure 4.4.8 Final Energy Consumption by Sector, 1990–2009



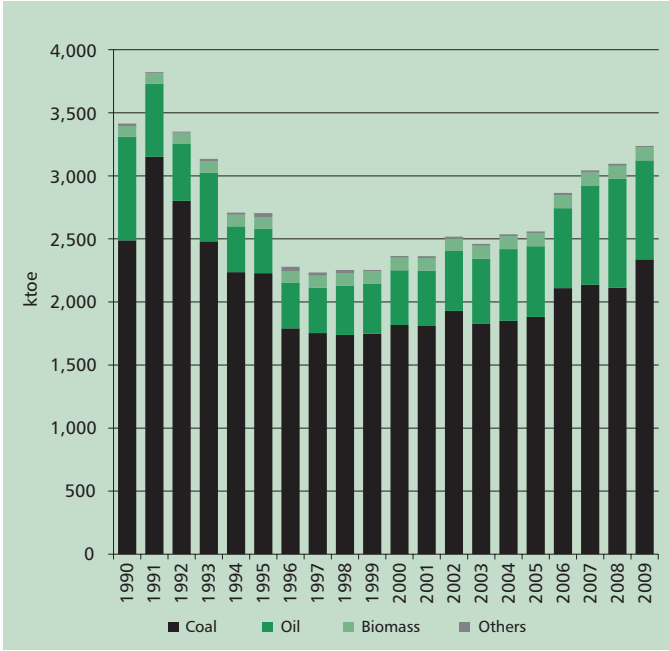
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 4.4.9 Final Energy Consumption by Type, 1990–2009



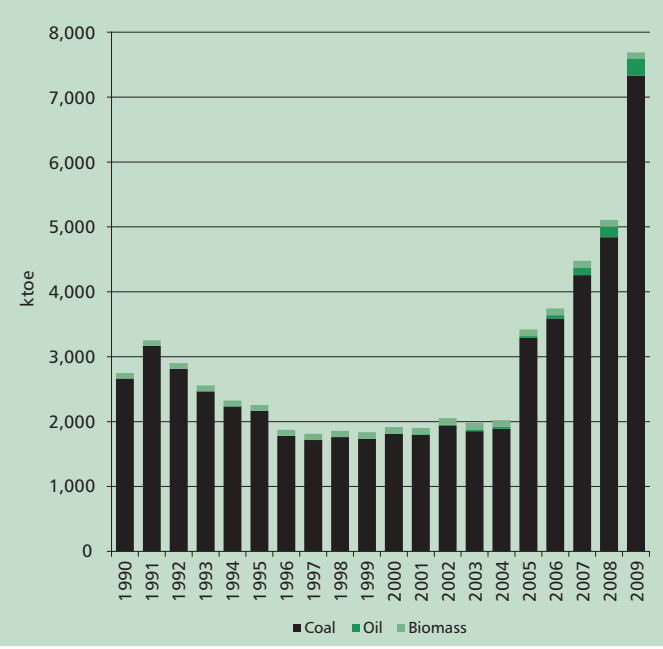
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 4.4.10 Total Primary Energy Supply, 1990–2009



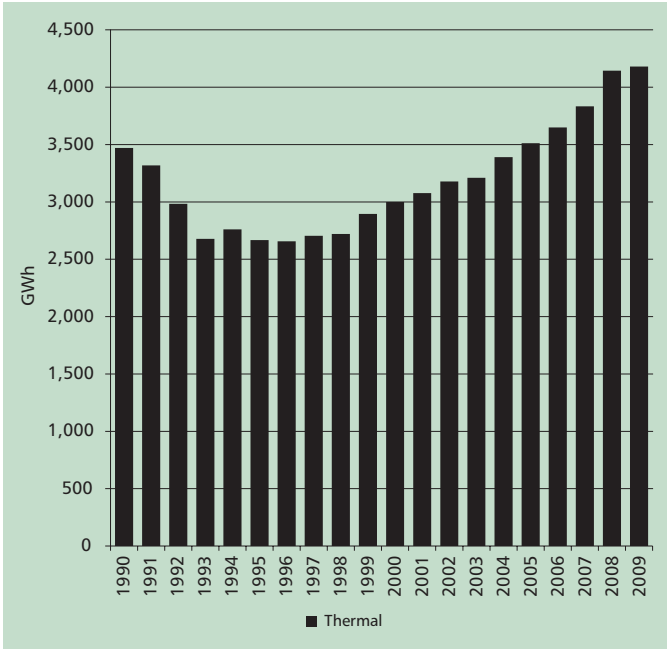
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 4.4.11 Indigenous Energy Production, 1990–2009



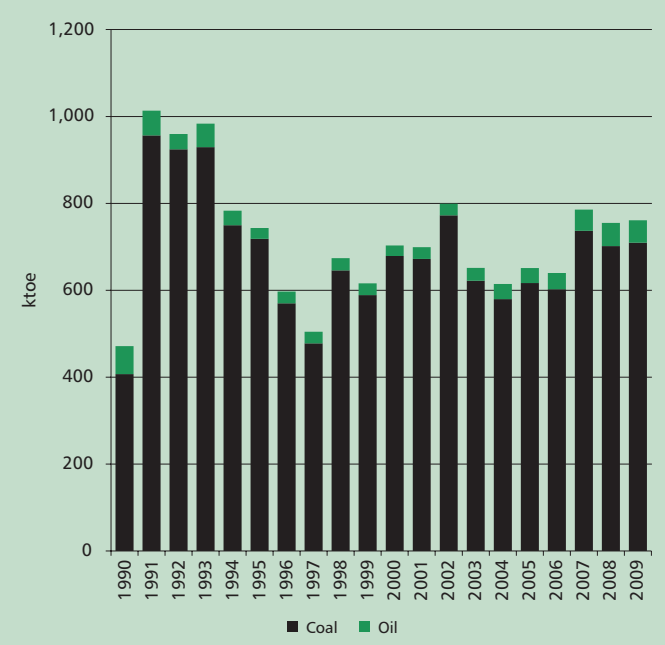
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 4.4.12 Electricity Generation by Source, 1990–2009



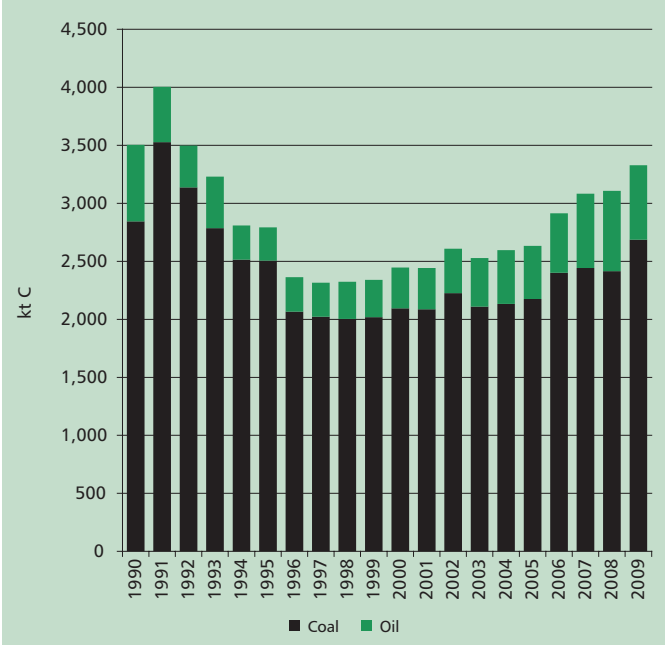
GWh = gigawatt-hour.
Source: IEA (2011b).

Figure 4.4.13 Fuel Input for Electricity Generation, 1990–2009



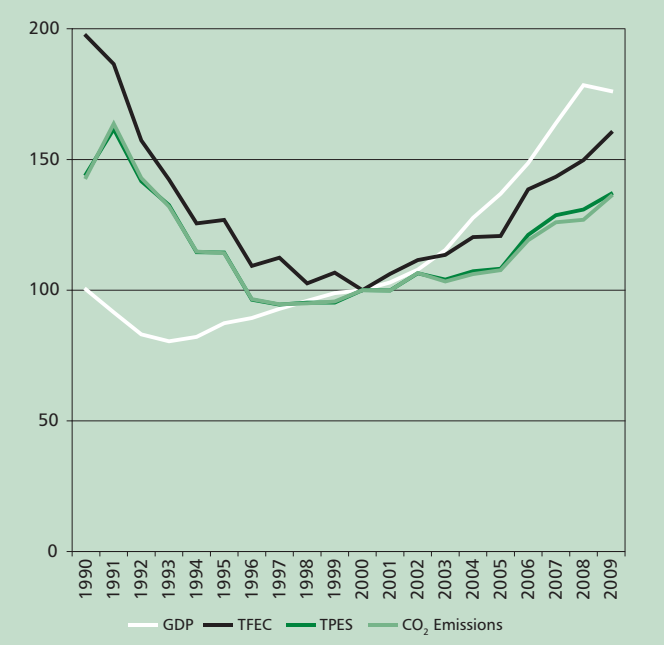
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 4.4.14 Carbon Dioxide Emissions from Fuel Combustion, 1990–2009



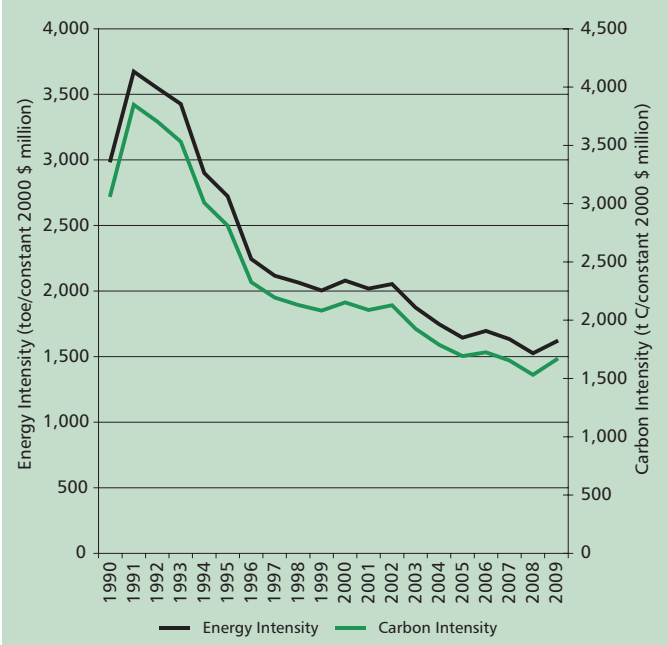
kt C = thousand tons of carbon equivalent.
Source: APERC estimates.

Figure 4.4.15 Growth of GDP, TFEC, TPES, and CO_2 Emissions (indexed to year 2000), 1990–2009



CO_2 = carbon dioxide, GDP = gross domestic product, TFEC = total final energy consumption, TPES = total primary energy supply.
Note: Indices are measured relative to the base year 2000 (2000 = 100).
Source: APERC estimates.

Figure 4.4.16 Energy and Carbon Intensities, 1990–2009



t C = ton of carbon equivalent, toe = ton of oil equivalent.
Source: APERC estimates.

Table 4.4.3 Mongolia Energy Balance Table, 2006

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	3,588	0	52	0	0	0	0	0	0	0	0	0	0	0	0	0	103	0	0	0	3,743
2.	Imports	0	0	0	671	300	0	321	4	0	46	0	0	0	0	0	0	0	0	21	0	692
3.	Exports	–1,503	0	–46	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–2	0	–1,551
4.	International Bunkers	0	0	0	–44	0	0	0	0	0	–44	0	0	0	0	0	0	0	0	0	0	–44
5.	Stock Changes	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25
6.	Total Primary Energy Supply	2,110	0	6	627	300	0	321	4	0	2	0	0	0	0	0	0	103	0	19	0	2,865
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	–1,735	129	0	–40	0	0	–36	–4	0	0	0	0	0	0	0	0	–47	0	314	785	–594
8.1	Power Generation	–1,581	0	0	–40	0	0	–36	–4	0	0	0	0	0	0	0	0	0	0	314	785	–522
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.4	Coal Transformation	–154	129	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–25
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–47	0	0	0	–47
9.	Loss and Own Use	0	–30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–92	–57	–179
10.	Discrepancy	3	0	–6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–1	–1	–5
11.	Total Final Energy Consumption	378	99	0	587	300	0	285	0	0	2	0	0	0	0	0	0	56	0	240	727	2,087
12.	Industry Sector	82	99	0	171	0	0	171	0	0	0	0	0	0	0	0	0	0	0	140	202	694
13.	Transport Sector	42	0	0	388	300	0	88	0	0	0	0	0	0	0	0	0	0	0	9	0	439
14.	Other Sectors	254	0	0	26	0	0	26	0	0	0	0	0	0	0	0	0	56	0	91	525	952
14.1	Residential and Commercial	189	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	40	0	69	492	790
14.1.1	Commerce and Public Services	72	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	157	229
14.1.2	Residential	117	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	40	0	69	335	561
14.2	Non-Specified Others	65	0	0	26	0	0	26	0	0	0	0	0	0	0	0	0	16	0	22	33	162
15.	Non-Energy Use	0	0	0	2	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	2
16.	Electricity Output (GWh)	3,535	0	0	114	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3,649
17.	Heat Output (TJ)	32,783	0	0	84	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	32,866

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.
Note: Figures may not add up to total because of rounding.
Source: IEA (2011b).

Table 4.4.4 Mongolia Energy Balance Table, 2007

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	4,257	0	117	0	0	0	0	0	0	0	0	0	0	0	0	0	103	0	0	0	4,477
2.	Imports	0	0	0	824	370	0	401	8	0	45	0	0	0	0	0	0	0	0	18	0	842
3.	Exports	–2,099	0	–112	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–1	0	–2,212
4.	International Bunkers	0	0	0	–42	0	0	0	0	0	–42	0	0	0	0	0	0	0	0	0	0	–42
5.	Stock Changes	–22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–22
6.	Total Primary Energy Supply	2,136	0	5	782	370	0	401	8	0	3	0	0	0	0	0	0	103	0	17	0	3,043
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	–1,802	87	0	–54	0	0	–46	–8	0	0	0	0	0	0	0	0	–47	0	329	772	–715
8.1	Power Generation	–1,698	0	0	–54	0	0	–46	–8	0	0	0	0	0	0	0	0	0	0	329	772	–651
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.4	Coal Transformation	–104	87	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–17
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–47	0	0	0	–47
9.	Loss and Own Use	0	–20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–91	–56	–167
10.	Discrepancy	1	0	–5	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	–2
11.	Total Final Energy Consumption	335	67	0	729	370	0	356	0	0	3	0	0	0	0	0	0	56	0	255	717	2,159
12.	Industry Sector	70	67	0	214	0	0	214	0	0	0	0	0	0	0	0	0	0	0	150	207	708
13.	Transport Sector	42	0	0	480	370	0	110	0	0	0	0	0	0	0	0	0	0	0	10	0	532
14.	Other Sectors	223	0	0	32	0	0	32	0	0	0	0	0	0	0	0	0	56	0	95	510	916
14.1	Residential and Commercial	157	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	40	0	72	477	746
14.1.1	Commerce and Public Services	28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	140	168
14.1.2	Residential	129	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	40	0	72	337	578
14.2	Non-Specified Others	66	0	0	32	0	0	32	0	0	0	0	0	0	0	0	0	16	0	23	33	170
15.	Non-Energy Use	0	0	0	3	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	3
16.	Electricity Output (GWh)	3,683	0	0	150	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3,833
17.	Heat Output (TJ)	32,196	0	0	167	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	32,364

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Source: IEA (2011b).

Table 4.4.5 Mongolia Energy Balance Table, 2008

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	4,842	0	162	0	0	0	0	0	0	0	0	0	0	0	0	0	103	0	0	0	5,107
2.	Imports	0	0	0	880	393	0	443	7	0	37	0	0	0	0	0	0	0	0	17	0	897
3.	Exports	–2,707	0	–146	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–1	0	–2,854
4.	International Bunkers	0	0	0	–34	0	0	0	0	0	–34	0	0	0	0	0	0	0	0	0	0	–34
5.	Stock Changes	–21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–21
6.	Total Primary Energy Supply	2,114	0	16	846	393	0	443	7	0	3	0	0	0	0	0	0	103	0	16	0	3,095
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	–1,772	87	0	–57	0	0	–50	–7	0	0	0	0	0	0	0	0	–47	0	356	776	–657
8.1	Power Generation	–1,668	0	0	–57	0	0	–50	–7	0	0	0	0	0	0	0	0	0	0	356	776	–593
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.4	Coal Transformation	–104	87	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–17
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–47	0	0	0	–47
9.	Loss and Own Use	0	–20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–93	–53	–166
10.	Discrepancy	–1	0	–16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–1	1	–17
11.	Total Final Energy Consumption	341	67	0	789	393	0	393	0	0	3	0	0	0	0	0	0	56	0	278	724	2,255
12.	Industry Sector	65	67	0	237	0	0	237	0	0	0	0	0	0	0	0	0	0	0	165	217	751
13.	Transport Sector	14	0	0	513	393	0	120	0	0	0	0	0	0	0	0	0	0	0	11	0	538
14.	Other Sectors	262	0	0	36	0	0	36	0	0	0	0	0	0	0	0	0	56	0	102	507	963
14.1	Residential and Commercial	200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	40	0	76	475	791
14.1.1	Commerce and Public Services	60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	132	192
14.1.2	Residential	140	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	40	0	76	343	599
14.2	Non-Specified Others	62	0	0	36	0	0	36	0	0	0	0	0	0	0	0	0	16	0	26	32	172
15.	Non-Energy Use	0	0	0	3	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	3
16.	Electricity Output (GWh)	3,985	0	0	160	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4,145
17.	Heat Output (TJ)	32,364	0	0	126	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	32,490

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.
Note: Figures may not add up to total because of rounding.
Source: IEA (2011b).

Table 4.4.6 Mongolia Energy Balance Table, 2009

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	7,328	0	258	0	0	0	0	0	0	0	0	0	0	0	0	0	103	0	0	0	7,689
2.	Imports	0	0	0	800	346	0	430	5	0	19	0	0	0	0	0	0	0	0	14	0	814
3.	Exports	–4,743	0	–265	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–2	0	–5,010
4.	International Bunkers	0	0	0	–16	0	0	0	0	0	–16	0	0	0	0	0	0	0	0	0	0	–16
5.	Stock Changes	–247	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–240
6.	Total Primary Energy Supply	2,338	0	0	784	346	0	430	5	0	3	0	0	0	0	0	0	103	0	12	0	3,237
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	–1,812	54	0	–54	0	0	–49	–5	0	0	0	0	0	0	0	0	–47	0	359	832	–668
8.1	Power Generation	–1,747	0	0	–54	0	0	–49	–5	0	0	0	0	0	0	0	0	0	0	359	832	–610
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.4	Coal Transformation	–65	54	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–11
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–47	0	0	0	–47
9.	Loss and Own Use	0	–12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–98	–50	–160
10.	Discrepancy	2	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	4
11.	Total Final Energy Consumption	528	42	0	731	346	0	382	0	0	3	0	0	0	0	0	0	56	0	274	782	2,413
12.	Industry Sector	78	42	0	230	0	0	230	0	0	0	0	0	0	0	0	0	0	0	162	200	712
13.	Transport Sector	14	0	0	464	346	0	118	0	0	0	0	0	0	0	0	0	0	0	11	0	489
14.	Other Sectors	436	0	0	34	0	0	34	0	0	0	0	0	0	0	0	0	56	0	101	582	1,209
14.1	Residential and Commercial	218	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	40	0	75	552	885
14.1.1	Commerce and Public Services	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	195	196
14.1.2	Residential	217	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	40	0	75	357	689
14.2	Non-Specified Others	218	0	0	34	0	0	34	0	0	0	0	0	0	0	0	0	16	0	26	30	324
15.	Non-Energy Use	0	0	0	3	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	3
16.	Electricity Output (GWh)	4,028	0	0	152	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4,180
17.	Heat Output (TJ)	34,750	0	0	84	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	34,834

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Source: IEA (2011b).

Table 4.4.7 Mongolia Summary Table, 1990–2009

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Indigenous Production (ktoe)																				
Coal	2,663	3,167	2,813	2,465	2,233	2,164	1,780	1,715	1,762	1,731	1,808	1,793	1,933	1,853	1,890	3,290	3,588	4,257	4,842	7,328
Oil	0	0	0	0	0	0	0	0	0	10	9	10	19	25	30	27	52	117	162	258
Gas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hydro	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Geothermal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Solar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wind	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Biomass	85	85	89	92	92	92	92	96	96	96	100	100	100	103	103	103	103	103	103	103
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	2,748	3,252	2,902	2,557	2,325	2,256	1,872	1,811	1,858	1,837	1,917	1,903	2,052	1,981	2,023	3,420	3,743	4,477	5,107	7,689
Primary Energy Supply (ktoe)																				
Coal	2,488	3,151	2,804	2,481	2,236	2,228	1,790	1,753	1,738	1,749	1,817	1,809	1,930	1,829	1,850	1,882	2,110	2,136	2,114	2,338
Oil	822	580	449	544	363	352	364	359	392	396	434	439	475	514	569	560	633	787	862	784
Gas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hydro	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Geothermal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Solar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wind	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Biomass	85	85	89	92	92	92	92	96	96	96	100	100	100	103	103	103	103	103	103	103
Others	20	7	9	17	18	33	33	26	27	12	14	15	13	14	14	14	19	17	16	12
Total	3,415	3,823	3,351	3,134	2,709	2,705	2,279	2,234	2,253	2,253	2,365	2,363	2,518	2,460	2,536	2,559	2,865	3,043	3,095	3,237
Final Energy Consumption by Sector (ktoe)																				
Industry	1,153	1,302	1,083	957	806	836	591	701	567	530	472	510	534	544	547	549	694	708	751	712
Transport	521	335	303	321	229	273	286	268	272	277	328	316	350	347	393	394	439	532	538	489
Residential	609	563	383	338	351	364	411	433	425	434	410	455	500	510	538	522	561	578	599	689
Commercial	165	305	208	248	261	142	98	125	109	119	144	100	104	122	160	198	229	168	192	196
Others	524	304	392	279	244	296	260	166	172	247	152	219	191	186	174	155	164	173	175	327
Total	2,972	2,809	2,369	2,143	1,891	1,911	1,646	1,693	1,545	1,607	1,506	1,600	1,679	1,709	1,812	1,818	2,087	2,159	2,255	2,413

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Table 4.4.7 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Final Energy Consumption by Type (ktoe)																				
Coal	1,002	1,231	911	804	680	676	440	489	295	330	286	322	305	322	309	294	477	402	408	570
Oil	720	479	386	456	301	306	316	310	345	355	401	402	441	478	528	524	587	729	789	731
Gas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Electricity	245	214	193	181	164	168	169	166	170	165	169	172	179	195	210	226	240	255	278	274
Heat	953	833	826	648	692	707	667	674	681	703	595	649	699	658	709	718	727	717	724	782
Biomass	52	52	53	54	54	54	54	54	54	54	55	55	55	56	56	56	56	56	56	56
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	2,972	2,809	2,369	2,143	1,891	1,911	1,646	1,693	1,545	1,607	1,506	1,600	1,679	1,709	1,812	1,818	2,087	2,159	2,255	2,413
Power Generation (GWh)																				
Thermal	3,471	3,319	2,983	2,678	2,760	2,667	2,656	2,704	2,720	2,896	3,000	3,077	3,178	3,210	3,390	3,512	3,649	3,833	4,145	4,180
Hydro	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Geothermal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Solar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wind	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	3,471	3,319	2,983	2,678	2,760	2,667	2,656	2,704	2,720	2,896	3,000	3,077	3,178	3,210	3,390	3,512	3,649	3,833	4,145	4,180
Loss and Own Use of Electricity (GWh)																				
Transmission and Distribution Losses	326	337	291	291	477	500	477	488	465	512	581	605	581	488	477	419	442	442	430	488
Own Use	535	570	570	477	593	593	581	593	593	605	616	640	651	616	628	616	628	616	651	651
Total	860	907	860	767	1,070	1,093	1,058	1,081	1,058	1,116	1,198	1,244	1,233	1,105	1,105	1,035	1,070	1,058	1,081	1,140
Fuel Input for Power Generation (ktoe)																				
Coal	407	956	924	929	750	718	570	478	646	589	679	672	773	622	580	617	602	737	702	710
Oil	65	57	36	54	33	25	27	27	28	27	24	27	27	30	35	35	38	49	53	52
Gas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	472	1,014	960	984	783	743	597	505	674	616	703	699	799	652	615	651	640	786	755	761
CO_2 Emissions (kt C)																				
Coal	2,844	3,528	3,138	2,786	2,514	2,507	2,066	2,023	2,004	2,019	2,095	2,087	2,226	2,110	2,133	2,176	2,402	2,443	2,415	2,686
Oil	660	477	359	444	295	286	297	293	320	322	352	356	382	418	464	458	512	640	692	643
Gas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	3,504	4,005	3,497	3,230	2,809	2,793	2,363	2,315	2,324	2,341	2,447	2,443	2,608	2,528	2,597	2,634	2,915	3,083	3,107	3,329

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Table 4.4.7 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Macroeconomic Indicators																				
Population (thousand)	2,193	2,226	2,252	2,271	2,288	2,306	2,325	2,346	2,367	2,389	2,411	2,435	2,459	2,485	2,514	2,547	2,584	2,625	2,667	2,712
Urban Population, %	57.0	57.0	56.9	56.9	56.8	56.8	56.8	56.7	56.7	56.6	56.6	56.6	56.6	56.7	56.7	56.7	56.9	57.0	57.2	57.3
GDP (constant 2000 $ million)	1,140	1,041	944	914	934	994	1,016	1,055	1,091	1,124	1,137	1,170	1,226	1,312	1,451	1,556	1,690	1,863	2,028	2,003
GDP (current $ million)	2,561	2,379	1,318	768	926	1,452	1,346	1,181	1,124	1,057	1,137	1,268	1,397	1,595	1,992	2,523	3,396	4,235	5,623	4,584
GDP (constant 2005 PPP $ million)	5,338	4,874	4,423	4,283	4,374	4,653	4,757	4,943	5,108	5,265	5,325	5,482	5,742	6,144	6,797	7,290	7,913	8,724	9,501	9,380
GDP/capita (constant 2000 $)	520	467	419	403	408	431	437	450	461	471	471	481	499	528	577	611	654	710	760	739
GDP/capita (current $)	1,168	1,069	585	338	405	630	579	503	475	443	471	521	568	642	792	991	1,314	1,614	2,108	1,690
GDP – Manufacturing (% of GDP)	10.3	9.8	10.0	9.5	9.0	11.2	9.2	7.7	7.6	7.0	6.7	8.9	10.6	11.4	10.0	7.5	7.8	9.0	8.5	7.8
Car Ownership (car/1,000 persons)	21	21	20	19	21	24	28	30	30	32	34	37	42	42	42	42	41	41	40	40
Basic Energy Indicators																				
TPES/capita (toe/person)	1.56	1.72	1.49	1.38	1.18	1.17	0.98	0.95	0.95	0.94	0.98	0.97	1.02	0.99	1.01	1.00	1.11	1.16	1.16	1.19
TFEC/capita (toe/person)	1.36	1.26	1.05	0.94	0.83	0.83	0.71	0.72	0.65	0.67	0.62	0.66	0.68	0.69	0.72	0.71	0.81	0.82	0.85	0.89
TPES/GDP (toe/constant 2000 $ million)	2,996	3,674	3,548	3,427	2,901	2,723	2,244	2,117	2,066	2,004	2,080	2,019	2,054	1,875	1,748	1,644	1,696	1,634	1,526	1,616
TFEC/GDP (toe/constant 2000 $ million)	2,608	2,699	2,509	2,344	2,025	1,924	1,621	1,604	1,417	1,430	1,325	1,367	1,370	1,303	1,249	1,168	1,235	1,159	1,112	1,205
Import Dependency (%)	19.5	14.9	13.4	18.4	14.2	16.6	17.9	18.9	17.5	18.5	18.9	19.5	18.5	19.5	20.2	–33.6	–30.6	–47.1	–65.0	–137.5
Oil Import Dependency (%)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	97.5	97.9	97.7	96.0	95.1	94.7	95.2	91.8	85.1	81.2	67.1
Electricity/capita (kWh/ person)	1,300	1,118	997	927	833	847	845	823	835	803	815	822	847	913	971	1,032	1,080	1,130	1,212	1,175
CO_2 Intensity (t C/constant 2000 $ million)	3,075	3,848	3,703	3,532	3,008	2,812	2,327	2,194	2,131	2,082	2,152	2,087	2,128	1,927	1,790	1,692	1,725	1,655	1,532	1,662
CO_2/capita (t C)	1.60	1.80	1.55	1.42	1.23	1.21	1.02	0.99	0.98	0.98	1.01	1.00	1.06	1.02	1.03	1.03	1.13	1.17	1.16	1.23
CO_2/TPES (t C/toe)	1.03	1.05	1.04	1.03	1.04	1.03	1.04	1.04	1.03	1.04	1.03	1.03	1.04	1.03	1.02	1.03	1.02	1.01	1.00	1.03

CO_2 = carbond dioxide, GDP = gross domestic product, GWh = gigawatt–hour, kt C = thousand tons of carbon equivalent, ktoe = thousand tons of oil equivalent, kWh = kilowatt–hour, PPP = purchasing power parity, t C = ton of carbon equivalent, TFEC = total final energy consumption, toe = ton of oil equivalent, TPES = total primary energy supply.

Note: Figures may not add up to total because of rounding.

Sources: APERC estimates, IEA (2011b), JAMA (2012), and World Bank.

4.5 Taipei,China

Economy Profile (2009)		Energy Reserves (year-end 2008)	
Total Surface Area (square kilometer)	36,191	Coal (million ton) - Recoverable	1.0
Population (thousand)	23,078	Gas (trillion cubic feet) - Proven	2.5
GDP (billion constant 2000 $)	391.2	Oil (billion barrel) - Proven	2.0
Electrification Rate (%)	99.0		

GDP = gross domestic product.

Sources: ADB (2012), IEA (2011c), [Taipei,China] Council for Economic Planning and Development (2011), and WEC (2010).

2009 Energy Supply and Demand Flow (ktoe)

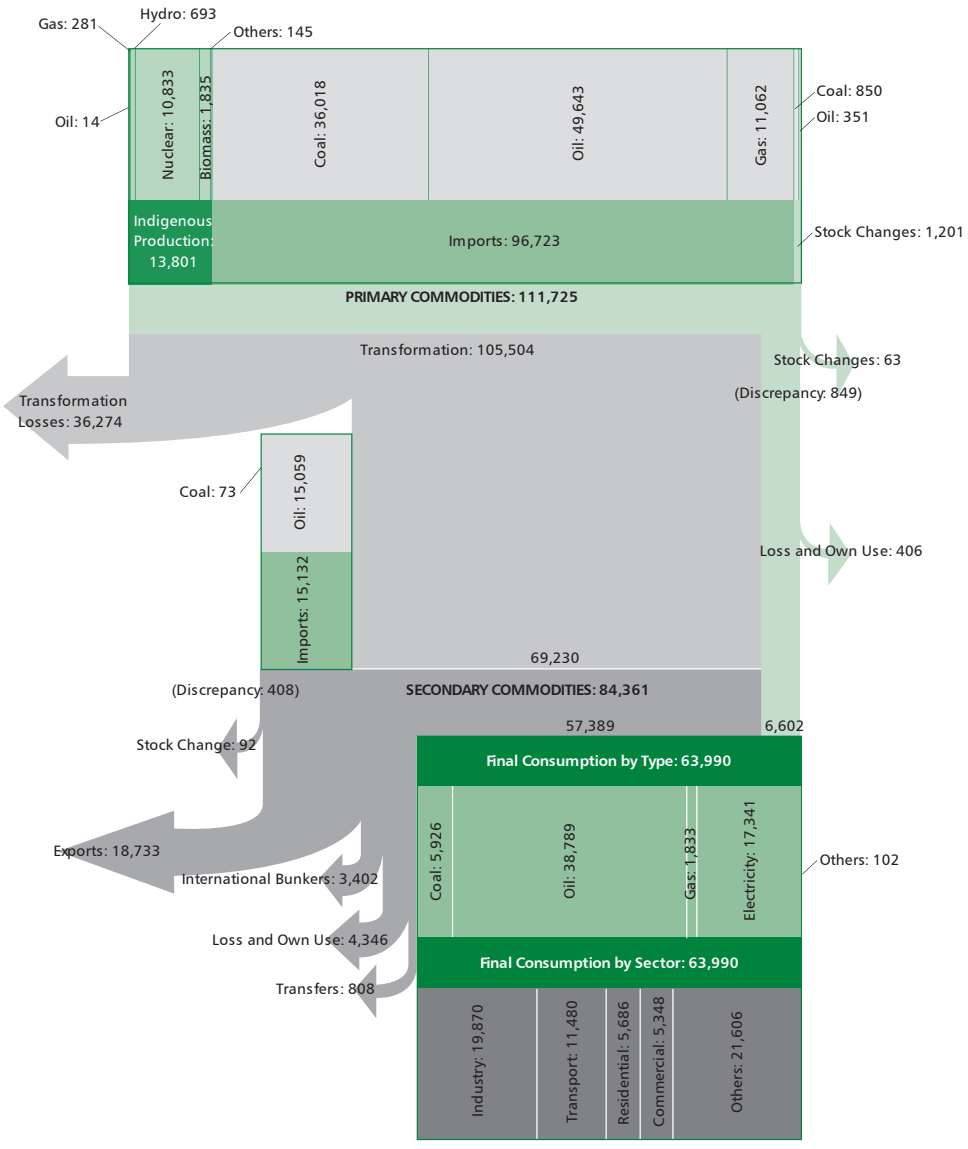


Table 4.5.1 Key Data and Economic Profile

	1990	1995	2000	2005	2009
Socioeconomic Data					
Population (thousand)	20,197	21,267	22,184	22,730	23,078
GDP (constant 2000 $ billion)	161.8	229.5	304.1	356.2	391.2
GDP (constant 2005 PPP $ billion)	250.3	354.8	458.1	546.7	603.5
GDP/capita (constant 2000 $)	8,013	10,792	13,707	15,672	16,951
GDP/capita (constant 2005 PPP $)	12,392	16,682	20,650	24,051	26,149

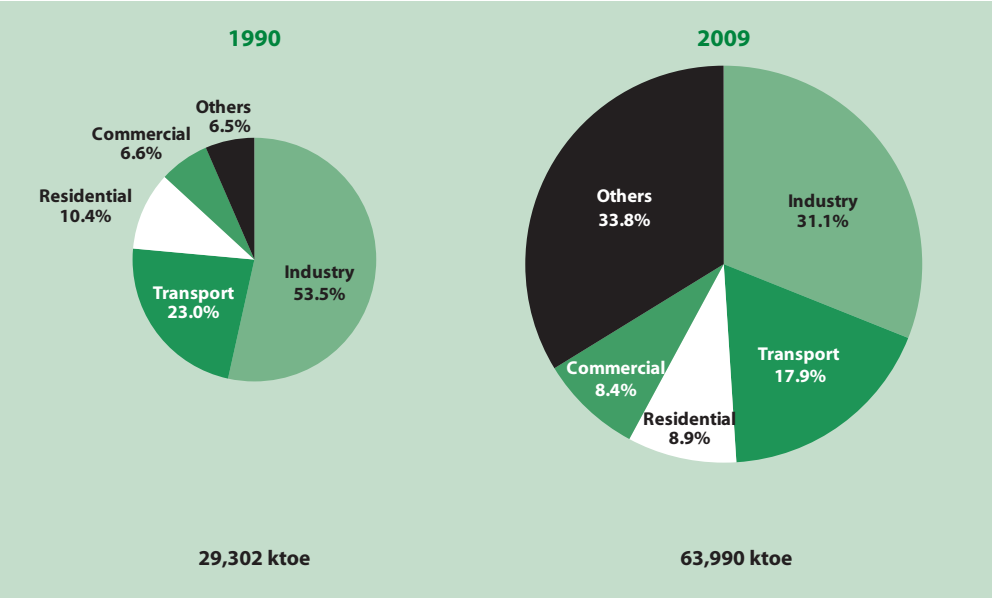
GDP = gross domestic product, PPP = purchasing power parity.
Source: [Taipei,China] Council for Economic Planning and Development (2011).

Table 4.5.2 Energy Supply and Demand

	1990	1995	2000	2005	2009
Primary Energy Supply (ktoe)					
Indigenous Production	10,748	10,913	11,476	13,152	13,801
Net Imports	34,729	50,258	67,506	91,442	90,767
Total PES	45,477	61,171	78,981	104,593	104,568
Coal	10,562	16,041	27,493	39,183	36,916
Oil	23,918	31,521	35,095	42,299	42,865
Gas	1,728	3,642	5,596	10,476	11,280
Biomass	0	0	0	1,443	1,835
Others	9,269	9,967	10,797	11,193	11,671
TPES/capita (toe)	2.25	2.88	3.56	4.60	4.53
TPES/GDP (toe/constant 2005 PPP $ million)	182	172	172	191	173
Final Energy Consumption (ktoe)					
Industry	15,667	19,946	29,393	23,738	19,870
Transportation	6,735	9,394	12,165	12,657	11,480
Other Sectors	6,899	8,422	12,000	25,812	32,640
Total FEC	29,302	37,761	53,558	62,206	63,990
Coal	5,903	7,881	8,391	6,706	5,926
Oil	16,106	19,301	29,907	36,692	38,789
Gas	926	1,534	1,490	1,986	1,833
Electricity	6,367	9,045	13,770	16,734	17,341
Biomass	0	0	0	0	0
Others	0	0	0	88	102

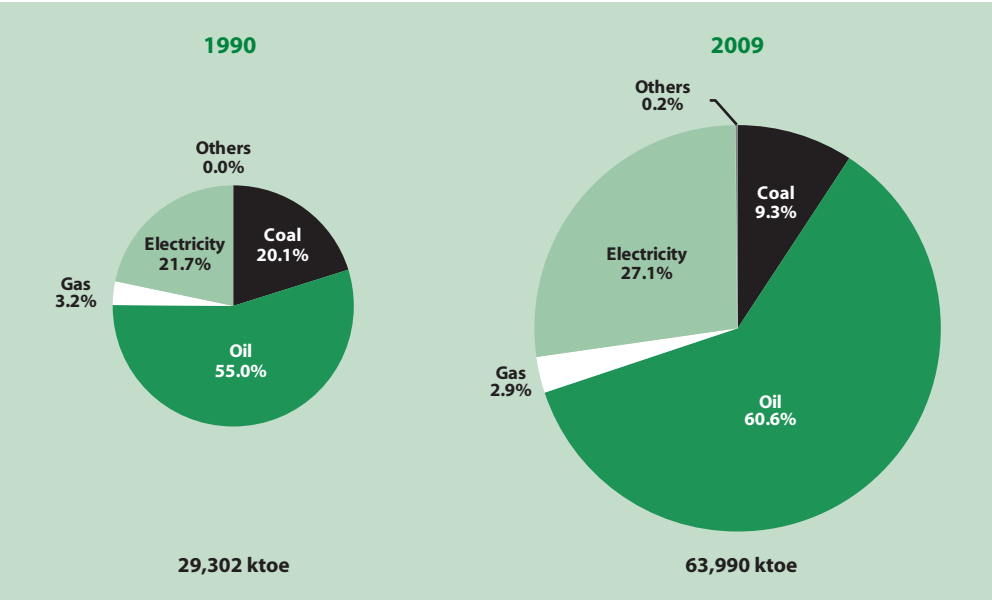
FEC = final energy consumption, GDP = gross domestic product, ktoe = thousand tons of oil equivalent, PES = primary energy supply, PPP = purchasing power parity, toe = ton of oil equivalent, TPES = total primary energy supply.
Source: APERC (APEC Energy Database).

Figure 4.5.1 Final Energy Consumption by Sector, 1990 and 2009



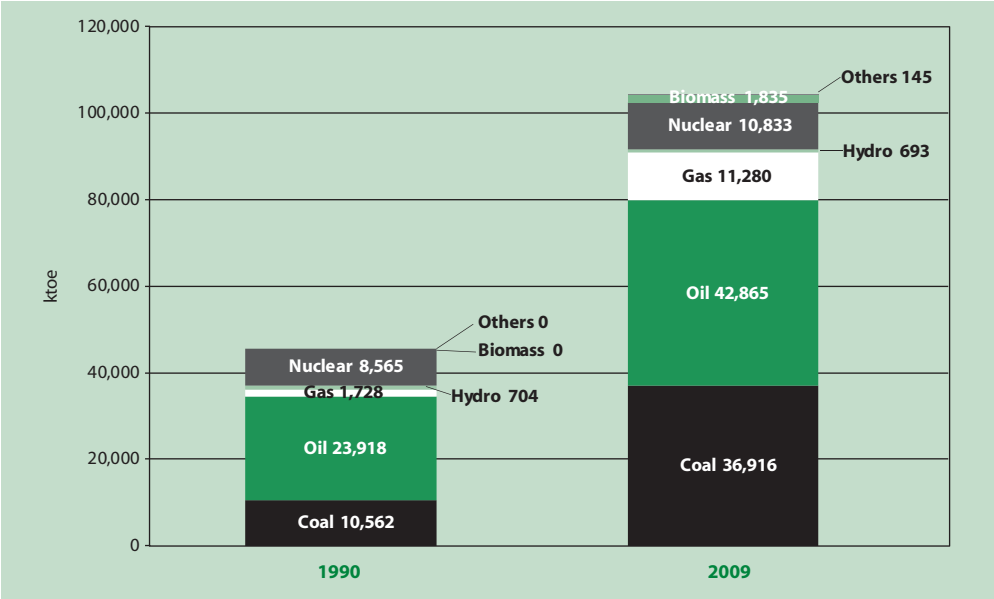
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 4.5.2 Final Energy Consumption by Type of Energy, 1990 and 2009



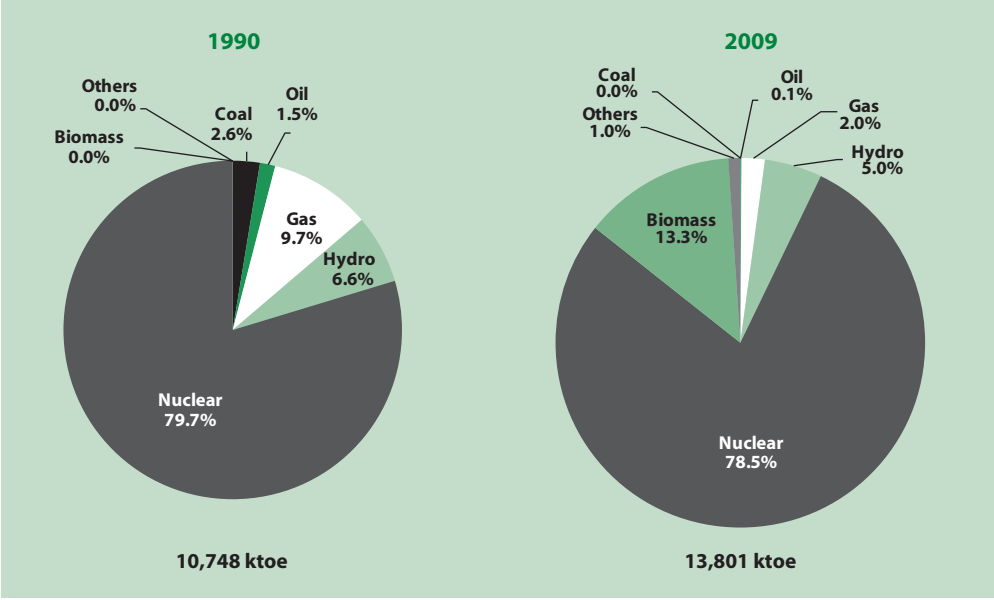
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 4.5.3 Total Primary Energy Supply, 1990 and 2009



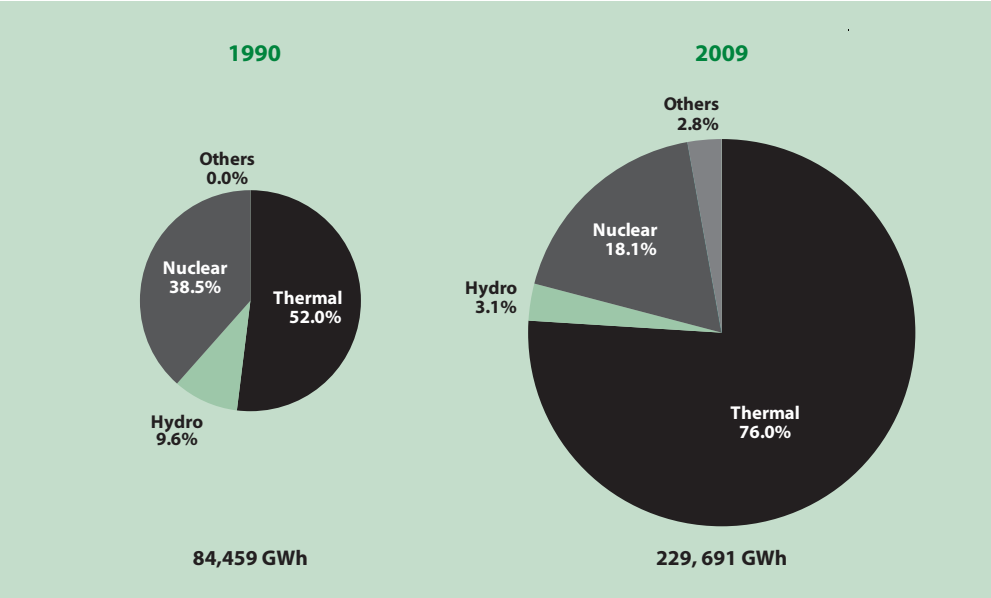
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 4.5.4 Indigenous Energy Production, 1990 and 2009



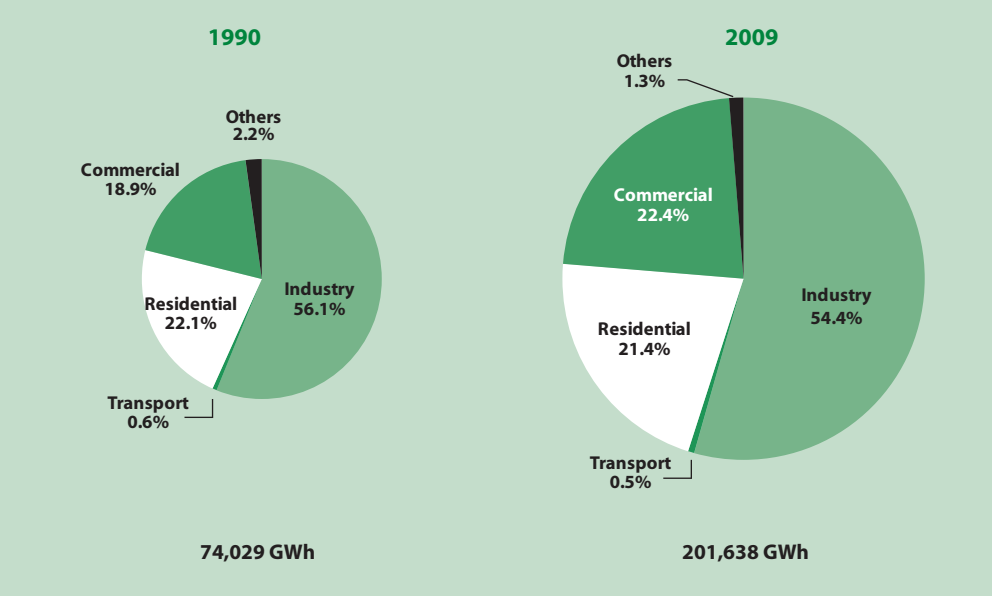
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 4.5.5 Electricity Generation by Plant Type, 1990 and 2009



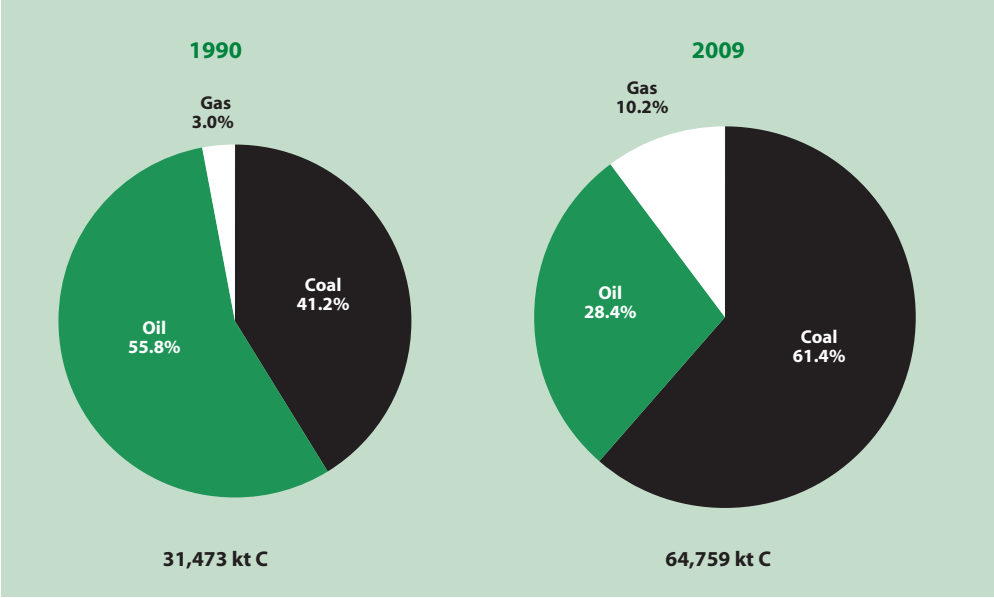
GWh = gigawatt-hour.
Source: APERC (APEC Energy Database).

Figure 4.5.6 Electricity Consumption by Sector, 1990 and 2009



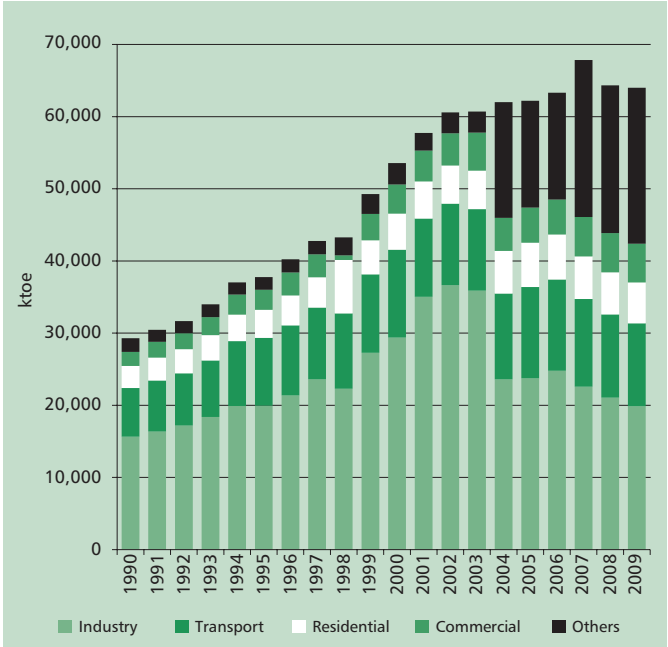
GWh = gigawatt-hour.
Source: APERC (APEC Energy Database).

Figure 4.5.7 Carbon Dioxide Emissions from Fuel Combustion, 1990 and 2009



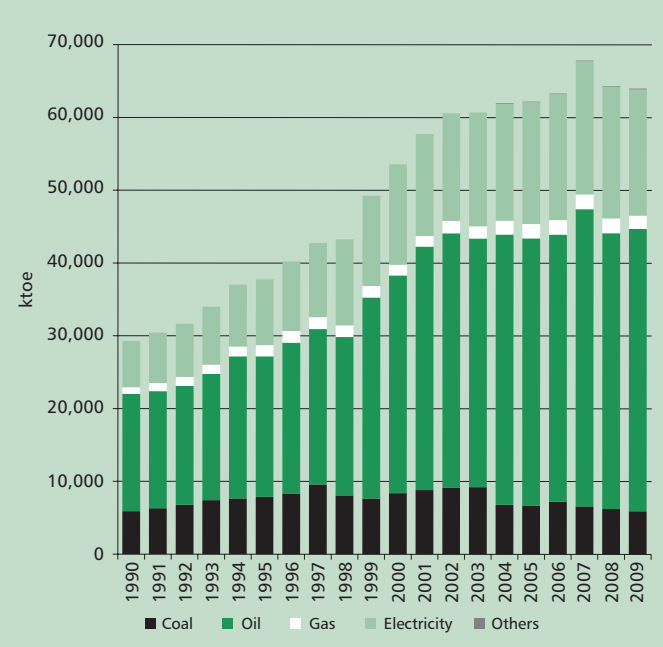
kt C = thousand tons of carbon equivalent.
Source: APERC estimates.

Figure 4.5.8 Final Energy Consumption by Sector, 1990–2009



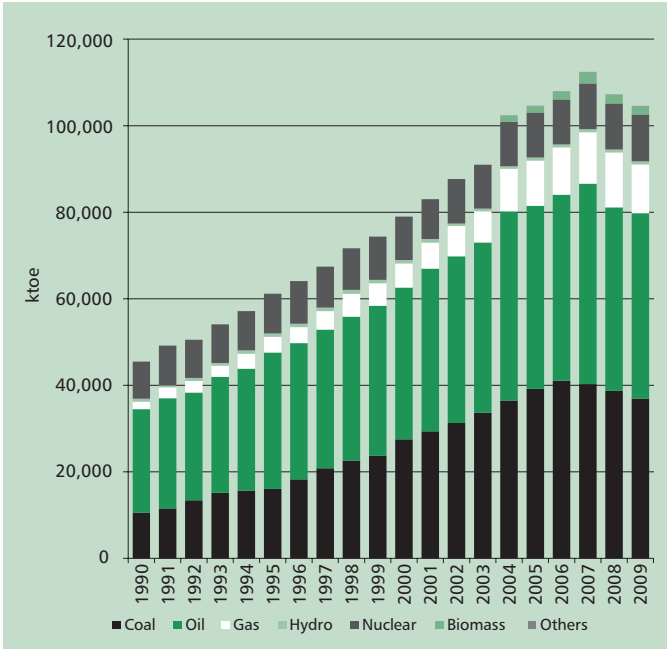
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 4.5.9 Final Energy Consumption by Type, 1990–2009



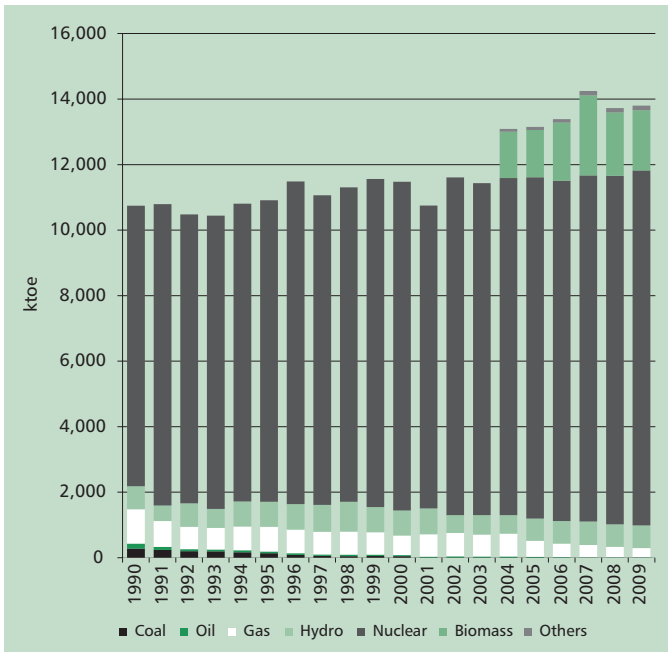
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 4.5.10 Total Primary Energy Supply, 1990–2009



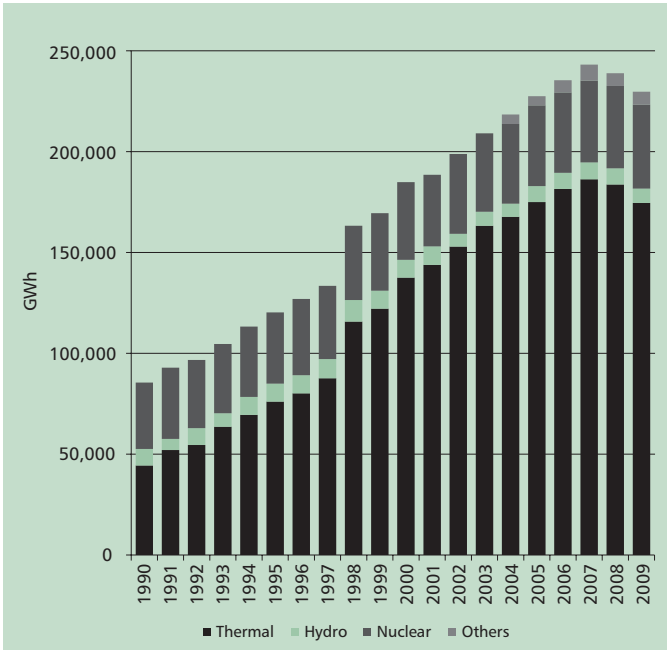
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 4.5.11 Indigenous Energy Production, 1990–2009



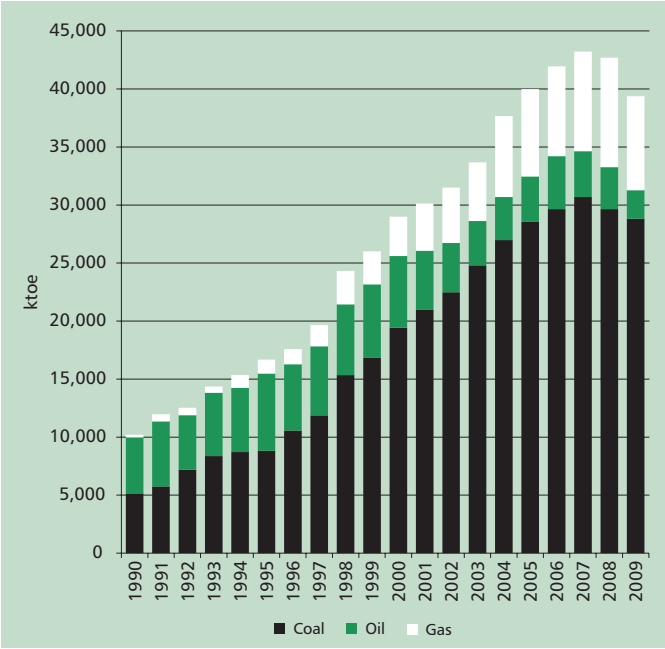
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 4.5.12 Electricity Generation by Source, 1990–2009



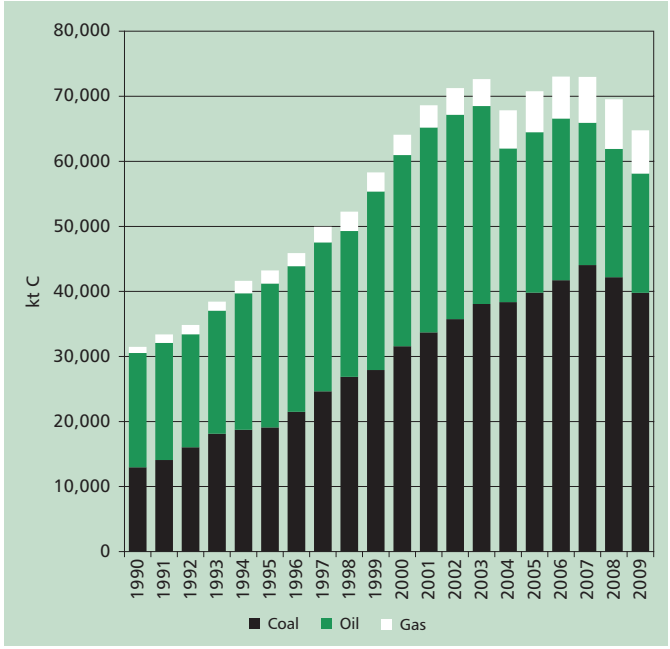
GWh = gigawatt-hour.
Source: APERC (APEC Energy Database).

Figure 4.5.13 Fuel Input for Electricity Generation, 1990–2009



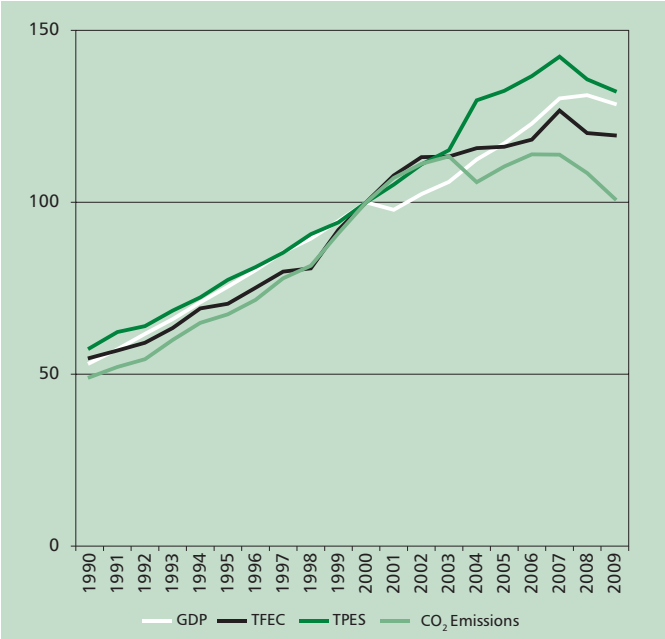
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 4.5.14 Carbon Dioxide Emissions from Fuel Combustion, 1990–2009



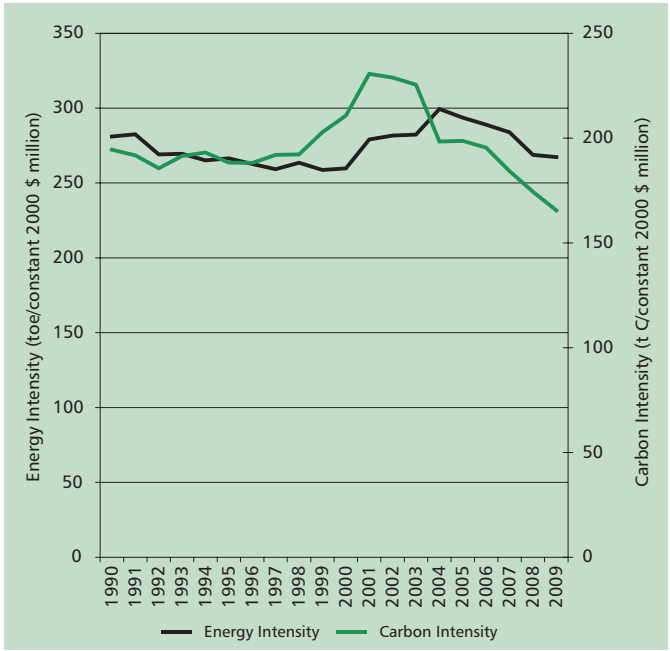
kt C = thousand tons of carbon equivalent.
Source: APERC estimates.

Figure 4.5.15 Growth of GDP, TFEC, TPES, and CO_2 Emissions (indexed to year 2000), 1990–2009



GDP = gross domestic product, TFEC = total final energy consumption, TPES = total primary energy supply.
Note: Indices are measured relative to the base year 2000 (2000 = 100).
Source: APERC estimates.

Figure 4.5.16 Energy and Carbon Intensities, 1990–2009



t C = ton of carbon equivalent , toe = ton of oil equivalent.
Source: APERC estimates.

Note: Taipei,China's primary energy supply and final energy consumption of biomass were reported only from 2004 to 2009. The amounts were however small, only around 2% of the TPES and 0.2% of TFEC.

Table 4.5.3 Taipei,China Energy Balance Table, 2006

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	0	0	21	0	0	0	0	0	0	0	412	685	10,390	0	0	15	1,773	92	0	0	13,389
2.	Imports	40,872	225	52,199	11,173	20	0	73	2,323	1,273	7,485	10,673	0	0	0	0	0	0	0	0	0	115,142
3.	Exports	0	0	0	−14,937	−3,582	0	−7,826	−318	−374	−2,838	0	0	0	0	0	0	0	0	0	0	−14,937
4.	International Bunkers	0	0	0	−4,459	0	0	−193	−2,134	0	−2,132	0	0	0	0	0	0	0	0	0	0	−4,459
5.	Stock Changes	−28	0	−293	−725	−125	−1	−159	−173	−34	−233	−128	0	0	0	0	0	0	0	0	0	−1,173
6.	Total Primary Energy Supply	40,844	225	51,927	−8,947	−3,687	−1	−8,105	−302	866	2,283	10,957	685	10,390	0	0	15	1,773	92	0	0	107,963
7.	Transfers	0	0	0	2,336	4,895	0	65	1,100	0	−3,724	0	0	0	0	0	0	0	0	0	0	2,336
8.	Total Transformation Sector	−33,342	1,914	−52,244	48,932	6,742	0	13,535	7,557	1,901	19,198	−8,489	−685	−10,390	0	0	−15	−1,773	0	20,242	0	−35,850
8.1	Power Generation	−29,117	−532	0	−4,559	0	0	−246	−3,752	0	−561	−7,738	−685	−10,390	0	0	−15	−1,773	0	20,242	0	−34,568
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	−751	0	0	0	0	0	0	0	0	0	−751
8.3	Refineries	0	0	−52,244	53,491	6,742	0	13,781	11,309	1,901	19,759	0	0	0	0	0	0	0	0	0	0	1,248
8.4	Coal Transformation	−4,225	2,447	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	−1,778
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	0	0	0	−2,629	−4	0	−30	−834	−390	−1,372	−304	0	0	0	0	0	0	0	−2,946	0	−5,879
10.	Discrepancy	−2,258	−129	316	−3,023	92	15	−278	−2,541	−264	−46	−155	0	0	0	0	0	0	0	0	0	−5,248
11.	Total Final Energy Consumption	5,244	2,010	0	36,669	8,037	14	5,188	4,979	2,112	16,339	2,010	0	0	0	0	0	0	92	17,296	0	63,321
12.	Industry Sector	5,234	2,010	0	7,321	6	6	180	4,271	712	2,145	900	0	0	0	0	0	0	0	9,327	0	24,792
13.	Transport Sector	0	0	0	12,552	7,987	0	4,113	223	56	173	0	0	0	0	0	0	0	0	88	0	12,640
14.	Other Sectors	0	0	0	2,787	44	8	895	484	1,345	12	1,110	0	0	0	0	0	0	92	7,880	0	11,870
14.1	Residential and Commercial	0	0	0	2,222	43	8	360	466	1,345	0	1,110	0	0	0	0	0	0	92	7,656	0	11,081
14.1.1	Commerce and Public Services	0	0	0	965	43	8	360	466	88	0	282	0	0	0	0	0	0	0	3,601	0	4,848
14.1.2	Residential	0	0	0	1,256	0	0	0	0	1,256	0	828	0	0	0	0	0	0	92	4,055	0	6,232
14.2	Non-Specified Others	0	0	0	566	0	0	535	18	0	12	0	0	0	0	0	0	0	0	224	0	789
15.	Non-Energy Use	9	0	0	14,009	0	0	0	0	0	14,009	0	0	0	0	0	0	0	0	0	0	14,019
16.	Electricity Output (GWh)	121,503	0	19,620	0	0	0	0	0	0	0	40,326	7,999	39,870	0	0	0	6,054	0	0	0	235,372
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.
Note: Figures may not add up to total because of rounding.
Source: APERC (APEC Energy Database).

Table 4.5.4 Taipei,China Energy Balance Table, 2007

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	0	0	16	0	0	0	0	0	0	0	371	718	10,565	0	0	38	2,446	95	0	0	14,249
2.	Imports	40,087	370	51,955	16,007	0	0	0	2,437	1,306	12,264	11,393	0	0	0	0	0	90	0	0	0	119,902
3.	Exports	0	–7	0	–17,779	–4,966	0	–9,070	–306	–365	–3,073	0	0	0	0	0	0	0	0	0	0	–17,787
4.	International Bunkers	0	0	0	–4,190	0	0	–189	–1,894	0	–2,107	0	0	0	0	0	0	0	0	0	0	–4,190
5.	Stock Changes	–150	–8	230	57	34	–1	155	44	–1	–173	122	0	0	0	0	0	0	0	0	0	252
6.	Total Primary Energy Supply	39,938	355	52,202	–5,906	–4,932	–1	–9,104	281	939	6,910	11,886	718	10,565	0	0	38	2,536	95	0	0	112,426
7.	Transfers	0	0	0	–1,390	4,745	0	–31	–2,330	200	–3,972	0	0	0	0	0	0	0	0	0	0	–1,390
8.	Total Transformation Sector	–34,017	2,148	–52,049	49,644	7,973	0	14,224	6,858	1,744	18,845	–9,317	–718	–10,565	0	0	–38	–2,536	0	20,908	0	–36,540
8.1	Power Generation	–30,147	–543	0	–3,954	0	0	–121	–3,264	0	–568	–8,575	–718	–10,565	0	0	–38	–2,446	0	20,908	0	–36,077
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	–743	0	0	0	0	0	0	0	0	0	–743
8.3	Refineries	0	0	–52,049	53,598	7,973	0	14,345	10,123	1,744	19,413	0	0	0	0	0	0	0	0	0	0	1,550
8.4	Coal Transformation	–3,871	2,691	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–1,180
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–90	0	0	0	–90
9.	Loss and Own Use	–886	–829	0	–2,352	–2	0	–46	–713	–183	–1,408	–367	–1	0	0	0	0	0	0	–1,967	0	–6,402
10.	Discrepancy	250	–369	–153	827	31	14	–173	796	–9	168	–150	1	0	0	0	0	0	0	–652	0	–247
11.	Total Final Energy Consumption	5,285	1,305	0	40,824	7,815	13	4,870	4,892	2,691	20,543	2,051	0	0	0	0	0	0	95	18,289	0	67,848
12.	Industry Sector	5,090	1,181	0	5,120	7	1	167	4,273	673	0	929	0	0	0	0	0	0	0	10,265	0	22,586
13.	Transport Sector	0	0	0	12,076	7,766	0	3,932	186	62	130	0	0	0	0	0	0	0	0	71	0	12,148
14.	Other Sectors	0	0	0	2,771	43	12	770	433	1,344	170	1,122	0	0	0	0	0	0	95	7,953	0	11,941
14.1	Residential and Commercial	0	0	0	2,406	42	12	428	410	1,344	170	1,122	0	0	0	0	0	0	95	7,728	0	11,351
14.1.1	Commerce and Public Services	0	0	0	1,150	42	12	428	410	88	170	275	0	0	0	0	0	0	0	4,019	0	5,444
14.1.2	Residential	0	0	0	1,256	0	0	0	0	1,256	0	847	0	0	0	0	0	0	95	3,709	0	5,906
14.2	Non-Specified Others	0	0	0	365	0	0	343	22	0	0	0	0	0	0	0	0	0	0	225	0	591
15.	Non-Energy Use	194	123	0	20,856	0	0	0	0	613	20,243	0	0	0	0	0	0	0	0	0	0	21,173
16.	Electricity Output (GWh)	125,022	0	16,122	0	0	0	0	0	0	0	45,144	8,350	40,539	0	0	0	7,942	0	0	0	243,119
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Source: APERC (APEC Energy Database).

Table 4.5.5 Taipei,China Energy Balance Table, 2008

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	0	0	14	0	0	0	0	0	0	0	318	688	10,639	0	0	34	1,934	99	0	0	13,727
2.	Imports	39,246	267	47,865	15,679	0	0	0	1,786	1,194	12,698	12,473	0	0	0	0	0	0	0	0	0	115,530
3.	Exports	0	–59	0	–17,393	–4,395	0	–9,306	–475	–358	–2,860	0	0	0	0	0	0	0	0	0	0	–17,452
4.	International Bunkers	0	0	0	–3,655	0	0	–171	–1,625	0	–1,858	0	0	0	0	0	0	0	0	0	0	–3,655
5.	Stock Changes	–745	20	–639	523	93	0	107	22	16	285	–90	0	0	0	0	0	0	0	0	0	–932
6.	Total Primary Energy Supply	38,501	228	47,241	–4,846	–4,302	0	–9,370	–292	853	8,265	12,700	688	10,639	0	0	34	1,934	99	0	0	107,218
7.	Transfers	0	0	0	–6,661	–14	0	–341	–2,176	–48	–4,082	0	0	0	0	0	0	0	0	0	0	–6,661
8.	Total Transformation Sector	–33,115	1,983	–47,351	51,042	11,631	0	14,547	6,770	1,935	16,160	–10,200	–687	–10,639	0	0	–34	–1,934	0	20,541	0	–30,395
8.1	Power Generation	–29,172	–477	0	–3,609	0	0	–127	–3,000	0	–482	–9,434	–687	–10,639	0	0	–34	–1,934	0	20,541	0	–35,445
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	–767	0	0	0	0	0	0	0	0	0	–767
8.3	Refineries	0	0	–47,351	54,651	11,631	0	14,674	9,769	1,935	16,642	0	0	0	0	0	0	0	0	0	0	7,300
8.4	Coal Transformation	–3,944	2,460	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–1,483
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	–682	–803	0	–1,871	–2	0	–41	–511	–66	–1,251	–453	–1	0	0	0	0	0	0	–1,844	0	–5,654
10.	Discrepancy	97	31	110	224	103	9	–61	138	–3	38	–11	0	0	0	0	0	0	0	–628	0	–177
11.	Total Final Energy Consumption	4,801	1,439	0	37,889	7,416	9	4,734	3,928	2,672	19,131	2,036	0	0	0	0	0	0	99	18,069	0	64,333
12.	Industry Sector	4,743	1,350	0	4,030	6	0	149	3,357	507	12	871	0	0	0	0	0	0	0	10,068	0	21,062
13.	Transport Sector	0	0	0	11,427	7,369	0	3,745	148	79	87	0	0	0	0	0	0	0	0	95	0	11,521
14.	Other Sectors	0	0	0	2,801	41	9	840	424	1,324	164	1,165	0	0	0	0	0	0	99	7,906	0	11,971
14.1	Residential and Commercial	0	0	0	2,341	41	9	398	405	1,324	164	1,165	0	0	0	0	0	0	99	7,683	0	11,287
14.1.1	Commerce and Public Services	0	0	0	1,105	41	9	398	405	88	164	334	0	0	0	0	0	0	0	4,012	0	5,451
14.1.2	Residential	0	0	0	1,236	0	0	0	0	1,236	0	831	0	0	0	0	0	0	99	3,671	0	5,837
14.2	Non-Specified Others	0	0	0	460	0	0	441	18	0	0	0	0	0	0	0	0	0	0	224	0	684
15.	Non-Energy Use	58	89	0	19,631	0	0	0	0	763	18,869	0	0	0	0	0	0	0	0	0	0	19,778
16.	Electricity Output (GWh)	120,907	0	14,421	0	0	0	0	0	0	0	48,392	7,994	40,827	0	0	0	6,304	0	0	0	238,845
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.
Note: Figures may not add up to total because of rounding.
Source: APERC (APEC Energy Database).

Table 4.5.6 Taipei,China Energy Balance Table, 2009

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	0	0	14	0	0	0	0	0	0	0	281	693	10,833	0	1	42	1,835	102	0	0	13,801
2.	Imports	36,018	73	49,643	15,059	0	0	0	851	1,405	12,804	11,062	0	0	0	0	0	0	0	0	0	111,855
3.	Exports	0	–25	0	–18,708	–4,346	0	–10,072	–569	–178	–3,542	0	0	0	0	0	0	0	0	0	0	–18,733
4.	International Bunkers	0	0	0	–3,402	0	0	–189	–1,458	0	–1,756	0	0	0	0	0	0	0	0	0	0	–3,402
5.	Stock Changes	850	0	351	–92	–56	1	–272	143	–96	187	–63	0	0	0	0	0	0	0	0	0	1,046
6.	Total Primary Energy Supply	36,868	48	50,008	–7,143	–4,402	1	–10,532	–1,033	1,130	7,693	11,280	693	10,833	0	1	42	1,835	102	0	0	104,568
7.	Transfers	0	0	0	–808	–94	0	–258	–1,462	–54	1,059	0	0	0	0	0	0	0	0	0	0	–808
8.	Total Transformation Sector	–32,420	1,819	–50,159	47,657	11,971	0	15,050	6,446	1,764	12,426	–9,523	–691	–10,833	0	–1	–42	–1,835	0	19,753	0	–36,274
8.1	Power Generation	–28,436	–381	0	–2,463	0	0	–57	–1,942	0	–464	–8,100	–691	–10,833	0	–1	–42	–1,835	0	19,753	0	–33,029
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	–1,423	0	0	0	0	0	0	0	0	0	–1,423
8.3	Refineries	0	0	–50,159	50,121	11,971	0	15,107	8,389	1,764	12,890	0	0	0	0	0	0	0	0	0	0	–39
8.4	Coal Transformation	–3,984	2,200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–1,784
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	0	–697	0	–1,877	–2	0	–28	–528	–43	–1,277	–404	–2	0	0	0	0	0	0	–1,772	0	–4,752
10.	Discrepancy	218	90	151	959	92	8	118	331	–7	418	479	0	0	0	0	0	0	0	–640	0	1,257
11.	Total Final Energy Consumption	4,667	1,259	0	38,789	7,565	9	4,350	3,754	2,791	20,319	1,833	0	0	0	0	0	0	102	17,341	0	63,990
12.	Industry Sector	4,614	1,204	0	3,798	6	0	133	3,146	434	79	820	0	0	0	0	0	0	0	9,434	0	19,870
13.	Transport Sector	0	0	0	11,385	7,519	0	3,542	162	85	76	0	0	0	0	0	0	0	0	95	0	11,480
14.	Other Sectors	0	0	0	2,652	40	9	676	446	1,315	167	1,013	0	0	0	0	0	0	102	7,812	0	11,578
14.1	Residential and Commercial	0	0	0	2,329	40	9	373	426	1,315	167	1,013	0	0	0	0	0	0	102	7,590	0	11,034
14.1.1	Commerce and Public Services	0	0	0	1,104	40	9	373	426	89	167	358	0	0	0	0	0	0	0	3,886	0	5,348
14.1.2	Residential	0	0	0	1,225	0	0	0	0	1,225	0	655	0	0	0	0	0	0	102	3,704	0	5,686
14.2	Non-Specified Others	0	0	0	323	0	0	302	20	0	0	0	0	0	0	0	0	0	0	222	0	545
15.	Non-Energy Use	53	55	0	20,954	0	0	0	0	957	19,997	0	0	0	0	0	0	0	0	0	0	21,062
16.	Electricity Output (GWh)	118,683	0	8,698	0	0	0	0	0	0	0	47,178	7,054	41,571	0	8	783	5,717	0	0	0	229,691
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Source: APERC (APEC Energy Database);

Table 4.5.7 Taipei,China Summary Table, 1990–2009

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Indigenous Production (ktoe)																				
Coal	278	237	197	193	168	139	87	58	47	54	49	0	0	0	0	0	0	0	0	0
Oil	156	94	62	56	59	53	51	43	46	40	32	35	44	39	40	29	21	16	14	14
Gas	1,045	790	685	663	727	754	722	689	704	685	598	680	710	666	695	487	412	371	318	281
Hydro	704	474	718	578	764	764	778	823	912	769	763	789	547	593	564	680	685	718	688	693
Nuclear	8,565	9,197	8,820	8,953	9,087	9,203	9,847	9,452	9,596	10,011	10,034	9,248	10,307	10,135	10,291	10,417	10,390	10,565	10,639	10,833
Geothermal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Solar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Wind	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	8	15	38	34	42
Biomass	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,412	1,443	1,773	2,446	1,934	1,835
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	83	88	92	95	99	102
Total	10,748	10,792	10,482	10,443	10,805	10,913	11,485	11,065	11,306	11,560	11,476	10,751	11,608	11,432	13,087	13,152	13,389	14,249	13,727	13,801
Primary Energy Supply (ktoe)																				
Coal	10,562	11,519	13,431	15,139	15,660	16,041	18,269	20,808	22,582	23,691	27,493	29,358	31,266	33,675	36,453	39,183	41,069	40,293	38,729	36,916
Oil	23,918	25,501	24,876	26,826	28,160	31,521	31,487	32,060	33,264	34,687	35,095	37,591	38,552	39,348	43,741	42,299	42,980	46,296	42,395	42,865
Gas	1,728	2,498	2,679	2,595	3,473	3,642	3,697	4,272	5,301	5,220	5,596	6,044	7,018	7,214	9,869	10,476	10,957	11,886	12,700	11,280
Hydro	704	474	718	578	764	764	778	823	912	769	763	789	547	593	564	680	685	718	688	693
Nuclear	8,565	9,197	8,820	8,953	9,087	9,203	9,847	9,452	9,596	10,011	10,034	9,248	10,307	10,135	10,291	10,417	10,390	10,565	10,639	10,833
Geothermal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Solar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Wind	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	8	15	38	34	42
Biomass	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,412	1,443	1,773	2,536	1,934	1,835
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	83	88	92	95	99	102
Total	45,477	49,188	50,525	54,091	57,144	61,171	64,078	67,415	71,655	74,379	78,981	83,028	87,690	90,964	102,415	104,593	107,963	112,426	107,218	104,568
Final Energy Consumption by Sector (ktoe)																				
Industry	15,667	16,365	17,204	18,377	19,901	19,946	21,361	23,609	22,288	27,289	29,393	35,031	36,640	35,892	23,610	23,738	24,792	22,586	21,062	19,870
Transport	6,735	7,067	7,226	7,841	8,991	9,394	9,722	9,922	10,458	10,864	12,165	10,847	11,309	11,300	11,888	12,657	12,640	12,148	11,521	11,480
Residential	3,044	3,177	3,336	3,498	3,667	3,897	4,151	4,209	7,398	4,709	5,009	5,156	5,270	5,323	5,886	6,140	6,232	5,906	5,837	5,686
Commercial	1,947	2,197	2,221	2,497	2,778	2,780	3,160	3,188	623	3,650	4,032	4,255	4,470	5,261	4,582	4,868	4,848	5,444	5,451	5,348
Others	1,908	1,656	1,684	1,770	1,697	1,745	1,842	1,841	2,496	2,752	2,959	2,452	2,894	2,922	16,029	14,804	14,808	21,764	20,462	21,606
Total	29,302	30,462	31,672	33,983	37,033	37,761	40,236	42,769	43,264	49,264	53,558	57,741	60,583	60,697	61,995	62,206	63,321	67,848	64,333	63,990

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Table 4.5.7 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Final Energy Consumption by Type (ktoe)																				
Coal	5,903	6,313	6,795	7,416	7,661	7,881	8,359	9,580	8,095	7,659	8,391	8,820	9,179	9,232	6,833	6,706	7,254	6,589	6,240	5,926
Oil	16,106	16,072	16,308	17,343	19,514	19,301	20,697	21,352	21,736	27,603	29,907	33,448	34,913	34,150	37,103	36,692	36,669	40,824	37,889	38,789
Gas	926	1,116	1,251	1,280	1,359	1,534	1,610	1,635	1,627	1,607	1,490	1,473	1,707	1,687	1,891	1,986	2,010	2,051	2,036	1,833
Electricity	6,367	6,961	7,318	7,945	8,498	9,045	9,570	10,202	11,806	12,395	13,770	13,999	14,784	15,628	16,084	16,734	17,296	18,289	18,069	17,341
Heat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Biomass	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	83	88	92	95	99	102
Total	29,302	30,462	31,672	33,983	37,033	37,761	40,236	42,769	43,264	49,264	53,558	57,741	60,583	60,697	61,995	62,206	63,321	67,848	64,333	63,990
Power Generation (GWh)																				
Thermal	44,405	52,053	54,534	63,564	69,492	76,062	80,124	87,612	115,754	122,115	137,480	143,863	152,908	163,267	167,633	175,001	181,449	186,288	183,720	174,558
Hydro	8,188	5,508	8,351	6,719	8,887	8,879	9,044	9,567	10,608	8,942	8,870	9,169	6,360	6,895	6,556	7,909	7,999	8,350	7,994	7,054
Nuclear	32,866	35,290	33,845	34,354	34,871	35,316	37,788	36,269	36,824	38,416	38,503	35,486	39,553	38,890	39,490	39,972	39,870	40,539	40,827	41,571
Geothermal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Solar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8
Wind	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	783
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4,712	4,567	6,054	7,942	6,304	5,717
Total	85,459	92,851	96,730	104,637	113,250	120,257	126,956	133,448	163,186	169,473	184,853	188,518	198,821	209,052	218,391	227,449	235,372	243,119	238,845	229,691
Loss and Own Use of Electricity (GWh)																				
Transmission and Distribution Losses	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	9,479	–	–	–
Own Use	–	–	–	–	–	–	–	–	–	–	–	–	–	–	12,703	13,197	13,603	14,012	13,239	12,724
Total	–	–	–	–	–	–	–	–	–	–	–	–	–	–	12,703	13,197	23,082	14,012	13,239	12,724
Fuel Input for Power Generation (ktoe)																				
Coal	5,145	5,750	7,188	8,363	8,709	8,820	10,565	11,880	15,341	16,829	19,428	20,964	22,479	24,798	26,984	28,585	29,650	30,690	29,649	28,817
Oil	4,825	5,604	4,701	5,459	5,523	6,653	5,715	5,947	6,105	6,337	6,171	5,092	4,241	3,821	3,706	3,882	4,559	3,954	3,609	2,463
Gas	241	617	638	530	1,130	1,210	1,300	1,846	2,876	2,846	3,393	4,077	4,782	5,063	6,975	7,518	7,738	8,575	9,434	8,100
Total	10,211	11,972	12,527	14,353	15,362	16,683	17,581	19,672	24,323	26,012	28,992	30,133	31,501	33,683	37,666	39,986	41,946	43,218	42,691	39,380
CO_2 Emissions (kt C)																				
Coal	12,970	14,088	16,049	18,135	18,736	19,091	21,492	24,654	26,877	27,905	31,581	33,705	35,733	38,077	38,351	39,805	41,721	44,060	42,184	39,778
Oil	17,568	17,986	17,358	18,911	20,982	22,127	22,382	22,882	22,401	27,468	29,378	31,501	31,438	30,422	23,630	24,681	24,870	21,878	19,727	18,359
Gas	936	1,318	1,441	1,381	1,904	2,000	2,031	2,395	2,976	2,937	3,130	3,409	4,079	4,151	5,862	6,294	6,439	7,042	7,637	6,621
Total	31,473	33,392	34,848	38,427	41,622	43,218	45,905	49,931	52,255	58,310	64,089	68,615	71,251	72,649	67,843	70,780	73,029	72,979	69,549	64,759

continued on next page

Table 4.5.7 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Macroeconomic Indicators																				
Population (thousand)	20,197	20,435	20,639	20,899	21,086	21,267	21,441	21,634	21,836	22,010	22,184	22,341	22,463	22,563	22,647	22,730	22,823	22,917	22,998	23,078
Urban Population, %	50.6	50.7	52.6	52.5	52.6	53.1	53.6	54.1	54.9	55.1	55.8	56.7	56.9	57.5	57.7	57.7	57.9	58.1	58.6	59.1
GDP (constant 2000 $ million)	161,830	174,100	187,760	200,710	215,540	229,520	243,970	260,060	271,890	287,510	304,090	297,490	311,280	322,180	342,000	356,230	373,640	395,994	398,884	391,200
GDP (current $ million)	163,410	192,552	217,895	229,479	254,783	266,919	287,588	262,724	285,702	307,343	308,784	283,733	299,590	314,799	356,089	357,391	375,613	397,944	384,058	389,547
GDP (constant 2005 PPP $ million)	250,289	270,024	290,430	309,982	333,514	354,787	374,429	394,931	408,621	433,020	458,118	450,556	474,271	491,674	522,108	546,664	576,388	610,873	615,331	603,479
GDP/capita (constant 2000 $)	8,013	8,520	9,098	9,604	10,222	10,792	11,379	12,021	12,452	13,062	13,707	13,316	13,857	14,279	15,101	15,672	16,371	17,279	17,345	16,951
GDP/capita (current $)	8,091	9,423	10,558	10,980	12,083	12,551	13,413	12,144	13,084	13,964	13,919	12,700	13,337	13,952	15,724	15,723	16,457	17,364	16,700	16,879
GDP – Manufacturing (% of GDP)	27.5	27.1	26.1	22.5	22.1	21.9	21.7	21.9	21.6	21.9	22.4	21.2	22.5	23.9	24.8	25.6	26.5	27.4	27.5	26.8
Car Ownership (car/1,000 persons)	138	177	192	193	204	218	231	243	246	241	250	254	255	272	282	293	294	295	304	314
Basic Energy Indicators																				
TPES/capita (toe/person)	2.25	2.41	2.45	2.59	2.71	2.88	2.99	3.12	3.28	3.38	3.56	3.72	3.90	4.03	4.52	4.60	4.73	4.91	4.66	4.53
TFEC/capita (toe/person)	1.45	1.49	1.53	1.63	1.76	1.78	1.88	1.98	1.98	2.24	2.41	2.58	2.70	2.69	2.74	2.74	2.77	2.96	2.80	2.77
TPES/GDP (toe/constant 2000 $ million)	281	283	269	269	265	267	263	259	264	259	260	279	282	282	299	294	289	284	269	267
TFEC/GDP (toe/constant 2000 $ million)	181	175	169	169	172	165	165	164	159	171	176	194	195	188	181	175	169	171	161	164
Import Dependency (%)	76.4	78.1	79.3	80.7	81.1	82.2	82.1	83.6	84.2	84.5	85.5	87.1	86.8	87.4	87.2	87.4	87.6	87.3	87.2	86.8
Oil Import Dependency (%)	99.3	99.6	99.8	99.8	99.8	99.8	99.8	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	100.0	100.0	100.0	100.0
Electricity/capita (kWh/ person)	3,666	3,962	4,124	4,421	4,687	4,946	5,191	5,484	6,288	6,549	7,219	7,288	7,654	8,056	8,260	8,562	8,813	9,281	9,137	8,739
CO_2 Intensity (t C/constant 2000 $ million)	194	192	186	191	193	188	188	192	192	203	211	231	229	225	198	199	195	184	174	166
CO_2/capita (t C)	1.56	1.63	1.69	1.84	1.97	2.03	2.14	2.31	2.39	2.65	2.89	3.07	3.17	3.22	3.00	3.11	3.20	3.18	3.02	2.81
CO_2/TPES (t C/toe)	0.69	0.68	0.69	0.71	0.73	0.71	0.72	0.74	0.73	0.78	0.81	0.83	0.81	0.80	0.66	0.68	0.68	0.65	0.65	0.62

– = no data or not applicable, CO_2 = carbon dioxide, GDP = gross domestic product, GWh = gigawatt–hour, kt C = thousand tons of carbon equivalent, ktoe = thousand tons of oil equivalent, kWh = kilowatt–hour, PPP = purchasing power parity, t C = ton of carbon equivalent, TFEC = total final energy consumption, toe = ton of oil equivalent, TPES = total primary energy supply.

Note: Figures may not add up to total because of rounding.

Sources: APERC (APEC Energy Database), APERC estimates, [Taipei,China] Council for Economic Planning and Development (2011), and JAMA (2012).

Chapter 5

The Pacific

The Pacific

Regional Profile (2009)		Energy Reserves (year-end 2008)	
Total Surface Area (square kilometer)	543,098	Coal (million ton) - Recoverable	0.0
Population (thousand)	10,014	Gas (trillion cubic feet) - Proven	15.6
GDP (constant 2000 $ billion)	9.2	Oil (billion barrel) - Proven	70.0
Electrification Rate (%)	22.0		

GDP = gross domestic product.

Sources: ADB (2011 and 2012), CIA (2012), World Bank, and WEC (2010).

2008 Energy Supply and Demand Flow (ktoe)

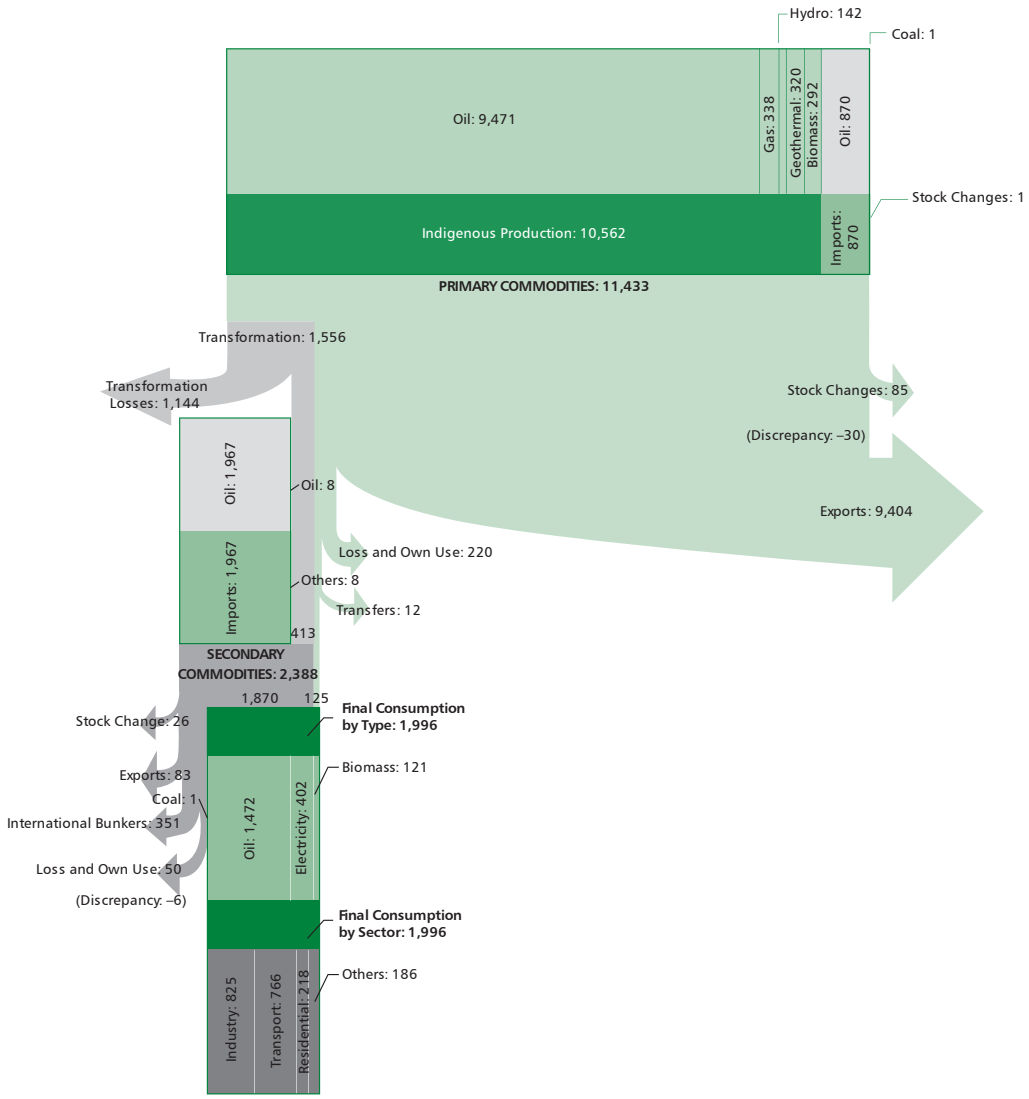


Table 5.1 Key Data and Economic Profile

	1990	1995	2000	2005	2008
Socioeconomic Data					
Population (thousand)	5,855	6,562	7,349	9,195	9,807
GDP (constant 2000 $ billion)	5.0	6.8	7.0	8.0	8.9
GDP (constant 2005 PPP $ billion)	11.9	16.6	17.0	19.3	21.9
GDP/capita (constant 2000 $)	854	1,036	950	868	911
GDP/capita (constant 2005 PPP $)	2,055	2,558	2,181	2,114	2,249

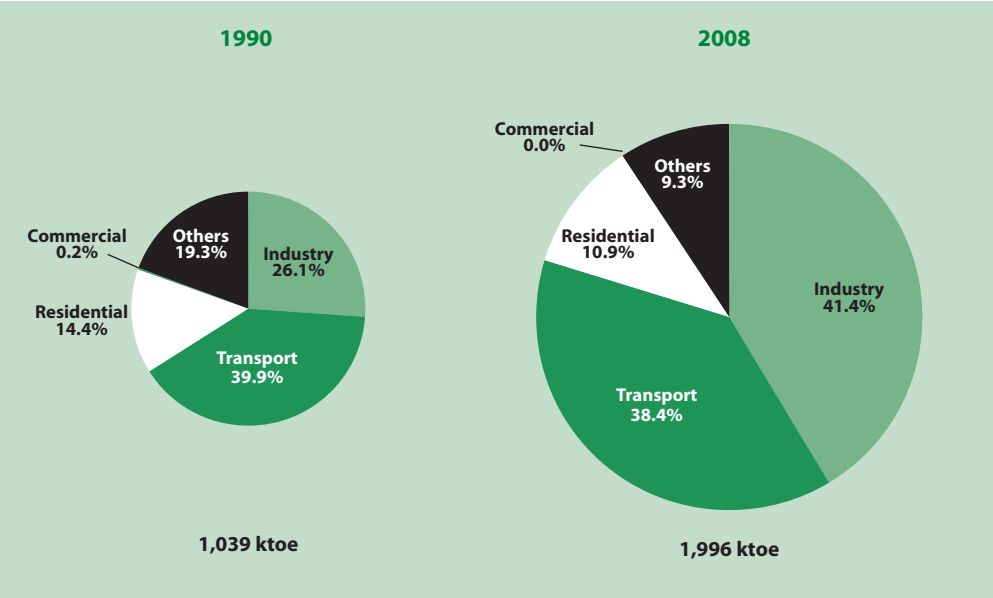
GDP = gross domestic product, PPP = purchasing power parity.
Note: Due to unavailability of data on GDP (constant 2005 PPP $ billion) for some years, several countries were not included in the computation for GDP/capita (constant 2005 PPP $). These countries are Cook Islands, Marshall Islands, and Nauru (1990, 1995, 2000, 2005, and 2008), Palau (1990), and Timor-Leste (1990, 1995, and 2000).
Sources: ADB (2011) and World Bank.

Table 5.2 Energy Supply and Demand

	1990	1995	2000	2005	2008
Primary Energy Supply (ktoe)					
Indigenous Production	4,946	5,321	4,256	10,584	10,562
Net Imports	–3,287	–3,418	–2,134	–7,425	–7,110
Total PES	1,659	1,903	2,122	3,159	3,451
Coal	18	14	12	1	1
Oil	1,196	1,285	1,505	2,353	2,360
Gas	72	83	119	241	338
Biomass	299	405	352	308	292
Others	75	116	134	254	461
TPES/capita (toe)	0.29	0.30	0.29	0.34	0.35
TPES/GDP (toe/constant 2005 PPP $ million)	140	115	125	164	158
Final Energy Consumption (ktoe)					
Industry	271	364	624	852	825
Transportation	415	484	540	781	766
Other Sectors	353	312	308	425	404
Total FEC	1,039	1,161	1,472	2,058	1,996
Coal	12	14	12	1	1
Oil	694	904	1,067	1,548	1,472
Gas	72	0	0	0	0
Electricity	193	172	270	386	402
Biomass	69	71	122	123	121
Others	0	0	0	0	0

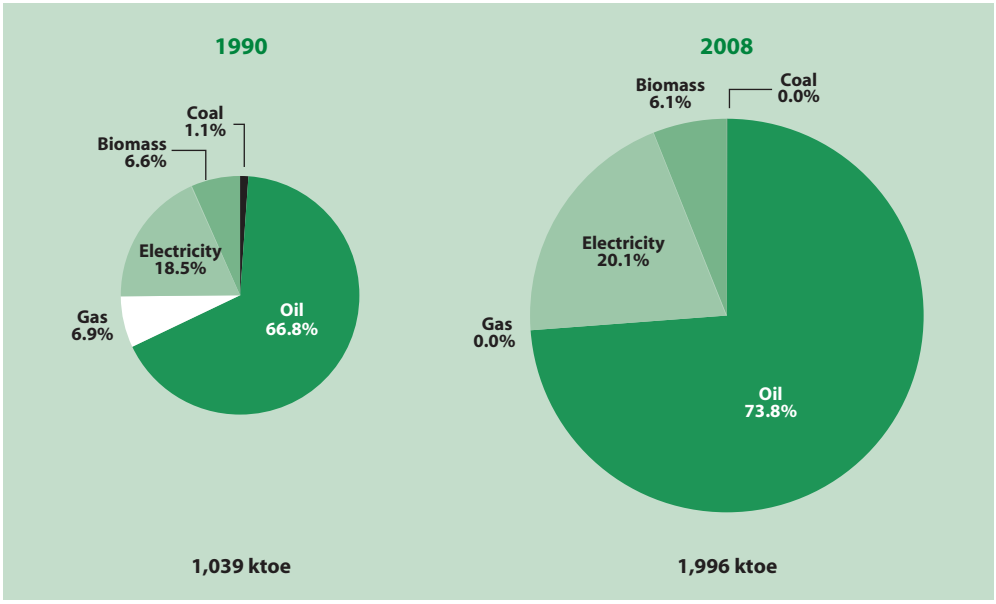
FEC = final energy consumption, GDP = gross domestic product, ktoe = thousand tons of oil equivalent, PES = primary energy supply, PPP = purchasing power parity, toe = ton of oil equivalent, TPES = total primary energy supply.
Sources: ADB (unpublished), APERC (APEC Energy Database), and UNSD (2011a).

Figure 5.1 Final Energy Consumption by Sector, 1990 and 2008



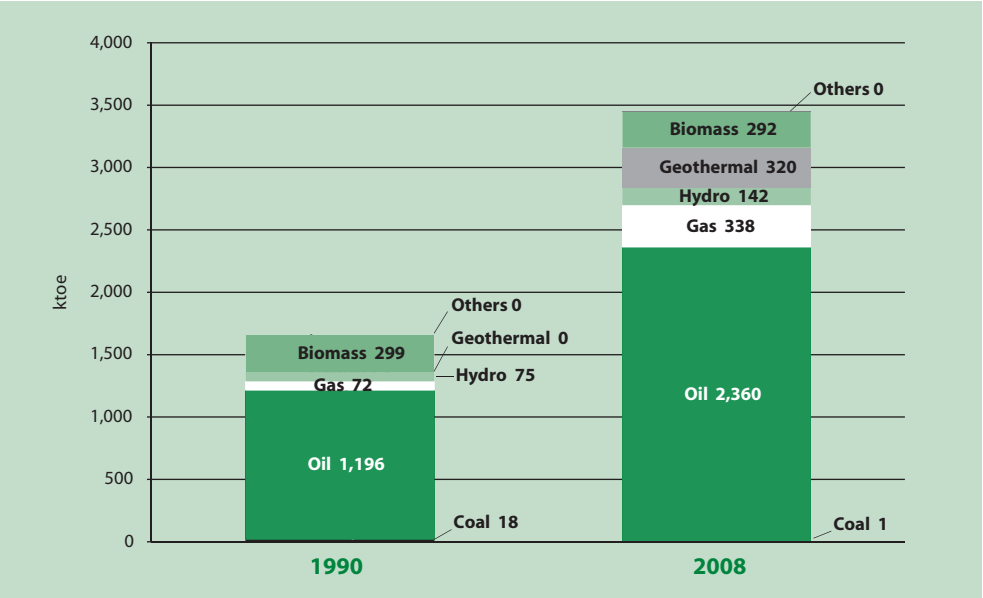
ktoe = thousand tons of oil equivalent.
Sources: ADB (unpublished), APERC (APEC Energy Database), and UNSD (2011a).

Figure 5.2 Final Energy Consumption by Type of Energy, 1990 and 2008



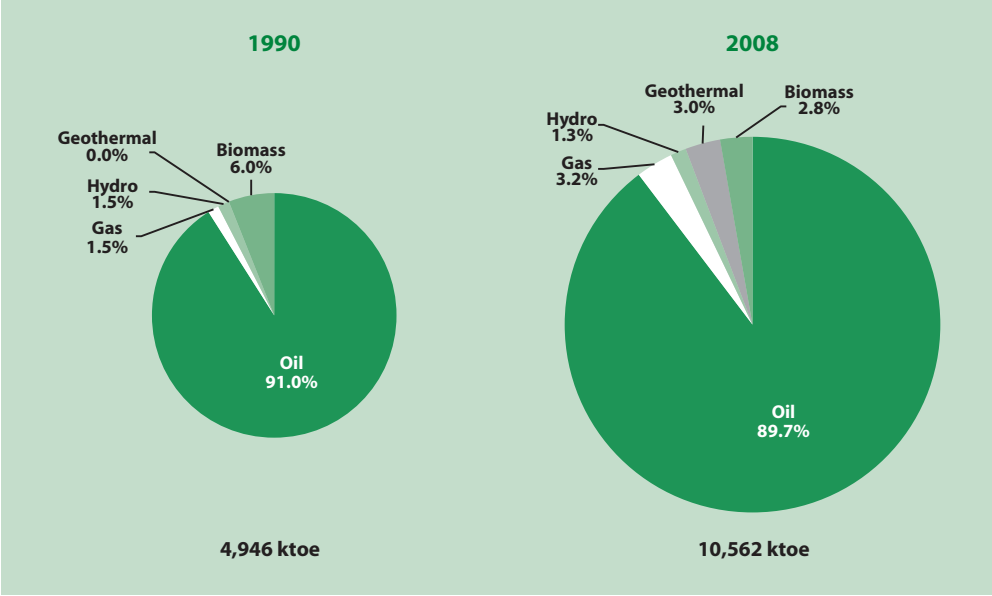
ktoe = thousand tons of oil equivalent.
Sources: ADB (unpublished), APERC (APEC Energy Database), and UNSD (2011a).

Figure 5.3 Total Primary Energy Supply, 1990 and 2008



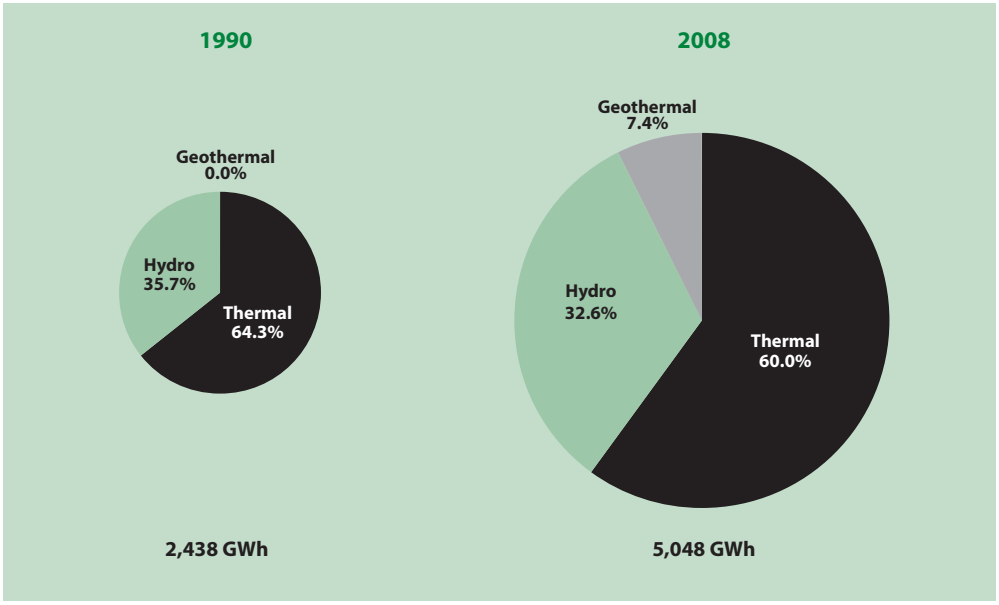
ktoe = thousand tons of oil equivalent.
Sources: ADB (unpublished), APERC (APEC Energy Database), and UNSD (2011a).

Figure 5.4 Indigenous Energy Production, 1990 and 2008



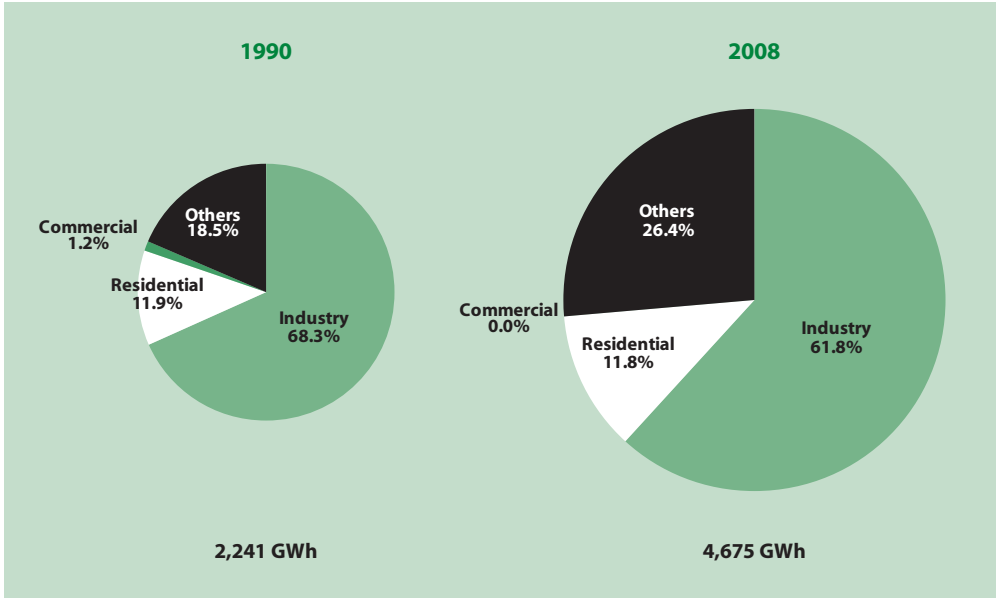
ktoe = thousand tons of oil equivalent.
Sources: ADB (unpublished), APERC (APEC Energy Database), and UNSD (2011a).

Figure 5.5 Electricity Generation by Plant Type, 1990 and 2008



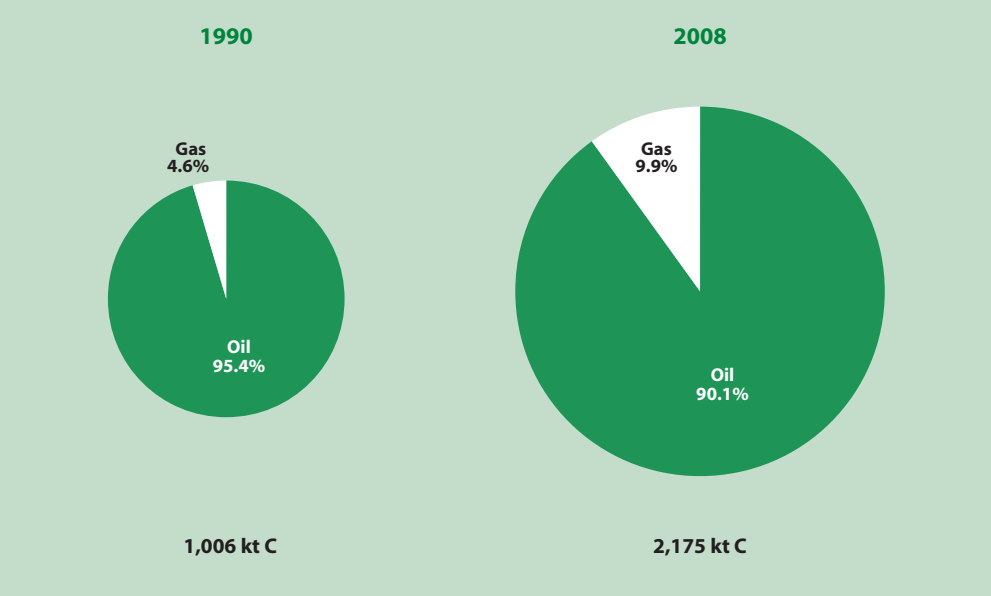
GWh = gigawatt-hour.
Sources: ADB (unpublished), APERC (APEC Energy Database), and UNSD (2011a).

Figure 5.6 Electricity Consumption by Sector, 1990 and 2008



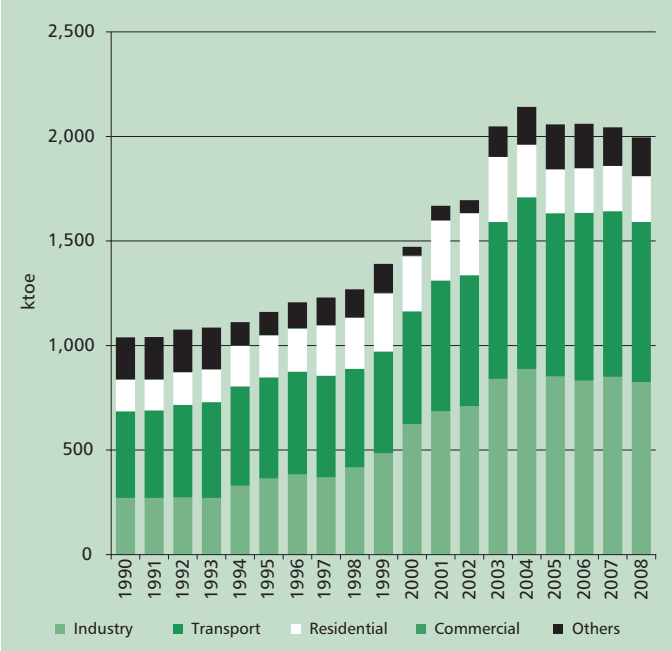
GWh = gigawatt-hour.
Sources: ADB (unpublished), APERC (APEC Energy Database), and UNSD (2011a).

Figure 5.7 Carbon Dioxide Emissions from Fuel Combustion, 1990 and 2008



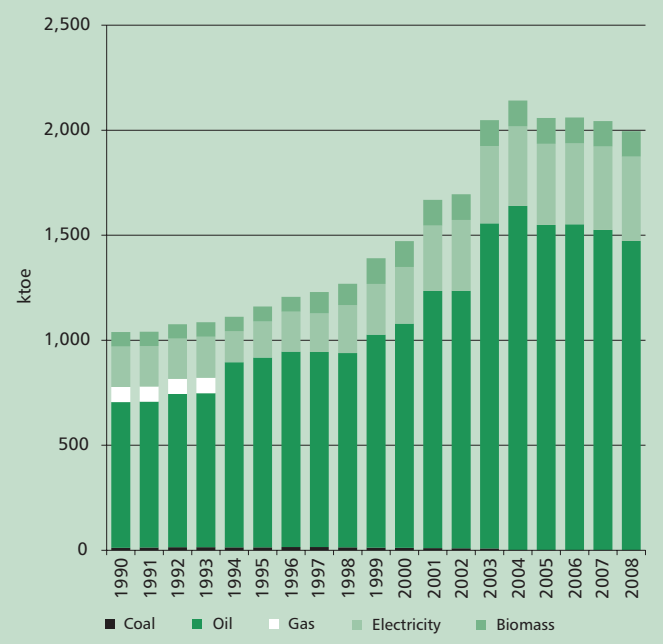
kt C = thousand tons of carbon equivalent.
Sources: APERC estimates.

Figure 5.8 Final Energy Consumption by Sector, 1990–2008



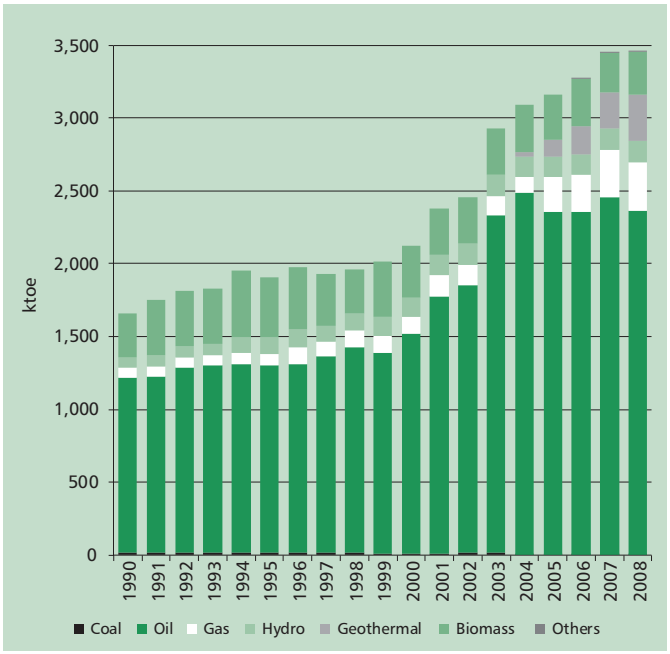
ktoe = thousand tons of oil equivalent.
Sources: ADB (unpublished), APERC (APEC Energy Database), and UNSD (2011a).

Figure 5.9 Final Energy Consumption by Type, 1990–2008



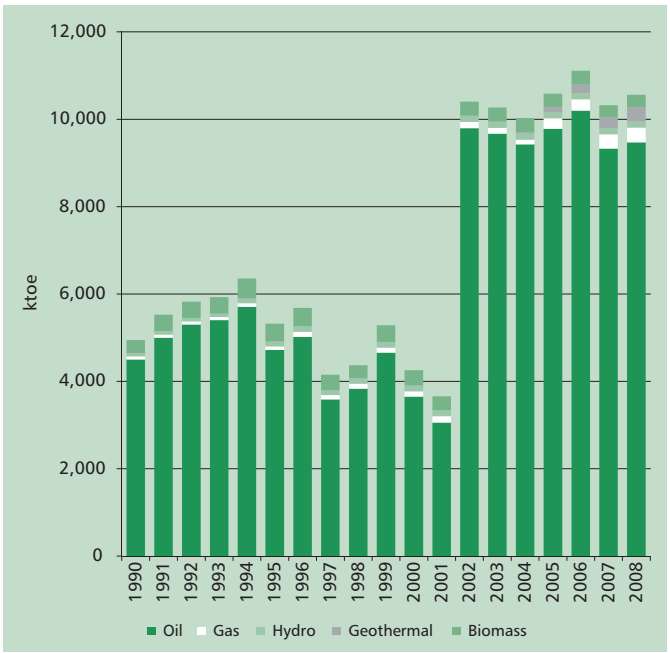
ktoe = thousand tons of oil equivalent.
Sources: ADB (unpublished), APERC (APEC Energy Database), and UNSD (2011a).

Figure 5.10 Total Primary Energy Supply, 1990–2008



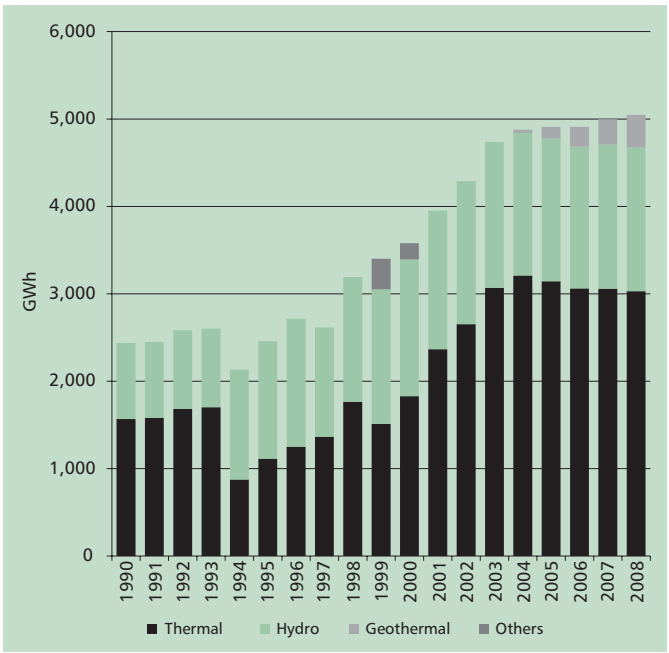
ktoe = thousand tons of oil equivalent.
Sources: ADB (unpublished), APERC (APEC Energy Database), and UNSD (2011a).

Figure 5.11 Indigenous Energy Production, 1990–2008



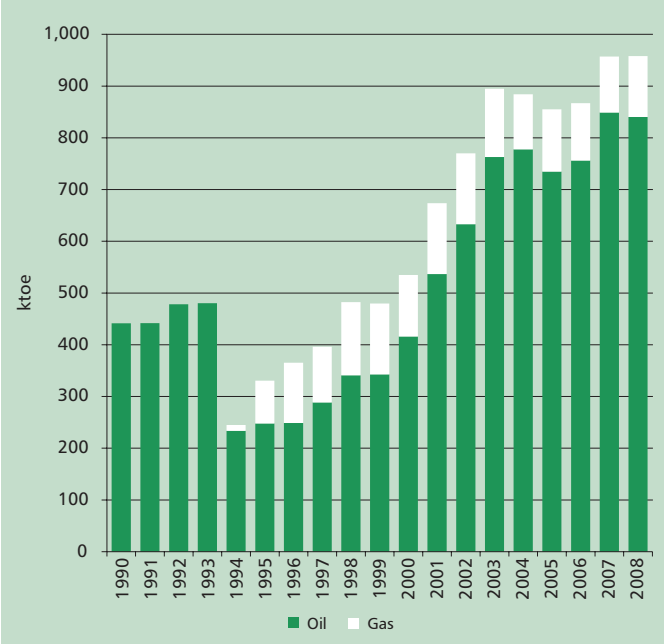
ktoe = thousand tons of oil equivalent.
Sources: ADB (unpublished), APERC (APEC Energy Database), and UNSD (2011a).

Figure 5.12 Electricity Generation by Source, 1990–2008



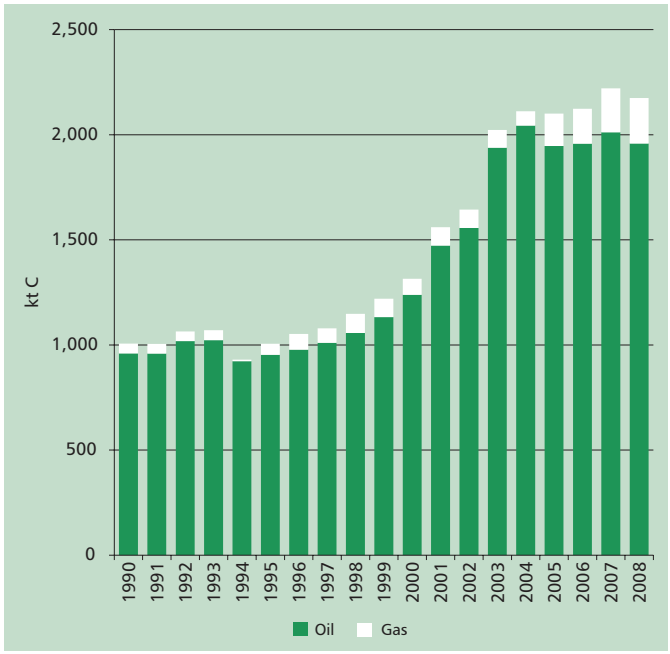
GWh = gigawatt-hour.
Sources: ADB (unpublished), APERC (APEC Energy Database), and UNSD (2011a).

Figure 5.13 Fuel Input for Electricity Generation, 1990–2008



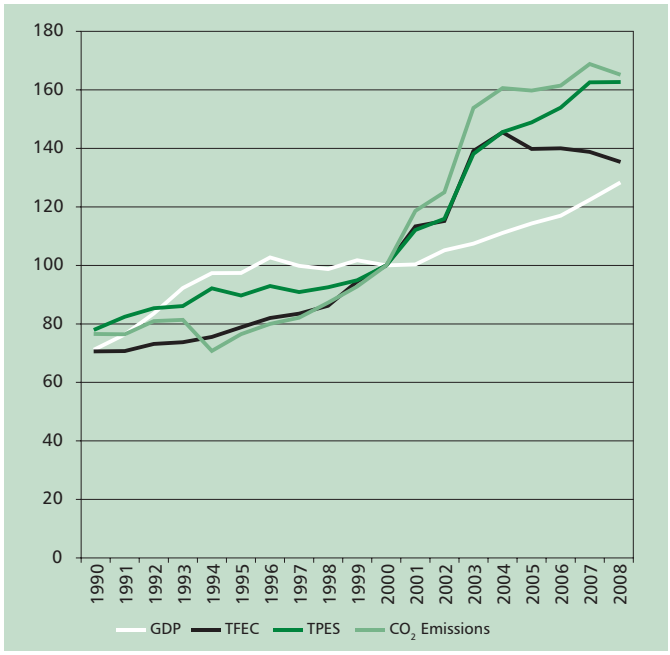
ktoe = thousand tons of oil equivalent.
Sources: ADB (unpublished), APERC (APEC Energy Database), APERC estimates, and UNSD (2011a).

Figure 5.14 Carbon Dioxide Emissions from Fuel Combustion, 1990–2008



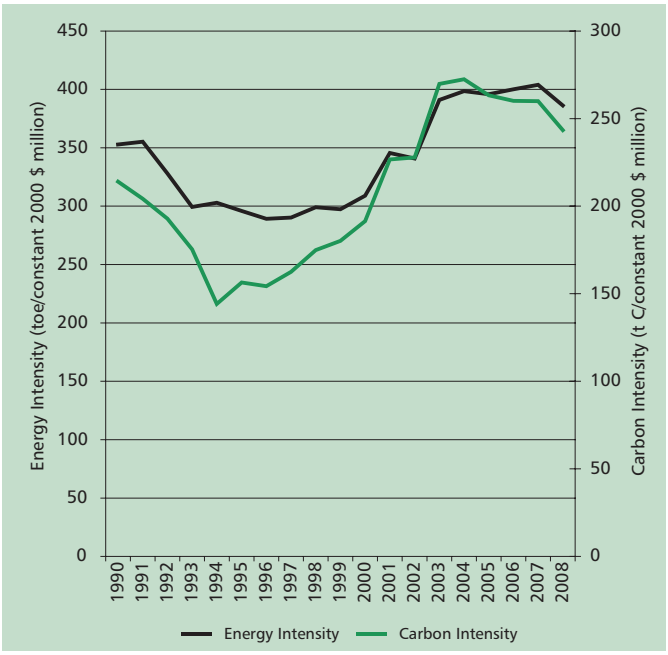
kt C = thousand tons of carbon equivalent.
Source: APERC estimates.

Figure 5.15 Growth of GDP, TFEC, TPES, and CO_2 (indexed to year 2000), 1990–2008



CO_2 = carbon dioxide, GDP = gross domestic product, TFEC = total final energy consumption, TPES = total primary energy supply.
Note: Indices are measured relative to the base year 2000 (2000 = 100).
Source: APERC estimates.

Figure 5.16 Energy and Carbon Intensities, 1990–2008



t C = ton of carbon equivalent , toe = ton of oil equivalent.
Source: APERC estimates.

Table 5.3 The Pacific Energy Balance Table, 2005

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	0	0	9,780	0	0	0	0	0	0	0	241	141	0	114	0	0	308	0	0	0	10,584
2.	Imports	0	0	917	2,226	246	87	1,211	354	32	297	0	0	0	0	0	0	0	0	0	0	3,143
3.	Exports	0	0	–9,657	–547	–23	–15	–94	–145	–3	–267	0	0	0	0	0	0	0	0	0	0	–10,204
4.	International Bunkers	0	0	0	–364	–5	0	–99	–1	0	–259	0	0	0	0	0	0	0	0	0	0	–364
5.	Stock Changes	1	0	0	–2	0	0	0	0	0	–2	0	0	0	0	0	0	0	0	0	0	0
6.	Total Primary Energy Supply	1	0	1,040	1,314	218	72	1,018	208	29	–231	241	141	0	114	0	0	308	0	0	0	3,159
7.	Transfers	0	0	–12	12	0	16	3	1	0	–9	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	0	0	–997	269	50	–11	14	–165	20	363	–120	–141	0	–114	0	0	–184	0	422	0	–864
8.1	Power Generation	0	0	–4	–731	0	–11	–415	–304	0	0	–120	–141	0	–114	0	0	0	0	422	0	–687
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	–993	1,000	50	0	429	139	20	363	0	0	0	0	0	0	0	0	0	0	8
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–184	0	0	0	–184
9.	Loss and Own Use	0	0	0	–34	0	0	–6	0	–18	–10	–121	0	0	0	0	0	0	0	–36	0	–191
10.	Discrepancy	0	0	–18	–26	0	–1	–7	0	–1	–17	0	0	0	0	0	0	–1	0	0	0	–45
11.	Total Final Energy Consumption	1	0	13	1,535	268	76	1,022	44	29	96	0	0	0	0	0	0	123	0	386	0	2,058
12.	Industry Sector	1	0	0	609	0	0	548	39	14	8	0	0	0	0	0	0	0	0	241	0	852
13.	Transport Sector	0	0	0	781	263	0	434	5	0	79	0	0	0	0	0	0	0	0	0	0	781
14.	Other Sectors	0	0	13	144	5	76	41	0	14	8	0	0	0	0	0	0	123	0	145	0	425
14.1	Residential and Commercial	0	0	0	46	0	35	0	0	11	0	0	0	0	0	0	0	122	0	42	0	210
14.1.1	Commerce and Public Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14.1.2	Residential	0	0	0	46	0	35	0	0	11	0	0	0	0	0	0	0	122	0	42	0	210
14.2	Non–Specified Others	0	0	13	98	5	40	41	0	3	8	0	0	0	0	0	0	1	0	103	0	215
15.	Non–Energy Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16.	Electricity Output (GWh)	0	0	1,730	853	0	32	652	169	0	0	560	1,634	0	132	0	0	0	0	0	0	4,909
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt–hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Source: ADB (unpublished), APERC (APEC Energy Database), and UNSD (2011a).

Table 5.4 The Pacific Energy Balance Table, 2006

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	0	0	10,198	0	0	0	0	0	0	0	259	139	0	195	0	0	319	0	0	0	11,111
2.	Imports	0	0	993	2,220	269	81	1,146	350	23	351	0	0	0	0	0	0	0	0	0	0	3,213
3.	Exports	0	0	−9,806	−554	−46	−15	−168	−102	0	−221	0	0	0	0	0	0	0	0	0	0	−10,360
4.	International Bunkers	0	0	0	−407	−9	0	−78	−1	0	−318	0	0	0	0	0	0	0	0	0	0	−407
5.	Stock Changes	1	0	−294	2	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	−291
6.	Total Primary Energy Supply	1	0	1,090	1,262	213	65	900	246	23	−186	259	139	0	195	0	0	320	0	0	0	3,266
7.	Transfers	0	0	−13	13	0	17	3	1	0	−9	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	0	0	−1,066	310	66	−6	121	−203	14	318	−111	−139	0	−195	0	0	−195	0	418	0	−978
8.1	Power Generation	0	0	−6	−750	0	−6	−434	−310	0	0	−111	−139	0	−195	0	0	0	0	422	0	−779
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	−1,060	1,060	66	0	555	108	14	318	0	0	0	0	0	0	0	0	0	0	1
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	−195	0	0	0	−195
9.	Loss and Own Use	0	0	0	−21	0	0	−7	0	−3	−10	−148	0	0	0	0	0	0	0	−37	0	−206
10.	Discrepancy	0	0	0	−24	1	−2	−7	0	−1	−15	0	0	0	0	0	0	−1	0	0	0	−25
11.	Total Final Energy Consumption	1	0	12	1,540	280	75	1,009	45	33	98	0	0	0	0	0	0	123	0	385	0	2,061
12.	Industry Sector	1	0	0	585	0	0	523	40	14	9	0	0	0	0	0	0	0	0	246	0	832
13.	Transport Sector	0	0	0	804	267	0	451	6	0	80	0	0	0	0	0	0	0	0	0	0	804
14.	Other Sectors	0	0	12	151	13	75	36	0	18	9	0	0	0	0	0	0	123	0	139	0	425
14.1	Residential and Commercial	0	0	0	48	0	35	0	0	13	0	0	0	0	0	0	0	122	0	42	0	212
14.1.1	Commerce and Public Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14.1.2	Residential	0	0	0	48	0	35	0	0	13	0	0	0	0	0	0	0	122	0	42	0	212
14.2	Non-Specified Others	0	0	12	103	13	40	36	0	5	9	0	0	0	0	0	0	1	0	97	0	213
15.	Non-Energy Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16.	Electricity Output (GWh)	0	0	1,709	828	0	21	619	187	0	0	525	1,622	0	227	0	0	0	0	0	0	4,911
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Source: ADB (unpublished), APERC (APEC Energy Database), and UNSD (2011a).

Table 5.5 The Pacific Energy Balance Table, 2007

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	0	0	9,330	0	0	0	0	0	0	0	326	142	0	249	0	0	275	0	0	0	10,321
2.	Imports	0	0	778	2,264	235	103	1,152	394	36	344	0	0	0	0	0	0	0	0	0	0	3,043
3.	Exports	0	0	–8,829	–262	–17	–15	–41	–40	–2	–146	0	0	0	0	0	0	0	0	0	0	–9,090
4.	International Bunkers	0	0	0	–400	–9	0	–75	–3	0	–313	0	0	0	0	0	0	0	0	0	0	–400
5.	Stock Changes	1	0	–454	30	–1	0	13	6	1	10	0	0	0	0	0	0	0	0	0	0	–424
6.	Total Primary Energy Supply	1	0	826	1,632	209	88	1,049	356	36	–105	326	142	0	249	0	0	275	0	0	0	3,450
7.	Transfers	0	0	–12	13	47	0	3	1	0	–39	0	0	0	0	0	0	0	0	0	0	1
8.	Total Transformation Sector	0	0	–802	–88	27	–6	–74	–306	4	266	–108	–142	0	–249	0	0	–153	0	430	0	–1,112
8.1	Power Generation	0	0	–1	–847	0	–6	–465	–376	0	0	–108	–142	0	–249	0	0	0	0	430	0	–918
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	–800	760	27	0	392	70	4	266	0	0	0	0	0	0	0	0	0	0	–41
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–153	0	0	0	–153
9.	Loss and Own Use	0	0	0	–17	0	0	–5	0	–1	–11	–217	0	0	0	0	0	0	0	–38	0	–273
10.	Discrepancy	0	0	0	–27	0	–3	–8	0	–2	–14	0	0	0	0	0	0	–1	0	5	0	–23
11.	Total Final Energy Consumption	1	0	12	1,513	283	78	965	51	37	98	0	0	0	0	0	0	121	0	397	0	2,043
12.	Industry Sector	1	0	12	590	0	0	513	46	16	16	0	0	0	0	0	0	0	0	248	0	850
13.	Transport Sector	0	0	0	793	273	0	432	6	0	82	0	0	0	0	0	0	0	0	0	0	793
14.	Other Sectors	0	0	0	131	11	78	20	0	22	0	0	0	0	0	0	0	121	0	149	0	401
14.1	Residential and Commercial	0	0	0	52	0	37	0	0	14	0	0	0	0	0	0	0	119	0	46	0	217
14.1.1	Commerce and Public Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14.1.2	Residential	0	0	0	52	0	37	0	0	14	0	0	0	0	0	0	0	119	0	46	0	217
14.2	Non-Specified Others	0	0	0	79	11	41	20	0	7	0	0	0	0	0	0	0	1	0	103	0	184
15.	Non-Energy Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16.	Electricity Output (GWh)	0	0	1,709	849	0	22	624	203	0	0	500	1,651	0	289	0	0	0	0	0	0	4,998
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.
Note: Figures may not add up to total because of rounding.
Source: ADB (unpublished), APERC (APEC Energy Database), and UNSD (2011a).

Table 5.6 The Pacific Energy Balance Table, 2008

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	0	0	9,471	0	0	0	0	0	0	0	338	142	0	320	0	0	292	0	0	0	10,562
2.	Imports	0	0	870	1,967	286	101	923	331	32	294	0	0	0	0	0	0	0	0	0	0	2,838
3.	Exports	0	0	–9,404	–83	–17	–15	–30	0	0	–21	0	0	0	0	0	0	0	0	0	0	–9,487
4.	International Bunkers	0	0	0	–351	–7	0	–77	–6	0	–261	0	0	0	0	0	0	0	0	0	0	–351
5.	Stock Changes	1	0	–85	–26	–4	0	–6	–8	–1	–7	0	0	0	0	0	0	0	0	0	0	–110
6.	Total Primary Energy Supply	1	0	852	1,508	258	86	810	317	32	5	338	142	0	320	0	0	292	0	0	0	3,451
7.	Transfers	0	0	–12	8	11	0	198	1	0	–201	0	0	0	0	0	0	0	0	0	0	–3
8.	Total Transformation Sector	0	0	–807	–21	0	–4	–77	–255	9	306	–118	–142	0	–320	0	0	–170	0	434	0	–1,144
8.1	Power Generation	0	0	–8	–832	0	–4	–452	–376	0	0	–118	–142	0	–320	0	0	0	0	434	0	–985
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	–799	811	0	0	374	121	9	306	0	0	0	0	0	0	0	0	0	0	12
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–170	0	0	0	–170
9.	Loss and Own Use	0	0	0	–14	0	0	–5	0	–2	–8	–220	0	0	0	0	0	0	0	–36	0	–270
10.	Discrepancy	0	0	–29	–12	16	–2	–10	0	–2	–15	0	0	0	0	0	0	–1	0	6	0	–37
11.	Total Final Energy Consumption	1	0	4	1,468	284	80	916	64	37	87	0	0	0	0	0	0	121	0	402	0	1,996
12.	Industry Sector	1	0	4	573	0	0	499	58	15	0	0	0	0	0	0	0	0	0	248	0	825
13.	Transport Sector	0	0	0	766	273	0	400	6	0	87	0	0	0	0	0	0	0	0	0	0	766
14.	Other Sectors	0	0	0	130	11	80	17	0	22	0	0	0	0	0	0	0	121	0	154	0	404
14.1	Residential and Commercial	0	0	0	51	0	38	0	0	14	0	0	0	0	0	0	0	119	0	48	0	218
14.1.1	Commerce and Public Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14.1.2	Residential	0	0	0	51	0	38	0	0	14	0	0	0	0	0	0	0	119	0	48	0	218
14.2	Non-Specified Others	0	0	0	78	11	42	17	0	8	0	0	0	0	0	0	0	1	0	106	0	186
15.	Non-Energy Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16.	Electricity Output (GWh)	0	0	1,622	862	0	15	644	203	0	0	546	1,646	0	372	0	0	0	0	0	0	5,048
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Source: ADB (unpublished), APERC (APEC Energy Database), and UNSD (2011a).

Table 5.7 The Pacific Summary Table, 1990–2009

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Indigenous Production (ktoe)																				
Coal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-
Oil	4,500	5,000	5,300	5,400	5,709	4,717	5,019	3,586	3,832	4,657	3,651	3,057	9,794	9,669	9,425	9,780	10,198	9,330	9,471	-
Gas	72	72	72	74	80	83	117	100	115	113	119	144	144	132	107	241	259	326	338	-
Hydro	75	75	77	77	109	116	126	108	123	132	134	136	141	144	140	141	139	142	142	-
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-
Geothermal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	33	114	195	249	320	-
Solar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-
Wind	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-
Biomass	299	379	377	377	456	405	419	359	301	380	352	320	325	323	323	308	319	275	292	-
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-
Total	4,946	5,526	5,826	5,928	6,353	5,321	5,681	4,151	4,371	5,282	4,256	3,658	10,403	10,268	10,027	10,584	11,111	10,321	10,562	-
Primary Energy Supply (ktoe)																				
Coal	18	14	15	15	14	14	15	15	14	13	12	11	13	14	2	1	1	1	1	-
Oil	1,196	1,209	1,269	1,284	1,296	1,285	1,295	1,347	1,410	1,375	1,505	1,767	1,837	2,318	2,485	2,353	2,352	2,458	2,360	-
Gas	72	72	72	74	80	83	117	100	115	113	119	144	144	132	107	241	259	326	338	-
Hydro	75	75	77	77	109	116	126	108	123	132	134	136	141	144	140	141	139	142	142	-
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-
Geothermal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	33	114	195	249	320	-
Solar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-
Wind	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-
Biomass	299	379	377	377	456	405	419	359	302	380	352	320	325	323	323	308	320	275	292	-
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-
Total	1,659	1,749	1,811	1,827	1,955	1,903	1,973	1,928	1,963	2,014	2,122	2,379	2,460	2,931	3,089	3,159	3,266	3,450	3,451	-
Final Energy Consumption by Sector (ktoe)																				
Industry	271	271	273	271	329	364	384	369	417	485	624	686	709	841	888	852	832	850	825	-
Transport	415	418	444	458	476	484	492	487	472	487	540	626	627	750	821	781	804	793	766	-
Residential	150	146	155	155	194	200	205	239	243	278	263	287	296	311	251	210	212	217	218	-
Commercial	2	2	2	2	2	2	2	2	2	3	3	0	0	0	0	0	0	0	0	-
Others	201	203	203	199	111	110	124	132	135	139	42	70	63	146	181	215	213	184	186	-
Total	1,039	1,041	1,076	1,086	1,112	1,161	1,207	1,230	1,269	1,391	1,472	1,669	1,695	2,048	2,142	2,058	2,061	2,043	1,996	-

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Table 5.7 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Final Energy Consumption by Type																				
Coal	12	14	15	15	14	14	15	15	14	13	12	11	10	9	1	1	1	1	1	–
Oil	694	694	729	733	882	904	931	929	925	1,014	1,067	1,224	1,226	1,548	1,639	1,548	1,552	1,525	1,472	–
Gas	72	72	72	74	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Electricity	193	193	192	195	147	172	190	183	228	241	270	311	337	368	379	386	385	397	402	–
Heat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Biomass	69	69	69	69	69	71	71	102	102	122	122	123	123	123	123	123	123	121	121	–
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Total	1,039	1,041	1,076	1,086	1,112	1,161	1,207	1,230	1,269	1,391	1,472	1,669	1,695	2,048	2,142	2,058	2,061	2,043	1,996	–
Power Generation (GWh)																				
Thermal	1,568	1,580	1,683	1,702	874	1,114	1,251	1,365	1,766	1,512	1,830	2,366	2,652	3,068	3,209	3,143	3,062	3,057	3,030	–
Hydro	870	870	900	900	1,259	1,345	1,463	1,250	1,427	1,540	1,563	1,588	1,638	1,669	1,632	1,634	1,622	1,651	1,646	–
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Geothermal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	38	132	227	289	372	–
Solar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Wind	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Others	0	0	0	0	0	0	0	0	0	349	186	0	0	0	0	0	0	0	0	–
Total	2,438	2,450	2,583	2,602	2,133	2,459	2,714	2,615	3,193	3,401	3,579	3,954	4,290	4,737	4,879	4,909	4,911	4,998	5,048	–
Loss and Own Use of Electricity (GWh)																				
Transmission and Distribution Losses	54	64	78	84	91	101	120	104	104	114	108	139	165	163	321	290	308	319	292	–
Own Use	–	–	–	–	–	–	–	–	–	–	–	–	–	–	104	75	75	78	78	–
Total	54	64	78	84	91	101	120	104	104	114	108	139	165	163	425	366	383	397	370	–
Fuel Input for Power Generation (ktoe)																				
Coal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Oil	441	442	478	480	234	248	249	289	341	343	416	537	633	763	778	735	756	849	840	–
Gas	0	0	0	0	11	83	117	108	141	137	119	137	137	132	107	120	111	108	118	–
Total	441	442	478	480	245	330	365	396	482	480	535	674	770	895	884	855	867	957	958	–
CO_2 Emissions (kt C)																				
Coal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Oil	960	959	1,019	1,023	923	953	978	1,011	1,057	1,132	1,239	1,473	1,556	1,938	2,044	1,946	1,957	2,012	1,959	–
Gas	46	46	46	47	7	53	75	69	91	88	76	88	88	85	68	155	166	209	216	–
Total	1,006	1,005	1,065	1,070	930	1,006	1,052	1,080	1,148	1,220	1,315	1,560	1,644	2,023	2,112	2,101	2,123	2,221	2,175	–

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Table 5.7 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Macroeconomic Indicators																				
Population (thousand)	5,855	5,987	6,125	6,267	6,413	6,562	6,715	6,869	7,027	7,186	7,349	7,512	8,564	8,772	8,985	9,195	9,402	9,603	9,807	10,014
Urban Population, %	19.9	19.8	19.8	19.7	19.7	19.6	19.5	19.4	19.3	19.1	19.0	18.9	19.5	19.5	19.4	19.4	19.5	19.5	19.6	19.6
GDP (constant 2000 $ million)	4,986	5,333	5,832	6,439	6,794	6,799	7,167	6,969	6,891	7,102	6,979	7,001	7,337	7,497	7,752	7,979	8,164	8,543	8,936	9,169
GDP (current $ million)	5,682	6,414	7,250	7,999	8,978	8,387	9,171	8,934	7,221	7,212	6,992	6,468	6,856	8,070	9,129	10,570	11,546	13,006	15,244	14,405
GDP (constant 2005 PPP $ million)	11,851	12,760	14,085	15,802	16,706	16,581	17,622	17,123	16,846	17,317	16,955	16,962	17,678	18,068	18,673	19,266	19,733	20,798	21,864	22,608
GDP/capita (constant 2000 $)	854	891	952	1,027	1,059	1,036	1,067	1,015	981	988	950	932	857	855	863	868	868	890	911	916
GDP/capita (current $)	970	1,071	1,184	1,276	1,400	1,278	1,366	1,301	1,028	1,004	951	861	801	920	1,016	1,150	1,228	1,354	1,554	1,438
GDP - Manufacturing (% of GDP)	8.3	8.6	8.1	7.6	7.7	7.8	8.1	8.7	9.0	8.7	8.2	8.6	8.2	8.1	8.3	7.9	7.9	7.7	7.4	7.2
Car Ownership (car/1,000 persons)	34	34	35	31	31	33	31	30	34	37	36	35	35	35	34	34	33	33	33	33
Basic Energy Indicators																				
TPES/capita (toe/person)	0.29	0.30	0.30	0.30	0.31	0.30	0.30	0.29	0.29	0.29	0.29	0.32	0.29	0.33	0.34	0.34	0.35	0.36	0.35	–
TFEC/capita (toe/person)	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.20	0.20	0.22	0.20	0.23	0.24	0.22	0.22	0.21	0.20	–
TPES/GDP (toe/constant 2000 $ million)	353	355	328	299	303	296	289	290	299	297	309	346	341	391	398	396	400	404	386	–
TFEC/GDP (toe/constant 2000 $ million)	221	211	195	178	172	180	177	185	193	205	214	242	235	273	276	258	252	239	223	–
Import Dependency (%)	–198.1	–216.0	–221.8	–224.4	–225.0	–179.6	–188.0	–115.3	–122.7	–162.3	–100.6	–53.8	–322.9	–250.3	–224.6	–235.1	–240.2	–199.1	–206.0	–
Oil Import Dependency (%)	–276.4	–313.5	–317.5	–320.5	–340.4	–267.0	–287.5	–166.2	–171.8	–238.6	–142.6	–73.0	–433.1	–317.1	–279.3	–315.6	–333.6	–279.6	–301.4	–
Electricity/capita (kWh/ person)	393	385	373	372	273	313	338	317	386	399	431	485	461	488	490	488	477	481	477	–
CO_2 Intensity (t C/constant 2000 $ million)	214	204	193	175	144	156	154	162	175	180	191	227	228	270	272	263	260	260	243	–
CO_2/capita (t C)	0.18	0.17	0.18	0.18	0.15	0.16	0.16	0.16	0.17	0.17	0.18	0.21	0.19	0.23	0.24	0.23	0.23	0.23	0.22	–
CO_2/TPES (t C/toe)	0.61	0.57	0.59	0.59	0.48	0.53	0.53	0.56	0.58	0.61	0.62	0.66	0.67	0.69	0.68	0.67	0.65	0.64	0.63	–

– = no data or not applicable, CO_2 = carbon dioxide, GDP = gross domestic product, GWh = gigawatt-hour, kt C = thousand tons of carbon equivalent, ktoe = thousand tons of oil equivalent, kWh = kilowatt-hour, PPP = purchasing power parity, t C = ton of carbon equivalent, TFEC = total final energy consumption, toe = ton of oil equivalent, TPES = total primary energy supply.

Notes: Figures may not add up to total because of rounding.

The following countries are excluded from the calculation of basic energy indicators due to unavailability of energy data: Marshall Islands (1990 - 2002); Federated States of Micronesia (1990 - 19999); Palau (1990 - 1992); Timor-Leste (1990 - 2001).

Sources: ADB (unpublished), APERC (APEC Energy Database), APERC estimates, JAMA (2012), UNSD (2011a), and World Bank.

5.1 Cook Islands

Country Profile (2009)		Energy Reserves (year-end 2008)	
Total Surface Area (square kilometer)	237	Coal (million ton) - Recoverable	0.0
Population (thousand)	23	Gas (trillion cubic feet) - Proven	0.0
GDP (billion constant 2000 $)	0.1	Oil (billion barrel) - Proven	0.0
Electrification Rate (%)	100.0		

GDP = gross domestic product.

Sources: ADB (2011 and 2012), CIA (2012), and GenderCC of the UNFCCC (2010).

2008 Energy Supply and Demand Flow (ktoe)

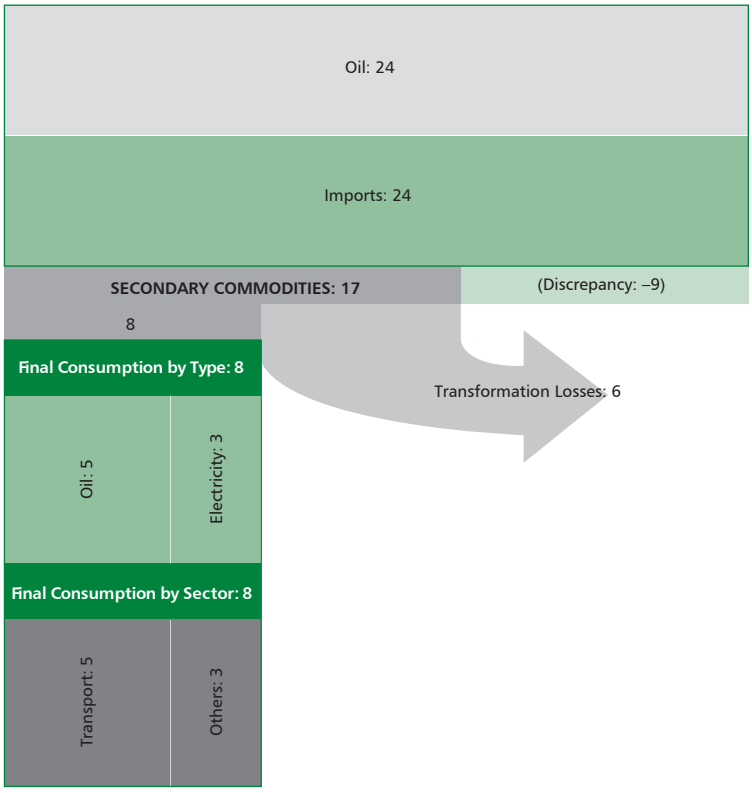


Table 5.1.1 Key Data and Economic Profile

	1990	1995	2000	2005	2008
Socioeconomic Data					
Population (thousand)	17	19	18	22	22
GDP (constant 2000 $ billion)	0.1	0.1	0.1	0.1	0.1
GDP (constant 2005 PPP $ billion)	–	–	–	–	–
GDP/capita (constant 2000 $)	3,588	3,686	4,514	4,573	4,343
GDP/capita (constant 2005 PPP $)	–	–	–	–	–

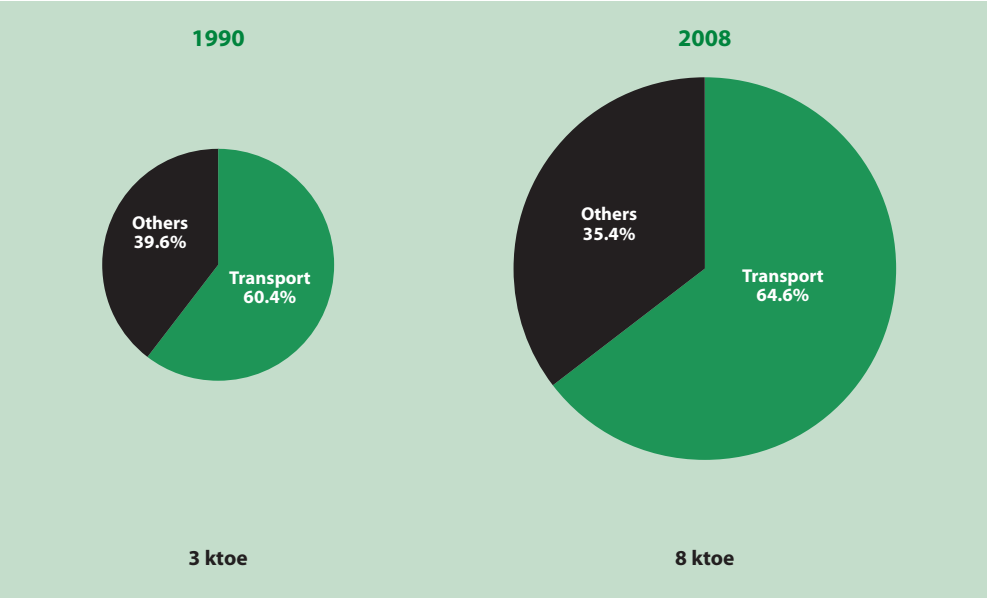
– = no data or not applicable, GDP = gross domestic product, PPP = purchasing power parity.
Source: ADB (2011).

Table 5.1.2 Energy Supply and Demand

	1990	1995	2000	2005	2008
Primary Energy Supply (ktoe)					
Indigenous Production	0	0	0	0	0
Net Imports	7	7	9	20	24
Total PES	7	7	9	20	24
Coal	0	0	0	0	0
Oil	7	7	9	20	24
Gas	0	0	0	0	0
Biomass	0	0	0	0	0
Others	0	0	0	0	0
TPES/capita (toe)	0.42	0.37	0.52	0.95	1.06
TPES/GDP (toe/constant 2005 PPP $ million)	–	–	–	–	–
Final Energy Consumption (ktoe)					
Industry	0	0	0	0	0
Transportation	2	2	3	5	5
Other Sectors	1	1	2	3	3
Total FEC	3	3	5	8	8
Coal	0	0	0	0	0
Oil	2	2	3	5	5
Gas	0	0	0	0	0
Electricity	1	1	2	3	3
Biomass	0	0	0	0	0
Others	0	0	0	0	0

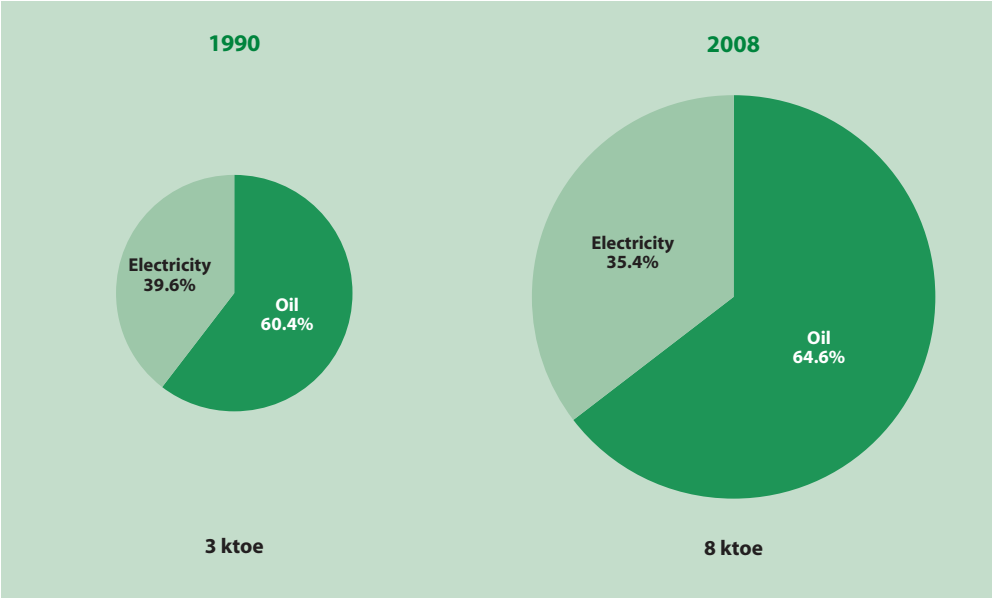
– = no data or not applicable, FEC = final energy consumption, GDP = gross domestic product, ktoe = thousand tons of oil equivalent, PES = primary energy supply, PPP = purchasing power parity, toe = ton of oil equivalent, TPES = total primary energy supply.
Source: UNSD (2011a).

Figure 5.1.1 Final Energy Consumption by Sector, 1990 and 2008



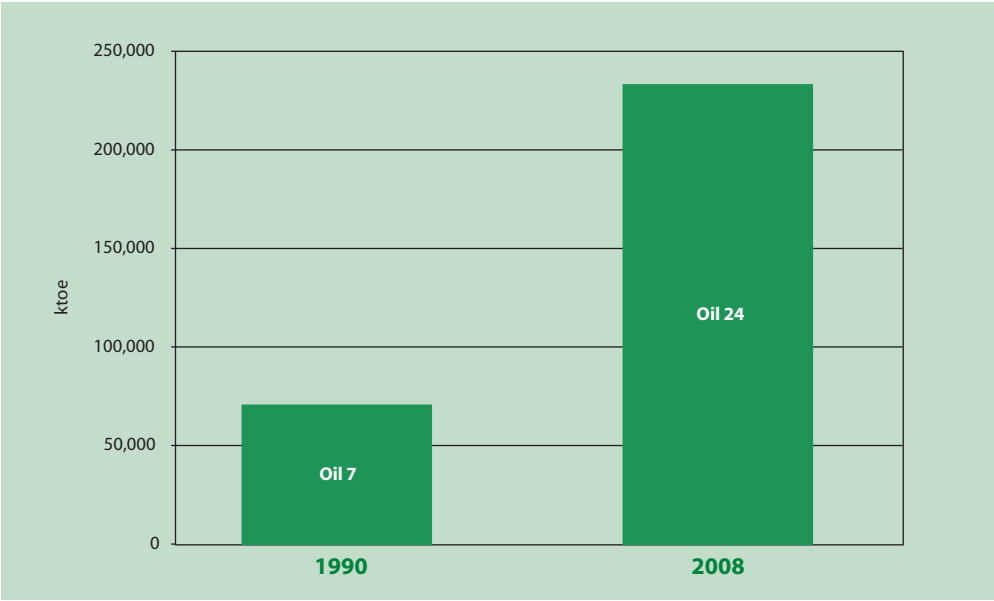
ktoe = thousand tons of oil equivalent.
Source: UNSD (2011a).

Figure 5.1.2 Final Energy Consumption by Type of Energy, 1990 and 2008



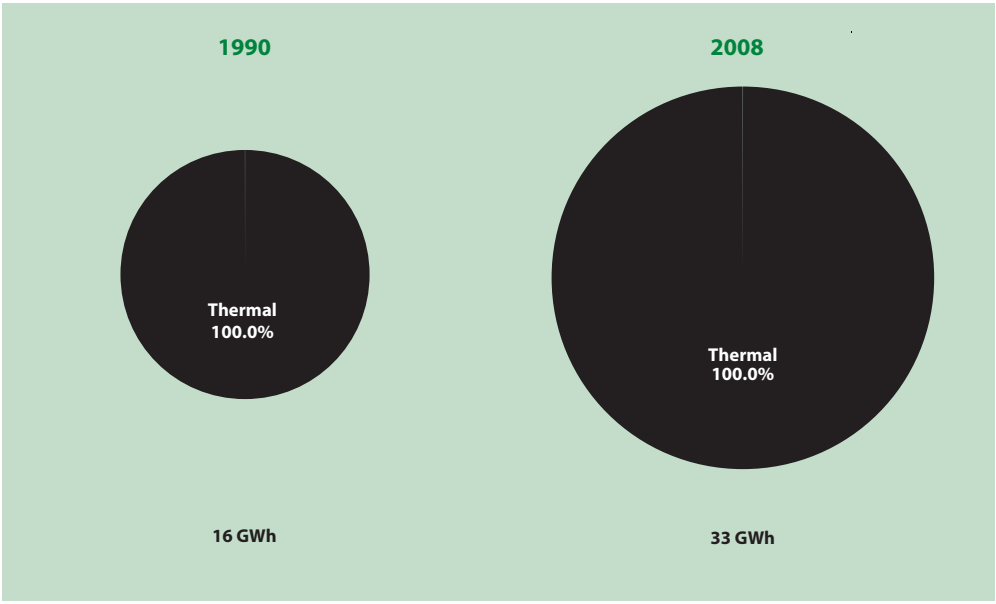
ktoe = thousand tons of oil equivalent.
Source: UNSD (2011a).

Figure 5.1.3 Total Primary Energy Supply, 1990 and 2008



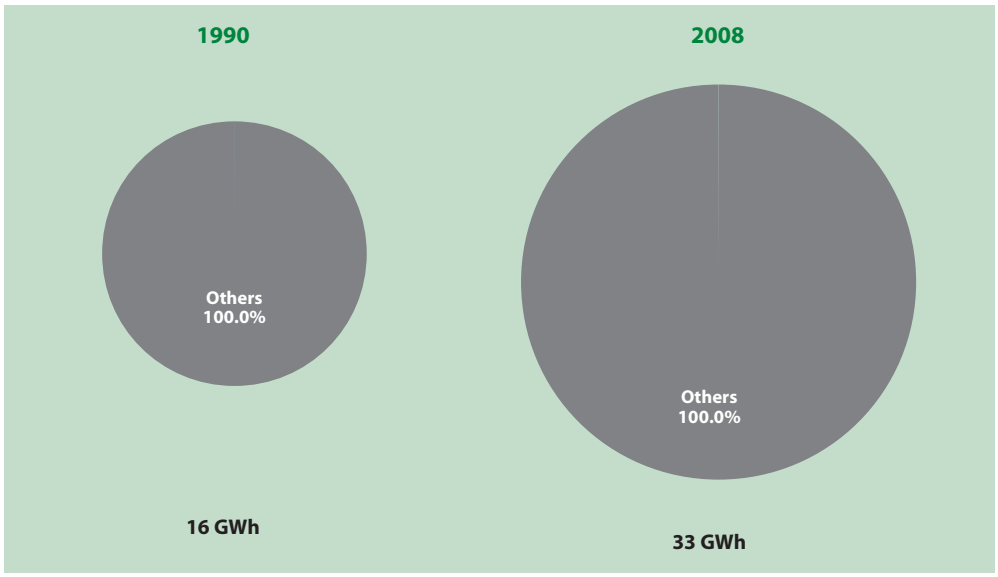
ktoe = thousand tons of oil equivalent.
Source: UNSD (2011a).

Figure 5.1.4 Electricity Generation by Plant Type, 1990 and 2008



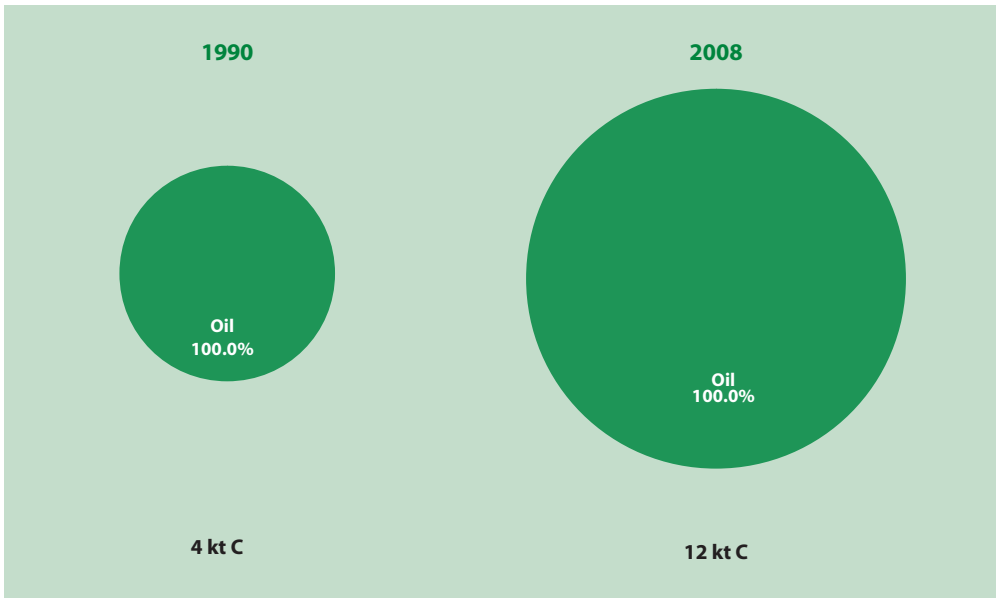
GWh = gigawatt-hour.
Source: UNSD (2011a).

Figure 5.1.5 Electricity Consumption by Sector, 1990 and 2008



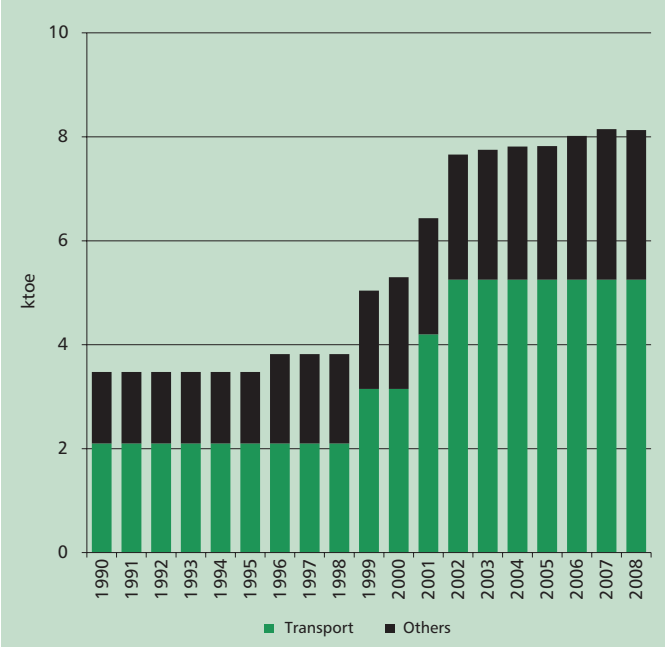
GWh = gigawatt-hour.
Source: UNSD (2011a).

Figure 5.1.6 Carbon Dioxide Emissions from Fuel Combustion, 1990 and 2008



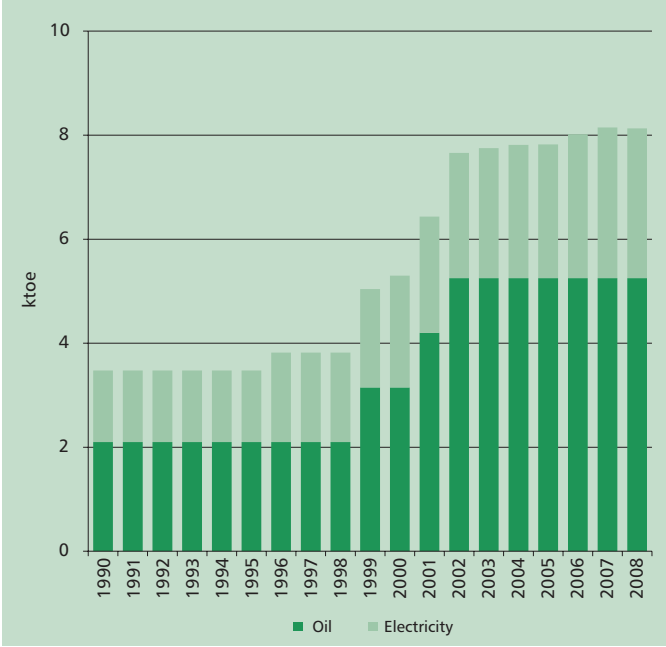
kt C = thousand tons of carbon equivalent.
Source: APERC estimates.

Figure 5.1.7 Final Energy Consumption by Sector, 1990–2008



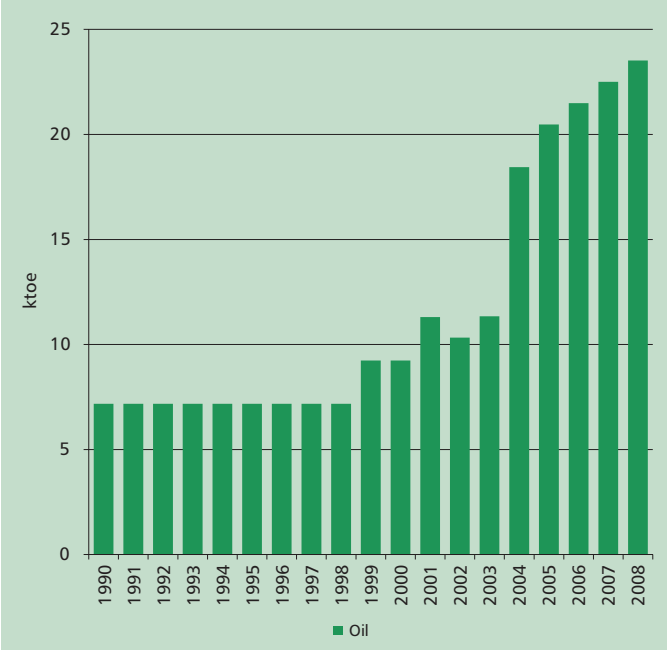
kt C = thousand tons of carbon equivalent.
Source: UNSD (2011a).

Figure 5.1.8 Final Energy Consumption by Type, 1990-2008



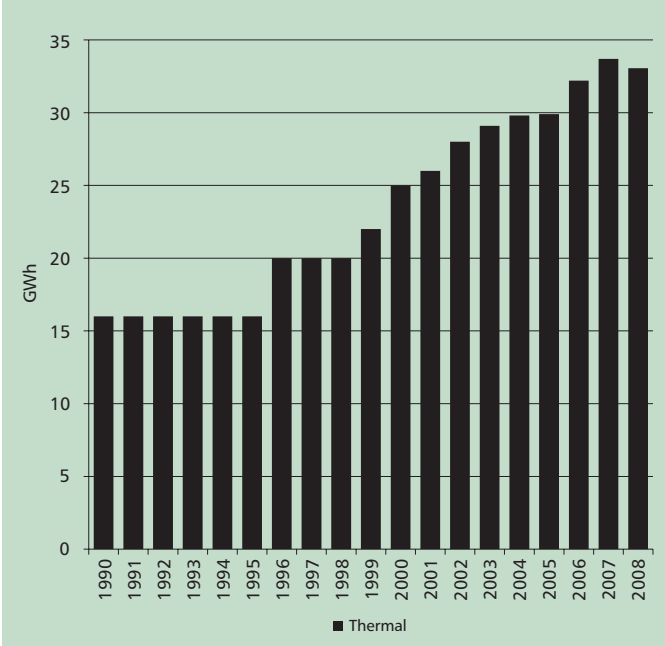
ktoe = thousand tons of oil equivalent.
Source: UNSD (2011a).

Figure 5.1.9 Total Primary Energy Supply, 1990–2008



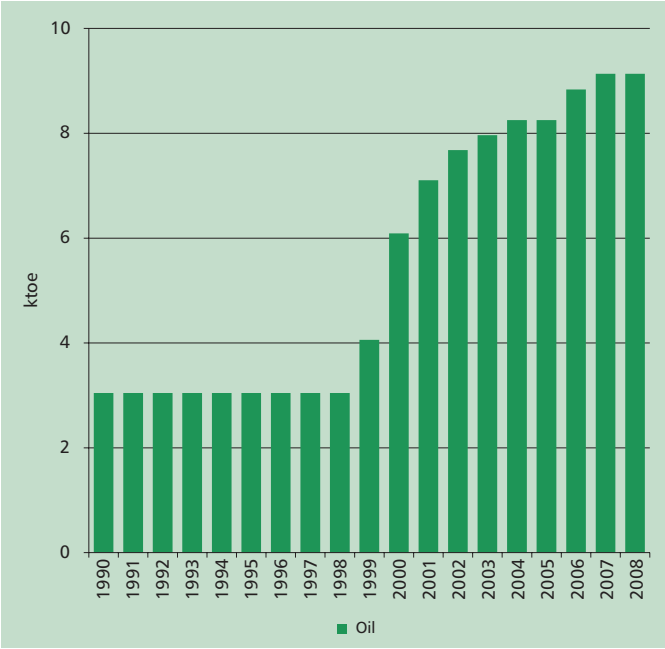
ktoe = thousand tons of oil equivalent.
Source: UNSD (2011a).

Figure 5.1.10 Electricity Generation by Source, 1990–2008



GWh = gigawatt-hour.
Source: UNSD (2011a).

Figure 5.1.11 Fuel Input for Electricity Generation, 1990-2008

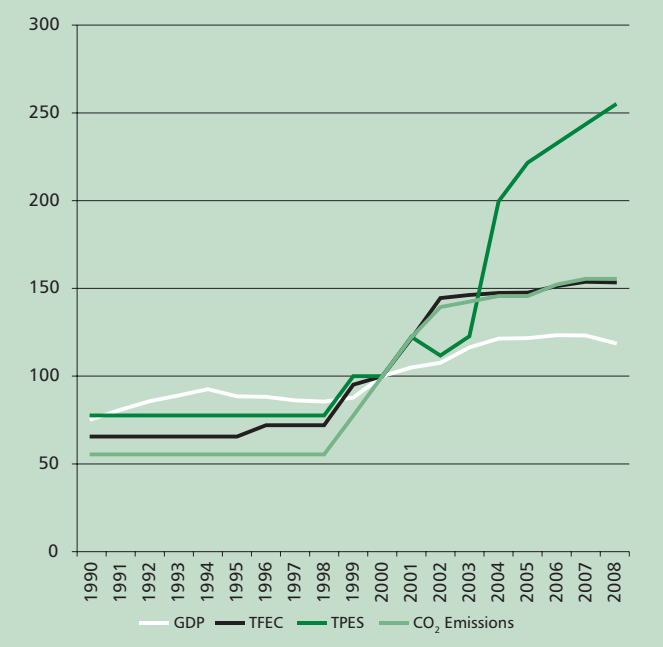


ktoe = thousand tons of oil equivalent.
Source: UNSD (2011a).

Figure 5.1.12 Carbon Dioxide Emissions from Fuel Combustion, 1990–2008

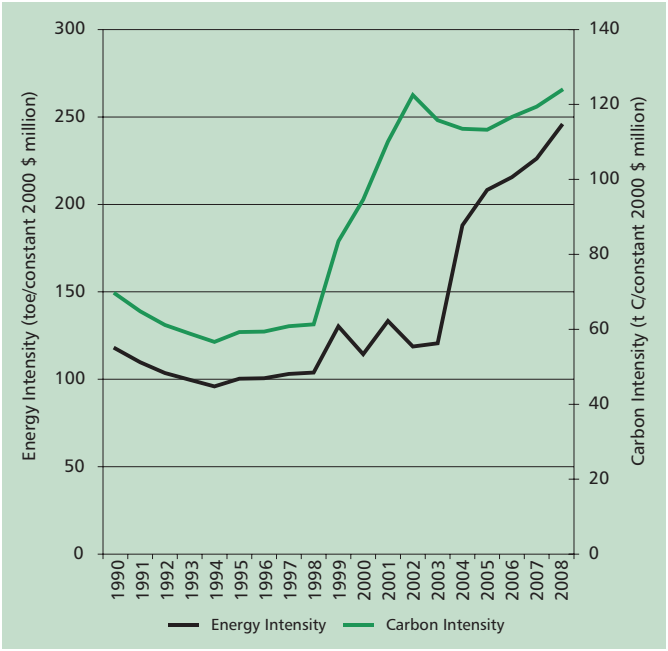
kt C = thousand tons of carbon equivalent.
Source: APERC estimates.

Figure 5.1.13 Growth of GDP, TFEC, TPES, and CO_2 (indexed to year 2000), 1990–2008



CO_2 = carbon dioxide, GDP = gross domestic product, TFEC = total final energy consumption, TPES = total primary energy supply.
Source: APERC estimates.

Figure 5.1.14 Energy and Carbon Intensities, 1990–2009



toe = ton of oil equivalent, t C = ton of carbon equivalent.
Source: APERC estimates.

Table 5.1.3 Cook Islands Energy Balance Table, 2005

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.	Imports	0	0	0	20	5	0	15	0	0	0	0	0	0	0	0	0	0	0	0	0	20
3.	Exports	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.	International Bunkers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5.	Stock Changes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6.	Total Primary Energy Supply	0	0	0	20	5	0	15	0	0	0	0	0	0	0	0	0	0	0	0	0	20
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	0	0	0	–8	0	0	–8	0	0	0	0	0	0	0	0	0	0	0	3	0	–6
8.1	Power Generation	0	0	0	–8	0	0	–8	0	0	0	0	0	0	0	0	0	0	0	3	0	–6
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10.	Discrepancy	0	0	0	–7	0	0	–7	0	0	0	0	0	0	0	0	0	0	0	0	0	–7
11.	Total Final Energy Consumption	0	0	0	5	5	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	8
12.	Industry Sector	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13.	Transport Sector	0	0	0	5	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
14.	Other Sectors	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3
14.1	Residential and Commercial	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14.1.1	Commerce and Public Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14.1.2	Residential	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14.2	Non–Specified Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3
15.	Non–Energy Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16.	Electricity Output (GWh)	0	0	0	30	0	0	30	0	0	0	0	0	0	0	0	0	0	0	0	0	30
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.
Note: Figures may not add up to total because of rounding.
Source: UNSD (2011a).

Table 5.1.4 Cook Islands Energy Balance Table, 2006

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.	Imports	0	0	0	21	5	0	16	0	0	0	0	0	0	0	0	0	0	0	0	0	21
3.	Exports	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.	International Bunkers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5.	Stock Changes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6.	Total Primary Energy Supply	0	0	0	21	5	0	16	0	0	0	0	0	0	0	0	0	0	0	0	0	21
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	0	0	0	–9	0	0	–9	0	0	0	0	0	0	0	0	0	0	0	3	0	–6
8.1	Power Generation	0	0	0	–9	0	0	–9	0	0	0	0	0	0	0	0	0	0	0	3	0	–6
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10.	Discrepancy	0	0	0	–7	0	0	–7	0	0	0	0	0	0	0	0	0	0	0	0	0	–7
11.	Total Final Energy Consumption	0	0	0	5	5	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	8
12.	Industry Sector	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13.	Transport Sector	0	0	0	5	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
14.	Other Sectors	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3
14.1	Residential and Commercial	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14.1.1	Commerce and Public Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14.1.2	Residential	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14.2	Non-Specified Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3
15.	Non-Energy Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16.	Electricity Output (GWh)	0	0	0	32	0	0	32	0	0	0	0	0	0	0	0	0	0	0	0	0	32
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Source: UNSD (2011a).

Table 5.1.5 Cook Islands Energy Balance Table, 2007

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.	Imports	0	0	0	23	5	0	17	0	0	0	0	0	0	0	0	0	0	0	0	0	23
3.	Exports	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.	International Bunkers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5.	Stock Changes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6.	Total Primary Energy Supply	0	0	0	23	5	0	17	0	0	0	0	0	0	0	0	0	0	0	0	0	23
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	0	0	0	–9	0	0	–9	0	0	0	0	0	0	0	0	0	0	0	3	0	–6
8.1	Power Generation	0	0	0	–9	0	0	–9	0	0	0	0	0	0	0	0	0	0	0	3	0	–6
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10.	Discrepancy	0	0	0	–8	0	0	–8	0	0	0	0	0	0	0	0	0	0	0	0	0	–8
11.	Total Final Energy Consumption	0	0	0	5	5	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	8
12.	Industry Sector	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13.	Transport Sector	0	0	0	5	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
14.	Other Sectors	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3
14.1	Residential and Commercial	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14.1.1	Commerce and Public Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14.1.2	Residential	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14.2	Non–Specified Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3
15.	Non–Energy Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16.	Electricity Output (GWh)	0	0	0	34	0	0	34	0	0	0	0	0	0	0	0	0	0	0	0	0	34
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.
Note: Figures may not add up to total because of rounding.
Source: UNSD (2011a).

Table 5.1.6 Cook Islands Energy Balance Table, 2008

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.	Imports	0	0	0	24	5	0	18	0	0	0	0	0	0	0	0	0	0	0	0	0	24
3.	Exports	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.	International Bunkers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5.	Stock Changes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6.	Total Primary Energy Supply	0	0	0	24	5	0	18	0	0	0	0	0	0	0	0	0	0	0	0	0	24
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	0	0	0	–9	0	0	–9	0	0	0	0	0	0	0	0	0	0	0	3	0	–6
8.1	Power Generation	0	0	0	–9	0	0	–9	0	0	0	0	0	0	0	0	0	0	0	3	0	–6
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10.	Discrepancy	0	0	0	–9	0	0	–9	0	0	0	0	0	0	0	0	0	0	0	0	0	–9
11.	Total Final Energy Consumption	0	0	0	5	5	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	8
12.	Industry Sector	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13.	Transport Sector	0	0	0	5	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
14.	Other Sectors	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3
14.1	Residential and Commercial	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14.1.1	Commerce and Public Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14.1.2	Residential	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14.2	Non-Specified Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3
15.	Non-Energy Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16.	Electricity Output (GWh)	0	0	0	33	0	0	33	0	0	0	0	0	0	0	0	0	0	0	0	0	33
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Source: UNSD (2011a).

Table 5.1.7 Cook Islands Summary Table, 1990–2009

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Indigenous Production (ktoe)																				
Coal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Oil	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Gas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Hydro	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Geothermal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Solar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Wind	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Biomass	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Primary Energy Supply (ktoe)																				
Coal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Oil	7	7	7	7	7	7	7	7	7	9	9	11	10	11	18	20	21	23	24	–
Gas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Hydro	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Geothermal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Solar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Wind	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Biomass	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Total	7	7	7	7	7	7	7	7	7	9	9	11	10	11	18	20	21	23	24	–
Final Energy Consumption by Sector (ktoe)																				
Industry	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Transport	2	2	2	2	2	2	2	2	2	3	3	4	5	5	5	5	5	5	5	–
Residential	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Commercial	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Others	1	1	1	1	1	1	2	2	2	2	2	2	2	3	3	3	3	3	3	–
Total	3	3	3	3	3	3	4	4	4	5	5	6	8	8	8	8	8	8	8	–

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Table 5.1.7 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Final Energy Consumption by Type (ktoe)																				
Coal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Oil	2	2	2	2	2	2	2	2	2	3	3	4	5	5	5	5	5	5	5	–
Gas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Electricity	1	1	1	1	1	1	2	2	2	2	2	2	2	3	3	3	3	3	3	–
Heat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Biomass	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Total	3	3	3	3	3	3	4	4	4	5	5	6	8	8	8	8	8	8	8	–
Power Generation (GWh)																				
Thermal	16	16	16	16	16	16	20	20	20	22	25	26	28	29	30	30	32	34	33	–
Hydro	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Geothermal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Solar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Wind	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Total	16	16	16	16	16	16	20	20	20	22	25	26	28	29	30	30	32	34	33	–
Loss and Own Use of Electricity (GWh)																				
Transmission and Distribution Losses	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Own Use	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Total	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Fuel Input for Power Generation (ktoe)																				
Coal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Oil	3	3	3	3	3	3	3	3	3	4	6	7	8	8	8	8	9	9	9	–
Gas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Total	3	3	3	3	3	3	3	3	3	4	6	7	8	8	8	8	9	9	9	–
CO_2 Emissions (kt C)																				
Coal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Oil	4	4	4	4	4	4	4	4	4	6	8	9	11	11	11	11	12	12	12	–
Gas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Total	4	4	4	4	4	4	4	4	4	6	8	9	11	11	11	11	12	12	12	–

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Table 5.1.7 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Macroeconomic Indicators																				
Population (thousand)	17	18	19	20	20	19	20	18	17	16	18	18	18	18	20	22	24	21	22	23
Urban Population, %	58.4	58.5	58.6	58.6	58.7	58.7	58.8	60.6	62.3	64.1	65.8	67.6	68.9	70.2	73.0	74.5	76.9	73.9	75.2	75.7
GDP (constant 2000 $ million)	61	65	69	72	75	72	71	70	69	71	81	85	87	94	98	98	100	99	96	93
GDP (current $ million)	59	64	66	74	88	93	94	87	76	81	92	96	111	153	178	183	188	228	233	207
GDP (constant 2005 PPP $ million)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
GDP/capita (constant 2000 $)	3,588	3,591	3,645	3,653	3,835	3,686	3,565	3,826	3,994	4,326	4,514	4,683	4,725	5,110	4,832	4,573	4,206	4,737	4,343	4,096
GDP/capita (current $)	3,450	3,514	3,479	3,751	4,499	4,814	4,709	4,757	4,364	4,929	5,119	5,317	6,043	8,303	8,792	8,491	7,926	10,854	10,563	9,139
GDP – Manufacturing (% of GDP)	3.9	2.5	2.7	2.8	2.8	2.8	2.5	2.6	3.3	3.3	3.9	3.9	3.9	3.9	4.1	4.1	3.6	3.7	4.0	4.2
Car Ownership (car/1,000 persons)	–	–	–	–	–	–	–	–	–	–	–	–	–	283	256	247	228	257	249	250
Basic Energy Indicators																				
TPES/capita (toe/person)	0.42	0.39	0.38	0.36	0.37	0.37	0.36	0.39	0.41	0.56	0.52	0.62	0.56	0.62	0.91	0.95	0.91	1.07	1.06	–
TFEC/capita (toe/person)	0.20	0.19	0.18	0.18	0.18	0.18	0.19	0.21	0.22	0.31	0.30	0.36	0.42	0.42	0.38	0.36	0.34	0.39	0.37	–
TPES/GDP (toe/constant 2000 $ million)	118	110	104	100	96	100	101	103	104	130	114	133	119	121	188	208	216	226	245	–
TFEC/GDP (toe/constant 2000 $ million)	57	53	50	48	46	49	54	55	55	71	66	76	88	82	80	80	80	82	85	–
Import Dependency (%)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	–
Oil Import Dependency (%)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	–
Electricity/capita (kWh/ person)	941	879	842	812	821	825	1,000	1,099	1,156	1,341	1,397	1,436	1,522	1,582	1,468	1,391	1,359	1,605	1,516	–
CO_2 Intensity (t C/constant 2000 $ million)	69	65	61	59	57	59	59	61	61	84	95	110	122	116	114	113	117	119	124	–
CO_2/capita (t C)	0.25	0.23	0.22	0.22	0.22	0.22	0.21	0.23	0.24	0.36	0.43	0.52	0.58	0.59	0.55	0.52	0.49	0.57	0.54	–
CO_2/TPES (t C/toe)	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.64	0.83	0.83	1.03	0.96	0.60	0.54	0.54	0.53	0.51	–

– = no data or not applicable, CO_2 = carbon dioxide, GDP = gross domestic product, GWh = gigawatt–hour, kt C = thousand tons of carbon equivalent, ktoe = thousand tons of oil equivalent, kWh = kilowatt–hour, PPP = purchasing power parity, t C = ton of carbon equivalent, TFEC = total final energy consumption, toe = ton of oil equivalent, TPES = total primary energy supply.

Note: Figures may not add up to total because of rounding.

Sources: ADB (2011), APERC estimates, JAMA (2012), and UNSD (2011a).

5.2 Fiji

Country Profile (2009)		Energy Reserves (year-end 2008)	
Total Surface Area (square kilometer)	18,270	Coal (million ton) - Recoverable	0.0
Population (thousand)	852	Gas (trillion cubic feet) - Proven	0.0
GDP (billion constant 2000 $)	1.9	Oil (billion barrel) - Proven	0.0
Electrification Rate (%)	75.0		

GDP = gross domestic product.

Sources: ADB (2012), CIA (2012), Ostojic et al. (2011), and World Bank.

2008 Energy Supply and Demand Flow (ktoe)

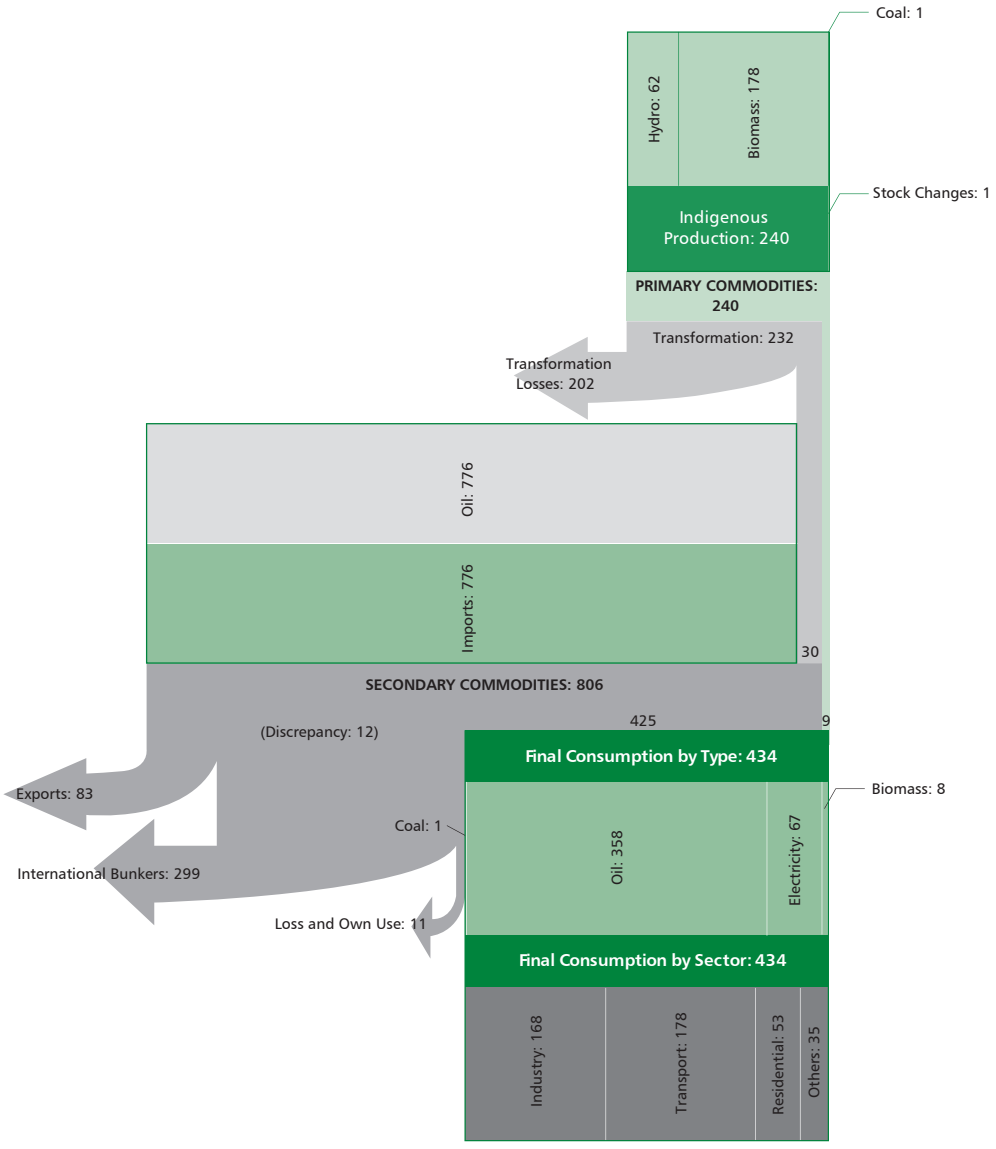


Table 5.2.1 Key Data and Economic Profile

	1990	1995	2000	2005	2008
Socioeconomic Data					
Population (thousand)	728	776	812	823	844
GDP (constant 2000 $ billion)	1.3	1.5	1.7	1.9	1.9
GDP (constant 2005 PPP $ billion)	2.5	2.8	3.2	3.6	3.6
GDP/capita (constant 2000 $)	1,833	1,955	2,075	2,308	2,296
GDP/capita (constant 2005 PPP $)	3,434	3,662	3,886	4,323	4,300

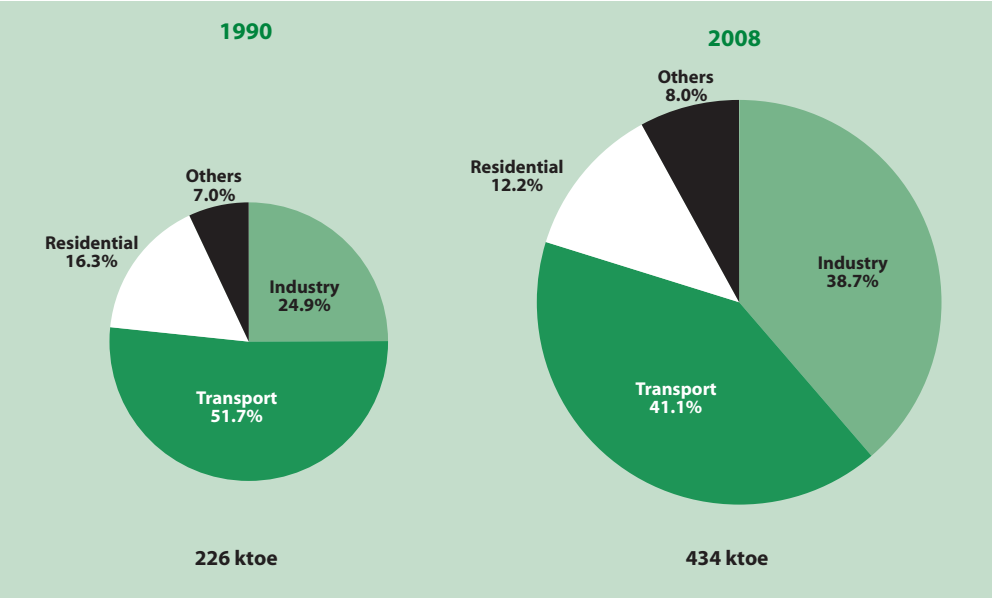
GDP = gross domestic product, PPP = purchasing power parity.
Source: World Bank.

Table 5.2.2 Energy Supply and Demand

	1990	1995	2000	2005	2008
Primary Energy Supply (ktoe)					
Indigenous Production	235	321	269	250	240
Net Imports	256	280	265	526	395
Total PES	491	600	534	776	635
Coal	17	14	12	1	1
Oil	239	266	253	525	394
Gas	0	0	0	0	0
Biomass	202	284	220	192	178
Others	33	37	49	58	62
TPES/capita (toe)	0.67	0.77	0.66	0.94	0.75
TPES/GDP (toe/constant 2005 PPP $ million)	196	211	169	218	175
Final Energy Consumption (ktoe)					
Industry	56	67	121	204	168
Transportation	117	115	108	234	178
Other Sectors	53	55	53	104	88
Total FEC	226	237	282	542	434
Coal	11	14	12	1	1
Oil	172	176	212	471	358
Gas	0	0	0	0	0
Electricity	36	39	50	62	67
Biomass	8	8	8	8	8
Others	0	0	0	0	0

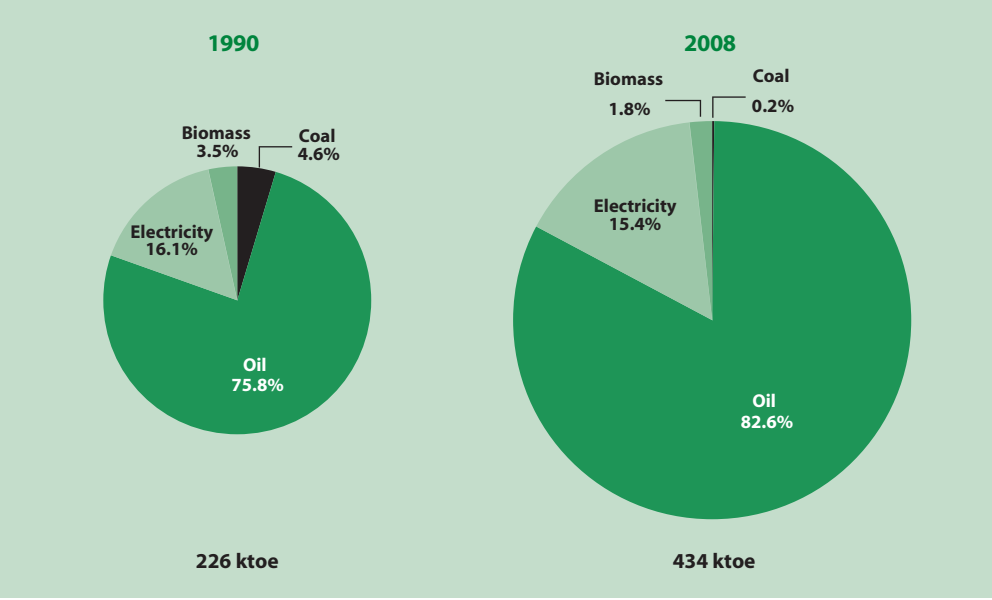
FEC = final energy consumption, GDP = gross domestic product, ktoe = thousand tons of oil equivalent, PES = primary energy supply, PPP = purchasing power parity, toe = ton of oil equivalent, TPES = total primary energy supply.
Source: UNSD (2011a).

Figure 5.2.1 Final Energy Consumption by Sector, 1990 and 2008



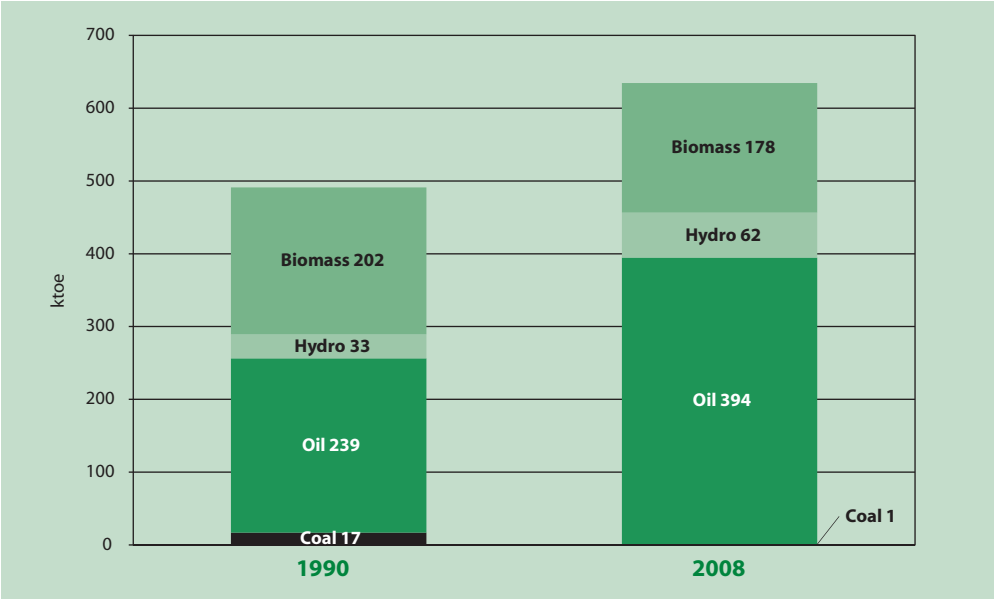
ktoe = thousand tons of oil equivalent.
Source: UNSD (2011a).

Figure 5.2.2 Final Energy Consumption by Type of Energy, 1990 and 2008



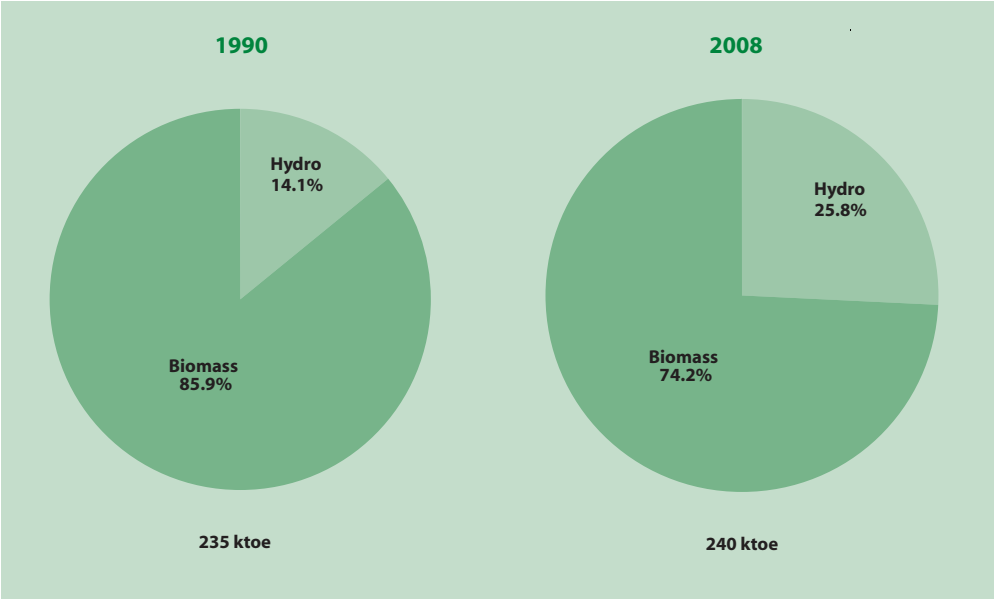
ktoe = thousand tons of oil equivalent.
Source: UNSD (2011a).

Figure 5.2.3 Total Primary Energy Supply, 1990 and 2008



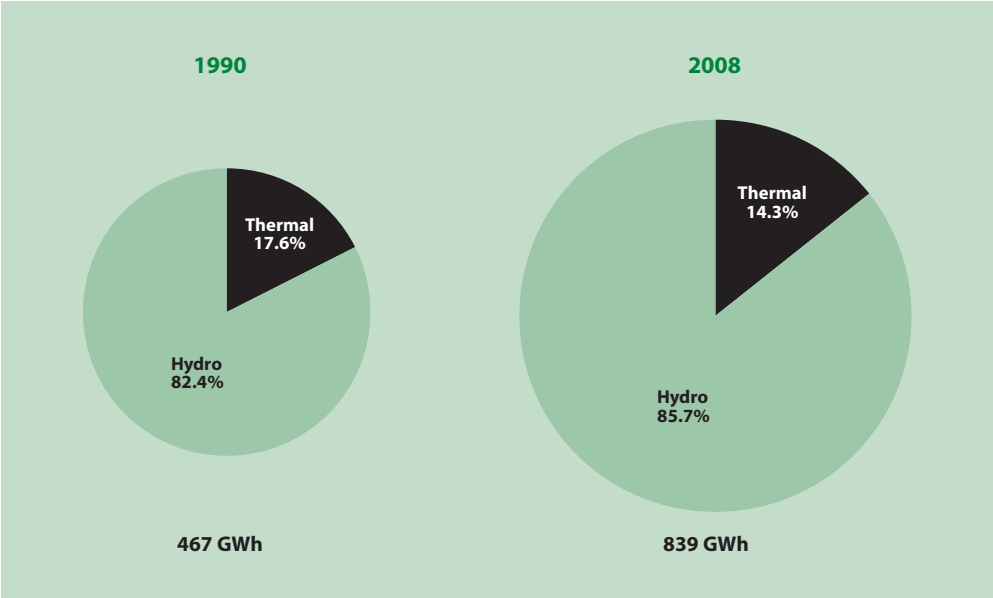
ktoe = thousand tons of oil equivalent.
Source: UNSD (2011a).

Figure 5.2.4 Indigenous Energy Production, 1990 and 2008



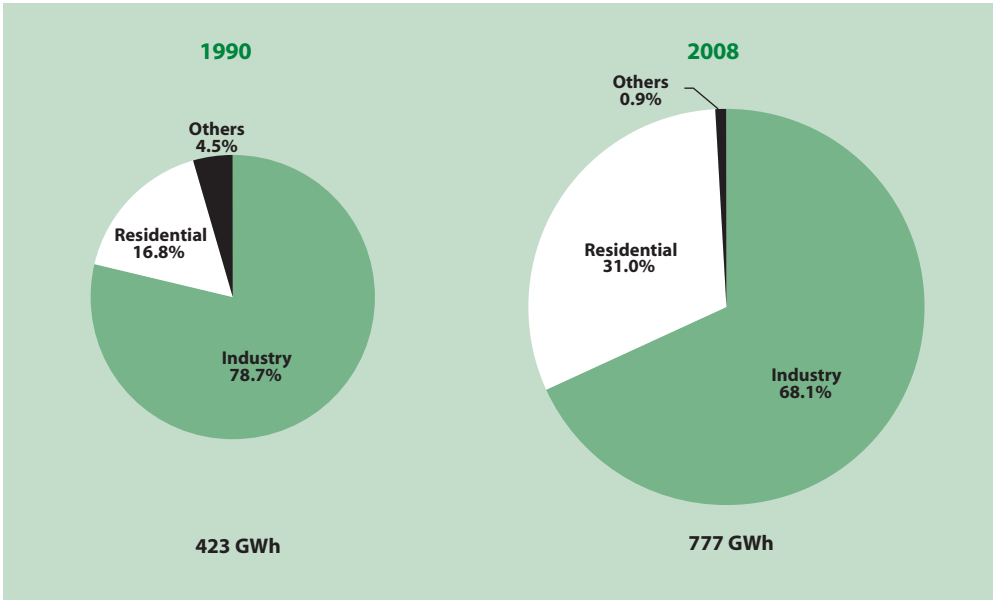
ktoe = thousand tons of oil equivalent.
Source: UNSD (2011a).

Figure 5.2.5 Electricity Generation by Plant Type, 1990 and 2008



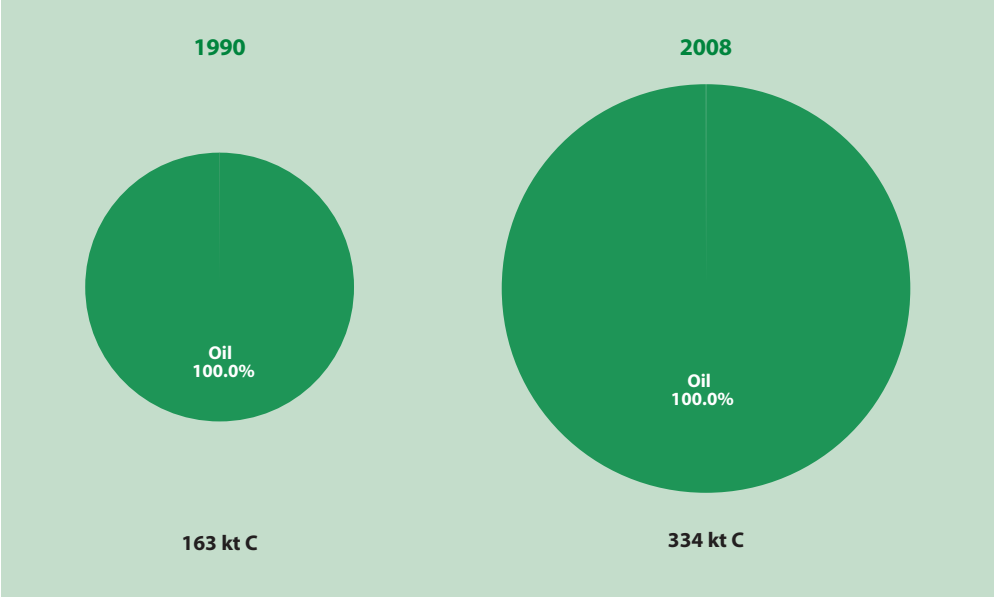
GWh = gigawatt-hour.
Source: UNSD (2011a).

Figure 5.2.6 Electricity Consumption by Sector, 1990 and 2008



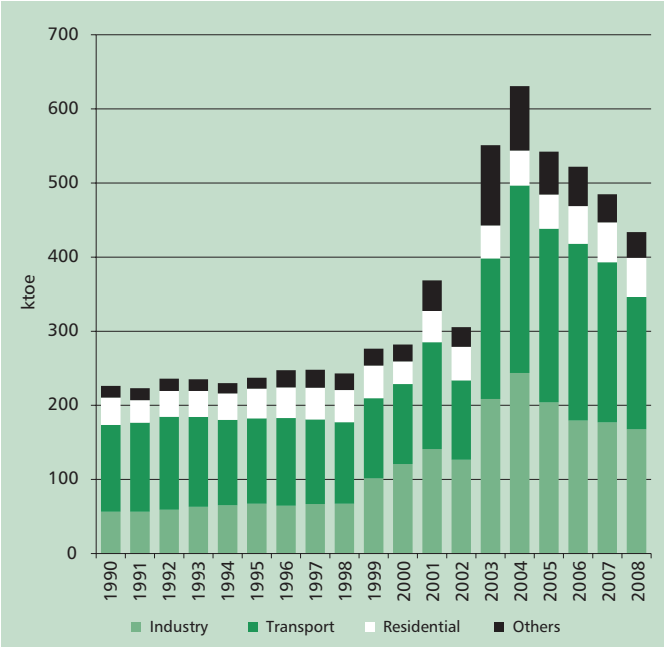
GWh = gigawatt-hour.
Source: UNSD (2011a).

Figure 5.2.7 Carbon Dioxide Emissions from Fuel Combustion, 1990 and 2008



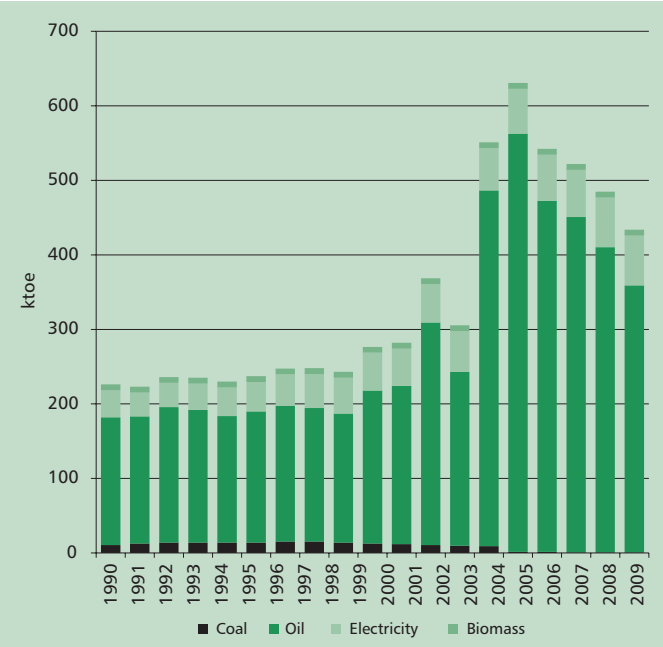
kt C = thousand tons of carbon equivalent.
Source: APERC estimates.

Figure 5.2.8 Final Energy Consumption by Sector, 1990–2008



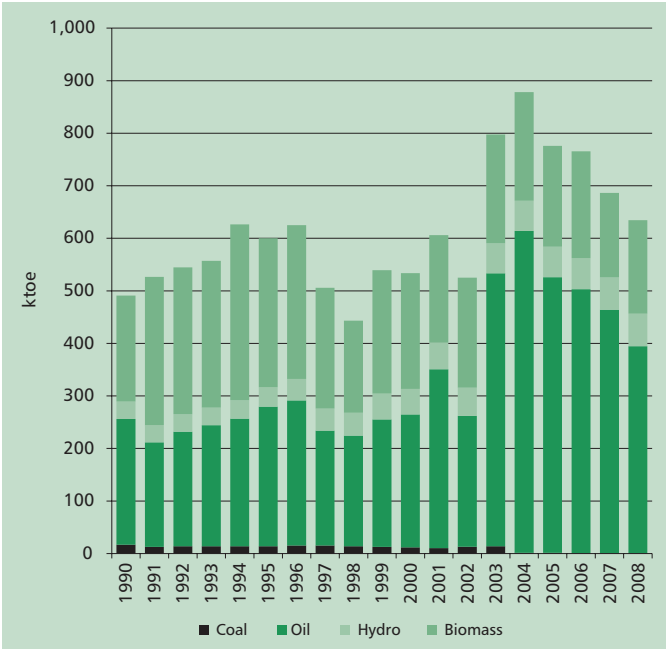
ktoe = thousand tons of oil equivalent.
Source: UNSD (2011a).

Figure 5.2.9 Final Energy Consumption by Type, 1990–2008



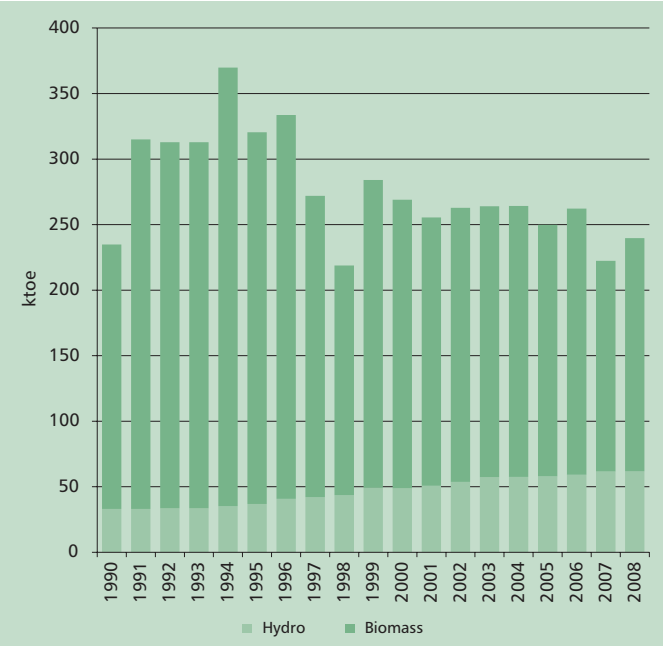
ktoe = thousand tons of oil equivalent.
Source: UNSD (2011a).

Figure 5.2.10 Total Primary Energy Supply, 1990–2008



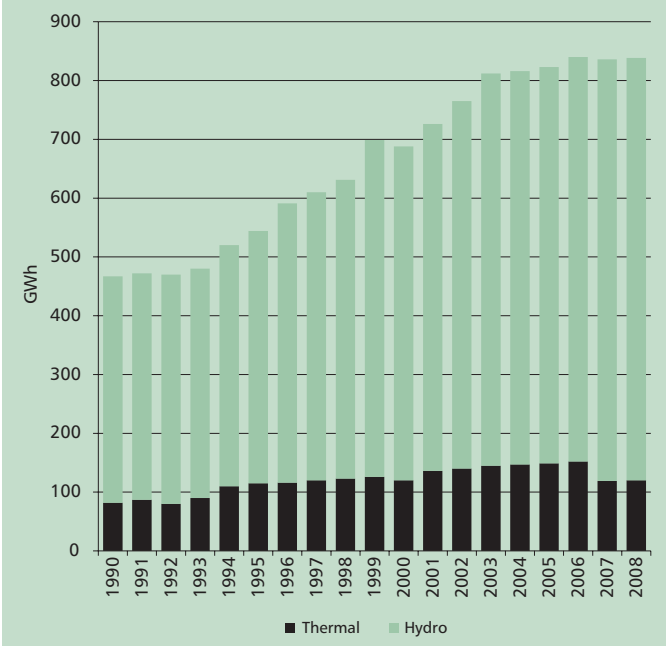
ktoe = thousand tons of oil equivalent.
Source: UNSD (2011a).

Figure 5.2.11 Indigenous Energy Production, 1990–2008



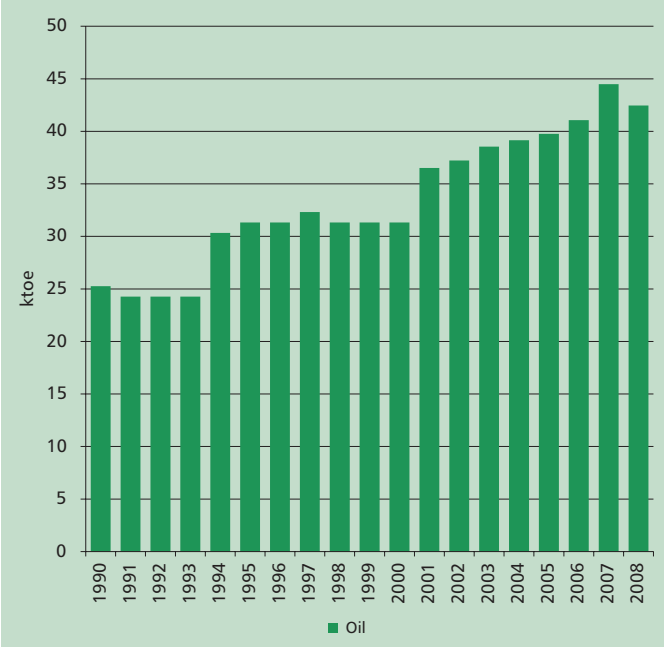
ktoe = thousand tons of oil equivalent.
Source: UNSD (2011a).

Figure 5.2.12 Electricity Generation by Source, 1990–2008



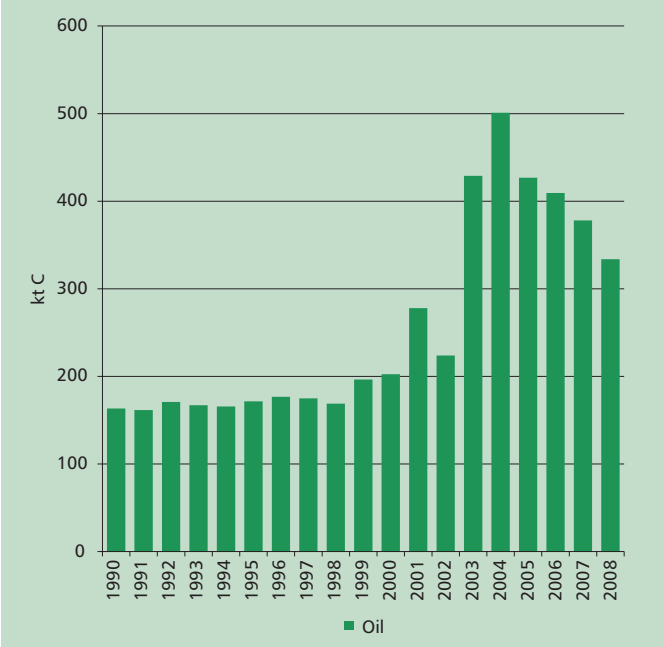
GWh = gigawatt-hour.
Source: UNSD (2011a).

Figure 5.2.13 Fuel Input for Electricity Generation, 1990–2008



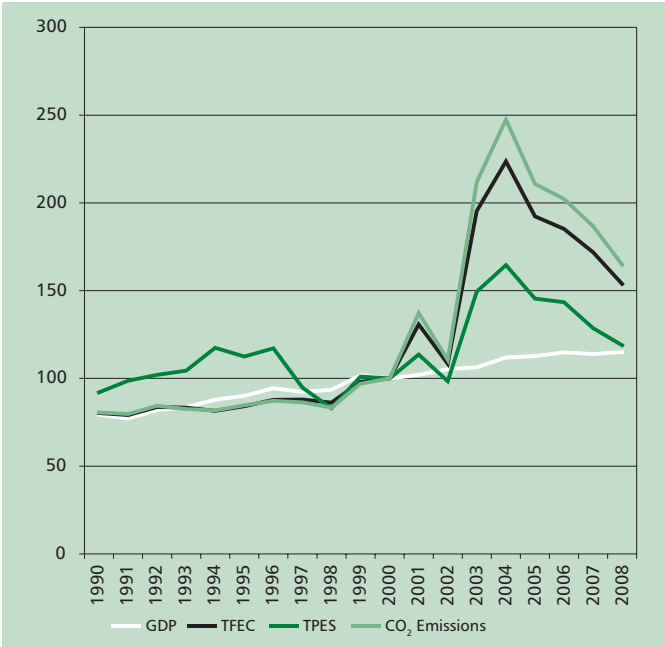
ktoe = thousand tons of oil equivalent.
Source: UNSD (2011a).

Figure 5.2.14 Carbon Dioxide Emissions from Fuel Combustion, 1990–2008



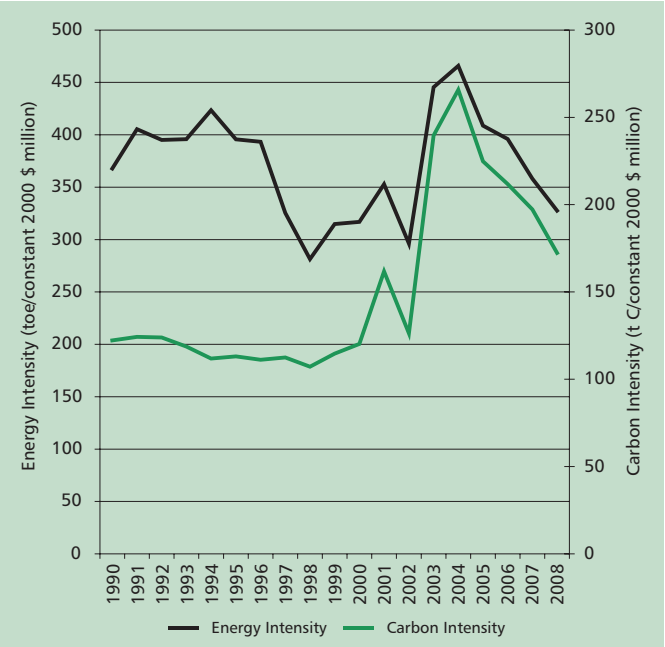
kt C = thousand tons of carbon equivalent.
Source: APERC estimates.

Figure 5.2.15 Growth of GDP, TFEC, TPES, and CO_2 (indexed to year 2000), 1990–2008



CO_2 = carbon dioxide, GDP = gross domestic product, TFEC = total final energy consumption, TPES = total primary energy supply.
Note: Indices are measured relative to the base year 2000 (2000 = 100).
Source: APERC estimates.

Figure 5.2.16 Energy and Carbon Intensities, 1990–2008



t C = ton of carbon equivalent, toe = ton of oil equivalent.
Source: APERC estimates.

Table 5.2.3 Fiji Energy Balance Table, 2005

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	0	0	0	0	0	0	0	0	0	0	0	58	0	0	0	0	192	0	0	0	250
2.	Imports	0	0	0	956	79	31	562	2	13	268	0	0	0	0	0	0	0	0	0	0	956
3.	Exports	0	0	0	–124	–17	–15	–71	0	0	–21	0	0	0	0	0	0	0	0	0	0	–124
4.	International Bunkers	0	0	0	–307	–2	0	–71	–1	0	–233	0	0	0	0	0	0	0	0	0	0	–307
5.	Stock Changes	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
6.	Total Primary Energy Supply	1	0	0	525	60	15	420	1	13	15	0	58	0	0	0	0	192	0	0	0	776
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	0	0	0	–40	0	0	–39	–1	0	0	0	–58	0	0	0	0	–184	0	71	0	–211
8.1	Power Generation	0	0	0	–40	0	0	–39	–1	0	0	0	–58	0	0	0	0	0	0	71	0	–27
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–184	0	0	0	–184
9.	Loss and Own Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–9	0	–9
10.	Discrepancy	0	0	0	–14	1	0	0	0	0	–15	0	0	0	0	0	0	0	0	1	0	–13
11.	Total Final Energy Consumption	1	0	0	471	61	15	382	0	13	0	0	0	0	0	0	0	8	0	62	0	542
12.	Industry Sector	1	0	0	165	0	0	162	0	2	0	0	0	0	0	0	0	0	0	38	0	204
13.	Transport Sector	0	0	0	234	56	0	179	0	0	0	0	0	0	0	0	0	0	0	0	0	234
14.	Other Sectors	0	0	0	72	5	15	41	0	11	0	0	0	0	0	0	0	8	0	24	0	104
14.1	Residential and Commercial	0	0	0	22	0	11	0	0	11	0	0	0	0	0	0	0	8	0	16	0	46
14.1.1	Commerce and Public Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14.1.2	Residential	0	0	0	22	0	11	0	0	11	0	0	0	0	0	0	0	8	0	16	0	46
14.2	Non–Specified Others	0	0	0	50	5	4	41	0	0	0	0	0	0	0	0	0	0	0	8	0	58
15.	Non–Energy Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16.	Electricity Output (GWh)	0	0	0	149	0	0	145	4	0	0	0	674	0	0	0	0	0	0	0	0	823
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.
Note: Figures may not add up to total because of rounding.
Source: UNSD (2011a).

Table 5.2.4 Fiji Energy Balance Table, 2006

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	0	0	0	0	0	0	0	0	0	0	0	59	0	0	0	0	203	0	0	0	262
2.	Imports	0	0	0	985	93	31	520	4	15	322	0	0	0	0	0	0	0	0	0	0	985
3.	Exports	0	0	0	–119	–17	–15	–66	0	0	–21	0	0	0	0	0	0	0	0	0	0	–119
4.	International Bunkers	0	0	0	–366	–6	0	–66	–1	0	–292	0	0	0	0	0	0	0	0	0	0	–366
5.	Stock Changes	1	0	0	2	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	3
6.	Total Primary Energy Supply	1	0	0	503	70	15	388	2	15	12	0	59	0	0	0	0	203	0	0	0	766
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	0	0	0	–41	0	0	–40	–1	0	0	0	–59	0	0	0	0	–195	0	72	0	–223
8.1	Power Generation	0	0	0	–41	0	0	–40	–1	0	0	0	–59	0	0	0	0	0	0	72	0	–28
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–195	0	0	0	–195
9.	Loss and Own Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–10	0	–10
10.	Discrepancy	0	0	0	–11	1	0	0	0	0	–12	0	0	0	0	0	0	0	0	1	0	–10
11.	Total Final Energy Consumption	1	0	0	450	70	15	348	1	15	0	0	0	0	0	0	0	8	0	63	0	522
12.	Industry Sector	1	0	0	135	0	0	132	1	2	0	0	0	0	0	0	0	0	0	44	0	179
13.	Transport Sector	0	0	0	238	58	0	181	0	0	0	0	0	0	0	0	0	0	0	0	0	238
14.	Other Sectors	0	0	0	77	13	15	36	0	13	0	0	0	0	0	0	0	8	0	20	0	104
14.1	Residential and Commercial	0	0	0	24	0	11	0	0	13	0	0	0	0	0	0	0	8	0	19	0	51
14.1.1	Commerce and Public Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14.1.2	Residential	0	0	0	24	0	11	0	0	13	0	0	0	0	0	0	0	8	0	19	0	51
14.2	Non–Specified Others	0	0	0	52	13	4	36	0	0	0	0	0	0	0	0	0	0	0	1	0	53
15.	Non–Energy Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16.	Electricity Output (GWh)	0	0	0	152	0	0	146	6	0	0	0	688	0	0	0	0	0	0	0	0	840
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.
Note: Figures may not add up to total because of rounding.
Source: UNSD (2011a).

Table 5.2.5 Fiji Energy Balance Table, 2007

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	0	0	0	0	0	0	0	0	0	0	0	62	0	0	0	0	161	0	0	0	222
2.	Imports	0	0	0	908	86	31	445	16	20	311	0	0	0	0	0	0	0	0	0	0	908
3.	Exports	0	0	0	–89	–17	–15	–41	0	0	–17	0	0	0	0	0	0	0	0	0	0	–89
4.	International Bunkers	0	0	0	–355	–5	0	–63	–3	0	–285	0	0	0	0	0	0	0	0	0	0	–355
5.	Stock Changes	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
6.	Total Primary Energy Supply	1	0	0	463	65	15	341	13	20	10	0	62	0	0	0	0	161	0	0	0	687
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	0	0	0	–44	0	0	–38	–7	0	0	0	–62	0	0	0	0	–153	0	72	0	–187
8.1	Power Generation	0	0	0	–44	0	0	–38	–7	0	0	0	–62	0	0	0	0	0	0	72	0	–34
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–153	0	0	0	–153
9.	Loss and Own Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–12	0	–12
10.	Discrepancy	0	0	0	–9	0	0	0	0	0	–10	0	0	0	0	0	0	0	0	6	0	–3
11.	Total Final Energy Consumption	1	0	0	410	65	15	303	6	20	0	0	0	0	0	0	0	8	0	67	0	485
12.	Industry Sector	1	0	0	131	0	0	122	6	3	0	0	0	0	0	0	0	0	0	45	0	177
13.	Transport Sector	0	0	0	216	55	0	161	0	0	0	0	0	0	0	0	0	0	0	0	0	216
14.	Other Sectors	0	0	0	63	11	15	20	0	16	0	0	0	0	0	0	0	8	0	21	0	92
14.1	Residential and Commercial	0	0	0	25	0	11	0	0	14	0	0	0	0	0	0	0	8	0	21	0	54
14.1.1	Commerce and Public Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14.1.2	Residential	0	0	0	25	0	11	0	0	14	0	0	0	0	0	0	0	8	0	21	0	54
14.2	Non–Specified Others	0	0	0	37	11	4	20	0	2	0	0	0	0	0	0	0	0	0	1	0	38
15.	Non–Energy Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16.	Electricity Output (GWh)	0	0	0	119	0	0	100	19	0	0	0	717	0	0	0	0	0	0	0	0	836
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.
Note: Figures may not add up to total because of rounding.
Source: UNSD (2011a).

Table 5.2.6 Fiji Energy Balance Table, 2008

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	0	0	0	0	0	0	0	0	0	0	0	62	0	0	0	0	178	0	0	0	240
2.	Imports	0	0	0	776	70	31	367	29	17	262	0	0	0	0	0	0	0	0	0	0	776
3.	Exports	0	0	0	–83	–17	–15	–30	0	0	–21	0	0	0	0	0	0	0	0	0	0	–83
4.	International Bunkers	0	0	0	–299	–4	0	–56	–6	0	–233	0	0	0	0	0	0	0	0	0	0	–299
5.	Stock Changes	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
6.	Total Primary Energy Supply	1	0	0	394	49	15	280	23	17	9	0	62	0	0	0	0	178	0	0	0	635
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	0	0	0	–42	0	0	–36	–7	0	0	0	–62	0	0	0	0	–170	0	72	0	–202
8.1	Power Generation	0	0	0	–42	0	0	–36	–7	0	0	0	–62	0	0	0	0	0	0	72	0	–32
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–170	0	0	0	–170
9.	Loss and Own Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–11	0	–11
10.	Discrepancy	0	0	0	7	16	0	0	0	0	–9	0	0	0	0	0	0	0	0	5	0	12
11.	Total Final Energy Consumption	1	0	0	358	65	15	245	16	17	0	0	0	0	0	0	0	8	0	67	0	434
12.	Industry Sector	1	0	0	122	0	0	104	16	2	0	0	0	0	0	0	0	0	0	46	0	168
13.	Transport Sector	0	0	0	178	55	0	124	0	0	0	0	0	0	0	0	0	0	0	0	0	178
14.	Other Sectors	0	0	0	58	11	15	17	0	15	0	0	0	0	0	0	0	8	0	21	0	88
14.1	Residential and Commercial	0	0	0	24	0	11	0	0	13	0	0	0	0	0	0	0	8	0	21	0	53
14.1.1	Commerce and Public Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14.1.2	Residential	0	0	0	24	0	11	0	0	13	0	0	0	0	0	0	0	8	0	21	0	53
14.2	Non–Specified Others	0	0	0	34	11	4	17	0	2	0	0	0	0	0	0	0	0	0	1	0	35
15.	Non–Energy Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16.	Electricity Output (GWh)	0	0	0	120	0	0	101	20	0	0	0	718	0	0	0	0	0	0	0	0	839
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Source: UNSD (2011a).

Table 5.2.7 Fiji Summary Table, 1990–2009

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Indigenous Production (ktoe)																				
Coal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Oil	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Gas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Hydro	33	33	34	34	35	37	41	42	44	49	49	51	54	57	58	58	59	62	62	–
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Geothermal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Solar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Wind	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Biomass	202	282	279	279	335	284	293	230	175	235	220	205	209	207	207	192	203	161	178	–
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Total	235	315	313	313	370	321	334	272	219	284	269	255	263	264	264	250	262	222	240	–
Primary Energy Supply (ktoe)																				
Coal	17	13	14	14	14	14	15	15	14	13	12	11	13	14	2	1	1	1	1	–
Oil	239	199	218	230	243	266	276	218	210	243	253	340	249	519	613	525	503	463	394	–
Gas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Hydro	33	33	34	34	35	37	41	42	44	49	49	51	54	57	58	58	59	62	62	–
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Geothermal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Solar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Wind	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Biomass	202	282	279	279	335	284	293	230	175	235	220	205	209	207	207	192	203	161	178	–
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Total	491	527	545	557	627	600	625	506	443	539	534	606	525	797	878	776	766	687	635	–
Final Energy Consumption by Sector (ktoe)																				
Industry	56	56	59	63	65	67	65	67	67	102	121	141	127	208	244	204	179	177	168	–
Transport	117	120	125	121	115	115	118	114	110	108	108	144	107	190	253	234	238	216	178	–
Residential	37	30	35	35	36	40	41	43	43	44	31	42	45	44	47	46	51	54	53	–
Commercial	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Others	16	16	17	16	14	15	23	24	22	23	23	41	27	108	87	58	53	38	35	–
Total	226	223	236	235	230	237	247	248	243	277	282	369	306	551	631	542	522	485	434	–

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Table 5.2.7 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Final Energy Consumption by Type (ktoe)																				
Coal	11	13	14	14	14	14	15	15	14	13	12	11	10	9	1	1	1	1	1	–
Oil	172	171	182	178	170	176	182	179	173	205	212	299	233	477	561	471	450	410	358	–
Gas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Electricity	36	32	32	35	38	39	42	46	48	51	50	52	55	57	60	62	63	67	67	–
Heat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Biomass	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	–
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Total	226	223	236	235	230	237	247	248	243	277	282	369	306	551	631	542	522	485	434	–
Power Generation (GWh)																				
Thermal	82	87	80	90	110	115	116	120	123	126	120	136	140	145	147	149	152	119	120	–
Hydro	385	385	390	390	410	429	475	490	508	573	568	590	625	667	669	674	688	717	718	–
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Geothermal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Solar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Wind	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Total	467	472	470	480	520	544	591	610	631	699	688	726	765	812	816	823	840	836	839	–
Loss and Own Use of Electricity (GWh)																				
Transmission and Distribution Losses	46	56	65	70	75	85	101	85	85	95	90	100	110	110	110	110	120	135	126	–
Own Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Total	46	56	65	70	75	85	101	85	85	95	90	100	110	110	110	110	120	135	126	–
Fuel Input for Power Generation (ktoe)																				
Coal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Oil	25	24	24	24	30	31	31	32	31	31	31	37	37	39	39	40	41	44	42	–
Gas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Total	25	24	24	24	30	31	31	32	31	31	31	37	37	39	39	40	41	44	42	–
CO_2 Emissions (kt C)																				
Coal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Oil	163	161	171	167	166	172	177	175	169	196	202	278	224	429	501	427	409	378	334	–
Gas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Total	163	161	171	167	166	172	177	175	169	196	202	278	224	429	501	427	409	378	334	–

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Table 5.2.7 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Macroeconomic Indicators																				
Population (thousand)	728	735	744	755	766	776	785	793	801	807	812	815	816	817	819	823	828	835	844	852
Urban Population, %	41.6	42.4	43.2	43.9	44.7	45.5	46.1	46.6	47.2	47.7	48.3	48.8	49.3	49.8	50.3	50.8	51.3	51.8	52.4	52.9
GDP (constant 2000 $ million)	1,335	1,299	1,378	1,408	1,480	1,517	1,589	1,554	1,575	1,713	1,684	1,718	1,773	1,790	1,885	1,899	1,934	1,917	1,937	1,912
GDP (current $ million)	1,337	1,384	1,532	1,635	1,825	1,970	2,129	2,094	1,657	1,942	1,684	1,660	1,843	2,316	2,728	3,007	3,103	3,380	3,590	2,879
GDP (constant 2005 PPP $ million)	2,501	2,434	2,582	2,637	2,771	2,841	2,977	2,912	2,949	3,209	3,154	3,218	3,320	3,354	3,531	3,556	3,622	3,591	3,628	3,582
GDP/capita (constant 2000 $)	1,833	1,767	1,852	1,865	1,932	1,955	2,025	1,960	1,967	2,123	2,075	2,108	2,172	2,191	2,302	2,308	2,335	2,295	2,296	2,244
GDP/capita (current $)	1,836	1,882	2,058	2,166	2,384	2,540	2,713	2,640	2,069	2,407	2,075	2,037	2,257	2,834	3,330	3,655	3,747	4,046	4,255	3,377
GDP – Manufacturing (% of GDP)	10.4	10.7	10.3	11.3	11.5	11.2	11.2	12.4	12.9	12.7	12.2	13.5	13.2	12.9	13.8	11.6	12.2	11.6	11.2	11.1
Car Ownership (car/1,000 persons)	78	82	87	93	91	106	91	99	108	124	124	123	124	159	160	160	160	160	160	159
Basic Energy Indicators																				
TPES/capita (toe/person)	0.67	0.72	0.73	0.74	0.82	0.77	0.80	0.64	0.55	0.67	0.66	0.74	0.64	0.98	1.07	0.94	0.92	0.82	0.75	–
TFEC/capita (toe/person)	0.31	0.30	0.32	0.31	0.30	0.31	0.32	0.31	0.30	0.34	0.35	0.45	0.37	0.67	0.77	0.66	0.63	0.58	0.51	–
TPES/GDP (toe/constant 2000 $ million)	368	405	395	396	423	396	393	325	281	315	317	353	296	445	466	409	396	358	328	–
TFEC/GDP (toe/constant 2000 $ million)	169	172	171	167	155	156	156	160	154	161	167	215	172	308	335	286	270	253	224	–
Import Dependency (%)	52.2	40.2	42.5	43.8	41.0	46.6	46.6	46.2	50.6	47.3	49.6	57.9	49.9	66.9	69.9	67.8	65.8	67.6	62.2	–
Oil Import Dependency (%)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	–
Electricity/capita (kWh/ person)	581	509	506	543	581	592	624	668	699	731	715	736	778	807	856	877	889	929	921	–
CO_2 Intensity (t C/constant 2000 $ million)	122	124	124	119	112	113	111	112	107	115	120	162	126	240	266	225	212	197	172	–
CO_2/capita (t C)	0.22	0.22	0.23	0.22	0.22	0.22	0.23	0.22	0.21	0.24	0.25	0.34	0.27	0.52	0.61	0.52	0.49	0.45	0.40	–
CO_2/TPES (t C/toe)	0.33	0.31	0.31	0.30	0.26	0.29	0.28	0.35	0.38	0.36	0.38	0.46	0.43	0.54	0.57	0.55	0.53	0.55	0.53	–

– = no data or not applicable, CO_2 = carbon dioxide, GDP = gross domestic product, GWh = gigawatt–hour, kt C = thousand tons of carbon equivalent, ktoe = thousand tons of oil equivalent, kWh = kilowatt–hour, PPP = purchasing power parity, t C = ton of carbon equivalent, TFEC = total final energy consumption, toe = ton of oil equivalent, TPES = total primary energy supply.

Note: Figures may not add up to total because of rounding.

Sources: APERC estimates, JAMA (2012), UNSD (2011a), and World Bank.

5.3 Kiribati

Country Profile (2009)		Energy Reserves (year-end 2008)	
Total Surface Area (square kilometer)	810	Coal (million ton) - Recoverable	0.0
Population (thousand)	98	Gas (trillion cubic feet) - Proven	0.0
GDP (billion constant 2000 $)	0.1	Oil (billion barrel) - Proven	0.0
Electrification Rate (%)	45.0		

GDP = gross domestic product.

Sources: ADB (2012), CIA (2012), Ostojic et al. (2011), and World Bank.

2008 Energy Supply and Demand Flow (ktoe)

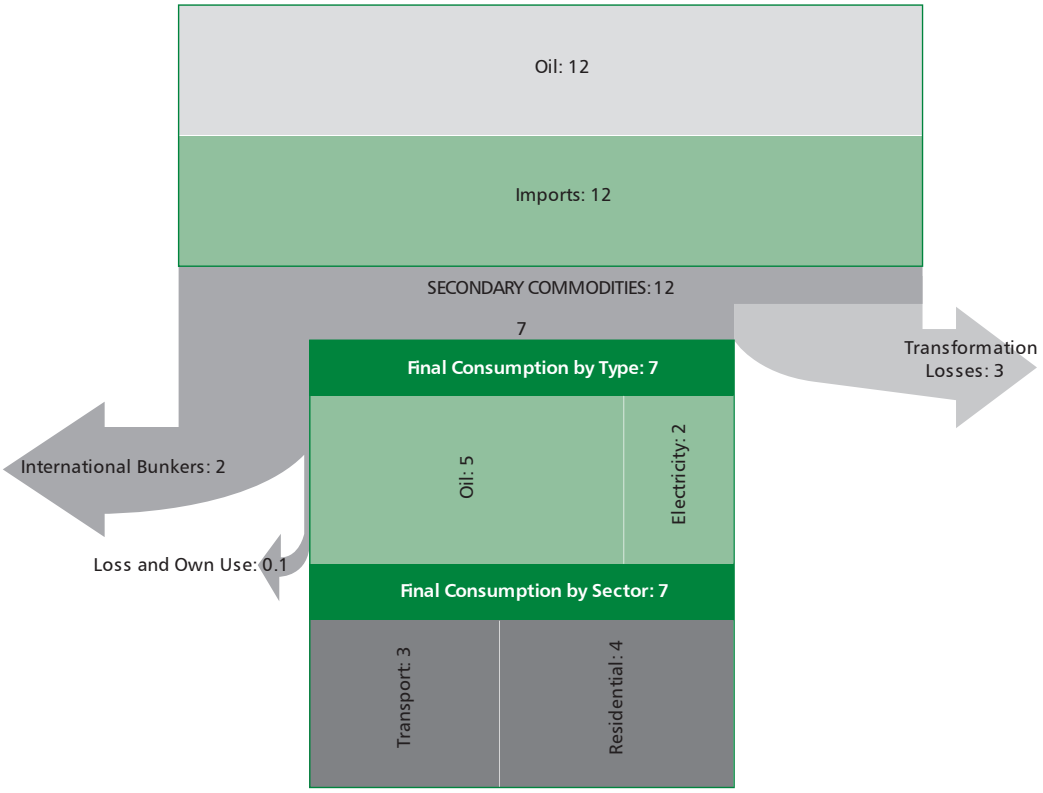


Table 5.3.1 Key Data and Economic Profile

	1990	1995	2000	2005	2008
Socioeconomic Data					
Population (thousand)	72	77	84	92	97
GDP (constant 2000 $ billion)	0.0	0.1	0.1	0.1	0.1
GDP (constant 2005 PPP $ billion)	0.1	0.1	0.2	0.2	0.2
GDP/capita (constant 2000 $)	670	655	812	808	779
GDP/capita (constant 2005 PPP $)	1,943	1,898	2,355	2,342	2,258

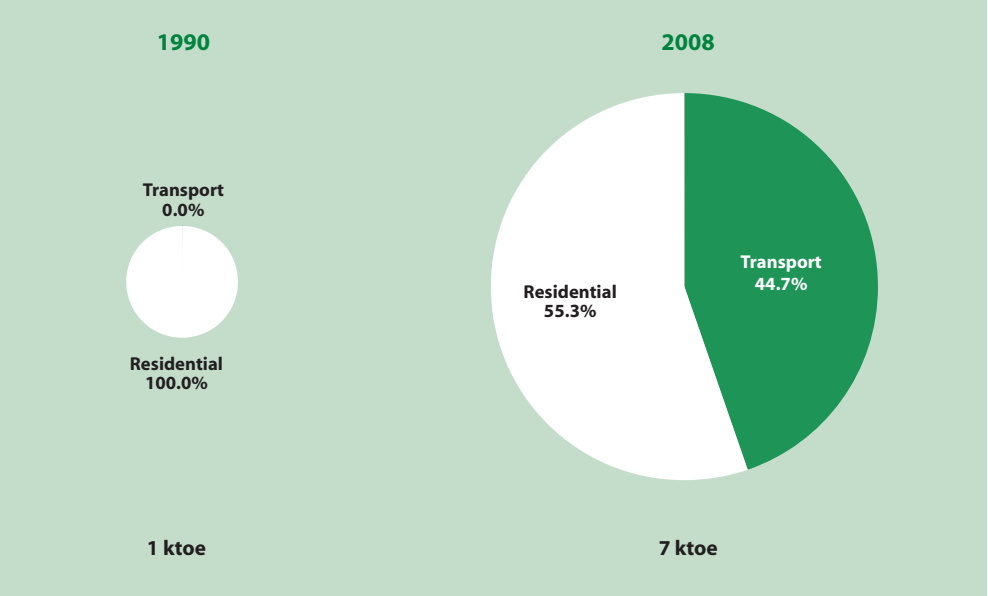
GDP = gross domestic product, PPP = purchasing power parity.
Source: World Bank.

Table 5.3.2 Energy Supply and Demand

	1990	1995	2000	2005	2008
Primary Energy Supply (ktoe)					
Indigenous Production	0	0	0	0	0
Net Imports	7	7	11	8	10
Total PES	7	7	11	8	10
Coal	0	0	0	0	0
Oil	7	7	11	8	10
Gas	0	0	0	0	0
Biomass	0	0	0	0	0
Others	0	0	0	0	0
TPES/capita (toe)	0.10	0.09	0.13	0.09	0.11
TPES/GDP (toe/constant 2005 PPP $ million)	51	49	57	38	47
Final Energy Consumption (ktoe)					
Industry	0	0	0	0	0
Transportation	0	0	0	2	3
Other Sectors	1	1	1	4	4
Total FEC	1	1	1	6	7
Coal	0	0	0	0	0
Oil	0	0	0	4	5
Gas	0	0	0	0	0
Electricity	1	1	1	2	2
Biomass	0	0	0	0	0
Others	0	0	0	0	0

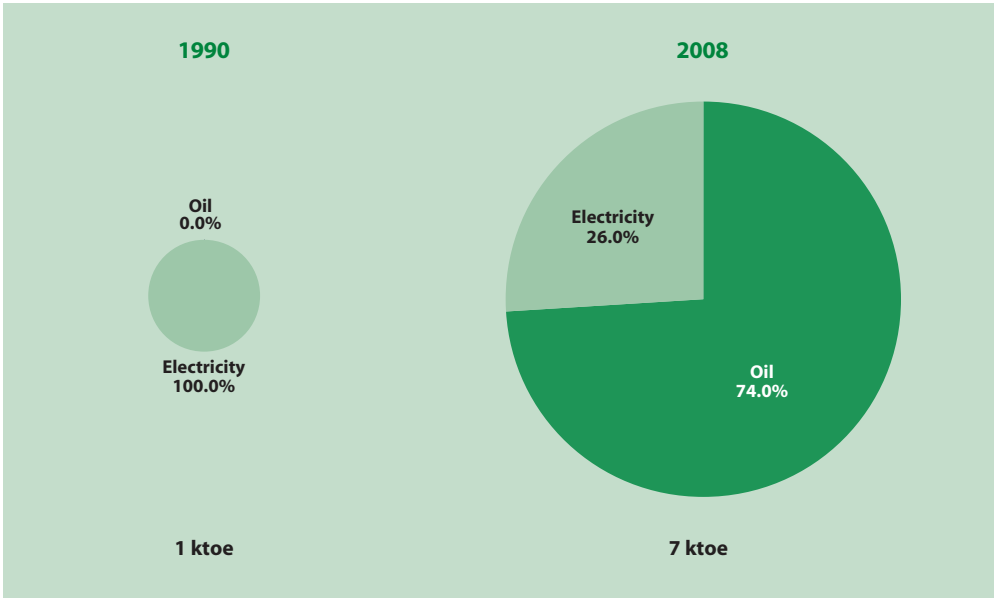
FEC = final energy consumption, GDP = gross domestic product, ktoe = thousand tons of oil equivalent, PES = primary energy supply, PPP = purchasing power parity, toe = ton of oil equivalent, TPES = total primary energy supply.
Source: UNSD (2011a).

Figure 5.3.1 Final Energy Consumption by Sector, 1990 and 2008



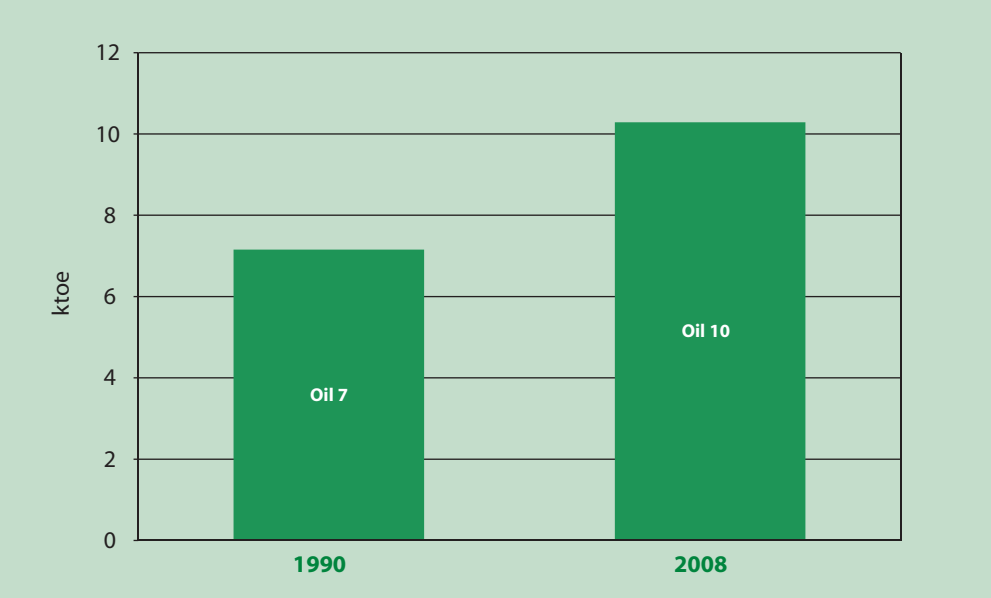
ktoe = thousand tons of oil equivalent.
Source: UNSD (2011a).

Figure 5.3.2 Final Energy Consumption by Type of Energy, 1990 and 2008



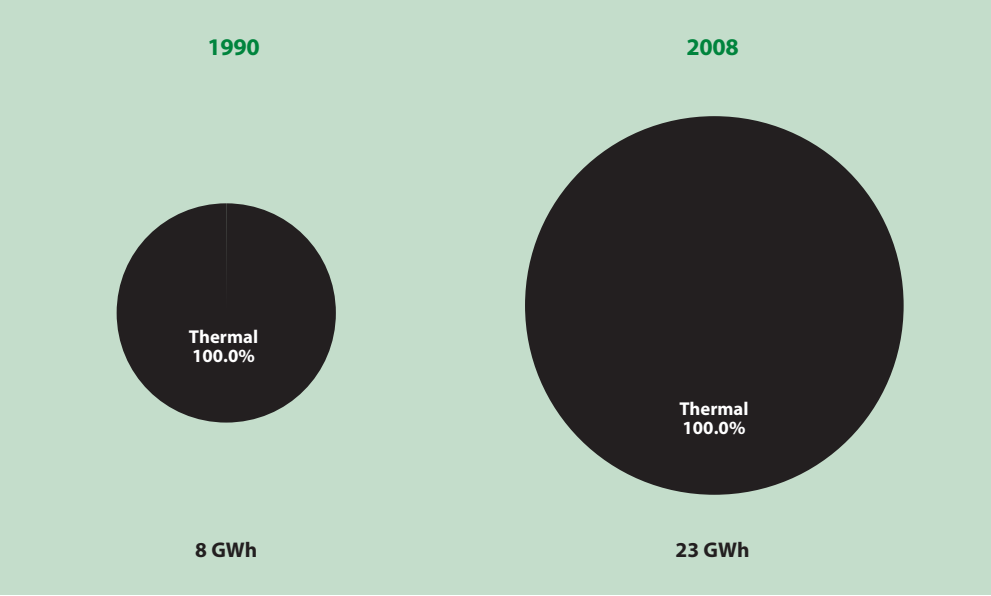
ktoe = thousand tons of oil equivalent.
Source: UNSD. 2011a

Figure 5.3.3 Total Primary Energy Supply, 1990 and 2008



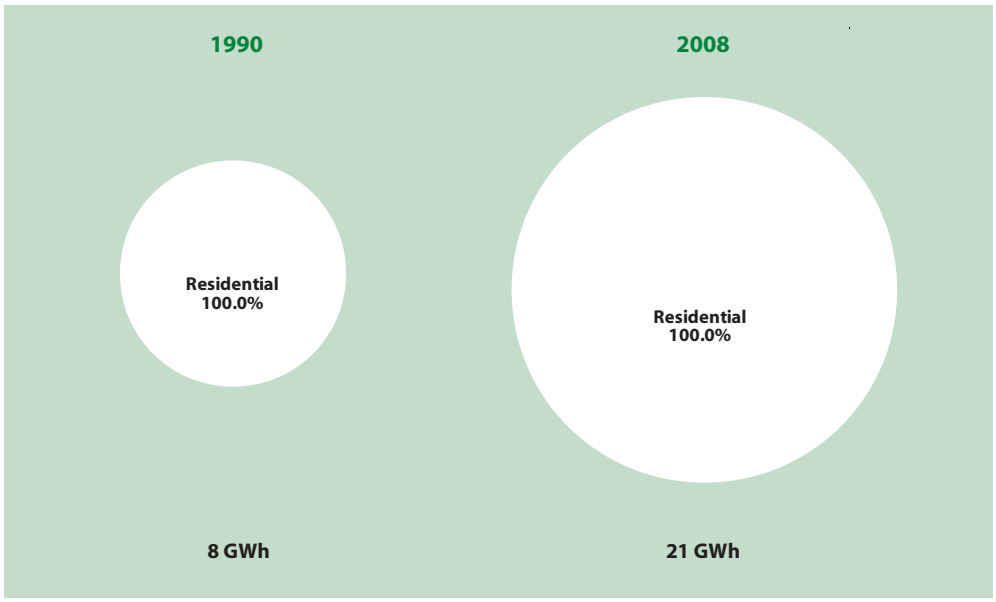
ktoe = thousand tons of oil equivalent.
Source: UNSD (2011a).

Figure 5.3.4 Electricity Generation by Plant Type, 1990 and 2008



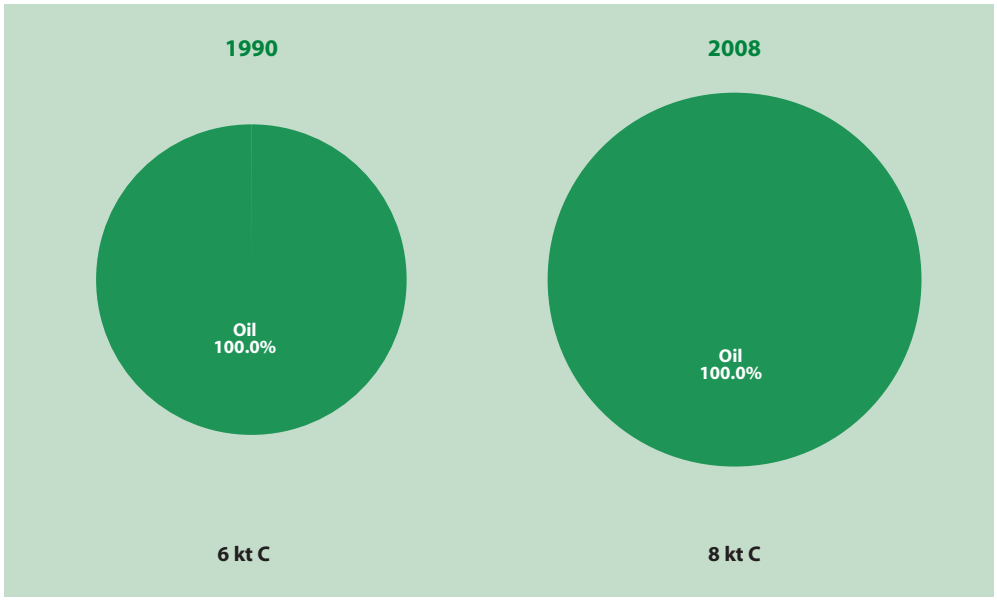
GWh = gigawatt-hour.
Source: UNSD (2011a).

Figure 5.3.5 Electricity Consumption by Sector, 1990 and 2008



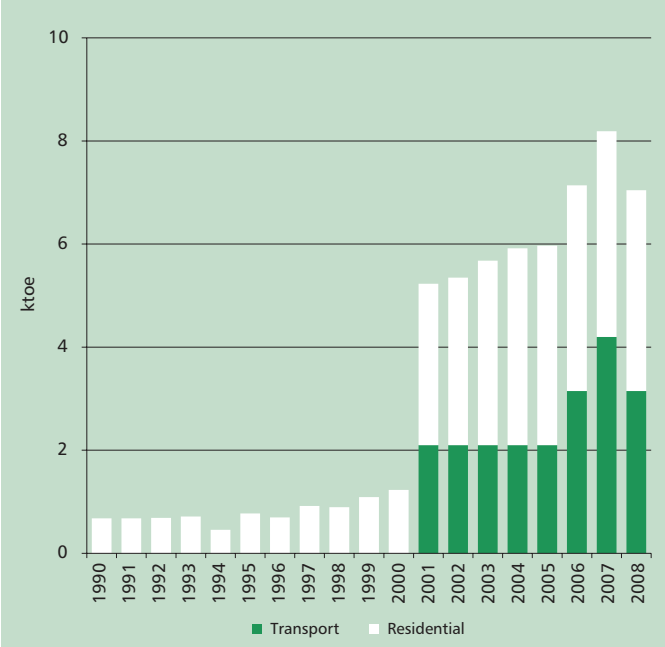
GWh = gigawatt-hour.
Source: UNSD (2011a).

Figure 5.3.6 Carbon Dioxide Emissions from Fuel Combustion, 1990 and 2008



kt C = thousand tons of carbon equivalent.
Source: APERC estimates.

Figure 5.3.7 Final Energy Consumption by Sector, 1990–2008

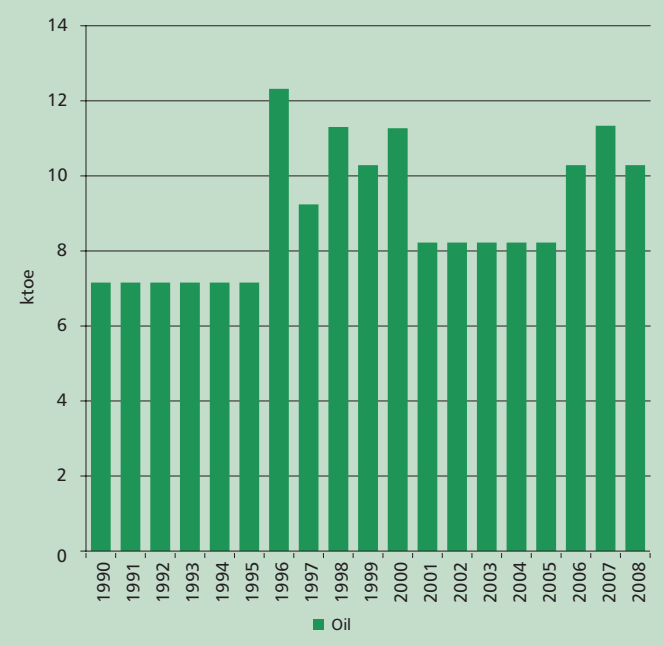


ktoe = thousand tons of oil equivalent.
Source: UNSD (2011a).

Figure 5.3.8 Final Energy Consumption by Type, 1990-2008

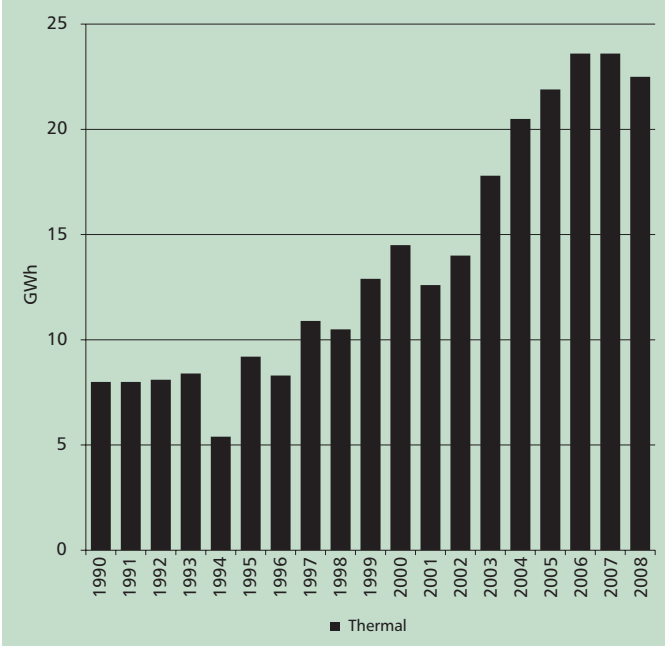
ktoe = thousand tons of oil equivalent.
Sources: APERC estimates, UNSD (2011a).

Figure 5.3.9 Total Primary Energy Supply, 1990–2008



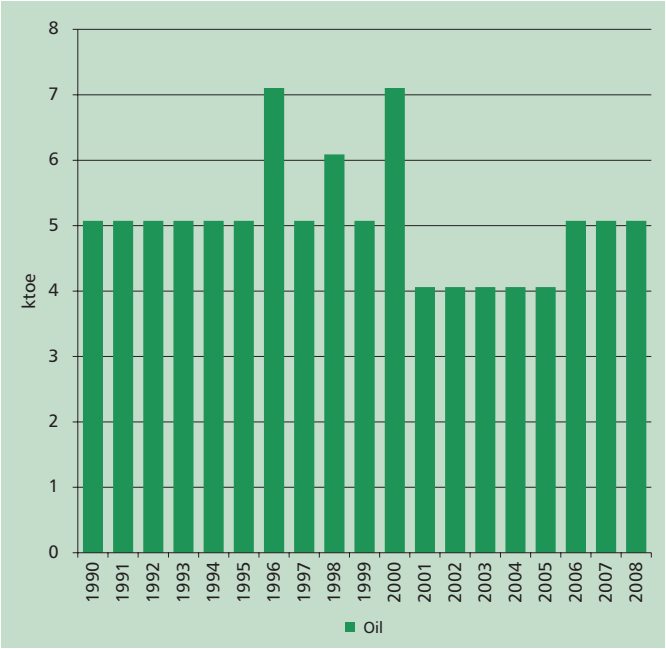
ktoe = thousand tons of oil equivalent.
Source: UNSD (2011a).

Figure 5.3.10 Electricity Generation by Source, 1990–2008



GWh = gigawatt-hour.
Source: UNSD (2011a).

Figure 5.3.11 Fuel Input for Electricity Generation, 1990-2008

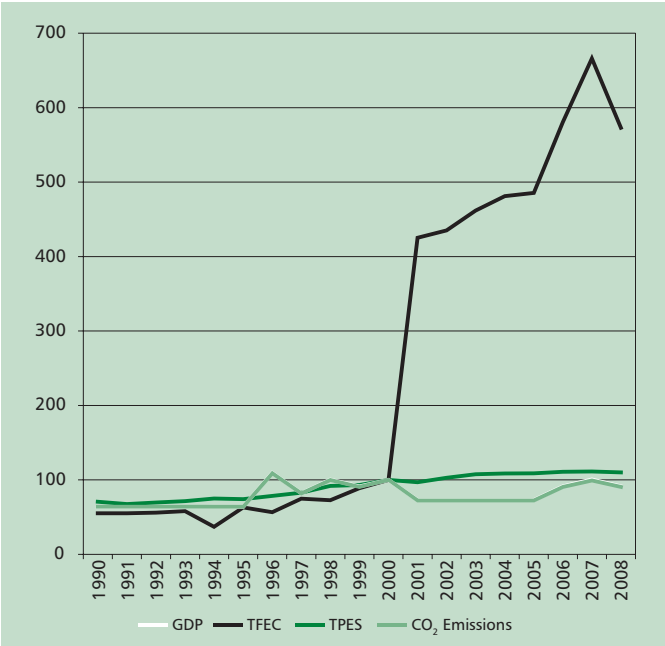


ktoe = thousand tons of oil equivalent.
Source: APERC estimates, and UNSD (2011a).

Figure 5.3.12 Carbon Dioxide Emissions from Fuel Combustion, 1990–2008

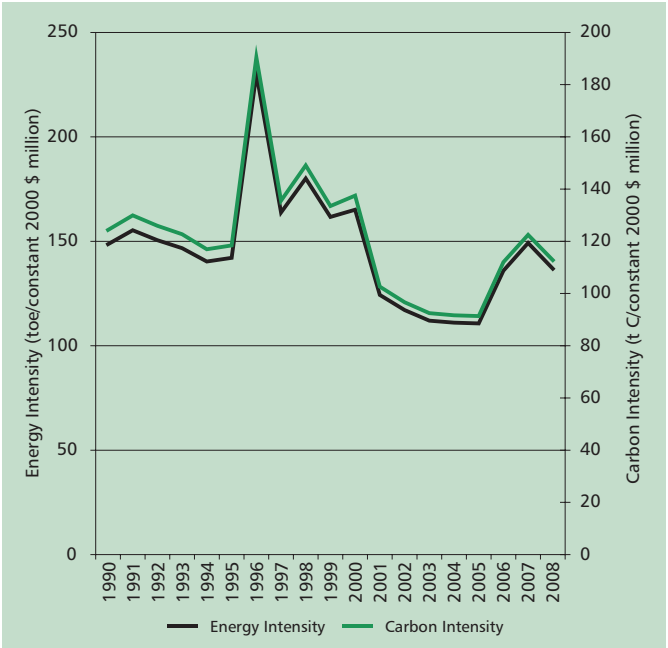
kt C = thousand tons of carbon equivalent.
Source: APERC estimates.

Figure 5.3.13 Growth of GDP, TFEC, TPES, and CO_2 (indexed to year 2000), 1990–2008



CO_2 = carbon dioxide, GDP = gross domestic product, TFEC = total final energy consumption, TPES = total primary energy supply.
Source: APERC estimates.

Figure 5.3.14 Energy and Carbon Intensities, 1990–2008



toe = ton of oil equivalent, t C = ton of carbon equivalent.
Source: APERC estimates.

Note: Energy balances for Kiribati are available in the United Nations Statistics Division energy database from 1990 to 2008. However, the primary supply of oil from 1990 to 2000 is not disaggregated into transformation and final consumption sectors. All the oil data appear as statistical discrepancies. This explains why there are no final consumption and fuel input for electricity of oil in the same period in Figures 5.3.1, 5.3.2, 5.3.6, 5.3.7, and 5.3.10. This also resulted in the sudden jump in the index of total final energy consumption in Figure 5.3.12.

Table 5.3.3 Kiribati Energy Balance Table, 2005

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.	Imports	0	0	0	10	3	2	4	0	0	1	0	0	0	0	0	0	0	0	0	0	10
3.	Exports	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.	International Bunkers	0	0	0	–2	–1	0	0	0	0	–1	0	0	0	0	0	0	0	0	0	0	–2
5.	Stock Changes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6.	Total Primary Energy Supply	0	0	0	8	2	2	4	0	0	0	0	0	0	0	0	0	0	0	0	0	8
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	0	0	0	–4	0	0	–4	0	0	0	0	0	0	0	0	0	0	0	2	0	–2
8.1	Power Generation	0	0	0	–4	0	0	–4	0	0	0	0	0	0	0	0	0	0	0	2	0	–2
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10.	Discrepancy	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11.	Total Final Energy Consumption	0	0	0	4	2	2	0	0	0	0	0	0	0	0	0	0	0	0	2	0	6
12.	Industry Sector	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13.	Transport Sector	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
14.	Other Sectors	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2	0	4
14.1	Residential and Commercial	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2	0	4
14.1.1	Commerce and Public Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14.1.2	Residential	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2	0	4
14.2	Non-Specified Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15.	Non-Energy Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16.	Electricity Output (GWh)	0	0	0	22	0	0	22	0	0	0	0	0	0	0	0	0	0	0	0	0	22
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.
Note: Figures may not add up to total because of rounding.
Source: UNSD (2011a).

Table 5.3.4 Kiribati Energy Balance Table, 2006

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.	Imports	0	0	0	12	4	2	5	0	0	1	0	0	0	0	0	0	0	0	0	0	12
3.	Exports	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.	International Bunkers	0	0	0	–2	–1	0	0	0	0	–1	0	0	0	0	0	0	0	0	0	0	–2
5.	Stock Changes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6.	Total Primary Energy Supply	0	0	0	10	3	2	5	0	0	0	0	0	0	0	0	0	0	0	0	0	10
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	0	0	0	–5	0	0	–5	0	0	0	0	0	0	0	0	0	0	0	2	0	–3
8.1	Power Generation	0	0	0	–5	0	0	–5	0	0	0	0	0	0	0	0	0	0	0	2	0	–3
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10.	Discrepancy	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11.	Total Final Energy Consumption	0	0	0	5	3	2	0	0	0	0	0	0	0	0	0	0	0	0	2	0	7
12.	Industry Sector	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13.	Transport Sector	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
14.	Other Sectors	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2	0	4
14.1	Residential and Commercial	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2	0	4
14.1.1	Commerce and Public Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14.1.2	Residential	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2	0	4
14.2	Non-Specified Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15.	Non-Energy Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16.	Electricity Output (GWh)	0	0	0	24	0	0	24	0	0	0	0	0	0	0	0	0	0	0	0	0	24
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Source: UNSD (2011a).

Table 5.3.5 Kiribati Energy Balance Table, 2007

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.	Imports	0	0	0	13	5	2	5	0	0	1	0	0	0	0	0	0	0	0	0	0	13
3.	Exports	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.	International Bunkers	0	0	0	–2	–1	0	0	0	0	–1	0	0	0	0	0	0	0	0	0	0	–2
5.	Stock Changes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6.	Total Primary Energy Supply	0	0	0	11	4	2	5	0	0	0	0	0	0	0	0	0	0	0	0	0	11
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	0	0	0	–5	0	0	–5	0	0	0	0	0	0	0	0	0	0	0	2	0	–3
8.1	Power Generation	0	0	0	–5	0	0	–5	0	0	0	0	0	0	0	0	0	0	0	2	0	–3
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10.	Discrepancy	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11.	Total Final Energy Consumption	0	0	0	6	4	2	0	0	0	0	0	0	0	0	0	0	0	0	2	0	8
12.	Industry Sector	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13.	Transport Sector	0	0	0	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
14.	Other Sectors	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2	0	4
14.1	Residential and Commercial	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2	0	4
14.1.1	Commerce and Public Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14.1.2	Residential	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2	0	4
14.2	Non-Specified Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15.	Non-Energy Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16.	Electricity Output (GWh)	0	0	0	24	0	0	24	0	0	0	0	0	0	0	0	0	0	0	0	0	24
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.
Note: Figures may not add up to total because of rounding.
Source: UNSD (2011a).

Table 5.3.6 Kiribati Energy Balance Table, 2008

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.	Imports	0	0	0	12	4	2	5	0	0	1	0	0	0	0	0	0	0	0	0	0	12
3.	Exports	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.	International Bunkers	0	0	0	–2	–1	0	0	0	0	–1	0	0	0	0	0	0	0	0	0	0	–2
5.	Stock Changes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6.	Total Primary Energy Supply	0	0	0	10	3	2	5	0	0	0	0	0	0	0	0	0	0	0	0	0	10
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	0	0	0	–5	0	0	–5	0	0	0	0	0	0	0	0	0	0	0	2	0	–3
8.1	Power Generation	0	0	0	–5	0	0	–5	0	0	0	0	0	0	0	0	0	0	0	2	0	–3
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10.	Discrepancy	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11.	Total Final Energy Consumption	0	0	0	5	3	2	0	0	0	0	0	0	0	0	0	0	0	0	2	0	7
12.	Industry Sector	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13.	Transport Sector	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
14.	Other Sectors	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2	0	4
14.1	Residential and Commercial	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2	0	4
14.1.1	Commerce and Public Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14.1.2	Residential	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2	0	4
14.2	Non-Specified Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15.	Non-Energy Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16.	Electricity Output (GWh)	0	0	0	23	0	0	23	0	0	0	0	0	0	0	0	0	0	0	0	0	23
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Source: UNSD (2011a).

Table 5.3.7 Kiribati Summary Table, 1990–2009

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Indigenous Production (ktoe)																				
Coal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Oil	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Gas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Hydro	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Geothermal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Solar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Wind	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Biomass	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Primary Energy Supply (ktoe)																				
Coal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Oil	7	7	7	7	7	7	12	9	11	10	11	8	8	8	8	8	10	11	10	–
Gas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Hydro	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Geothermal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Solar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Wind	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Biomass	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Total	7	7	7	7	7	7	12	9	11	10	11	8	8	8	8	8	10	11	10	–
Final Energy Consumption by Sector (ktoe)																				
Industry	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Transport	0	0	0	0	0	0	0	0	0	0	0	2	2	2	2	2	3	4	3	–
Residential	1	1	1	1	0	1	1	1	1	1	1	3	3	4	4	4	4	4	4	–
Commercial	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Total	1	1	1	1	0	1	1	1	1	1	1	5	5	6	6	6	7	8	7	–

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Table 5.3.7 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Final Energy Consumption by Type (ktoe)																				
Coal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Oil	0	0	0	0	0	0	0	0	0	0	0	4	4	4	4	4	5	6	5	–
Gas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Electricity	1	1	1	1	0	1	1	1	1	1	1	1	1	2	2	2	2	2	2	–
Heat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Biomass	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Total	1	1	1	1	0	1	1	1	1	1	1	5	5	6	6	6	7	8	7	–
Power Generation (GWh)																				
Thermal	8	8	8	8	5	9	8	11	11	13	15	13	14	18	21	22	24	24	23	–
Hydro	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Geothermal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Solar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Wind	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Total	8	8	8	8	5	9	8	11	11	13	15	13	14	18	21	22	24	24	23	–
Loss and Own Use of Electricity (GWh)																				
Transmission and Distribution Losses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	–
Own Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	–
Fuel Input for Power Generation (ktoe)																				
Coal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Oil	5	5	5	5	5	5	7	5	6	5	7	4	4	4	4	4	5	5	5	–
Gas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Total	5	5	5	5	5	5	7	5	6	5	7	4	4	4	4	4	5	5	5	–
CO_2 Emissions (kt C)										.										
Coal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Oil	6	6	6	6	6	6	10	8	9	8	9	7	7	7	7	7	8	9	8	–
Gas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Total	6	6	6	6	6	6	10	8	9	8	9	7	7	7	7	7	8	9	8	–

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Table 5.3.7 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Macroeconomic Indicators																				
Population (thousand)	72	73	74	75	76	77	78	80	81	83	84	86	87	89	90	92	94	95	97	98
Urban Population, %	35.0	35.3	35.6	35.8	36.1	36.4	37.7	39.0	40.4	41.7	43.0	43.1	43.2	43.4	43.5	43.6	43.7	43.8	43.8	43.9
GDP (constant 2000 $ million)	48	46	48	49	51	51	54	57	63	64	68	66	70	73	74	74	76	76	75	75
GDP (current $ million)	28	48	50	49	56	58	68	69	67	71	68	64	74	94	102	109	110	128	133	128
GDP (constant 2005 PPP $ million)	140	134	138	141	148	147	155	164	182	185	198	192	204	213	215	215	219	220	218	217
GDP/capita (constant 2000 $)	670	630	640	649	672	655	684	709	774	771	812	773	806	827	819	808	809	800	779	762
GDP/capita (current $)	395	653	670	646	738	746	865	868	827	855	812	746	851	1,053	1,133	1,184	1,173	1,345	1,373	1,306
GDP – Manufacturing (% of GDP)	5.7	5.5	5.2	5.3	5.1	5.5	5.2	5.0	4.6	4.9	4.4	4.7	4.3	4.4	4.6	4.5	4.7	5.6	5.7	5.5
Car Ownership (car/1,000 persons)	–	–	–	–	–	–	–	–	–	–	–	–	–	24	23	25	26	25	26	26
Basic Energy Indicators																				
TPES/capita (toe/person)	0.10	0.10	0.10	0.10	0.09	0.09	0.16	0.12	0.14	0.12	0.13	0.10	0.09	0.09	0.09	0.09	0.11	0.12	0.11	–
TFEC/capita (toe/person)	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.06	0.06	0.06	0.07	0.06	0.08	0.09	0.07	–
TPES/GDP (toe/constant 2000 $ million)	149	155	151	147	140	142	230	164	180	162	165	124	117	112	111	111	136	149	137	–
TFEC/GDP (toe/constant 2000 $ million)	14	15	14	15	9	15	13	16	14	17	18	79	76	77	80	80	94	108	94	–
Import Dependency (%)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	–
Oil Import Dependency (%)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	–
Electricity/capita (kWh/ person)	110	108	108	110	70	117	103	134	128	154	170	145	158	198	226	228	239	236	221	–
CO_2 Intensity (t C/constant 2000 $ million)	124	130	126	123	117	118	190	136	149	134	137	103	97	92	92	91	112	122	113	–
CO_2/capita (t C)	0.08	0.08	0.08	0.08	0.08	0.08	0.13	0.10	0.12	0.10	0.11	0.08	0.08	0.08	0.08	0.07	0.09	0.10	0.09	–
CO_2/TPES (t C/toe)	0.84	0.84	0.84	0.84	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.82	0.82	0.82	–

– = no data or not applicable, CO_2 = carbon dioxide, GDP = gross domestic product, GWh = gigawatt–hour, kt C = thousand tons of carbon equivalent, ktoe = thousand tons of oil equivalent, kWh = kilowatt–hour, PPP = purchasing power parity, t C = ton of carbon equivalent, TFEC = total final energy consumption, toe = ton of oil equivalent, TPES = total primary energy supply.

Note: Figures may not add up to total because of rounding.

Sources: APERC estimates, JAMA (2012), UNSD (2011a), and World Bank.

5.4 Marshall Islands

Country Profile (2009)		Energy Reserves (year-end 2008)	
Total Surface Area (square kilometer)	180	Coal (million ton) - Recoverable	0.0
Population (thousand)	53	Gas (trillion cubic feet) - Proven	0.0
GDP (billion constant 2000 $)	0.1	Oil (billion barrel) - Proven	0.0
Electrification Rate (%)	50.0		

GDP = gross domestic product.

Sources: ADB (2012), CIA (2012), Ostojic et al. (2011), and World Bank.

2008 Energy Supply and Demand Flow (ktoe)

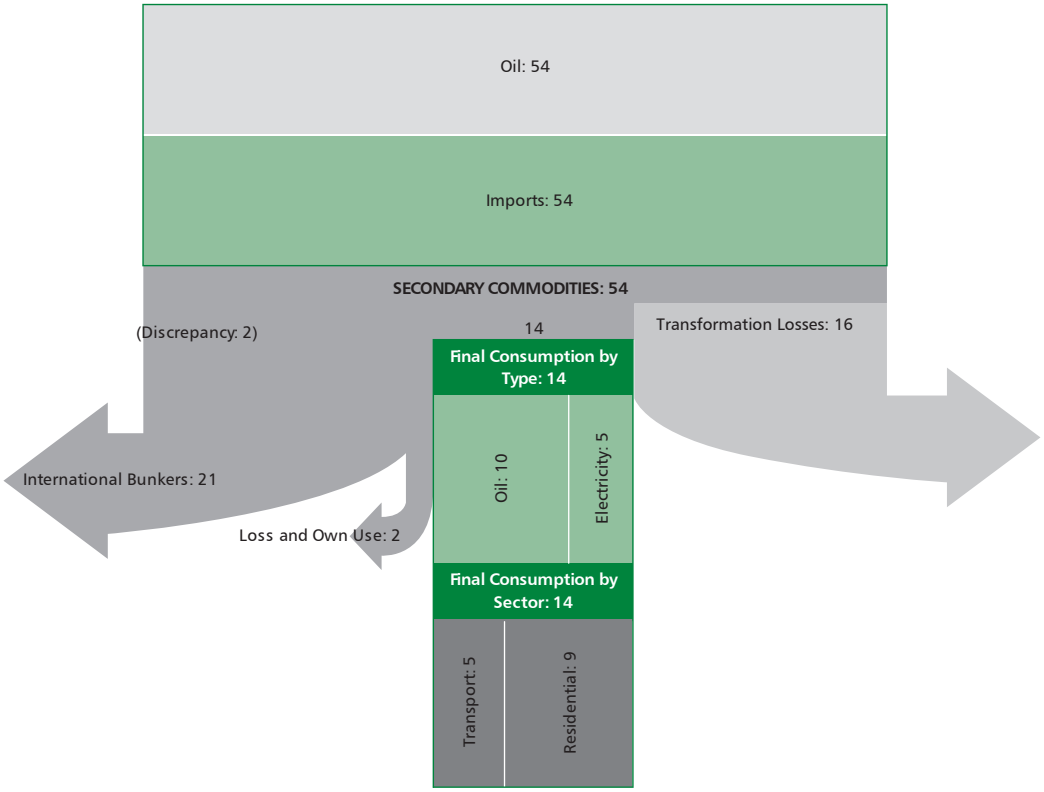


Table 5.4.1 Key Data and Economic Profile

	1990	1995	2000	2005	2008
Socioeconomic Data					
Population (thousand)	47	51	52	52	53
GDP (constant 2000 $ billion)	0.1	0.1	0.1	0.1	0.1
GDP (constant 2005 PPP $ billion)	–	–	–	–	–
GDP/capita (constant 2000 $)	2,138	2,581	2,127	2,368	2,399
GDP/capita (constant 2005 PPP $)	–	–	–	–	–

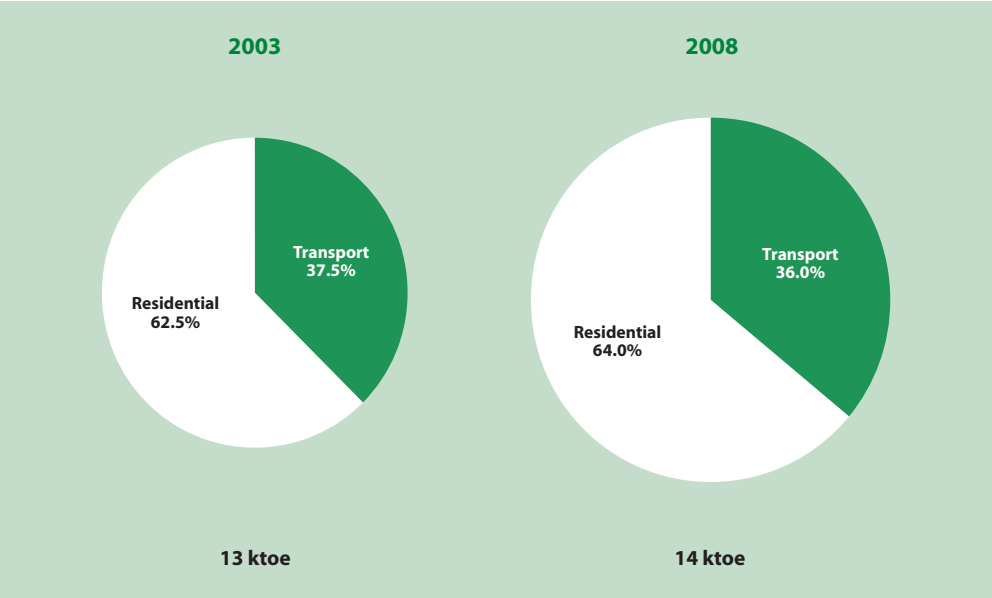
– = no data or not applicable, GDP = gross domestic product, PPP = purchasing power parity.
Source: World Bank.

Table 5.4.2 Energy Supply and Demand

	1990	1995	2000	2005	2008
Primary Energy Supply (ktoe)					
Indigenous Production	–	–	–	0	0
Net Imports	–	–	–	34	33
Total PES	–	–	–	34	33
Coal	–	–	–	0	0
Oil	–	–	–	34	33
Gas	–	–	–	0	0
Biomass	–	–	–	0	0
Others	–	–	–	0	0
TPES/capita (toe)	–	–	–	0.66	0.62
TPES/GDP (toe/constant 2005 PPP $ million)	–	–	–	–	–
Final Energy Consumption (ktoe)					
Industry	–	–	–	0	0
Transportation	–	–	–	5	5
Other Sectors	–	–	–	6	9
Total FEC	–	–	–	12	14
Coal	–	–	–	0	0
Oil	–	–	–	6	10
Gas	–	–	–	0	0
Electricity	–	–	–	5	5
Biomass	–	–	–	0	0
Others	–	–	–	0	0

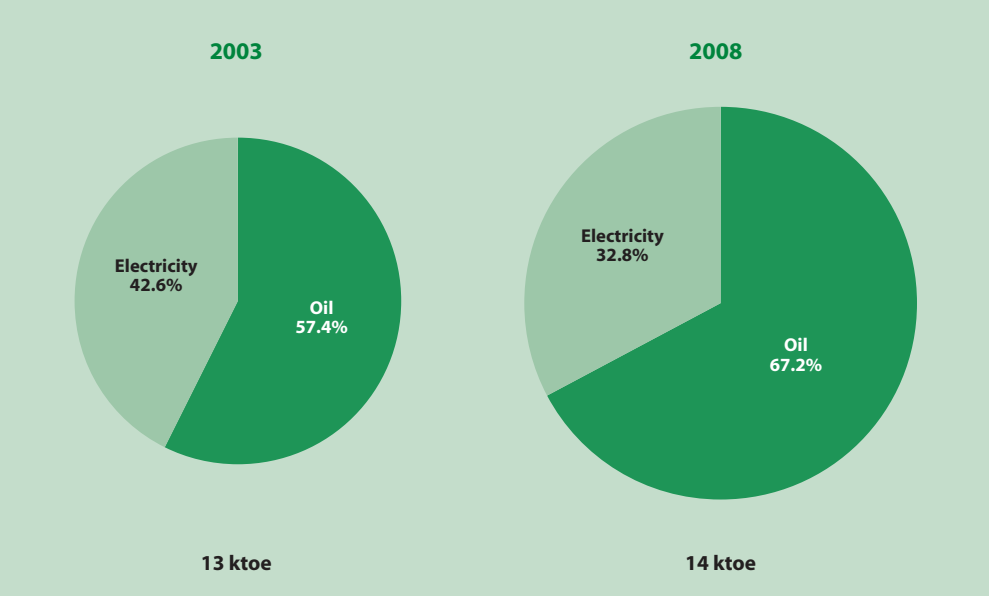
– = no data or not applicable, FEC = final energy consumption, GDP = gross domestic product, ktoe = thousand tons of oil equivalent, PES = primary energy supply, PPP = purchasing power parity, toe = ton of oil equivalent, TPES = total primary energy supply.
Source: ADB (unpublished).

Figure 5.4.1 Final Energy Consumption by Sector, 2003 and 2008



ktoe = thousand tons of oil equivalent.
Sources: ADB (unpublished).

Figure 5.4.2 Final Energy Consumption by Type of Energy, 2003 and 2008

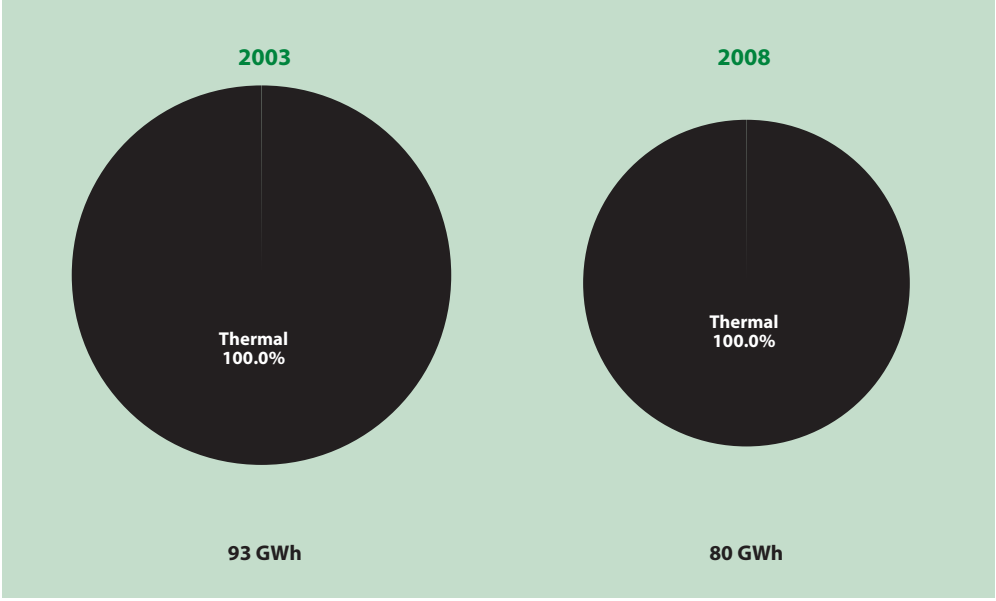


ktoe = thousand tons of oil equivalent.
Source: ADB (unpublished).

Figure 5.4.3 Total Primary Energy Supply, 2003 and 2008

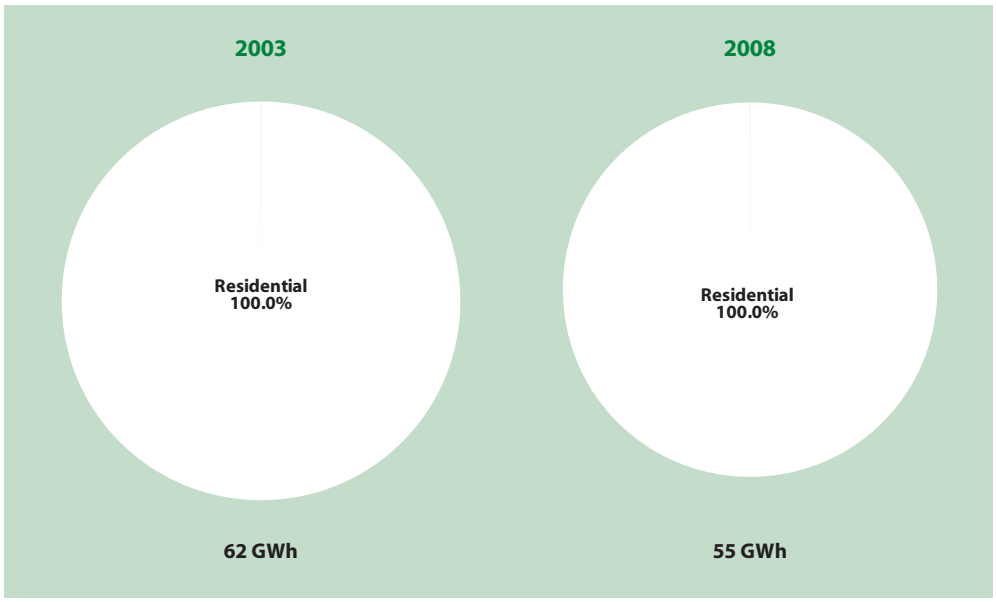
ktoe = thousand tons of oil equivalent.
Source: ADB (unpublished).

Figure 5.4.4 Electricity Generation by Plant Type, 2003 and 2008



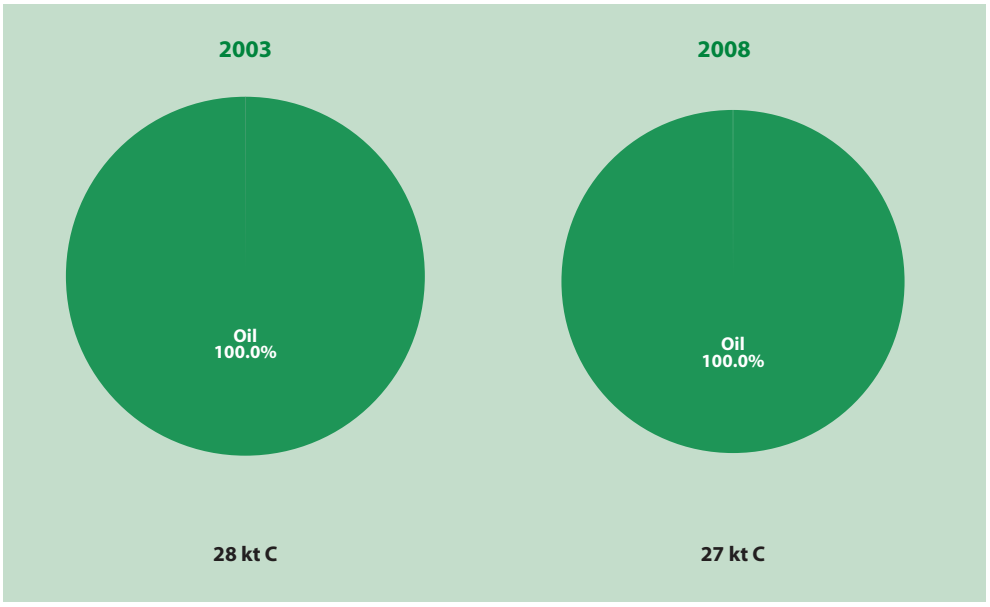
GWh = gigawatt-hour.
Source: ADB (unpublished).

Figure 5.4.5 Electricity Consumption by Sector, 2003 and 2008



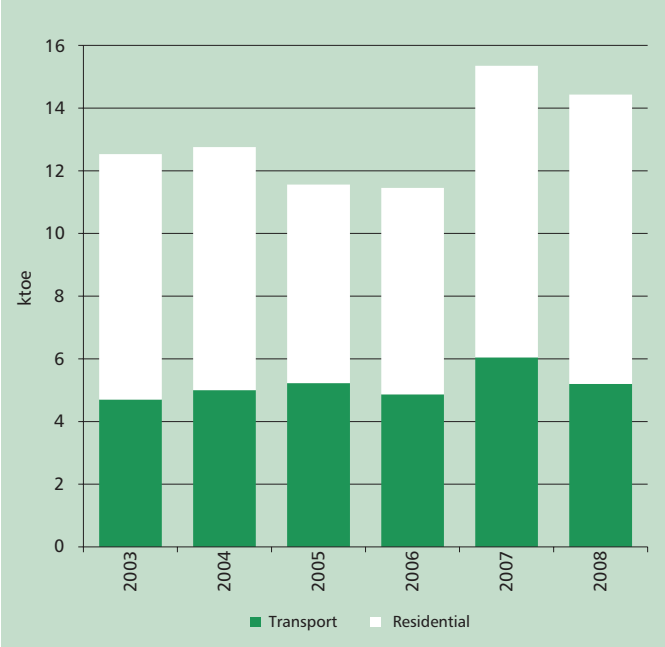
GWh = gigawatt-hour.
Source: ADB (unpublished).

Figure 5.4.6 Carbon Dioxide Emissions from Fuel Combustion, 2003 and 2008



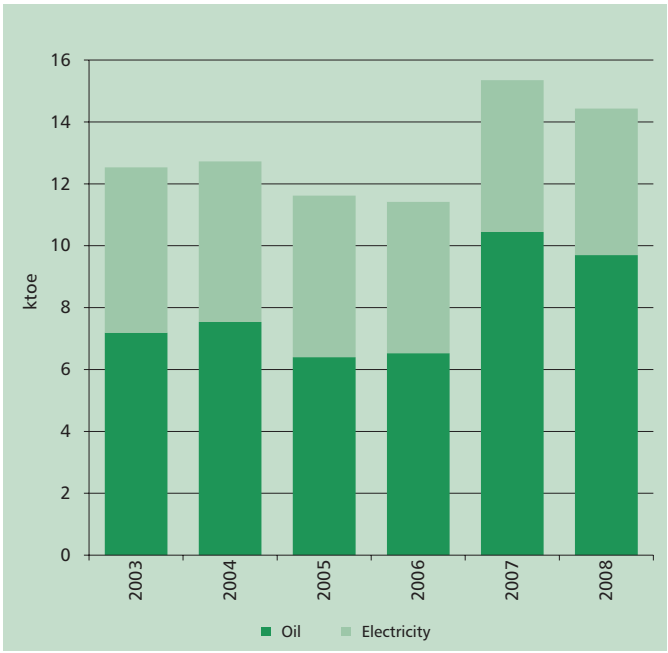
kt C = thousand tons of carbon equivalent.
Source: APERC estimates.

Figure 5.4.7 Final Energy Consumption by Sector, 2003–2008



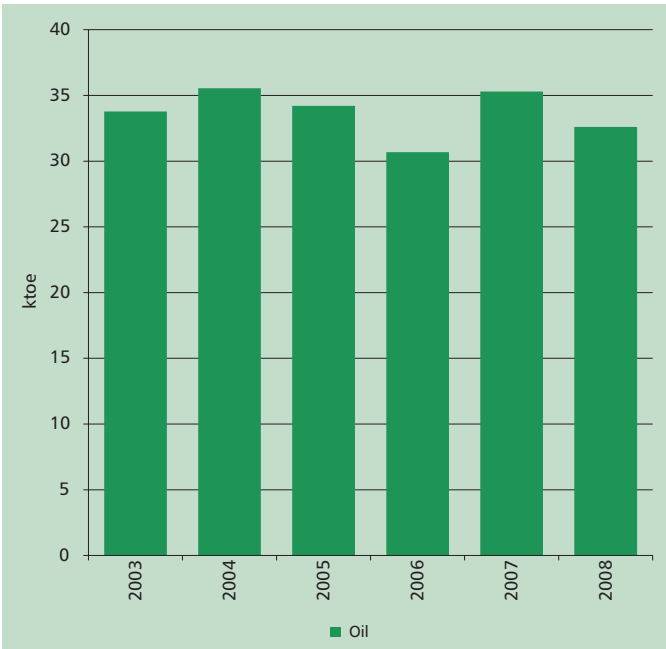
ktoe = thousand tons of oil equivalent.
Source: ADB (unpublished).

Figure 5.4.8 Final Energy Consumption by Type, 2003–2008



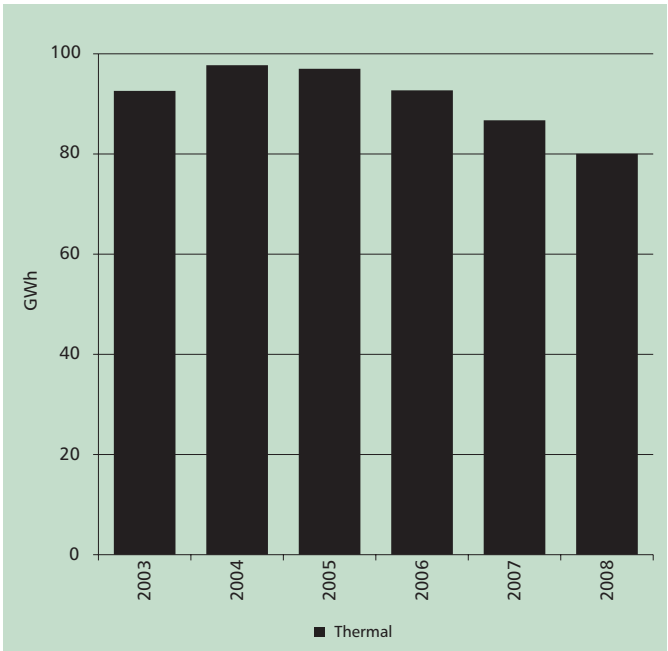
ktoe = thousand tons of oil equivalent.
Source: ADB (unpublished).

Figure 5.4.9 Total Primary Energy Supply, 2003–2008



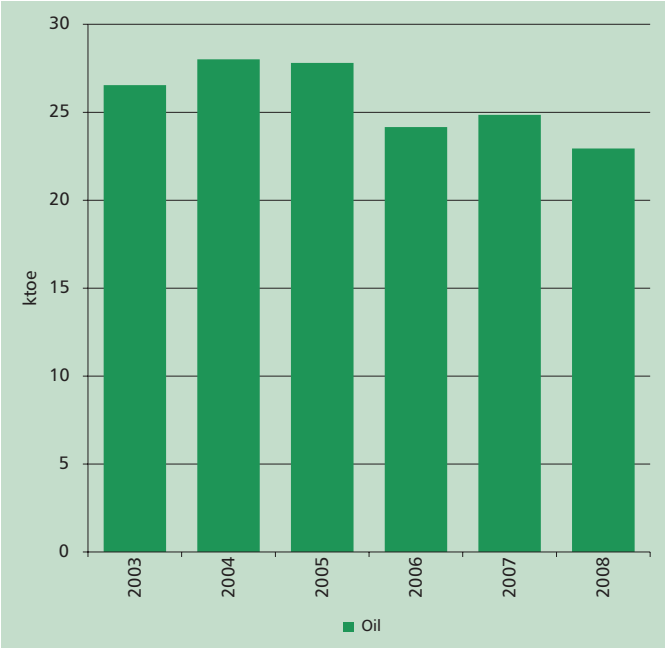
ktoe = thousand tons of oil equivalent.
Source: ADB (unpublished).

Figure 5.4.10 Electricity Generation by Source, 2003–2008



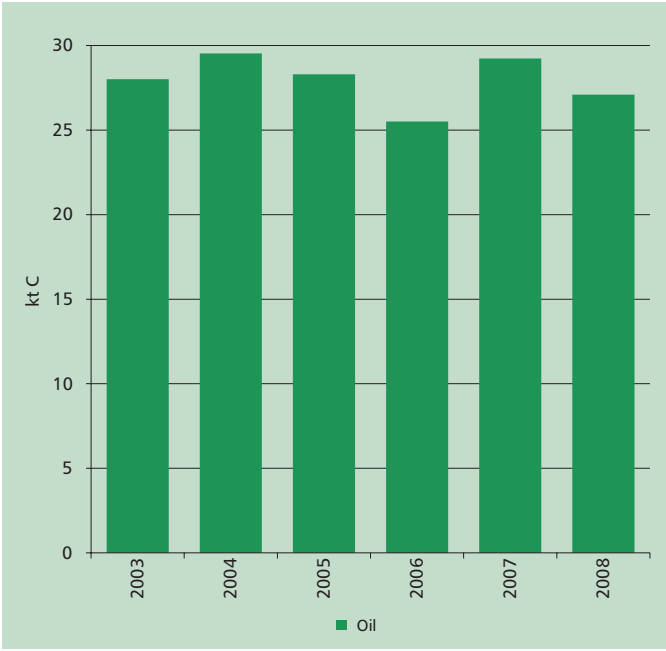
GWh = gigawatt-hour.
Source: ADB (unpublished).

Figure 5.4.11 Fuel Input for Electricity Generation, 2003–2008



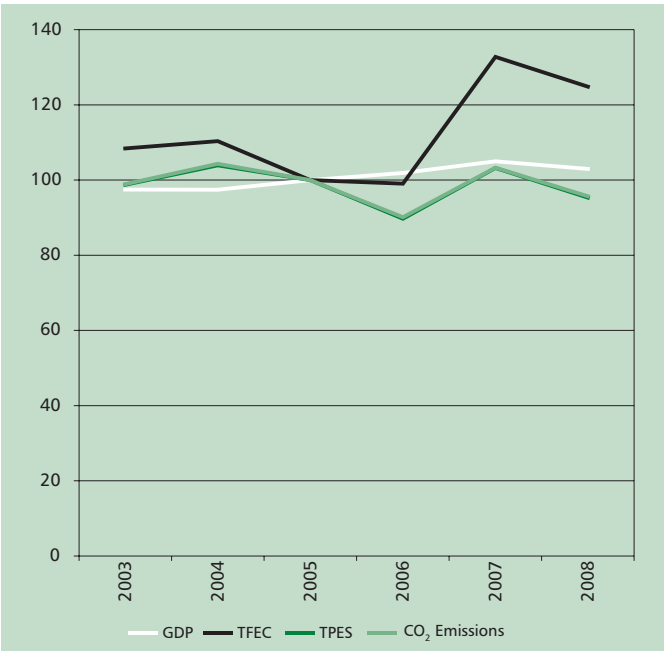
ktoe = thousand tons of oil equivalent.
Sources: ADB (unpublished), and APERC estimates.

Figure 5.4.12 Carbon Dioxide Emissions from Fuel Combustion, 2003–2008



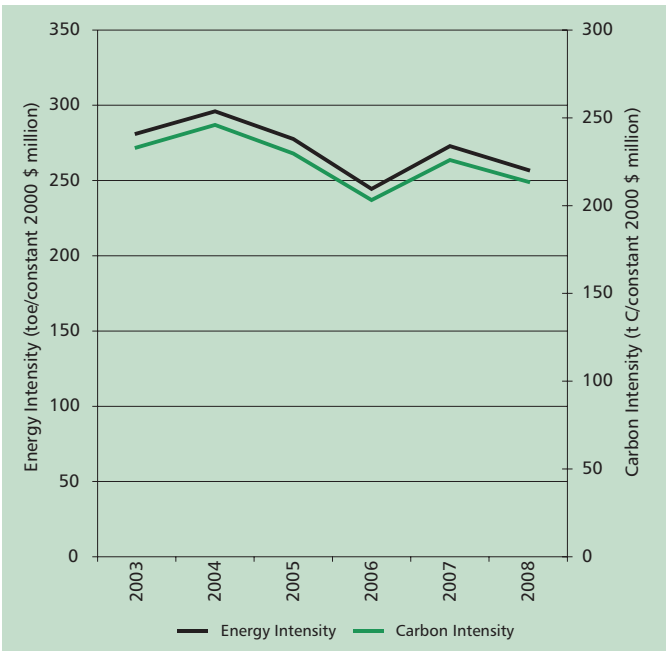
kt C = thousand tons of carbon equivalent.
Source: APERC estimates.

Figure 5.4.13 Growth of GDP, TFEC, TPES, and CO_2 (indexed to year 2000), 2003–2008



CO_2 = carbon dioxide, GDP = gross domestic product, TFEC = total final energy consumption, TPES = total primary energy supply.
Source: APERC estimates.

Figure 5.4.14 Energy and Carbon Intensities, 2003–2008



t C = ton of carbon equivalent, toe = ton of oil equivalent.
Source: APERC estimates.

Note: The energy balance data for Marshall Islands were collected through a study commissioned by ADB in 2008. The data available were only for the period 2003 to 2008.

Table 5.4.3 Marshall Islands Energy Balance Table, 2005

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.	Imports	0	0	0	62	5	10	46	0	0	0	0	0	0	0	0	0	0	0	0	0	62
3.	Exports	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.	International Bunkers	0	0	0	–28	0	0	–28	0	0	0	0	0	0	0	0	0	0	0	0	0	–28
5.	Stock Changes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6.	Total Primary Energy Supply	0	0	0	34	5	10	19	0	0	0	0	0	0	0	0	0	0	0	0	0	34
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	0	0	0	–28	0	–9	–19	0	0	0	0	0	0	0	0	0	0	0	8	0	–19
8.1	Power Generation	0	0	0	–28	0	–9	–19	0	0	0	0	0	0	0	0	0	0	0	8	0	–19
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–3	0	–3
10.	Discrepancy	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11.	Total Final Energy Consumption	0	0	0	6	5	1	0	0	0	0	0	0	0	0	0	0	0	0	5	0	12
12.	Industry Sector	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13.	Transport Sector	0	0	0	5	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
14.	Other Sectors	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	5	0	6
14.1	Residential and Commercial	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	5	0	6
14.1.1	Commerce and Public Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14.1.2	Residential	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	5	0	6
14.2	Non–Specified Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15.	Non–Energy Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16.	Electricity Output (GWh)	0	0	0	97	0	32	65	0	0	0	0	0	0	0	0	0	0	0	0	0	97
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.
Note: Figures may not add up to total because of rounding.
Source: ADB (unpublished).

Table 5.4.4 Marshall Islands Energy Balance Table, 2006

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.	Imports	0	0	0	43	5	7	31	0	0	0	0	0	0	0	0	0	0	0	0	0	43
3.	Exports	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.	International Bunkers	0	0	0	–12	0	0	–12	0	0	0	0	0	0	0	0	0	0	0	0	0	–12
5.	Stock Changes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6.	Total Primary Energy Supply	0	0	0	31	5	7	19	0	0	0	0	0	0	0	0	0	0	0	0	0	31
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	0	0	0	–24	0	–6	–19	0	0	0	0	0	0	0	0	0	0	0	8	0	–16
8.1	Power Generation	0	0	0	–24	0	–6	–19	0	0	0	0	0	0	0	0	0	0	0	8	0	–16
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–3	0	–3
10.	Discrepancy	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11.	Total Final Energy Consumption	0	0	0	7	5	1	0	0	0	0	0	0	0	0	0	0	0	0	5	0	11
12.	Industry Sector	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13.	Transport Sector	0	0	0	5	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
14.	Other Sectors	0	0	0	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	5	0	7
14.1	Residential and Commercial	0	0	0	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	5	0	7
14.1.1	Commerce and Public Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14.1.2	Residential	0	0	0	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	5	0	7
14.2	Non–Specified Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15.	Non–Energy Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16.	Electricity Output (GWh)	0	0	0	93	0	21	72	0	0	0	0	0	0	0	0	0	0	0	0	0	93
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Source: ADB (unpublished).

Table 5.4.5 Marshall Islands Energy Balance Table, 2007

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.	Imports	0	0	0	47	6	10	31	0	0	0	0	0	0	0	0	0	0	0	0	0	47
3.	Exports	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.	International Bunkers	0	0	0	–12	0	0	–12	0	0	0	0	0	0	0	0	0	0	0	0	0	–12
5.	Stock Changes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6.	Total Primary Energy Supply	0	0	0	35	6	10	19	0	0	0	0	0	0	0	0	0	0	0	0	0	35
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	0	0	0	–25	0	–6	–19	0	0	0	0	0	0	0	0	0	0	0	7	0	–17
8.1	Power Generation	0	0	0	–25	0	–6	–19	0	0	0	0	0	0	0	0	0	0	0	7	0	–17
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–3	0	–3
10.	Discrepancy	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11.	Total Final Energy Consumption	0	0	0	10	6	4	0	0	0	0	0	0	0	0	0	0	0	0	5	0	15
12.	Industry Sector	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13.	Transport Sector	0	0	0	6	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
14.	Other Sectors	0	0	0	4	0	4	0	0	0	0	0	0	0	0	0	0	0	0	5	0	9
14.1	Residential and Commercial	0	0	0	4	0	4	0	0	0	0	0	0	0	0	0	0	0	0	5	0	9
14.1.1	Commerce and Public Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14.1.2	Residential	0	0	0	4	0	4	0	0	0	0	0	0	0	0	0	0	0	0	5	0	9
14.2	Non–Specified Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15.	Non–Energy Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16.	Electricity Output (GWh)	0	0	0	87	0	22	65	0	0	0	0	0	0	0	0	0	0	0	0	0	87
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.
Note: Figures may not add up to total because of rounding.
Source: ADB (unpublished).

Table 5.4.6 Marshall Islands Energy Balance Table, 2008

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.	Imports	0	0	0	54	5	9	40	0	0	0	0	0	0	0	0	0	0	0	0	0	54
3.	Exports	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.	International Bunkers	0	0	0	–21	0	0	–21	0	0	0	0	0	0	0	0	0	0	0	0	0	–21
5.	Stock Changes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6.	Total Primary Energy Supply	0	0	0	33	5	9	19	0	0	0	0	0	0	0	0	0	0	0	0	0	33
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	0	0	0	–23	0	–4	–19	0	0	0	0	0	0	0	0	0	0	0	7	0	–16
8.1	Power Generation	0	0	0	–23	0	–4	–19	0	0	0	0	0	0	0	0	0	0	0	7	0	–16
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–2	0	–2
10.	Discrepancy	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2
11.	Total Final Energy Consumption	0	0	0	10	5	4	0	0	0	0	0	0	0	0	0	0	0	0	5	0	14
12.	Industry Sector	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13.	Transport Sector	0	0	0	5	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
14.	Other Sectors	0	0	0	5	0	4	0	0	0	0	0	0	0	0	0	0	0	0	5	0	9
14.1	Residential and Commercial	0	0	0	5	0	4	0	0	0	0	0	0	0	0	0	0	0	0	5	0	9
14.1.1	Commerce and Public Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14.1.2	Residential	0	0	0	5	0	4	0	0	0	0	0	0	0	0	0	0	0	0	5	0	9
14.2	Non–Specified Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15.	Non–Energy Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16.	Electricity Output (GWh)	0	0	0	80	0	15	65	0	0	0	0	0	0	0	0	0	0	0	0	0	80
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Source: ADB (unpublished).

Table 5.4.7 Marshall Islands Summary Table, 1990–2009

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Indigenous Production (ktoe)																				
Coal	–	–	–	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	–
Oil	–	–	–	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	–
Gas	–	–	–	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	–
Hydro	–	–	–	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	–
Nuclear	–	–	–	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	–
Geothermal	–	–	–	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	–
Solar	–	–	–	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	–
Wind	–	–	–	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	–
Biomass	–	–	–	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	–
Others	–	–	–	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	–
Total	–	–	–	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	–
Primary Energy Supply (ktoe)																				
Coal	–	–	–	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	–
Oil	–	–	–	–	–	–	–	–	–	–	–	–	–	34	36	34	31	35	33	–
Gas	–	–	–	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	–
Hydro	–	–	–	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	–
Nuclear	–	–	–	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	–
Geothermal	–	–	–	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	–
Solar	–	–	–	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	–
Wind	–	–	–	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	–
Biomass	–	–	–	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	–
Others	–	–	–	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	–
Total	–	–	–	–	–	–	–	–	–	–	–	–	–	34	36	34	31	35	33	–
Final Energy Consumption by Sector (ktoe)																				
Industry	–	–	–	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	–
Transport	–	–	–	–	–	–	–	–	–	–	–	–	–	5	5	5	5	6	5	–
Residential	–	–	–	–	–	–	–	–	–	–	–	–	–	8	8	6	7	9	9	–
Commercial	–	–	–	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	–
Others	–	–	–	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	–
Total	–	–	–	–	–	–	–	–	–	–	–	–	–	13	13	12	11	15	14	–

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Table 5.4.7 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Final Energy Consumption by Type (ktoe)																				
Coal	–	–	–	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	–
Oil	–	–	–	–	–	–	–	–	–	–	–	–	–	7	8	6	7	10	10	–
Gas	–	–	–	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	–
Electricity	–	–	–	–	–	–	–	–	–	–	–	–	–	5	5	5	5	5	5	–
Heat	–	–	–	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	–
Biomass	–	–	–	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	–
Others	–	–	–	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	–
Total	–	–	–	–	–	–	–	–	–	–	–	–	–	13	13	12	11	15	14	–
Power Generation (GWh)																				
Thermal	–	–	–	–	–	–	–	–	–	–	–	–	–	93	98	97	93	87	80	–
Hydro	–	–	–	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	–
Nuclear	–	–	–	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	–
Geothermal	–	–	–	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	–
Solar	–	–	–	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	–
Wind	–	–	–	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	–
Others	–	–	–	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	–
Total	–	–	–	–	–	–	–	–	–	–	–	–	–	93	98	97	93	87	80	–
Loss and Own Use of Electricity (GWh)																				
Transmission and Distribution Losses	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Own Use	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Total	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Fuel Input for Power Generation (ktoe)																				
Coal	–	–	–	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	–
Oil	–	–	–	–	–	–	–	–	–	–	–	–	–	27	28	28	24	25	23	–
Gas	–	–	–	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	–
Total	–	–	–	–	–	–	–	–	–	–	–	–	–	27	28	28	24	25	23	–
CO_2 Emissions (kt C)																				
Coal	–	–	–	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	–
Oil	–	–	–	–	–	–	–	–	–	–	–	–	–	28	30	28	26	29	27	–
Gas	–	–	–	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	–
Total	–	–	–	–	–	–	–	–	–	–	–	–	–	28	30	28	26	29	27	–

continued on next page

Table 5.4.7 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Macroeconomic Indicators																				
Population (thousand)	47	48	49	50	51	51	51	52	52	52	52	52	52	52	52	52	52	52	53	53
Urban Population, %	65.1	65.4	65.7	66.1	66.4	66.7	67.0	67.4	67.7	68.1	68.4	68.7	69.0	69.4	69.7	70.0	70.4	70.7	71.1	71.4
GDP (constant 2000 $ million)	101	101	108	115	122	132	118	110	107	105	111	117	120	120	120	123	126	129	127	125
GDP (current $ million)	78	83	91	99	108	120	111	106	109	108	111	115	125	127	131	138	143	150	153	152
GDP (constant 2005 PPP $ million)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
GDP/capita (constant 2000 $)	2,138	2,087	2,196	2,296	2,406	2,581	2,298	2,137	2,067	2,012	2,127	2,242	2,304	2,311	2,311	2,368	2,405	2,465	2,399	2,345
GDP/capita (current $)	1,660	1,702	1,845	1,988	2,137	2,357	2,157	2,056	2,093	2,073	2,127	2,209	2,396	2,441	2,523	2,643	2,746	2,853	2,885	2,838
GDP – Manufacturing (% of GDP)	1.0	1.1	1.0	0.7	1.1	2.5	1.5	1.6	1.5	3.2	4.4	4.4	4.1	4.3	4.2	4.2	4.2	4.2	4.3	4.2
Car Ownership (car/1,000 persons)	–	–	–	–	–	–	–	–	–	–	–	–	–	15	15	16	17	19	19	19
Basic Energy Indicators																				
TPES/capita (toe/person)	–	–	–	–	–	–	–	–	–	–	–	–	–	0.65	0.68	0.66	0.59	0.67	0.62	–
TFEC/capita (toe/person)	–	–	–	–	–	–	–	–	–	–	–	–	–	0.24	0.24	0.22	0.22	0.29	0.27	–
TPES/GDP (toe/constant 2000 $ million)	–	–	–	–	–	–	–	–	–	–	–	–	–	281	296	278	244	273	257	–
TFEC/GDP (toe/constant 2000 $ million)	–	–	–	–	–	–	–	–	–	–	–	–	–	104	106	94	91	119	114	–
Import Dependency (%)	–	–	–	–	–	–	–	–	–	–	–	–	–	100.0	100.0	100.0	100.0	100.0	100.0	–
Oil Import Dependency (%)	–	–	–	–	–	–	–	–	–	–	–	–	–	100.0	100.0	100.0	100.0	100.0	100.0	–
Electricity/capita (kWh/ person)	–	–	–	–	–	–	–	–	–	–	–	–	–	1,195	1,161	1,167	1,088	1,086	1,040	–
CO_2 Intensity (t C/constant 2000 $ million)	–	–	–	–	–	–	–	–	–	–	–	–	–	233	246	230	203	226	214	–
CO_2/capita (t C)	–	–	–	–	–	–	–	–	–	–	–	–	–	0.54	0.57	0.54	0.49	0.56	0.51	–
CO_2/TPES (t C/toe)	–	–	–	–	–	–	–	–	–	–	–	–	–	0.83	0.83	0.83	0.83	0.83	0.83	–

– = no data or not applicable, CO_2 = carbon dioxide, GDP = gross domestic product, GWh = gigawatt–hour, kt C = thousand tons of carbon equivalent, ktoe = thousand tons of oil equivalent, kWh = kilowatt–hour, PPP = purchasing power parity, t C = ton of carbon equivalent, TFEC = total final energy consumption, toe = ton of oil equivalent, TPES = total primary energy supply.

Note: Figures may not add up to total because of rounding.

Sources: ADB (unpublished), APERC estimates, JAMA (2012), and World Bank.

5.5 Federated States of Micronesia

Country Profile (2009)		Energy Reserves (year-end 2008)	
Total Surface Area (square kilometer)	700	Coal (million ton) - Recoverable	0.0
Population (thousand)	111	Gas (trillion cubic feet) - Proven	0.0
GDP (billion constant 2000 $)	0.2	Oil (billion barrel) - Proven	0.0
Electrification Rate (%)	45.0		

GDP = gross domestic product.

Sources: ADB (2012), Ostojic et al. (2011), and World Bank.

2008 Energy Supply and Demand Flow (ktoe)

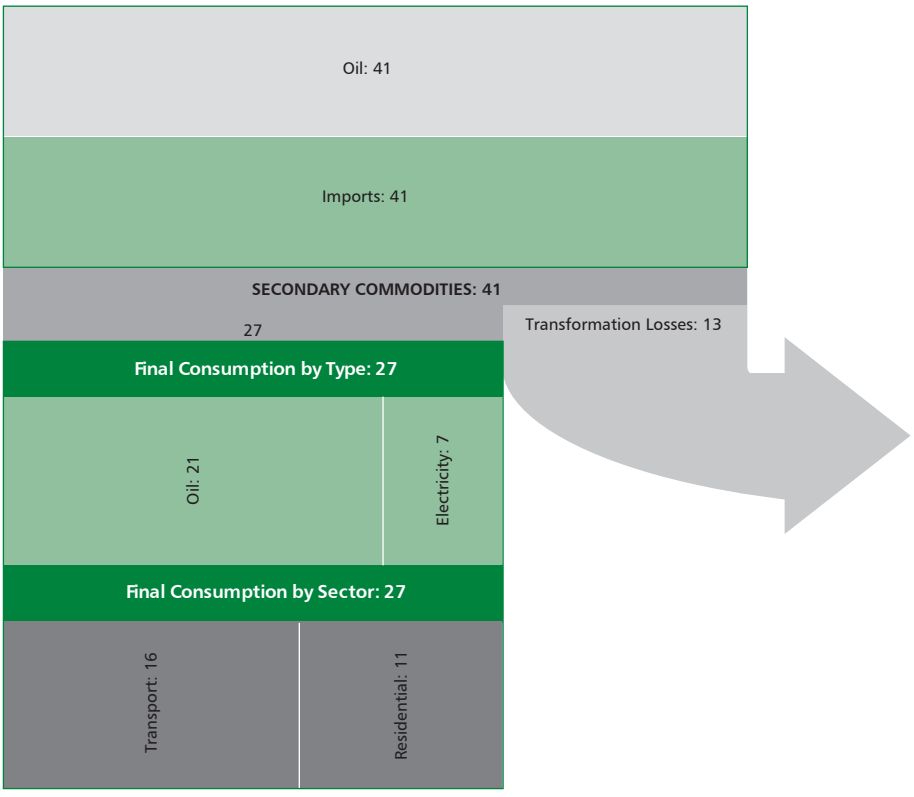


Table 5.5.1 Key Data and Economic Profile

	1990	1995	2000	2005	2008
Socioeconomic Data					
Population (thousand)	96	107	107	109	110
GDP (constant 2000 $ billion)	0.2	0.2	0.2	0.2	0.2
GDP (constant 2005 PPP $ billion)	0.3	0.3	0.3	0.3	0.3
GDP/capita (constant 2000 $)	1,891	2,192	2,181	2,193	2,079
GDP/capita (constant 2005 PPP $)	2,634	3,053	3,038	3,054	2,896

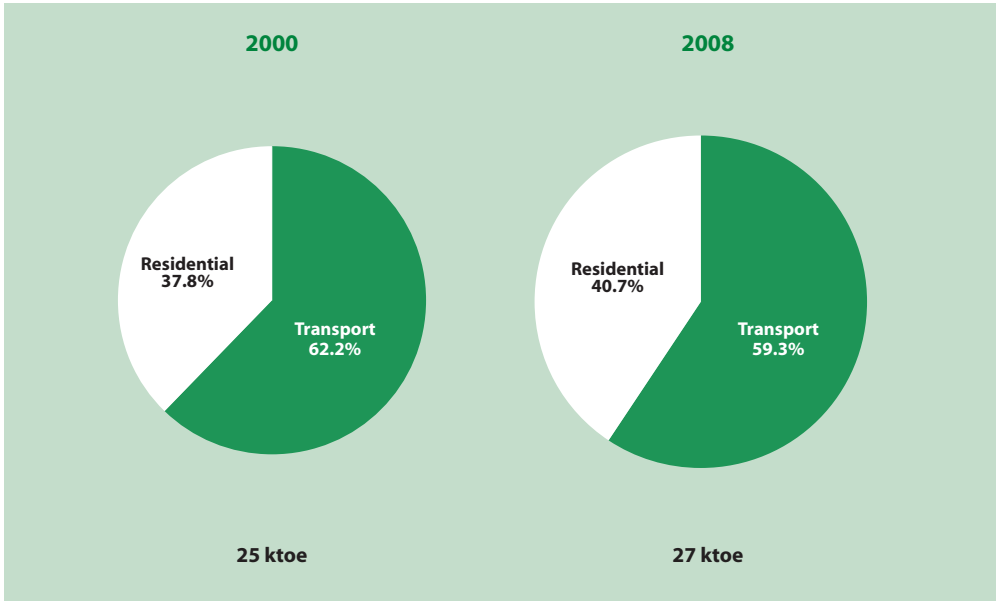
GDP = gross domestic product, PPP = purchasing power parity.
Source: World Bank.

Table 5.5.2 Energy Supply and Demand

	1990	1995	2000	2005	2008
Primary Energy Supply (ktoe)					
Indigenous Production	–	–	0	0	0
Net Imports	–	–	45	38	41
Total PES	–	–	45	38	41
Coal	–	–	0	0	0
Oil	–	–	45	38	41
Gas	–	–	0	0	0
Biomass	–	–	0	0	0
Others	–	–	0	0	0
TPES/capita (toe)	–	–	0.42	0.35	0.37
TPES/GDP (toe/constant 2005 PPP $ million)	–	–	138	115	127
Final Energy Consumption (ktoe)					
Industry	–	–	0	0	0
Transportation	–	–	16	13	16
Other Sectors	–	–	9	10	11
Total FEC	–	–	25	23	27
Coal	–	–	0	0	0
Oil	–	–	19	18	21
Gas	–	–	0	0	0
Electricity	–	–	6	6	7
Biomass	–	–	0	0	0
Others	–	–	0	0	0

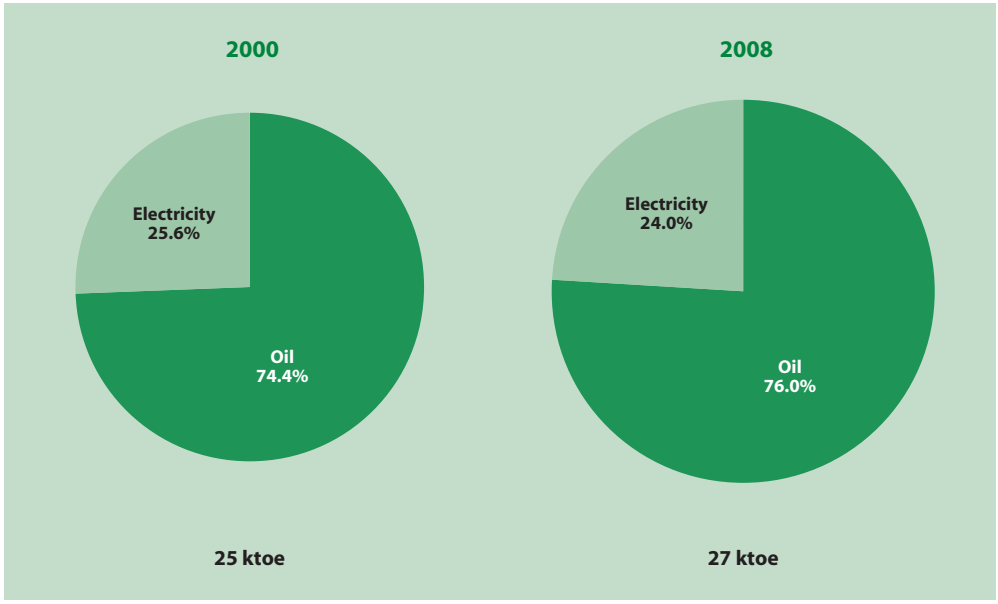
– = no data or not applicable, FEC = final energy consumption, GDP = gross domestic product, ktoe = thousand tons of oil equivalent, PES = primary energy supply, PPP = purchasing power parity, toe = ton of oil equivalent, TPES = total primary energy supply.
Source: ADB (unpublished).

Figure 5.5.1 Final Energy Consumption by Sector, 2000 and 2008



ktoe = thousand tons of oil equivalent.
Source: ADB (unpublished).

Figure 5.5.2 Final Energy Consumption by Type of Energy, 2000 and 2008

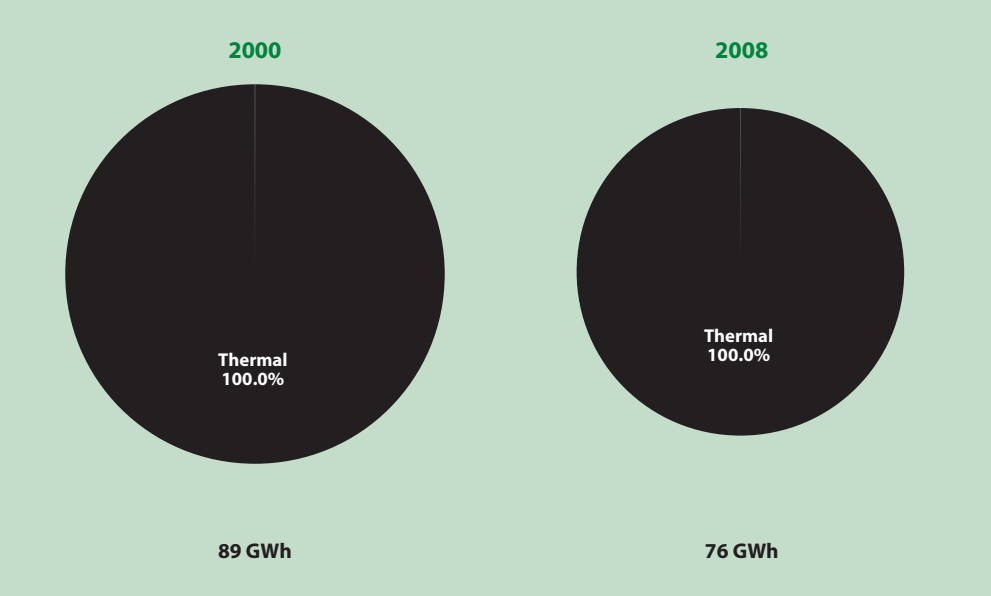


ktoe = thousand tons of oil equivalent.
Source: ADB (unpublished).

Figure 5.5.3 Total Primary Energy Supply, 2000 and 2008

ktoe = thousand tons of oil equivalent.
Source: ADB (unpublished).

Figure 5.5.4 Electricity Generation by Plant Type, 2000 and 2008

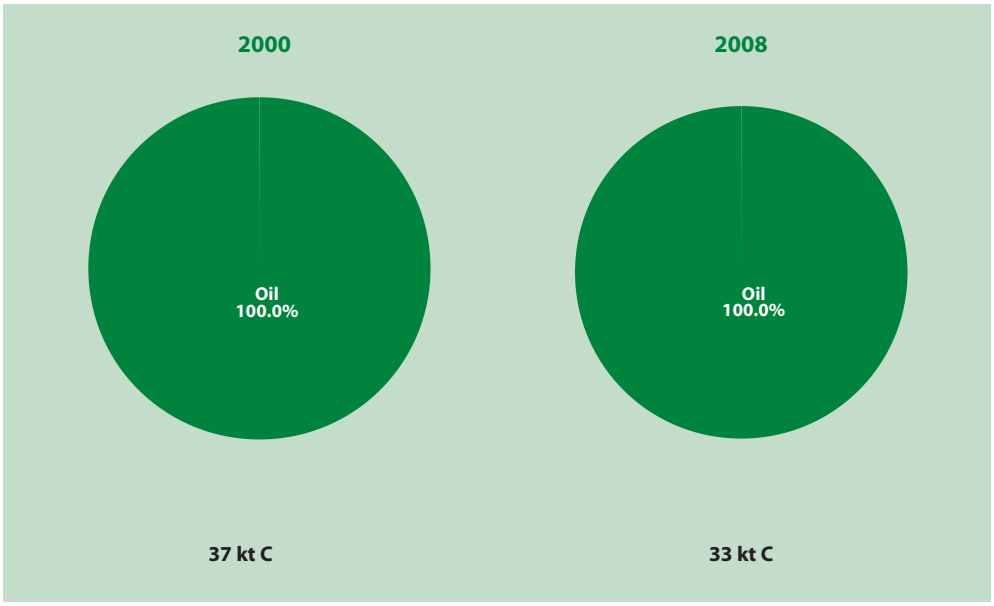


GWh = gigawatt-hour.
Source: ADB (unpublished).

Figure 5.5.5 Electricity Consumption by Sector, 2000 and 2008

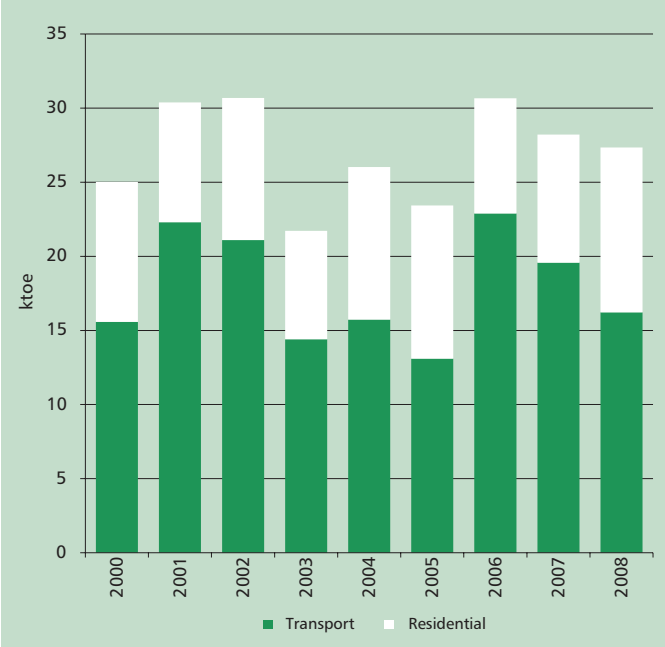
GWh = gigawatt-hour.
Source: ADB (unpublished).

Figure 5.5.6 Carbon Dioxide Emissions from Fuel Combustion, 2000 and 2008



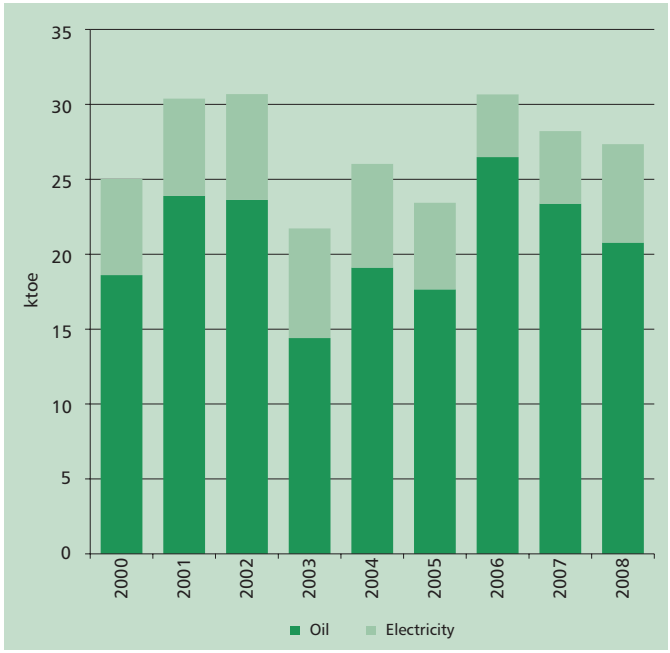
kt C = thousand tons of carbon equivalent.
Source: APERC estimates.

Figure 5.5.7 Final Energy Consumption by Sector, 2000–2008



ktoe = thousand tons of oil equivalent.
Source: ADB (unpublished).

Figure 5.5.8 Final Energy Consumption by Type, 2000–2008

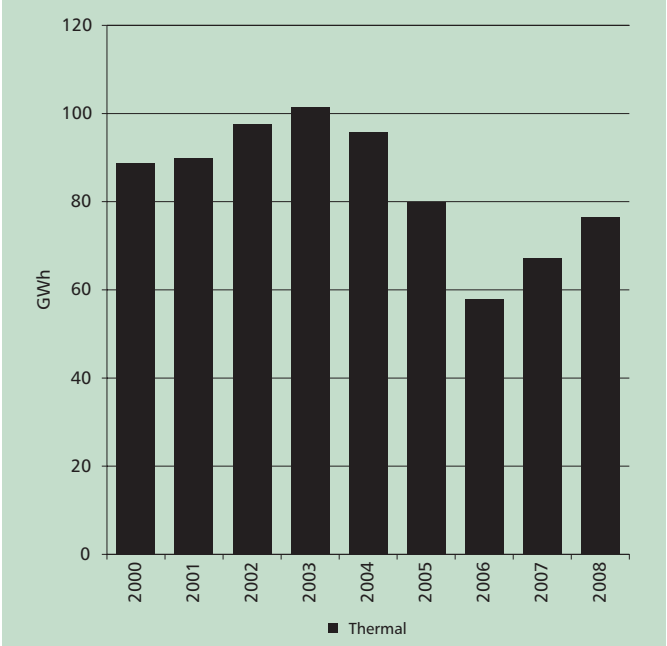


ktoe = thousand tons of oil equivalent.
Source: ADB (unpublished).

Figure 5.5.9 Total Primary Energy Supply, 2000–2008

ktoe = thousand tons of oil equivalent.
Source: ADB (unpublished).

Figure 5.5.10 Electricity Generation by Source, 2000–2008

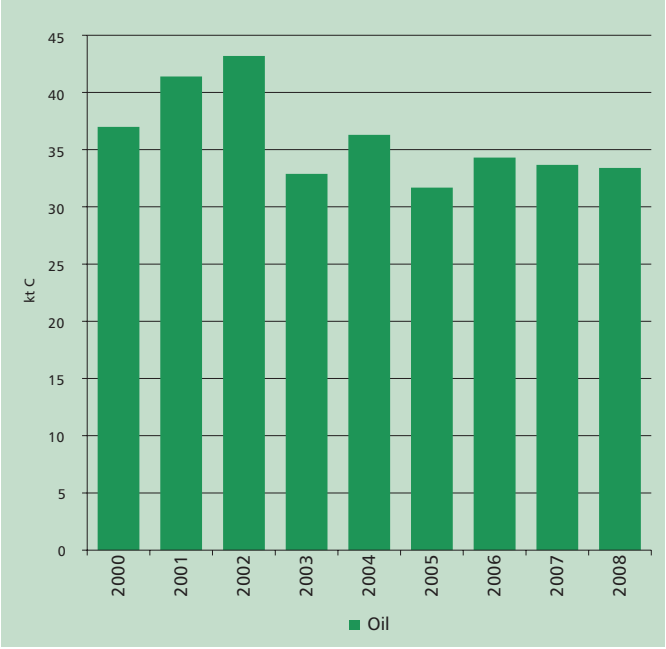


GWh = gigawatt-hour.
Source: ADB (unpublished).

Figure 5.5.11 Fuel Input for Electricity Generation, 2000–2008

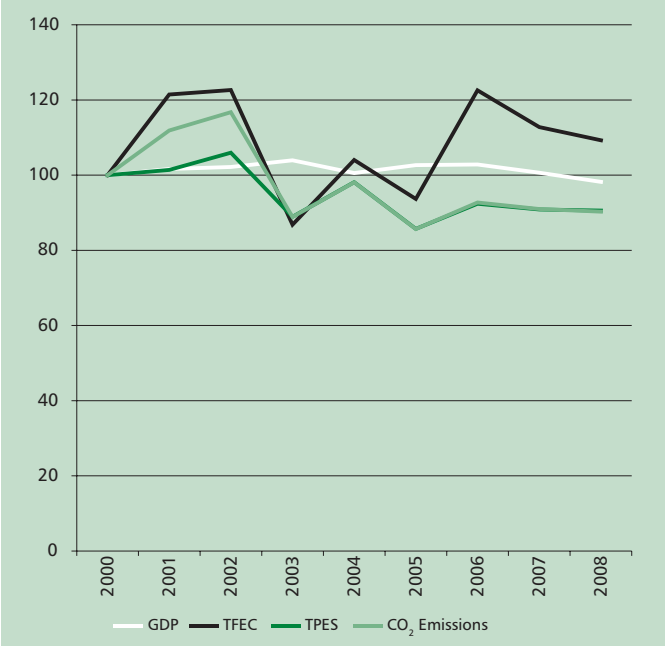
ktoe = thousand tons of oil equivalent.
Sources: ADB (unpublished), and APERC estimates.

Figure 5.5.12 Carbon Dioxide Emissions from Fuel Combustion, 2000–2008



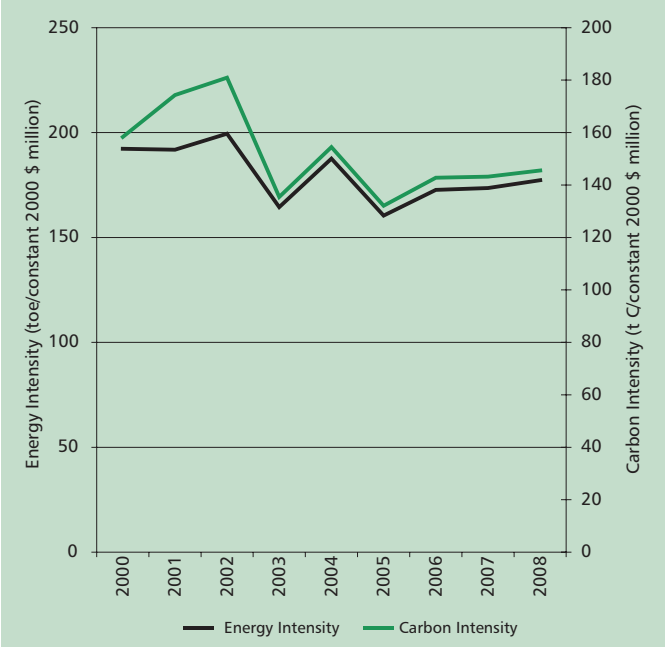
kt C = thousand tons of carbon equivalent.
Source: APERC estimates.

Figure 5.5.13 Growth of GDP, TFEC, TPES, and CO_2 (indexed to year 2000), 2000–2008



CO_2 = carbon dioxide, GDP = gross domestic product, TFEC = total final energy consumption, TPES = total primary energy supply.
Source: APERC estimates.

Figure 5.5.14 Energy and Carbon Intensities, 2000–2008



t C = ton of carbon equivalent, toe = ton of oil equivalent.
Source: APERC estimates.

Note: The energy balance data for Marshall Islands were collected through a study commissioned by ADB in 2008. The data available were only for the period 2000 to 2008.

Table 5.5.3 Federated States of Micronesia Energy Balance Table, 2005

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.	Imports	0	0	0	38	13	7	19	0	0	0	0	0	0	0	0	0	0	0	0	0	38
3.	Exports	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.	International Bunkers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5.	Stock Changes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6.	Total Primary Energy Supply	0	0	0	38	13	7	19	0	0	0	0	0	0	0	0	0	0	0	0	0	38
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	0	0	0	–21	0	–2	–19	0	0	0	0	0	0	0	0	0	0	0	7	0	–14
8.1	Power Generation	0	0	0	–21	0	–2	–19	0	0	0	0	0	0	0	0	0	0	0	7	0	–14
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–1	0	–1
10.	Discrepancy	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11.	Total Final Energy Consumption	0	0	0	18	13	5	0	0	0	0	0	0	0	0	0	0	0	0	6	0	23
12.	Industry Sector	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13.	Transport Sector	0	0	0	13	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13
14.	Other Sectors	0	0	0	5	0	5	0	0	0	0	0	0	0	0	0	0	0	0	6	0	10
14.1	Residential and Commercial	0	0	0	5	0	5	0	0	0	0	0	0	0	0	0	0	0	0	6	0	10
14.1.1	Commerce and Public Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14.1.2	Residential	0	0	0	5	0	5	0	0	0	0	0	0	0	0	0	0	0	0	6	0	10
14.2	Non-Specified Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15.	Non-Energy Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16.	Electricity Output (GWh)	0	0	0	80	0	0	80	0	0	0	0	0	0	0	0	0	0	0	0	0	80
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.
Note: Figures may not add up to total because of rounding.
Source: ADB (unpublished).

Table 5.5.4 Federated States of Micronesia Energy Balance Table, 2006

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.	Imports	0	0	0	41	14	4	24	0	0	0	0	0	0	0	0	0	0	0	0	0	41
3.	Exports	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.	International Bunkers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5.	Stock Changes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6.	Total Primary Energy Supply	0	0	0	41	14	4	24	0	0	0	0	0	0	0	0	0	0	0	0	0	41
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	0	0	0	–15	0	0	–15	0	0	0	0	0	0	0	0	0	0	0	1	0	–14
8.1	Power Generation	0	0	0	–15	0	0	–15	0	0	0	0	0	0	0	0	0	0	0	5	0	–10
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–1	0	–1
10.	Discrepancy	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11.	Total Final Energy Consumption	0	0	0	26	14	4	9	0	0	0	0	0	0	0	0	0	0	0	4	0	31
12.	Industry Sector	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13.	Transport Sector	0	0	0	23	14	0	9	0	0	0	0	0	0	0	0	0	0	0	0	0	23
14.	Other Sectors	0	0	0	4	0	4	0	0	0	0	0	0	0	0	0	0	0	0	4	0	8
14.1	Residential and Commercial	0	0	0	4	0	4	0	0	0	0	0	0	0	0	0	0	0	0	4	0	8
14.1.1	Commerce and Public Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14.1.2	Residential	0	0	0	4	0	4	0	0	0	0	0	0	0	0	0	0	0	0	4	0	8
14.2	Non-Specified Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15.	Non-Energy Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16.	Electricity Output (GWh)	0	0	0	58	0	0	58	0	0	0	0	0	0	0	0	0	0	0	0	0	58
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Source: ADB (unpublished).

Table 5.5.5 Federated States of Micronesia Energy Balance Table, 2007

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.	Imports	0	0	0	41	15	4	22	0	0	0	0	0	0	0	0	0	0	0	0	0	41
3.	Exports	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.	International Bunkers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5.	Stock Changes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6.	Total Primary Energy Supply	0	0	0	41	15	4	22	0	0	0	0	0	0	0	0	0	0	0	0	0	41
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	0	0	0	–17	0	0	–17	0	0	0	0	0	0	0	0	0	0	0	6	0	–12
8.1	Power Generation	0	0	0	–17	0	0	–17	0	0	0	0	0	0	0	0	0	0	0	6	0	–12
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–1	0	–1
10.	Discrepancy	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11.	Total Final Energy Consumption	0	0	0	23	15	4	5	0	0	0	0	0	0	0	0	0	0	0	5	0	28
12.	Industry Sector	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13.	Transport Sector	0	0	0	20	15	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	20
14.	Other Sectors	0	0	0	4	0	4	0	0	0	0	0	0	0	0	0	0	0	0	5	0	9
14.1	Residential and Commercial	0	0	0	4	0	4	0	0	0	0	0	0	0	0	0	0	0	0	5	0	9
14.1.1	Commerce and Public Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14.1.2	Residential	0	0	0	4	0	4	0	0	0	0	0	0	0	0	0	0	0	0	5	0	9
14.2	Non–Specified Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15.	Non–Energy Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16.	Electricity Output (GWh)	0	0	0	67	0	0	67	0	0	0	0	0	0	0	0	0	0	0	0	0	67
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.
Note: Figures may not add up to total because of rounding.
Source: ADB (unpublished).

Table 5.5.6 Federated States of Micronesia Energy Balance Table, 2008

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.	Imports	0	0	0	41	16	4	21	0	1	0	0	0	0	0	0	0	0	0	0	0	41
3.	Exports	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.	International Bunkers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5.	Stock Changes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6.	Total Primary Energy Supply	0	0	0	41	16	4	21	0	1	0	0	0	0	0	0	0	0	0	0	0	41
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	0	0	0	–20	0	0	–20	0	0	0	0	0	0	0	0	0	0	0	7	0	–13
8.1	Power Generation	0	0	0	–20	0	0	–20	0	0	0	0	0	0	0	0	0	0	0	7	0	–13
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10.	Discrepancy	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11.	Total Final Energy Consumption	0	0	0	21	16	4	1	0	1	0	0	0	0	0	0	0	0	0	7	0	27
12.	Industry Sector	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13.	Transport Sector	0	0	0	16	16	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	16
14.	Other Sectors	0	0	0	5	0	4	0	0	1	0	0	0	0	0	0	0	0	0	7	0	11
14.1	Residential and Commercial	0	0	0	5	0	4	0	0	1	0	0	0	0	0	0	0	0	0	7	0	11
14.1.1	Commerce and Public Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14.1.2	Residential	0	0	0	5	0	4	0	0	1	0	0	0	0	0	0	0	0	0	7	0	11
14.2	Non–Specified Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15.	Non–Energy Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16.	Electricity Output (GWh)	0	0	0	76	0	0	76	0	0	0	0	0	0	0	0	0	0	0	0	0	76
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Source: ADB (unpublished).

Table 5.5.7 Federated States of Micronesia Summary Table, 1990–2009

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Indigenous Production (ktoe)																				
Coal	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	0	0	0	–
Oil	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	0	0	0	–
Gas	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	0	0	0	–
Hydro	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	0	0	0	–
Nuclear	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	0	0	0	–
Geothermal	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	0	0	0	–
Solar	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	0	0	0	–
Wind	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	0	0	0	–
Biomass	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	0	0	0	–
Others	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	0	0	0	–
Total	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	0	0	0	–
Primary Energy Supply (ktoe)																				
Coal	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	0	0	0	–
Oil	–	–	–	–	–	–	–	–	–	–	45	46	48	40	44	38	41	41	41	–
Gas	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	0	0	0	–
Hydro	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	0	0	0	–
Nuclear	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	0	0	0	–
Geothermal	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	0	0	0	–
Solar	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	0	0	0	–
Wind	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	0	0	0	–
Biomass	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	0	0	0	–
Others	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	0	0	0	–
Total	–	–	–	–	–	–	–	–	–	–	45	46	48	40	44	38	41	41	41	–
Final Energy Consumption by Sector (ktoe)																				
Industry	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	0	0	0	–
Transport	–	–	–	–	–	–	–	–	–	–	16	22	21	14	16	13	23	20	16	–
Residential	–	–	–	–	–	–	–	–	–	–	9	8	10	7	10	10	8	9	11	–
Commercial	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	0	0	0	–
Others	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	0	0	0	–
Total	–	–	–	–	–	–	–	–	–	–	25	30	31	22	26	23	31	28	27	–

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Table 5.5.7 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Final Energy Consumption by Type (ktoe)																				
Coal	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	0	0	0	–
Oil	–	–	–	–	–	–	–	–	–	–	19	24	24	14	19	18	26	23	21	–
Gas	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	0	0	0	–
Electricity	–	–	–	–	–	–	–	–	–	–	6	6	7	7	7	6	4	5	7	–
Heat	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	0	0	0	–
Biomass	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	0	0	0	–
Others	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	0	0	0	–
Total	–	–	–	–	–	–	–	–	–	–	25	30	31	22	26	23	31	28	27	–
Power Generation (GWh)																				
Thermal	–	–	–	–	–	–	–	–	–	–	89	90	98	101	96	80	58	67	76	–
Hydro	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	0	0	0	–
Nuclear	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	0	0	0	–
Geothermal	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	0	0	0	–
Solar	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	0	0	0	–
Wind	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	0	0	0	–
Others	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	0	0	0	–
Total	–	–	–	–	–	–	–	–	–	–	89	90	98	101	96	80	58	67	76	–
Loss and Own Use of Electricity (GWh)																				
Transmission and Distribution Losses	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Own Use	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Total	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Fuel Input for Power Generation (ktoe)																				
Coal	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	0	0	0	–
Oil	–	–	–	–	–	–	–	–	–	–	26	27	29	26	25	21	15	17	20	–
Gas	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	0	0	0	–
Total	–	–	–	–	–	–	–	–	–	–	26	27	29	26	25	21	15	17	20	–
CO_2 Emissions (kt C)																				
Coal	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	0	0	0	–
Oil	–	–	–	–	–	–	–	–	–	–	37	41	43	33	36	32	34	34	33	–
Gas	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	0	0	0	–
Total	–	–	–	–	–	–	–	–	–	–	37	41	43	33	36	32	34	34	33	–

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Table 5.5.7 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Macroeconomic Indicators																				
Population (thousand)	96	99	101	104	106	107	108	108	108	107	107	107	108	108	109	109	110	110	110	111
Urban Population, %	25.8	25.7	25.5	25.4	25.2	25.1	24.5	24.0	23.4	22.9	22.3	22.3	22.3	22.3	22.3	22.3	22.4	22.5	22.5	22.6
GDP (constant 2000 $ million)	182	196	203	220	219	235	228	214	220	224	234	237	239	243	235	240	240	235	229	231
GDP (current $ million)	147	166	178	198	203	223	219	207	220	221	234	240	242	245	240	250	255	257	263	280
GDP (constant 2005 PPP $ million)	254	273	283	307	305	327	317	298	306	311	325	331	332	338	327	334	335	328	320	322
GDP/capita (constant 2000 $)	1,891	1,981	2,008	2,120	2,068	2,192	2,110	1,984	2,045	2,085	2,181	2,213	2,215	2,242	2,157	2,193	2,188	2,136	2,079	2,087
GDP/capita (current $)	1,528	1,683	1,758	1,912	1,914	2,076	2,032	1,921	2,045	2,062	2,181	2,240	2,244	2,263	2,201	2,285	2,318	2,339	2,387	2,528
GDP – Manufacturing (% of GDP)	1.4	1.4	1.5	1.4	1.4	1.5	1.3	1.5	1.7	1.5	1.7	2.0	1.9	1.7	1.4	0.6	0.4	0.4	0.4	0.4
Car Ownership (car/1,000 persons)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Basic Energy Indicators																				
TPES/capita (toe/person)	–	–	–	–	–	–	–	–	–	–	0.42	0.42	0.44	0.37	0.40	0.35	0.38	0.37	0.37	–
TFEC/capita (toe/person)	–	–	–	–	–	–	–	–	–	–	0.23	0.28	0.28	0.20	0.24	0.21	0.28	0.26	0.25	–
TPES/GDP (toe/constant 2000 $ million)	–	–	–	–	–	–	–	–	–	–	192	192	199	164	188	160	173	174	177	–
TFEC/GDP (toe/constant 2000 $ million)	–	–	–	–	–	–	–	–	–	–	107	128	129	89	111	98	128	120	119	–
Import Dependency (%)	–	–	–	–	–	–	–	–	–	–	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	–
Oil Import Dependency (%)	–	–	–	–	–	–	–	–	–	–	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	–
Electricity/capita (kWh/ person)	–	–	–	–	–	–	–	–	–	–	696	704	761	786	739	614	442	512	693	–
CO_2 Intensity (t C/constant 2000 $ million)	–	–	–	–	–	–	–	–	–	–	158	174	181	135	154	132	143	143	146	–
CO_2/capita (t C)	–	–	–	–	–	–	–	–	–	–	0.35	0.39	0.40	0.30	0.33	0.29	0.31	0.31	0.30	–
CO_2/TPES (t C/toe)	–	–	–	–	–	–	–	–	–	–	0.82	0.91	0.91	0.82	0.82	0.82	0.83	0.82	0.82	–

– = no data or not applicable, CO_2 = carbon dioxide, GDP = gross domestic product, GWh = gigawatt–hour, kt C = thousand tons of carbon equivalent, ktoe = thousand tons of oil equivalent, kWh = kilowatt–hour, PPP = purchasing power parity, t C = ton of carbon equivalent, TFEC = total final energy consumption, toe = ton of oil equivalent, TPES = total primary energy supply.
Note: Figures may not add up to total because of rounding.
Sources: ADB (unpublished), APERC estimates, and World Bank.

5.6 Nauru

Country Profile (2009)		Energy Reserves (year-end 2008)	
Total Surface Area (square kilometer)	47,088	Coal (million ton) - Recoverable	0.0
Population (thousand)	10	Gas (trillion cubic feet) - Proven	0.0
GDP (billion constant 2000 $)	0.0	Oil (billion barrel) - Proven	0.0
Electrification Rate (%)	100.0		

GDP = gross domestic product.

Sources: ADB (2011 and 2012), CIA (2012), and GenderCC of the UNFCCC (2010).

2008 Energy Supply and Demand Flow (ktoe)

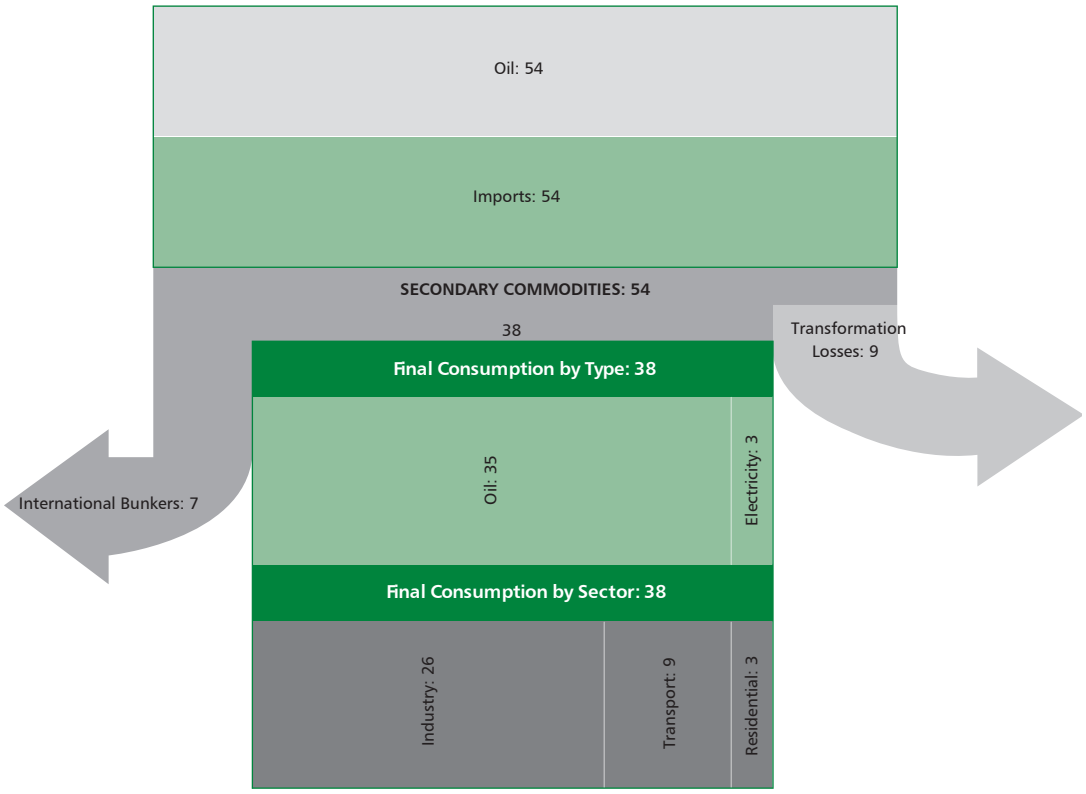


Table 5.6.1 Key Data and Economic Profile

	1990	1995	2000	2005	2008
Socioeconomic Data					
Population (thousand)	9	10	10	9	10
GDP (constant 2000 $ billion)	0.0	0.0	0.0	0.0	0.0
GDP (constant 2005 PPP $ billion)	–	–	–	–	–
GDP/capita (constant 2000 $)	3,417	2,228	1,812	1,967	3,386
GDP/capita (constant 2005 PPP $)	–	–	–	–	–

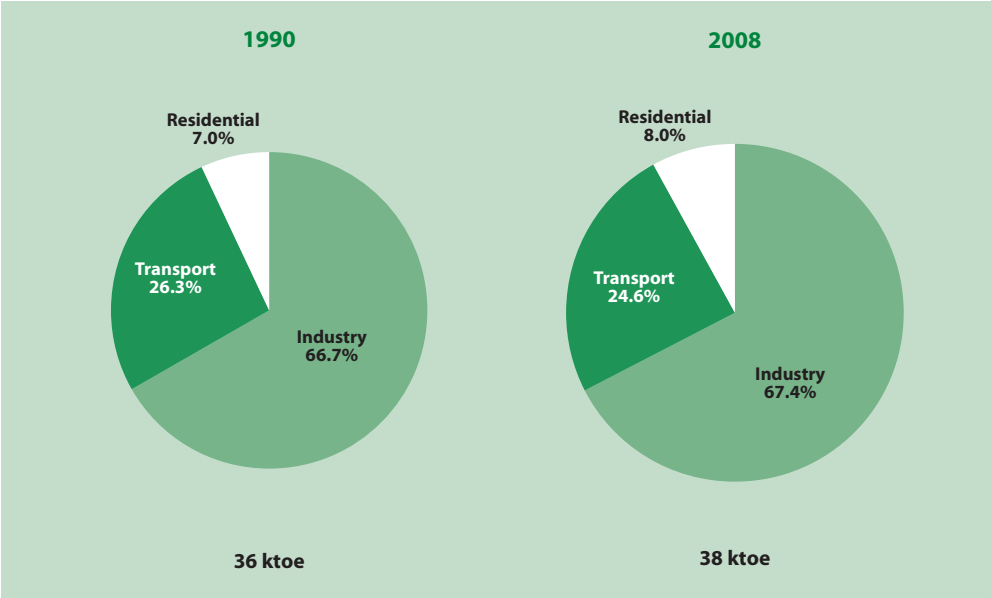
– = no data or not applicable, GDP = gross domestic product, PPP = purchasing power parity.
Source: ADB (2011).

Table 5.6.2 Energy Supply and Demand

	1990	1995	2000	2005	2008
Primary Energy Supply (ktoe)					
Indigenous Production	0	0	0	0	0
Net Imports	43	45	44	46	47
Total PES	43	45	44	46	47
Coal	0	0	0	0	0
Oil	43	45	44	46	47
Gas	0	0	0	0	0
Biomass	0	0	0	0	0
Others	0	0	0	0	0
TPES/capita (toe)	4.70	4.52	4.35	4.86	4.91
TPES/GDP (toe/constant 2005 PPP $ million)	–	–	–	–	–
Final Energy Consumption (ktoe)					
Industry	24	25	23	25	26
Transportation	9	9	9	9	9
Other Sectors	2	3	3	3	3
Total FEC	36	37	35	38	38
Coal	0	0	0	0	0
Oil	33	34	33	35	35
Gas	0	0	0	0	0
Electricity	2	3	3	3	3
Biomass	0	0	0	0	0
Others	0	0	0	0	0

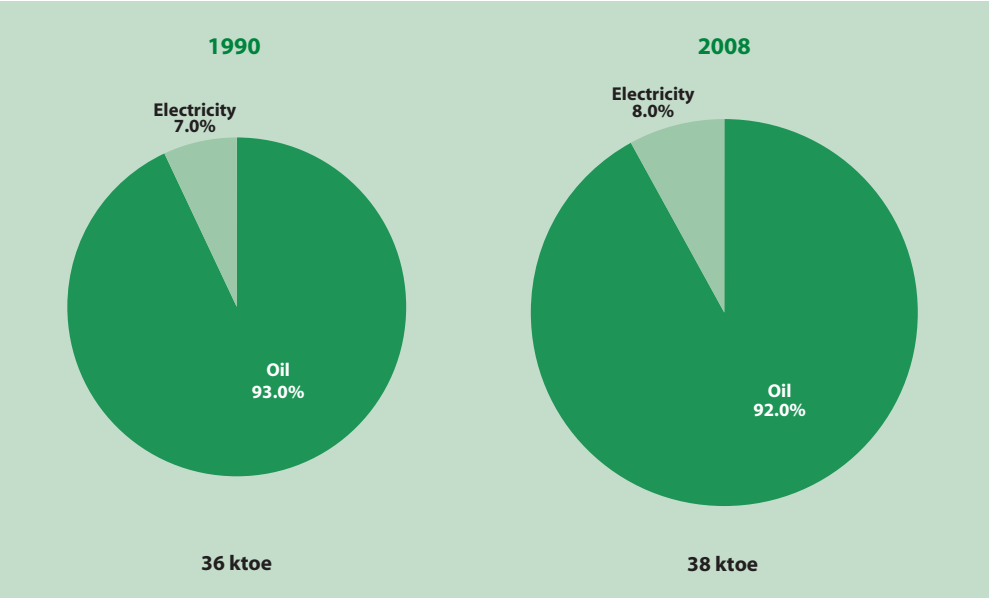
– = no data or not applicable, FEC = final energy consumption, GDP = gross domestic product, ktoe = thousand tons of oil equivalent, PES = primary energy supply, PPP = purchasing power parity, toe = ton of oil equivalent, TPES = total primary energy supply.
Source: UNSD (2011a).

Figure 5.6.1 Final Energy Consumption by Sector, 1990 and 2008



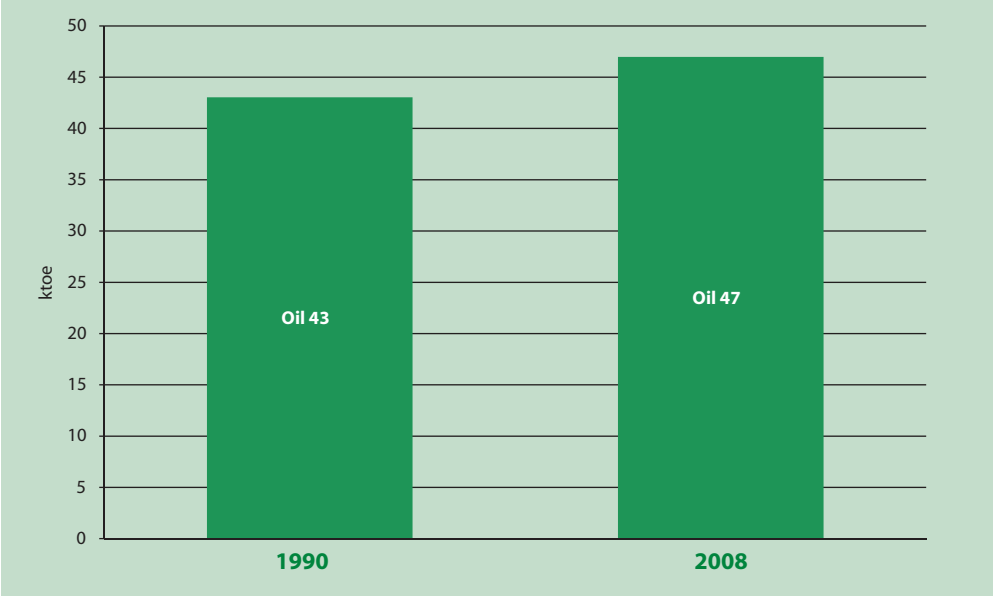
ktoe = thousand tons of oil equivalent.
Source: UNSD (2011a).

Figure 5.6.2 Final Energy Consumption by Type of Energy, 1990 and 2008



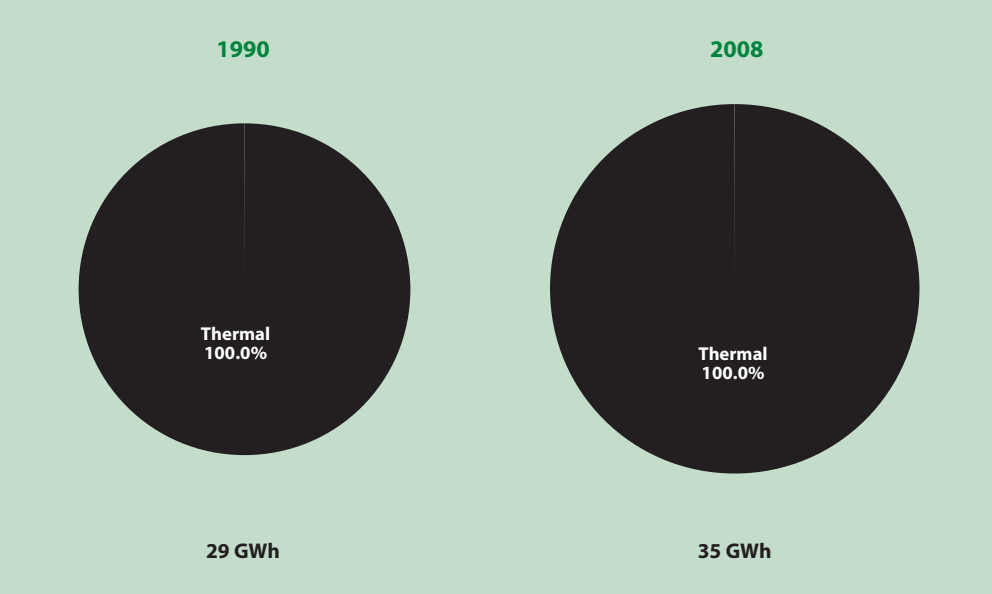
ktoe = thousand tons of oil equivalent.
Source: UNSD (2011a).

Figure 5.6.3 Total Primary Energy Supply, 1990 and 2008



ktoe = thousand tons of oil equivalent.
Source: UNSD (2011a).

Figure 5.6.4 Electricity Generation by Plant Type, 1990 and 2008

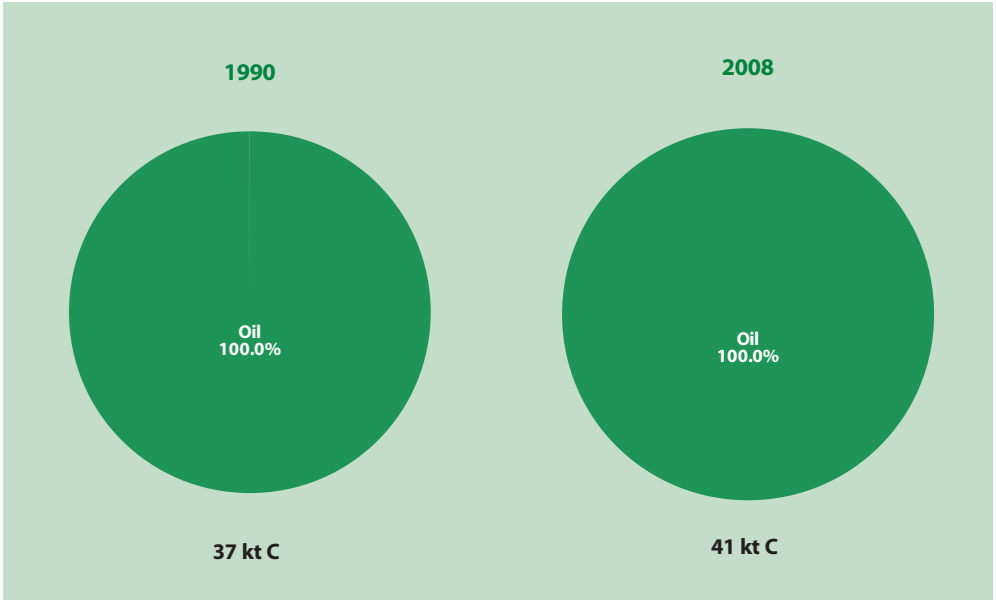


GWh = gigawatt-hour.
Source: UNSD (2011a).

Figure 5.6.5 Electricity Consumption by Sector, 1990 and 2008

GWh = gigawatt-hour.
Source: UNSD (2011a).

Figure 5.6.6 Carbon Dioxide Emissions from Fuel Combustion, 1990 and 2008



kt C = thousand tons of carbon equivalent.
Source: APERC estimates.

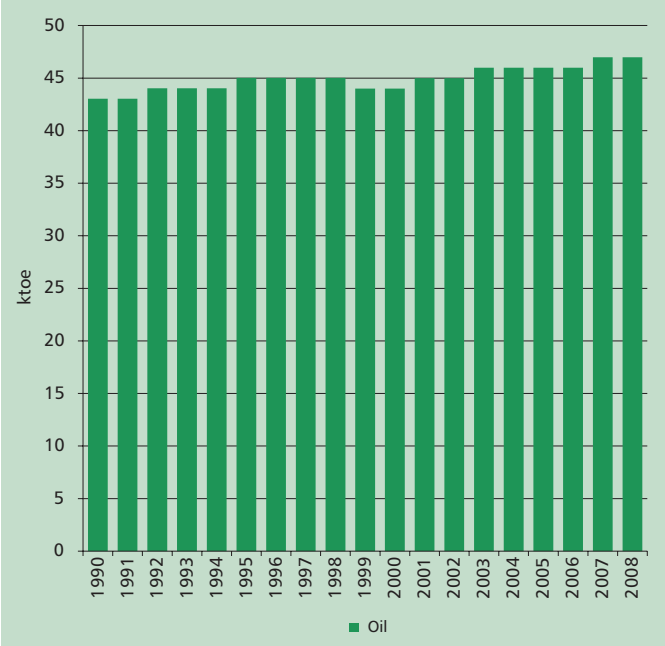
Figure 5.6.7 Final Energy Consumption by Sector, 1990–2008

ktoe = thousand tons of oil equivalent.
Source: UNSD (2011a).

Figure 5.6.8 Final Energy Consumption by Type, 1990–2008

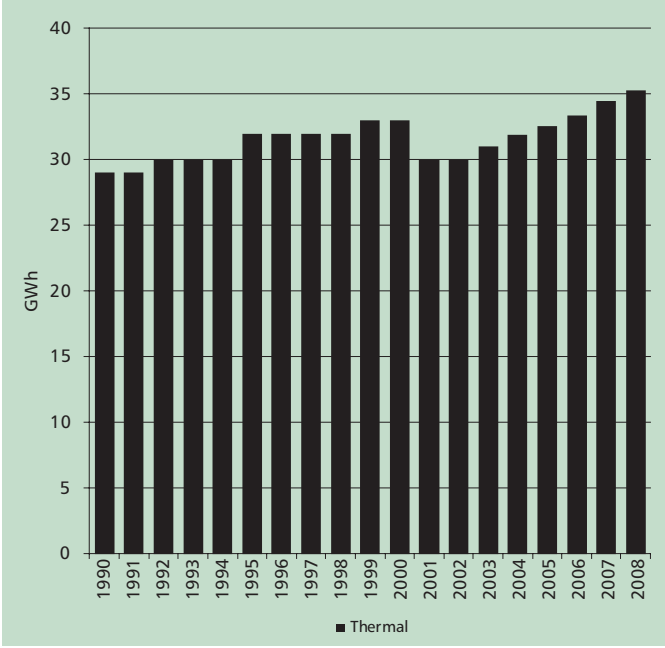
ktoe = thousand tons of oil equivalent.
Source: UNSD (2011a).

Figure 5.6.9 Total Primary Energy Supply, 1990–2008



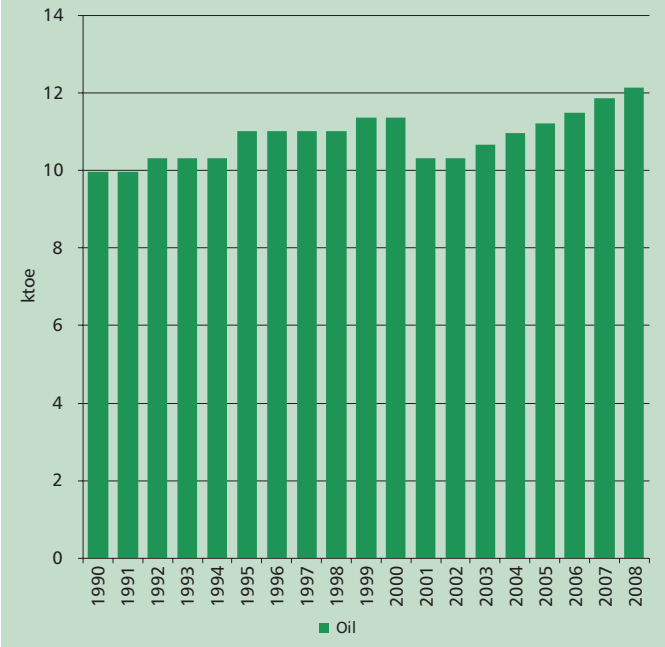
ktoe = thousand tons of oil equivalent.
Source: UNSD (2011a).

Figure 5.6.10 Electricity Generation by Source, 1990–2008



GWh = gigawatt-hour.
Source: UNSD (2011a).

Figure 5.6.11 Fuel Input for Electricity Generation, 1990–2008

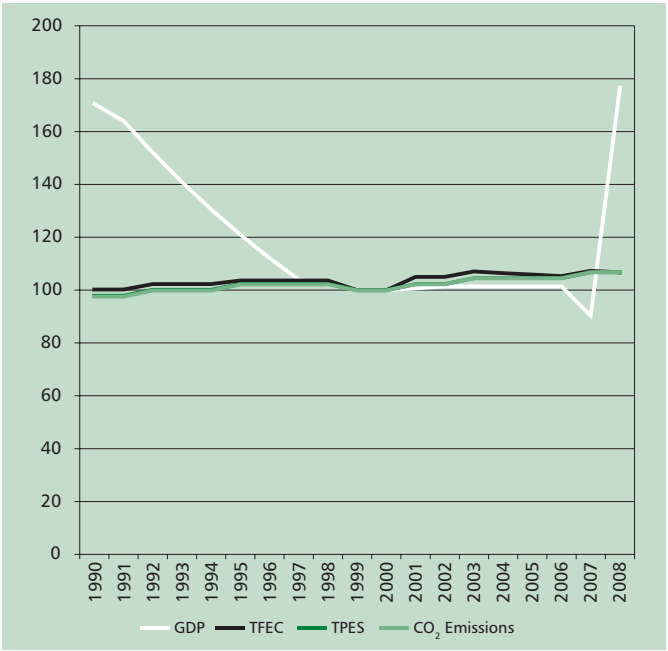


ktoe = thousand tons of oil equivalent.
Sources: UNSD (2011a).

Figure 5.6.12 Carbon Dioxide Emissions from Fuel Combustion, 1990–2008

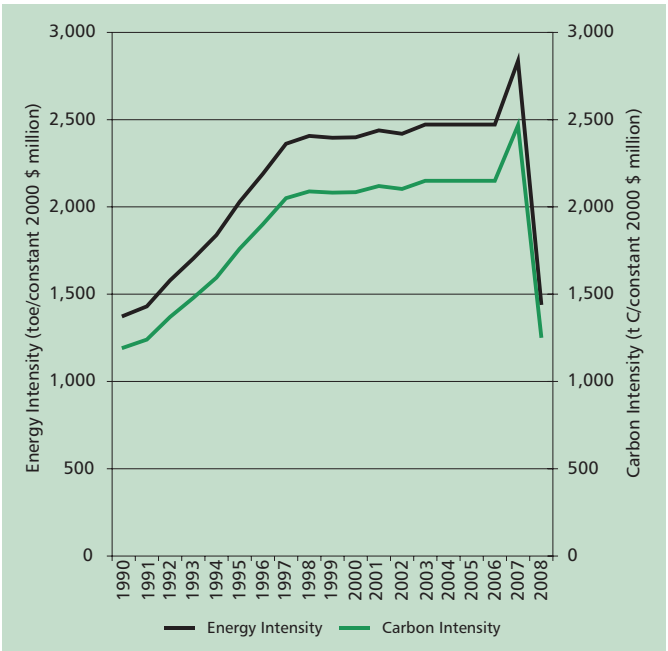
kt C = thousand tons of carbon equivalent.
Source: APERC estimates.

Figure 5.6.13 Growth of GDP, TFEC, TPES, and CO_2 (indexed to year 2000), 1990–2008



CO_2 = carbon dioxide, GDP = gross domestic product, TFEC = total final energy consumption, TPES = total primary energy supply.
Notes:
1. Indices are measured relative to the base year 2000 (2000 = 100).
2. Nauru's GDP almost doubled from 2007 to 2008, but energy consumption did not increase accordingly.
Source: APERC estimates.

Figure 5.6.14 Energy and Carbon Intensities, 1990–2008



t C = ton of carbon equivalent, toe = ton of oil equivalent.
Source: APERC estimates.

Table 5.6.3 Nauru Energy Balance Table, 2005

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.	Imports	0	0	0	53	5	0	4	37	0	7	0	0	0	0	0	0	0	0	0	0	53
3.	Exports	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.	International Bunkers	0	0	0	–7	0	0	0	0	0	–7	0	0	0	0	0	0	0	0	0	0	–7
5.	Stock Changes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6.	Total Primary Energy Supply	0	0	0	46	5	0	4	37	0	0	0	0	0	0	0	0	0	0	0	0	46
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	0	0	0	–11	0	0	0	–11	0	0	0	0	0	0	0	0	0	0	3	0	–8
8.1	Power Generation	0	0	0	–11	0	0	0	–11	0	0	0	0	0	0	0	0	0	0	3	0	–8
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10.	Discrepancy	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11.	Total Final Energy Consumption	0	0	0	35	5	0	4	25	0	0	0	0	0	0	0	0	0	0	3	0	38
12.	Industry Sector	0	0	0	25	0	0	0	25	0	0	0	0	0	0	0	0	0	0	0	0	25
13.	Transport Sector	0	0	0	9	5	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	9
14.	Other Sectors	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3
14.1	Residential and Commercial	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3
14.1.1	Commerce and Public Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14.1.2	Residential	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3
14.2	Non–Specified Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15.	Non–Energy Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16.	Electricity Output (GWh)	0	0	0	33	0	0	0	33	0	0	0	0	0	0	0	0	0	0	0	0	33
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.
Note: Figures may not add up to total because of rounding.
Source: UNSD (2011a).

Table 5.6.4 Nauru Energy Balance Table, 2006

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.	Imports	0	0	0	53	5	0	4	37	0	7	0	0	0	0	0	0	0	0	0	0	53
3.	Exports	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.	International Bunkers	0	0	0	–7	0	0	0	0	0	–7	0	0	0	0	0	0	0	0	0	0	–7
5.	Stock Changes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6.	Total Primary Energy Supply	0	0	0	46	5	0	4	37	0	0	0	0	0	0	0	0	0	0	0	0	46
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	0	0	0	–11	0	0	0	–11	0	0	0	0	0	0	0	0	0	0	3	0	–9
8.1	Power Generation	0	0	0	–11	0	0	0	–11	0	0	0	0	0	0	0	0	0	0	3	0	–9
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10.	Discrepancy	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11.	Total Final Energy Consumption	0	0	0	34	5	0	4	25	0	0	0	0	0	0	0	0	0	0	3	0	37
12.	Industry Sector	0	0	0	25	0	0	0	25	0	0	0	0	0	0	0	0	0	0	0	0	25
13.	Transport Sector	0	0	0	9	5	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	9
14.	Other Sectors	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3
14.1	Residential and Commercial	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3
14.1.1	Commerce and Public Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14.1.2	Residential	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3
14.2	Non–Specified Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15.	Non–Energy Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16.	Electricity Output (GWh)	0	0	0	33	0	0	0	33	0	0	0	0	0	0	0	0	0	0	0	0	33
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Source: UNSD (2011a).

Table 5.6.5 Nauru Energy Balance Table, 2007

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.	Imports	0	0	0	54	5	0	4	38	0	7	0	0	0	0	0	0	0	0	0	0	54
3.	Exports	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.	International Bunkers	0	0	0	–7	0	0	0	0	0	–7	0	0	0	0	0	0	0	0	0	0	–7
5.	Stock Changes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6.	Total Primary Energy Supply	0	0	0	47	5	0	4	38	0	0	0	0	0	0	0	0	0	0	0	0	47
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	0	0	0	–12	0	0	0	–12	0	0	0	0	0	0	0	0	0	0	3	0	–9
8.1	Power Generation	0	0	0	–12	0	0	0	–12	0	0	0	0	0	0	0	0	0	0	3	0	–9
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10.	Discrepancy	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11.	Total Final Energy Consumption	0	0	0	35	5	0	4	26	0	0	0	0	0	0	0	0	0	0	3	0	38
12.	Industry Sector	0	0	0	26	0	0	0	26	0	0	0	0	0	0	0	0	0	0	0	0	26
13.	Transport Sector	0	0	0	9	5	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	9
14.	Other Sectors	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3
14.1	Residential and Commercial	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3
14.1.1	Commerce and Public Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14.1.2	Residential	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3
14.2	Non–Specified Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15.	Non–Energy Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16.	Electricity Output (GWh)	0	0	0	35	0	0	0	35	0	0	0	0	0	0	0	0	0	0	0	0	35
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.
Note: Figures may not add up to total because of rounding.
Source: UNSD (2011a).

Table 5.6.6 Nauru Energy Balance Table, 2008

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.	Imports	0	0	0	54	5	0	4	38	0	7	0	0	0	0	0	0	0	0	0	0	54
3.	Exports	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.	International Bunkers	0	0	0	–7	0	0	0	0	0	–7	0	0	0	0	0	0	0	0	0	0	–7
5.	Stock Changes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6.	Total Primary Energy Supply	0	0	0	47	5	0	4	38	0	0	0	0	0	0	0	0	0	0	0	0	47
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	0	0	0	–12	0	0	0	–12	0	0	0	0	0	0	0	0	0	0	3	0	–9
8.1	Power Generation	0	0	0	–12	0	0	0	–12	0	0	0	0	0	0	0	0	0	0	3	0	–9
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10.	Discrepancy	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11.	Total Final Energy Consumption	0	0	0	35	5	0	4	26	0	0	0	0	0	0	0	0	0	0	3	0	38
12.	Industry Sector	0	0	0	26	0	0	0	26	0	0	0	0	0	0	0	0	0	0	0	0	26
13.	Transport Sector	0	0	0	9	5	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	9
14.	Other Sectors	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3
14.1	Residential and Commercial	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3
14.1.1	Commerce and Public Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14.1.2	Residential	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3
14.2	Non-Specified Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15.	Non-Energy Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16.	Electricity Output (GWh)	0	0	0	35	0	0	0	35	0	0	0	0	0	0	0	0	0	0	0	0	35
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Source: UNSD (2011a).

Table 5.6.7 Nauru Summary Table, 1990–2009

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Indigenous Production (ktoe)																				
Coal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Oil	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Gas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Hydro	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Geothermal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Solar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Wind	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Biomass	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Primary Energy Supply (ktoe)																				
Coal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Oil	43	43	44	44	44	45	45	45	45	44	44	45	45	46	46	46	46	47	47	–
Gas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Hydro	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Geothermal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Solar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Wind	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Biomass	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Total	43	43	44	44	44	45	45	45	45	44	44	45	45	46	46	46	46	47	47	–
Final Energy Consumption by Sector (ktoe)																				
Industry	24	24	24	24	24	25	25	25	25	23	23	25	25	26	26	25	25	26	26	–
Transport	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	–
Residential	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	–
Commercial	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Total	36	36	36	36	36	37	37	37	37	35	35	37	37	38	38	38	37	38	38	–

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Table 5.6.7 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Final Energy Consumption by Type (ktoe)																				
Coal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Oil	33	33	34	34	34	34	34	34	34	33	33	35	35	35	35	35	34	35	35	–
Gas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Electricity	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	–
Heat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Biomass	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Total	36	36	36	36	36	37	37	37	37	35	35	37	37	38	38	38	37	38	38	–
Power Generation (GWh)																				
Thermal	29	29	30	30	30	32	32	32	32	33	33	30	30	31	32	33	33	35	35	–
Hydro	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Geothermal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Solar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Wind	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Total	29	29	30	30	30	32	32	32	32	33	33	30	30	31	32	33	33	35	35	–
Loss and Own Use of Electricity (GWh)																				
Transmission and Distribution Losses	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Own Use	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Total	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Fuel Input for Power Generation (ktoe)																				
Coal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Oil	10	10	10	10	10	11	11	11	11	11	11	10	10	11	11	11	11	12	12	–
Gas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Total	10	10	10	10	10	11	11	11	11	11	11	10	10	11	11	11	11	12	12	–
CO_2 Emissions (kt C)												.								
Coal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Oil	37	37	38	38	38	39	39	39	39	38	38	39	39	40	40	40	40	41	41	–
Gas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Total	37	37	38	38	38	39	39	39	39	38	38	39	39	40	40	40	40	41	41	–

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Table 5.6.7 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Macroeconomic Indicators																				
Population (thousand)	9	9	10	10	10	10	10	10	10	10	10	10	10	10	10	9	9	9	10	10
Urban Population, %	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
GDP (constant 2000 $ million)	31	30	28	26	24	22	21	19	19	18	18	18	19	19	19	19	19	17	32	27
GDP (current $ million)	49	46	43	37	37	35	34	30	24	24	21	19	18	23	28	26	25	23	42	54
GDP (constant 2005 PPP $ million)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
GDP/capita (constant 2000 $)	3,417	3,220	2,812	2,602	2,408	2,228	2,062	1,908	1,870	1,832	1,812	1,826	1,848	1,884	1,924	1,967	2,015	1,767	3,386	2,715
GDP/capita (current $)	5,381	4,872	4,300	3,706	3,708	3,499	3,382	3,015	2,398	2,364	2,082	1,876	1,761	2,315	2,857	2,781	2,750	2,466	4,341	5,552
GDP – Manufacturing (% of GDP)	4.4	4.5	4.6	4.5	4.0	4.1	4.5	4.5	4.4	4.4	4.2	4.4	4.4	4.4	4.4	4.4	4.4	4.5	4.4	4.5
Car Ownership (car/1,000 persons)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Basic Energy Indicators																				
TPES/capita (toe/person)	4.70	4.61	4.44	4.43	4.43	4.52	4.51	4.51	4.50	4.39	4.35	4.45	4.47	4.66	4.76	4.86	4.98	5.01	4.91	–
TFEC/capita (toe/person)	3.89	3.80	3.66	3.65	3.65	3.69	3.69	3.68	3.67	3.54	3.51	3.69	3.70	3.85	3.91	3.97	4.05	4.06	3.96	–
TPES/GDP (toe/constant 2000 $ million)	1,377	1,430	1,579	1,704	1,839	2,029	2,189	2,362	2,407	2,396	2,399	2,438	2,419	2,472	2,472	2,472	2,472	2,836	1,450	–
TFEC/GDP (toe/constant 2000 $ million)	1,137	1,182	1,302	1,404	1,515	1,657	1,788	1,929	1,965	1,933	1,935	2,019	2,003	2,042	2,030	2,020	2,009	2,299	1,169	–
Import Dependency (%)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	–
Oil Import Dependency (%)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	–
Electricity/capita (kWh/person)	3,169	3,103	3,024	3,020	3,016	3,212	3,207	3,203	3,198	3,293	3,260	2,969	2,981	3,140	3,300	3,448	3,618	3,681	3,689	–
CO_2 Intensity (t C/constant 2000 $ million)	1,194	1,241	1,370	1,478	1,595	1,761	1,900	2,050	2,089	2,082	2,084	2,119	2,103	2,150	2,150	2,150	2,150	2,467	1,261	–
CO_2/capita (t C)	4.08	3.99	3.85	3.85	3.84	3.92	3.92	3.91	3.91	3.82	3.78	3.87	3.89	4.05	4.14	4.23	4.33	4.36	4.27	–
CO_2/TPES (t C/toe)	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	–

– = no data or not applicable, CO_2 = carbon dioxide, GDP = gross domestic product, GWh = gigawatt–hour, kt C = thousand tons of carbon equivalent, ktoe = thousand tons of oil equivalent, kWh = kilowatt–hour, PPP = purchasing power parity, t C = ton of carbon equivalent, TFEC = total final energy consumption, toe = ton of oil equivalent, TPES = total primary energy supply.

Note: Figures may not add up to total because of rounding.

Sources: ADB (2011), APERC estimates, and UNSD (2011a).

5.7 Palau

Country Profile (2009)		Energy Reserves (year-end 2008)	
Total Surface Area (square kilometer)	460	Coal (million ton) - Recoverable	0.0
Population (thousand)	20	Gas (trillion cubic feet) - Proven	0.0
GDP (billion constant 2000 $)	0.1	Oil (billion barrel) - Proven	0.0
Electrification Rate (%)	98.4		

GDP = gross domestic product.

Sources: ADB (2012), CIA (2012), GenderCC of the UNFCCC (2010), and World Bank.

2008 Energy Supply and Demand Flow (ktoe)

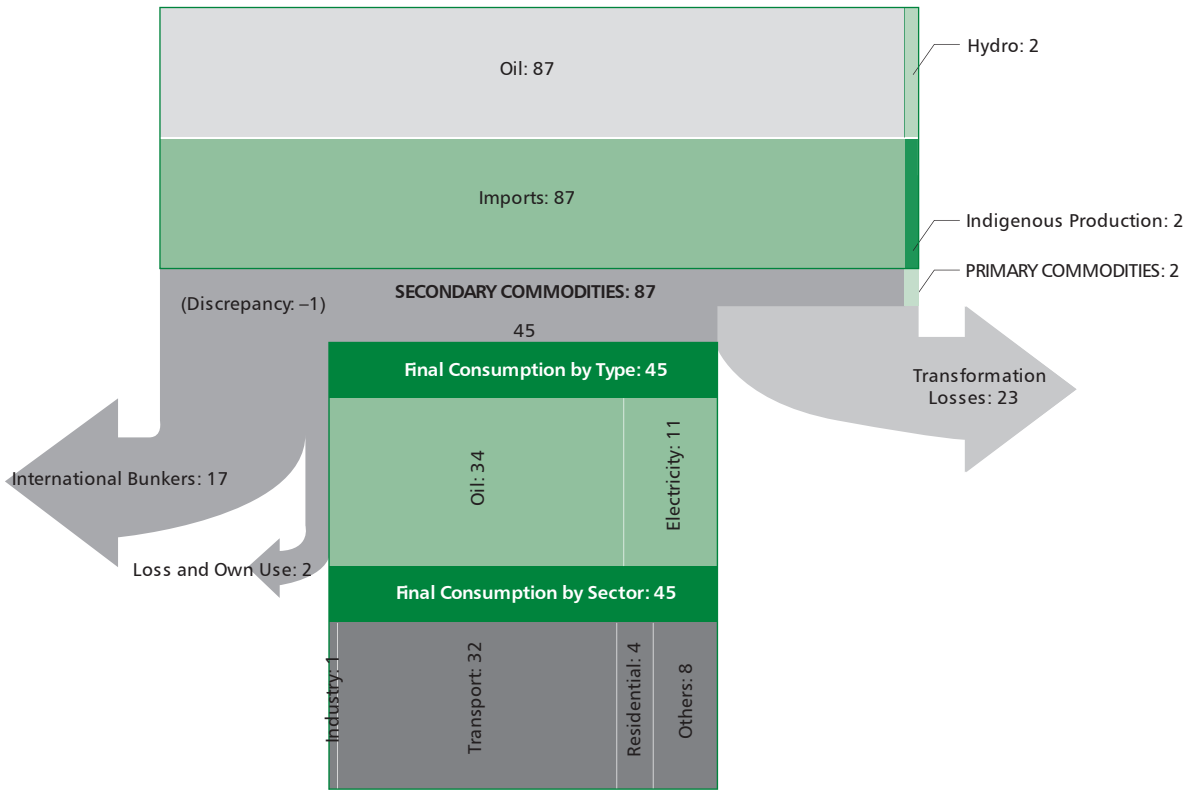


Table 5.7.1 Key Data and Economic Profile

	1990	1995	2000	2005	2008
Socioeconomic Data					
Population (thousand)	15	17	19	20	20
GDP (constant 2000 $ billion)	–	0.1	0.1	0.1	0.1
GDP (constant 2005 PPP $ billion)	–	0.2	0.2	0.3	0.3
GDP/capita (constant 2000 $)	–	6,356	6,252	6,430	6,328
GDP/capita (constant 2005 PPP $)	–	12,762	12,554	12,911	12,706

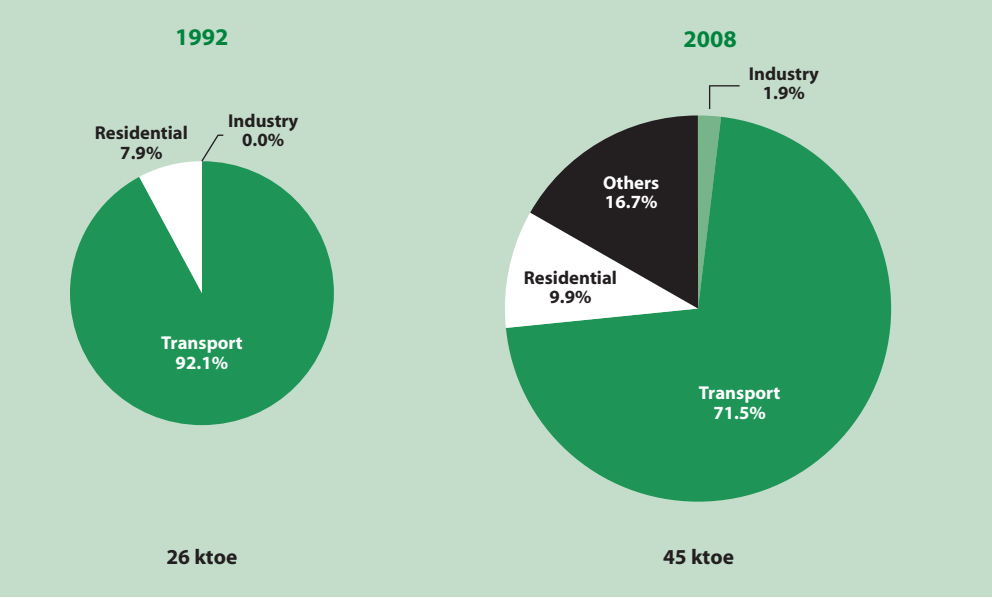
– = no data or not applicable, GDP = gross domestic product, PPP = purchasing power parity.
Source: World Bank.

Table 5.7.2 Energy Supply and Demand

	1990	1995	2000	2005	2008
Primary Energy Supply (ktoe)					
Indigenous Production	–	2	2	2	2
Net Imports	–	62	65	65	70
Total PES	–	63	67	66	72
Coal	–	0	0	0	0
Oil	–	62	65	65	70
Gas	–	0	0	0	0
Biomass	–	0	0	0	0
Others	–	2	2	2	2
TPES/capita (toe)	–	3.67	3.48	3.32	3.55
TPES/GDP (toe/constant 2005 PPP $ million)	–	288	277	257	279
Final Energy Consumption (ktoe)					
Industry	–	0	0	2	1
Transportation	–	24	25	31	32
Other Sectors	–	2	2	10	12
Total FEC	–	26	27	43	45
Coal	–	0	0	0	0
Oil	–	26	27	33	34
Gas	–	0	0	0	0
Electricity	–	0	0	9	11
Biomass	–	0	0	0	0
Others	–	0	0	0	0

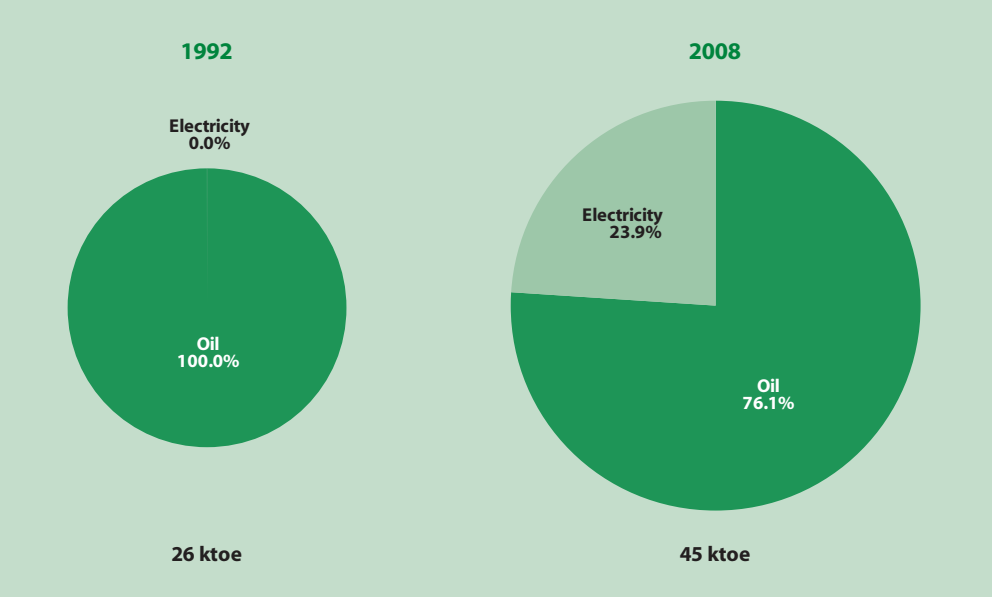
– = no data or not applicable, FEC = final energy consumption, GDP = gross domestic product, ktoe = thousand tons of oil equivalent, PES = primary energy supply, PPP = purchasing power parity, toe = ton of oil equivalent, TPES = total primary energy supply.
Source: UNSD (2011a).

Figure 5.7.1 Final Energy Consumption by Sector, 1992 and 2008



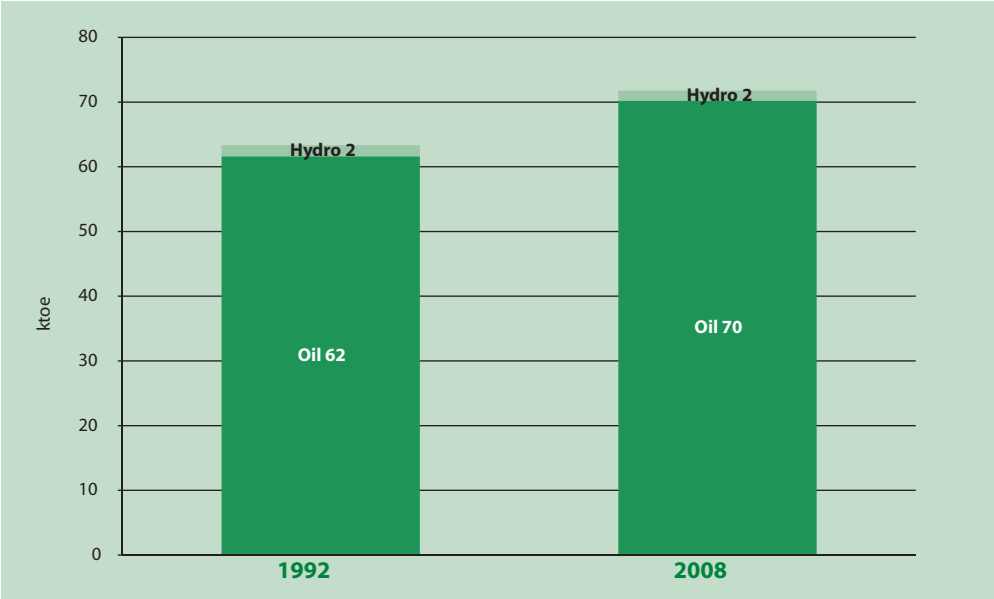
ktoe = thousand tons of oil equivalent.
Source: UNSD (2011a).

Figure 5.7.2 Final Energy Consumption by Type of Energy, 1992 and 2008



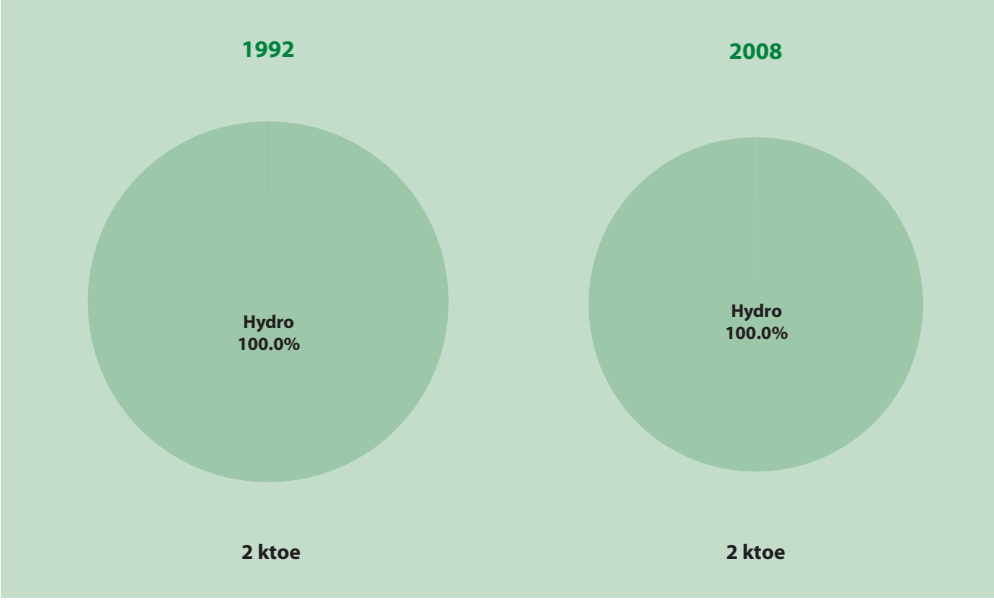
ktoe = thousand tons of oil equivalent.
Note: Although there was production of electric energy in Palau from 1992 to 2000, final consumption of electricity is reported as zero for the period.
Source: UNSD (2011a).

Figure 5.7.3 Total Primary Energy Supply, 1992 and 2008



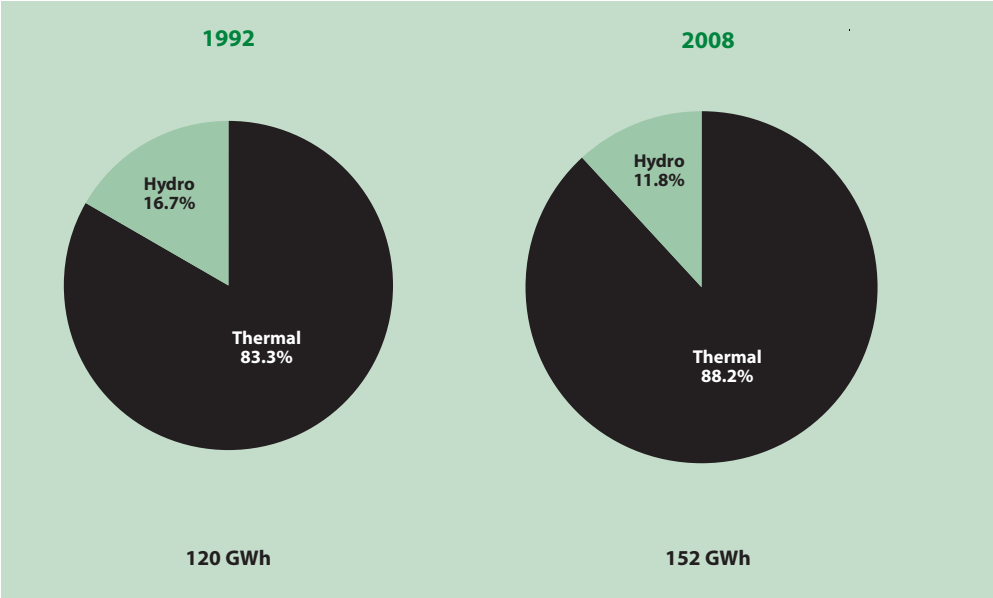
ktoe = thousand tons of oil equivalent.
Source: UNSD (2011a).

Figure 5.7.4 Indigenous Energy Production, 1992 and 2008



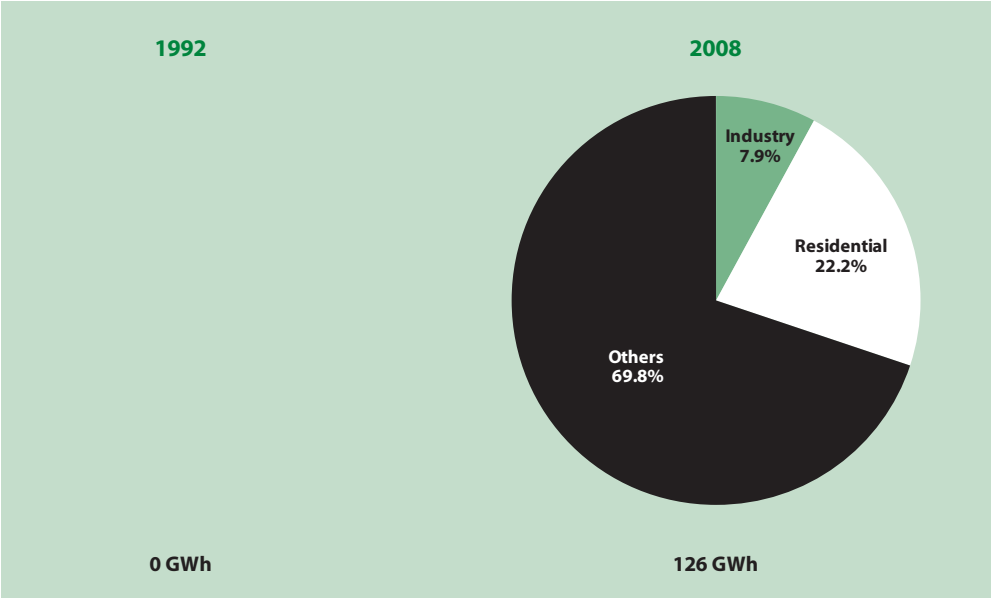
ktoe = thousand tons of oil equivalent.
Source: UNSD (2011a).

Figure 5.7.5 Electricity Generation by Plant Type, 1992 and 2008



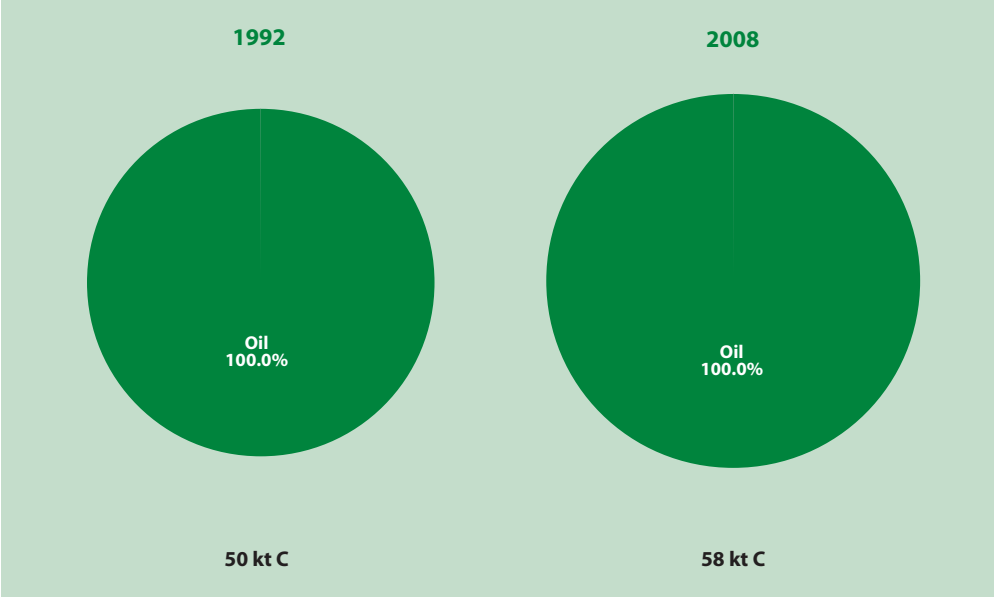
GWh = gigawatt-hour.
Source: UNSD (2011a).

Figure 5.7.6 Electricity Consumption by Sector, 1992 and 2008



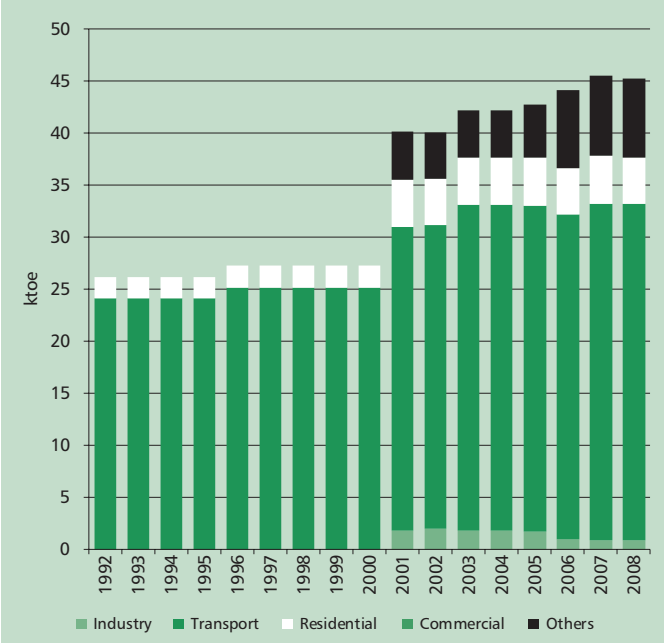
GWh = gigawatt-hour.
Note: Electricity consumption data prior to 2001 are not available.
Source: UNSD (2011a).

Figure 5.7.7 Carbon Dioxide Emissions from Fuel Combustion, 1992 and 2008



kt C = thousand tons of carbon equivalent.
Source: APERC estimates.

Figure 5.7.8 Final Energy Consumption by Sector, 1992–2008

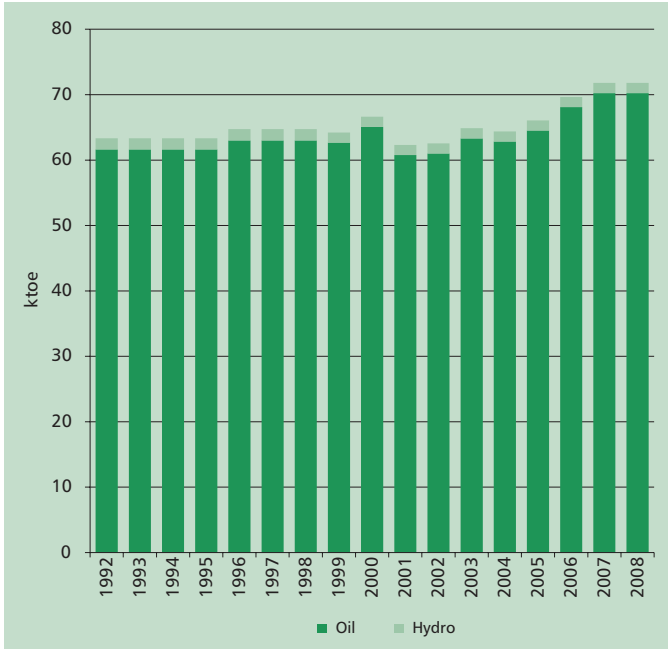


ktoe = thousand tons of oil equivalent.
Note: Although there was production of electric energy in Palau from 1992 to 2000, final consumption of electricity is reported as zero for the period. This explains the abrupt increase in final energy consumption from 2000 to 2001.
Source: UNSD (2011a).

Figure 5.7.9 Final Energy Consumption by Type, 1992–2008

ktoe = thousand tons of oil equivalent.
Although there was production of electric energy in Palau from 1992 to 2000, final consumption of electricity is reported as zero for the period. This explains the abrupt increase in final energy consumption from 2000 to 2001.
Source: UNSD (2011a).

Figure 5.7.10 Total Primary Energy Supply, 1992–2008

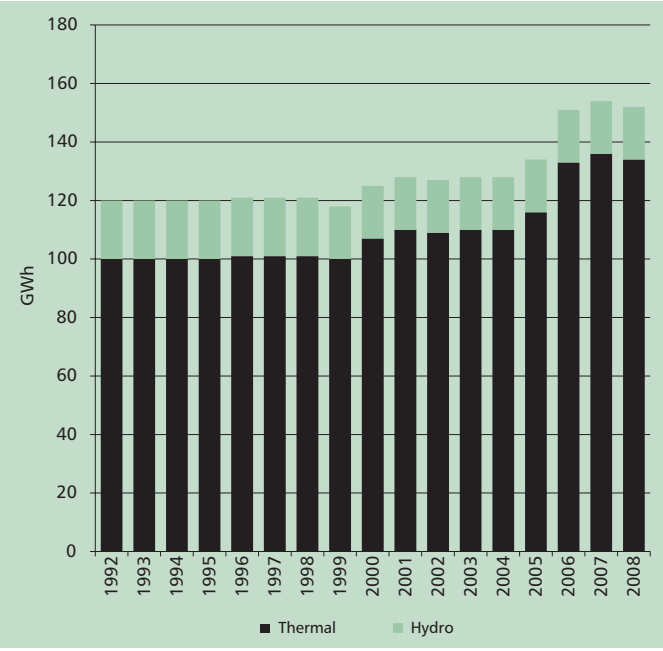


ktoe = thousand tons of oil equivalent.
Source: UNSD (2011a).

Figure 5.7.11 Indigenous Energy Production, 1992–2008

ktoe = thousand tons of oil equivalent.
Source: UNSD (2011a).

Figure 5.7.12 Electricity Generation by Source, 1992–2008



GWh = gigawatt-hour.
Source: UNSD (2011a).

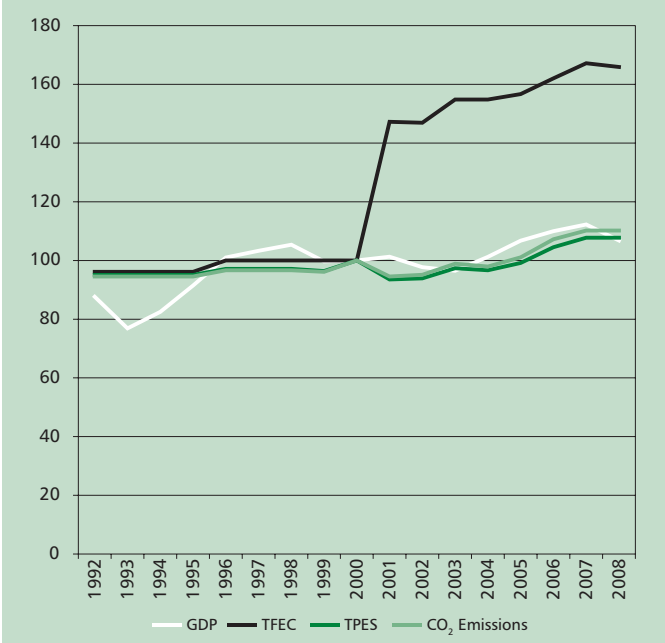
Figure 5.7.13 Fuel Input for Electricity Generation, 1992–2008

ktoe = thousand tons of oil equivalent.
Source: UNSD (2011a).

Figure 5.7.14 Carbon Dioxide Emissions from Fuel Combustion, 1992–2008

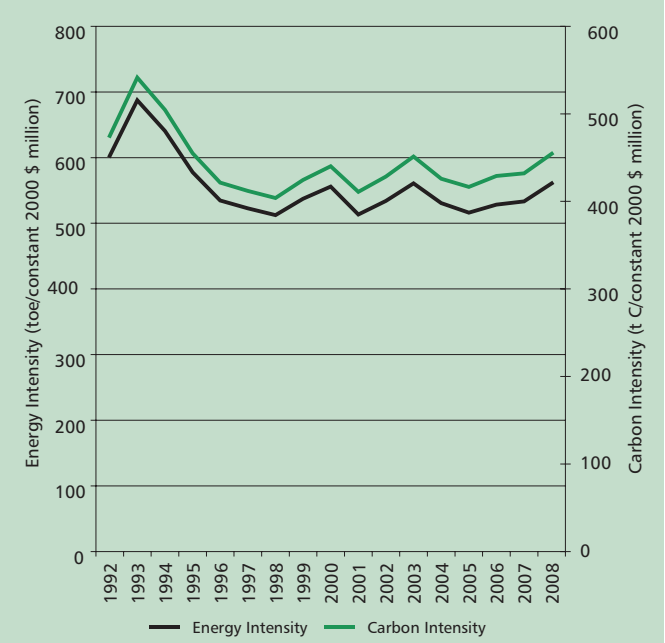
kt C = thousand tons of carbon equivalent.
Source: APERC estimates.

Figure 5.7.15 Growth of GDP, TFEC, TPES, and CO_2 (indexed to year 2000), 1992–2008



CO_2 = carbon dioxide, GDP = gross domestic product, TFEC = total final energy consumption, TPES = total primary energy supply.
Notes:
1. Indices are measured relative to the base year 2000 (2000 = 100).
2. Although there was production of electric energy in Palau from 1992 to 2000, final consumption of electricity is reported as zero for the period. This explains the abrupt jump in the index for TFEC from 2000 to 2001.
Source: APERC estimates.

Figure 5.7.16 Energy and Carbon Intensities, 1992–2008



t C = ton of carbon equivalent, toe = ton of oil equivalent.
Source: APERC estimates.

Table 5.7.3 Palau Energy Balance Table, 2005

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	2
2.	Imports	0	0	0	80	26	2	11	25	0	15	0	0	0	0	0	0	0	0	0	0	80
3.	Exports	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.	International Bunkers	0	0	0	–15	–1	0	0	0	0	–14	0	0	0	0	0	0	0	0	0	0	–15
5.	Stock Changes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6.	Total Primary Energy Supply	0	0	0	65	25	2	11	25	0	1	0	2	0	0	0	0	0	0	0	0	66
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	0	0	0	–30	0	0	–5	–25	0	0	0	–2	0	0	0	0	0	0	12	0	–20
8.1	Power Generation	0	0	0	–30	0	0	–5	–25	0	0	0	–2	0	0	0	0	0	0	12	0	–20
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–2	0	–2
10.	Discrepancy	0	0	0	–1	0	0	0	0	0	–1	0	0	0	0	0	0	0	0	0	0	–1
11.	Total Final Energy Consumption	0	0	0	33	25	2	6	0	0	0	0	0	0	0	0	0	0	0	9	0	43
12.	Industry Sector	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2
13.	Transport Sector	0	0	0	31	25	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	31
14.	Other Sectors	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	8	0	10
14.1	Residential and Commercial	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	3	0	5
14.1.1	Commerce and Public Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14.1.2	Residential	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	3	0	5
14.2	Non–Specified Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	5
15.	Non–Energy Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16.	Electricity Output (GWh)	0	0	0	116	0	0	20	96	0	0	0	18	0	0	0	0	0	0	0	0	134
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.
Note: Figures may not add up to total because of rounding.
Source: UNSD (2011a).

Table 5.7.4 Palau Energy Balance Table, 2006

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	2
2.	Imports	0	0	0	84	26	2	11	29	0	15	0	0	0	0	0	0	0	0	0	0	84
3.	Exports	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.	International Bunkers	0	0	0	–15	–1	0	0	0	0	–14	0	0	0	0	0	0	0	0	0	0	–15
5.	Stock Changes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6.	Total Primary Energy Supply	0	0	0	68	25	2	11	29	0	1	0	2	0	0	0	0	0	0	0	0	70
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	0	0	0	–34	0	0	–5	–29	0	0	0	–2	0	0	0	0	0	0	13	0	–23
8.1	Power Generation	0	0	0	–34	0	0	–5	–29	0	0	0	–2	0	0	0	0	0	0	13	0	–23
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–2	0	–2
10.	Discrepancy	0	0	0	–1	0	0	0	0	0	–1	0	0	0	0	0	0	0	0	0	0	–1
11.	Total Final Energy Consumption	0	0	0	33	25	2	6	0	0	0	0	0	0	0	0	0	0	0	11	0	44
12.	Industry Sector	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
13.	Transport Sector	0	0	0	31	25	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	31
14.	Other Sectors	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	10	0	12
14.1	Residential and Commercial	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2	0	4
14.1.1	Commerce and Public Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14.1.2	Residential	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2	0	4
14.2	Non-Specified Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	0	8
15.	Non-Energy Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16.	Electricity Output (GWh)	0	0	0	133	0	0	21	112	0	0	0	18	0	0	0	0	0	0	0	0	151
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Source: UNSD (2011a).

Table 5.7.5 Palau Energy Balance Table, 2007

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	2
2.	Imports	0	0	0	87	27	2	12	29	0	16	0	0	0	0	0	0	0	0	0	0	87
3.	Exports	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.	International Bunkers	0	0	0	–17	–1	0	0	0	0	–15	0	0	0	0	0	0	0	0	0	0	–17
5.	Stock Changes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6.	Total Primary Energy Supply	0	0	0	70	26	2	12	29	0	1	0	2	0	0	0	0	0	0	0	0	72
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	0	0	0	–35	0	0	–6	–29	0	0	0	–2	0	0	0	0	0	0	13	0	–23
8.1	Power Generation	0	0	0	–35	0	0	–6	–29	0	0	0	–2	0	0	0	0	0	0	13	0	–23
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–2	0	–2
10.	Discrepancy	0	0	0	–1	0	0	0	0	0	–1	0	0	0	0	0	0	0	0	0	0	–1
11.	Total Final Energy Consumption	0	0	0	34	26	2	6	0	0	0	0	0	0	0	0	0	0	0	11	0	46
12.	Industry Sector	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
13.	Transport Sector	0	0	0	32	26	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	32
14.	Other Sectors	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	10	0	12
14.1	Residential and Commercial	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	3	0	5
14.1.1	Commerce and Public Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14.1.2	Residential	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	3	0	5
14.2	Non-Specified Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	0	8
15.	Non-Energy Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16.	Electricity Output (GWh)	0	0	0	136	0	0	24	112	0	0	0	18	0	0	0	0	0	0	0	0	154
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.
Note: Figures may not add up to total because of rounding.
Source: UNSD (2011a).

Table 5.7.6 Palau Energy Balance Table, 2008

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	2
2.	Imports	0	0	0	87	27	2	12	29	0	16	0	0	0	0	0	0	0	0	0	0	87
3.	Exports	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.	International Bunkers	0	0	0	–17	–1	0	0	0	0	–15	0	0	0	0	0	0	0	0	0	0	–17
5.	Stock Changes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6.	Total Primary Energy Supply	0	0	0	70	26	2	12	29	0	1	0	2	0	0	0	0	0	0	0	0	72
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	0	0	0	–35	0	0	–6	–29	0	0	0	–2	0	0	0	0	0	0	13	0	–23
8.1	Power Generation	0	0	0	–35	0	0	–6	–29	0	0	0	–2	0	0	0	0	0	0	13	0	–23
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–2	0	–2
10.	Discrepancy	0	0	0	–1	0	0	0	0	0	–1	0	0	0	0	0	0	0	0	0	0	–1
11.	Total Final Energy Consumption	0	0	0	34	26	2	6	0	0	0	0	0	0	0	0	0	0	0	11	0	45
12.	Industry Sector	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
13.	Transport Sector	0	0	0	32	26	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	32
14.	Other Sectors	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	10	0	12
14.1	Residential and Commercial	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2	0	4
14.1.1	Commerce and Public Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14.1.2	Residential	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2	0	4
14.2	Non-Specified Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	0	8
15.	Non-Energy Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16.	Electricity Output (GWh)	0	0	0	134	0	0	23	111	0	0	0	18	0	0	0	0	0	0	0	0	152
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Source: UNSD (2011a).

Table 5.7.7 Palau Summary Table, 1990–2009

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Indigenous Production (ktoe)																				
Coal	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Oil	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Gas	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Hydro	–	–	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	–
Nuclear	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Geothermal	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Solar	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Wind	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Biomass	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Others	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Total	–	–	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	–
Primary Energy Supply (ktoe)																				
Coal	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Oil	–	–	62	62	62	62	63	63	63	63	65	61	61	63	63	65	68	70	70	–
Gas	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Hydro	–	–	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	–
Nuclear	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Geothermal	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Solar	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Wind	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Biomass	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Others	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Total	–	–	63	63	63	63	65	65	65	64	67	62	63	65	64	66	70	72	72	–
Final Energy Consumption by Sector (ktoe)																				
Industry	–	–	0	0	0	0	0	0	0	0	0	2	2	2	2	2	1	1	1	–
Transport	–	–	24	24	24	24	25	25	25	25	25	29	29	31	31	31	31	32	32	–
Residential	–	–	2	2	2	2	2	2	2	2	2	4	4	5	5	5	4	5	4	–
Commercial	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Others	–	–	0	0	0	0	0	0	0	0	0	5	4	5	5	5	8	8	8	–
Total	–	–	26	26	26	26	27	27	27	27	27	40	40	42	42	43	44	46	45	–

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Table 5.7.7 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Final Energy Consumption by Type (ktoe)																				
Coal	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Oil	–	–	26	26	26	26	27	27	27	27	27	31	31	33	33	33	33	34	34	–
Gas	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Electricity	–	–	0	0	0	0	0	0	0	0	0	9	9	9	9	9	11	11	11	–
Heat	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Biomass	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Others	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Total	–	–	26	26	26	26	27	27	27	27	27	40	40	42	42	43	44	46	45	–
Power Generation (GWh)																				
Thermal	–	–	100	100	100	100	101	101	101	100	107	110	109	110	110	116	133	136	134	–
Hydro	–	–	20	20	20	20	20	20	20	18	18	18	18	18	18	18	18	18	18	–
Nuclear	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Geothermal	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Solar	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Wind	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Others	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Total	–	–	120	120	120	120	121	121	121	118	125	128	127	128	128	134	151	154	152	–
Loss and Own Use of Electricity (GWh)																				
Transmission and Distribution Losses	–	–	5	5	5	5	5	5	5	5	5	25	25	25	25	25	25	25	25	–
Own Use	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Total	–	–	5	5	5	5	5	5	5	5	5	25	25	25	25	25	25	25	25	–
Fuel Input for Power Generation (ktoe)																				
Coal	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Oil	–	–	34	34	34	34	35	35	35	34	37	28	29	29	28	30	34	35	35	–
Gas	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Total	–	–	34	34	34	34	35	35	35	34	37	28	29	29	28	30	34	35	35	–
CO_2 Emissions (kt C)																				
Coal	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Oil	–	–	50	50	50	50	51	51	51	51	53	50	50	52	52	53	57	58	58	–
Gas	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Total	–	–	50	50	50	50	51	51	51	51	53	50	50	52	52	53	57	58	58	–

continued on next page

Table 5.7.7 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Macroeconomic Indicators																				
Population (thousand)	15	15	16	16	17	17	18	18	19	19	19	19	20	20	20	20	20	20	20	20
Urban Population, %	69.6	70.0	70.3	70.7	71.0	71.4	71.1	70.8	70.5	70.2	69.9	71.3	72.8	74.2	75.7	77.1	78.2	79.3	80.5	81.6
GDP (constant 2000 $ million)	–	112	105	92	99	110	121	124	126	120	120	121	117	116	121	128	132	135	128	125
GDP (current $ million)	77	84	82	76	84	95	108	113	117	113	120	125	119	123	134	145	157	164	166	165
GDP (constant 2005 PPP $ million)	–	225	211	185	199	220	243	249	254	240	241	244	235	232	244	257	265	270	257	252
GDP/capita (constant 2000 $)	–	7,256	6,611	5,638	5,884	6,356	6,842	6,834	6,820	6,331	6,252	6,258	5,986	5,871	6,126	6,430	6,588	6,690	6,328	6,159
GDP/capita (current $)	5,096	5,420	5,188	4,644	4,971	5,520	6,115	6,247	6,334	6,012	6,252	6,425	6,103	6,230	6,744	7,306	7,826	8,166	8,226	8,095
GDP – Manufacturing (% of GDP)	–	0.7	0.9	0.7	0.8	0.9	0.9	1.2	1.5	1.4	1.4	1.4	1.5	0.4	0.4	0.4	0.4	0.3	0.3	0.4
Car Ownership (car/1,000 persons)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Basic Energy Indicators																				
TPES/capita (toe/person)	–	–	3.99	3.88	3.77	3.67	3.66	3.57	3.49	3.40	3.48	3.21	3.20	3.29	3.25	3.32	3.48	3.57	3.55	–
TFEC/capita (toe/person)	–	–	1.65	1.60	1.56	1.52	1.54	1.50	1.47	1.44	1.42	2.07	2.05	2.14	2.13	2.15	2.21	2.27	2.24	–
TPES/GDP (toe/constant 2000 $ million)	–	–	603	687	641	578	535	523	512	537	556	513	534	561	531	516	528	533	561	–
TFEC/GDP (toe/constant 2000 $ million)	–	–	249	284	265	239	225	220	216	228	227	331	342	365	348	334	335	339	353	–
Import Dependency (%)	–	–	97.3	97.3	97.3	97.3	97.3	97.3	97.3	97.6	97.7	97.5	97.5	97.6	97.6	97.7	97.8	97.8	97.8	–
Oil Import Dependency (%)	–	–	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	–
Electricity/capita (kWh/ person)	–	–	0	0	0	0	0	0	0	0	0	5,309	5,211	5,229	5,201	5,476	6,297	6,462	6,229	–
CO_2 Intensity (t C/constant 2000 $ million)	–	–	475	541	505	455	421	412	404	424	440	411	428	451	426	417	429	432	454	–
CO_2/capita (t C)	–	–	3.14	3.05	2.97	2.89	2.88	2.82	2.75	2.69	2.75	2.57	2.56	2.65	2.61	2.68	2.83	2.89	2.88	–
CO_2/TPES (t C/toe)	–	–	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.80	0.80	0.80	0.80	0.81	0.81	0.81	0.81	–

– = no data or not applicable, CO_2 = carbon dioxide, GDP = gross domestic product, GWh = gigawatt–hour, kt C = thousand tons of carbon equivalent, ktoe = thousand tons of oil equivalent, kWh = kilowatt–hour, PPP = purchasing power parity, t C = ton of carbon equivalent, TFEC = total final energy consumption, toe = ton of oil equivalent, TPES = total primary energy supply.

Note: Figures may not add up to total because of rounding.

Sources: APERC estimates, UNSD (2011a), and World Bank.

5.8 Papua New Guinea

Country Profile (2009)		Energy Reserves (year-end 2008)	
Total Surface Area (square kilometer)	462,840	Coal (million ton) - Recoverable	–
Population (thousand)	6,703	Gas (trillion cubic feet) - Proven	15.6
GDP (billion constant 2000 $)	4.7	Oil (billion barrel) - Proven	70.0
Electrification Rate (%)	10.0		

– = no data or not applicable, GDP = gross domestic product.

Sources: ADB (2012), Ostojic et al. (2011), World Bank, and WEC (2010).

2009 Energy Supply and Demand Flow (ktoe)

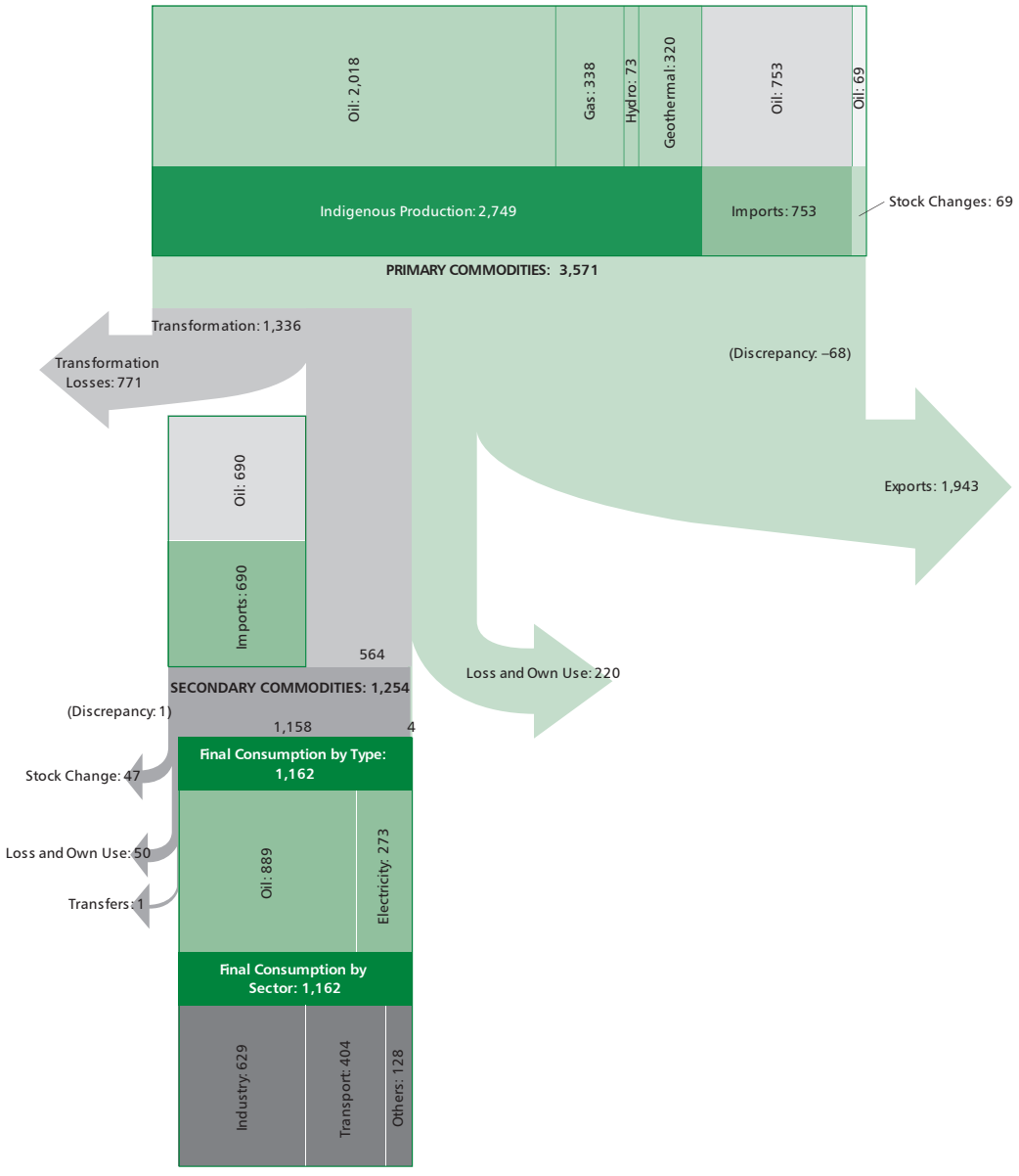


Table 5.8.1 Key Data and Economic Profile

	1990	1995	2000	2005	2009
Socioeconomic Data					
Population (thousand)	4,158	4,716	5,379	6,095	6,703
GDP (constant 2000 $ billion)	2.4	3.6	3.5	3.8	4.7
GDP (constant 2005 PPP $ billion)	7.0	10.6	10.5	11.4	14.1
GDP/capita (constant 2000 $)	567	755	655	626	705
GDP/capita (constant 2005 PPP $)	1,689	2,249	1,951	1,866	2,101

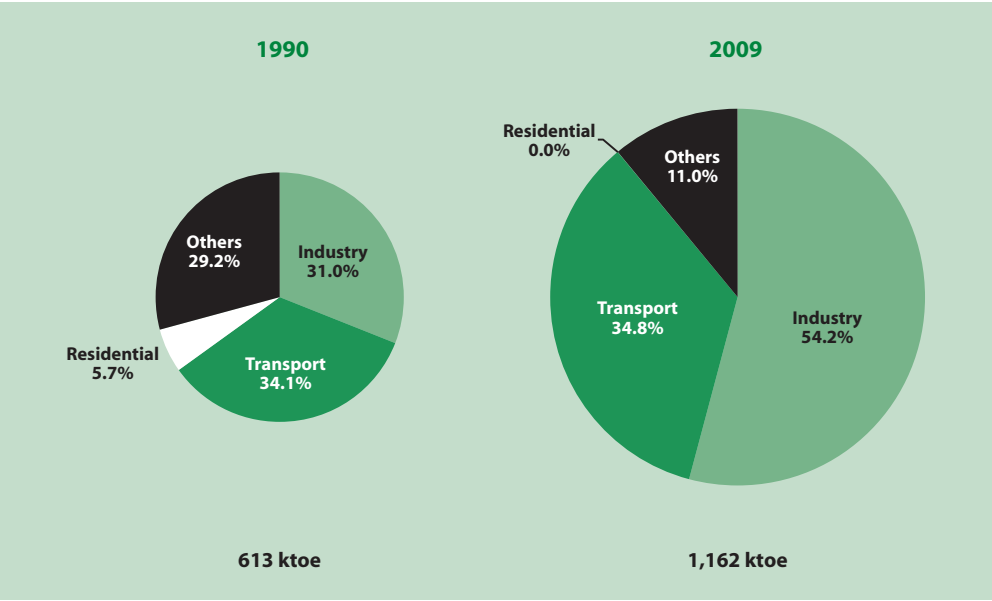
GDP = gross domestic product, PPP = purchasing power parity.
Source: World Bank.

Table 5.8.2 Energy Supply and Demand

	1990	1995	2000	2005	2009
Primary Energy Supply (ktoe)					
Indigenous Production	4,612	4,897	3,866	2,894	2,749
Net Imports	–3,746	–3,976	–2,743	–1,096	–478
Total PES	866	921	1,123	1,799	2,270
Coal	1	0	0	0	0
Oil	753	741	908	1,367	1,540
Gas	72	83	119	241	338
Biomass	0	22	16	0	0
Others	40	75	80	191	393
TPES/capita (toe)	0.21	0.20	0.21	0.30	0.34
TPES/GDP (toe/constant 2005 PPP $ million)	123	87	107	158	161
Final Energy Consumption (ktoe)					
Industry	190	271	480	617	629
Transportation	209	251	306	369	404
Other Sectors	214	168	94	129	128
Total FEC	613	689	880	1,115	1,162
Coal	1	0	0	0	0
Oil	398	571	686	849	889
Gas	72	0	0	0	0
Electricity	142	117	194	266	273
Biomass	0	1	0	0	0
Others	0	0	0	0	0

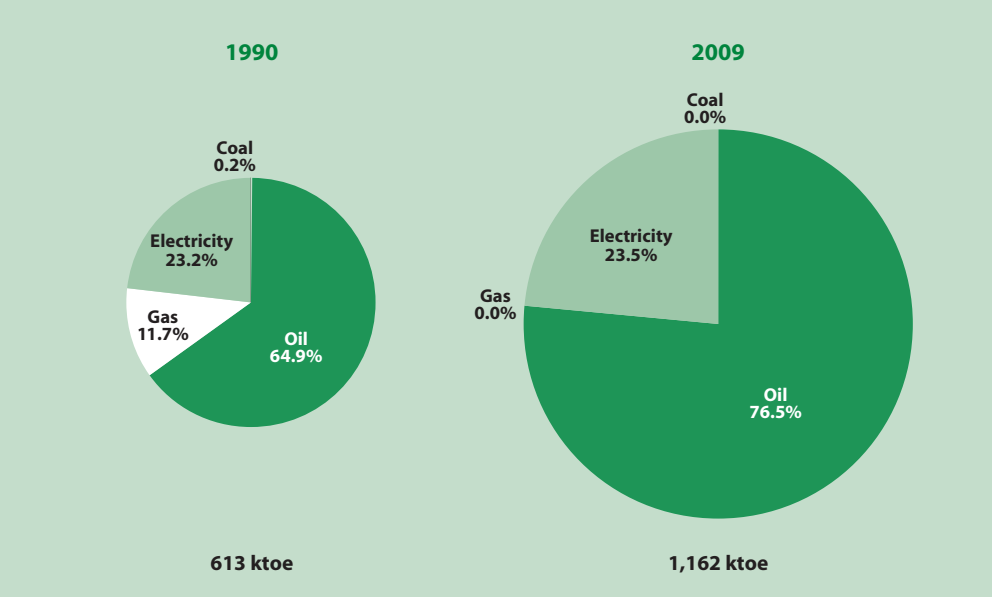
FEC = final energy consumption, GDP = gross domestic product, ktoe = thousand tons of oil equivalent, PES = primary energy supply, PPP = purchasing power parity, toe = ton of oil equivalent, TPES = total primary energy supply.
Source: APERC (APEC Energy Database).

Figure 5.8.1 Final Energy Consumption by Sector, 1990 and 2009



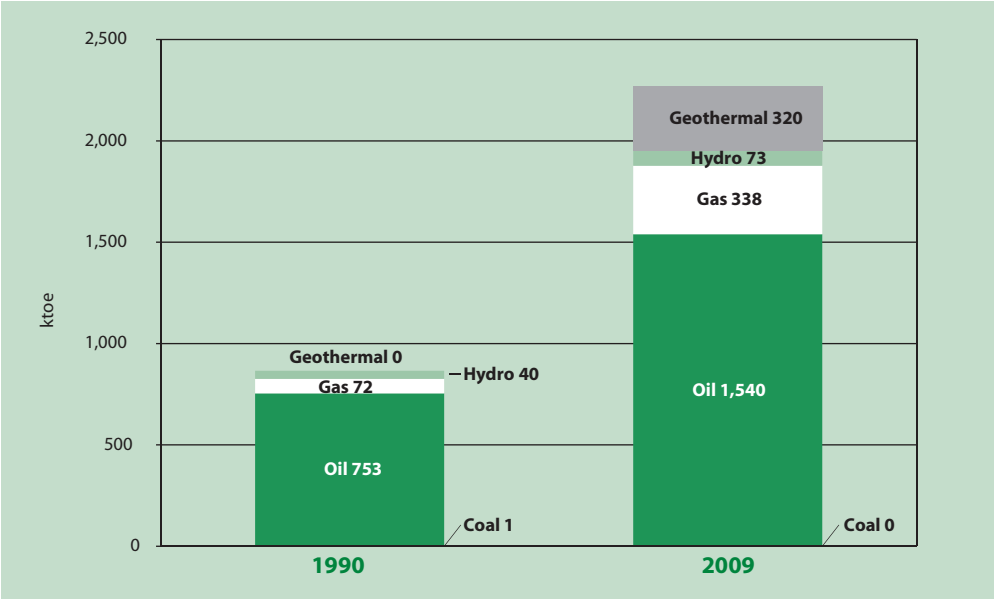
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 5.8.2 Final Energy Consumption by Type of Energy, 1990 and 2009



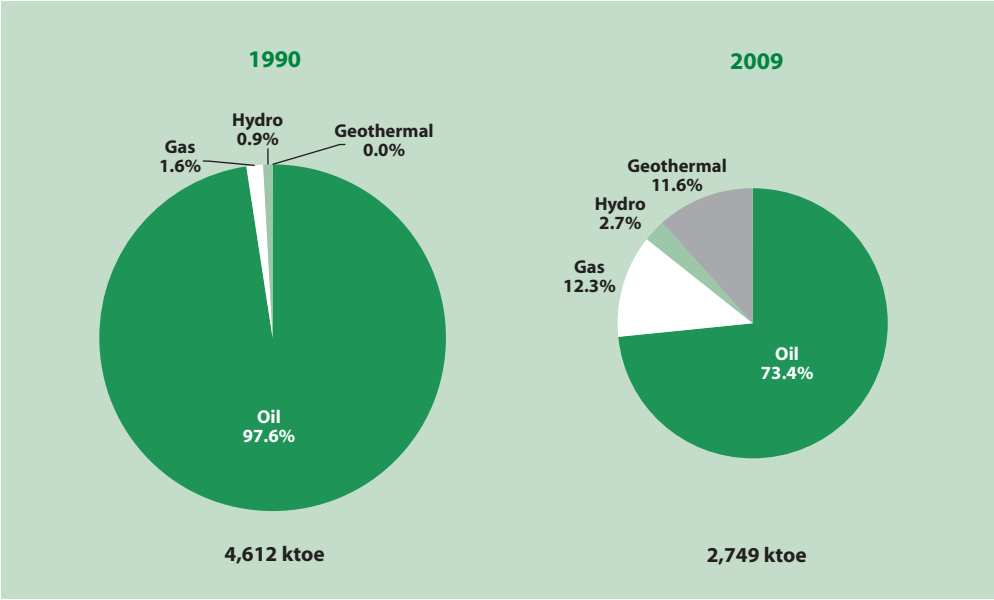
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 5.8.3 Total Primary Energy Supply, 1990 and 2009



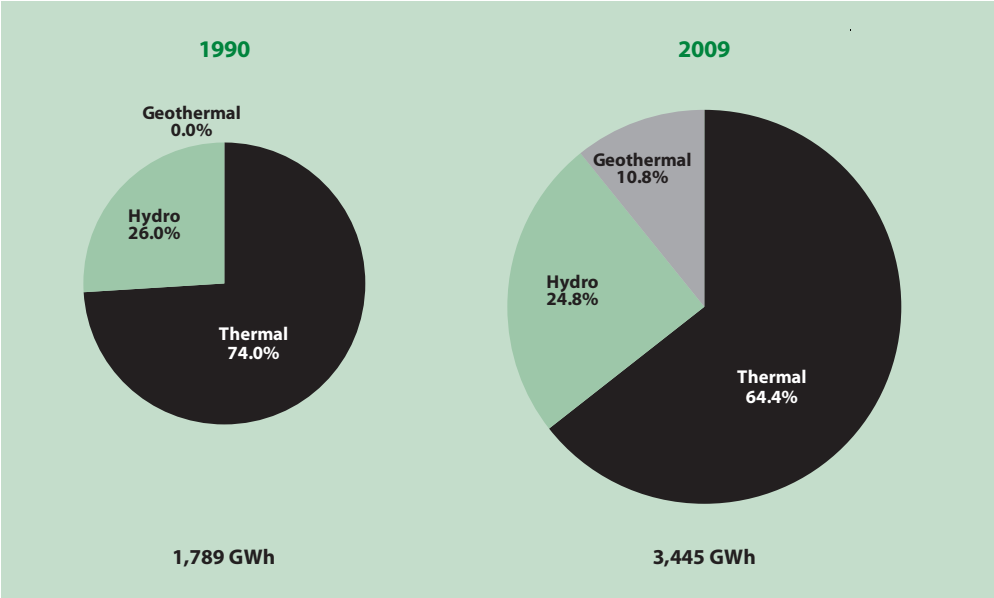
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 5.8.4 Indigenous Energy Production, 1990 and 2009



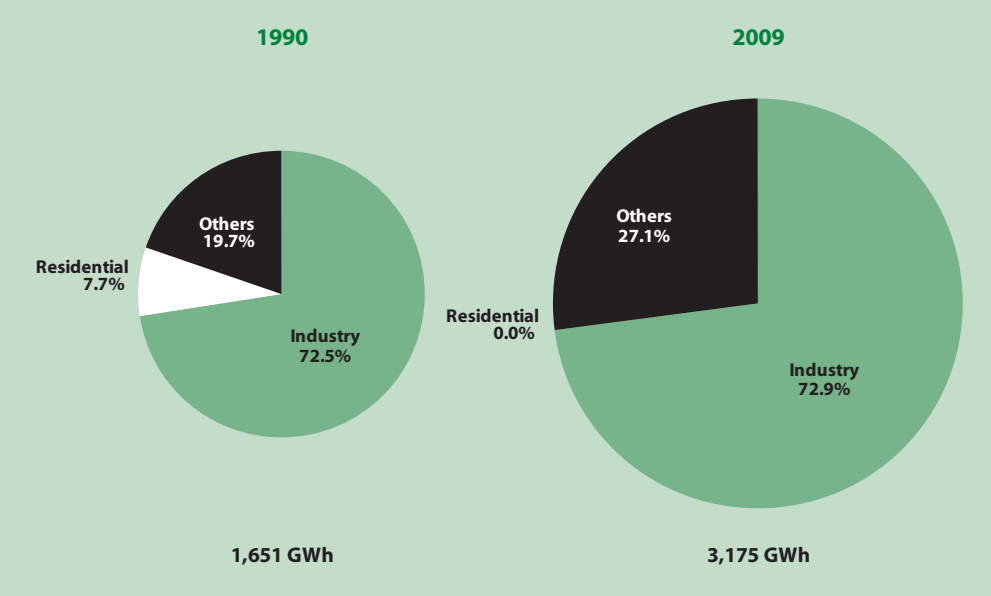
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 5.8.5 Electricity Generation by Plant Type, 1990 and 2009



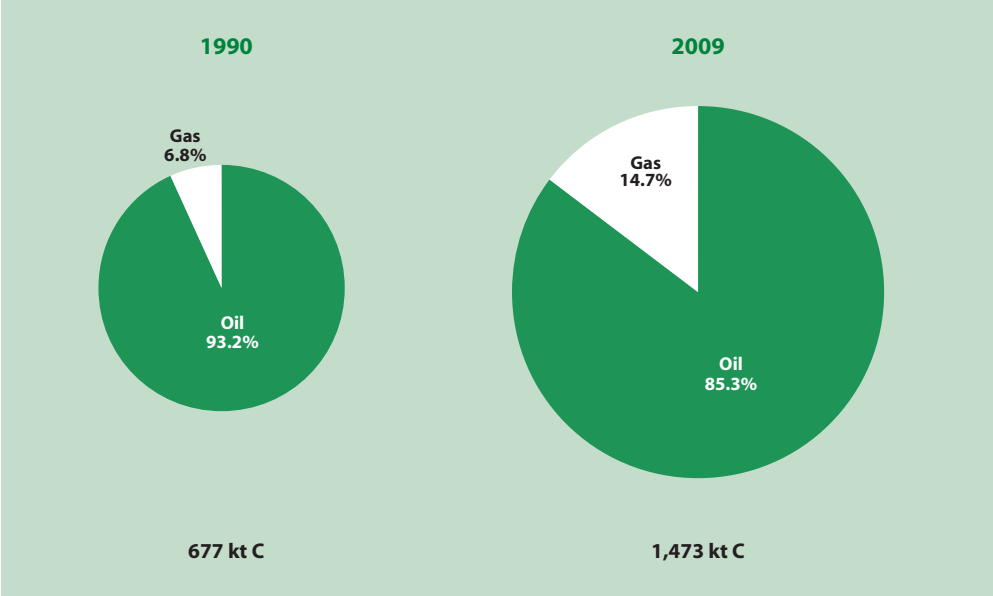
GWh = gigawatt-hour.
Source: APERC (APEC Energy Database).

Figure 5.8.6 Electricity Consumption by Sector, 1990 and 2009



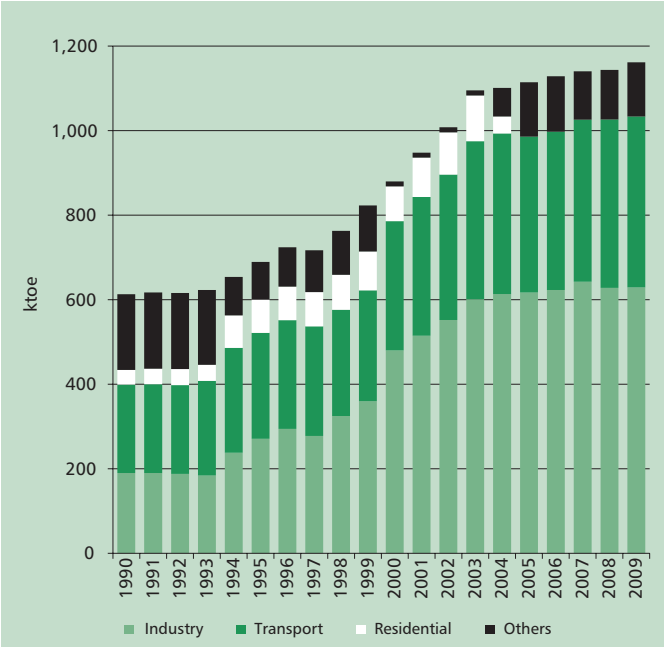
GWh = gigawatt-hour.
Source: APERC (APEC Energy Database).

Figure 5.8.7 Carbon Dioxide Emissions from Fuel Combustion, 1990 and 2009



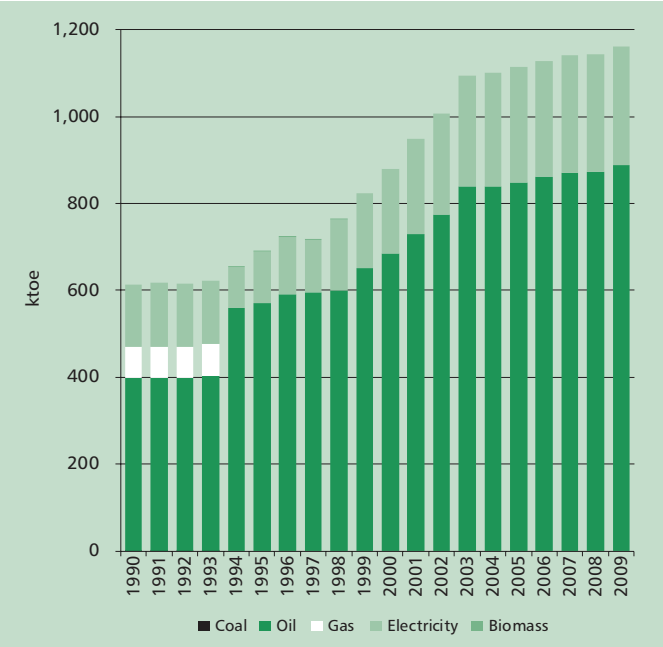
kt C = thousand tons of carbon equivalent.
Source: APERC estimates.

Figure 5.8.8 Final Energy Consumption by Sector, 1990–2009



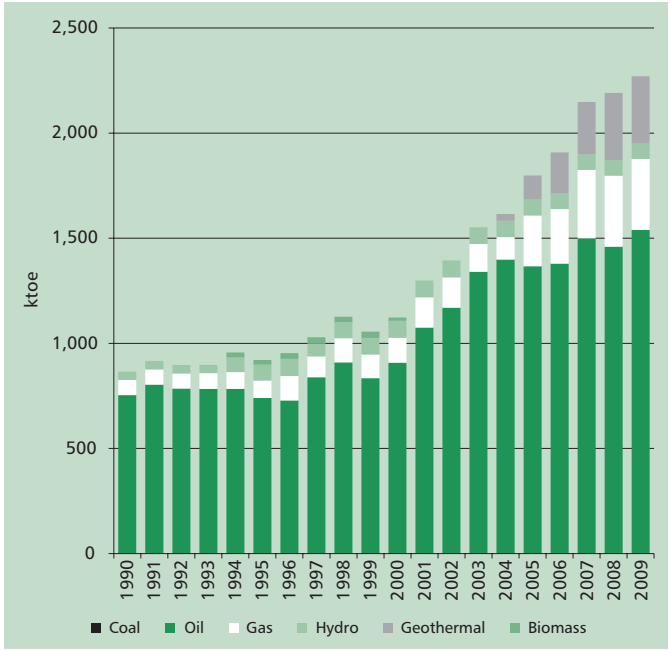
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 5.8.9 Final Energy Consumption by Type, 1990–2009



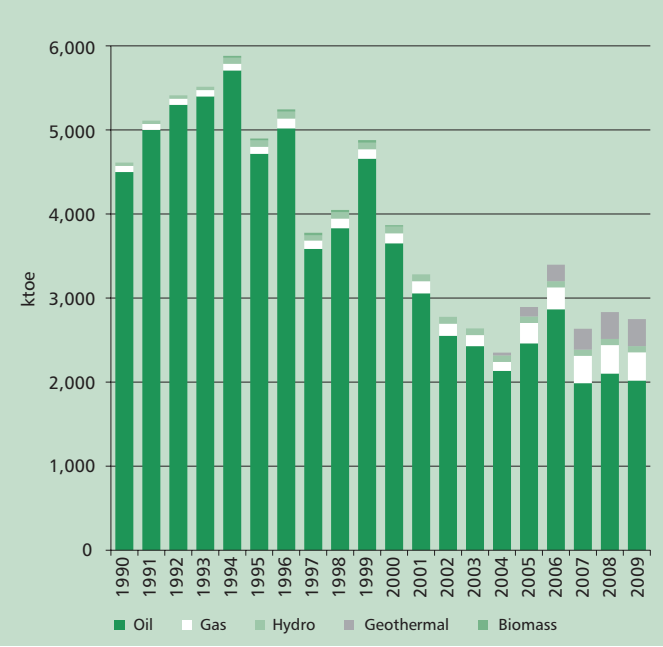
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 5.8.10 Total Primary Energy Supply, 1990–2009



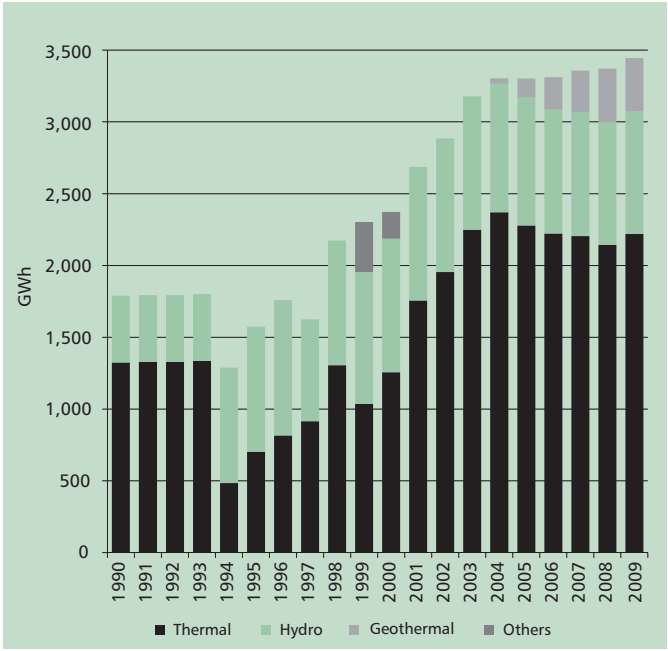
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 5.8.11 Indigenous Energy Production, 1990–2009



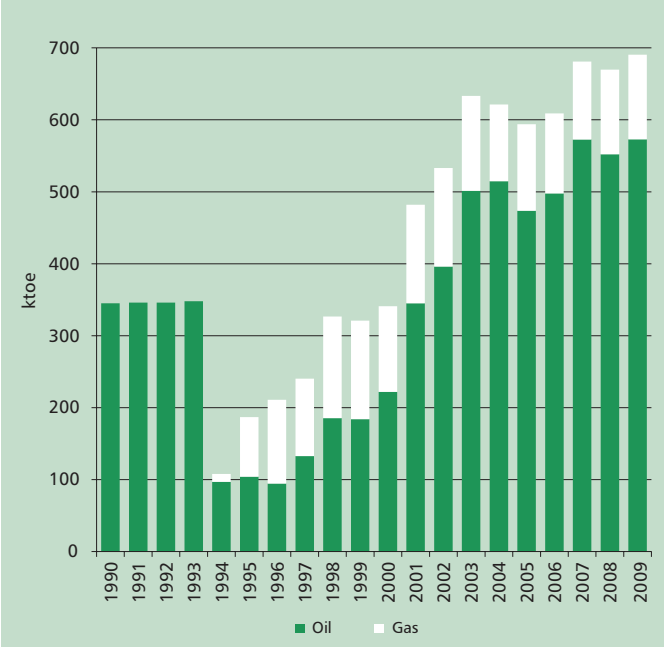
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 5.8.12 Electricity Generation by Source, 1990–2009



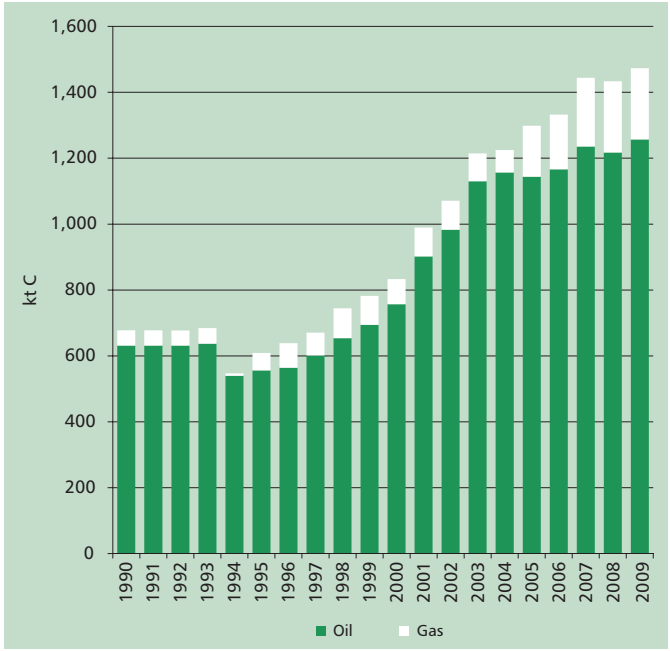
GWh = gigawatt-hour.
Source: APERC (APEC Energy Database).

Figure 5.8.13 Fuel Input for Electricity Generation, 1990–2009



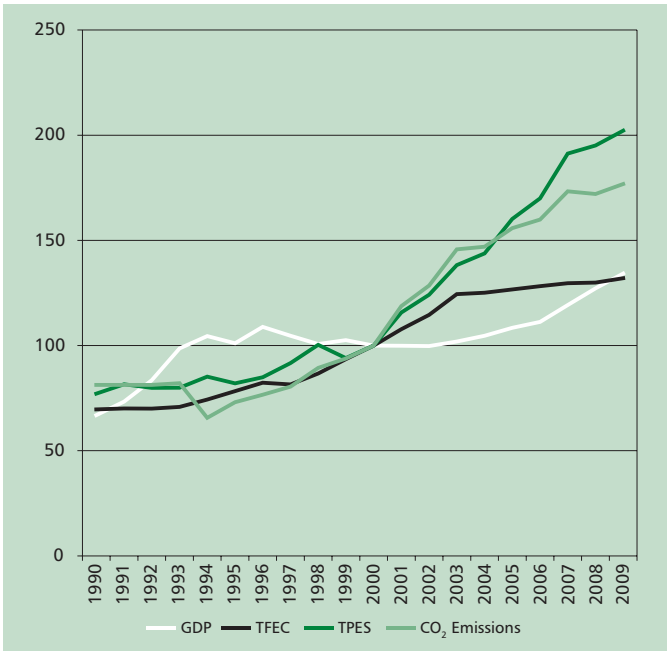
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 5.8.14 Carbon Dioxide Emissions from Fuel Combustion, 1990–2009



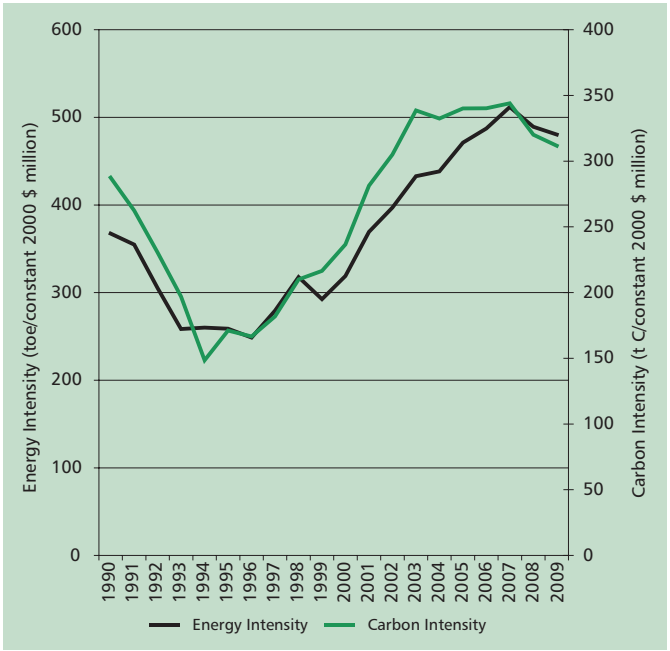
kt C = thousand tons of carbon equivalent.
Source: APERC estimates.

Figure 5.8.15 Growth of GDP, TFEC, TPES, and CO_2 (indexed to year 2000), 1990–2009



CO_2 = carbon dioxide, GDP = gross domestic product, TFEC = total final energy consumption, TPES = total primary energy supply.
Note: Indices are measured relative to the base year 2000 (2000 = 100).
Source: APERC estimates.

Figure 5.8.16 Energy and Carbon Intensities, 1990–2009



t C = ton of carbon equivalent, toe = ton of oil equivalent.
Source: APERC estimates.

Table 5.8.3 Papua New Guinea Energy Balance Table, 2006

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	0	0	2,867	0	0	0	0	0	0	0	259	74	0	195	0	0	0	0	0	0	3,396
2.	Imports	0	0	993	730	52	19	385	268	6	0	0	0	0	0	0	0	0	0	0	0	1,724
3.	Exports	0	0	–2,482	–435	–29	0	–102	–102	0	–201	0	0	0	0	0	0	0	0	0	0	–2,917
4.	International Bunkers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5.	Stock Changes	0	0	–294	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–294
6.	Total Primary Energy Supply	0	0	1,084	295	23	19	282	166	6	–201	259	74	0	195	0	0	0	0	0	0	1,908
7.	Transfers	0	0	–13	13	0	17	3	1	0	–9	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	0	0	–1,060	562	66	0	314	–149	14	318	–111	–74	0	–195	0	0	0	0	285	0	–593
8.1	Power Generation	0	0	0	–498	0	0	–241	–256	0	0	–111	–74	0	–195	0	0	0	0	285	0	–593
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	–1,060	1,060	66	0	555	108	14	318	0	0	0	0	0	0	0	0	0	0	1
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	0	0	0	–21	0	0	–7	0	–3	–10	–148	0	0	0	0	0	0	0	–18	0	–187
10.	Discrepancy	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11.	Total Final Energy Consumption	0	0	12	850	89	36	591	19	17	98	0	0	0	0	0	0	0	0	267	0	1,129
12.	Industry Sector	0	0	0	425	0	0	391	13	12	9	0	0	0	0	0	0	0	0	198	0	623
13.	Transport Sector	0	0	0	375	89	0	201	6	0	80	0	0	0	0	0	0	0	0	0	0	375
14.	Other Sectors	0	0	12	50	0	36	0	0	5	9	0	0	0	0	0	0	0	0	69	0	131
14.1	Residential and Commercial	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14.1.1	Commerce and Public Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14.1.2	Residential	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14.2	Non-Specified Others	0	0	12	50	0	36	0	0	5	9	0	0	0	0	0	0	0	0	69	0	131
15.	Non-Energy Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16.	Electricity Output (GWh)	0	0	1,697	0	0	0	0	0	0	0	525	863	0	227	0	0	0	0	0	0	3,312
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.
Note: Figures may not add up to total because of rounding.
Source: APERC (APEC Energy Database).

Table 5.8.4 Papua New Guinea Energy Balance Table, 2007

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	0	0	1,987	0	0	0	0	0	0	0	326	74	0	249	0	0	0	0	0	0	2,636
2.	Imports	0	0	778	818	16	37	451	299	14	0	0	0	0	0	0	0	0	0	0	0	1,596
3.	Exports	0	0	−1,487	−172	0	0	−1	−40	−2	−130	0	0	0	0	0	0	0	0	0	0	−1,659
4.	International Bunkers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5.	Stock Changes	0	0	−454	30	−1	0	13	6	1	10	0	0	0	0	0	0	0	0	0	0	−425
6.	Total Primary Energy Supply	0	0	824	675	16	37	464	264	14	−120	326	74	0	249	0	0	0	0	0	0	2,148
7.	Transfers	0	0	−12	13	47	0	3	1	0	−39	0	0	0	0	0	0	0	0	0	0	1
8.	Total Transformation Sector	0	0	−800	187	27	0	135	−246	4	266	−108	−74	0	−249	0	0	0	0	289	0	−756
8.1	Power Generation	0	0	0	−573	0	0	−257	−316	0	0	−108	−74	0	−249	0	0	0	0	289	0	−715
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	−800	760	27	0	392	70	4	266	0	0	0	0	0	0	0	0	0	0	−41
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	0	0	0	−17	0	0	−5	0	−1	−11	−217	0	0	0	0	0	0	0	−18	0	−253
10.	Discrepancy	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
11.	Total Final Energy Consumption	0	0	12	858	90	37	596	20	18	98	0	0	0	0	0	0	0	0	270	0	1,141
12.	Industry Sector	0	0	12	433	0	0	391	14	12	16	0	0	0	0	0	0	0	0	198	0	643
13.	Transport Sector	0	0	0	383	90	0	206	6	0	82	0	0	0	0	0	0	0	0	0	0	383
14.	Other Sectors	0	0	0	42	0	37	0	0	5	0	0	0	0	0	0	0	0	0	72	0	114
14.1	Residential and Commercial	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14.1.1	Commerce and Public Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14.1.2	Residential	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14.2	Non-Specified Others	0	0	0	42	0	37	0	0	5	0	0	0	0	0	0	0	0	0	72	0	114
15.	Non-Energy Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16.	Electricity Output (GWh)	0	0	1,705	0	0	0	0	0	0	0	500	863	0	289	0	0	0	0	0	0	3,357
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Source: APERC (APEC Energy Database).

Table 5.8.5 Papua New Guinea Energy Balance Table, 2008

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	0	0	2,102	0	0	0	0	0	0	0	338	74	0	320	0	0	0	0	0	0	2,833
2.	Imports	0	0	870	642	83	37	287	223	13	0	0	0	0	0	0	0	0	0	0	0	1,513
3.	Exports	0	0	–2,044	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–2,044
4.	International Bunkers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5.	Stock Changes	0	0	–85	–26	–4	0	–6	–8	–1	–8	0	0	0	0	0	0	0	0	0	0	–111
6.	Total Primary Energy Supply	0	0	844	616	79	37	281	215	12	–8	338	74	0	320	0	0	0	0	0	0	2,191
7.	Transfers	0	0	–12	8	11	0	198	1	0	–201	0	0	0	0	0	0	0	0	0	0	–3
8.	Total Transformation Sector	0	0	–799	259	0	0	138	–194	9	306	–118	–74	0	–320	0	0	0	0	290	0	–762
8.1	Power Generation	0	0	0	–552	0	0	–237	–316	0	0	–118	–74	0	–320	0	0	0	0	290	0	–773
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	–799	811	0	0	374	121	9	306	0	0	0	0	0	0	0	0	0	0	12
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	0	0	0	–14	0	0	–5	0	–2	–8	–220	0	0	0	0	0	0	0	–18	0	–253
10.	Discrepancy	0	0	–29	–1	0	1	0	0	0	–2	0	0	0	0	0	0	0	0	0	0	–30
11.	Total Final Energy Consumption	0	0	4	868	90	38	612	23	19	87	0	0	0	0	0	0	0	0	272	0	1,144
12.	Industry Sector	0	0	4	425	0	0	396	17	13	0	0	0	0	0	0	0	0	0	199	0	628
13.	Transport Sector	0	0	0	398	90	0	216	6	0	87	0	0	0	0	0	0	0	0	0	0	398
14.	Other Sectors	0	0	0	44	0	38	0	0	6	0	0	0	0	0	0	0	0	0	73	0	117
14.1	Residential and Commercial	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14.1.1	Commerce and Public Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14.1.2	Residential	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14.2	Non-Specified Others	0	0	0	44	0	38	0	0	6	0	0	0	0	0	0	0	0	0	73	0	117
15.	Non-Energy Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16.	Electricity Output (GWh)	0	0	1,598	0	0	0	0	0	0	0	546	855	0	372	0	0	0	0	0	0	3,372
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.
Note: Figures may not add up to total because of rounding.
Source: APERC (APEC Energy Database).

Table 5.8.6 Papua New Guinea Energy Balance Table, 2009

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	0	0	2,018	0	0	0	0	0	0	0	338	73	0	320	0	0	0	0	0	0	2,749
2.	Imports	0	0	753	690	26	38	366	246	14	0	0	0	0	0	0	0	0	0	0	0	1,443
3.	Exports	0	0	–1,943	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–1,943
4.	International Bunkers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5.	Stock Changes	0	0	69	–47	–4	0	–11	–1	–1	–29	0	0	0	0	0	0	0	0	0	0	22
6.	Total Primary Energy Supply	0	0	897	643	21	38	355	245	13	–29	338	73	0	320	0	0	0	0	0	0	2,270
7.	Transfers	0	0	0	–1	70	0	97	0	0	–168	0	0	0	0	0	0	0	0	0	0	–1
8.	Total Transformation Sector	0	0	–825	268	0	0	166	–222	6	319	–118	–73	0	–320	0	0	0	0	296	0	–771
8.1	Power Generation	0	0	0	–573	0	0	–252	–321	0	0	–118	–73	0	–320	0	0	0	0	296	0	–788
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	–825	841	0	0	418	99	6	319	0	0	0	0	0	0	0	0	0	0	16
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	0	0	0	–25	0	0	0	0	0	–25	–220	0	0	0	0	0	0	0	–24	0	–270
10.	Discrepancy	0	0	–68	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	–67
11.	Total Final Energy Consumption	0	0	4	885	92	38	617	23	19	97	0	0	0	0	0	0	0	0	273	0	1,162
12.	Industry Sector	0	0	4	426	0	0	396	17	13	0	0	0	0	0	0	0	0	0	199	0	629
13.	Transport Sector	0	0	0	404	92	0	221	5	0	86	0	0	0	0	0	0	0	0	0	0	404
14.	Other Sectors	0	0	0	54	0	38	0	0	6	11	0	0	0	0	0	0	0	0	74	0	128
14.1	Residential and Commercial	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14.1.1	Commerce and Public Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14.1.2	Residential	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14.2	Non–Specified Others	0	0	0	54	0	38	0	0	6	11	0	0	0	0	0	0	0	0	74	0	128
15.	Non–Energy Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16.	Electricity Output (GWh)	0	0	1,676	0	0	0	0	0	0	0	543	854	0	372	0	0	0	0	0	0	3,445
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Source: APERC (APEC Energy Database).

Table 5.8.7 Papua New Guinea Summary Table, 1990–2009

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Indigenous Production (ktoe)																				
Coal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Oil	4,500	5,000	5,300	5,400	5,709	4,717	5,019	3,586	3,832	4,657	3,651	3,057	2,552	2,427	2,134	2,462	2,867	1,987	2,102	2,018
Gas	72	72	72	74	80	83	117	100	115	113	119	144	144	132	107	241	259	326	338	338
Hydro	40	40	40	40	69	75	81	61	75	79	80	80	80	80	77	77	74	74	74	73
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Geothermal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	33	114	195	249	320	320
Solar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wind	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Biomass	0	0	0	0	24	22	27	30	27	30	16	0	0	0	0	0	0	0	0	0
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	4,612	5,112	5,412	5,514	5,882	4,897	5,244	3,776	4,049	4,879	3,866	3,281	2,776	2,640	2,350	2,894	3,396	2,636	2,833	2,749
Primary Energy Supply (ktoe)																				
Coal	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Oil	753	803	784	783	784	741	728	839	909	834	908	1,075	1,170	1,340	1,399	1,367	1,380	1,499	1,460	1,540
Gas	72	72	72	74	80	83	117	100	115	113	119	144	144	132	107	241	259	326	338	338
Hydro	40	40	40	40	69	75	81	61	75	79	80	80	80	80	77	77	74	74	74	73
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Geothermal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	33	114	195	249	320	320
Solar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wind	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Biomass	0	0	0	0	24	22	27	30	27	30	16	0	0	0	0	0	0	0	0	0
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	866	916	897	898	957	921	954	1,029	1,127	1,056	1,123	1,299	1,394	1,553	1,615	1,799	1,908	2,148	2,191	2,270
Final Energy Consumption by Sector (ktoe)																				
Industry	190	190	188	184	238	271	294	278	325	360	480	515	552	601	613	617	623	643	628	629
Transport	209	210	210	224	248	251	257	260	251	262	306	328	344	374	380	369	375	383	398	404
Residential	35	37	38	38	77	79	79	81	83	92	82	93	100	108	40	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Others	179	180	180	177	91	89	93	99	104	109	12	12	12	12	68	129	131	114	117	128
Total	613	617	616	623	654	689	724	717	763	823	880	948	1,008	1,095	1,101	1,115	1,129	1,141	1,144	1,162

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Table 5.8.7 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Final Energy Consumption by Type																				
Coal	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Oil	398	398	398	402	559	571	592	596	600	651	686	730	774	839	839	849	862	870	872	889
Gas	72	72	72	74	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Electricity	142	146	145	146	95	117	132	120	162	172	194	218	234	256	262	266	267	270	272	273
Heat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Biomass	0	0	0	0	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	613	617	616	623	654	689	724	717	763	823	880	948	1,008	1,095	1,101	1,115	1,129	1,141	1,144	1,162
Power Generation (GWh)																				
Thermal	1,324	1,328	1,328	1,335	484	703	816	915	1,305	1,035	1,256	1,756	1,954	2,249	2,371	2,278	2,222	2,205	2,144	2,219
Hydro	465	465	465	465	804	871	943	710	869	919	931	931	931	929	895	891	863	863	855	854
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Geothermal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	38	132	227	289	372	372
Solar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wind	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Others	0	0	0	0	0	0	0	0	0	349	186	0	0	0	0	0	0	0	0	0
Total	1,789	1,793	1,793	1,800	1,288	1,574	1,759	1,625	2,174	2,303	2,373	2,687	2,885	3,178	3,304	3,302	3,312	3,357	3,372	3,445
Loss and Own Use of Electricity (GWh)																				
Transmission and Distribution Losses	–	–	–	–	–	–	–	–	–	–	–	–	–	–	157	129	129	128	112	182
Own Use	–	–	–	–	–	–	–	–	–	–	–	–	–	–	104	75	75	78	78	102
Total	–	–	–	–	–	–	–	–	–	–	–	–	–	–	261	205	205	206	190	285
Fuel Input for Power Generation (ktoe)																				
Coal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Oil	345	346	346	348	97	104	94	133	185	184	222	345	396	501	515	474	498	573	552	573
Gas	0	0	0	0	11	83	117	108	141	137	119	137	137	132	107	120	111	108	118	118
Total	345	346	346	348	108	187	211	240	327	321	341	482	533	633	621	594	609	681	670	690
CO_2 Emissions (kt C)																				
Coal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Oil	631	631	631	637	540	556	564	601	654	694	757	902	983	1,130	1,157	1,144	1,166	1,236	1,217	1,257
Gas	46	46	46	47	7	53	75	69	91	88	76	88	88	85	68	155	166	209	216	216
Total	677	677	677	684	547	609	639	670	745	782	833	990	1,071	1,214	1,225	1,299	1,332	1,444	1,434	1,473

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Table 5.8.7 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Macroeconomic Indicators																				
Population (thousand)	4,158	4,262	4,369	4,480	4,595	4,716	4,841	4,970	5,104	5,241	5,379	5,519	5,660	5,803	5,948	6,095	6,245	6,396	6,549	6,703
Urban Population, %	15.0	14.8	14.6	14.5	14.3	14.1	13.9	13.7	13.6	13.4	13.2	13.1	13.0	12.8	12.7	12.6	12.6	12.6	12.5	12.5
GDP (constant 2000 $ million)	2,357	2,582	2,939	3,474	3,681	3,559	3,834	3,685	3,546	3,611	3,521	3,517	3,511	3,587	3,685	3,818	3,916	4,198	4,480	4,726
GDP (current $ million)	3,220	3,787	4,378	4,975	5,503	4,636	5,155	4,937	3,789	3,477	3,521	3,081	3,000	3,536	3,927	4,902	5,599	6,329	8,010	7,915
GDP (constant 2005 PPP $ million)	7,022	7,692	8,758	10,352	10,967	10,604	11,424	10,978	10,564	10,760	10,492	10,479	10,462	10,689	10,980	11,374	11,668	12,508	13,347	14,081
GDP/capita (constant 2000 $)	567	606	673	776	801	755	792	741	695	689	655	637	620	618	620	626	627	656	684	705
GDP/capita (current $)	774	889	1,002	1,110	1,197	983	1,065	993	742	663	655	558	530	609	660	804	897	990	1,223	1,181
GDP – Manufacturing (% of GDP)	7.4	7.8	7.4	6.5	6.6	6.9	7.4	8.1	8.7	7.9	7.2	7.2	6.8	7.0	6.9	7.4	7.5	7.4	7.2	7.1
Car Ownership (car/1,000 persons)	26	26	26	21	22	21	21	19	23	23	23	22	22	21	21	21	20	20	20	19
Basic Energy Indicators																				
TPES/capita (toe/person)	0.21	0.21	0.21	0.20	0.21	0.20	0.20	0.21	0.22	0.20	0.21	0.24	0.25	0.27	0.27	0.30	0.31	0.34	0.33	0.34
TFEC/capita (toe/person)	0.15	0.14	0.14	0.14	0.14	0.15	0.15	0.14	0.15	0.16	0.16	0.17	0.18	0.19	0.19	0.18	0.18	0.18	0.17	0.17
TPES/GDP (toe/constant 2000 $ million)	367	355	305	258	260	259	249	279	318	292	319	369	397	433	438	471	487	512	489	480
TFEC/GDP (toe/constant 2000 $ million)	260	239	210	179	178	194	189	195	215	228	250	270	287	305	299	292	288	272	255	246
Import Dependency (%)	–432.6	–458.1	–503.3	–514.0	–514.7	–431.8	–449.9	–266.9	–259.4	–362.0	–244.3	–152.6	–99.1	–70.0	–45.5	–60.9	–77.9	–22.7	–29.3	–21.1
Oil Import Dependency (%)	–497.6	–522.7	–576.0	–589.7	–628.6	–537.0	–589.1	–327.5	–321.3	–458.4	–302.1	–184.4	–118.1	–81.1	–52.5	–80.2	–107.8	–32.5	–44.0	–31.1
Electricity/capita (kWh/ person)	397	398	386	379	239	290	316	281	369	382	419	459	481	513	513	507	496	492	483	474
CO_2 Intensity (t C/constant 2000 $ million)	287	262	230	197	149	171	167	182	210	217	237	281	305	339	332	340	340	344	320	312
CO_2/capita (t C)	0.16	0.16	0.16	0.15	0.12	0.13	0.13	0.13	0.15	0.15	0.15	0.18	0.19	0.21	0.21	0.21	0.21	0.23	0.22	0.22
CO_2/TPES (t C/toe)	0.78	0.74	0.76	0.76	0.57	0.66	0.67	0.65	0.66	0.74	0.74	0.76	0.77	0.78	0.76	0.72	0.70	0.67	0.65	0.65

– = no data or not applicable, CO_2 = carbon dioxide, GDP = gross domestic product, GWh = gigawatt–hour, kt C = thousand tons of carbon equivalent, ktoe = thousand tons of oil equivalent, kWh = kilowatt–hour, PPP = purchasing power parity, t C = ton of carbon equivalent, TFEC = total final energy consumption, toe = ton of oil equivalent, TPES = total primary energy supply.

Note: Figures may not add up to total because of rounding.

Sources: APERC (APEC Energy Database), APERC estimates, JAMA (2012), and World Bank.

5.9 Samoa

Country Profile (2009)		Energy Reserves (year-end 2008)	
Total Surface Area (square kilometer)	47,088	Coal (million ton) - Recoverable	0.0
Population (thousand)	182	Gas (trillion cubic feet) - Proven	0.0
GDP (billion constant 2000 $)	0.3	Oil (billion barrel) - Proven	0.0
Electrification Rate (%)	95.0		

GDP = gross domestic product.

Sources: ADB (2012), CIA (2012), Ostojic et al. (2011), and World Bank.

2008 Energy Supply and Demand Flow (ktoe)

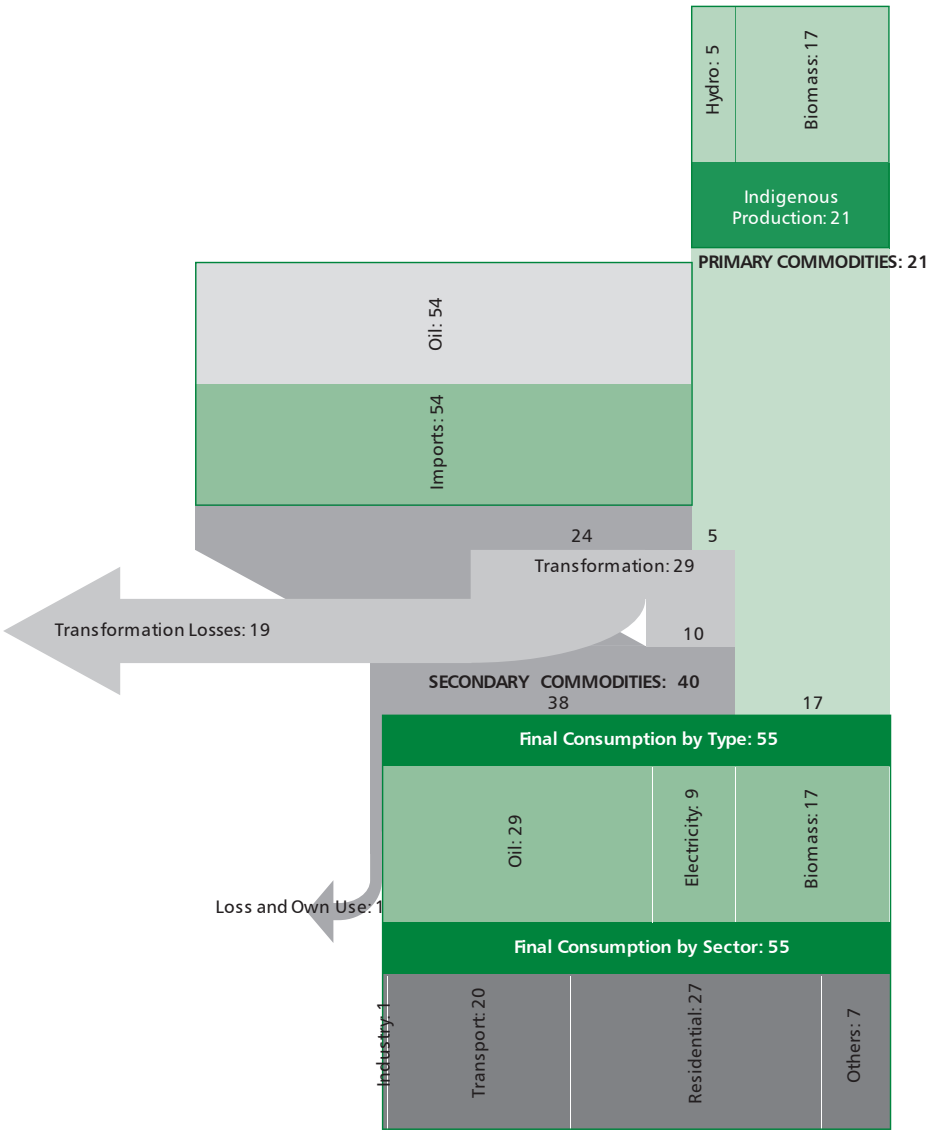


Table 5.9.1 Key Data and Economic Profile

	1990	1995	2000	2005	2008
Socioeconomic Data					
Population (thousand)	161	168	177	180	182
GDP (constant 2000 $ billion)	0.2	0.2	0.2	0.3	0.3
GDP (constant 2005 PPP $ billion)	0.4	0.4	0.5	0.7	0.7
GDP/capita (constant 2000 $)	1,192	1,204	1,391	1,742	1,806
GDP/capita (constant 2005 PPP $)	2,621	2,648	3,059	3,831	3,972

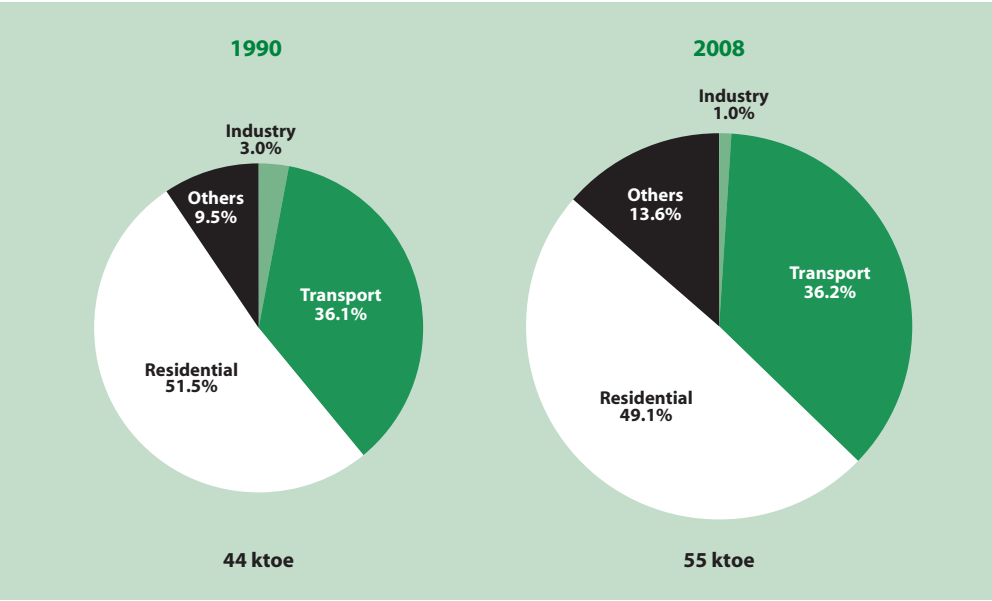
GDP = gross domestic product, PPP = purchasing power parity.
Source: World Bank.

Table 5.9.2 Energy Supply and Demand

	1990	1995	2000	2005	2008
Primary Energy Supply (ktoe)					
Indigenous Production	18	19	21	21	21
Net Imports	42	44	46	53	54
Total PES	61	63	67	74	75
Coal	0	0	0	0	0
Oil	42	44	46	53	54
Gas	0	0	0	0	0
Biomass	17	17	17	17	17
Others	2	2	4	4	5
TPES/capita (toe)	0.38	0.37	0.38	0.41	0.41
TPES/GDP (toe/constant 2005 PPP $ million)	143	141	124	106	104
Final Energy Consumption (ktoe)					
Industry	1	1	0	0	1
Transportation	16	17	17	20	20
Other Sectors	27	28	33	34	35
Total FEC	44	46	49	54	55
Coal	0	0	0	0	0
Oil	23	24	25	29	29
Gas	0	0	0	0	0
Electricity	4	5	8	8	9
Biomass	17	17	17	17	17
Others	0	0	0	0	0

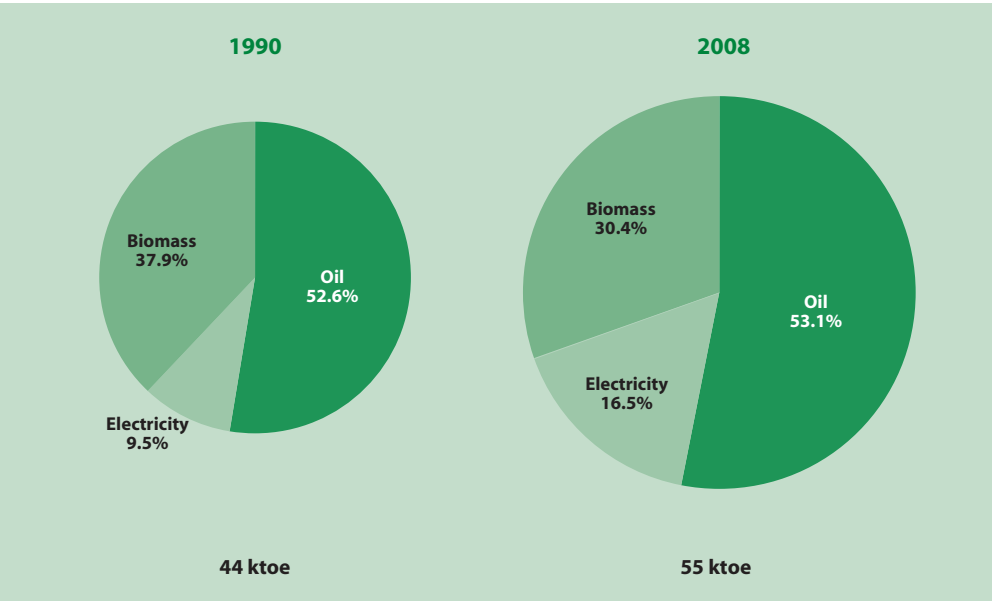
FEC = final energy consumption, GDP = gross domestic product, ktoe = thousand tons of oil equivalent, PES = primary energy supply, PPP = purchasing power parity, toe = ton of oil equivalent, TPES = total primary energy supply.
Source: UNSD (2011a).

Figure 5.9.1 Final Energy Consumption by Sector, 1990 and 2008



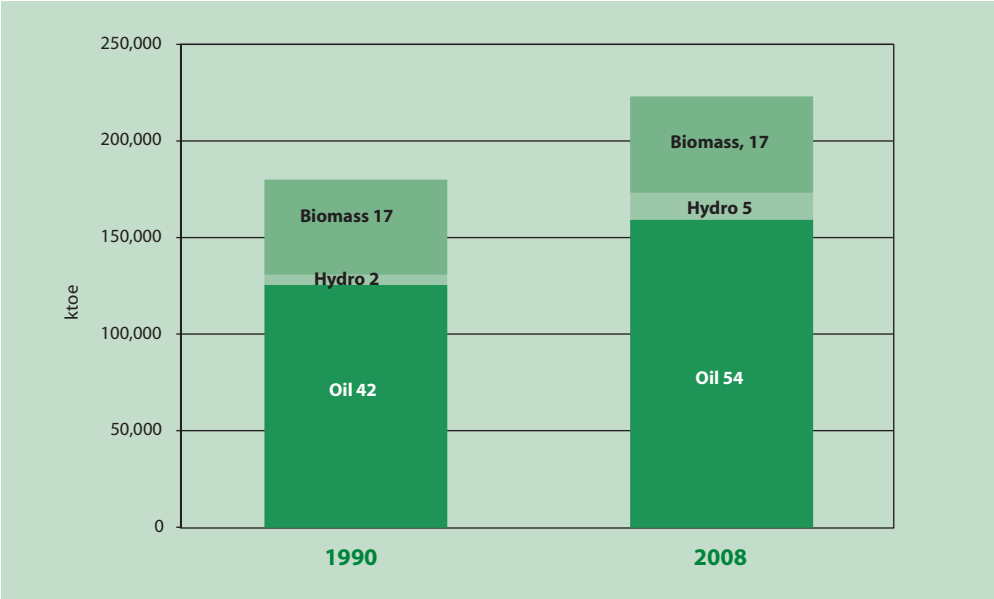
ktoe = thousand tons of oil equivalent.
Source: UNSD (2011a).

Figure 5.9.2 Final Energy Consumption by Type of Energy, 1990 and 2008



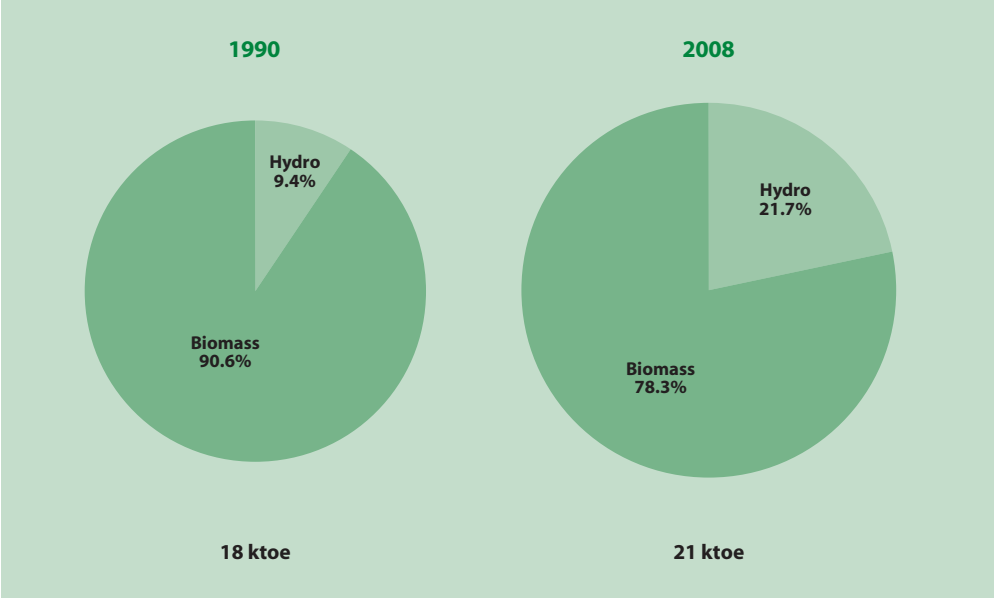
ktoe = thousand tons of oil equivalent.
Source: UNSD (2011a).

Figure 5.9.3 Total Primary Energy Supply, 1990 and 2008



ktoe = thousand tons of oil equivalent.
Source: UNSD (2011a).

Figure 5.9.4 Indigenous Energy Production, 1990 and 2008

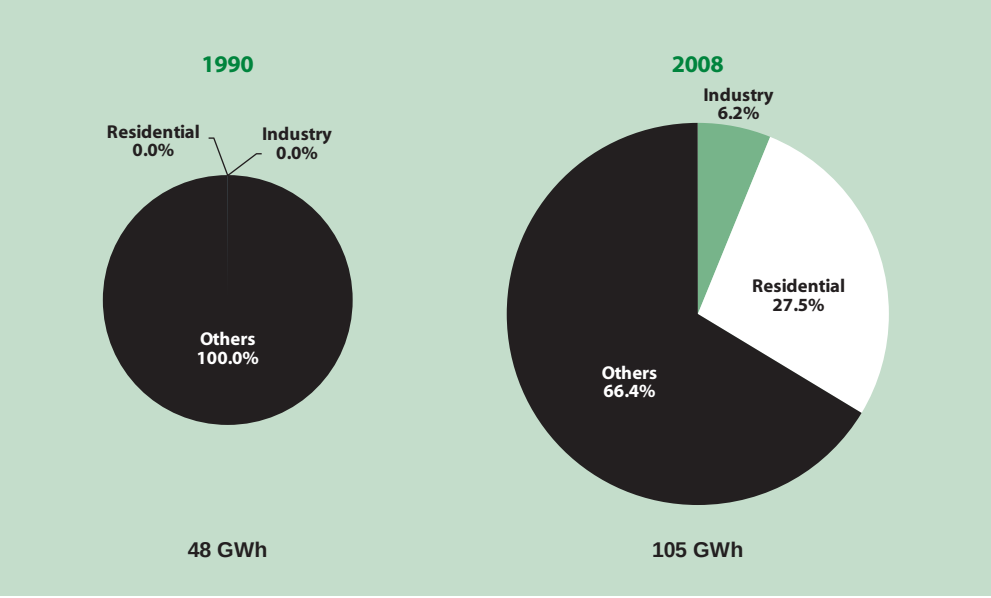


ktoe = thousand tons of oil equivalent.
Source: UNSD (2011a).

Figure 5.9.5 Electricity Generation by Plant Type, 1990 and 2008

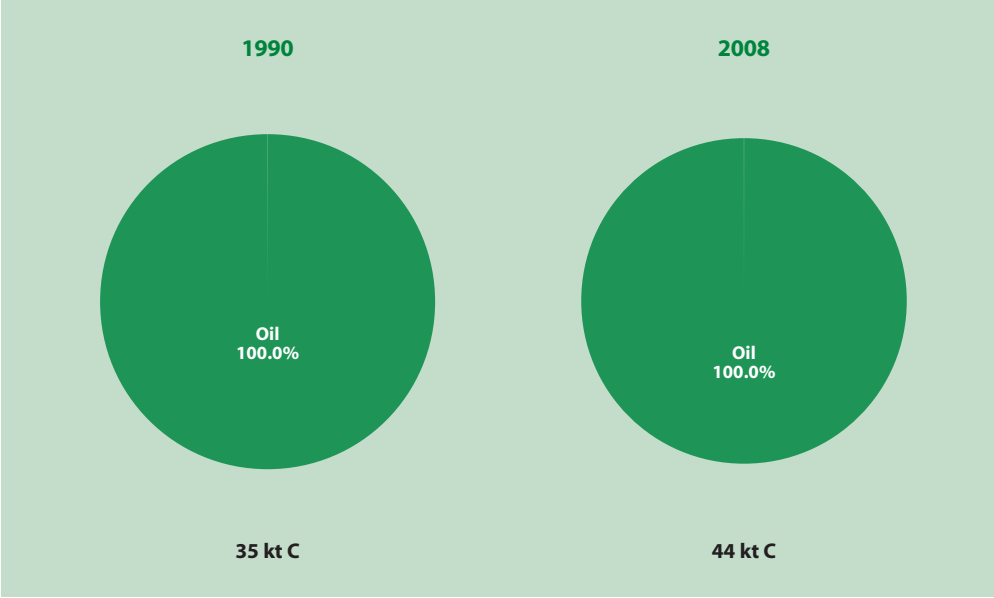
GWh = gigawatt-hour.
Source: UNSD (2011a).

Figure 5.9.6 Electricity Consumption by Sector, 1990 and 2008



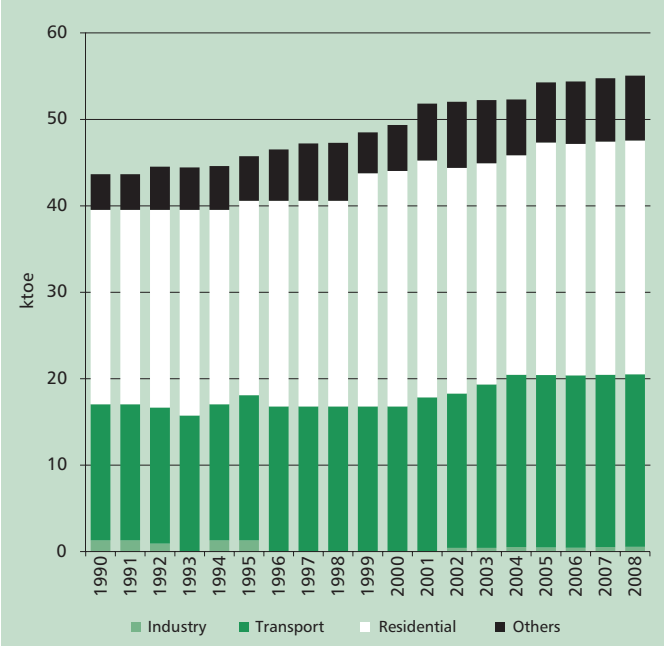
GWh = gigawatt-hour.
Source: UNSD (2011a).

Figure 5.9.7 Carbon Dioxide Emissions from Fuel Combustion, 1990 and 2008



kt C = thousand tons of carbon equivalent.
Source: APERC estimates.

Figure 5.9.8 Final Energy Consumption by Sector, 1990–2008

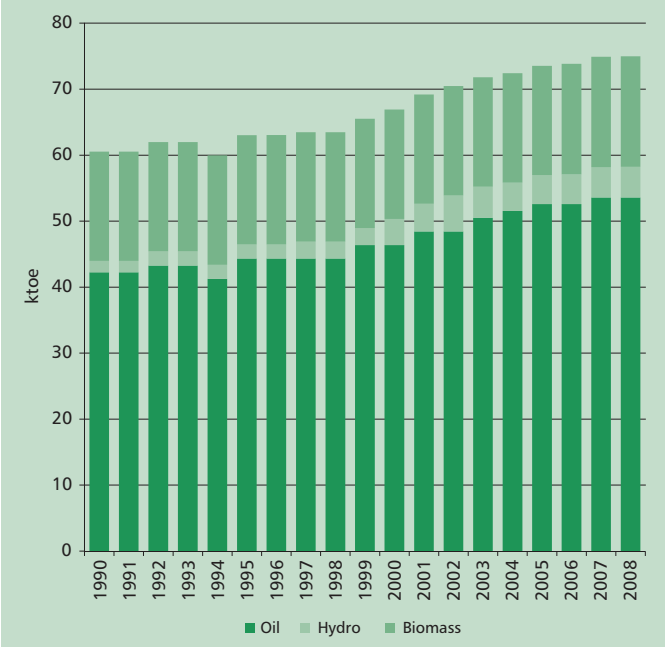


ktoe = thousand tons of oil equivalent.
Source: UNSD (2011a).

Figure 5.9.9 Final Energy Consumption by Type, 1990–2008

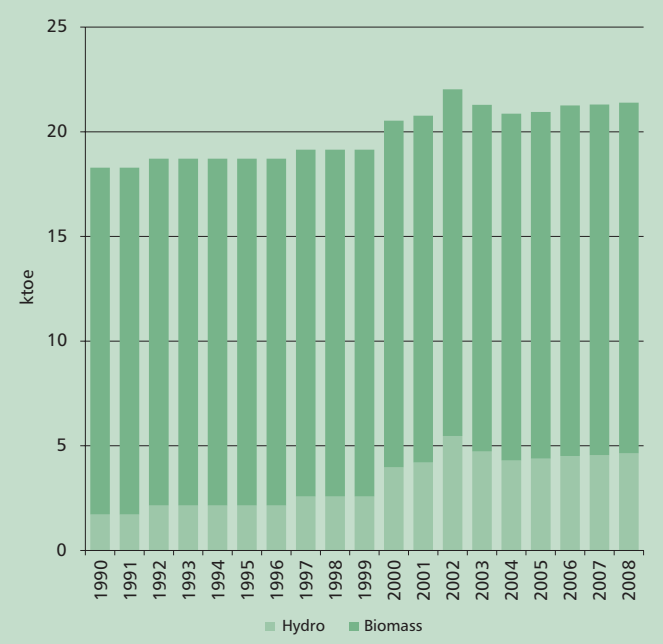
ktoe = thousand tons of oil equivalent.
Source: UNSD (2011a).

Figure 5.9.10 Total Primary Energy Supply, 1990–2008



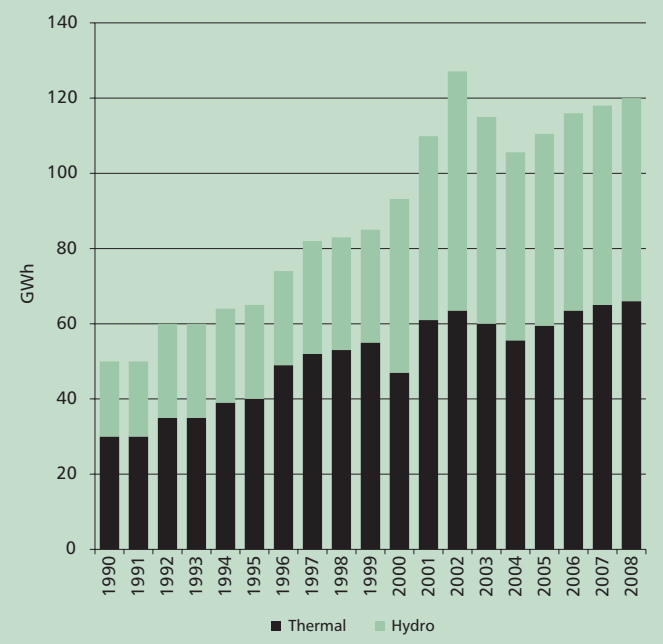
ktoe = thousand tons of oil equivalent.
Source: UNSD (2011a).

Figure 5.9.11 Indigenous Energy Production, 1990–2008



ktoe = thousand tons of oil equivalent.
Source: UNSD (2011a).

Figure 5.9.12 Electricity Generation by Source, 1990–2008

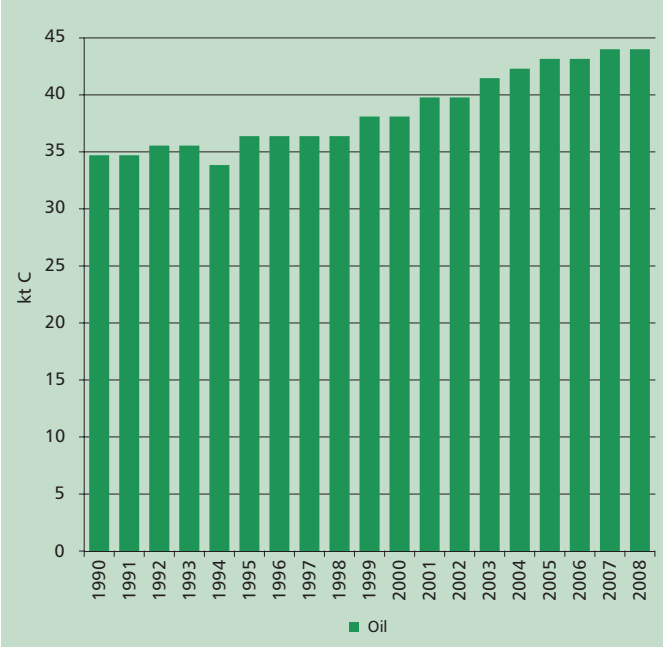


GWh = gigawatt-hour.
Source: UNSD (2011a).

Figure 5.9.13 Fuel Input for Electricity Generation, 1990–2008

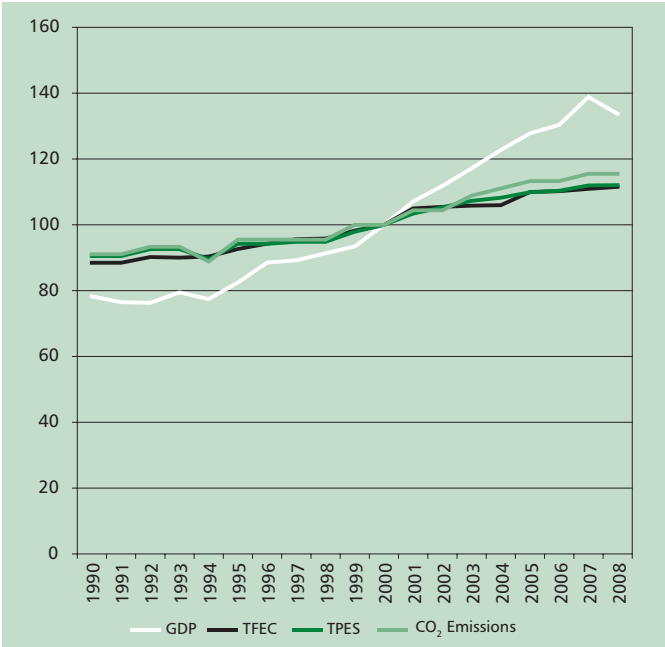
ktoe = thousand tons of oil equivalent.
Sources: APERC estimates, and UNSD (2011a).

Figure 5.9.14 Carbon Dioxide Emissions from Fuel Combustion, 1990–2008



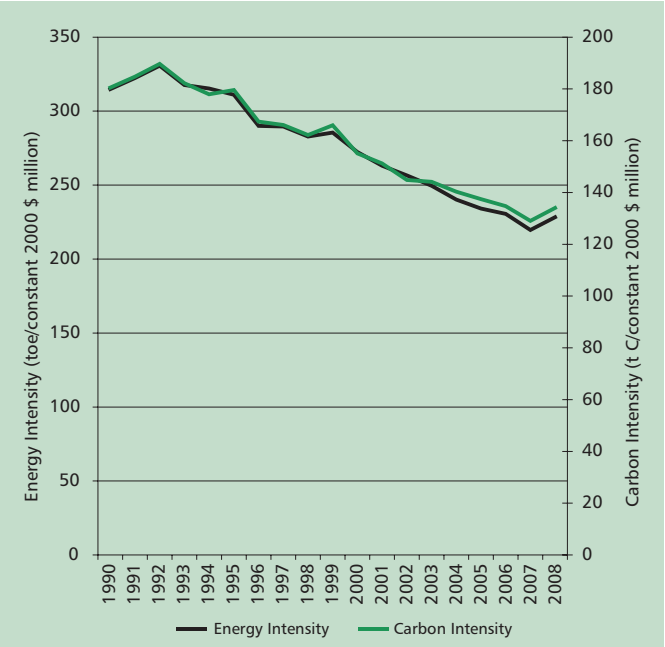
kt C = thousand tons of carbon equivalent.
Source: APERC estimates.

Figure 5.9.15 Growth of GDP, TFEC, TPES, and CO_2 (indexed to year 2000), 1990–2008



CO_2 = carbon dioxide, GDP = gross domestic product, TFEC = total final energy consumption, TPES = total primary energy supply.
Note: Indices are measured relative to the base year 2000 (2000 = 100).
Source: APERC estimates.

Figure 5.9.16 Energy and Carbon Intensities, 1990–2008



t C = ton of carbon equivalent, toe = ton of oil equivalent.
Source: APERC estimates.

Table 5.9.3 Samoa Energy Balance Table, 2005

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	17	0	0	0	21
2.	Imports	0	0	0	53	20	9	23	0	0	0	0	0	0	0	0	0	0	0	0	0	53
3.	Exports	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.	International Bunkers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5.	Stock Changes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6.	Total Primary Energy Supply	0	0	0	53	20	9	23	0	0	0	0	4	0	0	0	0	17	0	0	0	74
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	0	0	0	–23	0	0	–23	0	0	0	0	–4	0	0	0	0	0	0	10	0	–18
8.1	Power Generation	0	0	0	–23	0	0	–23	0	0	0	0	–4	0	0	0	0	0	0	10	0	–18
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–1	0	–1
10.	Discrepancy	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11.	Total Final Energy Consumption	0	0	0	29	20	9	0	0	0	0	0	0	0	0	0	0	17	0	8	0	54
12.	Industry Sector	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13.	Transport Sector	0	0	0	20	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20
14.	Other Sectors	0	0	0	9	0	9	0	0	0	0	0	0	0	0	0	0	17	0	8	0	34
14.1	Residential and Commercial	0	0	0	9	0	9	0	0	0	0	0	0	0	0	0	0	15	0	2	0	27
14.1.1	Commerce and Public Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14.1.2	Residential	0	0	0	9	0	9	0	0	0	0	0	0	0	0	0	0	15	0	2	0	27
14.2	Non-Specified Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	6	0	7
15.	Non-Energy Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16.	Electricity Output (GWh)	0	0	0	60	0	0	60	0	0	0	0	51	0	0	0	0	0	0	0	0	111
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.
Note: Figures may not add up to total because of rounding.
Source: UNSD (2011a).

Table 5.9.4 Samoa Energy Balance Table, 2006

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	17	0	0	0	21
2.	Imports	0	0	0	53	20	9	23	0	0	0	0	0	0	0	0	0	0	0	0	0	53
3.	Exports	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.	International Bunkers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5.	Stock Changes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6.	Total Primary Energy Supply	0	0	0	53	20	9	23	0	0	0	0	5	0	0	0	0	17	0	0	0	74
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	0	0	0	–23	0	0	–23	0	0	0	0	–5	0	0	0	0	0	0	10	0	–18
8.1	Power Generation	0	0	0	–23	0	0	–23	0	0	0	0	–5	0	0	0	0	0	0	10	0	–18
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–2	0	–2
10.	Discrepancy	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11.	Total Final Energy Consumption	0	0	0	29	20	9	0	0	0	0	0	0	0	0	0	0	17	0	8	0	54
12.	Industry Sector	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13.	Transport Sector	0	0	0	20	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20
14.	Other Sectors	0	0	0	9	0	9	0	0	0	0	0	0	0	0	0	0	17	0	8	0	34
14.1	Residential and Commercial	0	0	0	9	0	9	0	0	0	0	0	0	0	0	0	0	15	0	2	0	27
14.1.1	Commerce and Public Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14.1.2	Residential	0	0	0	9	0	9	0	0	0	0	0	0	0	0	0	0	15	0	2	0	27
14.2	Non–Specified Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	6	0	7
15.	Non–Energy Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16.	Electricity Output (GWh)	0	0	0	64	0	0	64	0	0	0	0	53	0	0	0	0	0	0	0	0	116
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Source: UNSD (2011a).

Table 5.9.5 Samoa Energy Balance Table, 2007

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	17	0	0	0	21
2.	Imports	0	0	0	54	20	9	24	0	0	0	0	0	0	0	0	0	0	0	0	0	54
3.	Exports	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.	International Bunkers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5.	Stock Changes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6.	Total Primary Energy Supply	0	0	0	54	20	9	24	0	0	0	0	5	0	0	0	0	17	0	0	0	75
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	0	0	0	–24	0	0	–24	0	0	0	0	–5	0	0	0	0	0	0	10	0	–19
8.1	Power Generation	0	0	0	–24	0	0	–24	0	0	0	0	–5	0	0	0	0	0	0	10	0	–19
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–1	0	–1
10.	Discrepancy	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11.	Total Final Energy Consumption	0	0	0	29	20	9	0	0	0	0	0	0	0	0	0	0	17	0	9	0	55
12.	Industry Sector	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
13.	Transport Sector	0	0	0	20	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20
14.	Other Sectors	0	0	0	9	0	9	0	0	0	0	0	0	0	0	0	0	17	0	8	0	34
14.1	Residential and Commercial	0	0	0	9	0	9	0	0	0	0	0	0	0	0	0	0	15	0	2	0	27
14.1.1	Commerce and Public Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14.1.2	Residential	0	0	0	9	0	9	0	0	0	0	0	0	0	0	0	0	15	0	2	0	27
14.2	Non–Specified Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	6	0	7
15.	Non–Energy Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16.	Electricity Output (GWh)	0	0	0	65	0	0	65	0	0	0	0	53	0	0	0	0	0	0	0	0	118
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.
Note: Figures may not add up to total because of rounding.
Source: UNSD (2011a).

Table 5.9.6 Samoa Energy Balance Table, 2008

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	17	0	0	0	21
2.	Imports	0	0	0	54	20	9	24	0	0	0	0	0	0	0	0	0	0	0	0	0	54
3.	Exports	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.	International Bunkers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5.	Stock Changes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6.	Total Primary Energy Supply	0	0	0	54	20	9	24	0	0	0	0	5	0	0	0	0	17	0	0	0	75
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	0	0	0	–24	0	0	–24	0	0	0	0	–5	0	0	0	0	0	0	10	0	–19
8.1	Power Generation	0	0	0	–24	0	0	–24	0	0	0	0	–5	0	0	0	0	0	0	10	0	–19
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–1	0	–1
10.	Discrepancy	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11.	Total Final Energy Consumption	0	0	0	29	20	9	0	0	0	0	0	0	0	0	0	0	17	0	9	0	55
12.	Industry Sector	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
13.	Transport Sector	0	0	0	20	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20
14.	Other Sectors	0	0	0	9	0	9	0	0	0	0	0	0	0	0	0	0	17	0	9	0	35
14.1	Residential and Commercial	0	0	0	9	0	9	0	0	0	0	0	0	0	0	0	0	15	0	2	0	27
14.1.1	Commerce and Public Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14.1.2	Residential	0	0	0	9	0	9	0	0	0	0	0	0	0	0	0	0	15	0	2	0	27
14.2	Non–Specified Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	6	0	7
15.	Non–Energy Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16.	Electricity Output (GWh)	0	0	0	66	0	0	66	0	0	0	0	54	0	0	0	0	0	0	0	0	120
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Source: UNSD (2011a).

Table 5.9.7 Samoa Summary Table, 1990–2009

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Indigenous Production (ktoe)																				
Coal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Oil	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Gas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Hydro	2	2	2	2	2	2	2	3	3	3	4	4	5	5	4	4	5	5	5	–
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Geothermal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Solar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Wind	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Biomass	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	–
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Total	18	18	19	19	19	19	19	19	19	19	21	21	22	21	21	21	21	21	21	–
Primary Energy Supply (ktoe)																				
Coal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Oil	42	42	43	43	41	44	44	44	44	46	46	48	48	50	52	53	53	54	54	–
Gas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Hydro	2	2	2	2	2	2	2	3	3	3	4	4	5	5	4	4	5	5	5	–
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Geothermal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Solar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Wind	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Biomass	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	–
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Total	61	61	62	62	60	63	63	63	63	66	67	69	70	72	72	74	74	75	75	–
Final Energy Consumption by Sector (ktoe)																				
Industry	1	1	1	0	1	1	0	0	0	0	0	0	0	0	1	0	0	1	1	–
Transport	16	16	16	16	16	17	17	17	17	17	17	18	18	19	20	20	20	20	20	–
Residential	22	22	23	24	22	22	24	24	24	27	27	27	26	26	25	27	27	27	27	–
Commercial	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Others	4	4	5	5	5	5	6	7	7	5	5	7	8	7	6	7	7	7	7	–
Total	44	44	45	44	45	46	47	47	47	48	49	52	52	52	52	54	54	55	55	–

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Table 5.9.7 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Final Energy Consumption by Type (ktoe)																				
Coal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Oil	23	23	23	23	23	24	24	24	24	25	25	26	26	27	28	29	29	29	29	–
Gas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Electricity	4	4	5	5	5	5	6	7	7	7	8	9	9	9	8	8	8	9	9	–
Heat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Biomass	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	–
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Total	44	44	45	44	45	46	47	47	47	48	49	52	52	52	52	54	54	55	55	–
Power Generation (GWh)																				
Thermal	30	30	35	35	39	40	49	52	53	55	47	61	64	60	56	60	64	65	66	–
Hydro	20	20	25	25	25	25	25	30	30	30	46	49	64	55	50	51	53	53	54	–
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Geothermal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Solar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Wind	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Total	50	50	60	60	64	65	74	82	83	85	93	110	127	115	106	111	116	118	120	–
Loss and Own Use of Electricity (GWh)																				
Transmission and Distribution Losses	2	2	2	3	5	5	5	5	5	5	3	3	19	16	18	12	18	16	14	–
Own Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Total	2	2	2	3	5	5	5	5	5	5	3	3	19	16	18	12	18	16	14	–
Fuel Input for Power Generation (ktoe)																				
Coal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Oil	19	19	20	20	18	20	20	20	20	21	21	22	22	23	23	23	23	24	24	–
Gas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Total	19	19	20	20	18	20	20	20	20	21	21	22	22	23	23	23	23	24	24	–
CO_2 Emissions (kt C)																				
Coal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Oil	35	35	36	36	34	36	36	36	36	38	38	40	40	41	42	43	43	44	44	–
Gas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Total	35	35	36	36	34	36	36	36	36	38	38	40	40	41	42	43	43	44	44	–

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Table 5.9.7 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Macroeconomic Indicators																				
Population (thousand)	161	163	164	165	167	168	170	172	174	175	177	178	178	179	180	180	181	181	182	182
Urban Population, %	21.2	21.3	21.3	21.4	21.4	21.5	21.6	21.7	21.7	21.8	21.9	22.0	22.1	22.2	22.3	22.4	22.6	22.8	23.0	23.2
GDP (constant 2000 $ million)	192	188	187	195	190	203	217	219	224	229	246	263	275	288	302	314	320	341	328	323
GDP (current $ million)	112	112	118	119	197	200	223	254	240	231	246	243	257	302	375	412	453	530	568	525
GDP (constant 2005 PPP $ million)	423	413	412	429	418	446	478	482	493	505	540	578	604	633	663	691	704	750	722	710
GDP/capita (constant 2000 $)	1,192	1,156	1,144	1,181	1,141	1,204	1,279	1,276	1,293	1,310	1,391	1,481	1,539	1,606	1,678	1,742	1,772	1,881	1,806	1,769
GDP/capita (current $)	695	689	720	718	1,182	1,191	1,310	1,481	1,384	1,317	1,391	1,370	1,438	1,685	2,084	2,287	2,506	2,925	3,126	2,880
GDP – Manufacturing (% of GDP)	18.9	19.2	18.9	18.6	19.9	18.2	17.8	16.6	14.1	14.5	14.8	16.1	15.9	16.3	14.8	14.8	12.4	13.5	11.4	9.3
Car Ownership (car/1,000 persons)	–	–	–	–	–	–	–	–	–	–	–	–	–	41	43	48	51	55	59	60
Basic Energy Indicators																				
TPES/capita (toe/person)	0.38	0.37	0.38	0.38	0.36	0.37	0.37	0.37	0.37	0.37	0.38	0.39	0.39	0.40	0.40	0.41	0.41	0.41	0.41	–
TFEC/capita (toe/person)	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.28	0.28	0.29	0.29	0.29	0.29	0.30	0.30	0.30	0.30	–
TPES/GDP (toe/constant 2000 $ million)	315	322	331	318	315	311	290	290	283	285	272	263	257	250	240	234	231	220	228	–
TFEC/GDP (toe/constant 2000 $ million)	227	232	238	228	235	226	214	215	211	211	201	197	189	182	173	173	170	161	168	–
Import Dependency (%)	69.8	69.8	69.8	69.8	68.8	70.3	70.3	69.8	69.8	70.8	69.3	70.0	68.7	70.3	71.2	71.5	71.2	71.6	71.5	–
Oil Import Dependency (%)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	–
Electricity/capita (kWh/ person)	298	295	354	345	354	357	406	448	449	457	510	600	611	553	487	548	541	563	580	–
CO_2 Intensity (t C/constant 2000 $ million)	180	185	190	182	178	180	167	166	162	166	155	151	145	144	140	137	135	129	134	–
CO_2/capita (t C)	0.22	0.21	0.22	0.22	0.20	0.22	0.21	0.21	0.21	0.22	0.22	0.22	0.22	0.23	0.24	0.24	0.24	0.24	0.24	–
CO_2/TPES (t C/toe)	0.57	0.57	0.57	0.57	0.56	0.58	0.58	0.57	0.57	0.58	0.57	0.57	0.56	0.58	0.58	0.59	0.58	0.59	0.59	–

– = no data or not applicable, CO_2 = carbon dioxide, GDP = gross domestic product, GWh = gigawatt–hour, kt C = thousand tons of carbon equivalent, ktoe = thousand tons of oil equivalent, kWh = kilowatt–hour, PPP = purchasing power parity, t C = ton of carbon equivalent, TFEC = total final energy consumption, toe = ton of oil equivalent, TPES = total primary energy supply.

Note: Figures may not add up to total because of rounding.

Sources: APERC estimates, JAMA (2012), UNSD (2011a), and World Bank.

5.10 Solomon Islands

Country Profile (2009)		Energy Reserves (year-end 2008)	
Total Surface Area (square kilometer)	47,088	Coal (million ton) - Recoverable	0.0
Population (thousand)	524	Gas (trillion cubic feet) - Proven	0.0
GDP (billion constant 2000 $)	0.6	Oil (billion barrel) - Proven	0.0
Electrification Rate (%)	12.0		

GDP = gross domestic product.

Sources: ADB (2012), CIA (2012), GenderCC of the UNFCCC (2010), and World Bank.

2008 Energy Supply and Demand Flow (ktoe)

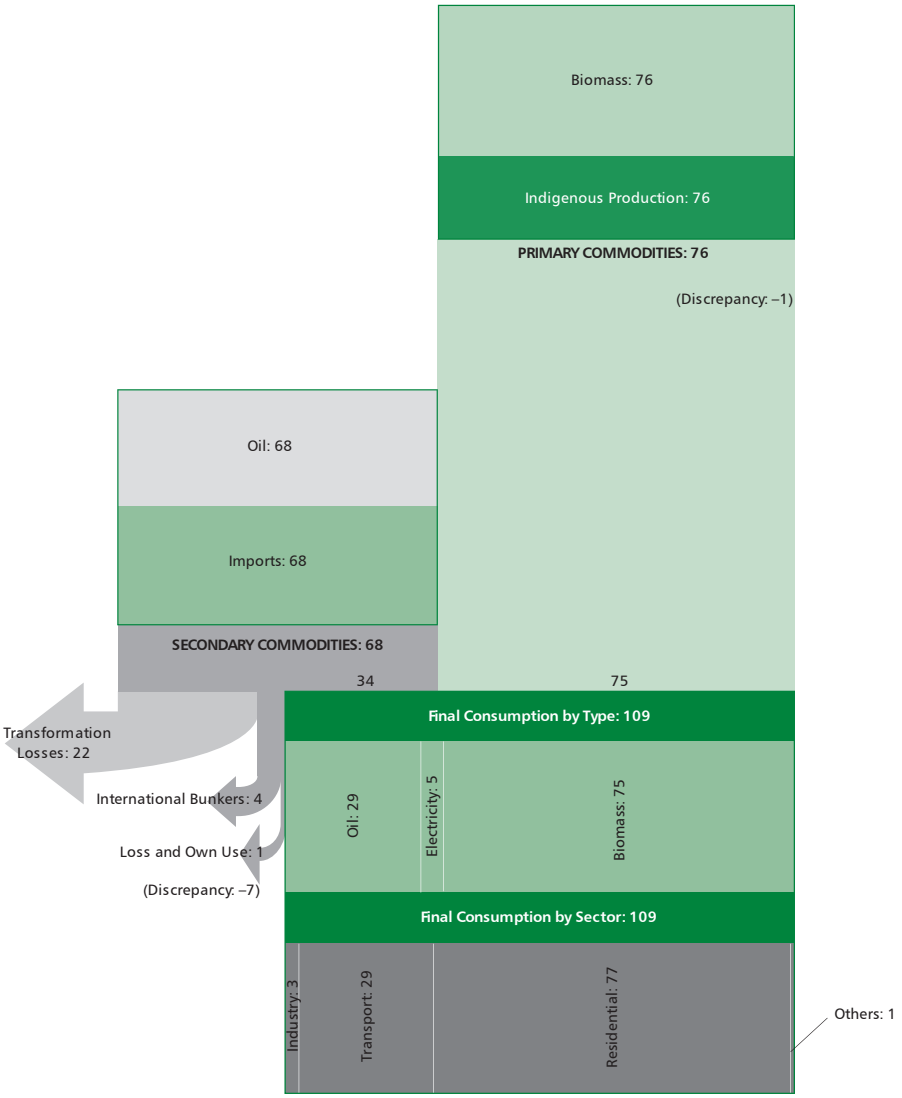


Table 5.10.1 Key Data and Economic Profile

	1990	1995	2000	2005	2008
Socioeconomic Data					
Population (thousand)	310	356	409	470	510
GDP (constant 2000 $ billion)	0.3	0.5	0.4	0.5	0.6
GDP (constant 2005 PPP $ billion)	0.7	1.1	0.9	1.0	1.2
GDP/capita (constant 2000 $)	1,101	1,404	1,065	976	1,141
GDP/capita (constant 2005 PPP $)	2,340	2,983	2,262	2,073	2,425

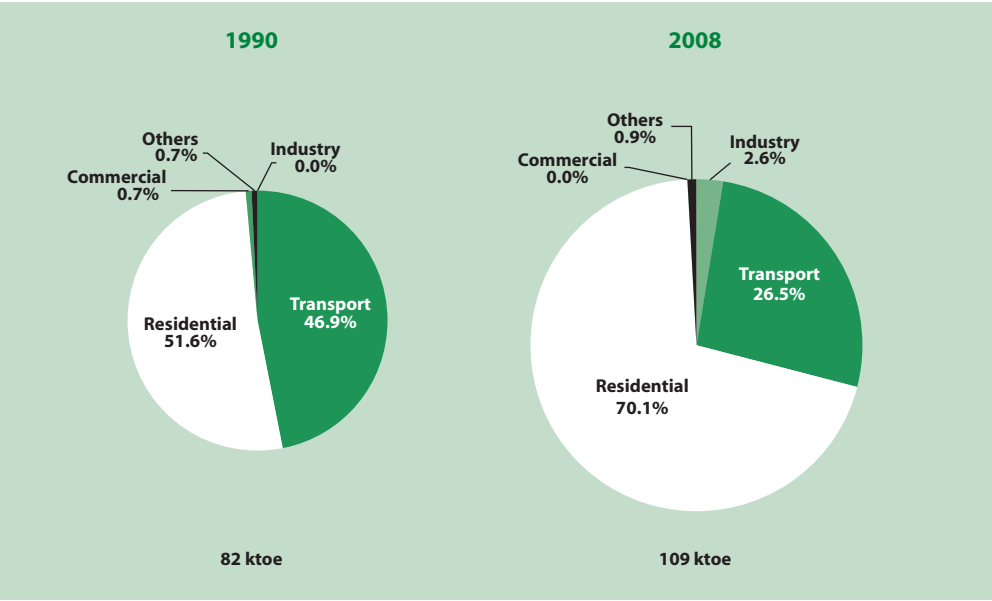
GDP = gross domestic product, PPP = purchasing power parity.
Source: World Bank.

Table 5.10.2 Energy Supply and Demand

	1990	1995	2000	2005	2008
Primary Energy Supply (ktoe)					
Indigenous Production	75	77	79	79	76
Net Imports	54	54	55	59	64
Total PES	130	131	134	138	141
Coal	0	0	0	0	0
Oil	54	54	55	59	64
Gas	0	0	0	0	0
Biomass	75	77	79	79	76
Others	0	0	0	0	0
TPES/capita (toe)	0.42	0.37	0.33	0.29	0.28
TPES/GDP (toe/constant 2005 PPP $ million)	179	123	145	142	114
Final Energy Consumption (ktoe)					
Industry	0	0	0	3	3
Transportation	39	38	30	30	29
Other Sectors	44	40	78	80	78
Total FEC	82	78	108	112	109
Coal	0	0	0	0	0
Oil	42	38	30	30	29
Gas	0	0	0	0	0
Electricity	2	0	0	5	5
Biomass	39	40	78	78	75
Others	0	0	0	0	0

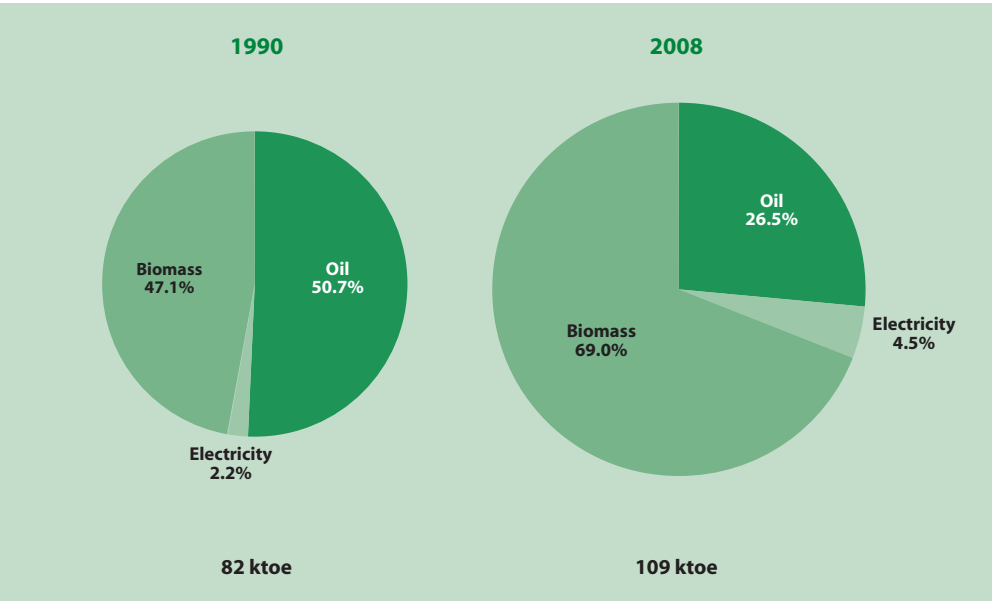
FEC = final energy consumption, GDP = gross domestic product, ktoe = thousand tons of oil equivalent, PES = primary energy supply, PPP = purchasing power parity, toe = ton of oil equivalent, TPES = total primary energy supply.
Source: UNSD (2011a).

Figure 5.10.1 Final Energy Consumption by Sector, 1990 and 2008



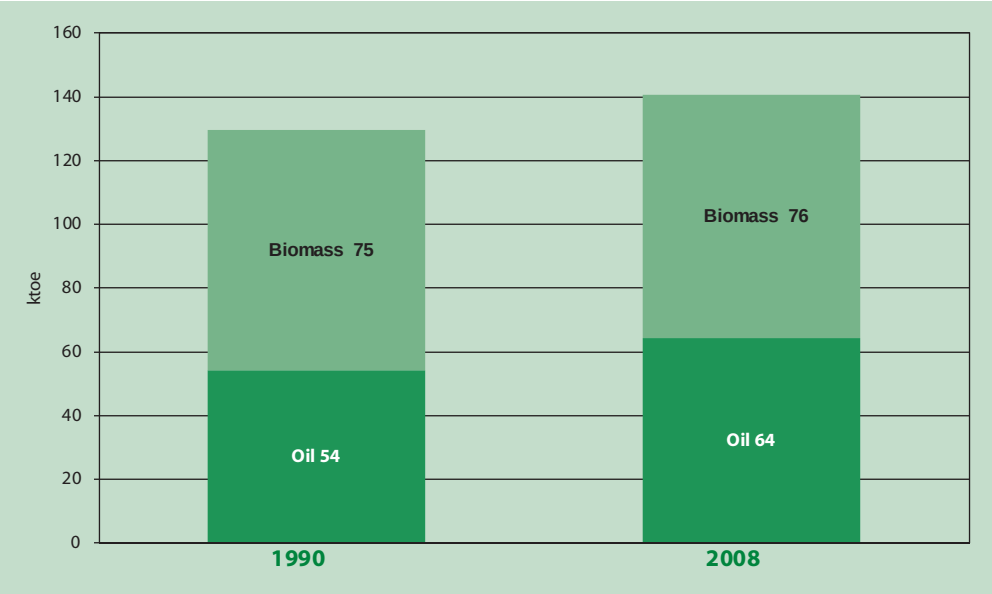
ktoe = thousand tons of oil equivalent.
Source: UNSD (2011a).

Figure 5.10.2 Final Energy Consumption by Type of Energy, 1990 and 2008



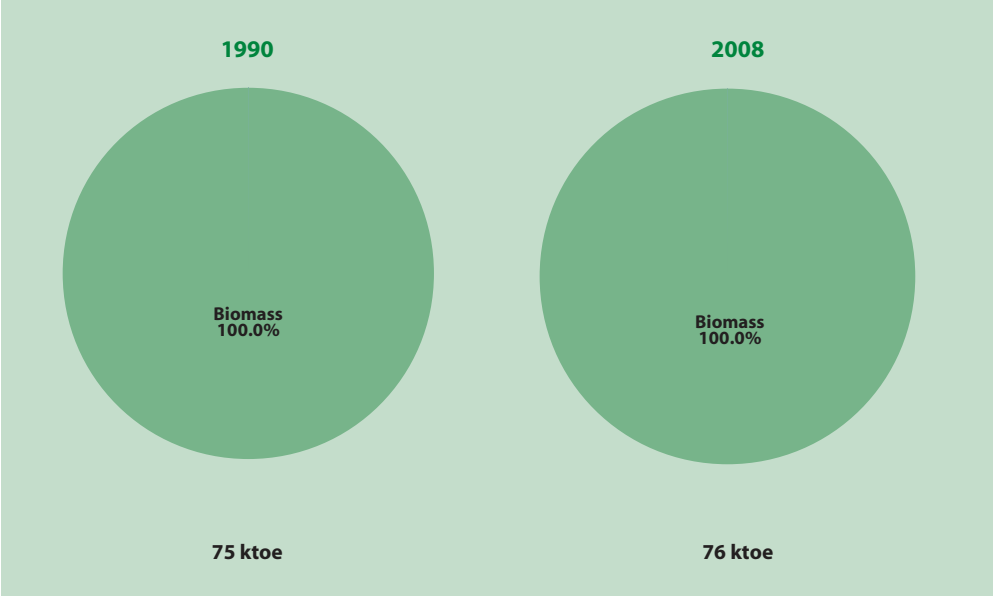
ktoe = thousand tons of oil equivalent.
Source: UNSD (2011a).

Figure 5.10.3 Total Primary Energy Supply, 1990 and 2008



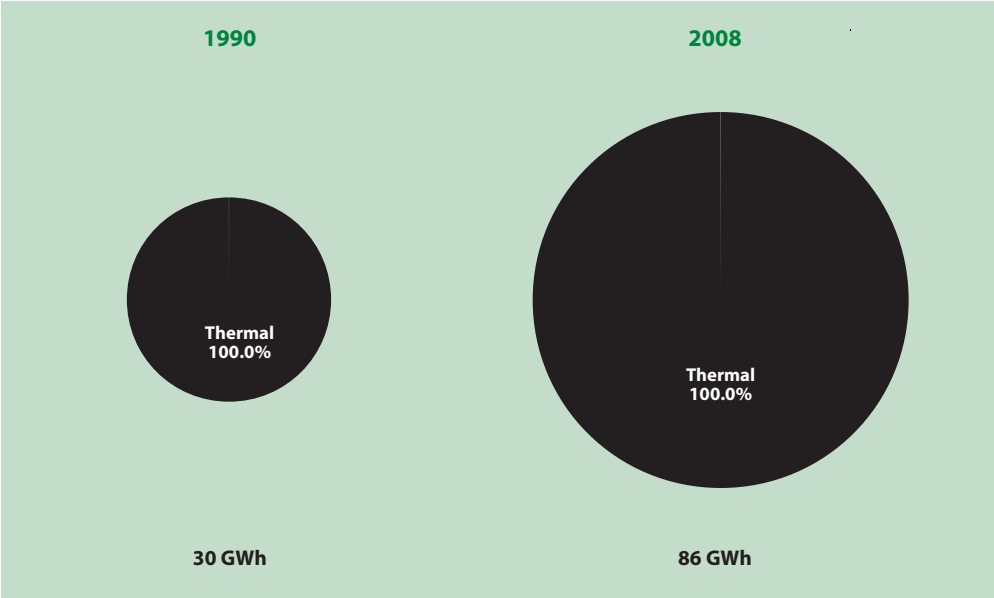
ktoe = thousand tons of oil equivalent.
Source: UNSD (2011a).

Figure 5.10.4 Indigenous Energy Production, 1990 and 2008



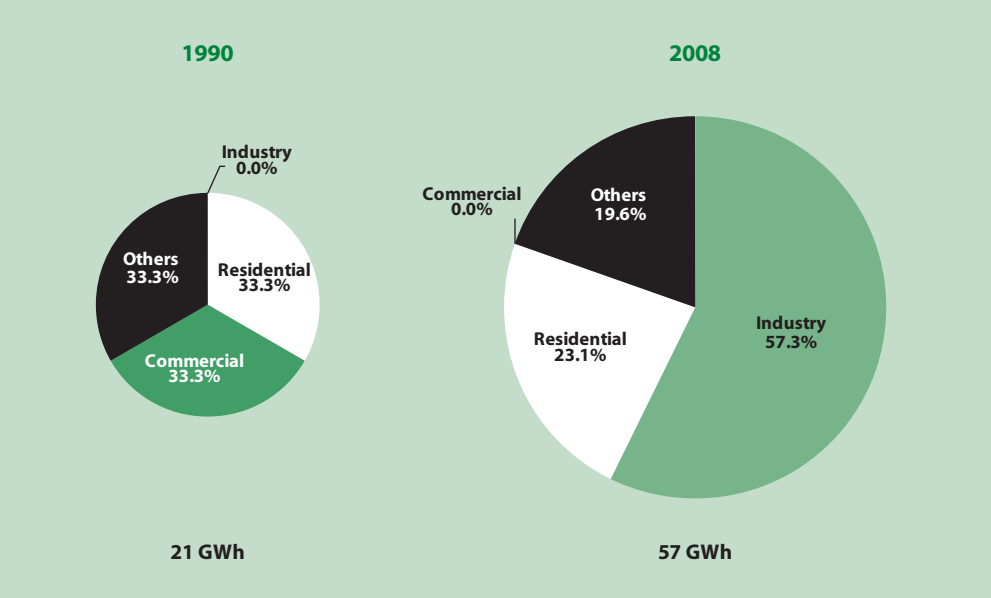
ktoe = thousand tons of oil equivalent.
Source: UNSD (2011a).

Figure 5.10.5 Electricity Generation by Plant Type, 1990 and 2008



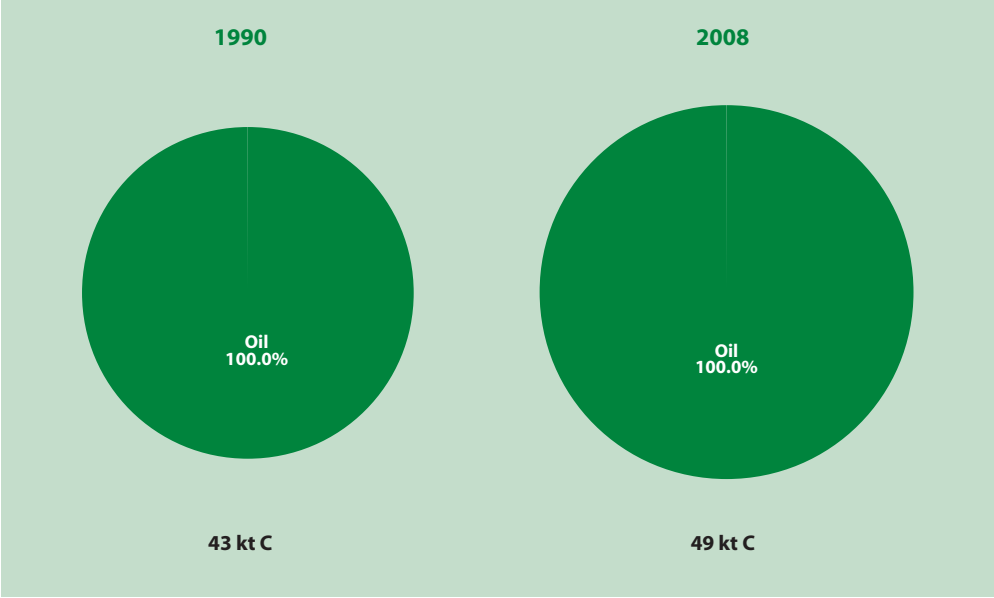
GWh = gigawatt-hour.
Source: UNSD (2011a).

Figure 5.10.6 Electricity Consumption by Sector, 1990 and 2008



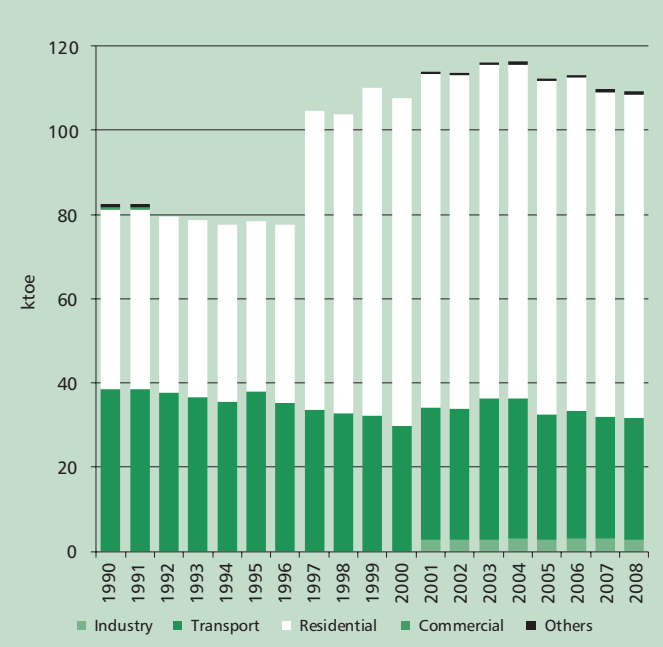
GWh = gigawatt-hour.
Source: UNSD (2011a).

Figure 5.10.7 Carbon Dioxide Emissions from Fuel Combustion, 1990 and 2008



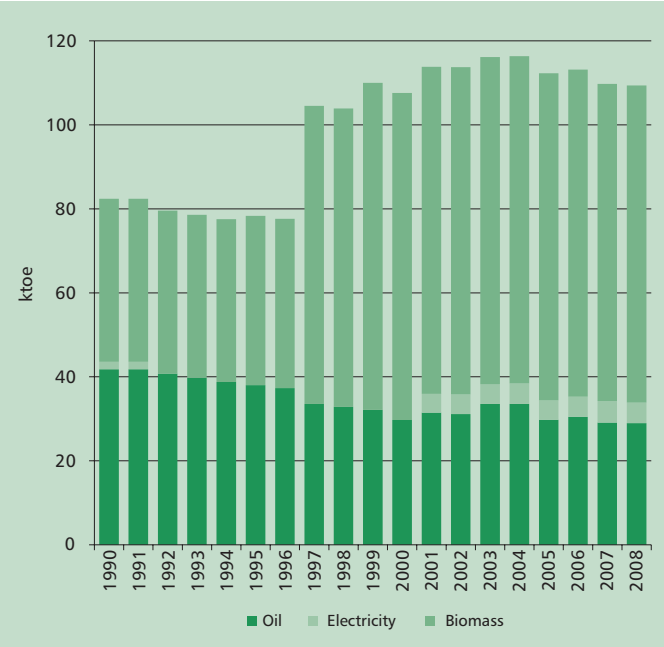
kt C = thousand tons of carbon equivalent.
Source: APERC estimates.

Figure 5.10.8 Final Energy Consumption by Sector, 1990–2008



ktoe = thousand tons of oil equivalent.
Source: UNSD (2011a).

Figure 5.10.9 Final Energy Consumption by Type, 1990–2008

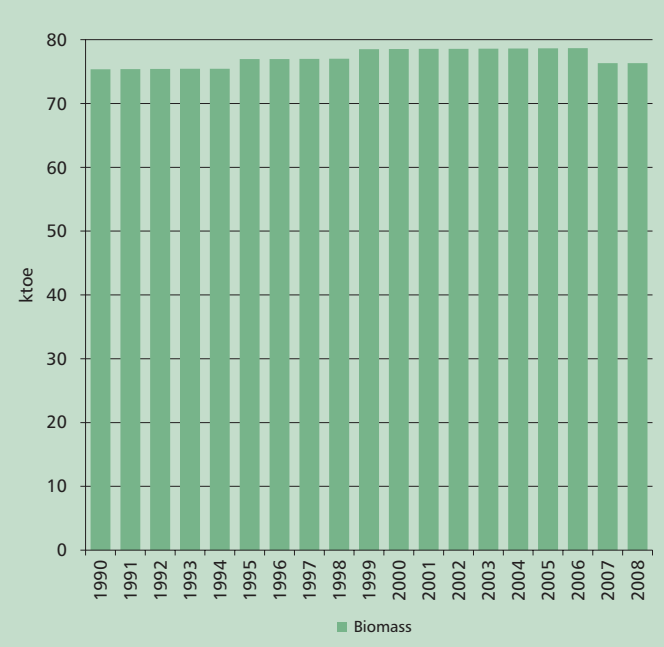


ktoe = thousand tons of oil equivalent.
Note: Although there was production of electric energy in Solomon Islands from 1992 to 2000, final consumption of electricity is reported as zero for the period.
Source: UNSD (2011a).

Figure 5.10.10 Total Primary Energy Supply, 1990–2008

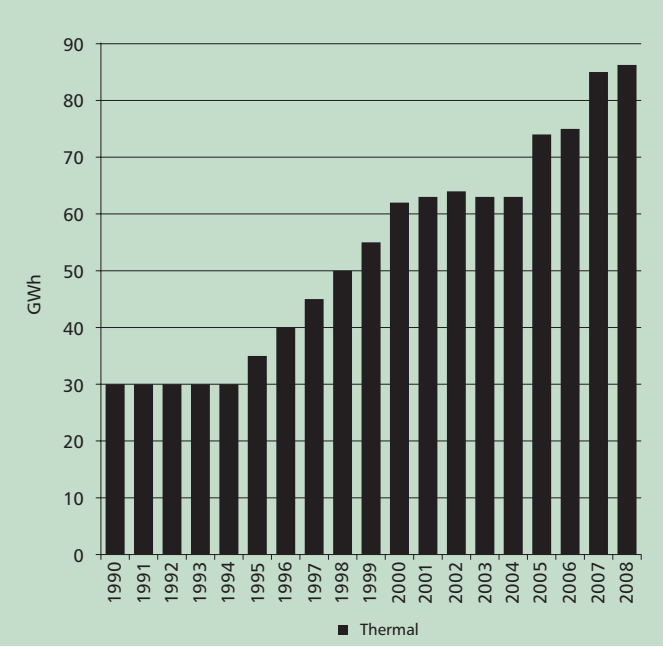
ktoe = thousand tons of oil equivalent.
Source: UNSD (2011a).

Figure 5.10.11 Indigenous Energy Production, 1990–2008



ktoe = thousand tons of oil equivalent.
Source: UNSD (2011a).

Figure 5.10.12 Electricity Generation by Source, 1990–2008



GWh = gigawatt-hour.
Source: UNSD (2011a).

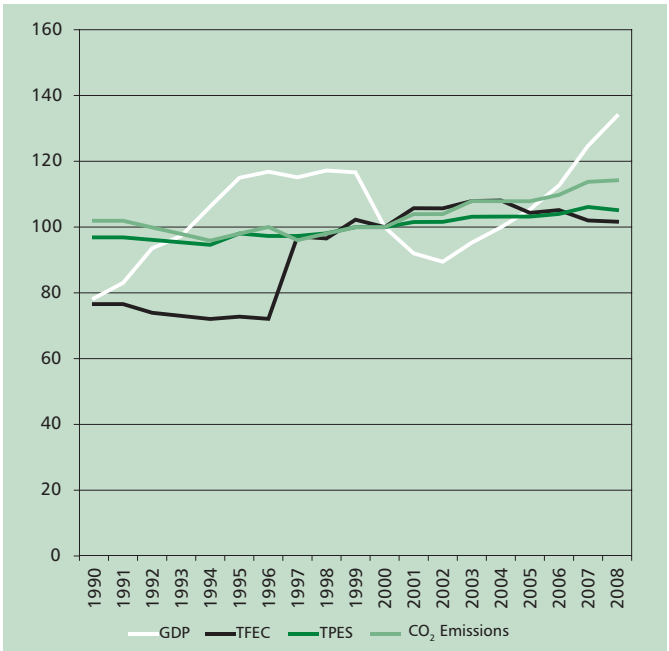
Figure 5.10.13 Fuel Input for Electricity Generation, 1990–2008

ktoe = thousand tons of oil equivalent.
Sources: APERC estimates, and UNSD (2011a).

Figure 5.10.14 Carbon Dioxide Emissions from Fuel Combustion, 1990–2008

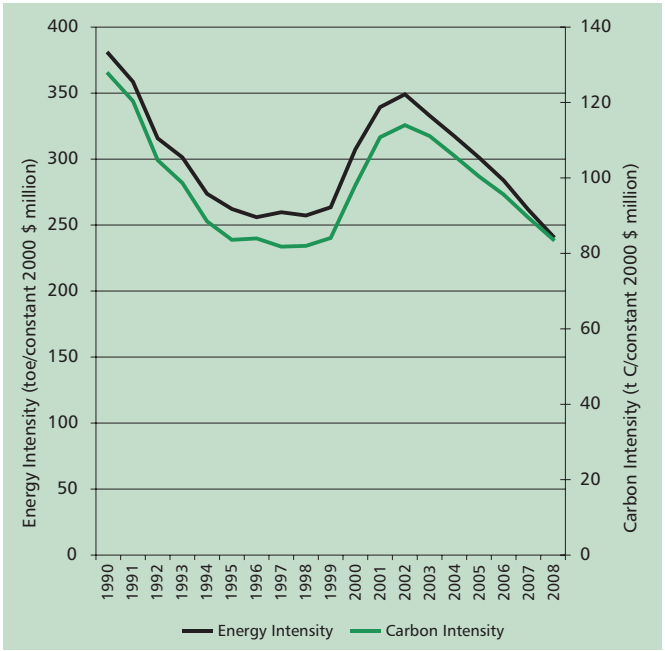
kt C = thousand tons of carbon equivalent.
Source: APERC estimates.

Figure 5.10.15 Growth of GDP, TFEC, TPES, and CO_2 (indexed to year 2000), 1990–2008



CO_2 = carbon dioxide, GDP = gross domestic product, TFEC = total final energy consumption, TPES = total primary energy supply.
Note: Indices are measured relative to the base year 2000 (2000 = 100).
Source: APERC estimates.

Figure 5.10.16 Energy and Carbon Intensities, 1990–2008



t C = ton of carbon equivalent, toe = ton of oil equivalent.
Source: APERC estimates.

Table 5.10.3 Solomon Islands Energy Balance Table, 2005

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	79	0	0	0	79
2.	Imports	0	0	0	63	14	2	43	0	1	3	0	0	0	0	0	0	0	0	0	0	63
3.	Exports	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.	International Bunkers	0	0	0	–3	–1	0	0	0	0	–2	0	0	0	0	0	0	0	0	0	0	–3
5.	Stock Changes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6.	Total Primary Energy Supply	0	0	0	59	13	2	43	0	1	1	0	0	0	0	0	0	79	0	0	0	138
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	0	0	0	–25	0	0	–25	0	0	0	0	0	0	0	0	0	0	0	6	0	–19
8.1	Power Generation	0	0	0	–25	0	0	–25	0	0	0	0	0	0	0	0	0	0	0	6	0	–19
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–1	0	–1
10.	Discrepancy	0	0	0	–4	0	–2	0	0	–1	–1	0	0	0	0	0	0	–1	0	–1	0	–6
11.	Total Final Energy Consumption	0	0	0	30	13	0	17	0	0	0	0	0	0	0	0	0	78	0	5	0	112
12.	Industry Sector	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3
13.	Transport Sector	0	0	0	30	13	0	17	0	0	0	0	0	0	0	0	0	0	0	0	0	30
14.	Other Sectors	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	78	0	2	0	80
14.1	Residential and Commercial	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	78	0	1	0	79
14.1.1	Commerce and Public Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14.1.2	Residential	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	78	0	1	0	79
14.2	Non-Specified Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
15.	Non-Energy Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16.	Electricity Output (GWh)	0	0	0	74	0	0	74	0	0	0	0	0	0	0	0	0	0	0	0	0	74
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.
Note: Figures may not add up to total because of rounding.
Source: UNSD (2011a).

Table 5.10.4 Solomon Islands Energy Balance Table, 2006

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	79	0	0	0	79
2.	Imports	0	0	0	64	15	2	43	0	1	3	0	0	0	0	0	0	0	0	0	0	64
3.	Exports	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.	International Bunkers	0	0	0	–3	–1	0	0	0	0	–2	0	0	0	0	0	0	0	0	0	0	–3
5.	Stock Changes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6.	Total Primary Energy Supply	0	0	0	60	14	2	43	0	1	1	0	0	0	0	0	0	79	0	0	0	139
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	0	0	0	–26	0	0	–26	0	0	0	0	0	0	0	0	0	0	0	6	0	–19
8.1	Power Generation	0	0	0	–26	0	0	–26	0	0	0	0	0	0	0	0	0	0	0	6	0	–19
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–1	0	–1
10.	Discrepancy	0	0	0	–4	0	–2	0	0	–1	–1	0	0	0	0	0	0	–1	0	–1	0	–6
11.	Total Final Energy Consumption	0	0	0	30	14	0	17	0	0	0	0	0	0	0	0	0	78	0	5	0	113
12.	Industry Sector	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3
13.	Transport Sector	0	0	0	30	14	0	17	0	0	0	0	0	0	0	0	0	0	0	0	0	30
14.	Other Sectors	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	78	0	2	0	80
14.1	Residential and Commercial	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	78	0	1	0	79
14.1.1	Commerce and Public Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14.1.2	Residential	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	78	0	1	0	79
14.2	Non-Specified Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
15.	Non-Energy Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16.	Electricity Output (GWh)	0	0	0	75	0	0	75	0	0	0	0	0	0	0	0	0	0	0	0	0	75
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Source: UNSD (2011a).

Table 5.10.5 Solomon Islands Energy Balance Table, 2007

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	76	0	0	0	76
2.	Imports	0	0	0	71	17	3	44	0	2	5	0	0	0	0	0	0	0	0	0	0	71
3.	Exports	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.	International Bunkers	0	0	0	–5	–2	0	0	0	0	–3	0	0	0	0	0	0	0	0	0	0	–5
5.	Stock Changes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6.	Total Primary Energy Supply	0	0	0	66	15	3	44	0	2	2	0	0	0	0	0	0	76	0	0	0	142
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	0	0	0	–29	0	0	–29	0	0	0	0	0	0	0	0	0	0	0	7	0	–22
8.1	Power Generation	0	0	0	–29	0	0	–29	0	0	0	0	0	0	0	0	0	0	0	7	0	–22
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–1	0	–1
10.	Discrepancy	0	0	0	–7	0	–3	0	0	–2	–2	0	0	0	0	0	0	–1	0	–1	0	–9
11.	Total Final Energy Consumption	0	0	0	29	15	0	14	0	0	0	0	0	0	0	0	0	76	0	5	0	110
12.	Industry Sector	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3
13.	Transport Sector	0	0	0	29	15	0	14	0	0	0	0	0	0	0	0	0	0	0	0	0	29
14.	Other Sectors	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	76	0	2	0	78
14.1	Residential and Commercial	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	76	0	1	0	77
14.1.1	Commerce and Public Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14.1.2	Residential	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	76	0	1	0	77
14.2	Non-Specified Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
15.	Non-Energy Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16.	Electricity Output (GWh)	0	0	0	85	0	0	85	0	0	0	0	0	0	0	0	0	0	0	0	0	85
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Source: UNSD (2011a).

Table 5.10.6 Solomon Islands Energy Balance Table, 2008

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	76	0	0	0	76
2.	Imports	0	0	0	68	17	3	43	0	2	4	0	0	0	0	0	0	0	0	0	0	68
3.	Exports	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.	International Bunkers	0	0	0	–4	–2	0	0	0	0	–3	0	0	0	0	0	0	0	0	0	0	–4
5.	Stock Changes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6.	Total Primary Energy Supply	0	0	0	64	15	3	43	0	2	2	0	0	0	0	0	0	76	0	0	0	141
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	0	0	0	–30	0	0	–30	0	0	0	0	0	0	0	0	0	0	0	7	0	–22
8.1	Power Generation	0	0	0	–30	0	0	–30	0	0	0	0	0	0	0	0	0	0	0	7	0	–22
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–1	0	–1
10.	Discrepancy	0	0	0	–6	0	–3	0	0	–2	–2	0	0	0	0	0	0	–1	0	–2	0	–8
11.	Total Final Energy Consumption	0	0	0	29	15	0	14	0	0	0	0	0	0	0	0	0	75	0	5	0	109
12.	Industry Sector	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3
13.	Transport Sector	0	0	0	29	15	0	14	0	0	0	0	0	0	0	0	0	0	0	0	0	29
14.	Other Sectors	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	75	0	2	0	78
14.1	Residential and Commercial	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	75	0	1	0	77
14.1.1	Commerce and Public Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14.1.2	Residential	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	75	0	1	0	77
14.2	Non–Specified Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
15.	Non–Energy Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16.	Electricity Output (GWh)	0	0	0	86	0	0	86	0	0	0	0	0	0	0	0	0	0	0	0	0	86
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Source: UNSD (2011a).

Table 5.10.7 Solomon Islands Summary Table, 1990–2009

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Indigenous Production (ktoe)																				
Coal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Oil	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Gas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Hydro	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Geothermal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Solar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Wind	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Biomass	75	75	75	75	75	77	77	77	77	79	79	79	79	79	79	79	79	76	76	–
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Total	75	75	75	75	75	77	77	77	77	79	79	79	79	79	79	79	79	76	76	–
Primary Energy Supply (ktoe)																				
Coal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Oil	54	54	53	52	51	54	53	53	54	55	55	57	57	59	59	59	60	66	64	–
Gas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Hydro	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Geothermal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Solar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Wind	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Biomass	75	75	75	75	75	77	77	77	77	79	79	79	79	79	79	79	79	76	76	–
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Total	130	130	129	128	127	131	130	130	131	134	134	136	136	138	138	138	139	142	141	–
Final Energy Consumption by Sector (ktoe)																				
Industry	0	0	0	0	0	0	0	0	0	0	0	3	3	3	3	3	3	3	3	–
Transport	39	39	38	37	36	38	35	34	33	32	30	31	31	34	34	30	30	29	29	–
Residential	43	43	42	42	42	40	42	71	71	78	78	79	79	79	79	79	79	77	77	–
Commercial	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Others	1	1	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	–
Total	82	82	80	79	78	78	78	105	104	110	108	114	114	116	116	112	113	110	109	–

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Table 5.10.7 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Final Energy Consumption by Type (ktoe)																				
Coal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-
Oil	42	42	41	40	39	38	37	34	33	32	30	31	31	34	34	30	30	29	29	-
Gas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-
Electricity	2	2	0	0	0	0	0	0	0	0	0	4	5	5	5	5	5	5	5	-
Heat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-
Biomass	39	39	39	39	39	40	40	71	71	78	78	78	78	78	78	78	78	76	75	-
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-
Total	82	82	80	79	78	78	78	105	104	110	108	114	114	116	116	112	113	110	109	-
Power Generation (GWh)																				
Thermal	30	30	30	30	30	35	40	45	50	55	62	63	64	63	63	74	75	85	86	-
Hydro	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-
Geothermal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-
Solar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-
Wind	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-
Total	30	30	30	30	30	35	40	45	50	55	62	63	64	63	63	74	75	85	86	-
Loss and Own Use of Electricity (GWh)																				
Transmission and Distribution Losses	2	2	2	2	2	2	4	4	4	4	5	5	6	6	6	8	9	10	10	–
Own Use	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Total	2	2	2	2	2	2	4	4	4	4	5	5	6	6	6	8	9	10	10	–
Fuel Input for Power Generation (ktoe)																				
Coal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Oil	10	10	10	10	10	12	14	15	17	19	21	22	22	22	22	25	26	29	30	–
Gas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Total	10	10	10	10	10	12	14	15	17	19	21	22	22	22	22	25	26	29	30	–
CO_2 Emissions (kt C)																				
Coal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Oil	43	43	43	42	41	42	43	41	42	43	43	44	44	46	46	46	47	49	49	–
Gas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Total	43	43	43	42	41	42	43	41	42	43	43	44	44	46	46	46	47	49	49	–

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Table 5.10.7 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Macroeconomic Indicators																				
Population (thousand)	310	318	328	337	347	356	366	377	387	398	409	420	432	444	457	470	483	496	510	524
Urban Population, %	13.7	13.9	14.1	14.3	14.5	14.7	14.9	15.1	15.3	15.5	15.7	16.0	16.2	16.5	16.7	17.0	17.3	17.6	18.0	18.3
GDP (constant 2000 $ million)	341	361	407	423	462	500	508	501	510	508	435	400	389	414	435	458	490	543	582	575
GDP (current $ million)	303	320	379	411	465	519	565	568	471	482	435	400	342	333	375	414	457	586	646	601
GDP (constant 2005 PPP $ million)	724	768	865	900	982	1,063	1,080	1,064	1,083	1,078	924	851	827	881	924	974	1,041	1,153	1,237	1,222
GDP/capita (constant 2000 $)	1,101	1,135	1,243	1,256	1,334	1,404	1,388	1,331	1,318	1,276	1,065	953	901	933	952	976	1,015	1,093	1,141	1,098
GDP/capita (current $)	977	1,006	1,156	1,220	1,341	1,457	1,543	1,508	1,218	1,213	1,065	953	791	749	821	881	946	1,181	1,266	1,147
GDP – Manufacturing (% of GDP)	6.4	11.1	9.1	7.4	7.6	7.5	7.6	7.8	7.9	8.0	7.7	6.9	6.7	5.6	5.4	5.1	5.0	4.6	4.4	4.4
Car Ownership (car/1,000 persons)	–	–	–	–	–	–	–	–	–	–	–	–	–	7	7	7	7	7	7	7
Basic Energy Indicators																				
TPES/capita (toe/person)	0.42	0.41	0.39	0.38	0.37	0.37	0.36	0.35	0.34	0.34	0.33	0.32	0.31	0.31	0.30	0.29	0.29	0.29	0.28	–
TFEC/capita (toe/person)	0.27	0.26	0.24	0.23	0.22	0.22	0.21	0.28	0.27	0.28	0.26	0.27	0.26	0.26	0.25	0.24	0.23	0.22	0.21	–
TPES/GDP (toe/constant 2000 $ million)	380	359	316	301	274	262	256	260	257	264	307	339	349	333	317	301	284	262	242	–
TFEC/GDP (toe/constant 2000 $ million)	242	228	195	186	168	157	153	209	204	217	247	284	292	280	268	245	231	202	188	–
Import Dependency (%)	41.8	41.8	41.3	40.9	40.4	41.3	40.9	40.8	41.3	41.3	41.3	42.2	42.2	43.0	43.0	43.0	43.5	46.2	45.7	–
Oil Import Dependency (%)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	–
Electricity/capita (kWh/ person)	68	66	0	0	0	0	0	0	0	0	0	124	127	124	125	115	116	121	112	–
CO_2 Intensity (t C/constant 2000 $ million)	128	120	105	99	88	84	84	82	82	84	98	111	114	111	106	100	96	89	84	–
CO_2/capita (t C)	0.14	0.14	0.13	0.12	0.12	0.12	0.12	0.11	0.11	0.11	0.10	0.11	0.10	0.10	0.10	0.10	0.10	0.10	0.10	–
CO_2/TPES (t C/toe)	0.34	0.34	0.33	0.33	0.32	0.32	0.33	0.31	0.32	0.32	0.32	0.33	0.33	0.33	0.33	0.33	0.34	0.34	0.35	–

– = no data or not applicable, CO_2 = carbon dioxide, GDP = gross domestic product, GWh = gigawatt-hour, kt C = thousand tons of carbon equivalent, ktoe = thousand tons of oil equivalent, kWh = kilowatt-hour, PPP = purchasing power parity, t C = ton of carbon equivalent, TFEC = total final energy consumption, toe = ton of oil equivalent, TPES = total primary energy supply.

Note:

1. Figures may not add up to total because of rounding.
2. Although there was production of electric energy in Solomon Islands from 1992 to 2000, final consumption of electricity is reported as zero for the period. This explains the zero values of Electricity/capita for 1992 to 2000.

Sources: APERC estimates, JAMA (2012), UNSD (2011a), and World Bank.

5.11 Timor-Leste

Country Profile (2009)		Energy Reserves (year-end 2008)	
Total Surface Area (square kilometer)	14,870	Coal (million ton) - Recoverable	–
Population (thousand)	1,100	Gas (trillion cubic feet) - Proven[a]	0.2
GDP (billion constant 2000 $)	0.4	Oil (billion barrel) - Proven[b]	0.6
Electrification Rate (%)	22.0		

– = no data or not applicable, GDP = gross domestic product.

[a] as of January 2006
[b] as of January 2011

Sources: ADB (2012), CIA (2012), IEA (2011c), and World Bank.

2008 Energy Supply and Demand Flow (ktoe)

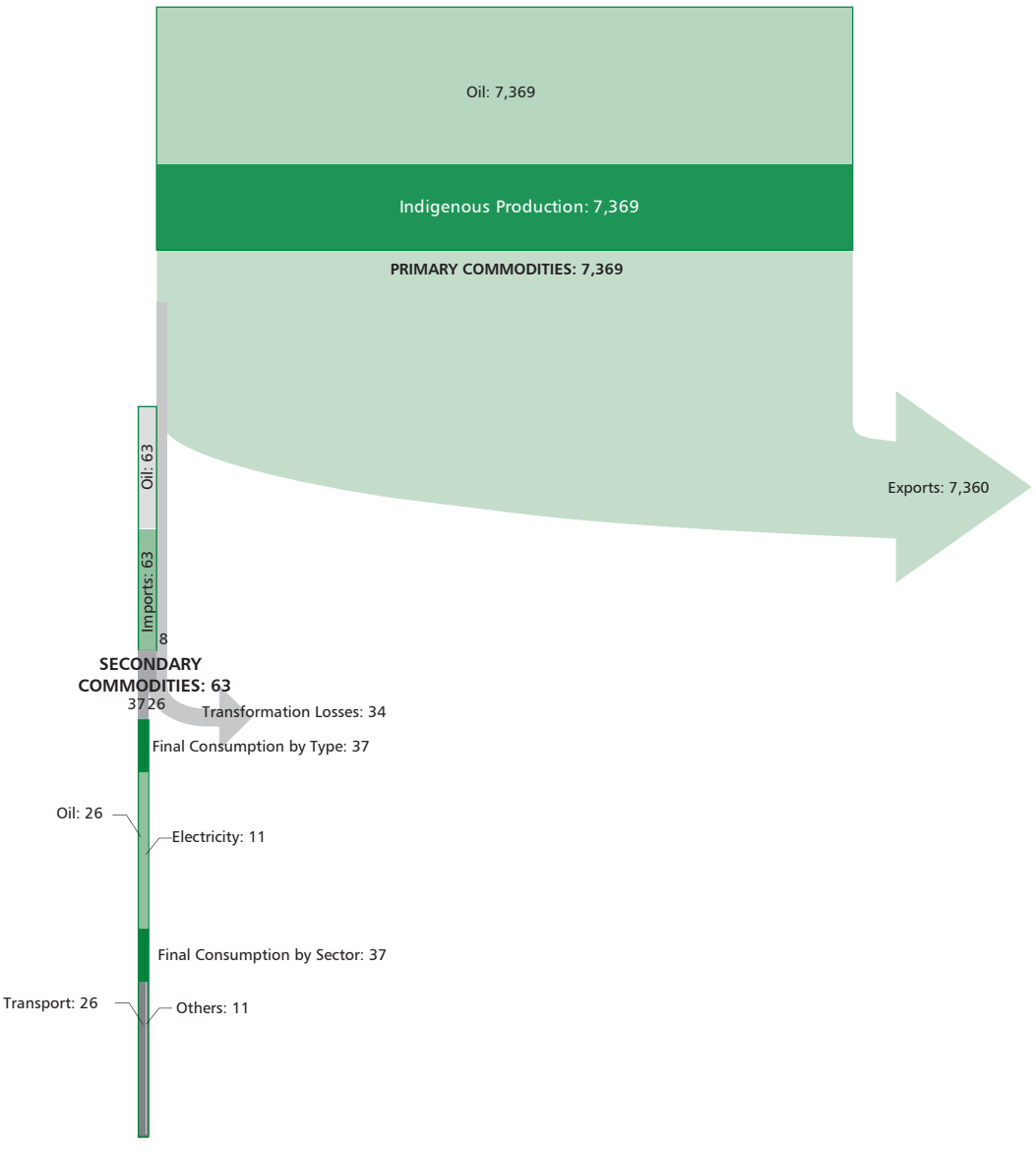


Table 5.11.1 Key Data and Economic Profile

	1990	1995	2000	2005	2008
Socioeconomic Data					
Population (thousand)	–	–	–	1,010	1,080
GDP (constant 2000 $ billion)	–	–	–	0.3	0.4
GDP (constant 2005 PPP $ billion)	–	–	–	0.7	0.8
GDP/capita (constant 2000 $)	–	–	–	311	334
GDP/capita (constant 2005 PPP $)	–	–	–	700	753

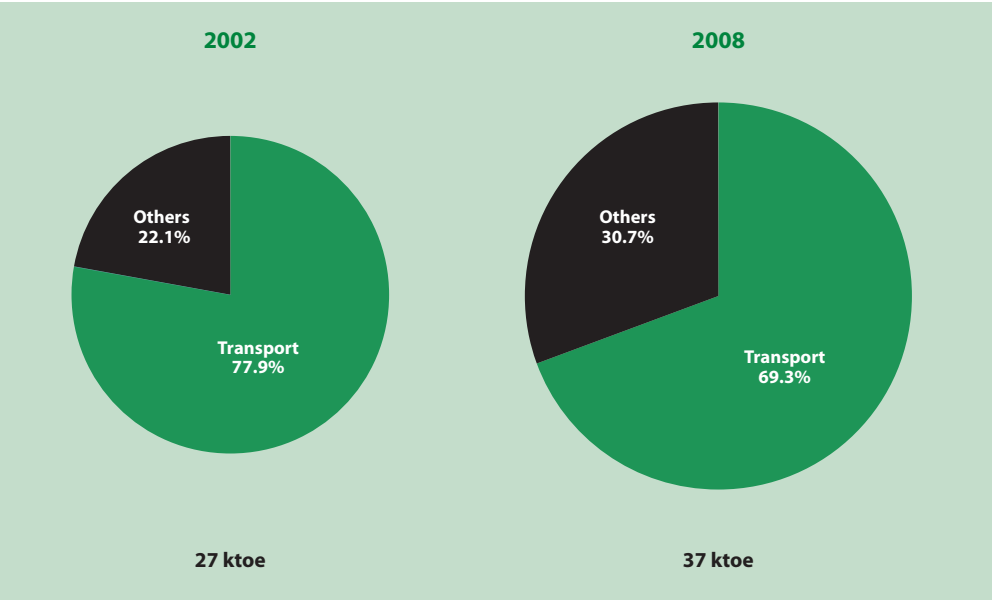
– = no data or not applicable, GDP = gross domestic product, PPP = purchasing power parity.
Source: World Bank.

Table 5.11.2 Energy Supply and Demand

	1990	1995	2000	2005	2008
Primary Energy Supply (ktoe)					
Indigenous Production	–	–	–	7,318	7,369
Net Imports	–	–	–	–7,255	–7,297
Total PES	–	–	–	62	72
Coal	–	–	–	0	0
Oil	–	–	–	62	72
Gas	–	–	–	0	0
Biomass	–	–	–	0	0
Others	–	–	–	0	0
TPES/capita (toe)	–	–	–	0.06	0.07
TPES/GDP (toe/constant 2005 PPP $ million)	–	–	–	88	88
Final Energy Consumption (ktoe)					
Industry	–	–	–	0	0
Transportation	–	–	–	24	26
Other Sectors	–	–	–	10	11
Total FEC	–	–	–	33	37
Coal	–	–	–	0	0
Oil	–	–	–	24	26
Gas	–	–	–	0	0
Electricity	–	–	–	10	11
Biomass	–	–	–	0	0
Others	–	–	–	0	0

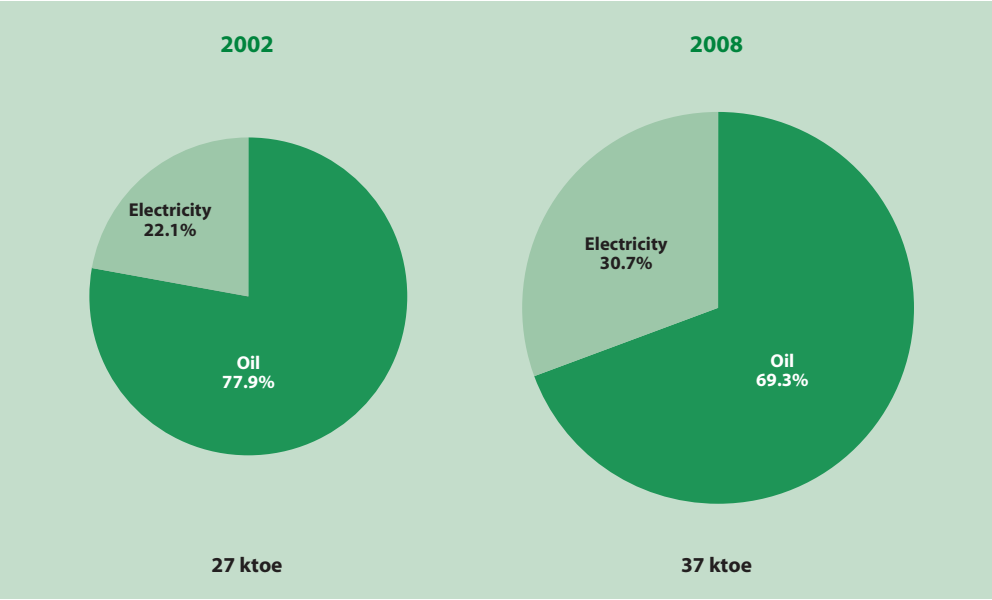
– = no data or not applicable, FEC = final energy consumption, GDP = gross domestic product, ktoe = thousand tons of oil equivalent, PES = primary energy supply, PPP = purchasing power parity, toe = ton of oil equivalent, TPES = total primary energy supply.
Source: UNSD (2011a).

Figure 5.11.1 Final Energy Consumption by Sector, 2002 and 2008



ktoe = thousand tons of oil equivalent.
Source: UNSD (2011a).

Figure 5.11.2 Final Energy Consumption by Type of Energy, 2002 and 2008

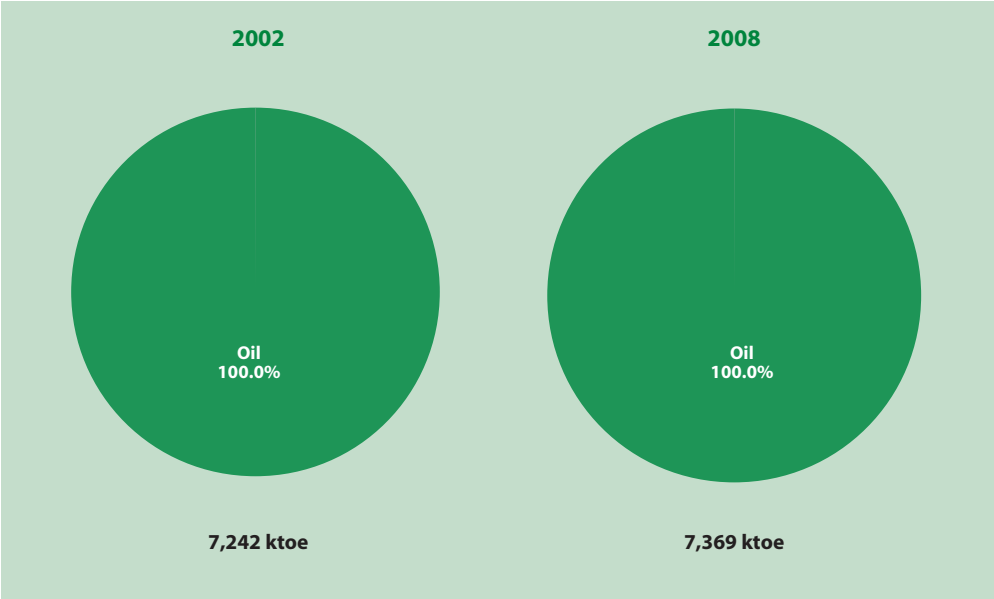


ktoe = thousand tons of oil equivalent.
Source: UNSD (2011a).

Figure 5.11.3 Total Primary Energy Supply, 2002 and 2008

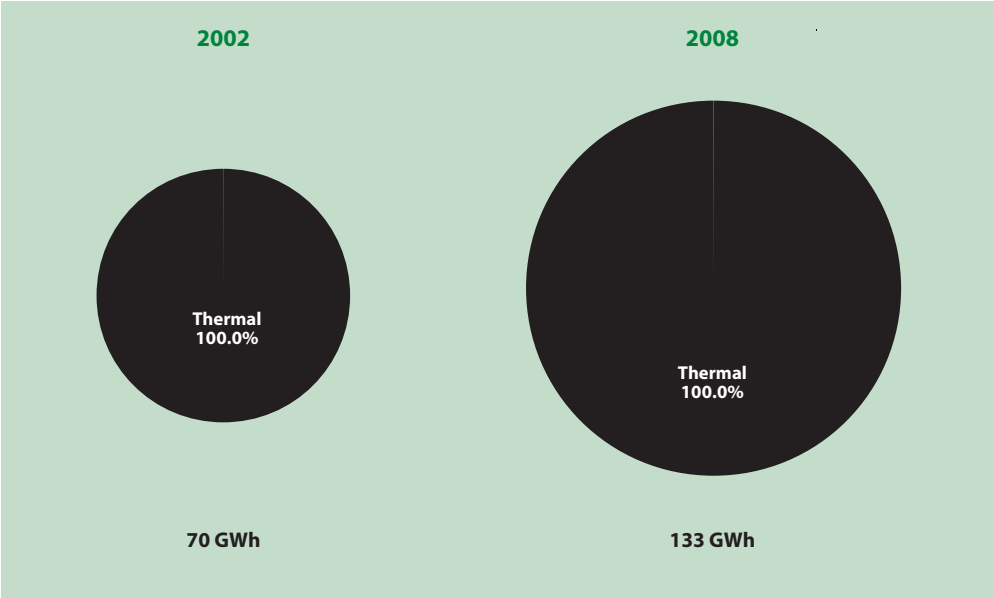
ktoe = thousand tons of oil equivalent.
Source: UNSD (2011a).

Figure 5.11.4 Indigenous Energy Production, 2002 and 2008



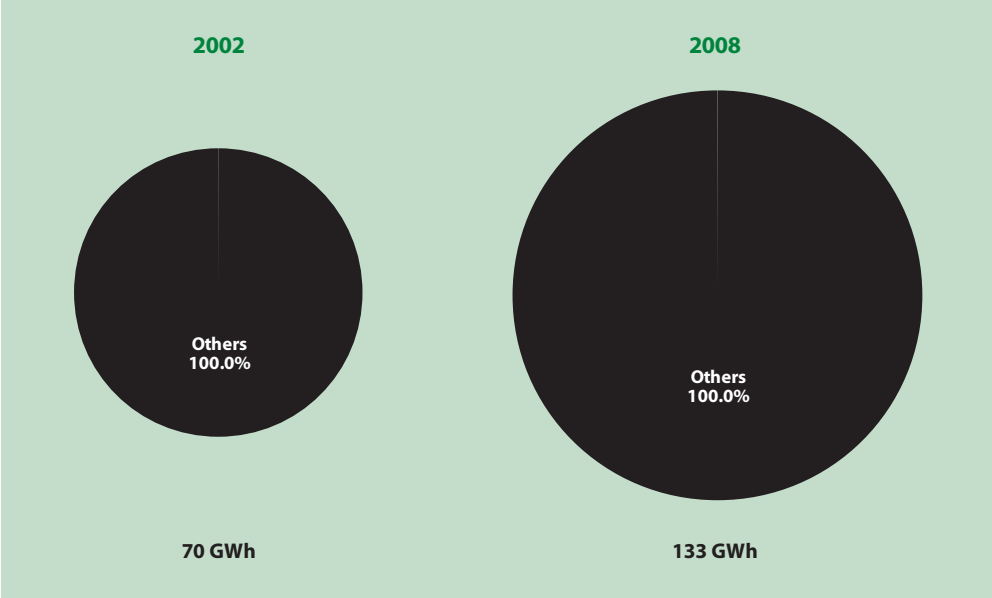
ktoe = thousand tons of oil equivalent.
Source: UNSD (2011a).

Figure 5.11.5 Electricity Generation by Plant Type, 2002 and 2008



GWh = gigawatt-hour.
Source: UNSD (2011a).

Figure 5.11.6 Electricity Consumption by Sector, 2002 and 2008

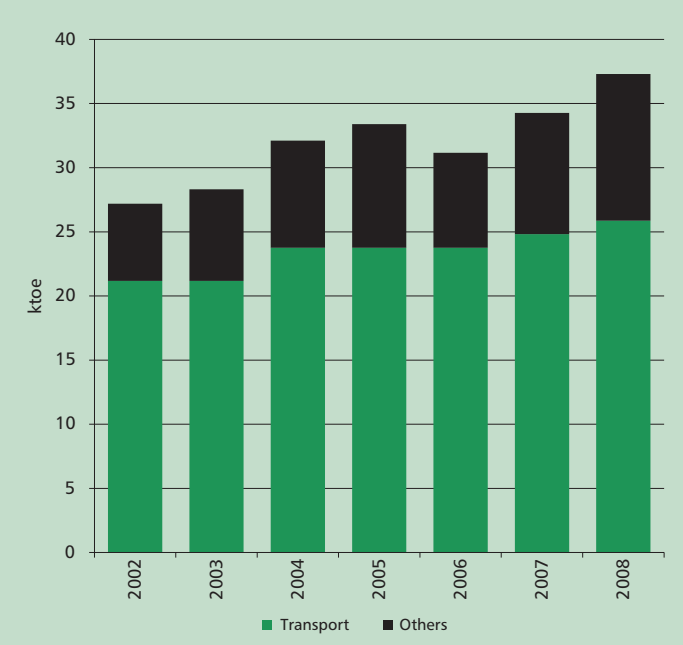


GWh = gigawatt-hour.
Source: UNSD (2011a).

Figure 5.11.7 Carbon Dioxide Emissions from Fuel Combustion, 2002 and 2008

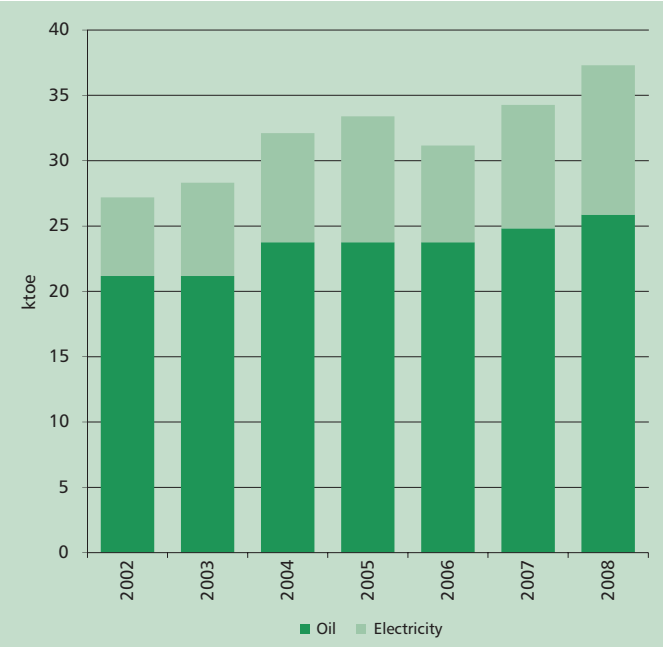
kt C = thousand tons of carbon equivalent.
Source: APERC estimates.

Figure 5.11.8 Final Energy Consumption by Sector, 2002–2008



ktoe = thousand tons of oil equivalent.
Source: UNSD (2011a).

Figure 5.11.9 Final Energy Consumption by Type, 2002–2008



ktoe = thousand tons of oil equivalent.
Source: UNSD (2011a).

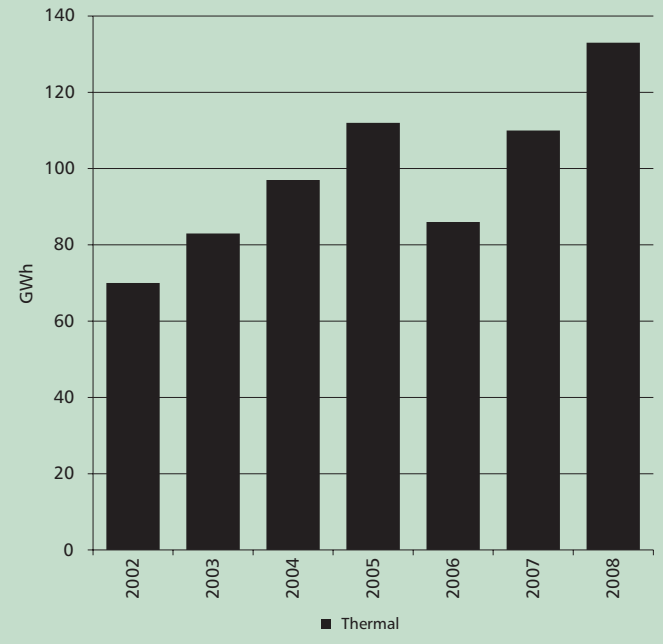
Figure 5.11.10 Total Primary Energy Supply, 2002–2008

ktoe = thousand tons of oil equivalent.
Source: UNSD (2011a).

Figure 5.11.11 Indigenous Energy Production, 2002–2008

ktoe = thousand tons of oil equivalent.
Source: UNSD (2011a).

Figure 5.11.12 Electricity Generation by Source, 2002–2008



GWh = gigawatt-hour.
Source: UNSD (2011a).

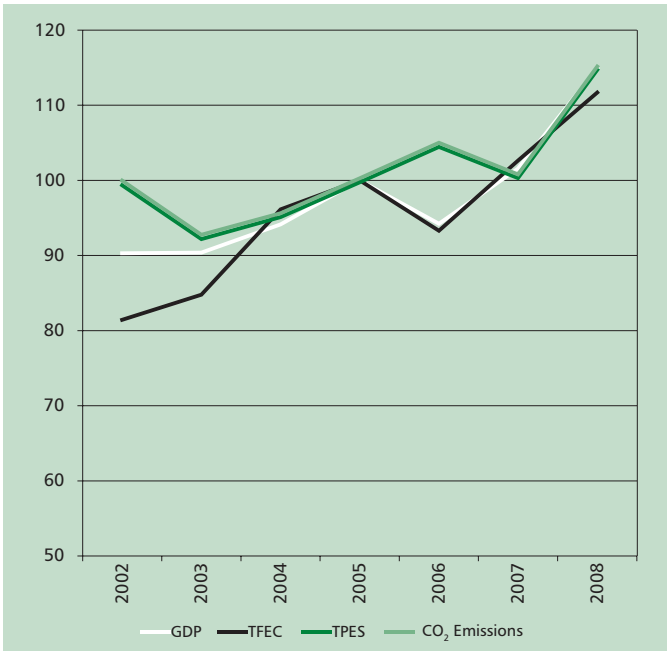
Figure 5.11.13 Fuel Input for Electricity Generation, 2002–2008

ktoe = thousand tons of oil equivalent.
Sources: UNSD (2011a).

Figure 5.11.14 Carbon Dioxide Emissions from Fuel Combustion, 2002–2008

kt C = thousand tons of carbon equivalent.
Source: APERC estimates.

Figure 5.11.15 Growth of GDP, TFEC, TPES, and CO_2 (indexed to year 2000), 2002–2008



CO_2 = carbon dioxide, GDP = gross domestic product, TFEC = total final energy consumption, TPES = total primary energy supply.
Note: Indices are measured relative to the base year 2000 (2000 = 100).
Source: APERC estimates.

Figure 5.11.16 Energy and Carbon Intensities, 2002–2008

t C = ton of carbon equivalent, toe = ton of oil equivalent.
Source: APERC estimates.

Table 5.11.3 Timor-Leste Energy Balance Table, 2005

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	0	0	7,318	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7,318
2.	Imports	0	0	0	58	13	0	46	0	0	0	0	0	0	0	0	0	0	0	0	0	58
3.	Exports	0	0	–7,314	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–7,314
4.	International Bunkers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5.	Stock Changes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6.	Total Primary Energy Supply	0	0	4	58	13	0	46	0	0	0	0	0	0	0	0	0	0	0	0	0	62
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	0	0	–4	–35	0	0	–35	0	0	0	0	0	0	0	0	0	0	0	10	0	–29
8.1	Power Generation	0	0	–4	–35	0	0	–35	0	0	0	0	0	0	0	0	0	0	0	10	0	–29
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10.	Discrepancy	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11.	Total Final Energy Consumption	0	0	0	24	13	0	11	0	0	0	0	0	0	0	0	0	0	0	10	0	33
12.	Industry Sector	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13.	Transport Sector	0	0	0	24	13	0	11	0	0	0	0	0	0	0	0	0	0	0	0	0	24
14.	Other Sectors	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0	10
14.1	Residential and Commercial	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14.1.1	Commerce and Public Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14.1.2	Residential	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14.2	Non-Specified Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0	10
15.	Non-Energy Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16.	Electricity Output (GWh)	0	0	12	100	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0	112
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.
Note: Figures may not add up to total because of rounding.
Source: UNSD (2011a).

Table 5.11.4 Timor-Leste Energy Balance Table, 2006

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	0	0	7,330	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7,330
2.	Imports	0	0	0	59	13	0	47	0	0	0	0	0	0	0	0	0	0	0	0	0	59
3.	Exports	0	0	–7,325	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–7,325
4.	International Bunkers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5.	Stock Changes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6.	Total Primary Energy Supply	0	0	6	59	13	0	47	0	0	0	0	0	0	0	0	0	0	0	0	0	65
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	0	0	–6	–36	0	0	–36	0	0	0	0	0	0	0	0	0	0	0	7	0	–34
8.1	Power Generation	0	0	–6	–36	0	0	–36	0	0	0	0	0	0	0	0	0	0	0	7	0	–34
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10.	Discrepancy	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11.	Total Final Energy Consumption	0	0	0	24	13	0	11	0	0	0	0	0	0	0	0	0	0	0	7	0	31
12.	Industry Sector	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13.	Transport Sector	0	0	0	24	13	0	11	0	0	0	0	0	0	0	0	0	0	0	0	0	24
14.	Other Sectors	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0	7
14.1	Residential and Commercial	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14.1.1	Commerce and Public Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14.1.2	Residential	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14.2	Non-Specified Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0	7
15.	Non-Energy Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16.	Electricity Output (GWh)	0	0	12	74	0	0	74	0	0	0	0	0	0	0	0	0	0	0	0	0	86
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Source: UNSD (2011a).

Table 5.11.5 Timor-Leste Energy Balance Table, 2007

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	0	0	7,343	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7,343
2.	Imports	0	0	0	61	14	0	48	0	0	0	0	0	0	0	0	0	0	0	0	0	61
3.	Exports	0	0	–7,342	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–7,342
4.	International Bunkers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5.	Stock Changes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6.	Total Primary Energy Supply	0	0	1	61	14	0	48	0	0	0	0	0	0	0	0	0	0	0	0	0	63
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	0	0	–1	–37	0	0	–37	0	0	0	0	0	0	0	0	0	0	0	9	0	–28
8.1	Power Generation	0	0	–1	–37	0	0	–37	0	0	0	0	0	0	0	0	0	0	0	9	0	–28
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10.	Discrepancy	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11.	Total Final Energy Consumption	0	0	0	25	14	0	11	0	0	0	0	0	0	0	0	0	0	0	9	0	34
12.	Industry Sector	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13.	Transport Sector	0	0	0	25	14	0	11	0	0	0	0	0	0	0	0	0	0	0	0	0	25
14.	Other Sectors	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9	0	9
14.1	Residential and Commercial	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14.1.1	Commerce and Public Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14.1.2	Residential	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14.2	Non-Specified Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9	0	9
15.	Non-Energy Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16.	Electricity Output (GWh)	0	0	4	106	0	0	106	0	0	0	0	0	0	0	0	0	0	0	0	0	110
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.
Note: Figures may not add up to total because of rounding.
Source: UNSD (2011a).

Table 5.11.6 Timor-Leste Energy Balance Table, 2008

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	0	0	7,369	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7,369
2.	Imports	0	0	0	63	15	0	49	0	0	0	0	0	0	0	0	0	0	0	0	0	63
3.	Exports	0	0	–7,360	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–7,360
4.	International Bunkers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5.	Stock Changes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6.	Total Primary Energy Supply	0	0	8	63	15	0	49	0	0	0	0	0	0	0	0	0	0	0	0	0	72
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	0	0	–8	–38	0	0	–38	0	0	0	0	0	0	0	0	0	0	0	11	0	–34
8.1	Power Generation	0	0	–8	–38	0	0	–38	0	0	0	0	0	0	0	0	0	0	0	11	0	–34
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10.	Discrepancy	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11.	Total Final Energy Consumption	0	0	0	26	15	0	11	0	0	0	0	0	0	0	0	0	0	0	11	0	37
12.	Industry Sector	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13.	Transport Sector	0	0	0	26	15	0	11	0	0	0	0	0	0	0	0	0	0	0	0	0	26
14.	Other Sectors	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	0	11
14.1	Residential and Commercial	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14.1.1	Commerce and Public Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14.1.2	Residential	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14.2	Non-Specified Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	0	11
15.	Non-Energy Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16.	Electricity Output (GWh)	0	0	24	109	0	0	109	0	0	0	0	0	0	0	0	0	0	0	0	0	133
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Source: UNSD (2011a).

Table 5.11.7 Timor-Leste Summary Table, 1990–2009

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Indigenous Production (ktoe)																				
Coal	–	–	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	0	–
Oil	–	–	–	–	–	–	–	–	–	–	–	–	7,242	7,242	7,291	7,318	7,330	7,343	7,369	–
Gas	–	–	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	0	–
Hydro	–	–	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	0	–
Nuclear	–	–	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	0	–
Geothermal	–	–	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	0	–
Solar	–	–	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	0	–
Wind	–	–	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	0	–
Biomass	–	–	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	0	–
Others	–	–	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	0	–
Total	–	–	–	–	–	–	–	–	–	–	–	–	7,242	7,242	7,291	7,318	7,330	7,343	7,369	–
Primary Energy Supply (ktoe)																				
Coal	–	–	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	0	–
Oil	–	–	–	–	–	–	–	–	–	–	–	–	62	58	59	62	65	63	72	–
Gas	–	–	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	0	–
Hydro	–	–	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	0	–
Nuclear	–	–	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	0	–
Geothermal	–	–	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	0	–
Solar	–	–	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	0	–
Wind	–	–	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	0	–
Biomass	–	–	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	0	–
Others	–	–	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	0	–
Total	–	–	–	–	–	–	–	–	–	–	–	–	62	58	59	62	65	63	72	–
Final Energy Consumption by Sector (ktoe)																				
Industry	–	–	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	0	–
Transport	–	–	–	–	–	–	–	–	–	–	–	–	21	21	24	24	24	25	26	–
Residential	–	–	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	0	–
Commercial	–	–	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	0	–
Others	–	–	–	–	–	–	–	–	–	–	–	–	6	7	8	10	7	9	11	–
Total	–	–	–	–	–	–	–	–	–	–	–	–	27	28	32	33	31	34	37	–

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Table 5.11.7 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Final Energy Consumption by Type (ktoe)																				
Coal	–	–	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	0	–
Oil	–	–	–	–	–	–	–	–	–	–	–	–	21	21	24	24	24	25	26	–
Gas	–	–	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	0	–
Electricity	–	–	–	–	–	–	–	–	–	–	–	–	6	7	8	10	7	9	11	–
Heat	–	–	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	0	–
Biomass	–	–	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	0	–
Others	–	–	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	0	–
Total	–	–	–	–	–	–	–	–	–	–	–	–	27	28	32	33	31	34	37	–
Power Generation (GWh)																				
Thermal	–	–	–	–	–	–	–	–	–	–	–	–	70	83	97	112	86	110	133	–
Hydro	–	–	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	0	–
Nuclear	–	–	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	0	–
Geothermal	–	–	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	0	–
Solar	–	–	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	0	–
Wind	–	–	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	0	–
Others	–	–	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	0	–
Total	–	–	–	–	–	–	–	–	–	–	–	–	70	83	97	112	86	110	133	–
Loss and Own Use of Electricity (GWh)																				
Transmission and Distribution Losses	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Own Use	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Total	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Fuel Input for Power Generation (ktoe)																				
Coal	–	–	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	0	–
Oil	–	–	–	–	–	–	–	–	–	–	–	–	41	36	36	39	41	38	46	–
Gas	–	–	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	0	–
Total	–	–	–	–	–	–	–	–	–	–	–	–	41	36	36	39	41	38	46	–
CO_2 Emissions (kt C)																				
Coal	–	–	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	0	–
Oil	–	–	–	–	–	–	–	–	–	–	–	–	52	48	50	52	54	52	60	–
Gas	–	–	–	–	–	–	–	–	–	–	–	–	0	0	0	0	0	0	0	–
Total	–	–	–	–	–	–	–	–	–	–	–	–	52	48	50	52	54	52	60	–

continued on next page

Table 5.11.7 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Macroeconomic Indicators																				
Population (thousand)	–	–	–	–	–	–	–	–	–	–	–	–	888	931	974	1,010	1,039	1,061	1,080	1,100
Urban Population, %	–	–	–	–	–	–	–	–	–	–	–	–	25.0	25.4	25.7	26.1	26.5	26.9	27.3	27.7
GDP (constant 2000 $ million)	–	–	–	–	–	–	–	–	–	–	–	–	284	284	296	314	296	319	361	387
GDP (current $ million)	–	–	–	–	–	–	–	–	–	–	–	–	284	298	309	332	327	398	498	598
GDP (constant 2005 PPP $ million)	–	–	–	–	–	–	–	–	–	–	–	–	639	639	666	707	667	719	813	871
GDP/capita (constant 2000 $)	–	–	–	–	–	–	–	–	–	–	–	–	319	305	304	311	285	301	334	352
GDP/capita (current $)	–	–	–	–	–	–	–	–	–	–	–	–	320	320	318	329	315	375	461	544
GDP – Manufacturing (% of GDP)	–	–	–	–	–	–	–	–	–	–	–	–	3.9	3.9	3.8	3.6	2.7	2.7	3.0	2.9
Car Ownership (car/1,000 persons)	–	–	–	–	–	–	–	–	–	–	–	–	–	2	2	1	1	1	1	1
Basic Energy Indicators																				
TPES/capita (toe/person)	–	–	–	–	–	–	–	–	–	–	–	–	0.07	0.06	0.06	0.06	0.06	0.06	0.07	–
TFEC/capita (toe/person)	–	–	–	–	–	–	–	–	–	–	–	–	0.03	0.03	0.03	0.03	0.03	0.03	0.03	–
TPES/GDP (toe/constant 2000 $ million)	–	–	–	–	–	–	–	–	–	–	–	–	219	203	201	198	220	196	198	–
TFEC/GDP (toe/constant 2000 $ million)	–	–	–	–	–	–	–	–	–	–	–	–	96	100	109	106	105	107	103	–
Import Dependency (%)	–	–	–	–	–	–	–	–	–	–	–	–	–11,570.2	–12,476.6	–12,170.8	–11,647.3	–11,137.7	–11,620.0	–10,189.0	–
Oil Import Dependency (%)	–	–	–	–	–	–	–	–	–	–	–	–	–11,570.2	–12,476.6	–12,170.8	–11,647.3	–11,137.7	–11,620.0	–10,189.0	–
Electricity/capita (kWh/ person)	–	–	–	–	–	–	–	–	–	–	–	–	79	89	100	111	83	104	123	–
CO_2 Intensity (t C/constant 2000 $ million)	–	–	–	–	–	–	–	–	–	–	–	–	183	169	168	165	184	164	165	–
CO_2/capita (t C)	–	–	–	–	–	–	–	–	–	–	–	–	0.06	0.05	0.05	0.05	0.05	0.05	0.06	–
CO_2/TPES (t C/toe)	–	–	–	–	–	–	–	–	–	–	–	–	0.83	0.83	0.83	0.83	0.83	0.83	0.83	–

– = no data or not applicable, CO_2 = carbon dioxide, GDP = gross domestic product, GWh = gigawatt–hour, kt C = thousand tons of carbon equivalent, ktoe = thousand tons of oil equivalent, kWh = kilowatt–hour, PPP = purchasing power parity, t C = ton of carbon equivalent, TFEC = total final energy consumption, toe = ton of oil equivalent, TPES = total primary energy supply.

Note: Figures may not add up to total because of rounding.

Sources: APERC estimates, JAMA (2012), UNSD (2011a), and World Bank.

5.12 Tonga

Country Profile (2009)		Energy Reserves (year-end 2008)	
Total Surface Area (square kilometer)	47,088	Coal (million ton) - Recoverable	0.0
Population (thousand)	104	Gas (trillion cubic feet) - Proven	0.0
GDP (billion constant 2000 $)	0.2	Oil (billion barrel) - Proven	0.0
Electrification Rate (%)	95.0		

GDP = gross domestic product.

Sources: ADB (2012), CIA (2012), Ostojic et al. (2011), and World Bank.

2008 Energy Supply and Demand Flow (ktoe)

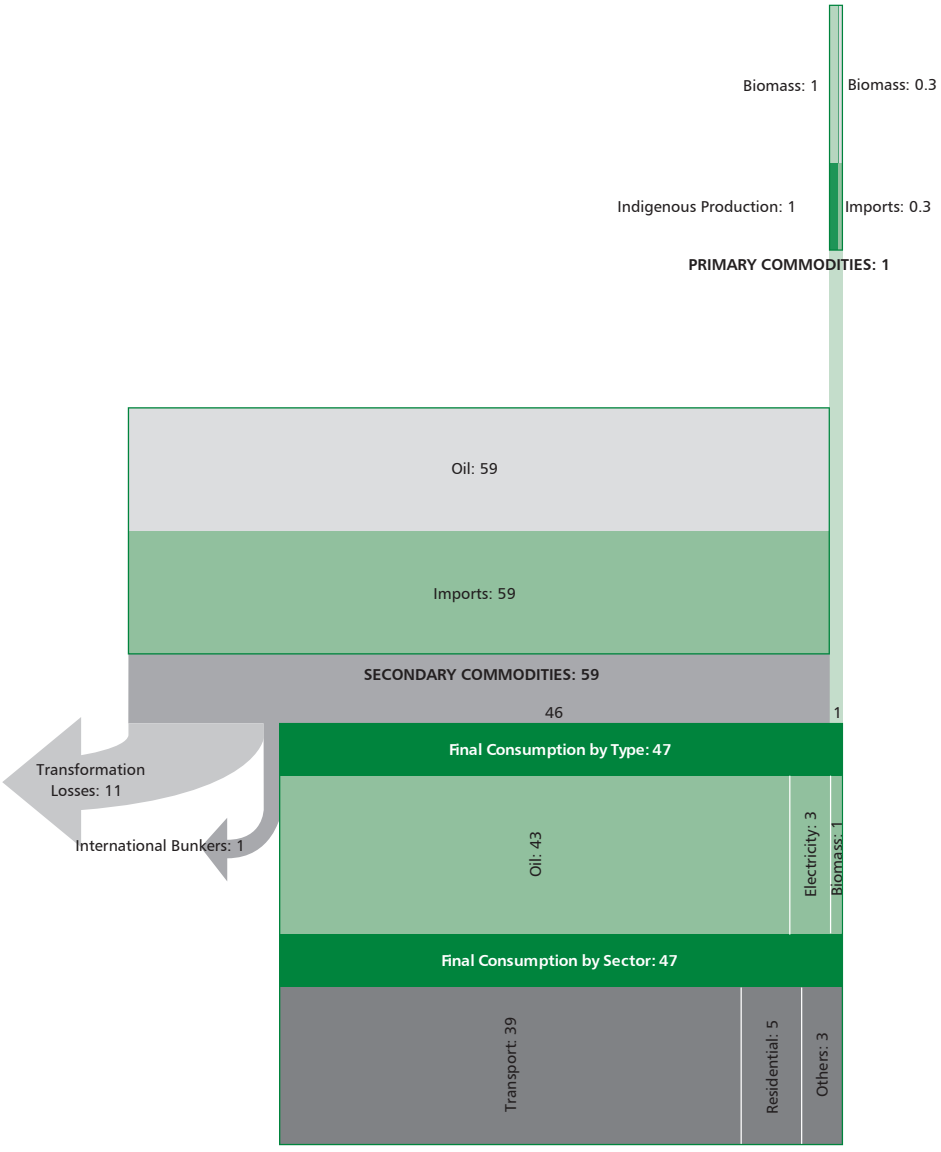


Table 5.12.1 Key Data and Economic Profile

	1990	1995	2000	2005	2008
Socioeconomic Data					
Population (thousand)	95	96	98	101	103
GDP (constant 2000 $ billion)	0.1	0.2	0.2	0.2	0.2
GDP (constant 2005 PPP $ billion)	0.3	0.3	0.4	0.4	0.4
GDP/capita (constant 2000 $)	1,494	1,785	1,926	2,062	2,059
GDP/capita (constant 2005 PPP $)	2,998	3,583	3,866	4,139	4,133

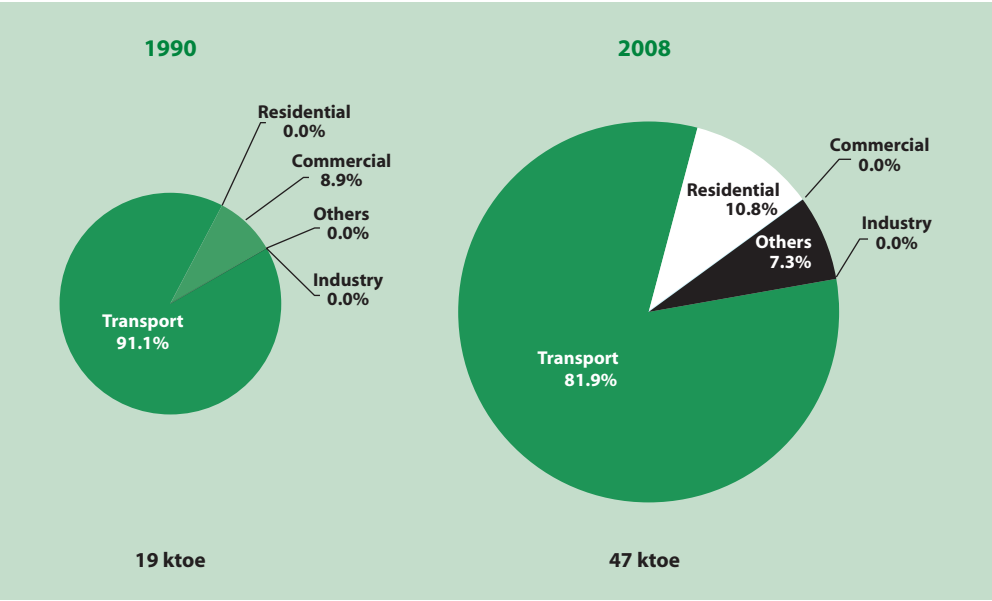
– = no data or not applicable, GDP = gross domestic product, PPP = purchasing power parity.
Source: World Bank.

Table 5.12.2 Energy Supply and Demand

	1990	1995	2000	2005	2008
Primary Energy Supply (ktoe)					
Indigenous Production	0	0	0	1	1
Net Imports	26	37	41	57	58
Total PES	26	37	41	58	59
Coal	0	0	0	0	0
Oil	26	37	40	57	58
Gas	0	0	0	0	0
Biomass	0	0	1	1	1
Others	0	0	0	0	0
TPES/capita (toe)	0.27	0.39	0.42	0.57	0.57
TPES/GDP (toe/constant 2005 PPP $ million)	90	108	108	138	139
Final Energy Consumption (ktoe)					
Industry	0	0	0	0	0
Transportation	18	24	21	36	39
Other Sectors	2	5	8	9	9
Total FEC	19	29	29	45	47
Coal	0	0	0	0	0
Oil	18	27	26	40	43
Gas	0	0	0	0	0
Electricity	2	2	3	4	3
Biomass	0	0	0	1	1
Others	0	0	0	0	0

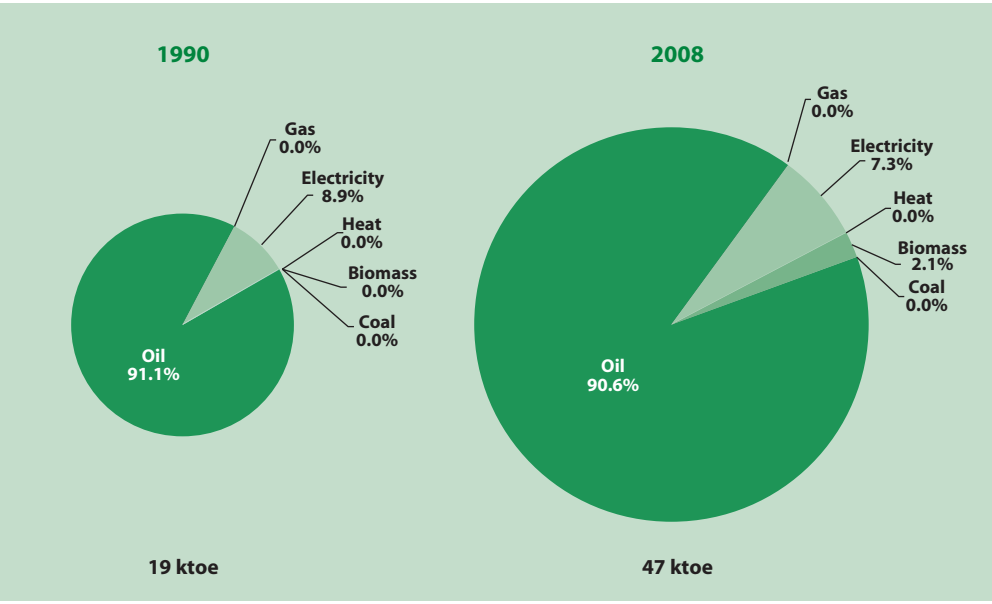
FEC = final energy consumption, GDP = gross domestic product, ktoe = thousand tons of oil equivalent, PES = primary energy supply, PPP = purchasing power parity, toe = ton of oil equivalent, TPES = total primary energy supply.
Source: UNSD (2011a).

Figure 5.12.1 Final Energy Consumption by Sector, 1990 and 2008



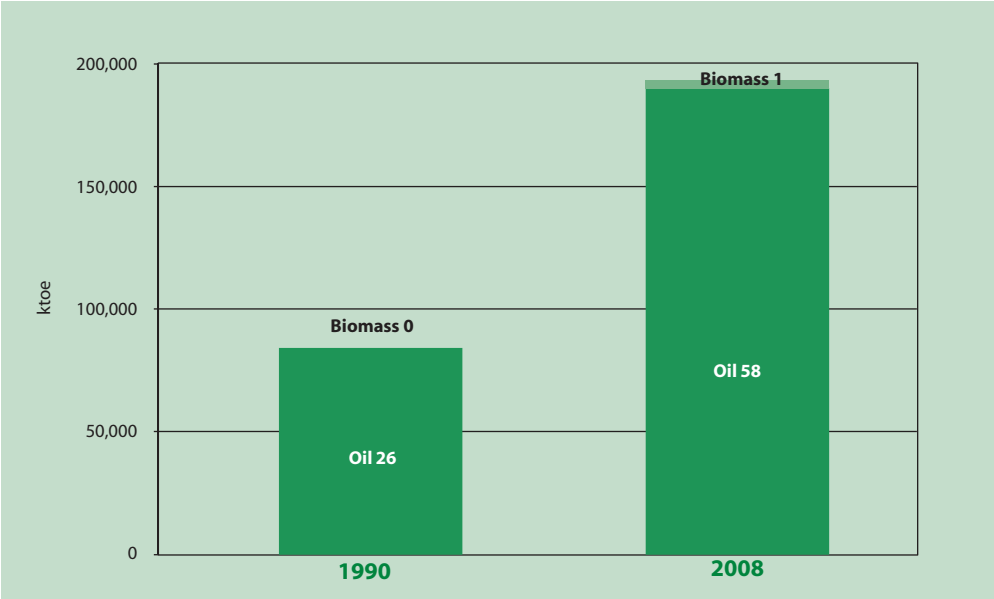
ktoe = thousand tons of oil equivalent.
Source: UNSD (2011a).

Figure 5.12.2 Final Energy Consumption by Type of Energy, 1990 and 2008



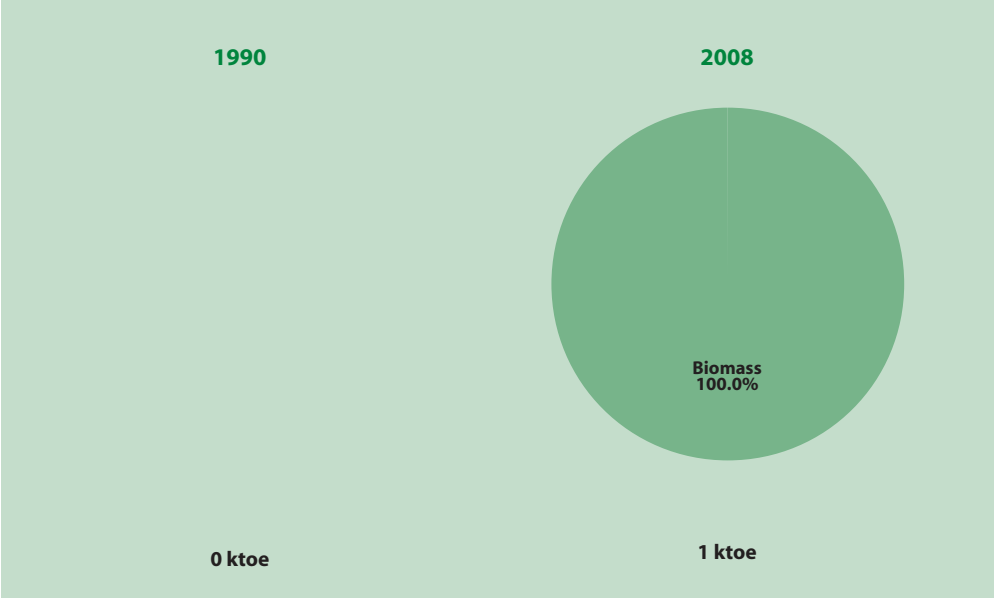
ktoe = thousand tons of oil equivalent.
Source: UNSD (2011a).

Figure 5.12.3 Total Primary Energy Supply, 1990 and 2008



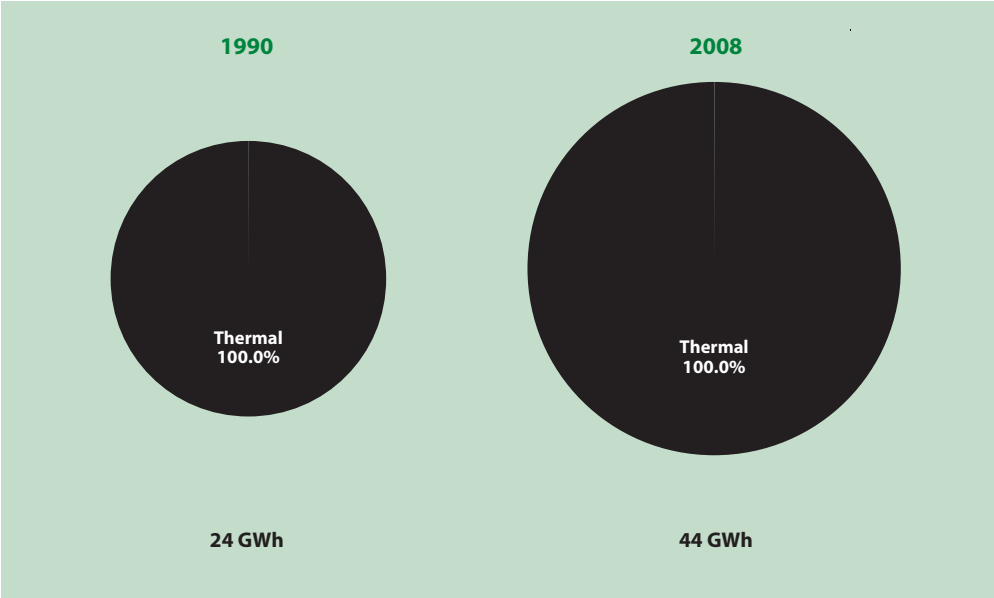
ktoe = thousand tons of oil equivalent.
Source: UNSD (2011a).

Figure 5.12.4 Indigenous Energy Production, 1990 and 2008



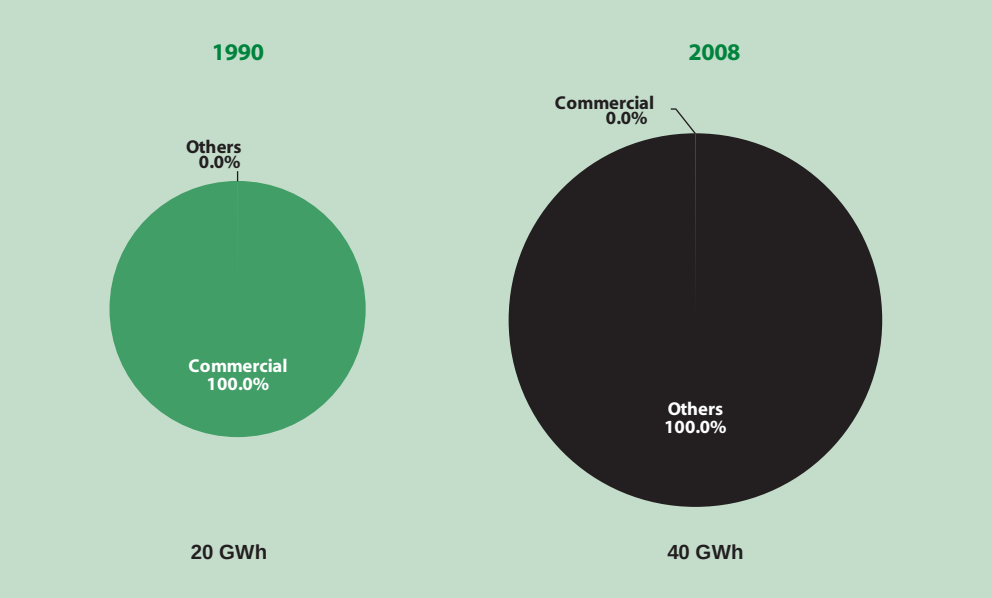
ktoe = thousand tons of oil equivalent.
Source: UNSD (2011a).

Figure 5.12.5 Electricity Generation by Plant Type, 1990 and 2008



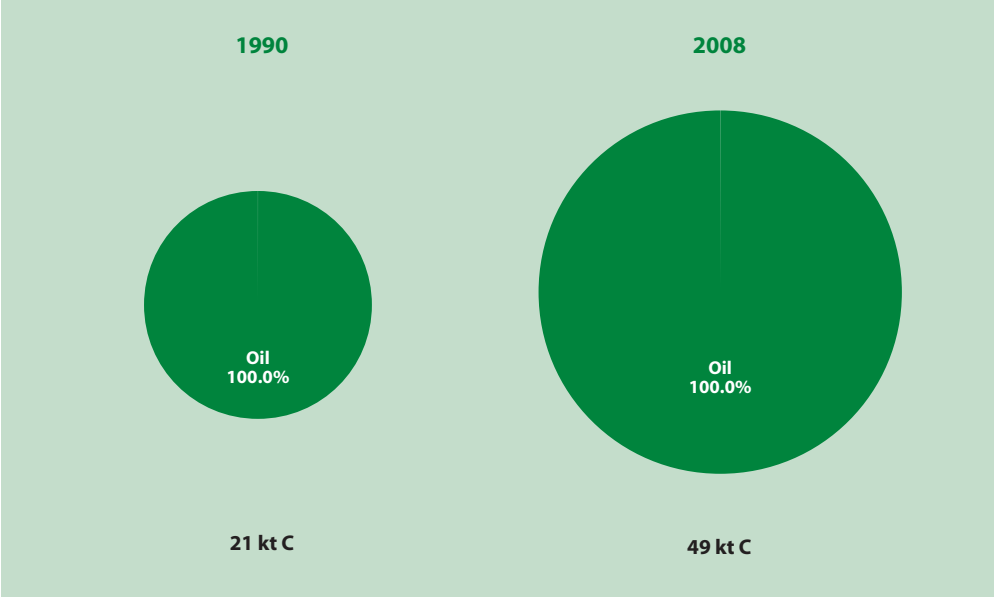
GWh = gigawatt-hour.
Source: UNSD (2011a).

Figure 5.12.6 Electricity Consumption by Sector, 1990 and 2008



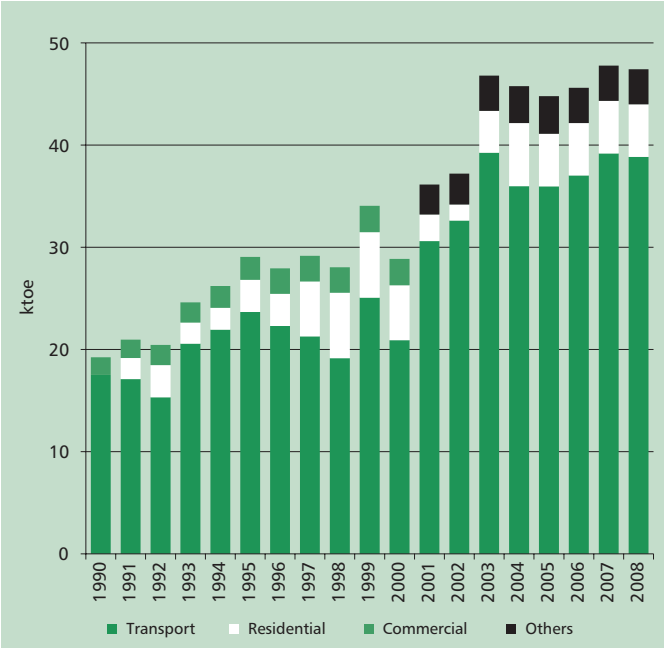
GWh = gigawatt-hour.
Source: UNSD (2011a).

Figure 5.12.7 Carbon Dioxide Emissions from Fuel Combustion, 1990 and 2008



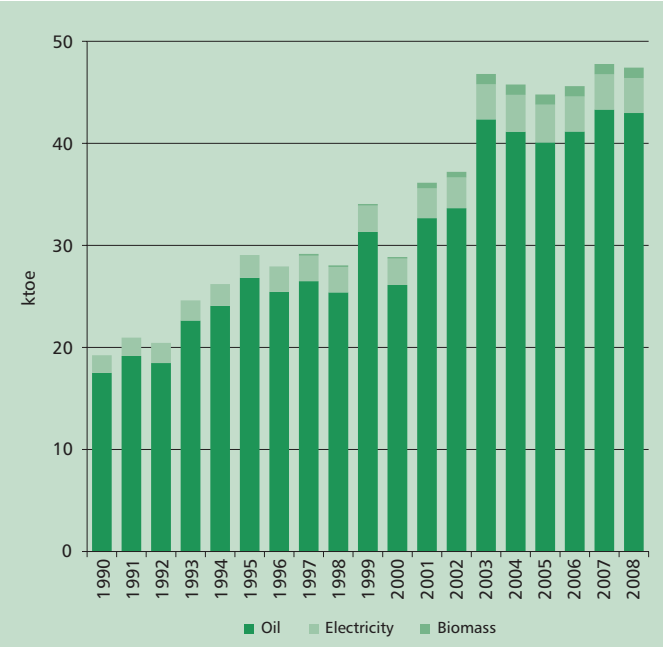
kt C = thousand tons of carbon equivalent.
Source: APERC estimates.

Figure 5.12.8 Final Energy Consumption by Sector, 1990–2008



ktoe = thousand tons of oil equivalent.
Source: UNSD (2011a).

Figure 5.12.9 Final Energy Consumption by Type, 1990–2008

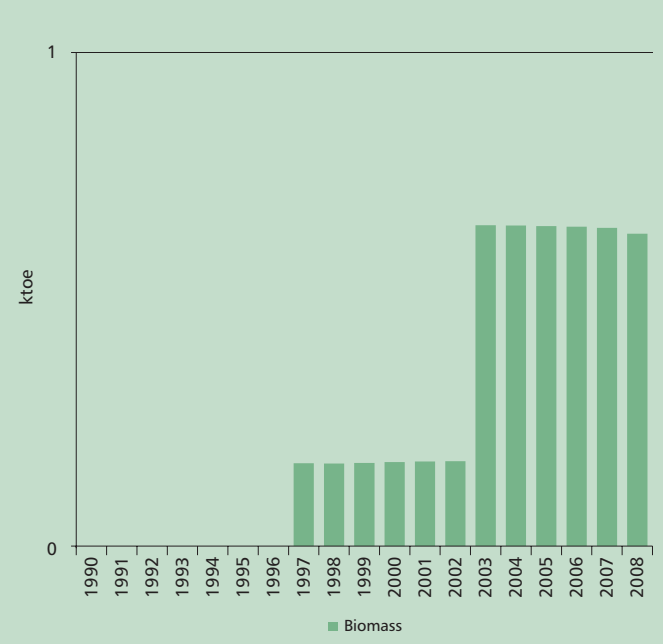


ktoe = thousand tons of oil equivalent.
Source: UNSD (2011a).

Figure 5.12.10 Total Primary Energy Supply, 1990–2008

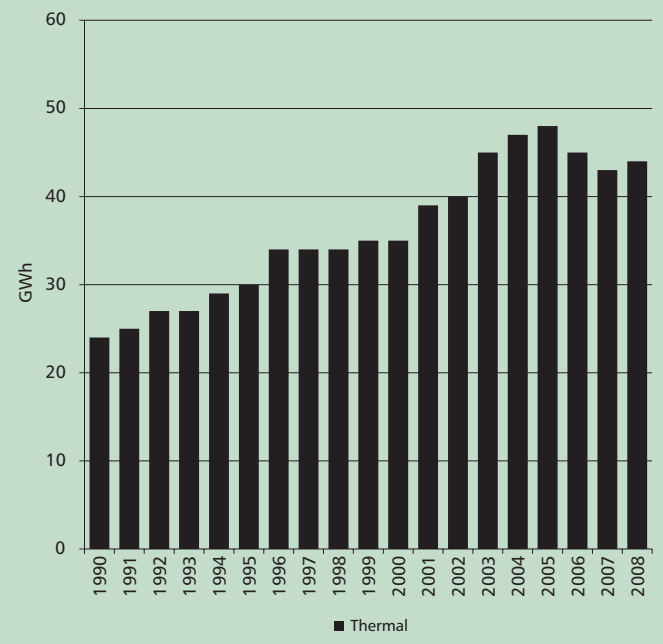
ktoe = thousand tons of oil equivalent.
Source: UNSD (2011a).

Figure 5.12.11 Indigenous Energy Production, 1990–2008



ktoe = thousand tons of oil equivalent.
Source: UNSD (2011a).

Figure 5.12.12 Electricity Generation by Source, 1990–2008



GWh = gigawatt-hour.
Source: UNSD (2011a).

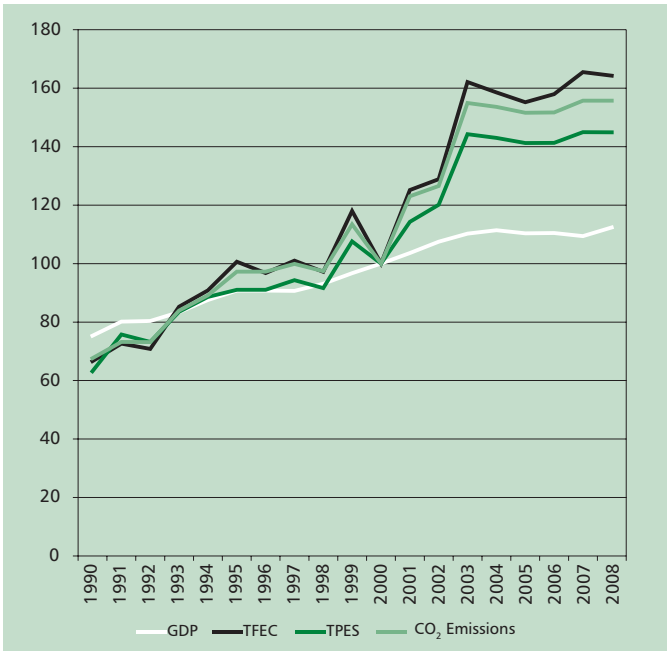
Figure 5.12.13 Fuel Input for Electricity Generation, 1990–2008

ktoe = thousand tons of oil equivalent.
Sources: UNSD (2011a).

Figure 5.12.14 Carbon Dioxide Emissions from Fuel Combustion, 1990–2008

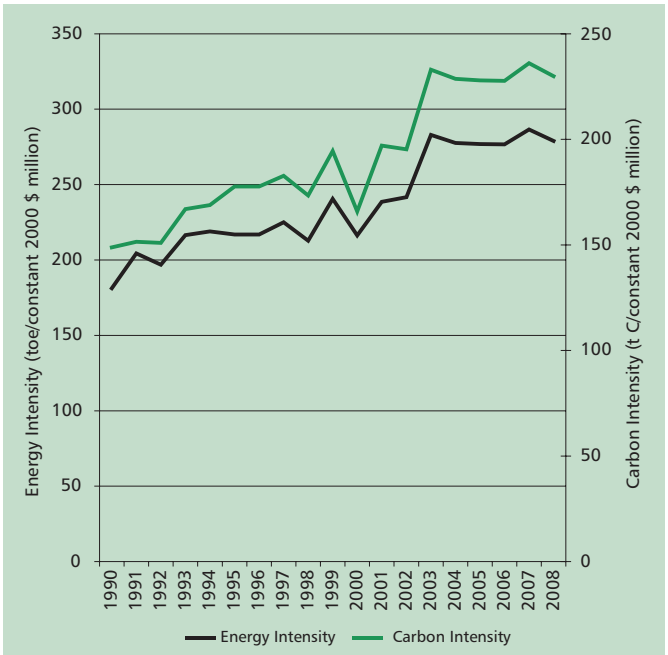
kt C = thousand tons of carbon equivalent.
Source: APERC estimates.

Figure 5.12.15 Growth of GDP, TFEC, TPES, and CO_2 (indexed to year 2000), 1990–2008



CO_2 = carbon dioxide, GDP = gross domestic product, TFEC = total final energy consumption, TPES = total primary energy supply.
Note: Indices are measured relative to the base year 2000 (2000 = 100).
Source: APERC estimates.

Figure 5.12.16 Energy and Carbon Intensities, 1990–2008



t C = ton of carbon equivalent, toe = ton of oil equivalent.
Source: APERC estimates.

Table 5.12.3 Tonga Energy Balance Table, 2005

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
2.	Imports	0	0	0	58	15	4	25	12	0	1	0	0	0	0	0	0	0	0	0	0	58
3.	Exports	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.	International Bunkers	0	0	0	–1	0	0	0	0	0	–1	0	0	0	0	0	0	0	0	0	0	–1
5.	Stock Changes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6.	Total Primary Energy Supply	0	0	0	57	15	4	25	12	0	0	0	0	0	0	0	0	1	0	0	0	58
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	0	0	0	–17	0	0	–4	–12	0	0	0	0	0	0	0	0	0	0	4	0	–12
8.1	Power Generation	0	0	0	–17	0	0	–4	–12	0	0	0	0	0	0	0	0	0	0	4	0	–12
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10.	Discrepancy	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11.	Total Final Energy Consumption	0	0	0	40	15	4	21	0	0	0	0	0	0	0	0	0	1	0	4	0	45
12.	Industry Sector	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13.	Transport Sector	0	0	0	36	15	0	21	0	0	0	0	0	0	0	0	0	0	0	0	0	36
14.	Other Sectors	0	0	0	4	0	4	0	0	0	0	0	0	0	0	0	0	1	0	4	0	9
14.1	Residential and Commercial	0	0	0	4	0	4	0	0	0	0	0	0	0	0	0	0	1	0	0	0	5
14.1.1	Commerce and Public Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14.1.2	Residential	0	0	0	4	0	4	0	0	0	0	0	0	0	0	0	0	1	0	0	0	5
14.2	Non-Specified Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	4
15.	Non-Energy Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16.	Electricity Output (GWh)	0	0	0	48	0	0	12	36	0	0	0	0	0	0	0	0	0	0	0	0	48
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.
Note: Figures may not add up to total because of rounding.
Source: UNSD (2011a).

Table 5.12.4 Tonga Energy Balance Table, 2006

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
2.	Imports	0	0	0	58	15	4	25	12	0	1	0	0	0	0	0	0	0	0	0	0	58
3.	Exports	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.	International Bunkers	0	0	0	–1	0	0	0	0	0	–1	0	0	0	0	0	0	0	0	0	0	–1
5.	Stock Changes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6.	Total Primary Energy Supply	0	0	0	57	15	4	25	12	0	0	0	0	0	0	0	0	1	0	0	0	58
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	0	0	0	–15	0	0	–3	–12	0	0	0	0	0	0	0	0	0	0	4	0	–12
8.1	Power Generation	0	0	0	–15	0	0	–3	–12	0	0	0	0	0	0	0	0	0	0	4	0	–12
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10.	Discrepancy	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11.	Total Final Energy Consumption	0	0	0	41	15	4	22	0	0	0	0	0	0	0	0	0	1	0	3	0	46
12.	Industry Sector	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13.	Transport Sector	0	0	0	37	15	0	22	0	0	0	0	0	0	0	0	0	0	0	0	0	37
14.	Other Sectors	0	0	0	4	0	4	0	0	0	0	0	0	0	0	0	0	1	0	3	0	9
14.1	Residential and Commercial	0	0	0	4	0	4	0	0	0	0	0	0	0	0	0	0	1	0	0	0	5
14.1.1	Commerce and Public Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14.1.2	Residential	0	0	0	4	0	4	0	0	0	0	0	0	0	0	0	0	1	0	0	0	5
14.2	Non-Specified Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3
15.	Non-Energy Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16.	Electricity Output (GWh)	0	0	0	45	0	0	9	36	0	0	0	0	0	0	0	0	0	0	0	0	45
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Source: UNSD (2011a).

Table 5.12.5 Tonga Energy Balance Table, 2007

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
2.	Imports	0	0	0	59	15	4	26	13	0	1	0	0	0	0	0	0	0	0	0	0	60
3.	Exports	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.	International Bunkers	0	0	0	–1	0	0	0	0	0	–1	0	0	0	0	0	0	0	0	0	0	–1
5.	Stock Changes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6.	Total Primary Energy Supply	0	0	0	58	15	4	26	13	0	0	0	0	0	0	0	0	1	0	0	0	59
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	0	0	0	–15	0	0	–2	–13	0	0	0	0	0	0	0	0	0	0	4	0	–11
8.1	Power Generation	0	0	0	–15	0	0	–2	–13	0	0	0	0	0	0	0	0	0	0	4	0	–11
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10.	Discrepancy	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11.	Total Final Energy Consumption	0	0	0	43	15	4	24	0	0	0	0	0	0	0	0	0	1	0	3	0	48
12.	Industry Sector	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13.	Transport Sector	0	0	0	39	15	0	24	0	0	0	0	0	0	0	0	0	0	0	0	0	39
14.	Other Sectors	0	0	0	4	0	4	0	0	0	0	0	0	0	0	0	0	1	0	3	0	9
14.1	Residential and Commercial	0	0	0	4	0	4	0	0	0	0	0	0	0	0	0	0	1	0	0	0	5
14.1.1	Commerce and Public Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14.1.2	Residential	0	0	0	4	0	4	0	0	0	0	0	0	0	0	0	0	1	0	0	0	5
14.2	Non-Specified Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3
15.	Non-Energy Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16.	Electricity Output (GWh)	0	0	0	43	0	0	6	37	0	0	0	0	0	0	0	0	0	0	0	0	43
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.
Note: Figures may not add up to total because of rounding.
Source: UNSD (2011a).

Table 5.12.6 Tonga Energy Balance Table, 2008

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
2.	Imports	0	0	0	59	15	4	26	13	0	1	0	0	0	0	0	0	0	0	0	0	60
3.	Exports	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.	International Bunkers	0	0	0	–1	0	0	0	0	0	–1	0	0	0	0	0	0	0	0	0	0	–1
5.	Stock Changes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6.	Total Primary Energy Supply	0	0	0	58	15	4	26	13	0	0	0	0	0	0	0	0	1	0	0	0	59
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	0	0	0	–15	0	0	–2	–13	0	0	0	0	0	0	0	0	0	0	4	0	–11
8.1	Power Generation	0	0	0	–15	0	0	–2	–13	0	0	0	0	0	0	0	0	0	0	4	0	–11
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10.	Discrepancy	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11.	Total Final Energy Consumption	0	0	0	43	15	4	24	0	0	0	0	0	0	0	0	0	1	0	3	0	47
12.	Industry Sector	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13.	Transport Sector	0	0	0	39	15	0	24	0	0	0	0	0	0	0	0	0	0	0	0	0	39
14.	Other Sectors	0	0	0	4	0	4	0	0	0	0	0	0	0	0	0	0	1	0	3	0	9
14.1	Residential and Commercial	0	0	0	4	0	4	0	0	0	0	0	0	0	0	0	0	1	0	0	0	5
14.1.1	Commerce and Public Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14.1.2	Residential	0	0	0	4	0	4	0	0	0	0	0	0	0	0	0	0	1	0	0	0	5
14.2	Non-Specified Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3
15.	Non-Energy Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16.	Electricity Output (GWh)	0	0	0	44	0	0	7	37	0	0	0	0	0	0	0	0	0	0	0	0	44
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Source: UNSD (2011a).

Table 5.12.7 Tonga Summary Table, 1990–2009

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Indigenous Production (ktoe)																				
Coal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Oil	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Gas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Hydro	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Geothermal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Solar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Wind	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Biomass	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	–
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	–
Primary Energy Supply (ktoe)																				
Coal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Oil	26	31	30	34	36	37	37	38	37	43	40	46	48	58	57	57	57	58	58	–
Gas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Hydro	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Geothermal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Solar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Wind	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Biomass	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	–
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Total	26	31	30	34	36	37	37	38	37	44	41	47	49	59	58	58	58	59	59	–
Final Energy Consumption by Sector (ktoe)																				
Industry	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Transport	18	17	15	21	22	24	22	21	19	25	21	31	33	39	36	36	37	39	39	–
Residential	0	2	3	2	2	3	3	5	6	6	5	3	2	4	6	5	5	5	5	–
Commercial	2	2	2	2	2	2	2	2	2	3	3	0	0	0	0	0	0	0	0	–
Others	0	0	0	0	0	0	0	0	0	0	0	3	3	3	4	4	3	3	3	–
Total	19	21	20	25	26	29	28	29	28	34	29	36	37	47	46	45	46	48	47	–

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Table 5.12.7 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Final Energy Consumption by Type (ktoe)																				
Coal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Oil	18	19	18	23	24	27	25	26	25	31	26	33	34	42	41	40	41	43	43	–
Gas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Electricity	2	2	2	2	2	2	2	2	2	3	3	3	3	3	4	4	3	3	3	–
Heat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Biomass	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	–
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Total	19	21	20	25	26	29	28	29	28	34	29	36	37	47	46	45	46	48	47	–
Power Generation (GWh)																				
Thermal	24	25	27	27	29	30	34	34	34	35	35	39	40	45	47	48	45	43	44	–
Hydro	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Geothermal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Solar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Wind	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Total	24	25	27	27	29	30	34	34	34	35	35	39	40	45	47	48	45	43	44	–
Loss and Own Use of Electricity (GWh)																				
Transmission and Distribution Losses	4	4	4	4	4	4	5	5	5	5	5	5	5	5	5	5	5	3	4	–
Own Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Total	4	4	4	4	4	4	5	5	5	5	5	5	5	5	5	5	5	3	4	–
Fuel Input for Power Generation (ktoe)																				
Coal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Oil	8	9	9	9	10	10	12	12	12	12	12	13	14	15	16	17	15	15	15	–
Gas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Total	8	9	9	9	10	10	12	12	12	12	12	13	14	15	16	17	15	15	15	–
CO_2 Emissions (kt C)																				
Coal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Oil	21	23	23	26	28	30	30	31	30	35	31	38	40	48	48	47	47	49	49	–
Gas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Total	21	23	23	26	28	30	30	31	30	35	31	38	40	48	48	47	47	49	49	–

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Table 5.12.7 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Macroeconomic Indicators																				
Population (thousand)	95	95	95	96	96	96	96	97	97	97	98	98	99	100	100	101	102	102	103	104
Urban Population, %	22.7	22.7	22.8	22.8	22.9	22.9	23.0	23.0	23.1	23.1	23.2	23.4	23.5	23.7	23.8	24.0	24.3	24.5	24.8	25.0
GDP (constant 2000 $ million)	142	151	152	157	165	171	171	171	176	182	189	195	203	208	210	208	208	206	212	212
GDP (current $ million)	114	132	137	138	194	203	220	212	189	195	189	166	181	207	239	260	295	305	348	312
GDP (constant 2005 PPP $ million)	285	304	304	316	331	344	344	343	353	366	379	392	407	417	422	418	418	414	425	425
GDP/capita (constant 2000 $)	1,494	1,587	1,589	1,646	1,725	1,785	1,780	1,771	1,812	1,873	1,926	1,984	2,047	2,087	2,095	2,062	2,051	2,018	2,059	2,044
GDP/capita (current $)	1,194	1,387	1,436	1,450	2,025	2,112	2,283	2,197	1,946	1,998	1,926	1,681	1,826	2,082	2,379	2,573	2,903	2,983	3,382	3,011
GDP – Manufacturing (% of GDP)	13.8	12.2	12 .1	12.3	10.0	9.2	9.6	9.8	9.6	9.6	9.2	8.8	8.7	8.9	9.2	8.7	8.5	8.4	8.3	8.8
Car Ownership (car/1,000 persons)	–	–	–	–	–	–	–	–	–	–	–	–	–	193	191	190	190	189	188	192
Basic Energy Indicators																				
TPES/capita (toe/person)	0.27	0.32	0.31	0.36	0.38	0.39	0.39	0.40	0.39	0.45	0.42	0.47	0.49	0.59	0.58	0.57	0.57	0.58	0.57	–
TFEC/capita (toe/person)	0.20	0.22	0.21	0.26	0.27	0.30	0.29	0.30	0.29	0.35	0.29	0.37	0.38	0.47	0.46	0.44	0.45	0.47	0.46	–
TPES/GDP (toe/constant 2000 $ million)	181	204	197	217	219	217	217	225	213	241	216	239	242	283	278	277	277	286	279	–
TFEC/GDP (toe/constant 2000 $ million)	135	139	135	156	159	170	163	170	160	187	153	185	183	225	218	215	219	231	224	–
Import Dependency (%)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.6	99.6	99.6	99.6	99.6	99.6	98.9	98.9	98.9	98.9	98.9	98.9	–
Oil Import Dependency (%)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	–
Electricity/capita (kWh/ person)	210	220	241	241	261	271	301	300	299	308	306	345	353	401	419	426	394	391	389	–
CO_2 Intensity (t C/constant 2000 $ million)	149	151	151	167	169	178	178	183	173	194	166	197	195	233	229	228	228	236	230	–
CO_2/capita (t C)	0.22	0.24	0.24	0.27	0.29	0.32	0.32	0.32	0.31	0.36	0.32	0.39	0.40	0.49	0.48	0.47	0.47	0.48	0.47	–
CO_2/TPES (t C/toe)	0.82	0.74	0.77	0.77	0.77	0.82	0.82	0.81	0.82	0.81	0.77	0.83	0.81	0.82	0.82	0.82	0.82	0.82	0.82	–

– = no data or not applicable, CO_2 = carbon dioxide, GDP = gross domestic product, GWh = gigawatt–hour, kt C = thousand tons of carbon equivalent, ktoe = thousand tons of oil equivalent, kWh = kilowatt–hour, PPP = purchasing power parity, t C = ton of carbon equivalent, TFEC = total final energy consumption, toe = ton of oil equivalent, TPES = total primary energy supply.

Note: Figures may not add up to total because of rounding.

Sources: APERC estimates, JAMA (2012), UNSD (2011a), and World Bank.

5.13 Vanuatu

Country Profile (2009)		Energy Reserves (year-end 2008)	
Total Surface Area (square kilometer)	12,190	Coal (million ton) - Recoverable	0.0
Population (thousand)	234	Gas (trillion cubic feet) - Proven	0.0
GDP (billion constant 2000 $)	0.4	Oil (billion barrel) - Proven	0.0
Electrification Rate (%)	27.0		

GDP = gross domestic product.

Sources: ADB (2012). CIA (2012), Ostojic et al. (2011), and World Bank.

2008 Energy Supply and Demand Flow (ktoe)

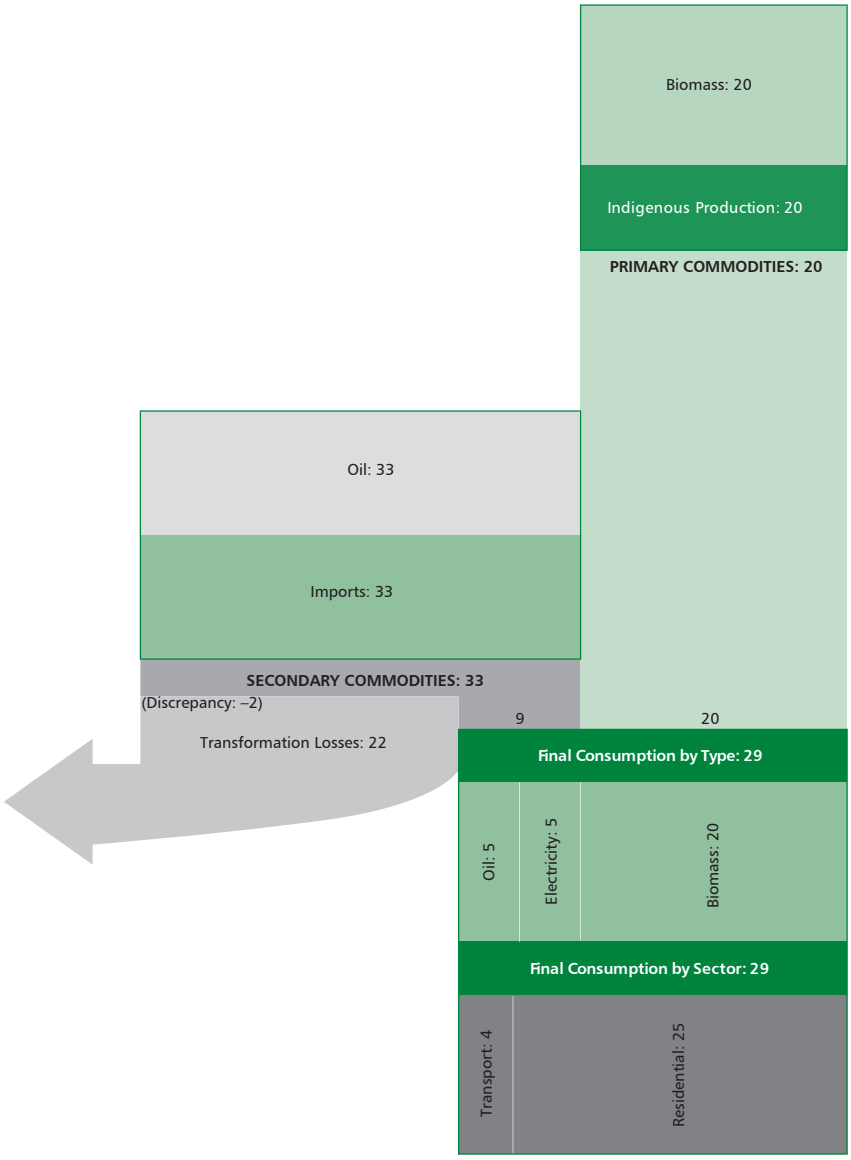


Table 5.13.1 Key Data and Economic Profile

	1990	1995	2000	2005	2008
Socioeconomic Data					
Population (thousand)	147	168	185	211	228
GDP (constant 2000 $ billion)	0.2	0.2	0.3	0.3	0.3
GDP (constant 2005 PPP $ billion)	0.5	0.6	0.7	0.7	0.9
GDP/capita (constant 2000 $)	1,327	1,358	1,470	1,356	1,524
GDP/capita (constant 2005 PPP $)	3,427	3,507	3,794	3,500	3,935

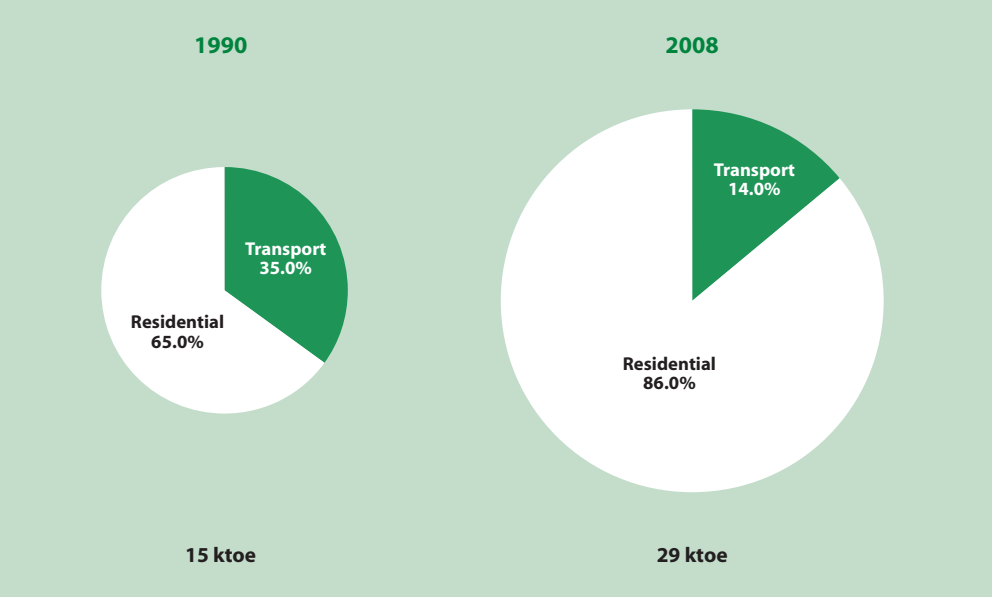
GDP = gross domestic product, PPP = purchasing power parity.
Source: World Bank.

Table 5.13.2 Energy Supply and Demand

	1990	1995	2000	2005	2008
Primary Energy Supply (ktoe)					
Indigenous Production	5	5	20	20	20
Net Imports	23	22	27	19	33
Total PES	29	28	48	39	53
Coal	0	0	0	0	0
Oil	23	22	28	19	33
Gas	0	0	0	0	0
Biomass	5	5	20	20	20
Others	0	0	0	0	0
TPES/capita (toe)	0.20	0.17	0.26	0.19	0.23
TPES/GDP (toe/constant 2005 PPP $ million)	58	47	68	53	59
Final Energy Consumption (ktoe)					
Industry	0	0	0	0	0
Transportation	5	4	5	3	4
Other Sectors	10	9	25	25	25
Total FEC	15	14	30	27	29
Coal	0	0	0	0	0
Oil	7	5	6	4	5
Gas	0	0	0	0	0
Electricity	2	3	4	4	5
Biomass	5	5	20	20	20
Others	0	0	0	0	0

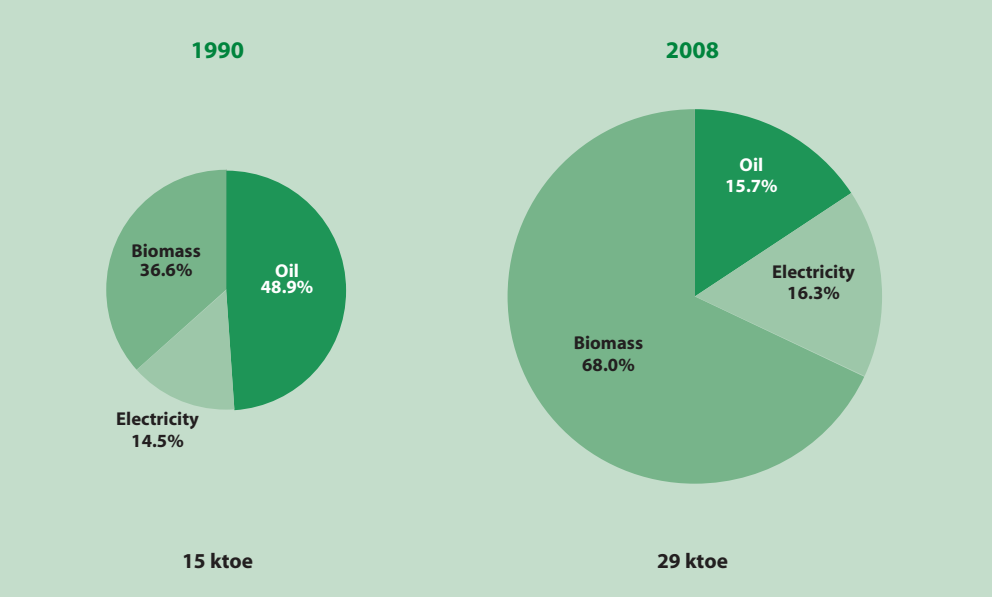
FEC = final energy consumption, GDP = gross domestic product, ktoe = thousand tons of oil equivalent, PES = primary energy supply, PPP = purchasing power parity, toe = ton of oil equivalent, TPES = total primary energy supply.
Source: UNSD (2011a).

Figure 5.13.1 Final Energy Consumption by Sector, 1990 and 2008



ktoe = thousand tons of oil equivalent.
Source: UNSD (2011a).

Figure 5.13.2 Final Energy Consumption by Type of Energy, 1990 and 2008

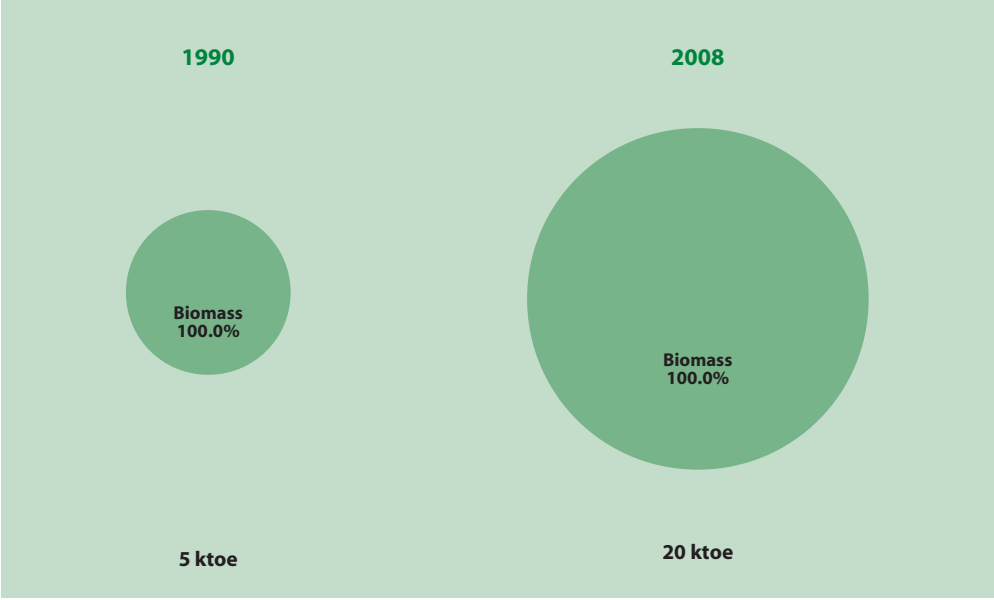


ktoe = thousand tons of oil equivalent.
Source: UNSD (2011a).

Figure 5.13.3 Total Primary Energy Supply, 1990 and 2008

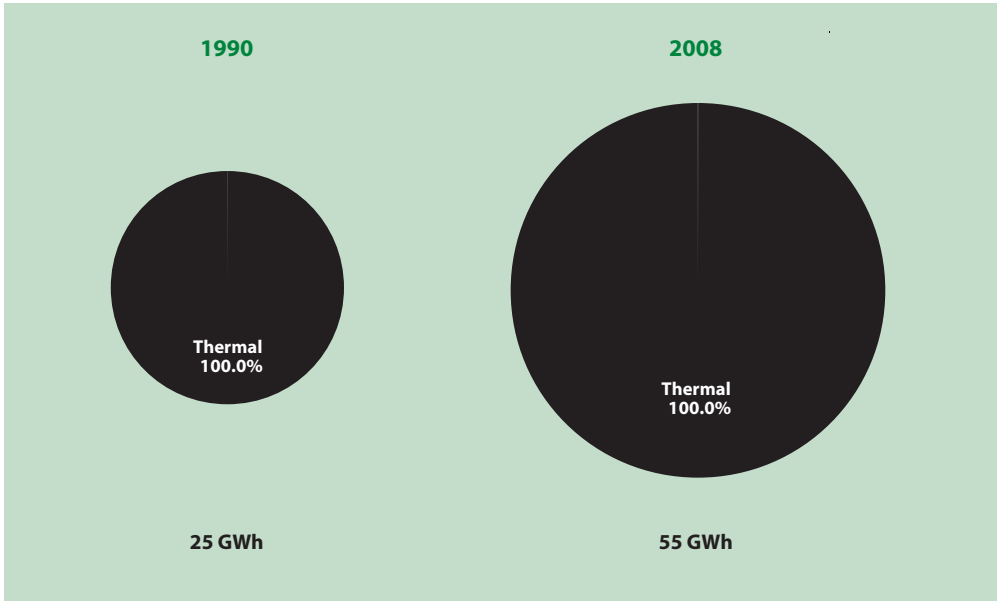
ktoe = thousand tons of oil equivalent.
Source: UNSD (2011a).

Figure 5.13.4 Indigenous Energy Production, 1990 and 2008



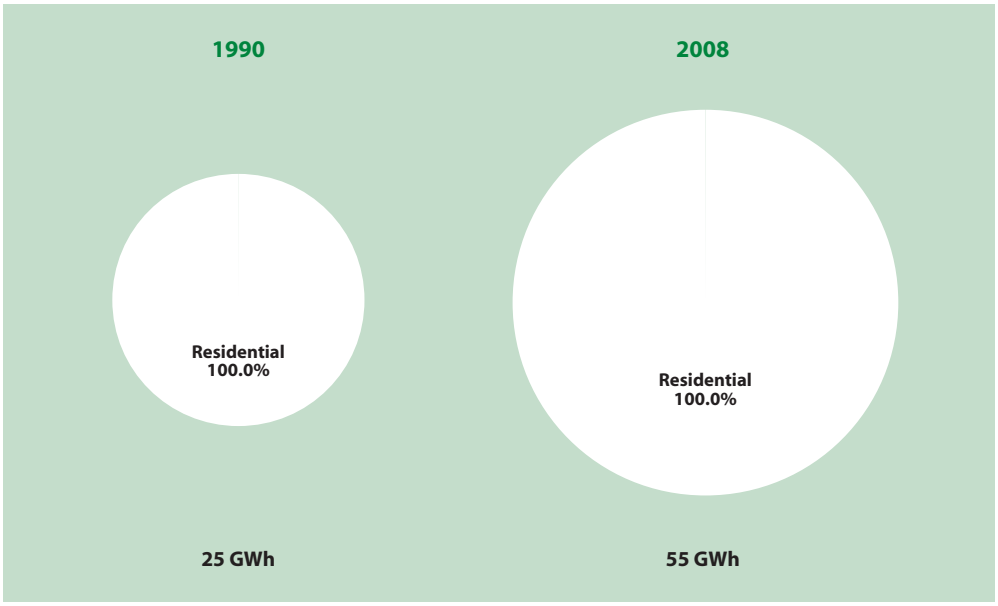
ktoe = thousand tons of oil equivalent.
Source: UNSD (2011a).

Figure 5.13.5 Electricity Generation by Plant Type, 1990 and 2008



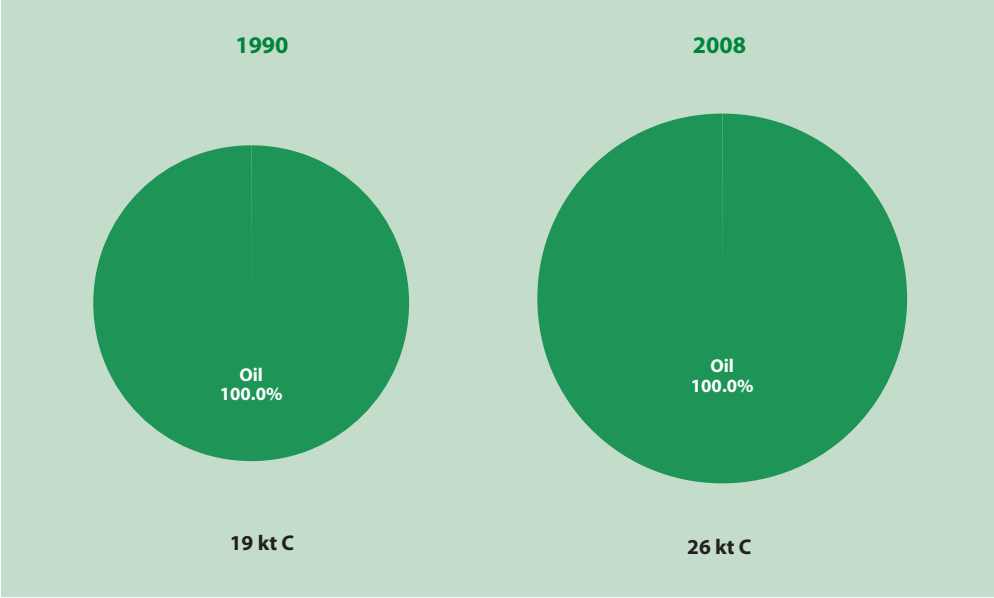
GWh = gigawatt-hour.
Source: UNSD (2011a).

Figure 5.13.6 Electricity Consumption by Sector, 1990 and 2008



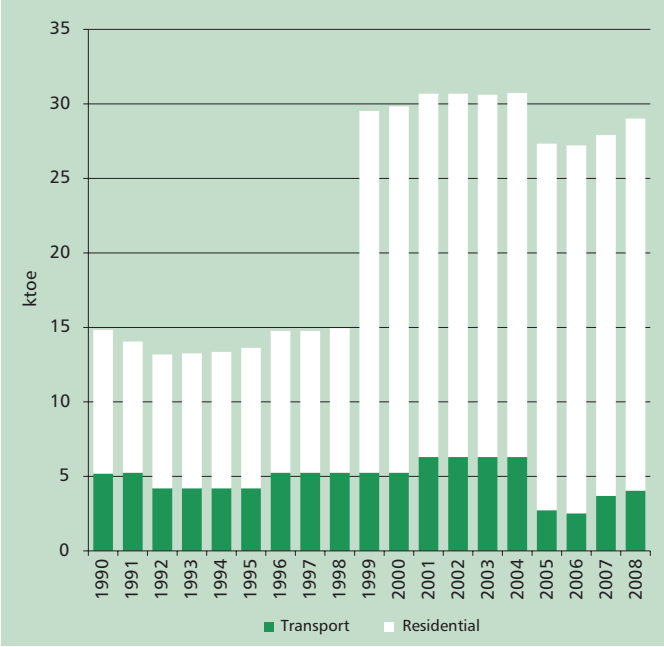
GWh = gigawatt-hour.
Source: UNSD (2011a).

Figure 5.13.7 Carbon Dioxide Emissions from Fuel Combustion, 1990 and 2008



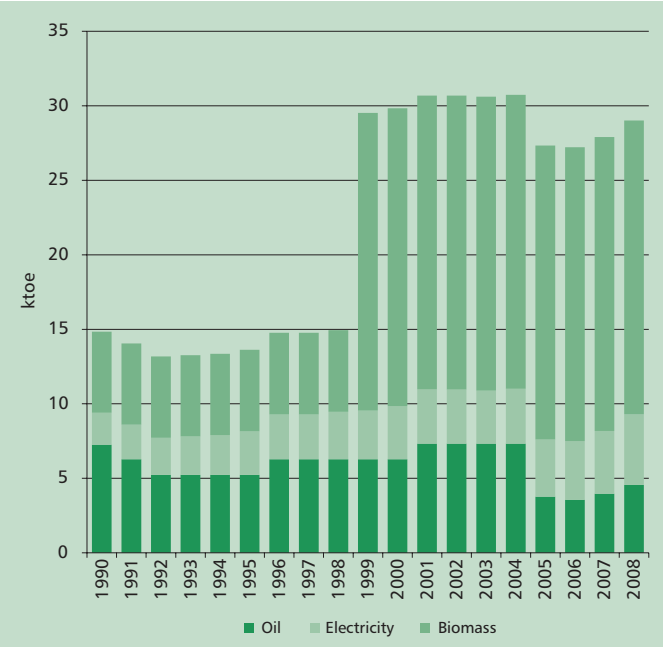
kt C = thousand tons of carbon equivalent.
Source: APERC estimates.

Figure 5.13.8 Final Energy Consumption by Sector, 1990–2008



ktoe = thousand tons of oil equivalent.
Note: Final energy consumption of biomass abruptly increased from 1998 to 1989. There may have been a change in the method for the re-estimation of biomass consumption from 1999 onwards.
Source: UNSD (2011a).

Figure 5.13.9 Final Energy Consumption by Type, 1990–2008

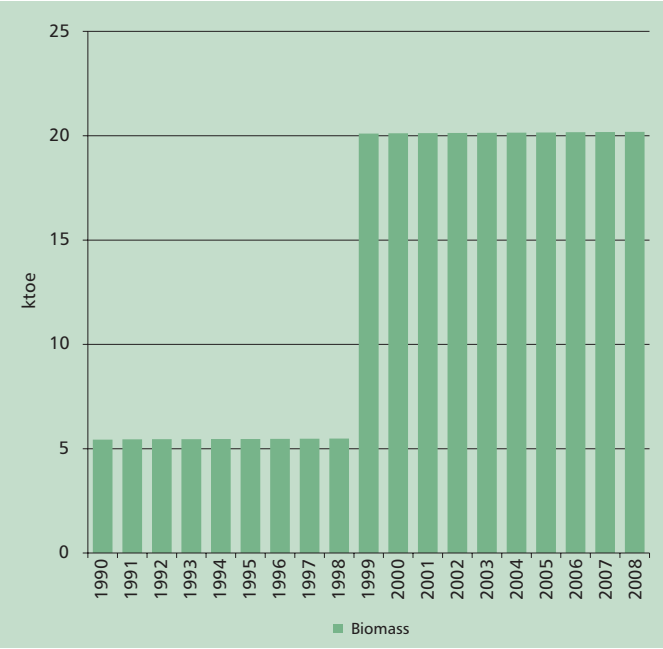


ktoe = thousand tons of oil equivalent.
Note: Final energy consumption of biomass abruptly increased from 1998 to 1989. There may have been a change in the method for the re-estimation of biomass consumption from 1999 onwards.
Source: UNSD (2011a).

Figure 5.13.10 Total Primary Energy Supply, 1990–2008

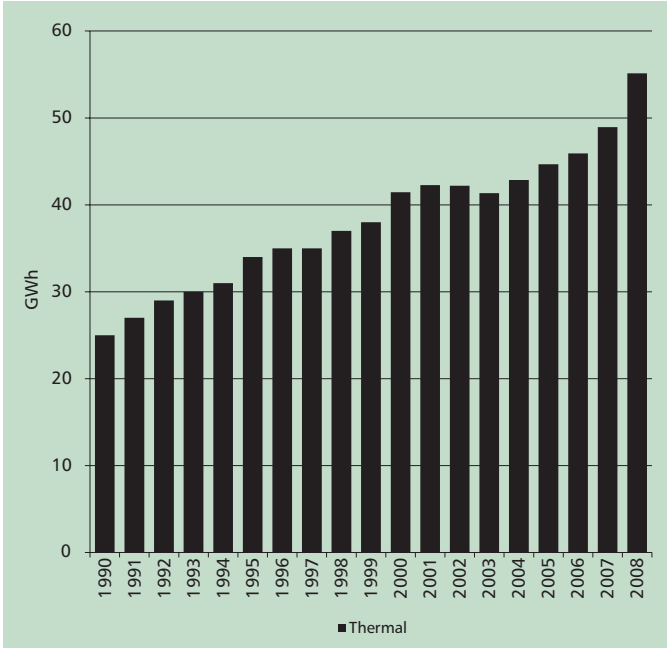
ktoe = thousand tons of oil equivalent.
Note: Primary energy supply of biomass abruptly increased from 1998 to 1989. There may have been a change in the method for the re-estimation of biomass consumption from 1999 onwards.
Source: UNSD (2011a).

Figure 5.13.11 Indigenous Energy Production, 1990–2008



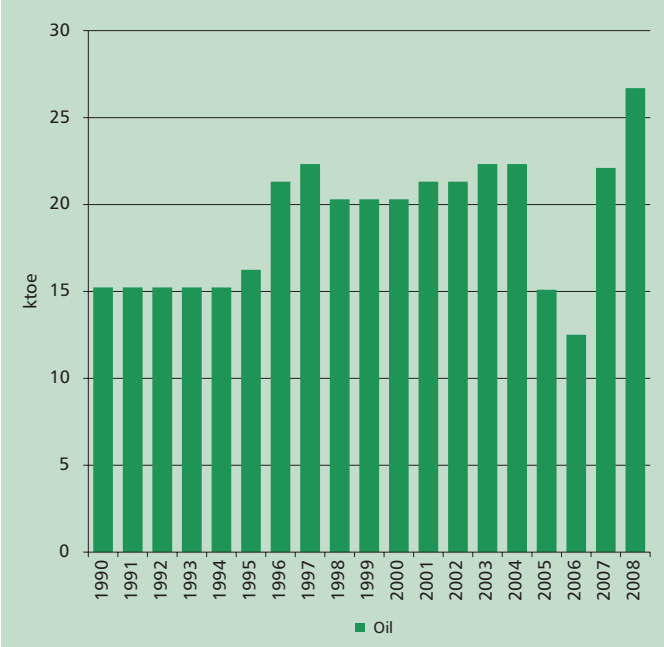
ktoe = thousand tons of oil equivalent.
Note: Indigenous production of biomass abruptly increased from 1998 to 1989. There may have been a change in the method for the re-estimation of biomass consumption from 1999 onwards.
Source: UNSD (2011a).

Figure 5.13.12 Electricity Generation by Source, 1990–2008



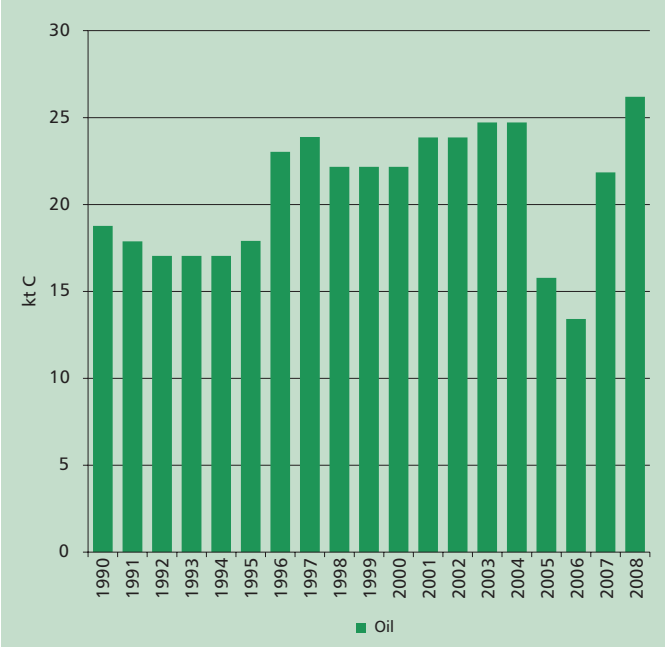
GWh = gigawatt-hour.
Source: UNSD (2011a).

Figure 5.13.13 Fuel Input for Electricity Generation, 1990–2008



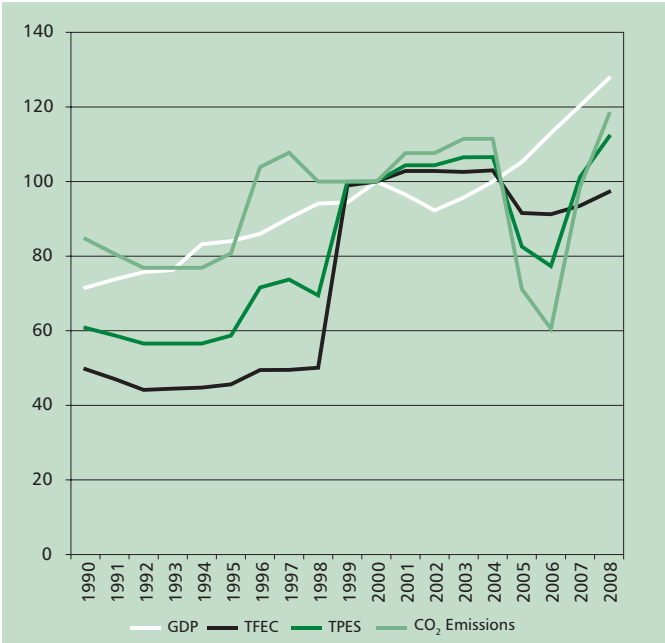
ktoe = thousand tons of oil equivalent.
Sources: APERC estimates, and UNSD (2011a).

Figure 5.13.14 Carbon Dioxide Emissions from Fuel Combustion, 1990–2008



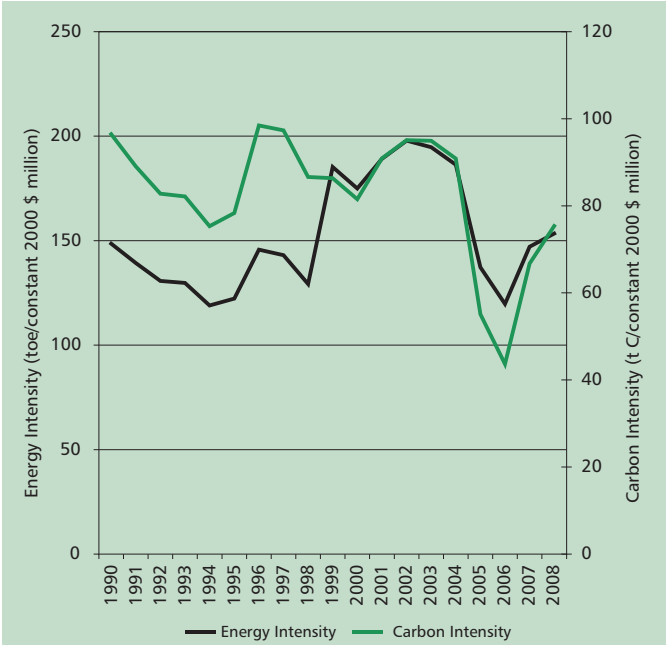
kt C = thousand tons of carbon equivalent.
Source: APERC estimates.

Figure 5.13.15 Growth of GDP, TFEC, TPES, and CO_2 (indexed to year 2000), 1990–2008



CO_2 = carbon dioxide, GDP = gross domestic product, TFEC = total final energy consumption, TPES = total primary energy supply.
Notes:
1. Indices are measured relative to the base year 2000 (2000 = 100).
2. Indigenous production, primary energy supply, and final energy consumption of biomass abruptly increased from 1998 to 1989. There may have been a change in the method for the re-estimation of biomass consumption from 1999 onwards. This explains the jump in the indices for TFEC and TPES from 1998 to 1999.
Source: APERC estimates.

Figure 5.13.16 Energy and Carbon Intensities, 1990–2008



t C = ton of carbon equivalent, toe = ton of oil equivalent.
Source: APERC estimates.

Table 5.13.3 Vanuatu Energy Balance Table, 2005

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	0	0	0	20
2.	Imports	0	0	0	19	3	0	15	0	0	1	0	0	0	0	0	0	0	0	0	0	19
3.	Exports	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.	International Bunkers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5.	Stock Changes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6.	Total Primary Energy Supply	0	0	0	19	3	0	15	0	0	1	0	0	0	0	0	0	20	0	0	0	39
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	0	0	0	–15	0	0	–15	0	0	0	0	0	0	0	0	0	0	0	4	0	–11
8.1	Power Generation	0	0	0	–15	0	0	–15	0	0	0	0	0	0	0	0	0	0	0	4	0	–11
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10.	Discrepancy	0	0	0	0	0	1	0	0	0	–1	0	0	0	0	0	0	0	0	0	0	–1
11.	Total Final Energy Consumption	0	0	0	4	3	1	0	0	0	0	0	0	0	0	0	0	20	0	4	0	27
12.	Industry Sector	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13.	Transport Sector	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
14.	Other Sectors	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	20	0	4	0	25
14.1	Residential and Commercial	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	20	0	4	0	25
14.1.1	Commerce and Public Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14.1.2	Residential	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	20	0	4	0	25
14.2	Non-Specified Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15.	Non-Energy Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16.	Electricity Output (GWh)	0	0	0	45	0	0	45	0	0	0	0	0	0	0	0	0	0	0	0	0	45
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.
Note: Figures may not add up to total because of rounding.
Source: UNSD (2011a).

Table 5.13.4 Vanuatu Energy Balance Table, 2006

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	0	0	0	20
2.	Imports	0	0	0	17	3	1	13	0	0	1	0	0	0	0	0	0	0	0	0	0	17
3.	Exports	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.	International Bunkers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5.	Stock Changes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6.	Total Primary Energy Supply	0	0	0	17	3	1	13	0	0	1	0	0	0	0	0	0	20	0	0	0	37
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	0	0	0	–13	0	0	–13	0	0	0	0	0	0	0	0	0	0	0	4	0	–9
8.1	Power Generation	0	0	0	–13	0	0	–13	0	0	0	0	0	0	0	0	0	0	0	4	0	–9
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10.	Discrepancy	0	0	0	–1	0	0	0	0	0	–1	0	0	0	0	0	0	0	0	0	0	–1
11.	Total Final Energy Consumption	0	0	0	4	3	1	0	0	0	0	0	0	0	0	0	0	20	0	4	0	27
12.	Industry Sector	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13.	Transport Sector	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
14.	Other Sectors	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	20	0	4	0	25
14.1	Residential and Commercial	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	20	0	4	0	25
14.1.1	Commerce and Public Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14.1.2	Residential	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	20	0	4	0	25
14.2	Non-Specified Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15.	Non-Energy Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16.	Electricity Output (GWh)	0	0	0	46	0	0	46	0	0	0	0	0	0	0	0	0	0	0	0	0	46
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Source: UNSD (2011a).

Table 5.13.5 Vanuatu Energy Balance Table, 2007

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	0	0	0	20
2.	Imports	0	0	0	28	4	0	22	0	0	2	0	0	0	0	0	0	0	0	0	0	28
3.	Exports	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.	International Bunkers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5.	Stock Changes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6.	Total Primary Energy Supply	0	0	0	28	4	0	22	0	0	2	0	0	0	0	0	0	20	0	0	0	48
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	0	0	0	–22	0	0	–22	0	0	0	0	0	0	0	0	0	0	0	4	0	–18
8.1	Power Generation	0	0	0	–22	0	0	–22	0	0	0	0	0	0	0	0	0	0	0	4	0	–18
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10.	Discrepancy	0	0	0	–2	0	0	0	0	0	–2	0	0	0	0	0	0	0	0	0	0	–2
11.	Total Final Energy Consumption	0	0	0	4	4	0	0	0	0	0	0	0	0	0	0	0	20	0	4	0	28
12.	Industry Sector	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13.	Transport Sector	0	0	0	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
14.	Other Sectors	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	0	4	0	24
14.1	Residential and Commercial	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	0	4	0	24
14.1.1	Commerce and Public Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14.1.2	Residential	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	0	4	0	24
14.2	Non-Specified Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15.	Non-Energy Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16.	Electricity Output (GWh)	0	0	0	49	0	0	49	0	0	0	0	0	0	0	0	0	0	0	0	0	49
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.
Note: Figures may not add up to total because of rounding.
Source: UNSD (2011a).

Table 5.13.6 Vanuatu Energy Balance Table, 2008

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	0	0	0	20
2.	Imports	0	0	0	33	4	1	27	0	0	2	0	0	0	0	0	0	0	0	0	0	33
3.	Exports	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.	International Bunkers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5.	Stock Changes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6.	Total Primary Energy Supply	0	0	0	33	4	1	27	0	0	2	0	0	0	0	0	0	20	0	0	0	53
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	0	0	0	–27	0	0	–27	0	0	0	0	0	0	0	0	0	0	0	5	0	–22
8.1	Power Generation	0	0	0	–27	0	0	–27	0	0	0	0	0	0	0	0	0	0	0	5	0	–22
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10.	Discrepancy	0	0	0	–2	0	0	0	0	0	–2	0	0	0	0	0	0	0	0	0	0	–2
11.	Total Final Energy Consumption	0	0	0	5	4	1	0	0	0	0	0	0	0	0	0	0	20	0	5	0	29
12.	Industry Sector	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13.	Transport Sector	0	0	0	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
14.	Other Sectors	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	20	0	5	0	25
14.1	Residential and Commercial	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	20	0	5	0	25
14.1.1	Commerce and Public Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14.1.2	Residential	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	20	0	5	0	25
14.2	Non-Specified Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15.	Non-Energy Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16.	Electricity Output (GWh)	0	0	0	55	0	0	55	0	0	0	0	0	0	0	0	0	0	0	0	0	55
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Source: UNSD (2011a).

Table 5.13.7 Vanuatu Summary Table, 1990–2009

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Indigenous Production (ktoe)																				
Coal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Oil	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Gas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Hydro	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Geothermal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Solar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Wind	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Biomass	5	5	5	5	5	5	5	5	5	20	20	20	20	20	20	20	20	20	20	–
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Total	5	5	5	5	5	5	5	5	5	20	20	20	20	20	20	20	20	20	20	–
Primary Energy Supply (ktoe)																				
Coal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Oil	23	23	21	21	21	22	29	30	28	28	28	30	30	31	31	19	17	28	33	–
Gas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Hydro	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Geothermal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Solar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Wind	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Biomass	5	5	5	5	5	5	5	5	5	20	20	20	20	20	20	20	20	20	20	–
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Total	29	28	27	27	27	28	34	35	33	48	48	50	50	51	51	39	37	48	53	–
Final Energy Consumption by Sector (ktoe)																				
Industry	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Transport	5	5	4	4	4	4	5	5	5	5	5	6	6	6	6	3	3	4	4	–
Residential	10	9	9	9	9	9	10	10	10	24	25	24	24	24	24	25	25	24	25	–
Commercial	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Total	15	14	13	13	13	14	15	15	15	30	30	31	31	31	31	27	27	28	29	–

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Table 5.13.7 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Final Energy Consumption by Type (ktoe)																				
Coal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Oil	7	6	5	5	5	5	6	6	6	6	6	7	7	7	7	4	4	4	5	–
Gas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Electricity	2	2	2	3	3	3	3	3	3	3	4	4	4	4	4	4	4	4	5	–
Heat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Biomass	5	5	5	5	5	5	5	5	5	20	20	20	20	20	20	20	20	20	20	–
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Total	15	14	13	13	13	14	15	15	15	30	30	31	31	31	31	27	27	28	29	–
Power Generation (GWh)																				
Thermal	25	27	29	30	31	34	35	35	37	38	41	42	42	41	43	45	46	49	55	–
Hydro	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Geothermal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Solar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Wind	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Total	25	27	29	30	31	34	35	35	37	38	41	42	42	41	43	45	46	49	55	–
Loss and Own Use of Electricity (GWh)																				
Transmission and Distribution Losses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Own Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Fuel Input for Power Generation (ktoe)																				
Coal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Oil	15	15	15	15	15	16	21	22	20	20	20	21	21	22	22	15	13	22	27	–
Gas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Total	15	15	15	15	15	16	21	22	20	20	20	21	21	22	22	15	13	22	27	–
CO_2 Emissions (kt C)																				
Coal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Oil	19	18	17	17	17	18	23	24	22	22	22	24	24	25	25	16	13	22	26	–
Gas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Total	19	18	17	17	17	18	23	24	22	22	22	24	24	25	25	16	13	22	26	–

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Table 5.13.7 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Macroeconomic Indicators																				
Population (thousand)	147	151	155	160	164	168	172	175	178	181	185	190	195	200	206	211	217	222	228	234
Urban Population, %	18.7	19.0	19.3	19.6	19.9	20.2	20.5	20.8	21.1	21.4	21.7	22.1	22.4	22.8	23.1	23.5	23.9	24.3	24.8	25.2
GDP (constant 2000 $ million)	195	201	206	207	226	229	234	245	256	257	272	263	251	260	272	286	307	327	348	360
GDP (current $ million)	158	189	196	188	219	234	245	256	262	268	272	258	262	313	364	393	435	528	593	590
GDP (constant 2005 PPP $ million)	502	518	532	536	584	590	604	633	661	663	702	678	648	672	702	739	793	845	897	928
GDP/capita (constant 2000 $)	1,327	1,331	1,326	1,298	1,378	1,358	1,362	1,403	1,438	1,417	1,470	1,385	1,290	1,302	1,323	1,356	1,418	1,472	1,524	1,538
GDP/capita (current $)	1,080	1,253	1,263	1,177	1,335	1,390	1,427	1,463	1,474	1,479	1,470	1,361	1,345	1,567	1,770	1,862	2,009	2,373	2,602	2,526
GDP – Manufacturing (% of GDP)	5.4	6.1	5.5	5.1	4.8	4.9	4.9	4.7	4.4	4.5	4.5	4.7	4.4	4.3	4.2	4.0	3.8	3.6	3.8	2.8
Car Ownership (car/1,000 persons)	–	–	–	–	–	–	–	–	–	–	–	–	–	64	63	63	63	62	61	62
Basic Energy Indicators																				
TPES/capita (toe/person)	0.20	0.19	0.17	0.17	0.16	0.17	0.20	0.20	0.19	0.26	0.26	0.26	0.26	0.25	0.25	0.19	0.17	0.22	0.23	–
TFEC/capita (toe/person)	0.10	0.09	0.08	0.08	0.08	0.08	0.09	0.08	0.08	0.16	0.16	0.16	0.16	0.15	0.15	0.13	0.13	0.13	0.13	–
TPES/GDP (toe/constant 2000 $ million)	149	139	131	130	119	122	146	143	129	185	175	189	198	195	186	137	120	147	153	–
TFEC/GDP (toe/constant 2000 $ million)	76	70	64	64	59	60	63	60	58	115	110	117	122	118	113	95	89	85	83	–
Import Dependency (%)	81.2	80.5	79.7	79.7	79.7	80.4	83.9	84.4	83.4	57.7	57.7	59.5	59.5	60.3	60.3	48.7	45.2	58.1	62.1	–
Oil Import Dependency (%)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	–
Electricity/capita (kWh/ person)	170	179	187	188	189	202	204	200	208	210	224	223	217	207	208	212	212	220	242	–
CO_2 Intensity (t C/constant 2000 $ million)	96	89	83	82	75	78	98	97	87	86	82	91	95	95	91	55	44	67	75	–
CO_2/capita (t C)	0.13	0.12	0.11	0.11	0.10	0.11	0.13	0.14	0.12	0.12	0.12	0.13	0.12	0.12	0.12	0.07	0.06	0.10	0.11	–
CO_2/TPES (t C/toe)	0.65	0.64	0.63	0.63	0.63	0.64	0.68	0.68	0.67	0.47	0.47	0.48	0.48	0.49	0.49	0.40	0.36	0.45	0.49	–

– = no data or not applicable, CO_2 = carbon dioxide, GDP = gross domestic product, GWh = gigawatt–hour, kt C = thousand tons of carbon equivalent, ktoe = thousand tons of oil equivalent, kWh = kilowatt–hour, PPP = purchasing power parity, t C = ton of carbon equivalent, TFEC = total final energy consumption, toe = ton of oil equivalent, TPES = total primary energy supply.

Note: Figures may not add up to total because of rounding.

Sources: APERC estimates, JAMA (2012), UNSD (2011a), and World Bank.

Chapter 6

South Asia

South Asia

Regional Profile (2009)		Energy Reserves (year-end 2008)	
Total Surface Area (square kilometer)	3,682,740	Coal (million ton) - Recoverable	60,894.0
Population (thousand)	1,353,505	Gas (trillion cubic feet) - Proven	50.1
GDP (constant 2000 $ billion)	998.4	Oil (billion barrel) - Proven	5,864.0
Electrification Rate (%)	70.7		

GDP = gross domestic product.

Sources: ADB (2012), APERC estimates, World Bank, and WEC (2010).

2009 Energy Supply and Demand Flow (ktoe)

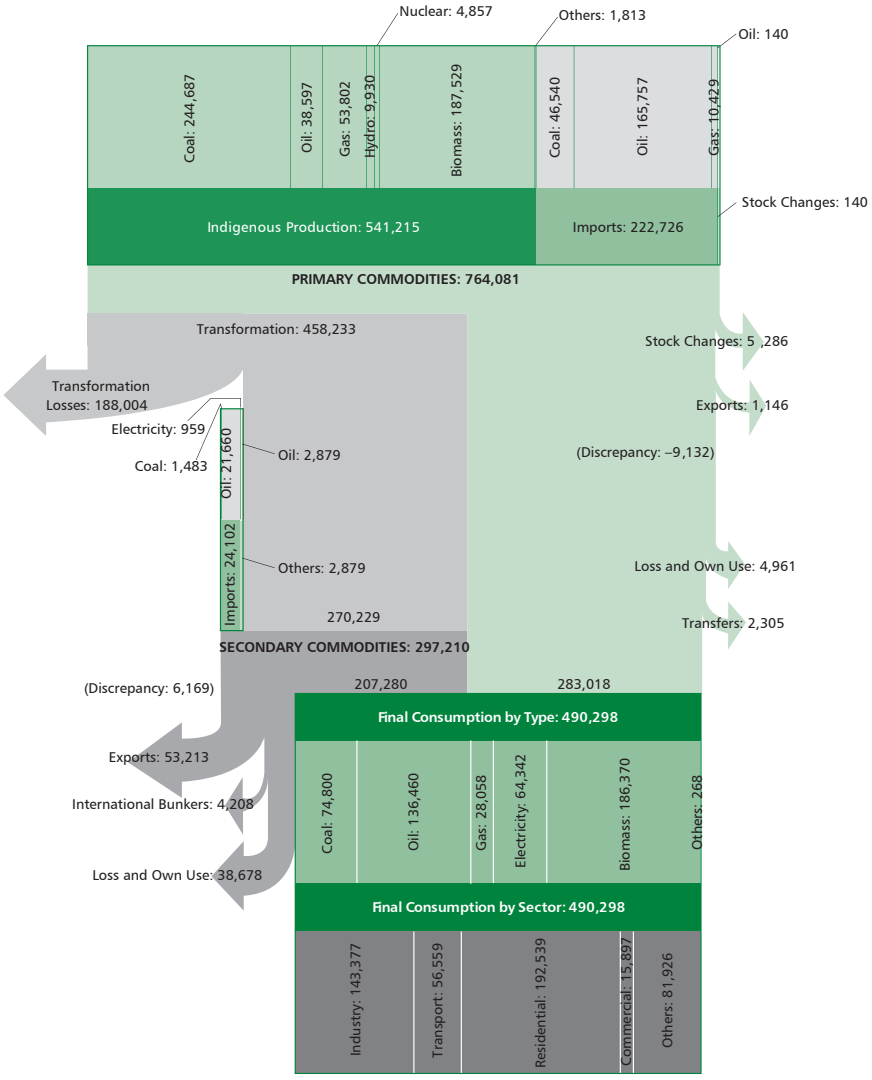


Table 6.1 Key Data and Economic Profile

	1990	1995	2000	2005	2009
Socioeconomic Data					
Population (thousand)	991,967	1,090,259	1,189,505	1,283,250	1,353,505
GDP (constant 2000 $ billion)	313.4	401.0	530.2	733.7	998.4
GDP (constant 2005 PPP $ billion)	1,184.1	1,515.5	2,005.2	2,780.6	3,791.2
GDP/capita (constant 2000 $)	316	368	446	572	738
GDP/capita (constant 2005 PPP $)	1,194	1,390	1,686	2,167	2,801

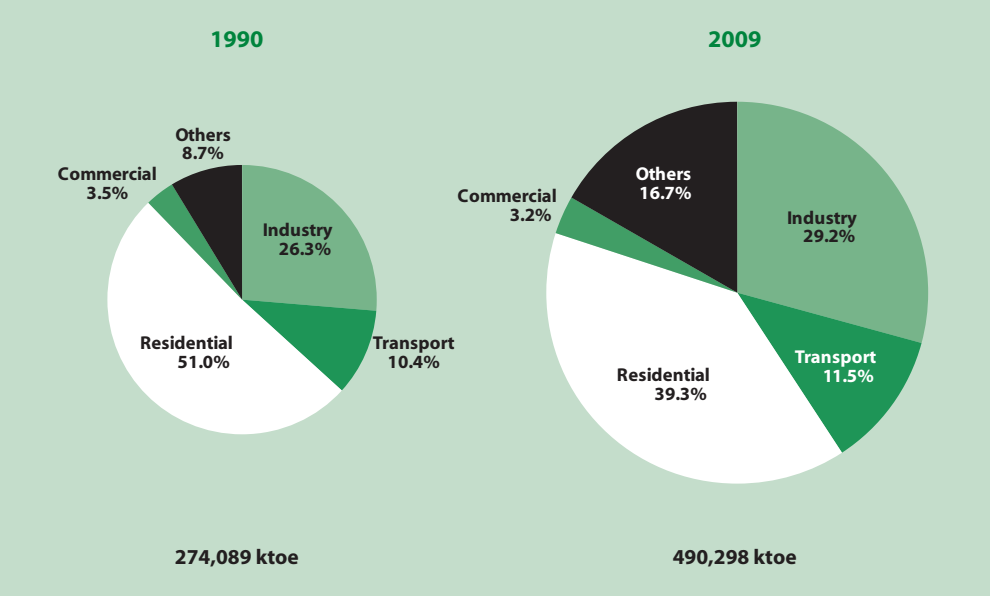
GDP = gross domestic product, PPP = purchasing power parity.
Note: In the computation of GDP/capita (constant 2005 PPP $) for 1990, the population of Maldives was not included in the denominator due to unavailability of GDP data.
Sources: World Bank.

Table 6.2 Energy Supply and Demand

	1990	1995	2000	2005	2009
Primary Energy Supply (ktoe)					
Indigenous Production	313,244	359,746	394,562	456,078	541,215
Net Imports	28,487	54,121	98,909	125,285	183,459
Total PES	341,731	413,868	493,472	581,363	724,674
Coal	103,733	136,375	162,092	208,312	286,242
Oil	64,877	87,862	120,429	135,762	169,175
Gas	14,292	22,816	30,436	42,549	64,231
Biomass	150,507	157,752	168,871	179,972	187,518
Others	8,322	9,062	11,644	14,767	17,508
TPES/capita (toe)	0.34	0.38	0.41	0.45	0.54
TPES/GDP (toe/constant 2005 PPP $ million)	289	273	246	209	191
Final Energy Consumption (ktoe)					
Industry	72,134	78,434	91,126	110,437	143,377
Transportation	28,610	38,092	35,099	38,883	56,559
Other Sectors	173,346	195,819	224,246	246,265	290,362
Total FEC	274,089	312,345	350,471	395,584	490,298
Coal	42,149	38,793	34,097	43,469	74,800
Oil	55,622	77,287	101,784	110,366	136,460
Gas	7,488	11,268	13,256	19,616	28,058
Electricity	18,905	27,731	33,235	43,208	64,342
Biomass	149,918	157,244	168,063	178,829	186,370
Others	8	21	35	96	268

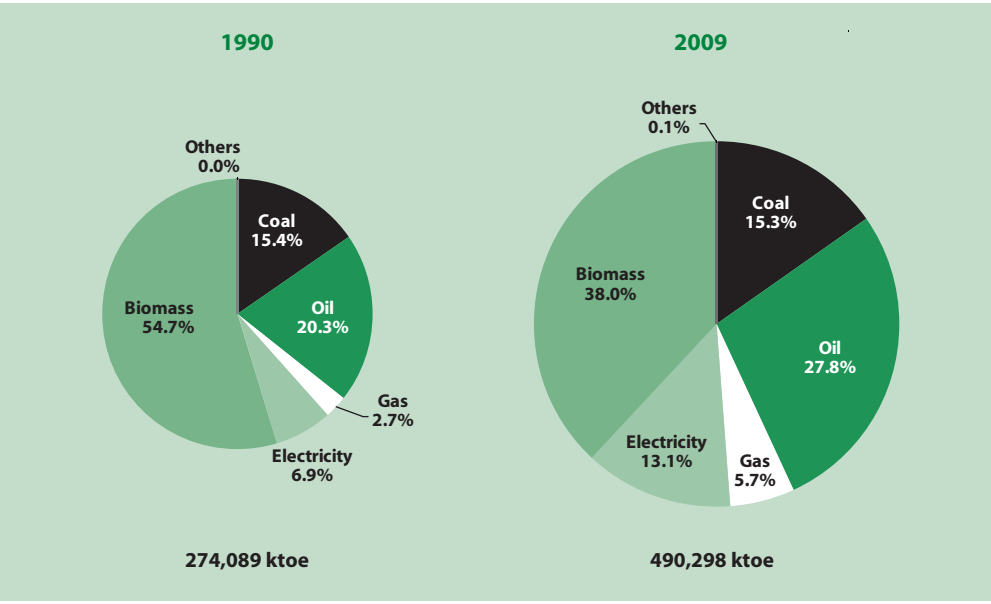
FEC = final energy consumption, GDP = gross domestic product, ktoe = thousand tons of oil equivalent, PES = primary energy supply, PPP = purchasing power parity, toe = ton of oil equivalent, TPES = total primary energy supply.
Sources: IEA (2011b) and UNSD (2011a).

Figure 6.1 Final Energy Consumption by Sector, 1990 and 2009



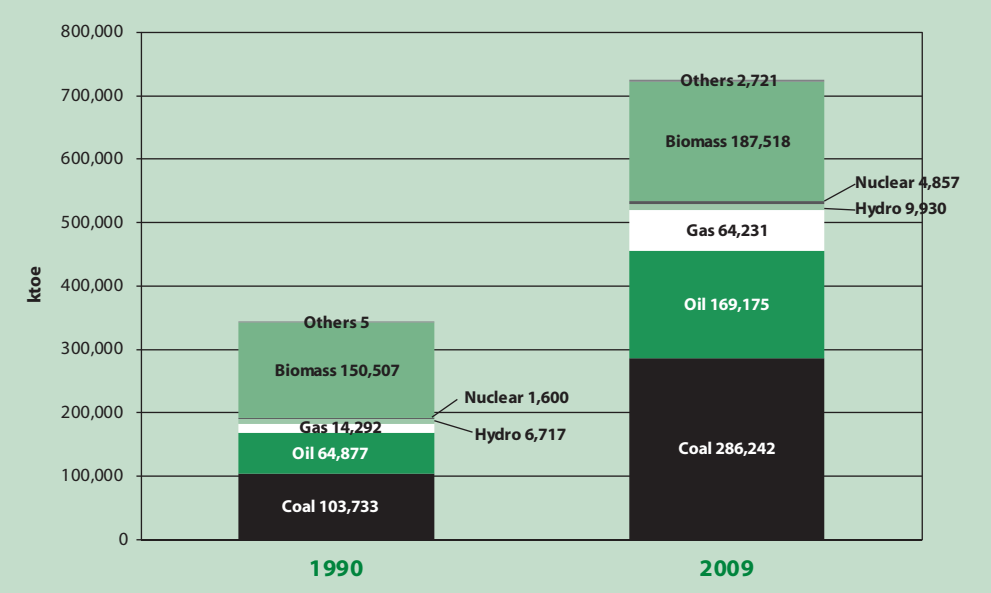
ktoe = thousand tons of oil equivalent.
Sources: IEA (2011b) and UNSD (2011a).

Figure 6.2 Final Energy Consumption by Type of Energy, 1990 and 2009



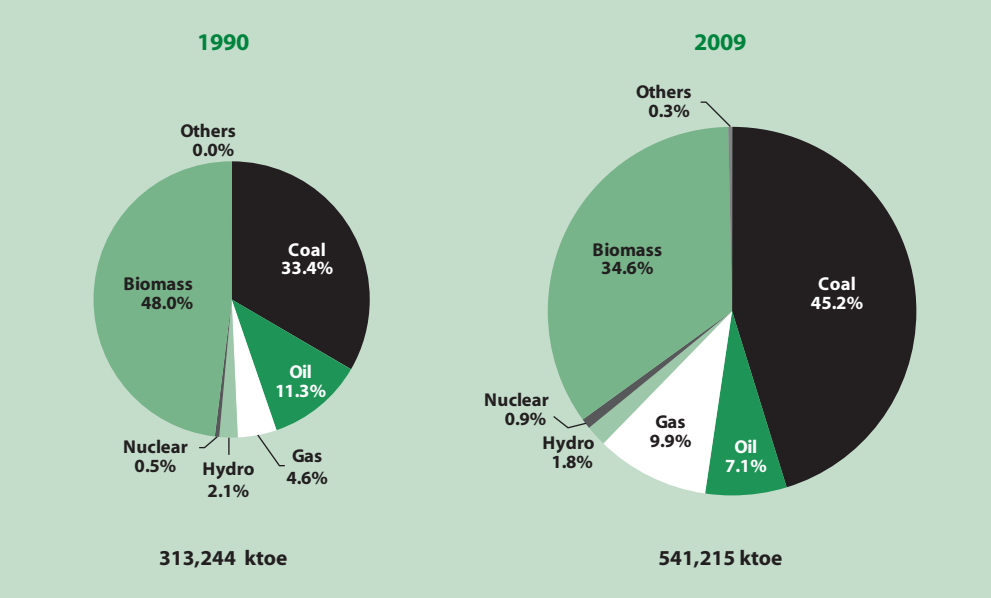
ktoe = thousand tons of oil equivalent.
Sources: IEA (2011b) and UNSD (2011a).

Figure 6.3 Total Primary Energy Supply, 1990 and 2009



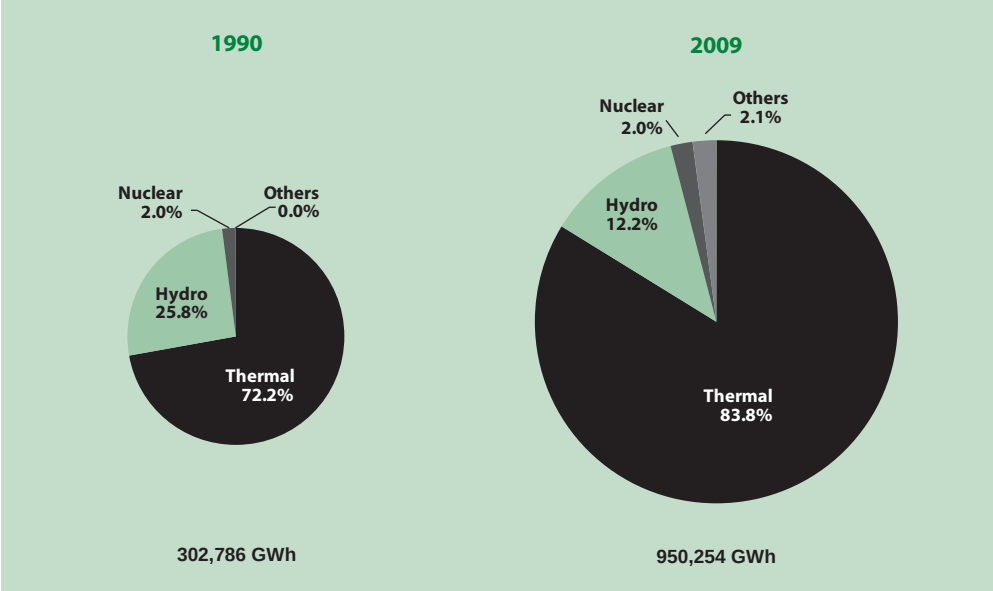
ktoe = thousand tons of oil equivalent.
Sources: IEA (2011b) and UNSD (2011a).

Figure 6.4 Indigenous Energy Production, 1990 and 2009



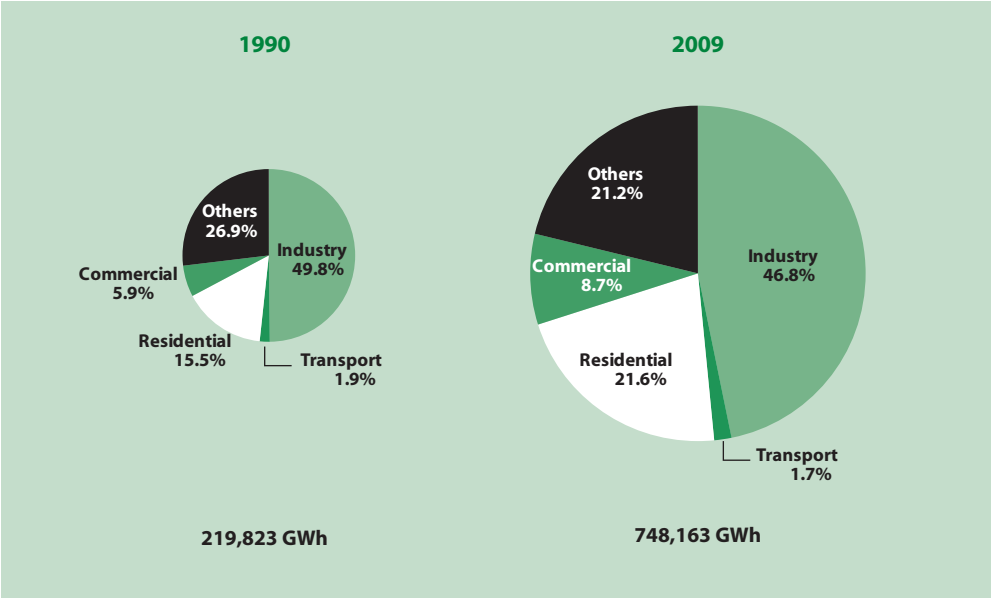
ktoe = thousand tons of oil equivalent.
Sources: IEA (2011b) and UNSD (2011a).

Figure 6.5 Electricity Generation by Plant Type, 1990 and 2009



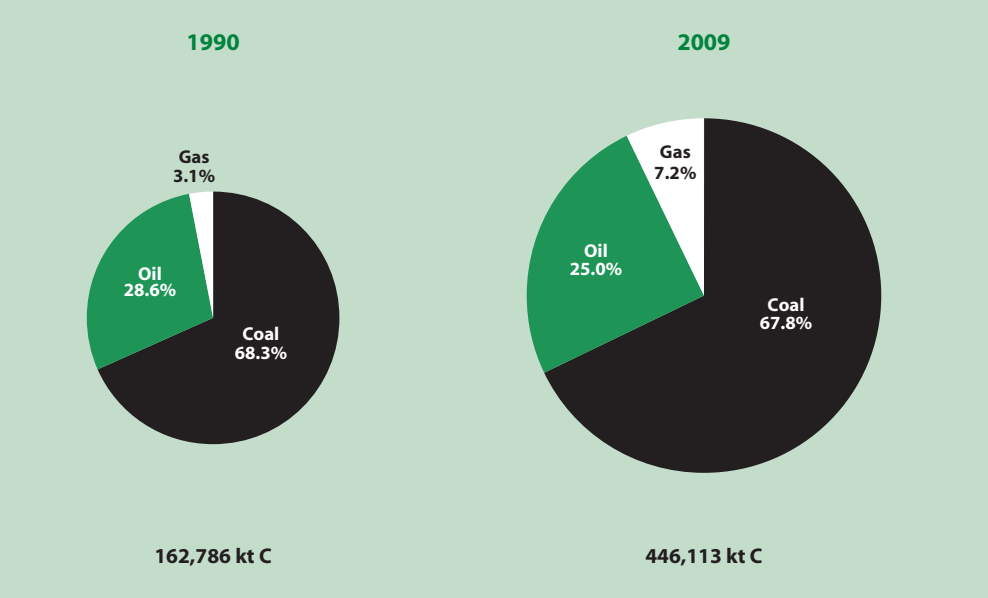
GWh = gigawatt-hour.
Sources: IEA (2011b) and UNSD (2011a).

Figure 6.6 Electricity Consumption by Sector, 1990 and 2009



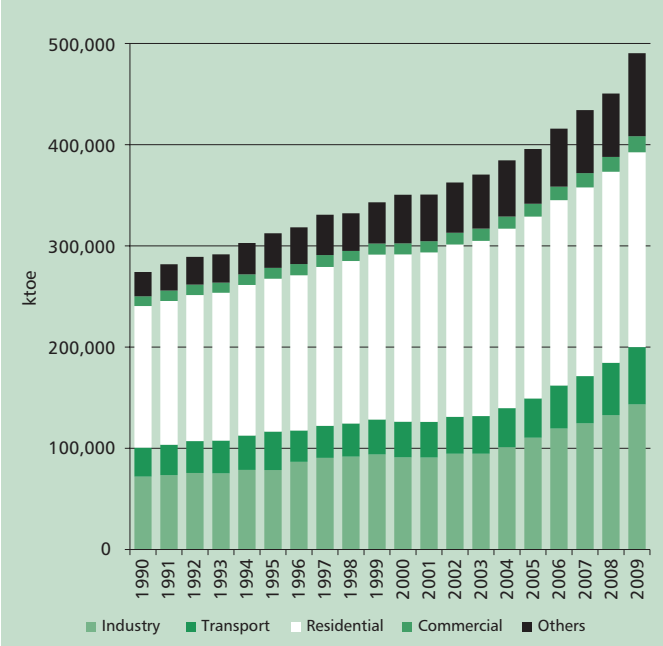
GWh = gigawatt-hour.
Sources: IEA (2011b) and UNSD (2011a).

Figure 6.7 Carbon Dioxide Emissions from Fuel Combustion, 1990 and 2009



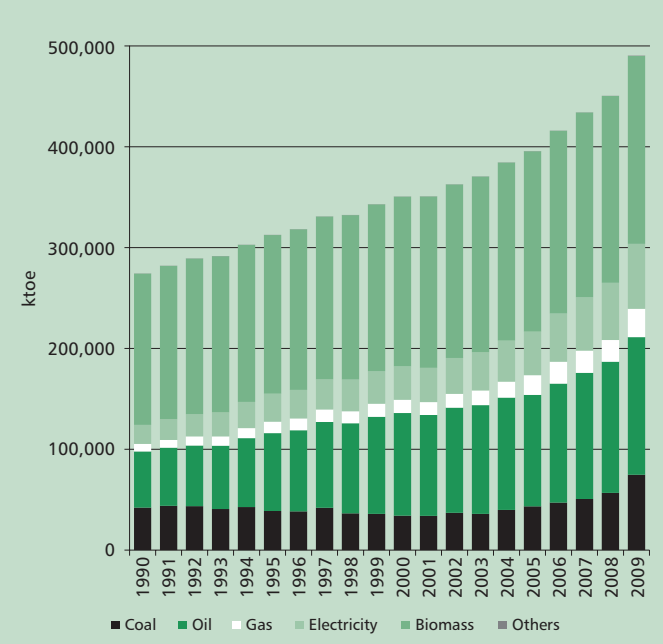
kt C = thousand tons of carbon equivalent.
Source: APERC estimates.

Figure 6.8 Final Energy Consumption by Sector, 1990–2009



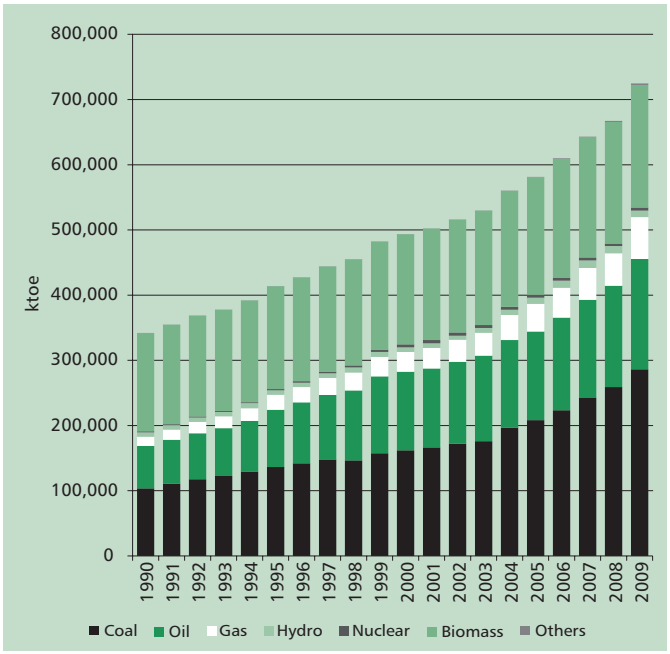
ktoe = thousand tons of oil equivalent.
Sources: IEA (2011b) and UNSD (2011a).

Figure 6.9 Final Energy Consumption by Type, 1990–2009



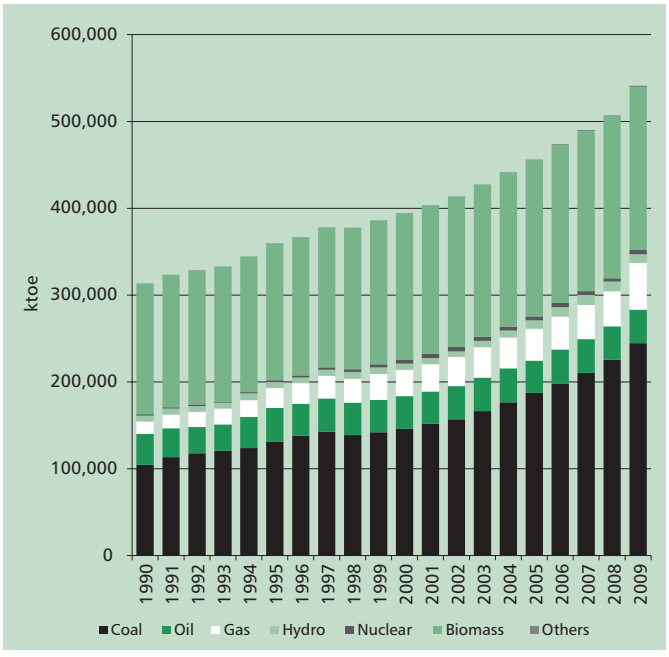
ktoe = thousand tons of oil equivalent.
Sources: IEA (2011b) and UNSD (2011a).

Figure 6.10 Total Primary Energy Supply, 1990–2009



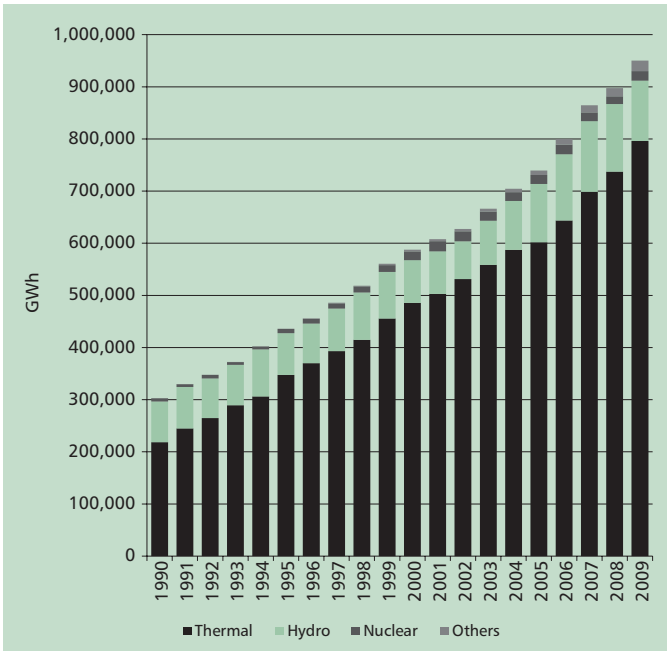
ktoe = thousand tons of oil equivalent.
Sources: IEA (2011b) and UNSD (2011a).

Figure 6.11 Indigenous Energy Production, 1990–2009



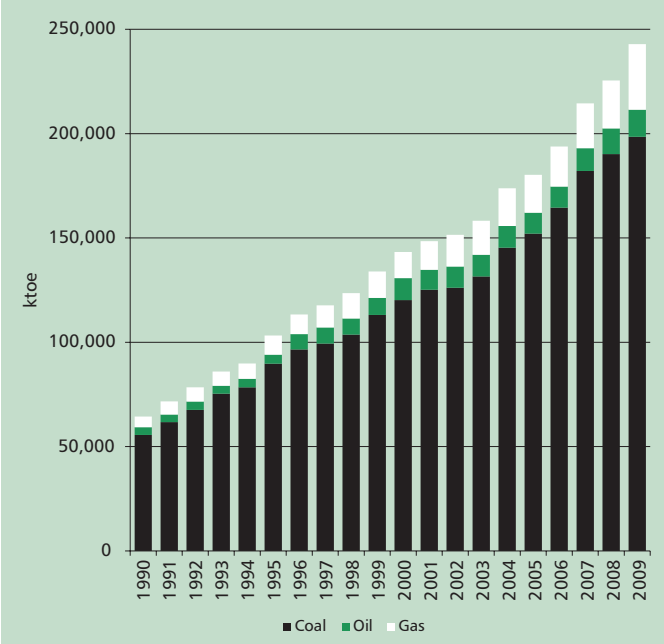
ktoe = thousand tons of oil equivalent.
Sources: IEA (2011b) and UNSD (2011a).

Figure 6.12 Electricity Generation by Source, 1990–2009



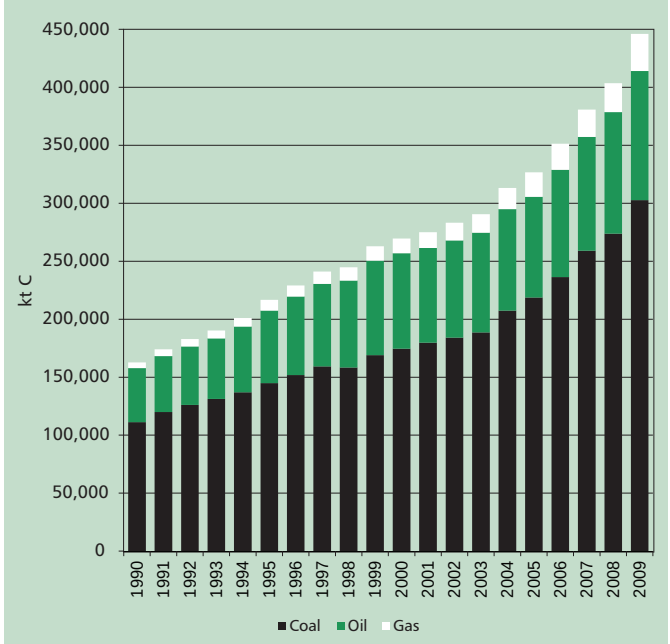
GWh = gigawatt-hour.
Sources: IEA (2011b) and UNSD (2011a).

Figure 6.13 Fuel Input for Electricity Generation, 1990–2009



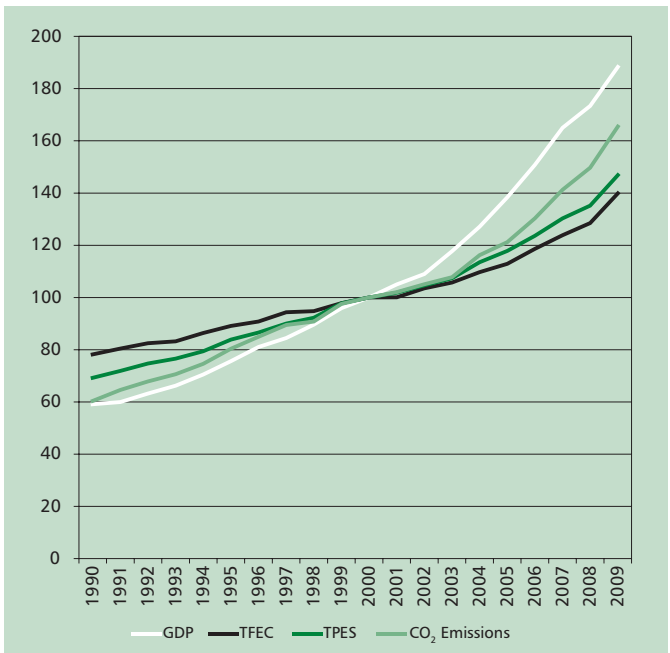
ktoe = thousand tons of oil equivalent.
Sources: IEA (2011b) and UNSD (2011a).

Figure 6.14 Carbon Dioxide Emissions from Fuel Combustion, 1990–2009



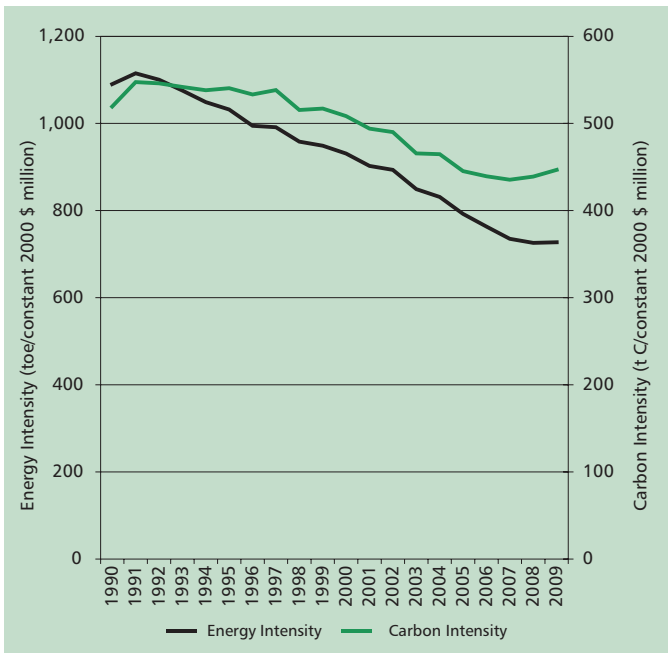
kt C = thousand tons of carbon equivalent.
Source: APERC estimates.

Figure 6.15 Growth of GDP, TFEC, TPES, and CO_2 (indexed to year 2000), 1990–2009



CO_2 = carbon dioxide, GDP = gross domestic product, TFEC = total final energy consumption, TPES = total primary energy supply.
Note: Indices are measured relative to the base year 2000 (2000 = 100).
Source: APERC estimates.

Figure 6.16 Energy and Carbon Intensities, 1990–2009



t C = ton of carbon equivalent, toe = ton of oil equivalent.
Source: APERC estimates.

Table 6.3 South Asia Energy Balance Table, 2006

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	198,231	0	39,093	0	0	0	0	0	0	0	37,833	10,922	4,900	0	3	747	182,160	116	0	0	474,005
2.	Imports	27,647	3,157	117,439	24,085	996	1,898	4,532	3,407	2,857	10,394	7,989	0	0	0	0	0	5	0	283	0	180,605
3.	Exports	−756	−51	0	−35,126	−4,089	−157	−11,758	−3,609	−127	−15,386	0	0	0	0	0	0	−2	0	−339	0	−36,274
4.	International Bunkers	0	0	0	−3,841	0	0	−47	−141	0	−3,653	0	0	0	0	0	0	0	0	0	0	−3,841
5.	Stock Changes	−4,726	0	65	221	65	34	−43	74	−2	93	0	0	0	0	0	0	−21	0	0	0	−4,461
6.	Total Primary Energy Supply	220,396	3,106	156,597	−14,662	−3,028	1,775	−7,316	−269	2,728	−8,552	45,822	10,922	4,900	0	3	747	182,142	116	−56	0	610,033
7.	Transfers	0	0	−2,149	2,365	0	0	0	0	2,365	0	0	0	0	0	0	0	0	0	0	0	216
8.	Total Transformation Sector	−181,026	5,868	−155,531	144,882	13,778	9,384	50,082	13,570	7,159	50,909	−19,164	−10,922	−4,900	0	−3	−748	−1,153	0	68,809	0	−153,888
8.1	Power Generation	−164,108	−465	0	−10,075	0	0	−6,995	−2,306	0	−774	−19,178	−10,922	−4,900	0	−3	−748	−1,108	0	68,809	0	−142,698
8.2	Gas Processing	−31	0	0	0	0	0	0	0	0	0	14	0	0	0	0	0	0	0	0	0	−17
8.3	Refineries	0	0	−155,531	154,957	13,778	9,384	57,077	15,876	7,159	51,683	0	0	0	0	0	0	0	0	0	0	−574
8.4	Coal Transformation	−16,887	6,333	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	−10,554
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	−45	0	0	0	−45
9.	Loss and Own Use	−229	−930	0	−12,771	−11	−7	−34	−115	0	−12,604	−4,943	0	0	0	0	0	0	0	−20,689	0	−39,562
10.	Discrepancy	43	0	1,083	−1,977	157	−271	709	−3,401	315	514	1	0	0	0	0	1	21	0	−133	0	−961
11.	Total Final Energy Consumption	39,184	8,044	0	117,838	10,896	10,881	43,441	9,785	12,567	30,267	21,716	0	0	0	0	0	181,010	116	47,931	0	415,838
12.	Industry Sector	32,503	7,820	0	20,181	1	28	11,609	6,830	431	1,282	7,855	0	0	0	0	0	29,176	0	21,936	0	119,471
13.	Transport Sector	0	0	0	40,426	10,894	0	27,632	482	8	1,410	1,094	0	0	0	0	0	120	0	930	0	42,570
14.	Other Sectors	6,680	224	0	29,656	1	10,853	4,200	2,473	12,128	0	1,988	0	0	0	0	0	151,714	116	25,065	0	215,443
14.1	Residential and Commercial	5,581	224	0	22,711	0	10,657	0	0	12,053	0	1,829	0	0	0	0	0	151,710	0	14,431	0	196,485
14.1.1	Commerce and Public Services	3,085	0	0	100	0	19	0	0	81	0	123	0	0	0	0	0	6,236	0	3,765	0	13,309
14.1.2	Residential	2,496	224	0	22,611	0	10,638	0	0	11,972	0	1,706	0	0	0	0	0	145,474	0	10,665	0	183,176
14.2	Non–Specified Others	1,099	0	0	6,945	1	196	4,200	2,473	75	0	159	0	0	0	0	0	4	116	10,634	0	18,958
15.	Non–Energy Use	0	0	0	27,575	0	0	0	0	0	27,575	10,779	0	0	0	0	0	0	0	0	0	38,354
16.	Electricity Output (GWh)	517,197	1,352	0	36,198	0	0	214	0	0	29,484	88,901	126,997	18,802	0	34	8,692	1,932	0	0	0	800,105
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt–hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.
Note: Figures may not add up to total because of rounding.
Sources: IEA (2011b) and UNSD (2011a).

Table 6.4 South Asia Energy Balance Table, 2007

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	210,458	0	38,864	0	0	0	0	0	0	0	39,234	11,633	4,419	0	3	1,014	184,272	166	0	0	490,063
2.	Imports	31,966	2,862	127,565	29,364	954	2,928	7,139	1,737	3,871	12,735	9,638	0	0	0	0	0	23	0	488	0	201,905
3.	Exports	–747	–65	0	–42,396	–4,859	–143	–14,797	–4,530	–112	–17,955	0	0	0	0	0	0	–4	0	–497	0	–43,709
4.	International Bunkers	0	0	0	–4,075	0	0	–64	–190	0	–3,821	0	0	0	0	0	0	0	0	0	0	–4,075
5.	Stock Changes	–1,221	0	–40	271	113	54	0	62	8	34	0	0	0	0	0	0	–23	0	0	0	–1,013
6.	Total Primary Energy Supply	240,455	2,797	166,389	–16,837	–3,792	2,839	–7,722	–2,921	3,767	–9,007	48,872	11,633	4,419	0	3	1,014	184,269	166	–9	0	643,171
7.	Transfers	0	0	–2,116	2,327	0	0	0	0	2,327	0	0	0	0	0	0	0	0	0	0	0	211
8.	Total Transformation Sector	–197,169	5,586	–164,592	154,546	15,473	8,574	54,234	13,553	7,636	55,076	–21,486	–11,633	–4,419	0	–3	–1,015	–1,166	0	74,363	0	–166,988
8.1	Power Generation	–181,731	–390	0	–10,891	0	0	–7,551	–2,425	0	–915	–21,501	–11,633	–4,419	0	–3	–1,015	–1,119	0	74,363	0	–158,338
8.2	Gas Processing	–32	0	0	0	0	0	0	0	0	0	15	0	0	0	0	0	0	0	0	0	–17
8.3	Refineries	0	0	–164,592	165,437	15,473	8,574	61,785	15,978	7,636	55,991	0	0	0	0	0	0	0	0	0	0	845
8.4	Coal Transformation	–15,406	5,976	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–9,430
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–47	0	0	0	–47
9.	Loss and Own Use	–242	–781	0	–13,638	0	0	0	–73	0	–13,565	–5,261	0	0	0	0	0	0	0	–21,096	0	–41,018
10.	Discrepancy	71	1	319	–1,344	404	–818	103	–527	338	–844	2	0	0	0	0	1	20	0	–301	0	–1,231
11.	Total Final Energy Consumption	43,116	7,603	0	125,054	12,085	10,595	46,615	10,032	14,068	31,660	22,127	0	0	0	0	0	183,122	166	52,957	0	434,145
12.	Industry Sector	36,084	7,360	0	20,604	1	23	12,201	7,021	895	463	6,629	0	0	0	0	0	29,474	0	24,484	0	124,635
13.	Transport Sector	0	0	0	43,998	12,083	0	29,773	472	8	1,662	1,666	0	0	0	0	0	134	0	956	0	46,754
14.	Other Sectors	7,032	243	0	30,917	1	10,572	4,641	2,539	13,165	0	1,797	0	0	0	0	0	153,514	166	27,516	0	221,186
14.1	Residential and Commercial	5,815	243	0	23,324	0	10,412	0	0	12,913	0	1,647	0	0	0	0	0	153,510	0	15,894	0	200,433
14.1.1	Commerce and Public Services	3,236	0	0	101	0	15	0	0	86	0	133	0	0	0	0	0	6,307	0	4,345	0	14,122
14.1.2	Residential	2,579	243	0	23,223	0	10,397	0	0	12,827	0	1,514	0	0	0	0	0	147,203	0	11,549	0	186,311
14.2	Non–Specified Others	1,217	0	0	7,593	1	160	4,641	2,539	252	0	150	0	0	0	0	0	4	166	11,622	0	20,753
15.	Non–Energy Use	0	0	0	29,535	0	0	0	0	0	29,535	12,035	0	0	0	0	0	0	0	0	0	41,570
16.	Electricity Output (GWh)	552,334	1,135	0	41,793	0	0	247	0	0	33,959	103,413	135,271	16,957	0	35	11,798	1,952	0	0	0	864,688
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Sources: IEA (2011b) and UNSD (2011a).

Table 6.5 South Asia Energy Balance Table, 2008

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	225,606	0	38,417	0	0	0	0	0	0	0	40,362	11,151	3,834	0	3	1,182	186,400	167	0	0	507,121
2.	Imports	37,667	1,268	134,135	25,638	1,057	1,777	7,156	1,934	3,207	10,507	9,302	0	0	0	0	0	32	0	827	0	208,870
3.	Exports	−761	−901	0	−38,526	−5,816	−81	−14,241	−5,696	−123	−12,569	0	0	0	0	0	0	−7	0	−519	0	−40,714
4.	International Bunkers	0	0	0	−4,092	0	0	−79	−295	0	−3,718	0	0	0	0	0	0	0	0	0	0	−4,092
5.	Stock Changes	−3,879	0	−166	64	64	−14	6	5	0	3	0	0	0	0	0	0	−10	0	0	0	−3,991
6.	Total Primary Energy Supply	258,632	367	172,386	−16,916	−4,695	1,682	−7,158	−4,052	3,084	−5,777	49,664	11,151	3,834	0	3	1,182	186,416	167	308	0	667,194
7.	Transfers	0	0	−2,220	2,443	0	0	0	0	2,443	0	0	0	0	0	0	0	0	0	0	0	223
8.	Total Transformation Sector	−205,453	5,811	−169,300	158,844	17,444	9,008	57,912	15,284	7,966	51,230	−22,972	−11,151	−3,834	0	−3	−1,182	−1,173	0	77,193	0	−173,220
8.1	Power Generation	−189,838	−394	0	−12,312	0	0	−8,473	−2,451	0	−1,388	−22,987	−11,151	−3,834	0	−3	−1,182	−1,132	0	77,193	0	−165,640
8.2	Gas Processing	−34	0	0	0	0	0	0	0	0	0	15	0	0	0	0	0	0	0	0	0	−19
8.3	Refineries	0	0	−169,300	171,156	17,444	9,008	66,385	17,735	7,966	52,618	0	0	0	0	0	0	0	0	0	0	1,856
8.4	Coal Transformation	−15,581	6,205	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	−9,376
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	−41	0	0	0	−41
9.	Loss and Own Use	−227	−789	0	−13,814	−1	0	0	−65	0	−13,748	−5,103	0	0	0	0	0	0	0	−20,838	0	−40,771
10.	Discrepancy	−1,633	1	−866	−509	351	−306	1,441	−1,154	653	−1,494	2	0	0	0	0	0	22	0	−12	0	−2,995
11.	Total Final Energy Consumption	51,319	5,390	0	130,048	13,099	10,384	52,195	10,013	14,146	30,211	21,591	0	0	0	0	0	185,265	167	56,651	0	450,431
12.	Industry Sector	41,813	5,158	0	22,544	0	24	14,531	6,857	627	505	6,280	0	0	0	0	0	29,803	0	27,173	0	132,771
13.	Transport Sector	0	0	0	48,060	13,099	0	32,654	676	8	1,623	2,527	0	0	0	0	0	148	0	999	0	51,734
14.	Other Sectors	9,506	232	0	31,362	0	10,360	5,010	2,480	13,511	0	2,001	0	0	0	0	0	155,314	167	28,479	0	227,060
14.1	Residential and Commercial	5,990	232	0	23,466	0	10,224	0	0	13,241	0	1,857	0	0	0	0	0	155,309	0	16,431	0	203,285
14.1.1	Commerce and Public Services	3,394	0	0	94	0	8	0	0	86	0	155	0	0	0	0	0	6,380	0	4,480	0	14,503
14.1.2	Residential	2,596	232	0	23,372	0	10,216	0	0	13,155	0	1,702	0	0	0	0	0	148,929	0	11,951	0	188,781
14.2	Non–Specified Others	3,516	0	0	7,896	0	136	5,010	2,480	270	0	144	0	0	0	0	0	4	167	12,048	0	23,775
15.	Non–Energy Use	0	0	0	28,083	0	0	0	0	0	28,083	10,783	0	0	0	0	0	0	0	0	0	38,866
16.	Electricity Output (GWh)	582,014	1,147	0	41,268	0	0	280	0	0	34,148	113,033	129,662	14,713	0	36	13,743	1,975	0	0	0	897,591
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.
Note: Figures may not add up to total because of rounding.
Source: IEA (2011b) and UNSD (2011a).

Table 6.6 South Asia Energy Balance Table, 2009

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	244,687	0	38,597	0	0	0	0	0	0	0	53,802	9,930	4,857	0	3	1,542	187,529	268	0	0	541,215
2.	Imports	46,540	1,483	165,757	21,660	993	1,248	6,990	1,504	3,444	7,481	10,429	0	0	0	0	0	0	0	959	0	246,828
3.	Exports	–1,145	–47	0	–53,115	–10,446	–48	–19,091	–4,967	–148	–18,415	0	0	0	0	0	0	–1	0	–51	0	–54,359
4.	International Bunkers	0	0	0	–4,208	0	0	–94	–297	0	–3,817	0	0	0	0	0	0	0	0	0	0	–4,208
5.	Stock Changes	–5,276	0	140	344	129	0	0	262	0	–47	0	0	0	0	0	0	–10	0	0	0	–4,802
6.	Total Primary Energy Supply	284,806	1,436	204,494	–35,319	–9,324	1,200	–12,195	–3,498	3,296	–14,798	64,231	9,930	4,857	0	3	1,542	187,518	268	908	0	724,674
7.	Transfers	0	0	–2,305	2,535	0	0	0	0	2,535	0	0	0	0	0	0	0	0	0	0	0	230
8.	Total Transformation Sector	–213,644	5,819	–195,662	182,688	24,439	9,591	67,706	15,372	7,430	58,150	–31,424	–9,931	–4,857	0	–3	–1,542	–1,170	0	81,722	0	–188,004
8.1	Power Generation	–198,161	–388	0	–12,950	0	0	–9,264	–2,598	0	–1,088	–31,440	–9,931	–4,857	0	–3	–1,542	–1,145	0	81,722	0	–178,695
8.2	Gas Processing	–36	0	0	0	0	0	0	0	0	0	16	0	0	0	0	0	0	0	0	0	–20
8.3	Refineries	0	0	–195,662	195,638	24,439	9,591	76,970	17,970	7,430	59,238	0	0	0	0	0	0	0	0	0	0	–24
8.4	Coal Transformation	–15,447	6,207	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–9,240
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–25	0	0	0	–25
9.	Loss and Own Use	–213	–777	0	–13,469	0	0	0	–62	0	–13,407	–4,748	0	0	0	0	0	0	0	–24,432	0	–43,639
10.	Discrepancy	–2,627	0	–6,527	25	–382	–488	1,676	–1,810	2,040	–1,011	–1	1	0	0	0	0	22	0	6,144	0	–2,963
11.	Total Final Energy Consumption	68,322	6,478	0	136,460	14,733	10,303	57,187	10,002	15,301	28,934	28,058	0	0	0	0	0	186,370	268	64,342	0	490,298
12.	Industry Sector	43,845	6,234	0	24,084	0	21	15,990	6,892	676	505	8,977	0	0	0	0	0	30,133	0	30,104	0	143,377
13.	Transport Sector	0	0	0	52,608	14,733	0	35,555	630	9	1,681	2,719	0	0	0	0	0	164	0	1,068	0	56,559
14.	Other Sectors	24,477	244	0	33,020	0	10,282	5,642	2,480	14,616	0	2,079	0	0	0	0	0	156,073	268	33,170	0	249,331
14.1	Residential and Commercial	6,182	244	0	24,486	0	10,163	0	0	14,323	0	1,926	0	0	0	0	0	156,073	0	19,525	0	208,436
14.1.1	Commerce and Public Services	3,560	0	0	103	0	6	0	0	97	0	175	0	0	0	0	0	6,451	0	5,608	0	15,897
14.1.2	Residential	2,622	244	0	24,383	0	10,157	0	0	14,226	0	1,751	0	0	0	0	0	149,622	0	13,917	0	192,539
14.2	Non–Specified Others	18,295	0	0	8,534	0	119	5,642	2,480	293	0	153	0	0	0	0	0	0	268	13,645	0	40,895
15.	Non–Energy Use	0	0	0	26,748	0	0	0	0	0	26,748	14,283	0	0	0	0	0	0	0	0	0	41,031
16.	Electricity Output (GWh)	616,092	1,130	0	33,903	0	0	0	0	0	26,099	145,046	115,471	18,636	0	43	17,936	1,997	0	0	0	950,254
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Sources: IEA (2011b) and UNSD (2011a).

Table 6.7 South Asia Summary Table, 1990–2009

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Indigenous Production (ktoe)																				
Coal	104,694	113,310	117,789	120,567	123,804	130,864	137,882	142,605	138,825	141,939	146,280	151,856	156,824	166,346	176,423	187,355	198,231	210,458	225,606	244,687
Oil	35,417	33,367	30,249	30,485	35,735	39,276	37,080	38,282	37,326	37,310	37,337	37,087	38,344	38,665	39,233	37,241	39,093	38,864	38,417	38,597
Gas	14,292	15,789	17,578	18,334	19,497	22,816	23,543	26,109	27,537	29,810	30,436	31,467	33,854	34,929	35,562	36,731	37,833	39,234	40,362	53,802
Hydro	6,717	6,810	6,533	6,659	7,765	6,898	6,544	7,028	7,801	7,660	7,056	7,016	6,208	7,271	8,055	9,601	10,922	11,633	11,151	9,930
Nuclear	1,600	1,440	1,753	1,407	1,472	2,080	2,364	2,628	3,107	3,453	4,405	5,075	5,053	4,634	4,433	4,515	4,900	4,419	3,834	4,857
Geothermal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Solar	0	0	0	0	0	0	1	1	1	1	2	2	2	2	3	3	3	3	3	3
Wind	3	3	8	9	17	45	79	89	97	130	145	193	231	309	386	568	747	1,014	1,182	1,542
Biomass	150,512	152,486	154,725	155,475	156,235	157,746	159,251	161,205	162,852	165,893	168,867	171,012	173,169	175,373	177,659	179,968	182,160	184,272	186,400	187,529
Others	8	12	15	17	19	21	23	24	32	34	35	39	41	51	64	96	116	166	167	268
Total	313,244	323,217	328,651	332,953	344,543	359,746	366,767	377,970	377,578	386,230	394,562	403,746	413,726	427,581	441,818	456,078	474,005	490,063	507,121	541,215
Primary Energy Supply (ktoe)																				
Coal	103,733	111,015	117,605	122,719	129,410	136,375	142,110	147,986	146,562	157,454	162,092	166,578	172,074	176,051	196,945	208,312	223,502	243,252	258,999	286,242
Oil	64,877	67,028	70,543	73,151	77,576	87,862	93,412	99,032	107,154	117,969	120,429	121,029	125,668	131,024	134,163	135,762	141,935	149,552	155,470	169,175
Gas	14,292	15,789	17,578	18,334	19,497	22,816	23,543	26,109	27,537	29,810	30,436	31,467	33,854	35,216	38,472	42,549	45,822	48,872	49,664	64,231
Hydro	6,717	6,810	6,533	6,659	7,765	6,898	6,544	7,028	7,801	7,660	7,056	7,016	6,208	7,271	8,055	9,601	10,922	11,633	11,151	9,930
Nuclear	1,600	1,440	1,753	1,407	1,472	2,080	2,364	2,628	3,107	3,453	4,405	5,075	5,053	4,634	4,433	4,515	4,900	4,419	3,834	4,857
Geothermal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Solar	0	0	0	0	0	0	1	1	1	1	2	2	2	2	3	3	3	3	3	3
Wind	3	3	8	9	17	45	79	89	97	130	145	193	231	309	386	568	747	1,014	1,182	1,542
Biomass	150,507	152,479	154,718	155,468	156,216	157,752	159,252	161,206	162,865	165,902	168,871	171,009	173,168	175,374	177,663	179,972	182,142	184,269	186,416	187,518
Others	2	16	6	20	23	39	26	5	26	44	36	39	22	34	83	81	60	157	475	1,176
Total	341,731	354,579	368,745	377,768	391,976	413,868	427,331	444,084	455,150	482,422	493,472	502,407	516,280	529,915	560,203	581,363	610,033	643,171	667,194	724,674
Final Energy Consumption by Sector (ktoe)																				
Industry	72,134	73,498	75,536	75,238	78,549	78,434	86,602	90,607	91,714	93,966	91,126	90,932	94,694	94,723	101,079	110,437	119,471	124,635	132,771	143,377
Transport	28,610	30,064	31,504	32,321	34,078	38,092	30,934	31,564	32,792	34,488	35,099	35,267	36,390	37,130	38,618	38,883	42,570	46,754	51,734	56,559
Residential	139,806	141,953	144,281	146,078	148,675	150,980	153,435	157,017	160,426	162,986	165,409	167,350	170,340	173,102	177,291	179,566	183,176	186,311	188,781	192,539
Commercial	9,666	10,346	10,331	9,999	10,525	10,705	11,043	11,752	9,958	10,741	10,745	11,035	11,585	12,139	12,046	12,722	13,309	14,122	14,503	15,897
Others	23,873	25,941	27,395	27,872	30,888	34,135	36,182	39,743	37,257	40,761	48,091	46,080	49,645	53,366	55,377	53,976	57,312	62,323	62,641	81,926
Total	274,089	281,802	289,048	291,508	302,716	312,345	318,196	330,683	332,147	342,942	350,471	350,664	362,655	370,460	384,411	395,584	415,838	434,145	450,431	490,298

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Table 6.7 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Final Energy Consumption by Type (ktoe)																				
Coal	42,149	43,855	43,582	40,716	42,694	38,793	38,511	42,065	36,461	35,991	34,097	33,916	36,992	35,953	39,902	43,469	47,228	50,719	56,709	74,800
Oil	55,622	57,806	60,204	62,807	68,358	77,287	80,373	85,043	89,310	96,271	101,784	100,021	104,350	107,817	111,302	110,366	117,838	125,054	130,048	136,460
Gas	7,488	7,551	9,005	9,221	9,988	11,268	11,721	12,284	11,877	12,838	13,256	12,894	13,582	14,525	15,828	19,616	21,716	22,127	21,591	28,058
Electricity	18,905	20,679	22,116	23,832	25,930	27,731	28,294	30,042	31,586	32,449	33,235	33,861	35,624	37,852	40,785	43,208	47,931	52,957	56,651	64,342
Heat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Biomass	149,918	151,899	154,125	154,915	155,727	157,244	159,275	161,225	162,882	165,358	168,063	169,934	172,066	174,262	176,529	178,829	181,010	183,122	185,265	186,370
Others	8	12	15	17	19	21	23	24	32	34	35	39	41	51	64	96	116	166	167	268
Total	274,089	281,802	289,048	291,508	302,716	312,345	318,196	330,683	332,147	342,942	350,471	350,664	362,655	370,460	384,411	395,584	415,838	434,145	450,431	490,298
Power Generation (GWh)																				
Thermal	218,494	245,049	264,829	289,244	306,226	347,394	369,923	393,040	414,857	455,809	485,598	502,810	531,369	558,587	587,411	601,929	643,648	698,675	737,462	796,171
Hydro	78,119	79,189	75,984	77,436	90,277	80,209	76,074	81,727	90,715	89,067	82,047	81,588	72,181	84,551	93,667	111,637	126,997	135,271	129,662	115,471
Nuclear	6,141	5,525	6,726	5,398	5,648	7,982	9,071	10,083	11,922	13,249	16,902	19,475	19,390	17,780	17,011	17,324	18,802	16,957	14,713	18,636
Geothermal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Solar	0	0	0	0	0	1	6	6	6	6	15	20	24	28	31	33	34	35	36	43
Wind	32	39	88	99	200	529	922	1,037	1,127	1,512	1,687	2,244	2,691	3,593	4,493	6,605	8,692	11,798	13,743	17,936
Others	0	0	0	0	0	0	0	0	0	971	1,347	1,820	1,840	1,863	1,885	1,910	1,932	1,952	1,975	1,997
Total	302,786	329,802	347,627	372,177	402,351	436,115	455,996	485,893	518,627	560,614	587,596	607,957	627,495	666,402	704,498	739,438	800,105	864,688	897,591	950,254
Loss and Own Use of Electricity (GWh)																				
Transmission and Distribution Losses	59,826	65,198	64,746	67,738	72,366	82,279	94,040	100,905	114,847	144,092	159,336	170,271	167,105	178,330	179,739	184,436	187,360	189,730	184,760	223,140
Own Use	23,070	24,198	25,593	27,349	28,593	31,372	32,977	35,407	36,453	39,151	41,372	43,209	45,233	46,953	49,209	50,849	53,209	55,570	57,547	60,953
Total	82,896	89,396	90,339	95,087	100,959	113,651	127,016	136,312	151,300	183,243	200,708	213,481	212,338	225,283	228,948	235,285	240,569	245,300	242,307	284,093
Fuel Input for Power Generation (ktoe)																				
Coal	55,576	61,759	67,585	75,373	78,439	89,738	96,588	99,385	103,685	113,104	120,251	125,172	126,141	131,557	145,371	152,124	164,573	182,121	190,232	198,549
Oil	3,718	3,642	4,041	3,759	4,030	4,353	7,342	7,740	7,760	8,159	10,532	9,595	10,143	10,415	10,401	10,009	10,075	10,891	12,312	12,950
Gas	5,138	6,253	6,775	6,861	7,403	9,166	9,440	10,590	12,134	12,682	12,528	13,687	15,255	16,287	18,027	18,158	19,178	21,501	22,987	31,440
Total	64,432	71,654	78,401	85,993	89,872	103,257	113,370	117,715	123,579	133,945	143,311	148,454	151,539	158,258	173,798	180,292	193,826	214,513	225,531	242,939
CO_2 Emissions (kt C)																				
Coal	111,197	119,993	126,159	131,301	136,955	144,948	151,875	159,358	158,412	169,087	174,633	179,791	184,185	188,627	207,389	218,768	236,295	259,105	273,796	302,669
Oil	46,619	48,204	50,416	52,119	56,759	62,573	67,735	71,162	74,930	81,454	82,290	81,576	83,845	86,042	87,527	86,791	92,563	98,114	104,838	111,440
Gas	4,970	5,868	6,401	6,930	7,348	9,188	9,475	10,647	11,466	12,385	12,669	13,710	15,165	15,918	18,322	21,169	22,455	23,607	24,915	32,004
Total	162,786	174,065	182,977	190,350	201,063	216,710	229,085	241,167	244,807	262,927	269,591	275,077	283,196	290,587	313,237	326,729	351,313	380,826	403,549	446,113

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Table 6.7 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Macroeconomic Indicators																				
Population (thousand)	991,967	1,012,177	1,031,608	1,051,218	1,070,677	1,090,259	1,109,940	1,129,706	1,149,555	1,169,490	1,189,505	1,209,186	1,228,492	1,247,338	1,265,616	1,283,250	1,301,034	1,318,382	1,335,831	1,353,505
Urban Population, %	24.4	24.7	24.9	25.1	25.4	25.6	25.8	26.1	26.3	26.5	26.8	27.0	27.2	27.4	27.7	27.9	28.2	28.5	28.8	29.1
GDP (constant 2000 $ million)	313,442	317,983	335,106	351,211	373,651	401,006	429,663	447,984	474,993	508,408	530,184	556,740	577,893	624,047	673,909	733,673	799,457	874,725	919,135	998,429
GDP (current $ million)	359,752	311,891	290,889	323,752	373,668	412,355	448,181	474,096	481,891	517,846	530,184	547,834	579,236	678,130	807,820	928,648	1,052,763	1,356,177	1,351,882	1,524,596
GDP (constant 2005 PPP $ million)	1,184,141	1,200,500	1,265,311	1,326,122	1,411,856	1,515,473	1,625,060	1,693,658	1,796,189	1,923,828	2,005,212	2,105,926	2,185,494	2,361,789	2,551,780	2,780,608	3,031,570	3,319,515	3,486,866	3,791,153
GDP/capita (constant 2000 $)	316	314	325	334	349	368	387	397	413	435	446	460	470	500	532	572	614	663	688	738
GDP/capita (current $)	363	308	282	308	349	378	404	420	419	443	446	453	472	544	638	724	809	1,029	1,012	1,126
GDP - Manufacturing (% of GDP)	13.5	13.1	12.9	13.4	13.9	14.9	15.2	14.7	14.4	13.9	14.3	14.0	14.3	14.1	14.2	14.3	14.9	15.0	14.9	14.9
Car Ownership (car/1,000 persons)	5	5	5	5	6	6	6	7	8	8	8	9	10	12	12	13	14	15	15	15
Basic Energy Indicators																				
TPES/capita (toe/person)	0.34	0.35	0.36	0.36	0.37	0.38	0.39	0.39	0.40	0.41	0.41	0.42	0.42	0.42	0.44	0.45	0.47	0.49	0.50	0.54
TFEC/capita (toe/person)	0.28	0.28	0.28	0.28	0.28	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.30	0.30	0.30	0.31	0.32	0.33	0.34	0.36
TPES/GDP (toe/constant 2000 $ million)	1,090	1,115	1,100	1,076	1,049	1,032	995	991	958	949	931	902	893	849	831	792	763	735	726	727
TFEC/GDP (toe/constant 2000 $ million)	874	886	863	830	810	779	741	738	699	675	661	630	628	594	570	539	520	496	490	492
Import Dependency (%)	8.3	8.8	10.9	11.9	12.1	13.1	14.2	14.9	17.0	19.9	20.0	19.6	19.9	19.3	21.1	21.6	22.3	23.8	24.0	25.3
Oil Import Dependency (%)	45.4	50.2	57.1	58.3	53.9	55.3	60.3	61.3	65.2	68.4	69.0	69.4	69.5	70.5	70.8	72.6	72.5	74.0	75.3	77.2
Electricity/capita (kWh/person)	222	238	249	264	282	296	296	309	320	323	325	326	337	353	375	392	428	467	493	553
CO_2 Intensity (t C/constant 2000 $ million)	519	547	546	542	538	540	533	538	515	517	508	494	490	466	465	445	439	435	439	447
CO_2/capita (t C)	0.16	0.17	0.18	0.18	0.19	0.20	0.21	0.21	0.21	0.22	0.23	0.23	0.23	0.23	0.25	0.25	0.27	0.29	0.30	0.33
CO_2/TPES (t C/toe)	0.48	0.49	0.50	0.50	0.51	0.52	0.54	0.54	0.54	0.55	0.55	0.55	0.55	0.55	0.56	0.56	0.58	0.59	0.60	0.62

– = no data or not applicable, CO_2 = carbon dioxide, GDP = gross domestic product, GWh = gigawatt-hour, kt C = thousand tons of carbon equivalent, ktoe = thousand tons of oil equivalent, kWh = kilowatt-hour, PPP = purchasing power parity, t C = ton of carbon equivalent, TFEC = total final energy consumption, toe = ton of oil equivalent, TPES = total primary energy supply.

Note: Figures may not add up to total because of rounding.

Sources: APERC estimates, IEA (2011b), JAMA (2012), UNSD (2011a), and World Bank.

6.1 Bangladesh

Country Profile (2009)		Energy Reserves (year-end 2008)	
Total Surface Area (square kilometer)	144,000	Coal (million ton) - Recoverable	293.0
Population (thousand)	147,030	Gas (trillion cubic feet) - Proven	12.1
GDP (constant 2000 $ billion)	78.2	Oil (billion barrel) - Proven	28.0
Electrification Rate (%)	41.0		

GDP = gross domestic product.

Sources: ADB (2012), IEA (2011c), World Bank, and WEC (2010).

2009 Energy Supply and Demand Flow (ktoe)

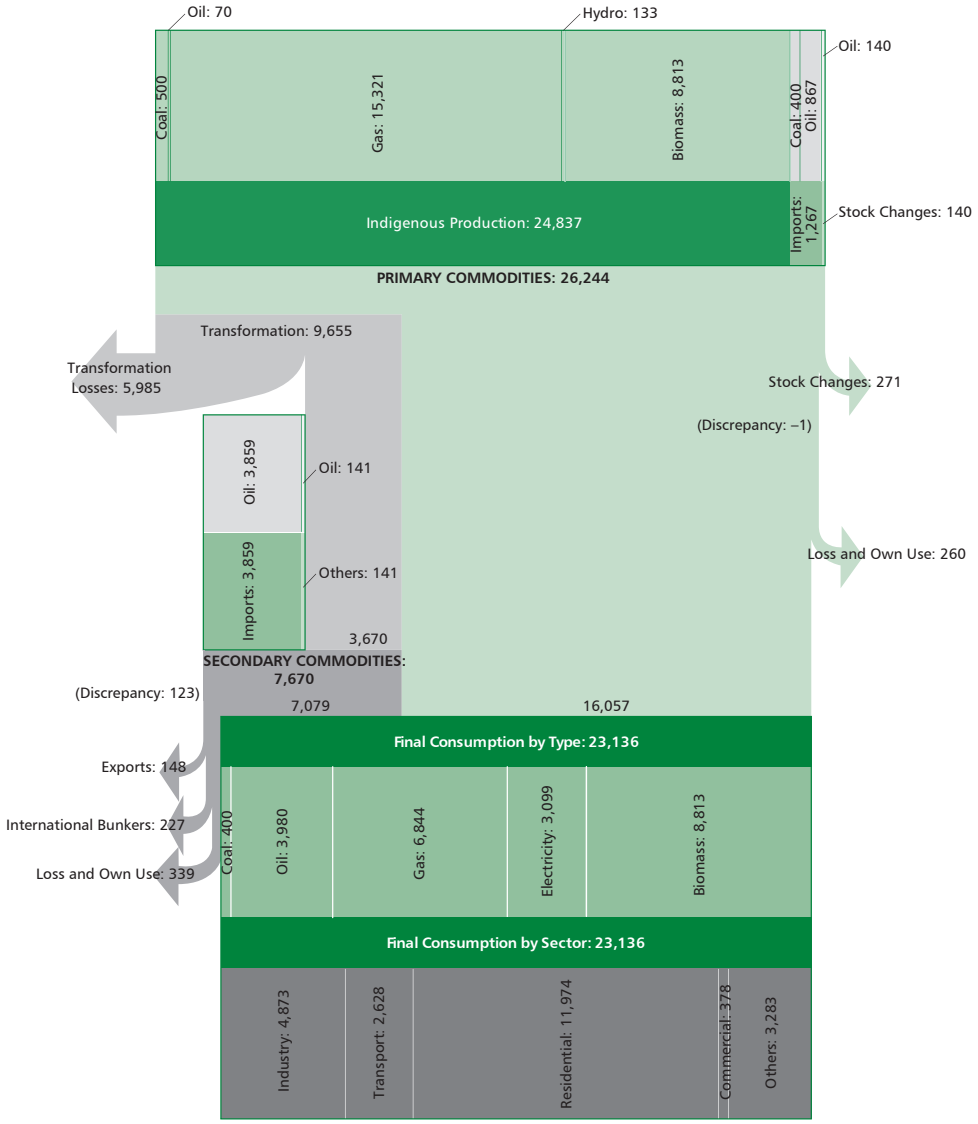


Table 6.1.1 Key Data and Economic Profile

	1990	1995	2000	2005	2009
Socioeconomic Data					
Population (thousand)	105,256	117,487	129,592	140,588	147,030
GDP (constant 2000 $ billion)	29.5	36.6	47.1	61.4	78.2
GDP (constant 2005 PPP $ billion)	78.6	97.5	125.7	163.7	208.6
GDP/capita (constant 2000 $)	280	311	364	437	532
GDP/capita (constant 2005 PPP $)	747	830	970	1,165	1,419

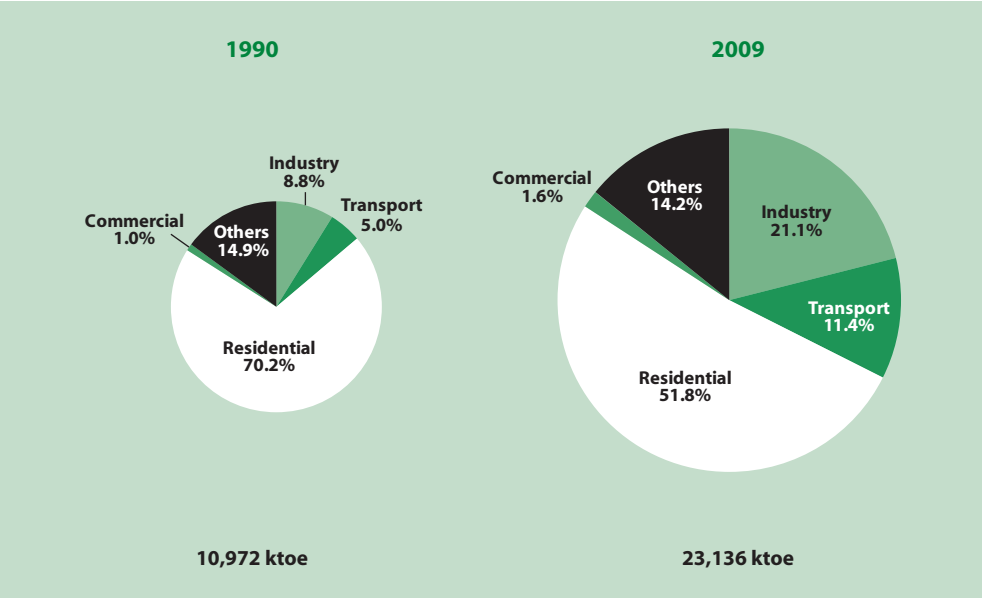
GDP = gross domestic product, PPP = purchasing power parity.
Sources: World Bank.

Table 6.1.2 Energy Supply and Demand

	1990	1995	2000	2005	2009
Primary Energy Supply (ktoe)					
Indigenous Production	10,757	12,777	15,155	19,343	24,837
Net Imports	1,978	3,119	3,446	4,534	4,761
Total PES	12,735	15,896	18,601	23,877	29,598
Coal	281	321	330	371	629
Oil	1,791	2,837	3,213	4,299	4,702
Gas	3,724	5,489	7,374	10,800	15,321
Biomass	6,863	7,217	7,603	8,296	8,813
Others	76	32	81	111	133
TPES/capita (toe)	0.12	0.14	0.14	0.17	0.20
TPES/GDP (toe/constant 2005 PPP $ million)	162	163	148	146	142
Final Energy Consumption (ktoe)					
Industry	971	1,486	1,886	2,692	4,873
Transportation	545	873	996	1,552	2,628
Other Sectors	9,456	11,176	12,408	14,617	15,635
Total FEC	10,972	13,535	15,290	18,861	23,136
Coal	281	321	330	350	400
Oil	1,571	2,411	2,716	3,633	3,980
Gas	1,852	2,867	3,570	4,668	6,844
Electricity	405	719	1,071	1,914	3,099
Biomass	6,863	7,217	7,603	8,296	8,813
Others	0	0	0	0	0

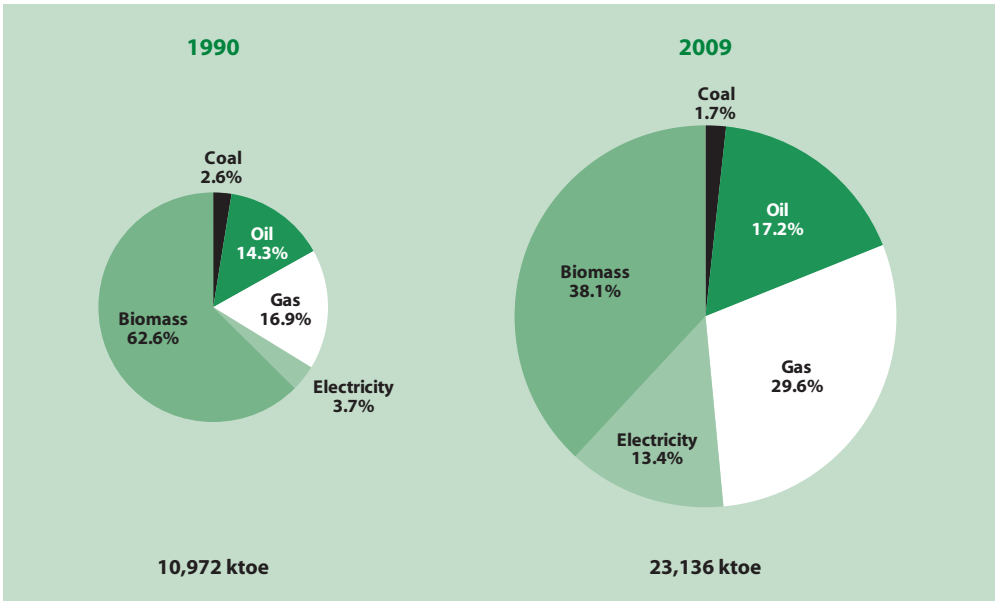
FEC = final energy consumption, GDP = gross domestic product, ktoe = thousand tons of oil equivalent, PES = primary energy supply, PPP = purchasing power parity, toe = ton of oil equivalent, TPES = total primary energy supply.
Source: IEA (2011b).

Figure 6.1.1 Final Energy Consumption by Sector, 1990 and 2009



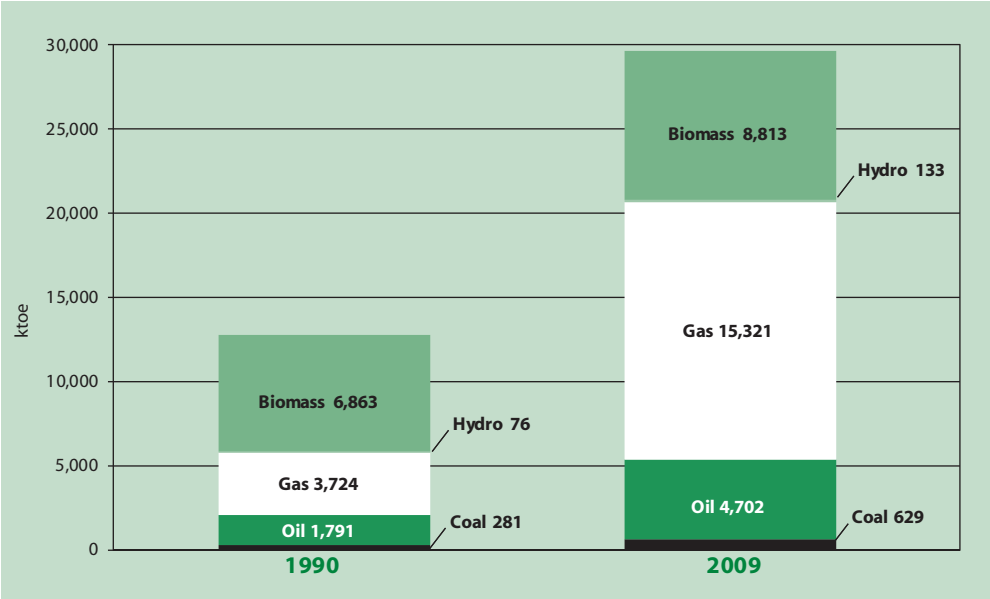
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 6.1.2 Final Energy Consumption by Type of Energy, 1990 and 2009



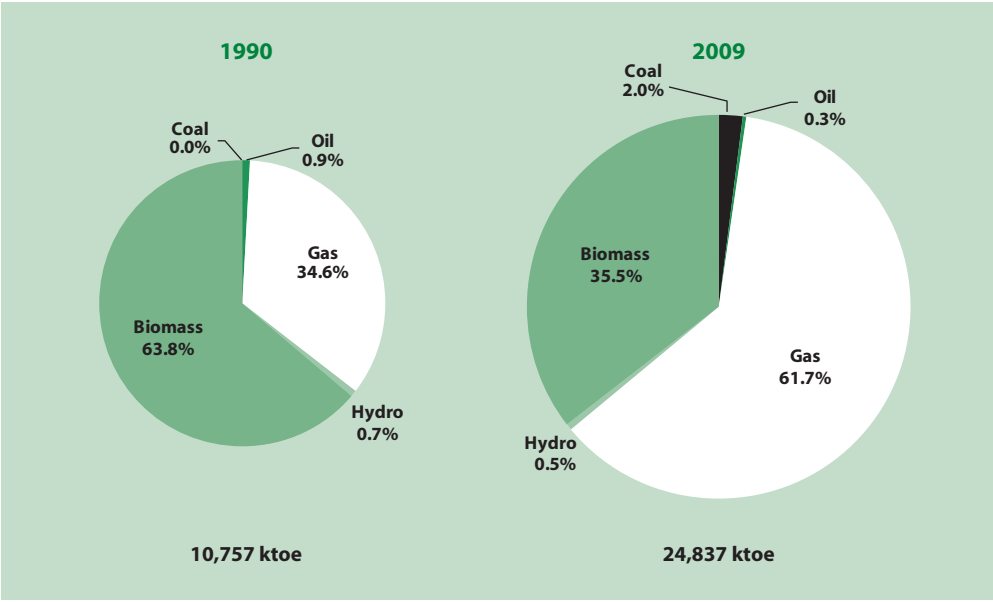
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 6.1.3 Total Primary Energy Supply, 1990 and 2009



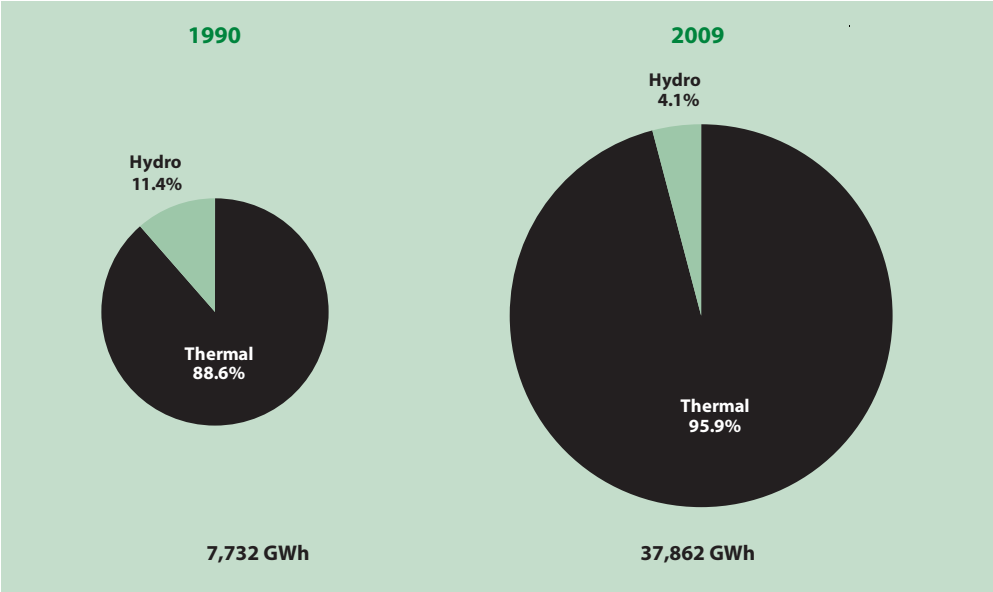
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 6.1.4 Indigenous Energy Production, 1990 and 2009



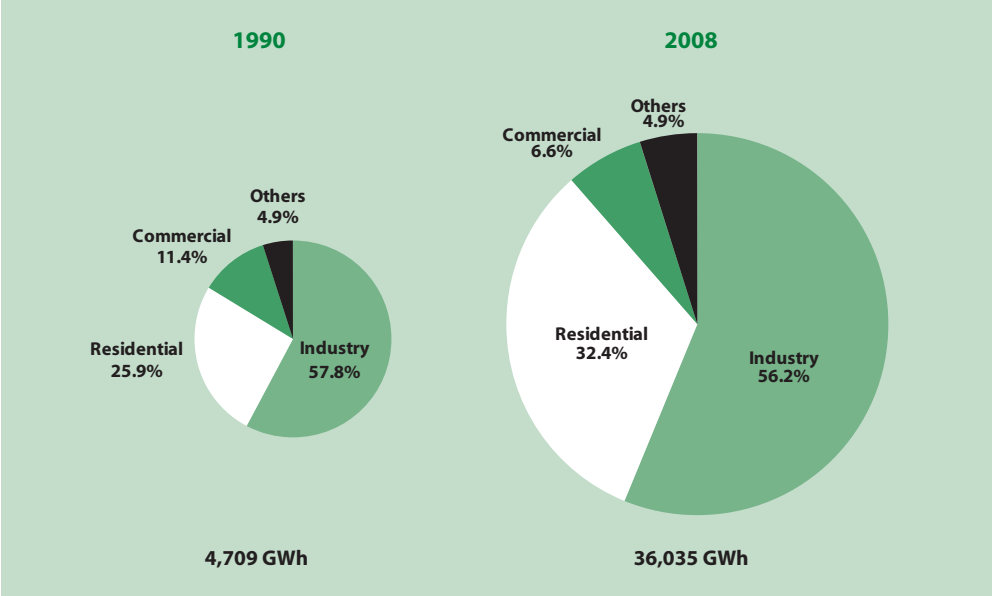
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 6.1.5 Electricity Generation by Plant Type, 1990 and 2009



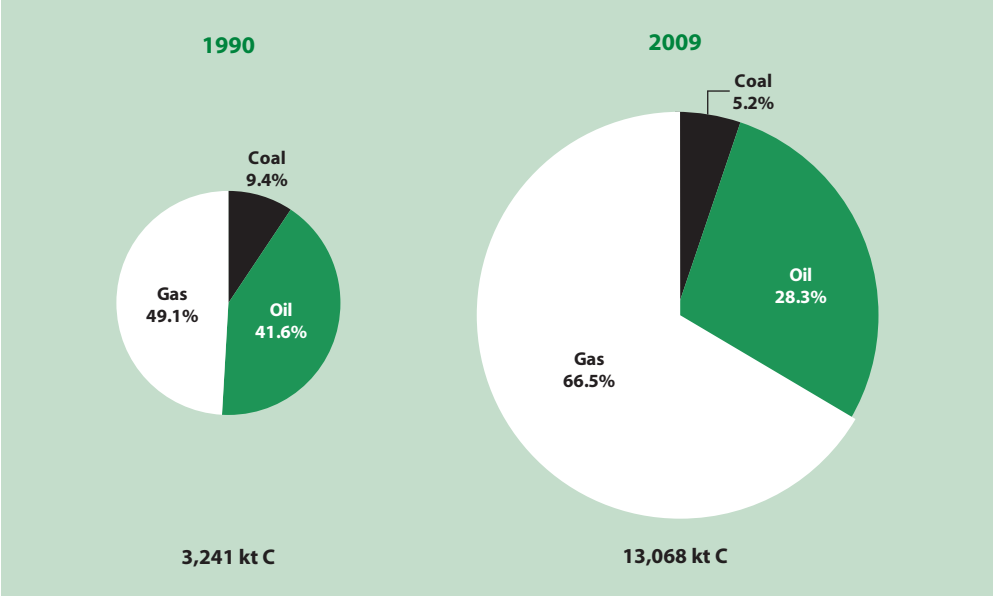
GWh = gigawatt-hour.
Source: IEA (2011b).

Figure 6.1.6 Electricity Consumption by Sector, 1990 and 2008



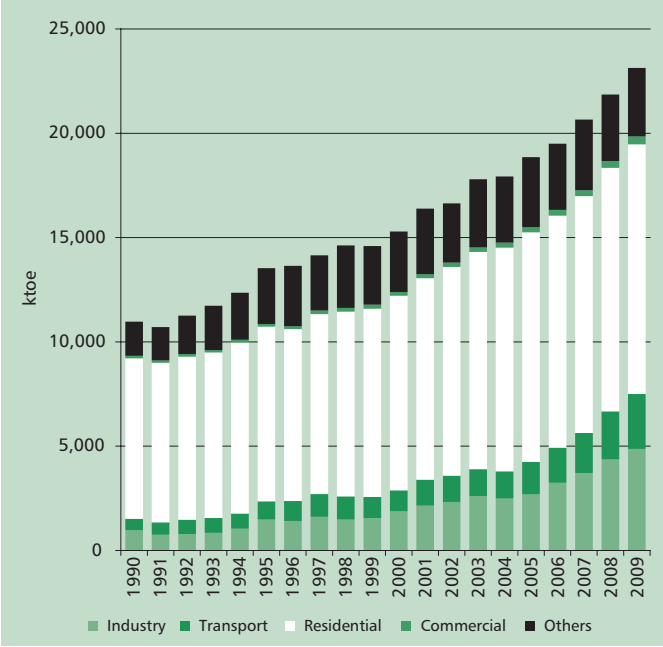
GWh = gigawatt-hour.
Source: IEA (2011b).

Figure 6.1.7 Carbon Dioxide Emissions from Fuel Combustion, 1990 and 2009



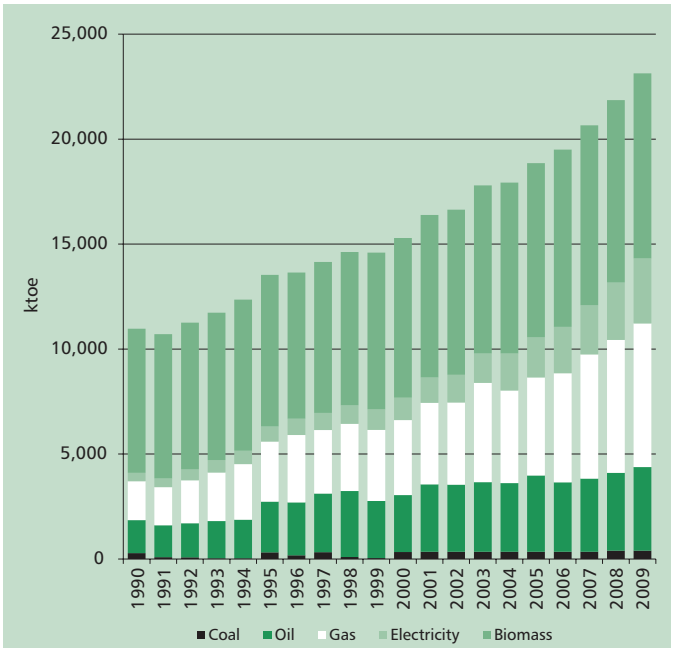
kt C = thousand tons of carbon equivalent.
Source: APERC estimates.

Figure 6.1.8 Final Energy Consumption by Sector, 1990–2009



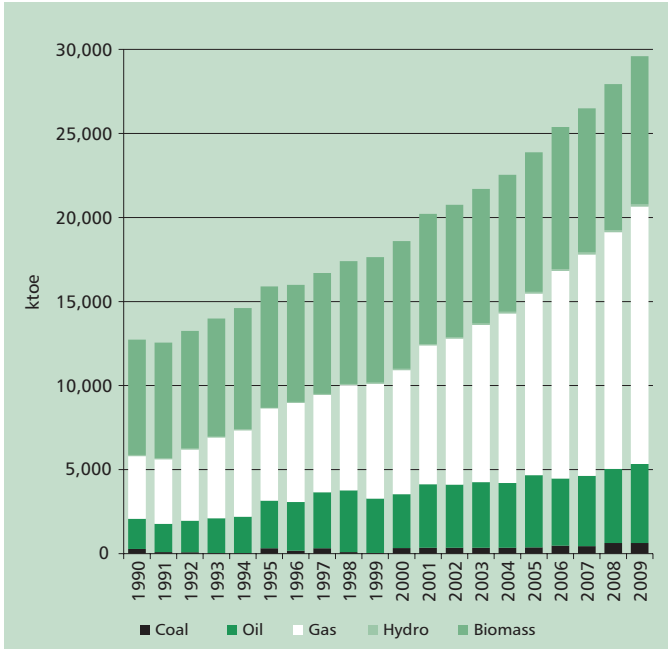
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 6.1.9 Final Energy Consumption by Type, 1990–2009



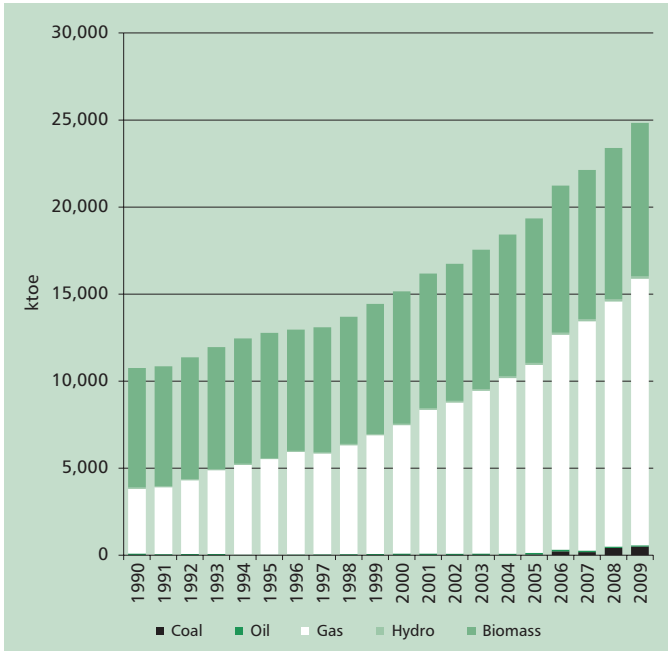
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 6.1.10 Total Primary Energy Supply, 1990–2009



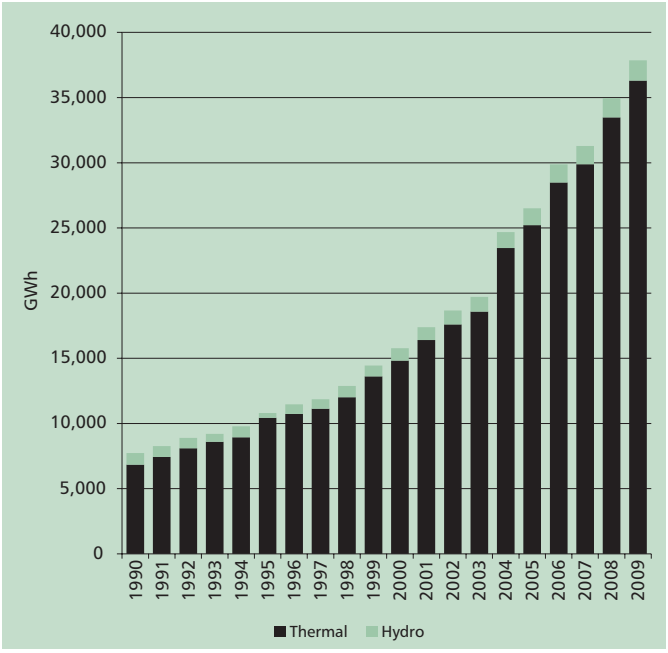
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 6.1.11 Indigenous Energy Production, 1990–2009



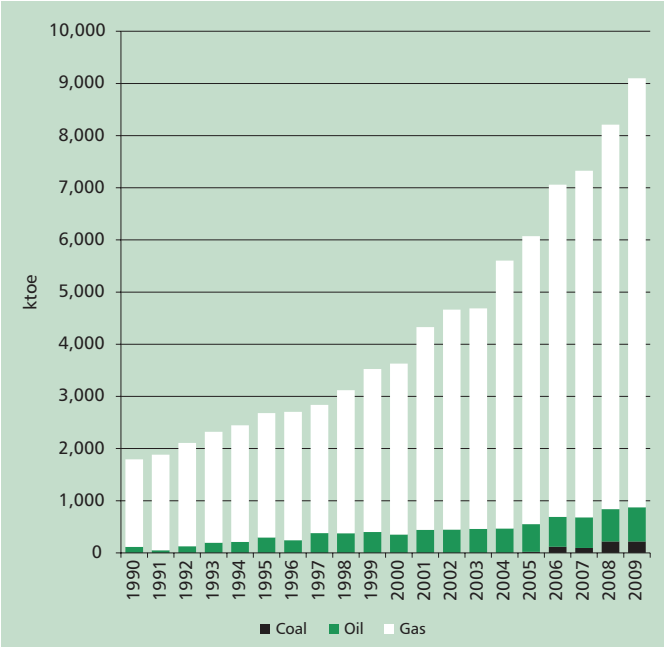
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 6.1.12 Electricity Generation by Source, 1990–2009



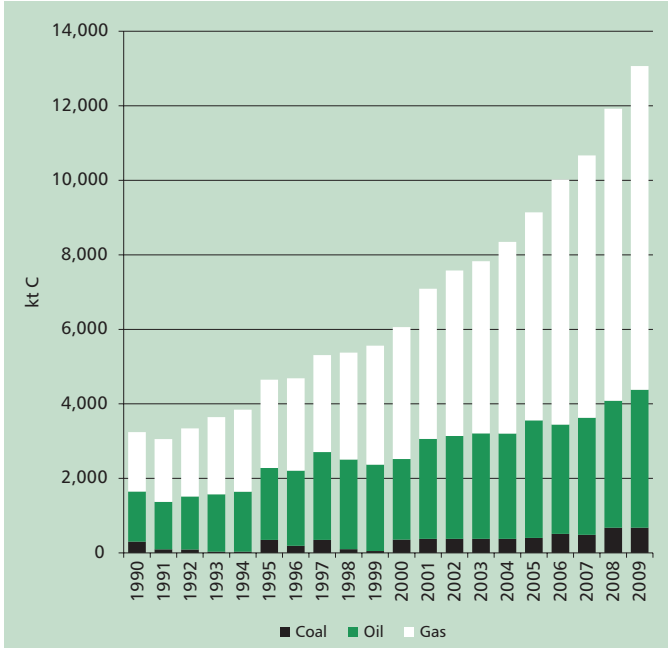
GWh = gigawatt-hour.
Source: IEA (2011b).

Figure 6.1.13 Fuel Input for Electricity Generation, 1990–2009



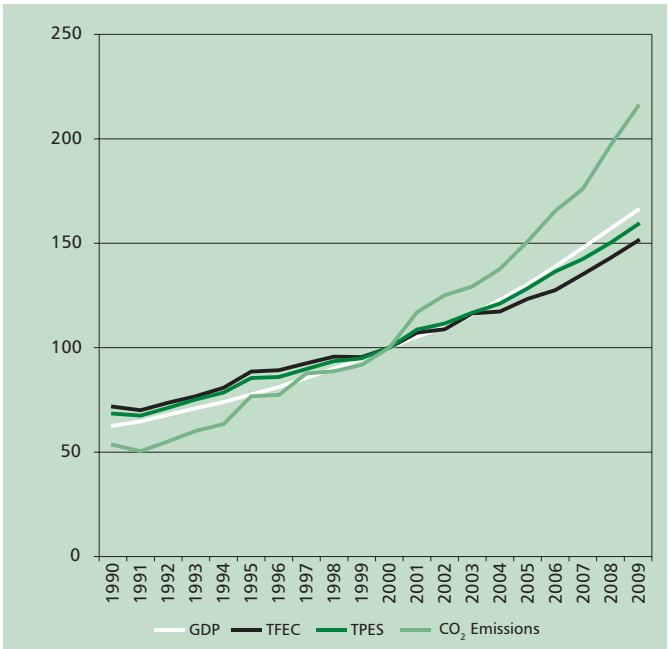
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 6.1.14 Carbon Dioxide Emissions from Fuel Combustion, 1990–2009



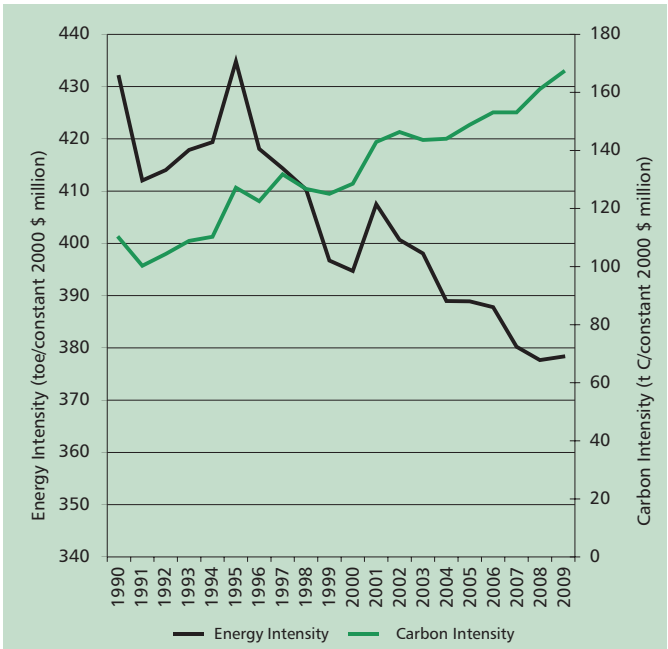
kt C = thousand tons of carbon equivalent.
Source: APERC estimates.

Figure 6.1.15 Growth of GDP, TFEC, TPES, and CO_2 (indexed to year 2000), 1990–2009



CO_2 = carbon dioxide, GDP = gross domestic product, TFEC = total final energy consumption, TPES = total primary energy supply.
Note: Indices are measured relative to the base year 2000 (2000 = 100).
Source: APERC estimates.

Figure 6.1.16 Energy and Carbon Intensities, 1990–2009



t C = ton of carbon equivalent, toe = ton of oil equivalent.
Source: APERC estimates.

Table 6.1.3 Bangladesh Energy Balance Table, 2006

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	225	0	95	0	0	0	0	0	0	0	12,344	119	0	0	0	0	8,446	0	0	0	21,229
2.	Imports	350	0	1,262	2,993	178	183	1,851	381	0	400	0	0	0	0	0	0	0	0	0	0	4,605
3.	Exports	0	0	0	−125	0	0	0	0	0	−125	0	0	0	0	0	0	0	0	0	0	−125
4.	International Bunkers	0	0	0	−324	0	0	0	−35	0	−289	0	0	0	0	0	0	0	0	0	0	−324
5.	Stock Changes	−102	0	83	20	2	0	0	0	0	18	0	0	0	0	0	0	0	0	0	0	1
6.	Total Primary Energy Supply	473	0	1,440	2,564	180	183	1,851	346	0	4	12,344	119	0	0	0	0	8,446	0	0	0	25,386
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	−118	0	−1,439	808	150	350	−44	−181	9	524	−6,369	−119	0	0	0	0	0	0	2,570	0	−4,667
8.1	Power Generation	−118	0	0	−572	0	0	−338	−234	0	0	−6,369	−119	0	0	0	0	0	0	2,570	0	−4,608
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	−1,439	1,380	150	350	294	53	9	524	0	0	0	0	0	0	0	0	0	0	−59
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	−5	0	0	−70	0	0	0	−36	0	−34	−776	0	0	0	0	0	0	0	−297	0	−1,148
10.	Discrepancy	0	0	−1	2	0	1	−1	1	0	1	1	0	0	0	0	0	0	0	−68	0	−66
11.	Total Final Energy Consumption	350	0	0	3,304	330	534	1,806	130	9	495	5,200	0	0	0	0	0	8,446	0	2,205	0	19,505
12.	Industry Sector	350	0	0	238	0	0	66	130	0	42	1,487	0	0	0	0	0	0	0	1,174	0	3,249
13.	Transport Sector	0	0	0	1,520	330	0	1,190	0	0	0	157	0	0	0	0	0	0	0	0	0	1,677
14.	Other Sectors	0	0	0	1,093	0	534	550	0	9	0	1,480	0	0	0	0	0	8,446	0	1,031	0	12,050
14.1	Residential and Commercial	0	0	0	543	0	534	0	0	9	0	1,462	0	0	0	0	0	8,446	0	952	0	11,403
14.1.1	Commerce and Public Services	0	0	0	0	0	0	0	0	0	0	123	0	0	0	0	0	0	0	151	0	274
14.1.2	Residential	0	0	0	543	0	534	0	0	9	0	1,339	0	0	0	0	0	8,446	0	801	0	11,129
14.2	Non–Specified Others	0	0	0	550	0	0	550	0	0	0	18	0	0	0	0	0	0	0	79	0	647
15.	Non–Energy Use	0	0	0	453	0	0	0	0	0	453	2,076	0	0	0	0	0	0	0	0	0	2,529
16.	Electricity Output (GWh)	343	0	0	1,640	0	0	0	0	0	0	26,507	1,389	0	0	0	0	0	0	0	0	29,879
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.
Note: Figures may not add up to total because of rounding.
Source: IEA (2011b).

Table 6.1.4 Bangladesh Energy Balance Table, 2007

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	180	0	86	0	0	0	0	0	0	0	13,176	120	0	0	0	0	8,570	0	0	0	22,132
2.	Imports	350	0	1,219	3,180	121	159	2,123	406	0	371	0	0	0	0	0	0	0	0	0	0	4,749
3.	Exports	0	0	0	–132	0	0	0	0	0	–132	0	0	0	0	0	0	0	0	0	0	–132
4.	International Bunkers	0	0	0	–287	0	0	0	–35	0	–252	0	0	0	0	0	0	0	0	0	0	–287
5.	Stock Changes	–82	0	1	110	94	0	0	0	0	16	0	0	0	0	0	0	0	0	0	0	29
6.	Total Primary Energy Supply	448	0	1,306	2,871	215	159	2,123	371	0	3	13,176	120	0	0	0	0	8,570	0	0	0	26,491
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	–94	0	–1,306	685	136	318	–72	–201	14	490	–6,647	–120	0	0	0	0	0	0	2,691	0	–4,791
8.1	Power Generation	–94	0	0	–587	0	0	–339	–248	0	0	–6,647	–120	0	0	0	0	0	0	2,691	0	–4,757
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	–1,306	1,272	136	318	267	47	14	490	0	0	0	0	0	0	0	0	0	0	–34
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	–4	0	0	–82	0	0	0	–33	0	–49	–610	0	0	0	0	0	0	0	–289	0	–985
10.	Discrepancy	0	0	0	6	0	0	0	1	0	5	2	0	0	0	0	0	0	0	–63	0	–55
11.	Total Final Energy Consumption	350	0	0	3,480	351	477	2,051	138	14	449	5,921	0	0	0	0	0	8,570	0	2,339	0	20,660
12.	Industry Sector	350	0	0	253	0	0	70	138	0	45	1,816	0	0	0	0	0	0	0	1,298	0	3,717
13.	Transport Sector	0	0	0	1,638	351	0	1,287	0	0	0	281	0	0	0	0	0	0	0	0	0	1,919
14.	Other Sectors	0	0	0	1,185	0	477	694	0	14	0	1,633	0	0	0	0	0	8,570	0	1,041	0	12,429
14.1	Residential and Commercial	0	0	0	491	0	477	0	0	14	0	1,615	0	0	0	0	0	8,570	0	961	0	11,637
14.1.1	Commerce and Public Services	0	0	0	0	0	0	0	0	0	0	133	0	0	0	0	0	0	0	152	0	285
14.1.2	Residential	0	0	0	491	0	477	0	0	14	0	1,482	0	0	0	0	0	8,570	0	809	0	11,352
14.2	Non-Specified Others	0	0	0	694	0	0	694	0	0	0	18	0	0	0	0	0	0	0	80	0	792
15.	Non-Energy Use	0	0	0	404	0	0	0	0	0	404	2,191	0	0	0	0	0	0	0	0	0	2,595
16.	Electricity Output (GWh)	275	0	0	1,643	0	0	0	0	0	0	27,976	1,392	0	0	0	0	0	0	0	0	31,286
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Source: IEA (2011b).

Table 6.1.5 Bangladesh Energy Balance Table, 2008

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	420	0	78	0	0	0	0	0	0	0	14,079	127	0	0	0	0	8,692	0	0	0	23,396
2.	Imports	400	0	1,251	3,518	159	139	2,436	431	0	353	0	0	0	0	0	0	0	0	0	0	5,169
3.	Exports	0	0	0	–140	0	0	0	0	0	–140	0	0	0	0	0	0	0	0	0	0	–140
4.	International Bunkers	0	0	0	–254	0	0	0	–35	0	–219	0	0	0	0	0	0	0	0	0	0	–254
5.	Stock Changes	–191	0	–142	104	90	0	0	0	0	14	0	0	0	0	0	0	0	0	0	0	–229
6.	Total Primary Energy Supply	629	0	1,187	3,228	249	139	2,436	396	0	8	14,079	127	0	0	0	0	8,692	0	0	0	27,942
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	–219	0	–1,187	543	123	289	–117	–222	45	425	–7,371	–127	0	0	0	0	0	0	3,006	0	–5,355
8.1	Power Generation	–219	0	0	–621	0	0	–359	–262	0	0	–7,371	–127	0	0	0	0	0	0	3,006	0	–5,332
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	–1,187	1,164	123	289	242	40	45	425	0	0	0	0	0	0	0	0	0	0	–23
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	–9	0	0	–77	0	0	0	–30	0	–47	–380	0	0	0	0	0	0	0	–314	0	–780
10.	Discrepancy	–1	0	0	13	0	0	–1	3	0	11	2	0	0	0	0	0	0	0	40	0	54
11.	Total Final Energy Consumption	400	0	0	3,707	372	428	2,318	147	45	397	6,330	0	0	0	0	0	8,692	0	2,732	0	21,861
12.	Industry Sector	400	0	0	269	0	0	74	147	0	48	2,161	0	0	0	0	0	0	0	1,539	0	4,369
13.	Transport Sector	0	0	0	1,764	372	0	1,392	0	0	0	535	0	0	0	0	0	0	0	0	0	2,299
14.	Other Sectors	0	0	0	1,325	0	428	852	0	45	0	1,790	0	0	0	0	0	8,692	0	1,193	0	13,000
14.1	Residential and Commercial	0	0	0	473	0	428	0	0	45	0	1,773	0	0	0	0	0	8,692	0	1,064	0	12,002
14.1.1	Commerce and Public Services	0	0	0	0	0	0	0	0	0	0	155	0	0	0	0	0	0	0	165	0	320
14.1.2	Residential	0	0	0	473	0	428	0	0	45	0	1,618	0	0	0	0	0	8,692	0	899	0	11,682
14.2	Non–Specified Others	0	0	0	852	0	0	852	0	0	0	17	0	0	0	0	0	0	0	129	0	998
15.	Non–Energy Use	0	0	0	349	0	0	0	0	0	349	1,844	0	0	0	0	0	0	0	0	0	2,193
16.	Electricity Output (GWh)	638	0	0	1,739	0	0	0	0	0	0	31,106	1,474	0	0	0	0	0	0	0	0	34,957
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.
Note: Figures may not add up to total because of rounding.
Source: IEA (2011b).

Table 6.1.6 Bangladesh Energy Balance Table, 2009

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	500	0	70	0	0	0	0	0	0	0	15,321	133	0	0	0	0	8,813	0	0	0	24,837
2.	Imports	400	0	867	3,859	153	121	2,792	456	0	337	0	0	0	0	0	0	0	0	0	0	5,126
3.	Exports	0	0	0	−148	0	0	0	0	0	−148	0	0	0	0	0	0	0	0	0	0	−148
4.	International Bunkers	0	0	0	−227	0	0	0	−35	0	−192	0	0	0	0	0	0	0	0	0	0	−227
5.	Stock Changes	−271	0	140	141	129	0	0	0	0	12	0	0	0	0	0	0	0	0	0	0	10
6.	Total Primary Energy Supply	629	0	1,077	3,625	282	121	2,792	421	0	9	15,321	133	0	0	0	0	8,813	0	0	0	29,598
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	−219	0	−1,077	414	111	263	−160	−241	45	396	−8,226	−133	0	0	0	0	0	0	3,256	0	−5,985
8.1	Power Generation	−219	0	0	−656	0	0	−379	−277	0	0	−8,226	−133	0	0	0	0	0	0	3,256	0	−5,978
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	−1,077	1,070	111	263	219	36	45	396	0	0	0	0	0	0	0	0	0	0	−7
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	−9	0	0	−82	0	0	0	−27	0	−55	−251	0	0	0	0	0	0	0	−257	0	−599
10.	Discrepancy	−1	0	0	23	1	0	2	3	0	17	0	0	0	0	0	0	0	0	100	0	122
11.	Total Final Energy Consumption	400	0	0	3,980	394	384	2,634	156	45	367	6,844	0	0	0	0	0	8,813	0	3,099	0	23,136
12.	Industry Sector	400	0	0	287	0	0	79	156	0	52	2,444	0	0	0	0	0	0	0	1,742	0	4,873
13.	Transport Sector	0	0	0	1,901	394	0	1,507	0	0	0	727	0	0	0	0	0	0	0	0	0	2,628
14.	Other Sectors	0	0	0	1,477	0	384	1,048	0	45	0	1,919	0	0	0	0	0	8,813	0	1,357	0	13,566
14.1	Residential and Commercial	0	0	0	429	0	384	0	0	45	0	1,904	0	0	0	0	0	8,813	0	1,206	0	12,352
14.1.1	Commerce and Public Services	0	0	0	0	0	0	0	0	0	0	175	0	0	0	0	0	0	0	203	0	378
14.1.2	Residential	0	0	0	429	0	384	0	0	45	0	1,729	0	0	0	0	0	8,813	0	1,003	0	11,974
14.2	Non-Specified Others	0	0	0	1,048	0	0	1,048	0	0	0	15	0	0	0	0	0	0	0	151	0	1,214
15.	Non-Energy Use	0	0	0	315	0	0	0	0	0	315	1,754	0	0	0	0	0	0	0	0	0	2,069
16.	Electricity Output (GWh)	638	0	0	1,832	0	0	0	0	0	0	33,840	1,552	0	0	0	0	0	0	0	0	37,862
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Source: IEA (2011b).

Table 6.1.7 Bangladesh Summary Table, 1990–2009

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Indigenous Production (ktoe)																				
Coal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	38	225	180	420	500
Oil	94	66	69	75	39	39	43	50	60	72	97	95	88	102	92	98	95	86	78	70
Gas	3,724	3,835	4,237	4,808	5,145	5,489	5,891	5,791	6,258	6,823	7,374	8,258	8,687	9,345	10,087	10,800	12,344	13,176	14,079	15,321
Hydro	76	72	68	52	73	32	64	62	74	72	81	85	92	97	105	111	119	120	127	133
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Geothermal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Solar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wind	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Biomass	6,863	6,875	6,991	7,020	7,198	7,217	6,962	7,194	7,306	7,469	7,603	7,740	7,872	8,006	8,142	8,296	8,446	8,570	8,692	8,813
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	10,757	10,848	11,365	11,955	12,455	12,777	12,960	13,097	13,698	14,436	15,155	16,178	16,739	17,550	18,426	19,343	21,229	22,132	23,396	24,837
Primary Energy Supply (ktoe)																				
Coal	281	90	84	31	29	321	176	323	93	46	330	350	350	350	350	371	473	448	629	629
Oil	1,791	1,685	1,873	2,077	2,167	2,837	2,898	3,332	3,672	3,236	3,213	3,783	3,755	3,906	3,854	4,299	4,004	4,177	4,415	4,702
Gas	3,724	3,835	4,237	4,808	5,145	5,489	5,891	5,791	6,258	6,823	7,374	8,258	8,687	9,345	10,087	10,800	12,344	13,176	14,079	15,321
Hydro	76	72	68	52	73	32	64	62	74	72	81	85	92	97	105	111	119	120	127	133
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Geothermal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Solar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wind	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Biomass	6,863	6,875	6,991	7,020	7,198	7,217	6,962	7,194	7,306	7,469	7,603	7,740	7,872	8,006	8,142	8,296	8,446	8,570	8,692	8,813
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	12,735	12,557	13,253	13,988	14,612	15,896	15,991	16,702	17,403	17,646	18,601	20,216	20,756	21,704	22,538	23,877	25,386	26,491	27,942	29,598
Final Energy Consumption by Sector (ktoe)																				
Industry	971	753	789	847	1,047	1,486	1,412	1,613	1,483	1,554	1,886	2,153	2,331	2,611	2,494	2,692	3,249	3,717	4,369	4,873
Transport	545	598	689	709	724	873	962	1,091	1,114	1,013	996	1,241	1,260	1,289	1,303	1,552	1,677	1,919	2,299	2,628
Residential	7,701	7,646	7,816	7,937	8,202	8,371	8,240	8,629	8,853	9,029	9,335	9,660	10,006	10,412	10,724	11,009	11,129	11,352	11,682	11,974
Commercial	115	113	126	117	127	129	136	171	181	192	174	191	204	218	237	246	274	285	320	378
Others	1,640	1,605	1,839	2,127	2,258	2,676	2,897	2,649	2,998	2,810	2,899	3,145	2,844	3,270	3,176	3,362	3,176	3,387	3,191	3,283
Total	10,972	10,715	11,259	11,737	12,358	13,535	13,647	14,153	14,629	14,598	15,290	16,390	16,645	17,800	17,934	18,861	19,505	20,660	21,861	23,136

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Table 6.1.7 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Final Energy Consumption by Type (ktoe)																				
Coal	281	90	84	31	29	321	176	323	93	46	330	350	350	350	350	350	350	350	400	400
Oil	1,571	1,522	1,622	1,776	1,844	2,411	2,520	2,800	3,148	2,716	2,716	3,209	3,191	3,314	3,265	3,633	3,304	3,480	3,707	3,980
Gas	1,852	1,809	2,044	2,315	2,647	2,867	3,215	3,024	3,204	3,391	3,570	3,887	3,919	4,726	4,415	4,668	5,200	5,921	6,330	6,844
Electricity	405	419	518	595	640	719	774	812	878	976	1,071	1,204	1,313	1,404	1,762	1,914	2,205	2,339	2,732	3,099
Heat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Biomass	6,863	6,875	6,991	7,020	7,198	7,217	6,962	7,194	7,306	7,469	7,603	7,740	7,872	8,006	8,142	8,296	8,446	8,570	8,692	8,813
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	10,972	10,715	11,259	11,737	12,358	13,535	13,647	14,153	14,629	14,598	15,290	16,390	16,645	17,800	17,934	18,861	19,505	20,660	21,861	23,136
Power Generation (GWh)																				
Thermal	6,848	7,432	8,098	8,598	8,937	10,434	10,735	11,139	12,017	13,617	14,825	16,399	17,599	18,586	23,458	25,213	28,490	29,894	33,483	36,310
Hydro	884	838	796	608	847	372	739	719	865	833	946	993	1,066	1,126	1,226	1,293	1,389	1,392	1,474	1,552
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Geothermal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Solar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wind	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	7,732	8,270	8,894	9,206	9,784	10,806	11,474	11,858	12,882	14,450	15,771	17,392	18,665	19,712	24,684	26,506	29,879	31,286	34,957	37,862
Loss and Own Use of Electricity (GWh)																				
Transmission and Distribution Losses	2,593	2,942	2,372	1,791	1,767	1,791	1,837	1,791	1,988	2,291	2,419	2,419	2,372	2,267	2,035	1,965	1,779	1,605	1,686	860
Own Use	430	453	500	512	570	640	640	616	686	814	884	977	1,047	1,105	1,384	1,488	1,674	1,756	1,965	2,128
Total	3,023	3,395	2,872	2,302	2,337	2,430	2,477	2,407	2,674	3,105	3,302	3,395	3,419	3,372	3,419	3,453	3,453	3,360	3,651	2,988
Fuel Input for Power Generation (ktoe)																				
Coal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	118	94	219	219
Oil	117	51	128	197	210	297	243	378	377	401	353	441	449	459	468	532	572	587	621	656
Gas	1,677	1,833	1,980	2,126	2,237	2,383	2,461	2,459	2,741	3,125	3,275	3,889	4,216	4,228	5,135	5,522	6,369	6,647	7,371	8,226
Total	1,794	1,884	2,108	2,323	2,447	2,680	2,704	2,837	3,118	3,526	3,628	4,330	4,665	4,687	5,603	6,074	7,059	7,328	8,211	9,101
CO_2 Emissions (kt C)																				
Coal	304	97	91	33	31	347	190	349	100	50	356	378	378	378	378	401	511	484	678	678
Oil	1,346	1,273	1,423	1,541	1,612	1,932	2,016	2,358	2,406	2,318	2,164	2,680	2,759	2,829	2,827	3,156	2,934	3,146	3,406	3,699
Gas	1,591	1,687	1,827	2,070	2,198	2,371	2,481	2,604	2,870	3,195	3,539	4,033	4,444	4,624	5,142	5,583	6,578	7,038	7,838	8,691
Total	3,241	3,057	3,340	3,644	3,842	4,650	4,687	5,311	5,377	5,563	6,059	7,091	7,581	7,831	8,347	9,139	10,023	10,668	11,922	13,068

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Table 6.1.7 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Macroeconomic Indicators																				
Population (thousand)	105,256	107,769	110,226	112,645	115,059	117,487	119,929	122,370	124,803	127,215	129,592	131,945	134,266	136,515	138,633	140,588	142,354	143,957	145,478	147,030
Urban Population, %	19.8	20.2	20.6	20.9	21.3	21.7	22.1	22.5	22.8	23.2	23.6	24.0	24.4	24.9	25.3	25.7	26.2	26.7	27.1	27.6
GDP (constant 2000 $ million)	29,490	30,475	32,010	33,475	34,842	36,558	38,248	40,308	42,415	44,481	47,125	49,610	51,801	54,523	57,942	61,393	65,463	69,671	73,984	78,231
GDP (current $ million)	30,129	30,957	31,709	33,167	33,769	37,940	40,666	42,319	44,092	45,694	47,125	46,988	47,571	51,914	56,561	60,278	61,901	68,415	79,554	89,360
GDP (constant 2005 PPP $ million)	78,646	81,273	85,368	89,273	92,920	97,496	102,002	107,498	113,117	118,625	125,677	132,305	138,147	145,408	154,525	163,728	174,582	185,804	197,306	208,634
GDP/capita (constant 2000 $)	280	283	290	297	303	311	319	329	340	350	364	376	386	399	418	437	460	484	509	532
GDP/capita (current $)	286	287	288	294	293	323	339	346	353	359	364	356	354	380	408	429	435	475	547	608
GDP - Manufacturing (% of GDP)	12.1	12.4	12.7	13.2	13.7	14.4	14.7	14.6	15.1	14.9	14.7	14.9	15.0	15 .3	15 .4	15.7	16 .3	16.8	17.0	17.1
Car Ownership (car/1,000 persons)	1	1	1	1	1	1	1	1	1	1	1	2	1	2	2	2	2	2	2	1
Basic Energy Indicators																				
TPES/capita (toe/person)	0.12	0.12	0.12	0.12	0.13	0.14	0.13	0.14	0.14	0.14	0.14	0.15	0.15	0.16	0.16	0.17	0.18	0.18	0.19	0.20
TFEC/capita (toe/person)	0.10	0.10	0.10	0.10	0.11	0.12	0.11	0.12	0.12	0.11	0.12	0.12	0.12	0.13	0.13	0.13	0.14	0.14	0.15	0.16
TPES/GDP (toe/constant 2000 $ million)	432	412	414	418	419	435	418	414	410	397	395	407	401	398	389	389	388	380	378	378
TFEC/GDP (toe/constant 2000 $ million)	372	352	352	351	355	370	357	351	345	328	324	330	321	326	310	307	298	297	295	296
Import Dependency (%)	15.5	13.6	14.2	14.5	14.8	19.6	19.0	21.6	21.3	18.2	18.5	20.0	19.4	19.1	18.2	19.0	16.4	16.5	16.3	16.1
Oil Import Dependency (%)	94.8	96.1	96.3	96.4	98.2	98.6	98.5	98.5	98.4	97.8	97.0	97.5	97.7	97.4	97.6	97.7	97.6	97.9	98.2	98.5
Electricity/capita (kWh/ person)	45	45	55	61	65	71	75	77	82	89	96	106	114	120	148	158	180	189	218	245
CO_2 Intensity (t C/constant 2000 $ million)	110	100	104	109	110	127	123	132	127	125	129	143	146	144	144	149	153	153	161	167
CO_2/capita (t C)	0.03	0.03	0.03	0.03	0.03	0.04	0.04	0.04	0.04	0.04	0.05	0.05	0.06	0.06	0.06	0.07	0.07	0.07	0.08	0.09
CO_2/TPES (t C/toe)	0.25	0.24	0.25	0.26	0.26	0.29	0.29	0.32	0.31	0.32	0.33	0.35	0.37	0.36	0.37	0.38	0.39	0.40	0.43	0.44

CO_2 = carbon dioxide, GDP = gross domestic product, GWh = gigawatt-hour, kt C = thousand tons of carbon equivalent, ktoe = thousand tons of oil equivalent, kWh = kilowatt-hour, PPP = purchasing power parity, t C = ton of carbon equivalent, TFEC = total final energy consumption, toe = ton of oil equivalent, TPES = total primary energy supply.

Note: Figures may not add up to total because of rounding.

Sources: APERC estimates, IEA (2011b), JAMA (2012), and World Bank.

6.2 Bhutan

Country Profile (2009)		Energy Reserves (year-end 2008)	
Total Surface Area (square kilometer)	38,390	Coal (million ton) - Recoverable	–
Population (thousand)	714	Gas (trillion cubic feet) - Proven	–
GDP (constant 2000 $ billion)	0.9	Oil (billion barrel) - Proven	–
Electrification Rate (%)	–		

– = no data or not applicable, GDP = gross domestic product.

Sources: ADB (2012), IEA (2011c), and World Bank.

2008 Energy Supply and Demand Flow (ktoe)

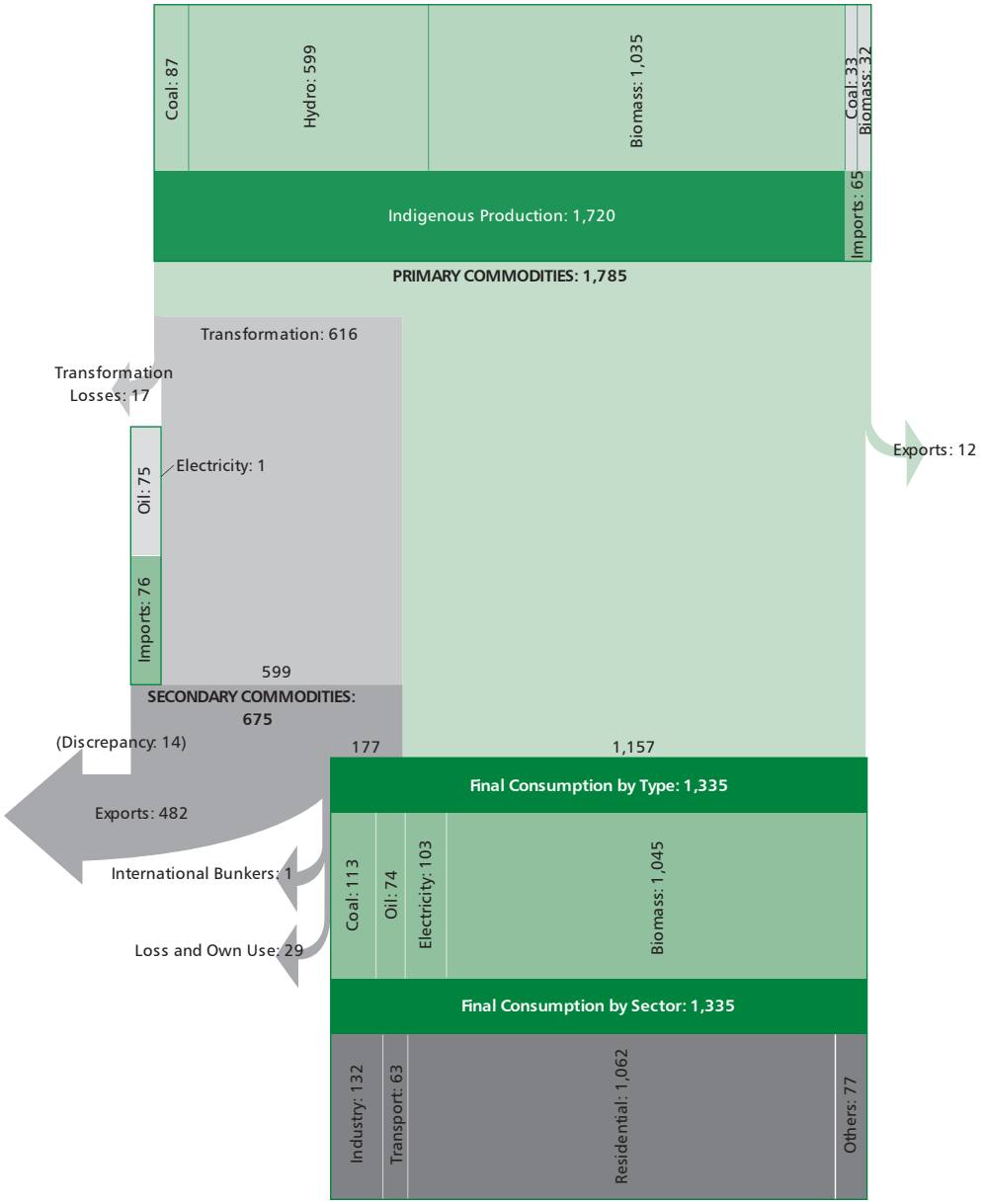


Table 6.2.1 Key Data and Economic Profile

	1990	1995	2000	2005	2008
Socioeconomic Data					
Population (thousand)	559	519	571	659	701
GDP (constant 2000 $ billion)	0.3	0.3	0.4	0.6	0.8
GDP (constant 2005 PPP $ billion)	0.9	1.1	1.5	2.3	3.0
GDP/capita (constant 2000 $)	465	608	749	964	1,195
GDP/capita (constant 2005 PPP $)	1,679	2,193	2,703	3,480	4,315

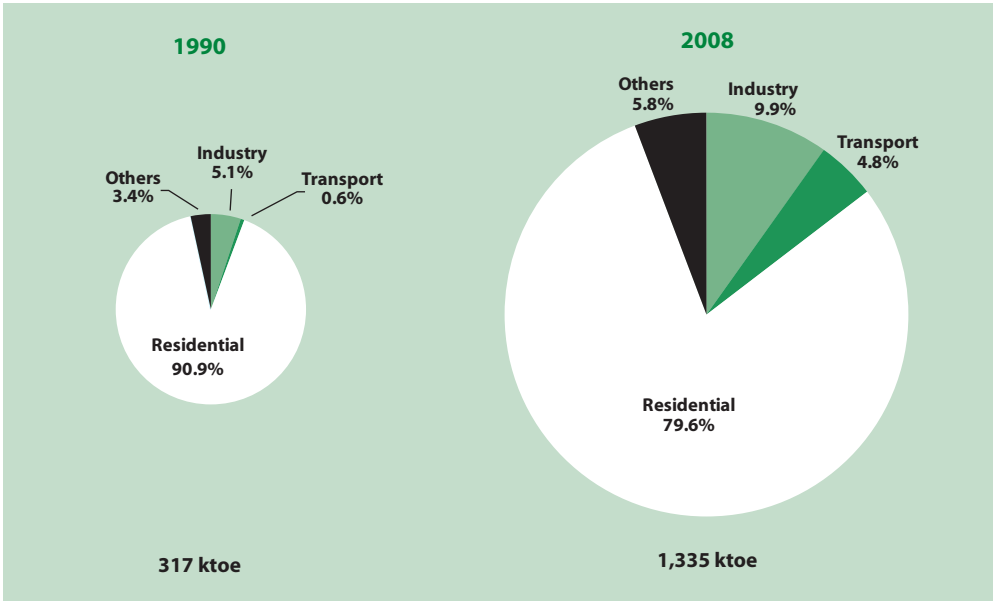
GDP = gross domestic product, PPP = purchasing power parity.
Source: World Bank.

Table 6.2.2 Energy Supply and Demand

	1990	1995	2000	2005	2008
Primary Energy Supply (ktoe)					
Indigenous Production	980	1,036	1,115	1,284	1,720
Net Imports	–80	–96	–49	–51	–354
Total PES	900	940	1,066	1,233	1,366
Coal	13	20	46	102	113
Oil	29	36	51	71	74
Gas	0	0	0	0	0
Biomass	844	856	933	996	1,062
Others	14	28	36	63	118
TPES/capita (toe)	1.61	1.81	1.87	1.87	1.95
TPES/GDP (toe/constant 2005 PPP $ million)	960	827	690	537	452
Final Energy Consumption (ktoe)					
Industry	16	30	51	101	132
Transportation	2	25	38	55	63
Other Sectors	299	358	975	1,048	1,140
Total FEC	317	413	1,064	1,204	1,335
Coal	13	20	46	102	113
Oil	13	36	51	71	74
Gas	0	0	0	0	0
Electricity	13	23	34	53	103
Biomass	279	333	932	979	1,045
Others	0	0	0	0	0

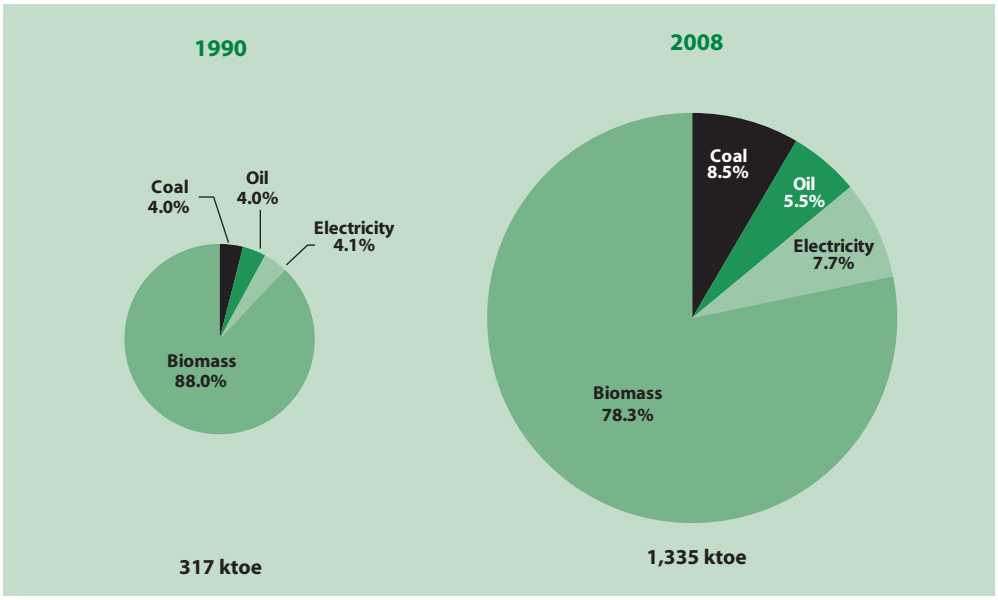
FEC = final energy consumption, GDP = gross domestic product, ktoe = thousand tons of oil equivalent, PES = primary energy supply, PPP = purchasing power parity, toe = ton of oil equivalent, TPES = total primary energy supply.
Source: UNSD (2011a).

Figure 6.2.1 Final Energy Consumption by Sector, 1990 and 2008



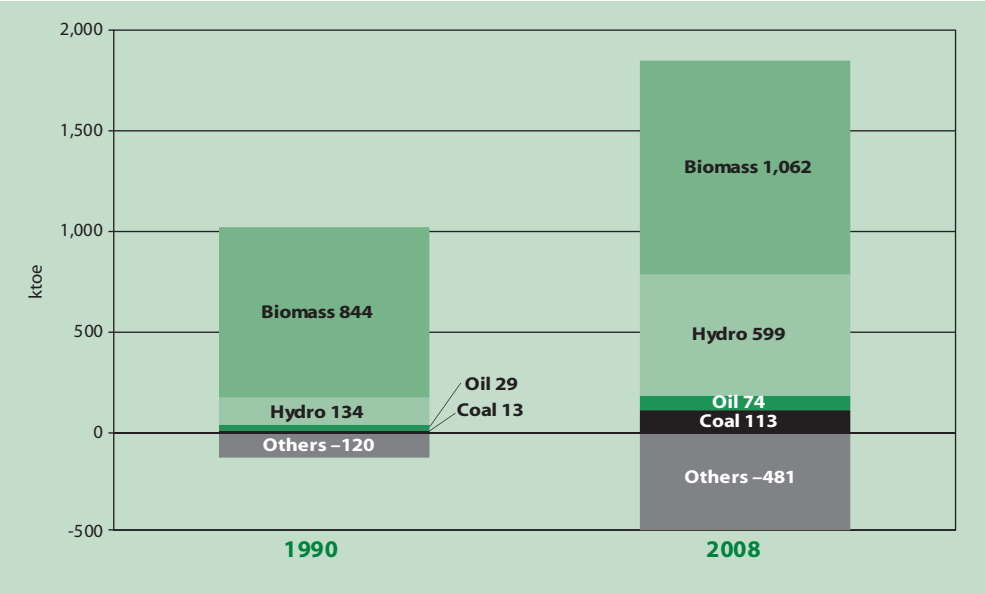
ktoe = thousand tons of oil equivalent.
Source: UNSD (2011a).

Figure 6.2.2 Final Energy Consumption by Type of Energy, 1990 and 2008



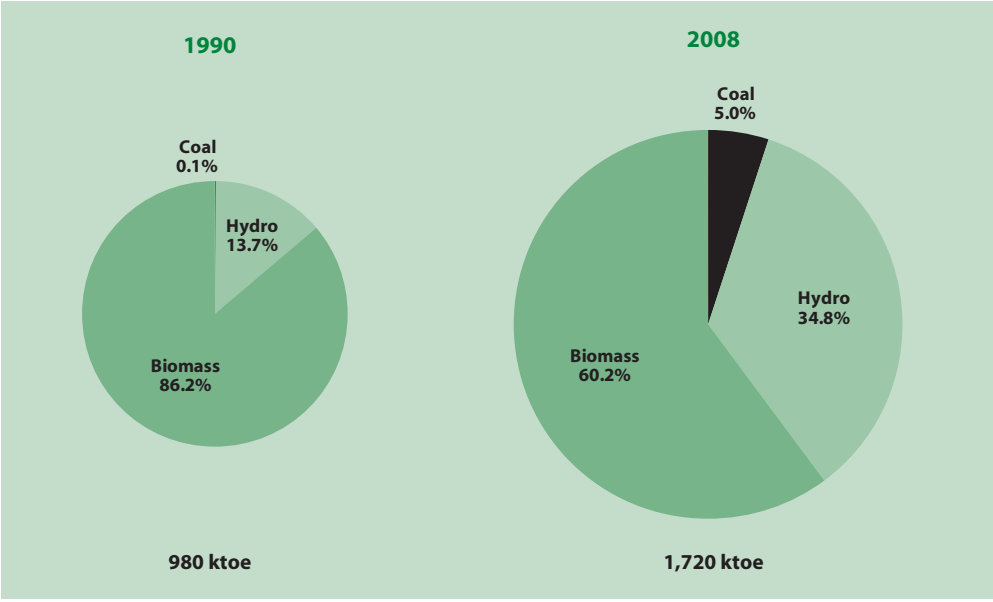
ktoe = thousand tons of oil equivalent.
Source: UNSD (2011a).

Figure 6.2.3 Total Primary Energy Supply, 1990 and 2008



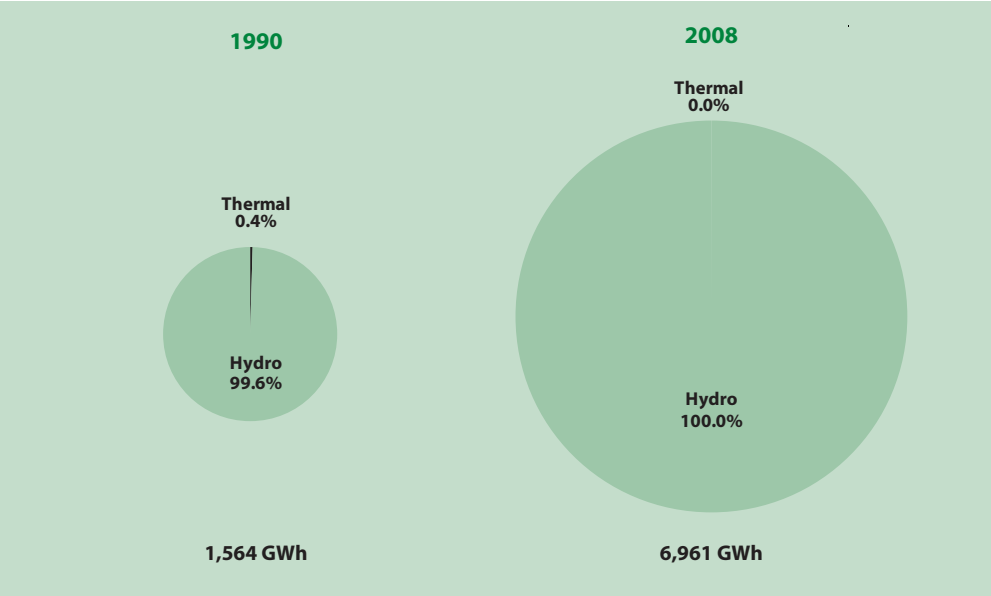
ktoe = thousand tons of oil equivalent.
Source: UNSD (2011a).

Figure 6.2.4 Indigenous Energy Production, 1990 and 2008



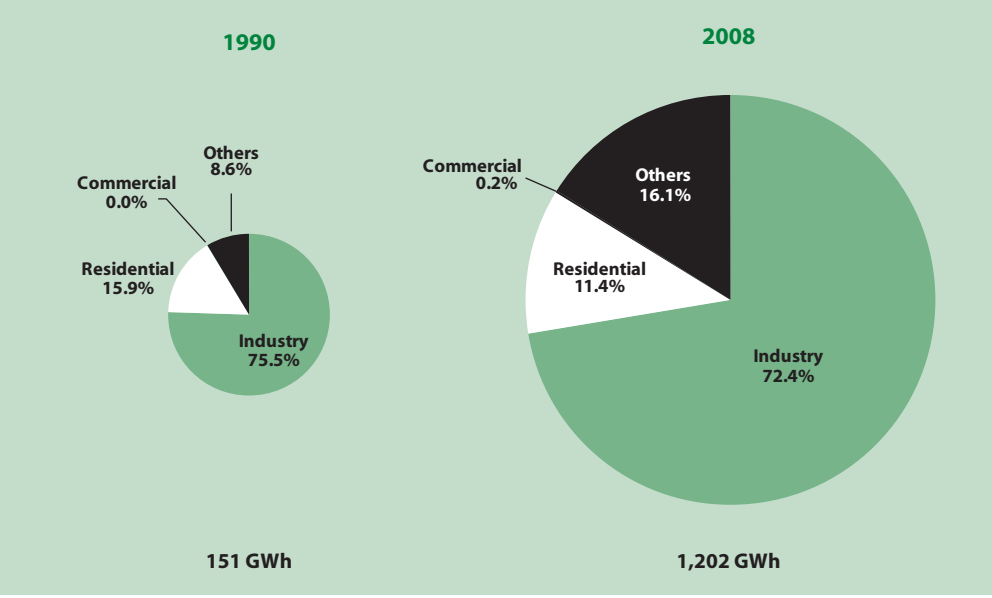
ktoe = thousand tons of oil equivalent.
Source: UNSD (2011a).

Figure 6.2.5 Electricity Generation by Plant Type, 1990 and 2008



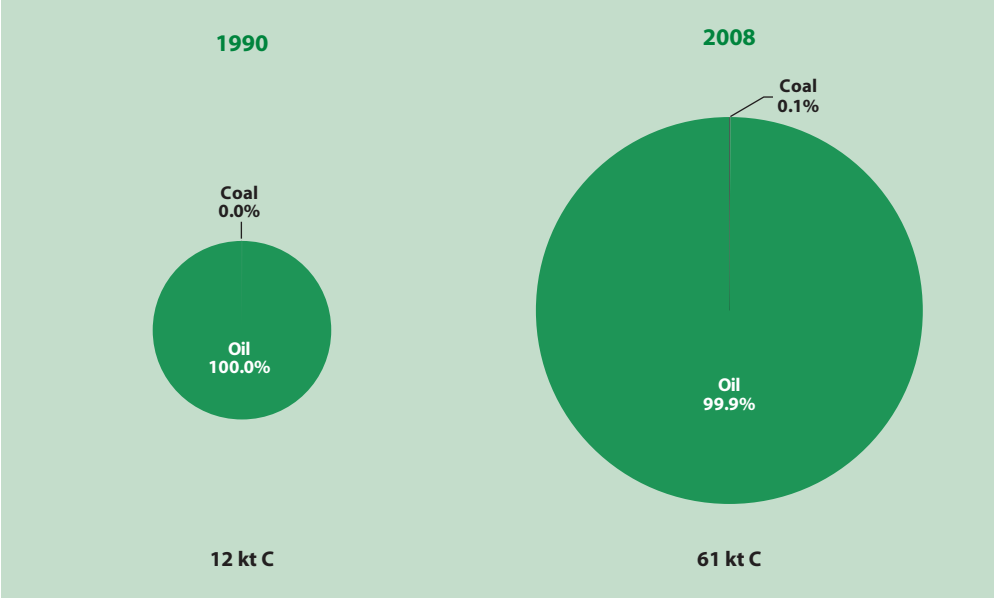
GWh = gigawatt-hour.
Source: UNSD (2011a).

Figure 6.2.6 Electricity Consumption by Sector, 1990 and 2008



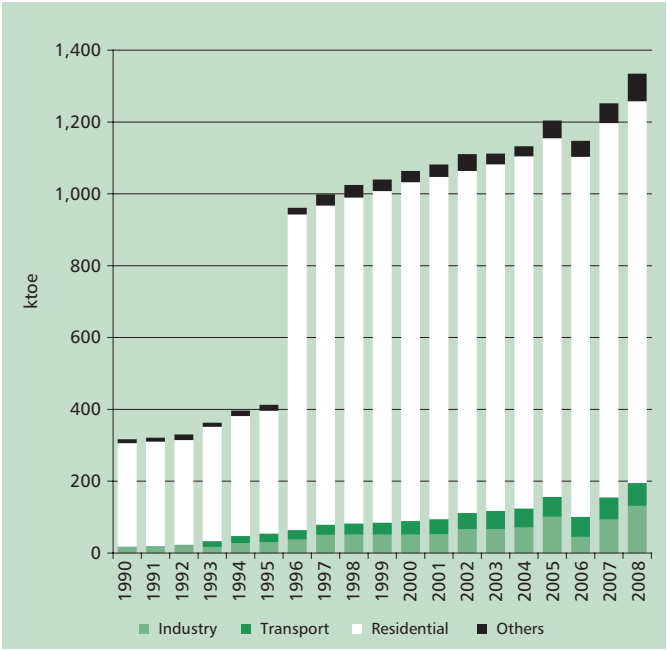
GWh = gigawatt-hour.
Source: UNSD (2011a).

Figure 6.2.7 Carbon Dioxide Emissions from Fuel Combustion, 1990 and 2008



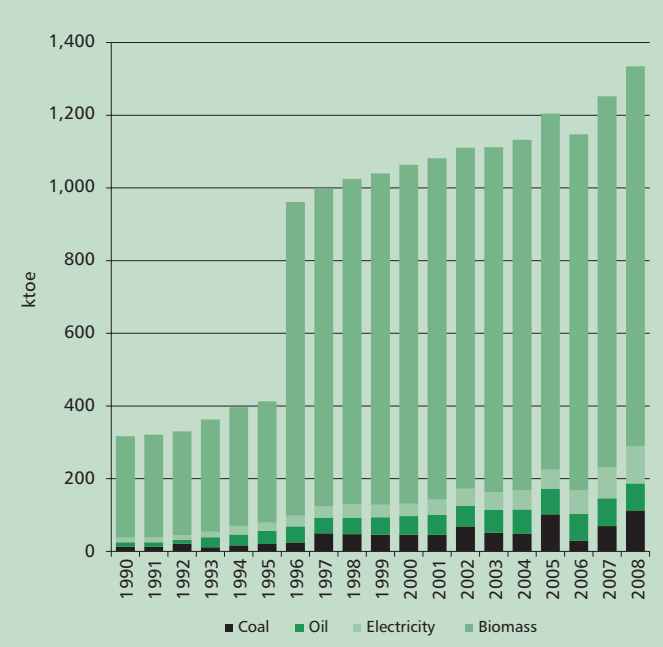
kt C = thousand tons of carbon equivalent.
Source: APERC estimates.

Figure 6.2.8 Final Energy Consumption by Sector, 1990–2008



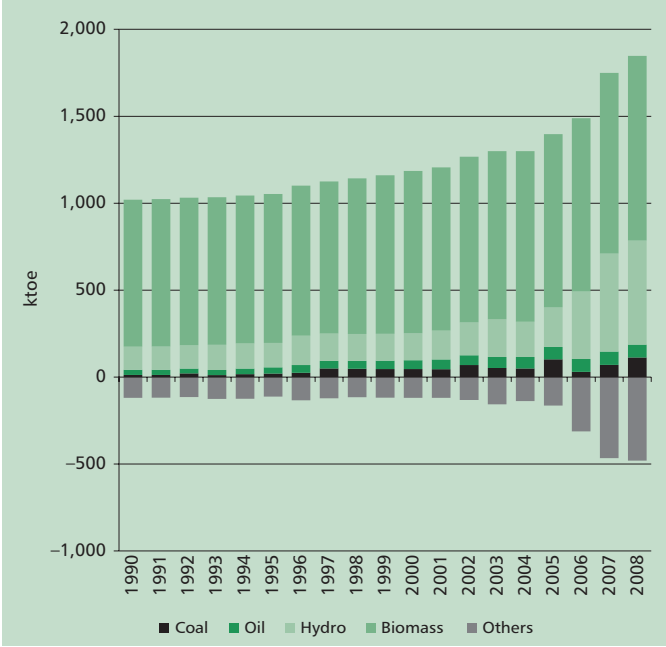
ktoe = thousand tons of oil equivalent.
Source: UNSD (2011a).

Figure 6.2.9 Final Energy Consumption by Type, 1990–2008



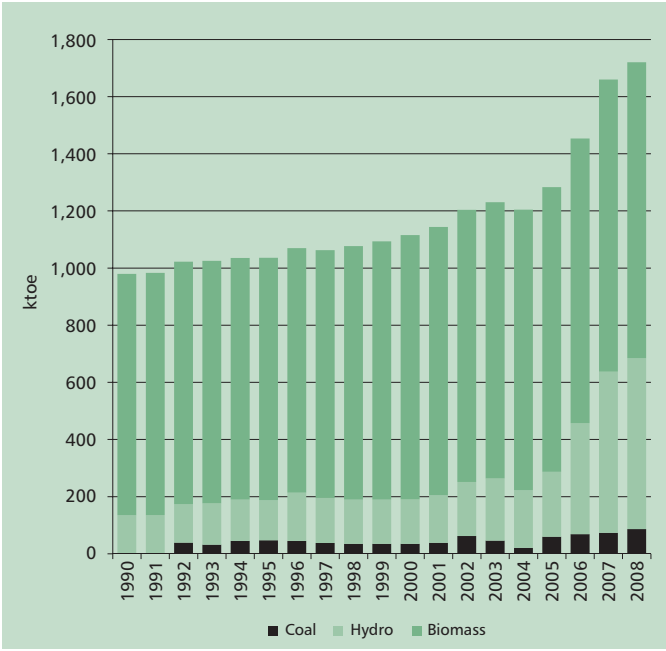
ktoe = thousand tons of oil equivalent.
Source: UNSD (2011a).

Figure 6.2.10 Total Primary Energy Supply, 1990–2008



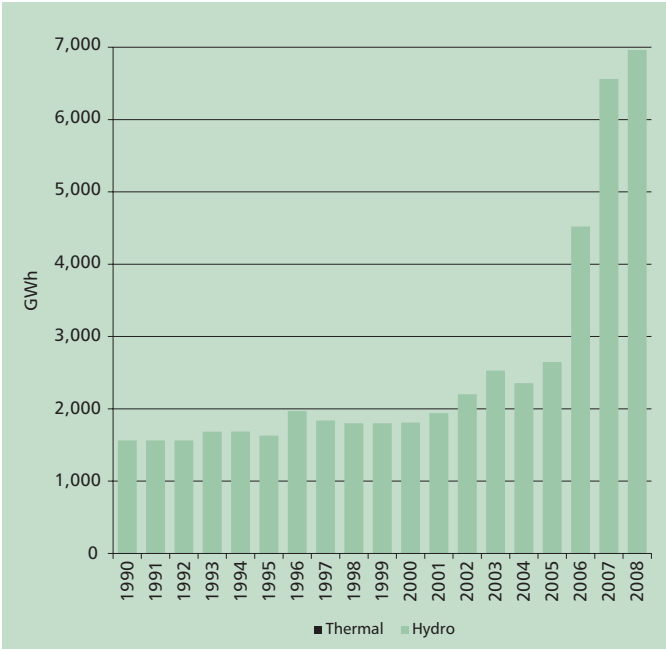
ktoe = thousand tons of oil equivalent.
Source: UNSD (2011a).

Figure 6.2.11 Indigenous Energy Production, 1990–2008



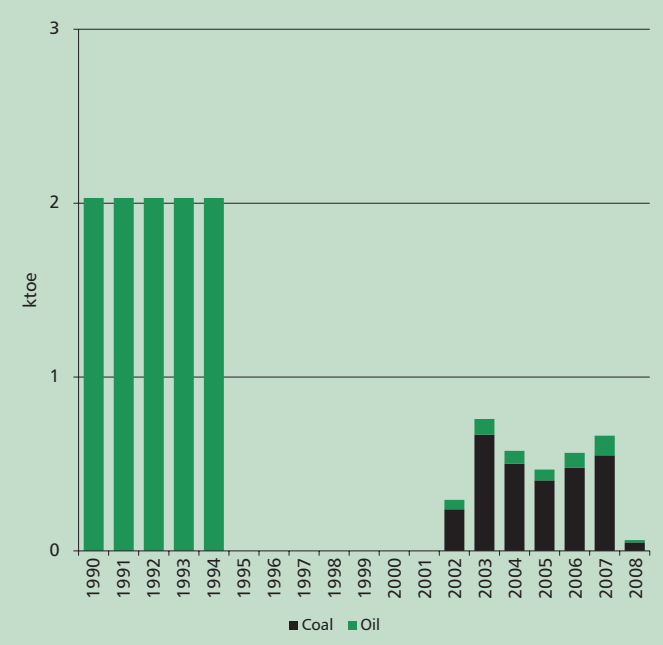
ktoe = thousand tons of oil equivalent.
Source: UNSD (2011a).

Figure 6.2.12 Electricity Generation by Source, 1990–2008



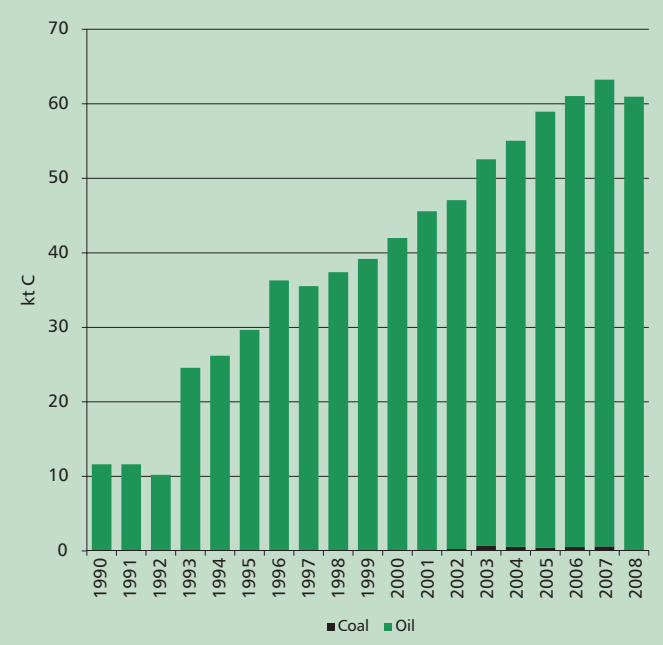
GWh = gigawatt-hour.
Source: UNSD (2011a).

Figure 6.2.13 Fuel Input for Electricity Generation, 1994–2009



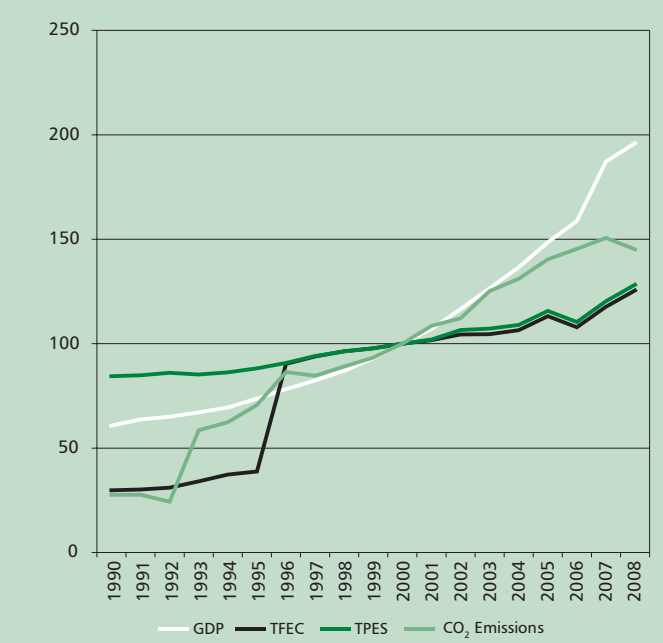
ktoe = thousand tons of oil equivalent.
Sources: APERC estimates, and UNSD (2011a).

Figure 6.2.14 Carbon Dioxide Emissions from Fuel Combustion, 1994–2009



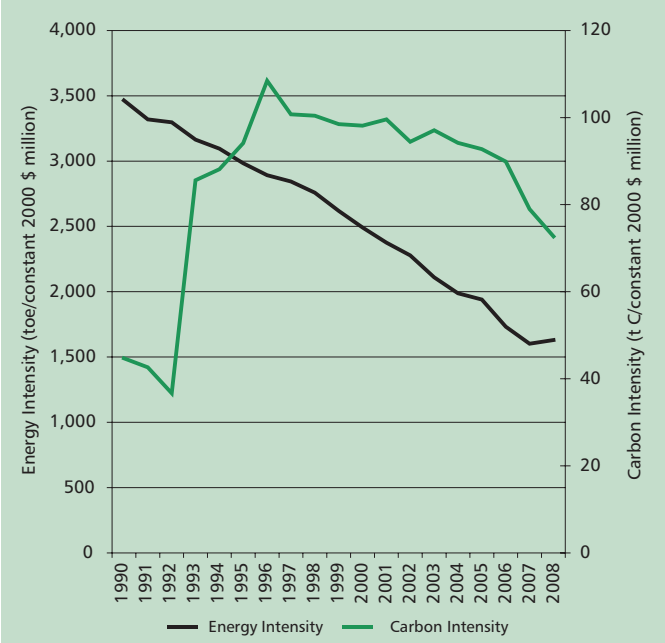
kt C = thousand tons of carbon equivalent.
Source: APERC estimates.

Figure 6.2.15 Growth of GDP, TFEC, TPES, and CO_2 (indexed to year 2000), 1990–20098



CO_2 = carbon dioxide, GDP = gross domestic product, TFEC = total final energy consumption, TPES = total primary energy supply.
Note: Indices are measured relative to the base year 2000 (2000 = 100).
Source: APERC estimates.

Figure 6.2.16 Energy and Carbon Intensities, 1990–2008



t C = ton of carbon equivalent, toe = ton of oil equivalent.
Source: APERC estimates.

Table 6.2.3 Bhutan Energy Balance Table, 2005

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	60	0	0	0	0	0	0	0	0	0	0	228	0	0	0	0	996	0	0	0	1,284
2.	Imports	78	0	0	72	11	11	44	0	5	2	0	0	0	0	0	0	0	0	3	0	152
3.	Exports	–35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–167	0	–202
4.	International Bunkers	0	0	0	–1	0	0	0	0	0	–1	0	0	0	0	0	0	0	0	0	0	–1
5.	Stock Changes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6.	Total Primary Energy Supply	102	0	0	71	11	11	44	0	5	1	0	228	0	0	0	0	996	0	–164	0	1,233
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	0	0	0	0	0	0	0	0	0	0	0	–228	0	0	0	0	–17	0	228	0	–18
8.1	Power Generation	0	0	0	0	0	0	0	0	0	0	0	–228	0	0	0	0	0	0	228	0	0
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–17	0	0	0	–17
9.	Loss and Own Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–11	0	–11
10.	Discrepancy	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11.	Total Final Energy Consumption	102	0	0	71	11	11	44	0	5	1	0	0	0	0	0	0	979	0	53	0	1,204
12.	Industry Sector	66	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	35	0	101
13.	Transport Sector	0	0	0	55	11	0	44	0	0	1	0	0	0	0	0	0	0	0	0	0	55
14.	Other Sectors	36	0	0	15	0	11	0	0	5	0	0	0	0	0	0	0	979	0	18	0	1,048
14.1	Residential and Commercial	0	0	0	15	0	11	0	0	5	0	0	0	0	0	0	0	975	0	9	0	999
14.1.1	Commerce and Public Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14.1.2	Residential	0	0	0	15	0	11	0	0	5	0	0	0	0	0	0	0	975	0	8	0	999
14.2	Non-Specified Others	36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	9	0	49
15.	Non-Energy Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16.	Electricity Output (GWh)	0	0	0	2	0	0	2	0	0	0	0	2,646	0	0	0	0	0	0	0	0	2,648
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.
Note: Figures may not add up to total because of rounding.
Source: UNSD (2011a).

Table 6.2.4 Bhutan Energy Balance Table, 2006

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	69	0	0	0	0	0	0	0	0	0	0	389	0	0	0	0	996	0	0	0	1,454
2.	Imports	7	0	0	74	12	12	43	0	5	1	0	0	0	0	0	0	0	0	1	0	83
3.	Exports	–46	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–313	0	–359
4.	International Bunkers	0	0	0	–1	0	0	0	0	0	–1	0	0	0	0	0	0	0	0	0	0	–1
5.	Stock Changes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6.	Total Primary Energy Supply	30	0	0	73	12	12	43	0	5	1	0	389	0	0	0	0	996	0	–312	0	1,176
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	0	0	0	0	0	0	0	0	0	0	0	–389	0	0	0	0	–17	0	389	0	–18
8.1	Power Generation	0	0	0	0	0	0	0	0	0	0	0	–389	0	0	0	0	0	0	389	0	0
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–17	0	0	0	–17
9.	Loss and Own Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–12	0	–12
10.	Discrepancy	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
11.	Total Final Energy Consumption	30	0	0	73	12	12	43	0	5	1	0	0	0	0	0	0	979	0	66	0	1,148
12.	Industry Sector	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	43	0	45
13.	Transport Sector	0	0	0	56	12	0	43	0	0	1	0	0	0	0	0	0	0	0	0	0	56
14.	Other Sectors	27	0	0	17	0	12	0	0	5	0	0	0	0	0	0	0	979	0	23	0	1,047
14.1	Residential and Commercial	0	0	0	17	0	12	0	0	5	0	0	0	0	0	0	0	975	0	10	0	1,002
14.1.1	Commerce and Public Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14.1.2	Residential	0	0	0	17	0	12	0	0	5	0	0	0	0	0	0	0	975	0	10	0	1,002
14.2	Non-Specified Others	27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	13	0	44
15.	Non-Energy Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16.	Electricity Output (GWh)	0	0	0	2	0	0	2	0	0	0	0	4,519	0	0	0	0	0	0	0	0	4,521
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Source: UNSD (2011a).

Table 6.2.5 Bhutan Energy Balance Table, 2007

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	74	0	0	0	0	0	0	0	0	0	0	564	0	0	0	0	1,022	0	0	0	1,660
2.	Imports	18	0	0	77	13	9	47	0	6	2	0	0	0	0	0	0	19	0	1	0	115
3.	Exports	–21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–3	0	–467	0	–491
4.	International Bunkers	0	0	0	–1	0	0	0	0	0	–1	0	0	0	0	0	0	0	0	0	0	–1
5.	Stock Changes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6.	Total Primary Energy Supply	70	0	0	76	13	9	47	0	6	1	0	564	0	0	0	0	1,039	0	–466	0	1,283
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	–1	0	0	0	0	0	0	0	0	0	0	–564	0	0	0	0	–17	0	564	0	–18
8.1	Power Generation	–1	0	0	0	0	0	0	0	0	0	0	–564	0	0	0	0	0	0	564	0	0
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–17	0	0	0	–17
9.	Loss and Own Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–16	0	–16
10.	Discrepancy	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3
11.	Total Final Energy Consumption	70	0	0	76	13	9	47	0	6	1	0	0	0	0	0	0	1,021	0	85	0	1,252
12.	Industry Sector	35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	58	0	93
13.	Transport Sector	0	0	0	62	13	0	47	0	0	1	0	0	0	0	0	0	0	0	0	0	62
14.	Other Sectors	35	0	0	14	0	9	0	0	6	0	0	0	0	0	0	0	1,021	0	27	0	1,097
14.1	Residential and Commercial	0	0	0	14	0	9	0	0	6	0	0	0	0	0	0	0	1,017	0	11	0	1,042
14.1.1	Commerce and Public Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14.1.2	Residential	0	0	0	14	0	9	0	0	6	0	0	0	0	0	0	0	1,017	0	11	0	1,042
14.2	Non-Specified Others	35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	15	0	55
15.	Non-Energy Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16.	Electricity Output (GWh)	0	0	0	2	0	0	2	0	0	0	0	6,560	0	0	0	0	0	0	0	0	6,562
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.
Note: Figures may not add up to total because of rounding.
Source: UNSD (2011a).

Table 6.2.6 Bhutan Energy Balance Table, 2008

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	87	0	0	0	0	0	0	0	0	0	0	599	0	0	0	0	1,035	0	0	0	1,720
2.	Imports	33	0	0	75	14	4	49	0	6	1	0	0	0	0	0	0	32	0	1	0	141
3.	Exports	–6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–6	0	–482	0	–494
4.	International Bunkers	0	0	0	–1	0	0	0	0	0	–1	0	0	0	0	0	0	0	0	0	0	–1
5.	Stock Changes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6.	Total Primary Energy Supply	113	0	0	74	14	4	49	0	6	1	0	599	0	0	0	0	1,062	0	–481	0	1,366
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	0	0	0	0	0	0	0	0	0	0	0	–599	0	0	0	0	–17	0	599	0	–17
8.1	Power Generation	0	0	0	0	0	0	0	0	0	0	0	–599	0	0	0	0	0	0	599	0	0
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–17	0	0	0	–17
9.	Loss and Own Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–29	0	–29
10.	Discrepancy	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14	0	14
11.	Total Final Energy Consumption	113	0	0	74	14	4	49	0	6	1	0	0	0	0	0	0	1,045	0	103	0	1,335
12.	Industry Sector	57	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	75	0	132
13.	Transport Sector	0	0	0	63	14	0	49	0	0	1	0	0	0	0	0	0	0	0	0	0	63
14.	Other Sectors	56	0	0	11	0	4	0	0	6	0	0	0	0	0	0	0	1,045	0	29	0	1,140
14.1	Residential and Commercial	0	0	0	11	0	4	0	0	6	0	0	0	0	0	0	0	1,040	0	12	0	1,063
14.1.1	Commerce and Public Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14.1.2	Residential	0	0	0	11	0	4	0	0	6	0	0	0	0	0	0	0	1,040	0	12	0	1,062
14.2	Non-Specified Others	56	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	17	0	77
15.	Non-Energy Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16.	Electricity Output (GWh)	0	0	0	0	0	0	0	0	0	0	0	6,961	0	0	0	0	0	0	0	0	6,961
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Source: UNSD (2011a).

Table 6.2.7 Bhutan Summary Table, 1990–2009

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Indigenous Production (ktoe)																				
Coal	1	1	39	32	45	48	45	38	35	35	35	39	62	46	21	60	69	74	87	–
Oil	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Gas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Hydro	134	134	134	145	145	140	170	158	155	155	156	167	189	217	202	228	389	564	599	–
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Geothermal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Solar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Wind	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Biomass	844	848	849	848	846	848	855	867	887	904	925	939	953	967	982	996	996	1,022	1,035	–
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Total	980	983	1,023	1,025	1,035	1,036	1,070	1,062	1,077	1,094	1,115	1,144	1,204	1,231	1,205	1,284	1,454	1,660	1,720	–
Primary Energy Supply (ktoe)																				
Coal	13	13	21	11	17	20	25	50	48	46	46	46	69	53	50	102	30	70	113	–
Oil	29	29	28	30	32	36	44	43	46	48	51	55	57	63	66	71	73	76	74	–
Gas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Hydro	134	134	134	145	145	140	170	158	155	155	156	167	189	217	202	228	389	564	599	–
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Geothermal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Solar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Wind	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Biomass	844	848	849	848	851	856	863	874	895	912	933	939	953	967	982	996	996	1,039	1,062	–
Others	–120	–119	–115	–126	–125	–112	–134	–122	–116	–118	–120	–119	–132	–157	–138	–164	–312	–466	–481	–
Total	900	905	917	908	920	940	968	1,003	1,027	1,042	1,066	1,087	1,135	1,142	1,162	1,233	1,176	1,283	1,366	–
Final Energy Consumption by Sector (ktoe)																				
Industry	16	17	21	17	28	30	37	51	51	51	51	52	66	67	71	101	45	93	132	–
Transport	2	2	2	16	19	25	27	29	32	34	38	42	45	50	53	55	56	62	63	–
Residential	288	291	292	318	334	341	879	888	907	923	943	953	952	965	980	999	1,002	1,042	1,062	–
Commercial	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Others	11	11	16	11	15	17	19	32	35	32	31	35	47	30	28	49	44	55	77	–
Total	317	321	330	363	397	413	961	999	1,025	1,040	1,064	1,082	1,111	1,112	1,133	1,204	1,148	1,252	1,335	–

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Table 6.2.7 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Final Energy Consumption by Type (ktoe)																				
Coal	13	13	21	11	17	20	25	50	48	46	46	46	69	52	49	102	30	70	113	–
Oil	13	13	10	28	30	36	44	43	46	48	51	55	57	63	66	71	73	76	74	–
Gas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Electricity	13	14	14	15	24	23	29	32	37	35	34	42	47	48	53	53	66	85	103	–
Heat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Biomass	279	282	285	309	326	333	863	874	895	911	932	939	938	950	964	979	979	1,021	1,045	–
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Total	317	321	330	363	397	413	961	999	1,025	1,040	1,064	1,082	1,111	1,112	1,133	1,204	1,148	1,252	1,335	–
Power Generation (GWh)																				
Thermal	7	4	1	1	1	0	0	0	0	0	0	1	1	2	2	2	2	2	0	–
Hydro	1,557	1,560	1,563	1,683	1,685	1,630	1,972	1,838	1,801	1,800	1,810	1,940	2,200	2,527	2,353	2,646	4,519	6,560	6,961	–
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Geothermal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Solar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Wind	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Total	1,564	1,564	1,564	1,684	1,686	1,630	1,972	1,838	1,801	1,800	1,810	1,941	2,201	2,529	2,355	2,648	4,521	6,562	6,961	–
Loss and Own Use of Electricity (GWh)																				
Transmission and Distribution Losses	21	22	23	27	27	28	54	23	21	21	21	44	103	134	141	129	141	181	335	–
Own Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Total	21	22	23	27	27	28	54	23	21	21	21	44	103	134	141	129	141	181	335	–
Fuel Input for Power Generation (ktoe)																				
Coal	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	0	–
Oil	2	2	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Gas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Total	2	2	2	2	2	0	0	0	0	0	0	0	0	1	1	0	1	1	0	–
CO_2 Emissions (kt C)																				
Coal	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	1	0	–
Oil	12	12	10	25	26	30	36	36	37	39	42	46	47	52	55	59	61	63	61	–
Gas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Total	12	12	10	25	26	30	36	36	37	39	42	46	47	53	55	59	61	63	61	–

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Table 6.2.7 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Macroeconomic Indicators																				
Population (thousand)	559	556	546	534	523	519	521	528	541	555	571	588	606	624	642	659	675	689	701	714
Urban Population, %	16.4	17.2	18.0	18.9	19.7	20.5	21.5	22.5	23.4	24.4	25.4	26.5	27.6	28.8	29.9	31.0	32.2	33.3	34.5	35.6
GDP (constant 2000 $ million)	260	273	278	287	297	315	335	353	372	398	428	458	499	541	584	636	679	801	838	895
GDP (current $ million)	281	244	238	227	253	286	301	343	356	397	428	456	507	611	690	819	898	1,196	1,257	1,265
GDP (constant 2005 PPP $ million)	938	984	1,004	1,036	1,073	1,137	1,208	1,273	1,344	1,436	1,544	1,652	1,799	1,954	2,109	2,294	2,452	2,891	3,026	3,230
GDP/capita (constant 2000 $)	465	490	509	538	568	608	643	668	689	716	749	778	823	867	910	964	1,007	1,163	1,195	1,254
GDP/capita (current $)	504	438	436	426	484	552	578	649	658	714	749	775	837	979	1,075	1,242	1,331	1,737	1,793	1,772
GDP – Manufacturing (% of GDP)	6.9	6.6	6.5	6.5	7.0	8.0	8.8	9.1	8.9	8.6	8.3	7.9	7.5	7.3	7.2	7.7	8.0	8.5	8.8	8.8
Car Ownership (car/1,000 persons)	–	–	–	–	–	–	–	–	–	–	–	–	36	35	34	34	34	34	34	35
Basic Energy Indicators																				
TPES/capita (toe/person)	1.61	1.63	1.68	1.70	1.76	1.81	1.86	1.90	1.90	1.88	1.87	1.85	1.87	1.83	1.81	1.87	1.74	1.86	1.95	–
TFEC/capita (toe/person)	0.57	0.58	0.60	0.68	0.76	0.80	1.85	1.89	1.90	1.87	1.86	1.84	1.83	1.78	1.76	1.83	1.70	1.82	1.90	–
TPES/GDP (toe/constant 2000 $ million)	3,465	3,319	3,298	3,164	3,095	2,984	2,892	2,844	2,758	2,618	2,492	2,375	2,278	2,111	1,988	1,940	1,732	1,602	1,630	–
TFEC/GDP (toe/constant 2000 $ million)	1,219	1,179	1,187	1,264	1,335	1,309	2,873	2,832	2,753	2,613	2,487	2,363	2,228	2,055	1,938	1,895	1,690	1,563	1,592	–
Import Dependency (%)	–8.8	–8.7	–11.5	–12.8	–12.6	–10.2	–10.5	–5.9	–4.9	–5.0	–4.6	–5.2	–6.0	–7.7	–3.7	–4.1	–23.6	–29.4	–25.9	–
Oil Import Dependency (%)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	–
Electricity/capita (kWh/person)	270	290	291	326	527	519	659	695	797	724	698	832	909	898	964	930	1,132	1,438	1,714	–
CO_2 Intensity (t C/constant 2000 $ million)	45	43	37	86	88	94	108	101	100	98	98	100	94	97	94	93	90	79	73	–
CO_2/capita (t C)	0.02	0.02	0.02	0.05	0.05	0.06	0.07	0.07	0.07	0.07	0.07	0.08	0.08	0.08	0.09	0.09	0.09	0.09	0.09	–
CO_2/TPES (t C/toe)	0.01	0.01	0.01	0.03	0.03	0.03	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.05	0.05	0.05	0.05	0.05	0.04	–

– = no data or not applicable, CO_2 = carbon dioxide, GDP = gross domestic product, GWh = gigawatt–hour, kt C = thousand tons of carbon equivalent, ktoe = thousand tons of oil equivalent, kWh = kilowatt–hour, PPP = purchasing power parity, t C = ton of carbon equivalent, TFEC = total final energy consumption, toe = ton of oil equivalent, TPES = total primary energy supply.

Note: Figures may not add up to total because of rounding.

Sources: APERC estimates, JAMA (2012), UNSD (2011a), and World Bank.

6.3 India

Country Profile (2009)		Energy Reserves (year-end 2008)	
Total Surface Area (square kilometer)	3,287,260	Coal (million ton) - Recoverable	60,600.0
Population (thousand)	1,155,348	Gas (trillion cubic feet) - Proven	37.9
GDP (constant 2000 $ billion)	885.4	Oil (billion barrel) - Proven	5,836.0
Electrification Rate (%)	75.0		

GDP = gross domestic product.

Sources: ADB (2012), IEA (2011c), World Bank, and WEC (2010).

2009 Energy Supply and Demand Flow (ktoe)

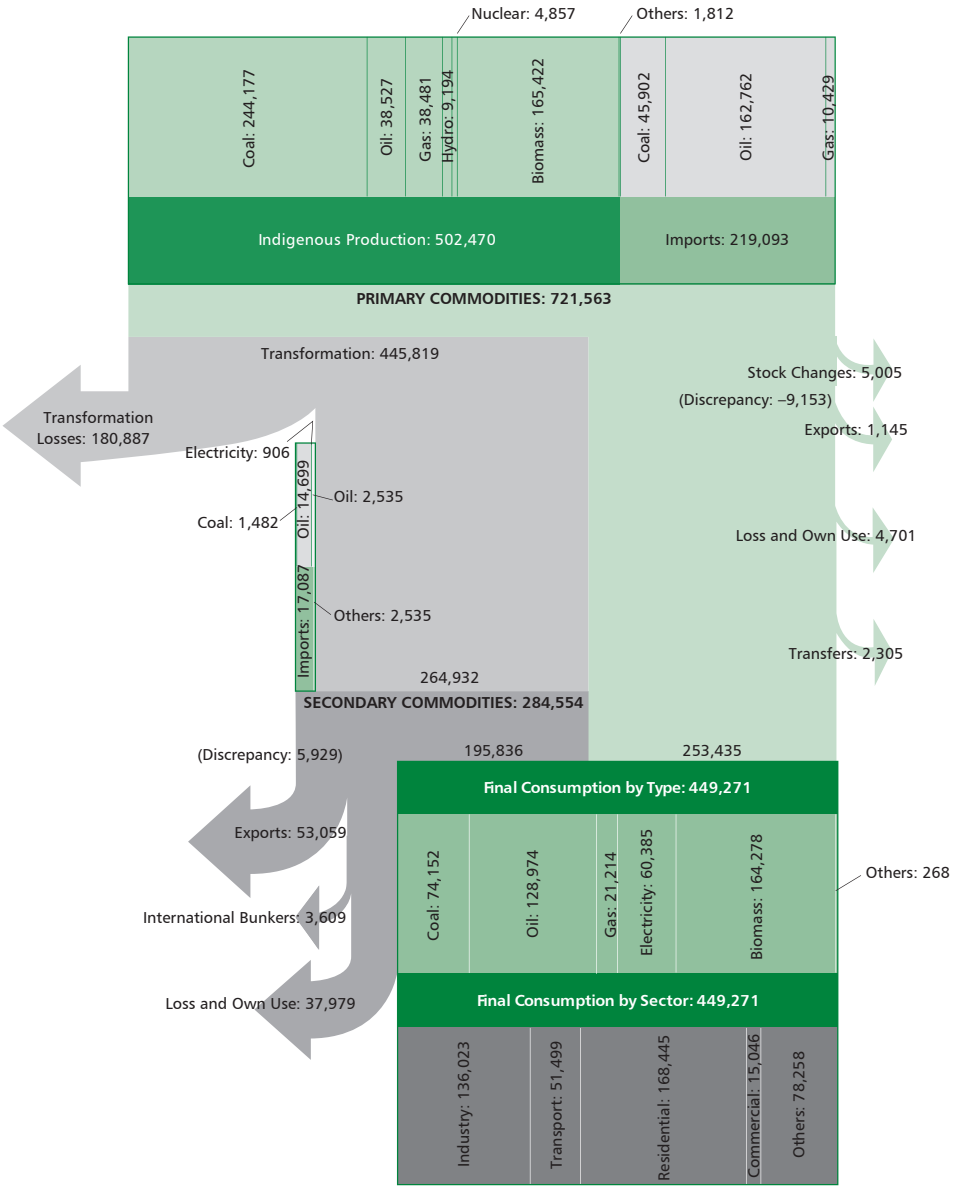


Table 6.3.1 Key Data and Economic Profile

	1990	1995	2000	2005	2009
Socioeconomic Data					
Population (thousand)	849,515	932,180	1,015,923	1,094,583	1,155,348
GDP (constant 2000 $ billion)	270.5	346.6	460.2	644.5	885.4
GDP (constant 2005 PPP $ billion)	1,056.5	1,353.7	1,797.4	2,517.3	3,458.3
GDP/capita (constant 2000 $)	318	372	453	589	766
GDP/capita (constant 2005 PPP $)	1,244	1,452	1,769	2,300	2,993

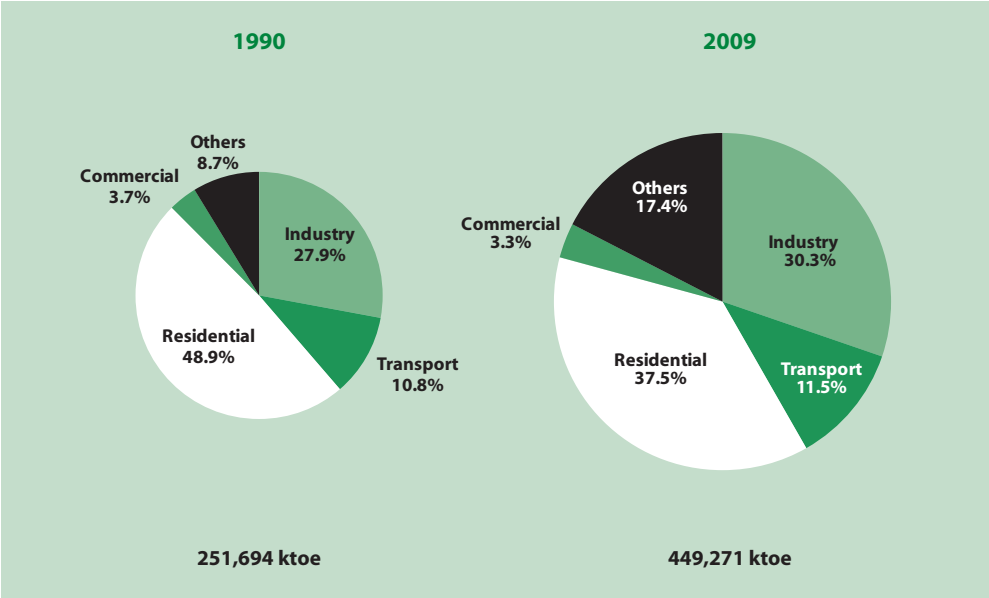
GDP = gross domestic product, PPP = purchasing power parity.
Source: World Bank.

Table 6.3.2 Energy Supply and Demand

	1990	1995	2000	2005	2009
Primary Energy Supply (ktoe)					
Indigenous Production	291,816	335,772	366,406	422,379	502,470
Net Imports	24,926	48,512	90,809	115,528	173,362
Total PES	316,742	384,284	457,215	537,907	675,832
Coal	103,385	135,956	161,457	207,525	285,364
Oil	61,439	82,478	112,715	126,444	159,412
Gas	10,568	17,327	23,062	31,749	48,910
Biomass	133,459	140,003	148,879	158,125	165,422
Others	7,891	8,520	11,102	14,064	16,724
TPES/capita (toe)	0.37	0.41	0.45	0.49	0.58
TPES/GDP (toe/constant 2005 PPP $ million)	300	284	254	214	195
Final Energy Consumption (ktoe)					
Industry	70,260	76,051	87,099	105,225	136,023
Transportation	27,096	35,706	31,985	34,761	51,499
Other Sectors	154,338	174,203	199,494	218,251	261,749
Total FEC	251,694	285,960	318,578	358,237	449,271
Coal	41,808	38,373	33,462	42,705	74,152
Oil	52,575	72,574	95,694	102,931	128,974
Gas	5,636	8,401	9,686	14,948	21,214
Electricity	18,209	26,588	31,594	40,526	60,385
Biomass	133,458	140,003	148,107	157,031	164,278
Others	8	21	35	96	268

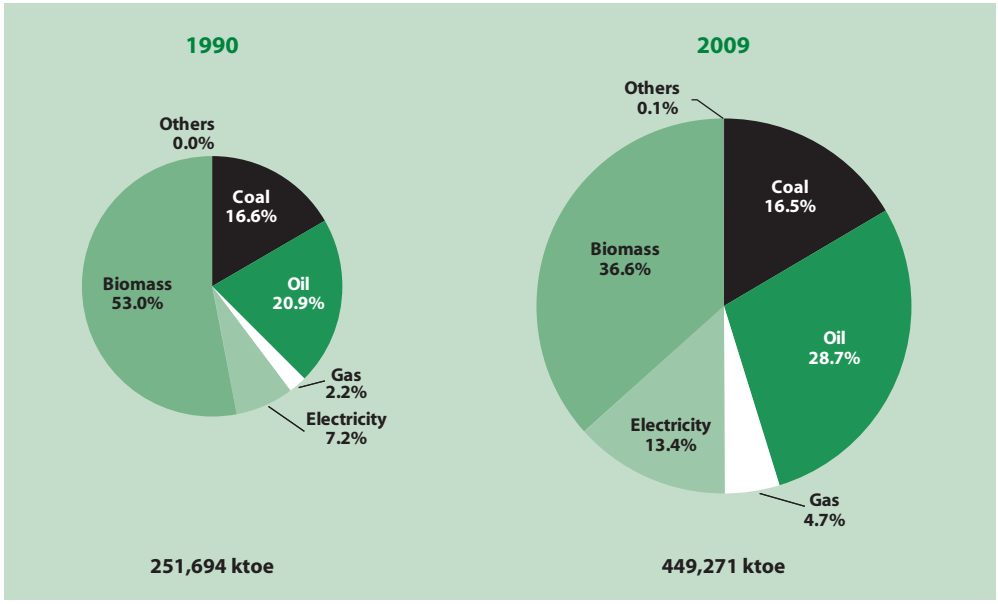
FEC = final energy consumption, GDP = gross domestic product, ktoe = thousand tons of oil equivalent, PES = primary energy supply, PPP = purchasing power parity, toe = ton of oil equivalent, TPES = total primary energy supply.
Source: IEA (2011b).

Figure 6.3.1 Final Energy Consumption by Sector, 1990 and 2009



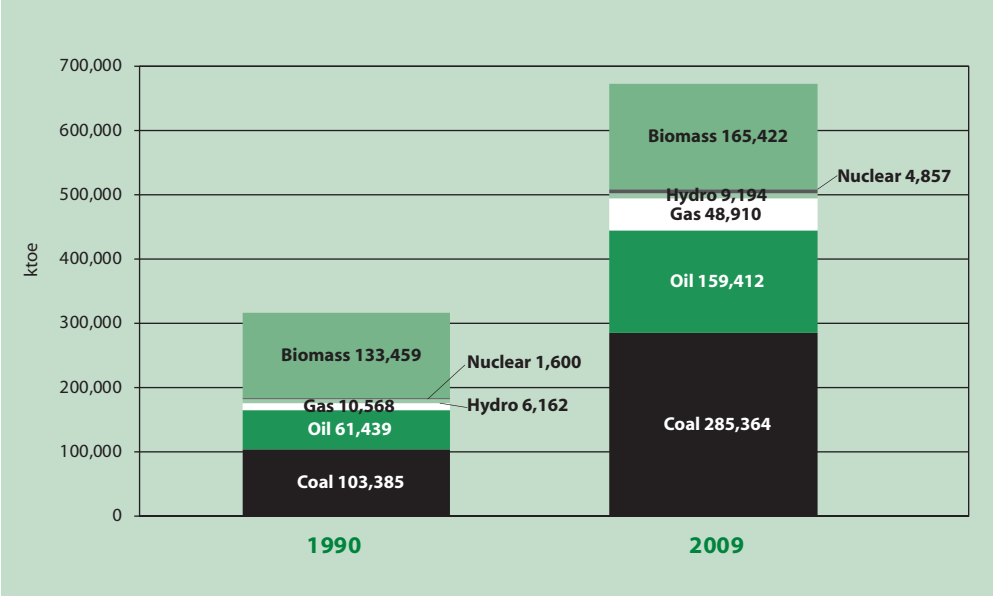
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 6.3.2 Final Energy Consumption by Type of Energy, 1990 and 2009



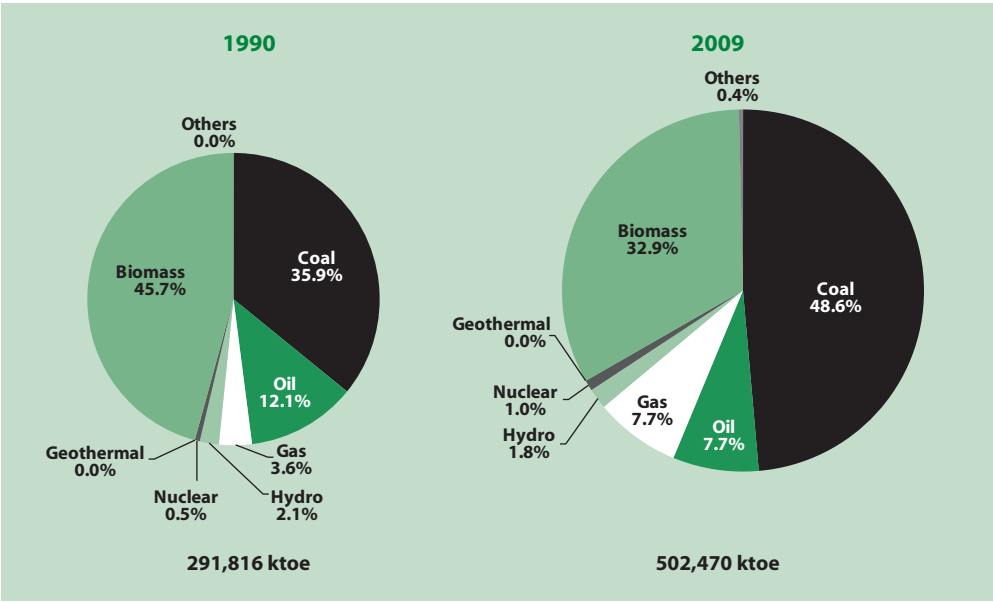
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 6.3.3 Total Primary Energy Supply, 1990 and 2009



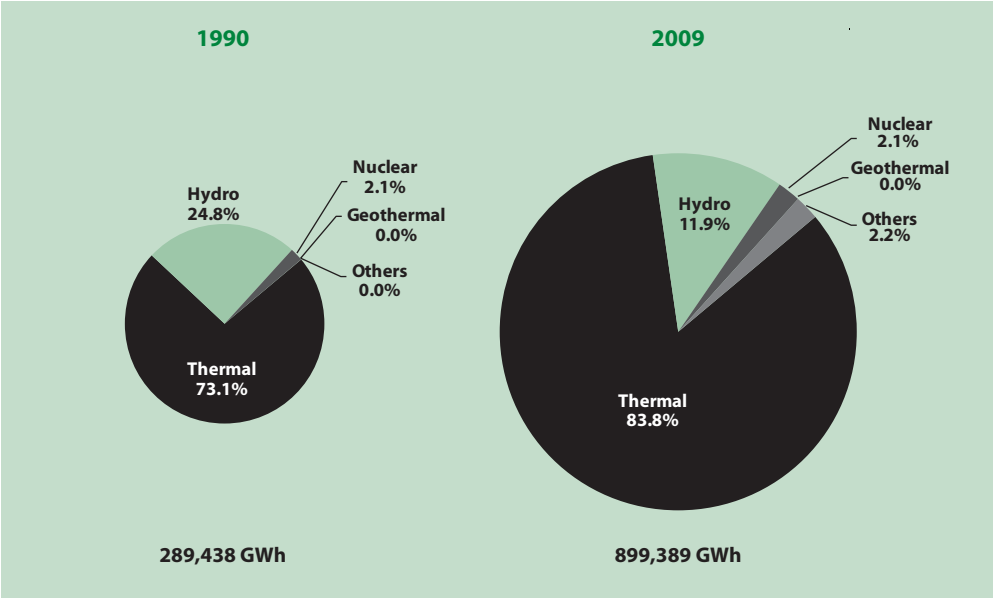
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 6.3.4 Indigenous Energy Production, 1990 and 2009



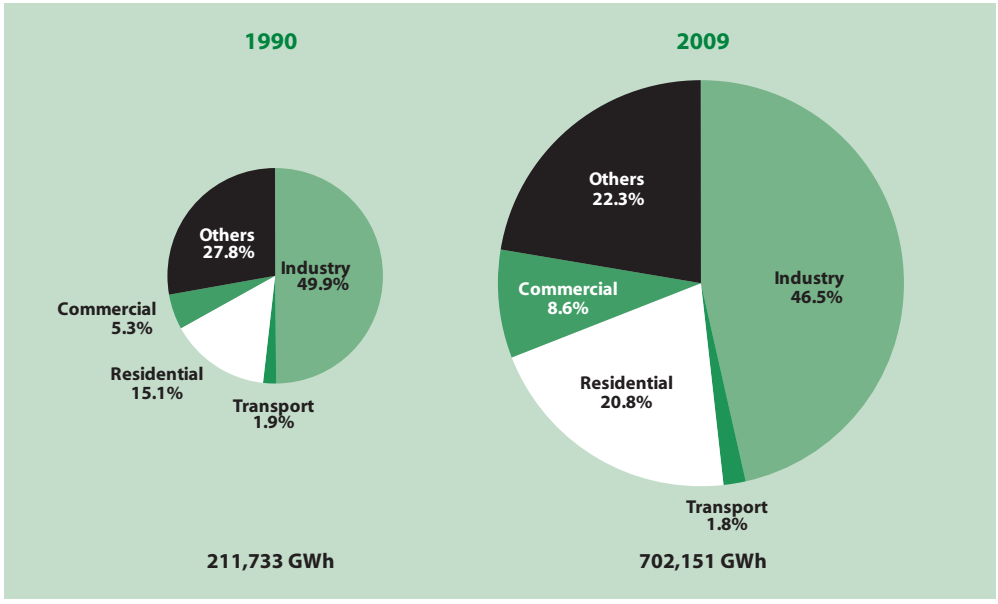
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 6.3.5 Electricity Generation by Plant Type, 1990 and 2009



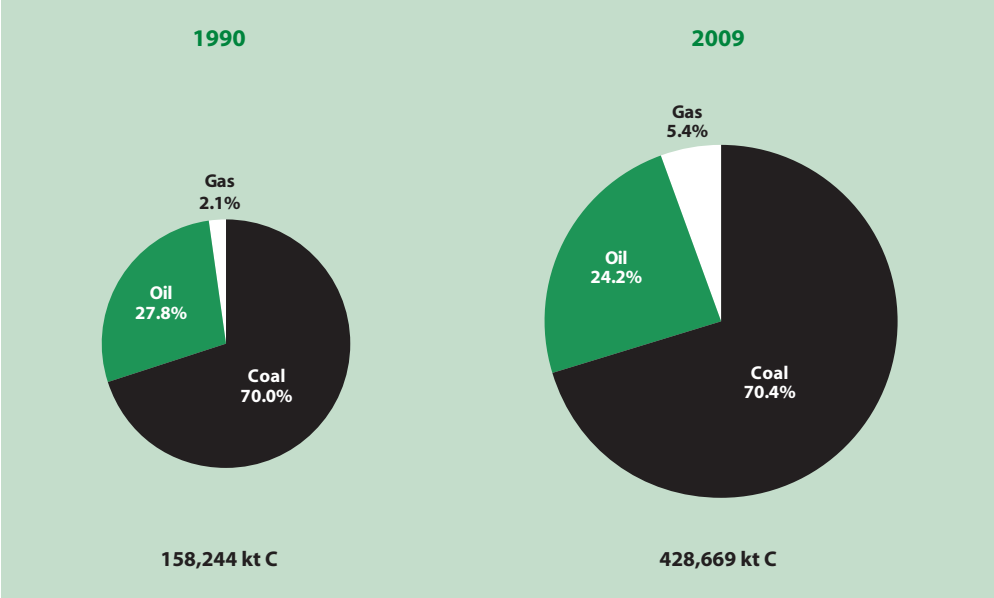
GWh = gigawatt-hour.
Source: IEA (2011b).

Figure 6.3.6 Electricity Consumption by Sector, 1990 and 2009



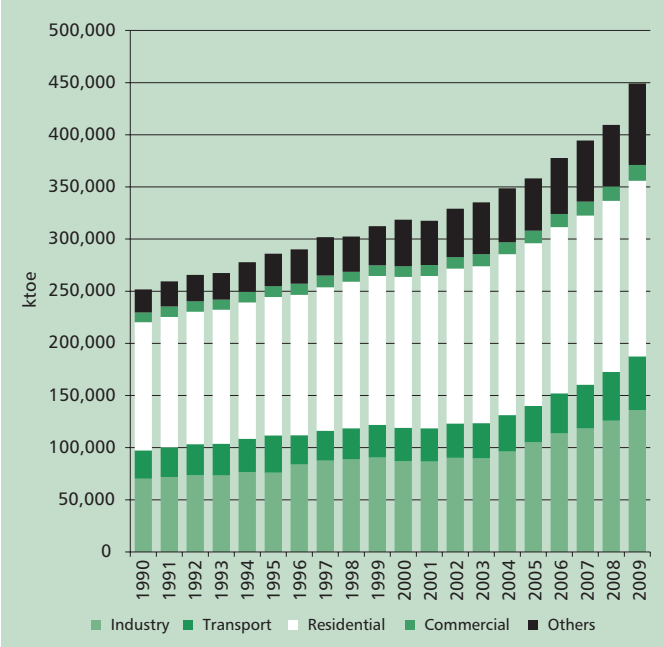
GWh = gigawatt-hour.
Source: IEA (2011b).

Figure 6.3.7 Carbon Dioxide Emissions from Fuel Combustion, 1990 and 2009



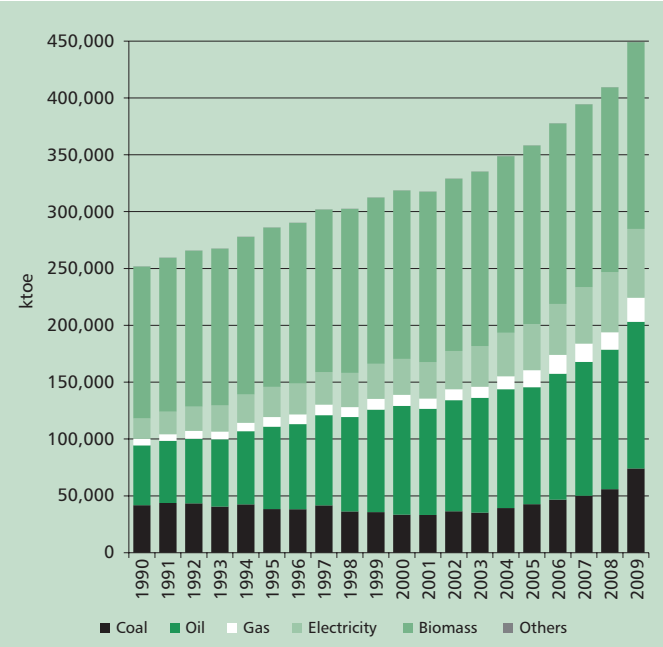
kt C = thousand tons of carbon equivalent.
Source: APERC estimates.

Figure 6.3.8 Final Energy Consumption by Sector, 1990–2009



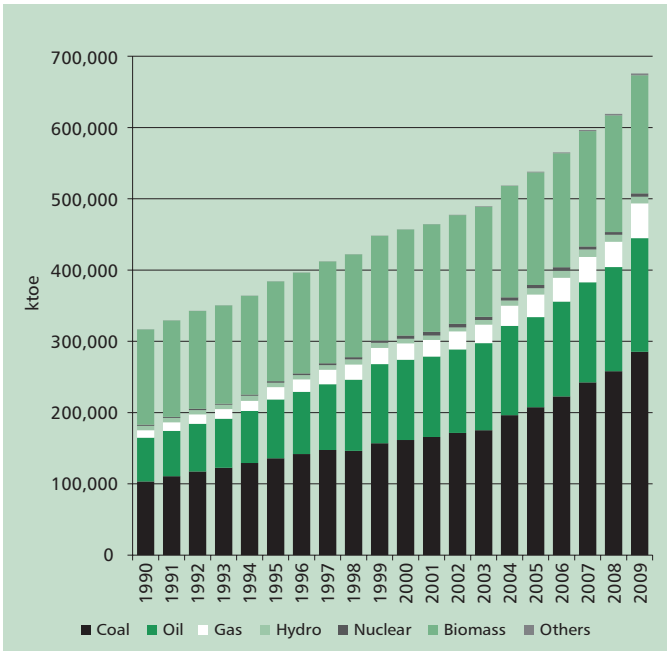
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 6.3.9 Final Energy Consumption by Type, 1990–2009



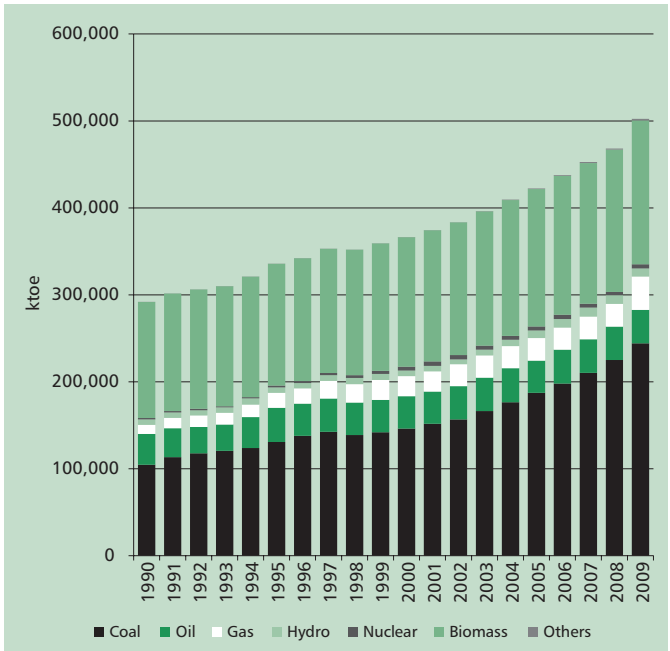
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 6.3.10 Total Primary Energy Supply, 1990–2008



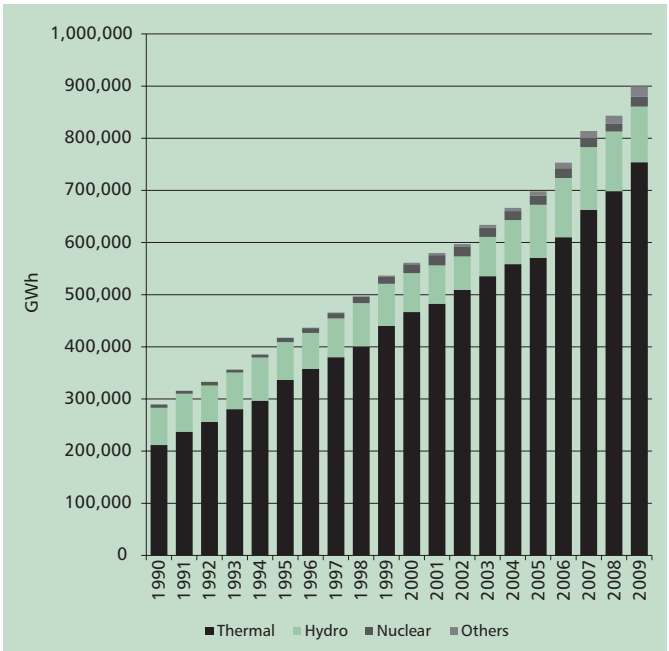
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 6.3.11 Indigenous Energy Production, 1990–2009



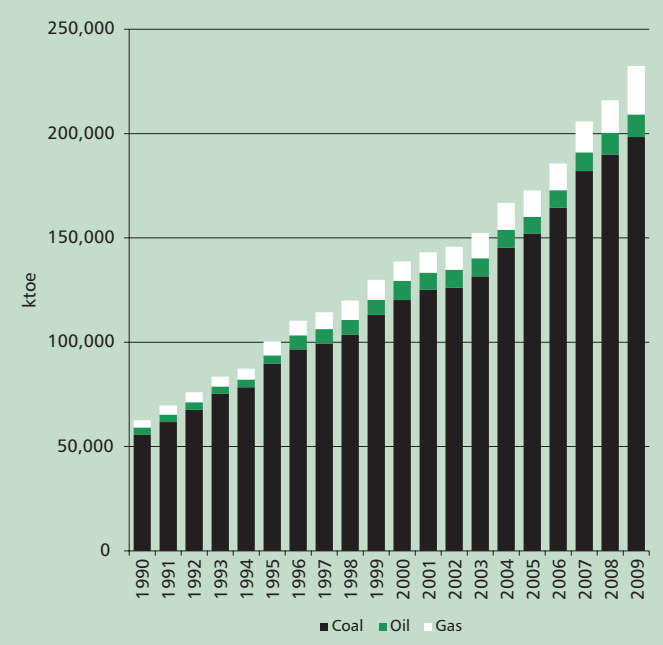
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 6.3.12 Electricity Generation by Source, 1990–2009



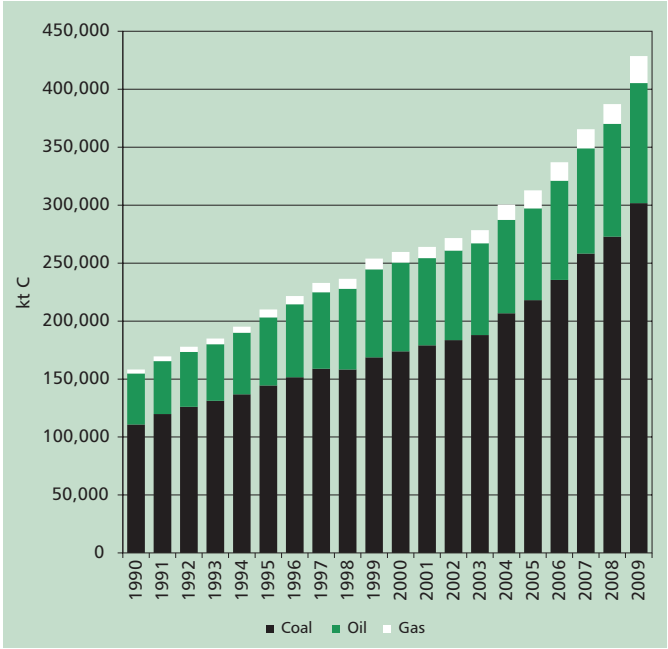
GWh = gigawatt-hour.
Source: IEA (2011b).

Figure 6.3.13 Fuel Input for Electricity Generation, 1990–2009



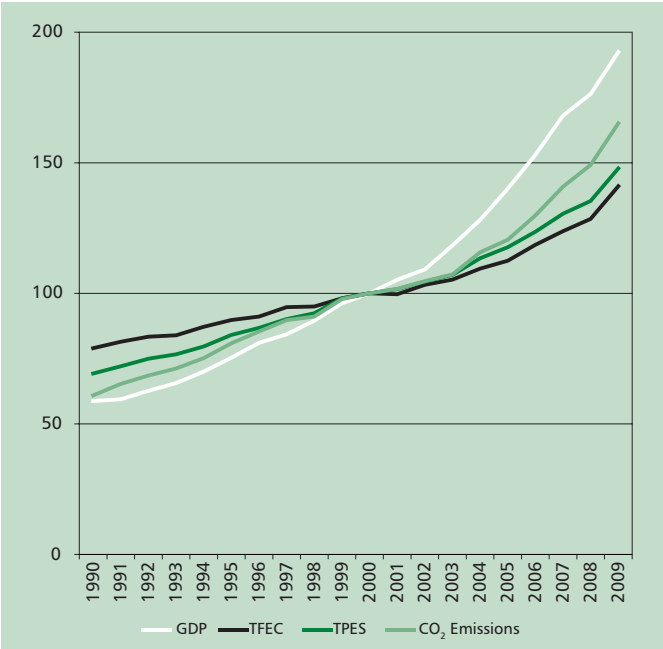
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 6.3.14 Carbon Dioxide Emissions from Fuel Combustion, 1990–2009



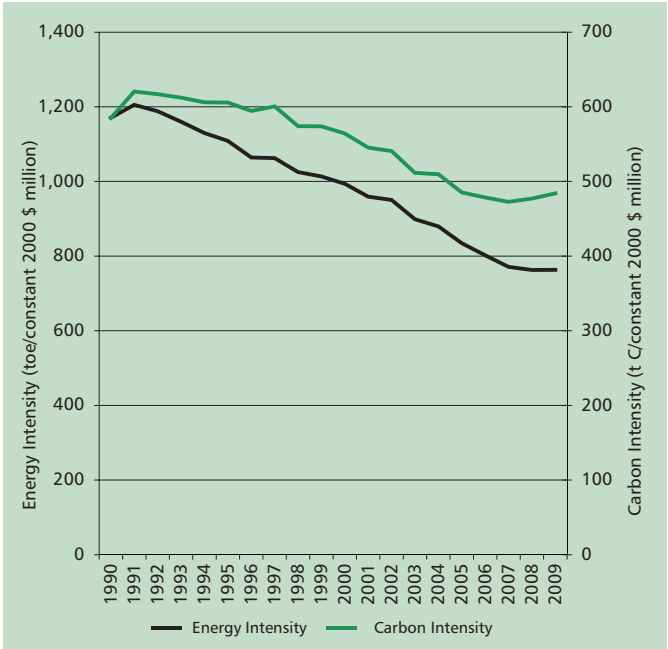
kt C = thousand tons of carbon equivalent.
Source: APERC estimates.

Figure 6.3.15 Growth of GDP, TFEC, TPES, and CO_2 (indexed to year 2000), 1990–2009



CO_2 = carbon dioxide, GDP = gross domestic product, TFEC = total final energy consumption, TPES = total primary energy supply.
Note: Indices are measured relative to the base year 2000 (2000 = 100).
Source: APERC estimates.

Figure 6.3.16 Energy and Carbon Intensities, 1990–2009



t C = ton of carbon equivalent, toe = ton of oil equivalent.
Source: APERC estimates.

Table 6.3.3 India Energy Balance Table, 2006

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	197,925	0	38,998	0	0	0	0	0	0	0	25,489	9,780	4,900	0	2	747	159,916	116	0	0	437,873
2.	Imports	27,098	3,156	113,955	18,018	450	1,490	1,000	2,864	2,574	9,640	7,989	0	0	0	0	0	0	0	254	0	170,470
3.	Exports	–710	–51	0	–34,954	–4,089	–157	–11,758	–3,609	–127	–15,214	0	0	0	0	0	0	0	0	–19	0	–35,734
4.	International Bunkers	0	0	0	–2,986	0	0	–4	–12	0	–2,970	0	0	0	0	0	0	0	0	0	0	–2,986
5.	Stock Changes	–4,624	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–4,624
6.	Total Primary Energy Supply	219,689	3,105	152,953	–19,922	–3,639	1,333	–10,762	–757	2,447	–8,544	33,478	9,780	4,900	0	2	747	159,916	116	235	0	564,999
7.	Transfers	0	0	–2,149	2,365	0	0	0	0	2,365	0	0	0	0	0	0	0	0	0	0	0	216
8.	Total Transformation Sector	–180,908	5,868	–151,888	143,063	13,417	8,883	49,776	13,690	7,134	50,163	–12,795	–9,780	–4,900	0	–2	–748	–1,106	0	64,779	0	–148,417
8.1	Power Generation	–163,990	–465	0	–8,439	0	0	–6,348	–1,382	0	–709	–12,809	–9,780	–4,900	0	–2	–748	–1,106	0	64,779	0	–137,460
8.2	Gas Processing	–31	0	0	0	0	0	0	0	0	0	14	0	0	0	0	0	0	0	0	0	–17
8.3	Refineries	0	0	–151,888	151,502	13,417	8,883	56,124	15,072	7,134	50,872	0	0	0	0	0	0	0	0	0	0	–386
8.4	Coal Transformation	–16,887	6,333	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–10,554
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	–224	–930	0	–12,545	0	0	0	0	0	–12,545	–4,167	0	0	0	0	0	0	0	–20,062	0	–37,928
10.	Discrepancy	52	0	1,084	–2,147	158	–272	675	–3,498	317	473	0	0	0	0	0	1	0	0	–67	0	–1,077
11.	Total Final Energy Consumption	38,609	8,043	0	110,814	9,936	9,944	39,689	9,435	12,263	29,547	16,516	0	0	0	0	0	158,810	116	44,885	0	377,793
12.	Industry Sector	31,957	7,819	0	19,598	0	0	11,458	6,514	408	1,218	6,368	0	0	0	0	0	27,596	0	20,422	0	113,760
13.	Transport Sector	0	0	0	36,377	9,936	0	24,686	482	0	1,273	937	0	0	0	0	0	120	0	929	0	38,363
14.	Other Sectors	6,652	224	0	27,783	0	9,944	3,545	2,439	11,855	0	508	0	0	0	0	0	131,094	116	23,534	0	189,911
14.1	Residential and Commercial	5,580	224	0	21,724	0	9,944	0	0	11,780	0	367	0	0	0	0	0	131,094	0	13,005	0	171,994
14.1.1	Commerce and Public Services	3,085	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6,067	0	3,459	0	12,611
14.1.2	Residential	2,495	224	0	21,724	0	9,944	0	0	11,780	0	367	0	0	0	0	0	125,027	0	9,546	0	159,383
14.2	Non-Specified Others	1,072	0	0	6,059	0	0	3,545	2,439	75	0	141	0	0	0	0	0	0	116	10,529	0	17,917
15.	Non-Energy Use	0	0	0	27,056	0	0	0	0	0	27,056	8,703	0	0	0	0	0	0	0	0	0	35,759
16.	Electricity Output (GWh)	516,854	1,352	0	29,484	0	0	0	0	0	29,484	62,394	113,720	18,802	0	19	8,690	1,930	0	0	0	753,245
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.
Note: Figures may not add up to total because of rounding.
Source: IEA (2011b).

Table 6.3.4 India Energy Balance Table, 2007

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	210,196	0	38,778	0	0	0	0	0	0	0	26,058	10,371	4,419	0	2	1,014	161,730	166	0	0	452,734
2.	Imports	31,362	2,861	124,349	22,822	351	2,604	3,052	1,140	3,586	12,089	9,638	0	0	0	0	0	0	0	450	0	191,482
3.	Exports	–726	–65	0	–42,264	–4,859	–143	–14,797	–4,530	–112	–17,823	0	0	0	0	0	0	0	0	–25	0	–43,080
4.	International Bunkers	0	0	0	–3,437	0	0	–16	–33	0	–3,388	0	0	0	0	0	0	0	0	0	0	–3,437
5.	Stock Changes	–1,139	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–1,139
6.	Total Primary Energy Supply	239,693	2,796	163,127	–22,879	–4,508	2,461	–11,761	–3,423	3,474	–9,122	35,696	10,371	4,419	0	2	1,014	161,730	166	425	0	596,560
7.	Transfers	0	0	–2,116	2,327	0	0	0	0	2,327	0	0	0	0	0	0	0	0	0	0	0	211
8.	Total Transformation Sector	–197,074	5,586	–161,330	153,303	15,159	8,154	54,278	13,753	7,605	54,354	–14,839	–10,370	–4,419	0	–2	–1,015	–1,118	0	69,996	0	–161,282
8.1	Power Generation	–181,636	–390	0	–9,003	0	0	–6,773	–1,421	0	–809	–14,854	–10,370	–4,419	0	–2	–1,015	–1,118	0	69,996	0	–152,811
8.2	Gas Processing	–32	0	0	0	0	0	0	0	0	0	15	0	0	0	0	0	0	0	0	0	–17
8.3	Refineries	0	0	–161,330	162,306	15,159	8,154	61,051	15,174	7,605	55,163	0	0	0	0	0	0	0	0	0	0	976
8.4	Coal Transformation	–15,406	5,976	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–9,430
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	–238	–781	0	–13,500	0	0	0	0	0	–13,500	–4,651	0	0	0	0	0	0	0	–20,475	0	–39,645
10.	Discrepancy	70	1	319	–1,508	405	–818	19	–649	337	–802	0	–1	0	0	0	1	–1	0	–241	0	–1,360
11.	Total Final Energy Consumption	42,451	7,602	0	117,743	11,056	9,797	42,536	9,681	13,743	30,930	16,206	0	0	0	0	0	160,611	166	49,705	0	394,484
12.	Industry Sector	35,455	7,359	0	20,034	0	0	12,051	6,700	868	415	4,813	0	0	0	0	0	27,907	0	22,825	0	118,393
13.	Transport Sector	0	0	0	39,613	11,056	0	26,633	472	0	1,452	1,385	0	0	0	0	0	134	0	955	0	42,087
14.	Other Sectors	6,996	243	0	29,033	0	9,797	3,852	2,509	12,875	0	164	0	0	0	0	0	132,570	166	25,925	0	195,097
14.1	Residential and Commercial	5,814	243	0	22,420	0	9,797	0	0	12,623	0	32	0	0	0	0	0	132,570	0	14,414	0	175,493
14.1.1	Commerce and Public Services	3,236	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6,135	0	4,015	0	13,386
14.1.2	Residential	2,578	243	0	22,420	0	9,797	0	0	12,623	0	32	0	0	0	0	0	126,435	0	10,399	0	162,107
14.2	Non-Specified Others	1,182	0	0	6,613	0	0	3,852	2,509	252	0	132	0	0	0	0	0	0	166	11,511	0	19,604
15.	Non-Energy Use	0	0	0	29,063	0	0	0	0	0	29,063	9,844	0	0	0	0	0	0	0	0	0	38,907
16.	Electricity Output (GWh)	552,059	1,135	0	33,959	0	0	0	0	0	33,959	75,437	120,589	16,957	0	19	11,796	1,951	0	0	0	813,902
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Source: IEA (2011b).

Table 6.3.5 India Energy Balance Table, 2008

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	225,090	0	38,339	0	0	0	0	0	0	0	26,283	9,829	3,834	0	2	1,182	163,565	167	0	0	468,291
2.	Imports	37,008	1,267	130,974	18,612	425	1,516	2,828	1,153	2,898	9,792	9,302	0	0	0	0	0	0	0	795	0	197,958
3.	Exports	−755	−901	0	−38,386	−5,816	−81	−14,241	−5,696	−123	−12,429	0	0	0	0	0	0	0	0	−33	0	−40,075
4.	International Bunkers	0	0	0	−3,464	0	0	−19	−122	0	−3,323	0	0	0	0	0	0	0	0	0	0	−3,464
5.	Stock Changes	−3,688	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	−3,688
6.	Total Primary Energy Supply	257,655	366	169,313	−23,238	−5,391	1,435	−11,432	−4,665	2,775	−5,960	35,585	9,829	3,834	0	2	1,182	163,565	167	762	0	619,022
7.	Transfers	0	0	−2,220	2,443	0	0	0	0	2,443	0	0	0	0	0	0	0	0	0	0	0	223
8.	Total Transformation Sector	−205,234	5,811	−166,184	157,763	17,142	8,602	57,899	15,589	7,904	50,627	−15,601	−9,829	−3,834	0	−2	−1,182	−1,131	0	72,527	0	−166,896
8.1	Power Generation	−189,619	−394	0	−10,391	0	0	−7,768	−1,390	0	−1,233	−15,616	−9,829	−3,834	0	−2	−1,182	−1,131	0	72,527	0	−159,471
8.2	Gas Processing	−34	0	0	0	0	0	0	0	0	0	15	0	0	0	0	0	0	0	0	0	−19
8.3	Refineries	0	0	−166,184	168,154	17,142	8,602	65,667	16,979	7,904	51,860	0	0	0	0	0	0	0	0	0	0	1,970
8.4	Coal Transformation	−15,581	6,205	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	−9,376
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	−218	−789	0	−13,685	0	0	0	0	0	−13,685	−4,723	0	0	0	0	0	0	0	−20,241	0	−39,656
10.	Discrepancy	−1,632	1	−909	−636	294	−305	1,417	−1,238	653	−1,457	0	0	0	0	0	0	1	0	−65	0	−3,240
11.	Total Final Energy Consumption	50,571	5,389	0	122,647	12,045	9,732	47,884	9,686	13,775	29,525	15,261	0	0	0	0	0	162,435	167	52,983	0	409,453
12.	Industry Sector	41,122	5,157	0	21,978	0	0	14,367	6,556	608	447	4,119	0	0	0	0	0	28,222	0	25,256	0	125,854
13.	Transport Sector	0	0	0	43,609	12,045	0	29,464	676	0	1,424	1,992	0	0	0	0	0	148	0	999	0	46,748
14.	Other Sectors	9,449	232	0	29,406	0	9,732	4,053	2,454	13,167	0	211	0	0	0	0	0	134,065	167	26,728	0	200,258
14.1	Residential and Commercial	5,989	232	0	22,629	0	9,732	0	0	12,897	0	84	0	0	0	0	0	134,065	0	14,844	0	177,843
14.1.1	Commerce and Public Services	3,394	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6,205	0	4,132	0	13,731
14.1.2	Residential	2,595	232	0	22,629	0	9,732	0	0	12,897	0	84	0	0	0	0	0	127,860	0	10,712	0	164,112
14.2	Non-Specified Others	3,460	0	0	6,777	0	0	4,053	2,454	270	0	127	0	0	0	0	0	0	167	11,884	0	22,415
15.	Non-Energy Use	0	0	0	27,654	0	0	0	0	0	27,654	8,939	0	0	0	0	0	0	0	0	0	36,593
16.	Electricity Output (GWh)	581,376	1,147	0	34,148	0	0	0	0	0	34,148	81,927	114,295	14,713	0	20	13,740	1,973	0	0	0	843,339
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Source: IEA (2011b).

Table 6.3.6 India Energy Balance Table, 2009

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	244,177	0	38,527	0	0	0	0	0	0	0	38,481	9,194	4,857	0	2	1,542	165,422	268	0	0	502,470
2.	Imports	45,902	1,482	162,762	14,699	412	1,030	2,618	732	3,126	6,781	10,429	0	0	0	0	0	0	0	906	0	236,180
3.	Exports	–1,145	–47	0	–52,967	–10,446	–48	–19,091	–4,967	–148	–18,267	0	0	0	0	0	0	0	0	–45	0	–54,204
4.	International Bunkers	0	0	0	–3,609	0	0	–37	–122	0	–3,450	0	0	0	0	0	0	0	0	0	0	–3,609
5.	Stock Changes	–5,005	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–5,005
6.	Total Primary Energy Supply	283,929	1,435	201,289	–41,877	–10,034	982	–16,510	–4,357	2,978	–14,936	48,910	9,194	4,857	0	2	1,542	165,422	268	861	0	675,832
7.	Transfers	0	0	–2,305	2,535	0	0	0	0	2,535	0	0	0	0	0	0	0	0	0	0	0	230
8.	Total Transformation Sector	–213,425	5,819	–192,457	181,766	24,133	9,241	67,687	15,786	7,360	57,559	–23,198	–9,194	–4,857	0	–2	–1,542	–1,144	0	77,347	0	–180,887
8.1	Power Generation	–197,942	–388	0	–10,848	0	0	–8,555	–1,386	0	–907	–23,214	–9,194	–4,857	0	–2	–1,542	–1,144	0	77,347	0	–171,784
8.2	Gas Processing	–36	0	0	0	0	0	0	0	0	0	16	0	0	0	0	0	0	0	0	0	–20
8.3	Refineries	0	0	–192,457	192,614	24,133	9,241	76,242	17,172	7,360	58,466	0	0	0	0	0	0	0	0	0	0	157
8.4	Coal Transformation	–15,447	6,207	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–9,240
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	–204	–777	0	–13,335	0	0	0	0	0	–13,335	–4,497	0	0	0	0	0	0	0	–23,867	0	–42,680
10.	Discrepancy	–2,625	0	–6,527	–115	–383	–490	1,560	–1,814	2,040	–1,028	–1	0	0	0	0	0	0	0	6,044	0	–3,224
11.	Total Final Energy Consumption	67,675	6,477	0	128,974	13,716	9,733	52,737	9,615	14,913	28,260	21,214	0	0	0	0	0	164,278	268	60,385	0	449,271
12.	Industry Sector	43,199	6,233	0	23,460	0	0	15,822	6,538	658	442	6,533	0	0	0	0	0	28,540	0	28,058	0	136,023
13.	Transport Sector	0	0	0	48,276	13,716	0	32,451	630	0	1,479	1,992	0	0	0	0	0	164	0	1,067	0	51,499
14.	Other Sectors	24,476	244	0	30,899	0	9,733	4,464	2,447	14,255	0	160	0	0	0	0	0	135,574	268	31,260	0	222,881
14.1	Residential and Commercial	6,181	244	0	23,695	0	9,733	0	0	13,962	0	22	0	0	0	0	0	135,574	0	17,775	0	183,491
14.1.1	Commerce and Public Services	3,560	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6,274	0	5,212	0	15,046
14.1.2	Residential	2,621	244	0	23,695	0	9,733	0	0	13,962	0	22	0	0	0	0	0	129,300	0	12,563	0	168,445
14.2	Non-Specified Others	18,295	0	0	7,204	0	0	4,464	2,447	293	0	138	0	0	0	0	0	0	268	13,485	0	39,390
15.	Non-Energy Use	0	0	0	26,339	0	0	0	0	0	26,339	12,529	0	0	0	0	0	0	0	0	0	38,868
16.	Electricity Output (GWh)	615,454	1,130	0	26,099	0	0	0	0	0	26,099	111,206	106,909	18,636	0	27	17,933	1,995	0	0	0	899,389
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Source: IEA (2011b).

Table 6.3.7 India Summary Table, 1990–2009

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Indigenous Production (ktoe)																				
Coal	104,693	113,309	117,750	120,535	123,759	130,816	137,837	142,567	138,790	141,904	146,235	151,811	156,755	166,294	176,397	187,250	197,925	210,196	225,090	244,177
Oil	35,323	33,301	30,180	30,410	35,696	39,237	37,037	38,232	37,266	37,238	37,240	36,992	38,256	38,563	39,141	37,143	38,998	38,778	38,339	38,527
Gas	10,568	11,954	13,341	13,526	14,352	17,327	17,652	20,318	21,279	22,987	23,062	23,209	25,167	25,584	25,475	25,931	25,489	26,058	26,283	38,481
Hydro	6,162	6,259	6,010	6,061	7,115	6,243	5,928	6,421	7,138	6,953	6,404	6,338	5,513	6,479	7,286	8,749	9,780	10,371	9,829	9,194
Nuclear	1,600	1,440	1,753	1,407	1,472	2,080	2,364	2,628	3,107	3,453	4,405	5,075	5,053	4,634	4,433	4,515	4,900	4,419	3,834	4,857
Geothermal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Solar	0	0	0	0	0	0	1	1	1	1	1	1	1	1	2	2	2	2	2	2
Wind	3	3	8	9	17	45	79	89	97	130	145	193	231	309	386	568	747	1,014	1,182	1,542
Biomass	133,459	135,289	137,145	137,891	138,637	140,003	141,339	142,788	144,232	146,745	148,879	150,865	152,604	154,435	156,269	158,125	159,916	161,730	163,565	165,422
Others	8	12	15	17	19	21	23	24	32	34	35	39	41	51	64	96	116	166	167	268
Total	291,816	301,567	306,202	309,856	321,067	335,772	342,260	353,068	351,942	359,445	366,406	374,523	383,621	396,350	409,453	422,379	437,873	452,734	468,291	502,470
Primary Energy Supply (ktoe)																				
Coal	103,385	110,851	117,466	122,644	129,296	135,956	141,846	147,549	146,357	157,119	161,457	165,886	171,505	175,406	196,372	207,525	222,794	242,489	258,021	285,364
Oil	61,439	63,555	66,786	68,784	73,019	82,478	87,314	92,297	99,917	110,807	112,715	112,785	117,275	122,163	125,295	126,444	133,031	140,248	146,075	159,412
Gas	10,568	11,954	13,341	13,526	14,352	17,327	17,652	20,318	21,279	22,987	23,062	23,209	25,167	25,871	28,385	31,749	33,478	35,696	35,585	48,910
Hydro	6,162	6,259	6,010	6,061	7,115	6,243	5,928	6,421	7,138	6,953	6,404	6,338	5,513	6,479	7,286	8,749	9,780	10,371	9,829	9,194
Nuclear	1,600	1,440	1,753	1,407	1,472	2,080	2,364	2,628	3,107	3,453	4,405	5,075	5,053	4,634	4,433	4,515	4,900	4,419	3,834	4,857
Geothermal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Solar	0	0	0	0	0	0	1	1	1	1	1	1	1	1	2	2	2	2	2	2
Wind	3	3	8	9	17	45	79	89	97	130	145	193	231	309	386	568	747	1,014	1,182	1,542
Biomass	133,459	135,289	137,145	137,891	138,637	140,003	141,339	142,788	144,232	146,745	148,879	150,865	152,604	154,435	156,269	158,125	159,916	161,730	163,565	165,422
Others	126	137	118	141	141	152	156	115	128	150	147	150	157	196	210	230	351	591	929	1,129
Total	316,742	329,488	342,627	350,463	364,049	384,284	396,679	412,206	422,256	448,345	457,215	464,502	477,506	489,494	518,638	537,907	564,999	596,560	619,022	675,832
Final Energy Consumption by Sector (ktoe)																				
Industry	70,260	71,837	73,695	73,386	76,633	76,051	83,977	87,640	88,817	90,537	87,099	86,759	90,311	89,903	96,330	105,225	113,760	118,393	125,854	136,023
Transport	27,096	28,462	29,685	30,399	31,952	35,706	28,000	28,583	29,715	31,303	31,985	31,896	32,911	33,536	34,887	34,761	38,363	42,087	46,748	51,499
Residential	122,992	125,048	127,055	128,558	130,752	132,776	134,645	137,607	140,627	142,859	144,632	145,987	148,533	150,610	154,334	156,061	159,383	162,107	164,112	168,445
Commercial	9,367	10,023	9,941	9,649	10,172	10,330	10,626	11,279	9,470	10,209	10,233	10,495	11,008	11,523	11,393	12,033	12,611	13,386	13,731	15,046
Others	21,979	24,071	25,250	25,432	28,291	31,097	32,892	36,690	33,833	37,521	44,629	42,401	46,291	49,679	51,781	50,157	53,676	58,511	59,008	78,258
Total	251,694	259,441	265,626	267,424	277,800	285,960	290,140	301,799	302,462	312,429	318,578	317,538	329,054	335,251	348,725	358,237	377,793	394,484	409,453	449,271

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Table 6.3.7 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Final Energy Consumption by Type (ktoe)																				
Coal	41,808	43,692	43,450	40,641	42,578	38,373	38,247	41,629	36,256	35,657	33,462	33,224	36,423	35,308	39,329	42,705	46,652	50,053	55,960	74,152
Oil	52,575	54,753	56,782	59,088	64,338	72,574	74,937	79,353	83,089	90,191	95,694	93,380	97,695	100,957	104,458	102,931	110,814	117,743	122,647	128,974
Gas	5,636	5,742	6,961	6,906	7,341	8,401	8,506	9,260	8,673	9,447	9,686	9,007	9,663	9,799	11,413	14,948	16,516	16,206	15,261	21,214
Electricity	18,209	19,952	21,273	22,880	24,887	26,588	27,088	28,746	30,180	30,912	31,594	32,065	33,683	35,769	38,274	40,526	44,885	49,705	52,983	60,385
Heat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Biomass	133,458	135,290	137,145	137,892	138,637	140,003	141,339	142,787	144,232	146,188	148,107	149,823	151,549	153,367	155,187	157,031	158,810	160,611	162,435	164,278
Others	8	12	15	17	19	21	23	24	32	34	35	39	41	51	64	96	116	166	167	268
Total	251,694	259,441	265,626	267,424	277,800	285,960	290,140	301,799	302,462	312,429	318,578	317,538	329,054	335,251	348,725	358,237	377,793	394,484	409,453	449,271
Power Generation (GWh)																				
Thermal	211,609	237,292	256,013	280,360	296,863	336,516	357,807	380,025	400,871	440,021	466,846	482,615	509,258	535,448	558,518	570,658	610,084	662,590	698,598	753,889
Hydro	71,656	72,775	69,886	70,478	82,727	72,596	68,930	74,661	83,003	80,853	74,462	73,697	64,104	75,339	84,723	101,730	113,720	120,589	114,295	106,909
Nuclear	6,141	5,525	6,726	5,398	5,648	7,982	9,071	10,083	11,922	13,249	16,902	19,475	19,390	17,780	17,011	17,324	18,802	16,957	14,713	18,636
Geothermal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Solar	0	0	0	0	0	1	6	6	6	6	7	12	14	17	19	19	19	19	20	27
Wind	32	39	88	99	200	529	922	1,037	1,127	1,509	1,684	2,241	2,687	3,590	4,490	6,603	8,690	11,796	13,740	17,933
Others	0	0	0	0	0	0	0	0	0	971	1,347	1,820	1,840	1,863	1,885	1,908	1,930	1,951	1,973	1,995
Total	289,438	315,631	332,713	356,335	385,438	417,624	436,736	465,812	496,929	536,609	561,248	579,860	597,293	634,037	666,646	698,242	753,245	813,902	843,339	899,389
Loss and Own Use of Electricity (GWh)																				
Transmission and Distribution Losses	56,523	61,442	61,570	65,012	69,570	79,360	91,105	97,919	111,488	140,163	155,070	166,116	162,884	174,035	175,535	180,105	183,047	185,512	180,326	219,860
Own Use	22,558	23,651	24,988	26,721	27,919	30,616	32,198	34,698	35,640	38,186	39,698	41,453	43,360	45,012	47,000	47,686	50,233	52,570	55,035	57,663
Total	79,081	85,093	86,558	91,733	97,488	109,977	123,302	132,616	147,128	178,349	194,767	207,570	206,244	219,047	222,535	227,791	233,279	238,081	235,360	277,523
Fuel Input for Power Generation (ktoe)																				
Coal	55,576	61,759	67,585	75,373	78,439	89,738	96,588	99,385	103,685	113,104	120,251	125,172	126,141	131,556	145,370	152,104	164,455	182,026	190,013	198,330
Oil	3,592	3,515	3,674	3,442	3,698	3,954	6,737	6,882	6,970	7,272	9,154	8,197	8,599	8,727	8,545	8,024	8,439	9,003	10,391	10,848
Gas	3,461	4,420	4,795	4,735	5,166	6,783	6,979	8,131	9,393	9,557	9,253	9,798	11,039	12,059	12,892	12,636	12,809	14,854	15,616	23,214
Total	62,629	69,694	76,054	83,550	87,303	100,475	110,304	114,398	120,048	129,933	138,658	143,167	145,779	152,342	166,807	172,764	185,703	205,883	216,020	232,392
CO_2 Emissions (kt C)																				
Coal	110,842	119,831	126,040	131,231	136,849	144,516	151,616	158,941	158,242	168,776	173,996	179,093	183,644	187,986	206,822	218,030	235,572	258,355	272,863	301,723
Oil	44,022	45,588	47,293	48,859	53,218	58,654	62,993	65,997	69,615	75,932	76,514	75,274	77,297	79,215	80,526	79,225	85,556	90,692	97,286	103,633
Gas	3,380	4,181	4,574	4,861	5,150	6,817	6,994	8,043	8,595	9,190	9,129	9,677	10,721	11,295	13,180	15,587	15,877	16,569	17,077	23,313
Total	158,244	169,600	177,907	184,951	195,216	209,987	221,604	232,981	236,453	253,898	259,640	264,044	271,662	278,496	300,528	312,842	337,005	365,616	387,226	428,669

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Table 6.3.7 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Macroeconomic Indicators																				
Population (thousand)	849,515	866,530	882,821	899,329	915,697	932,180	948,759	965,428	982,182	999,016	1,015,923	1,032,473	1,048,641	1,064,399	1,079,721	1,094,583	1,109,811	1,124,787	1,139,965	1,155,348
Urban Population, %	25.5	25.7	25.9	26.2	26.4	26.6	26.8	27.0	27.3	27.5	27.7	27.9	28.1	28.3	28.5	28.7	29.0	29.3	29.5	29.8
GDP (constant 2000 $ million)	270,495	273,372	288,353	302,101	322,203	346,591	372,784	387,899	411,923	442,353	460,182	484,189	502,428	544,486	589,559	644,500	704,256	773,393	811,540	885,430
GDP (current $ million)	317,467	267,524	245,553	276,037	323,506	356,299	388,344	410,915	416,252	450,476	460,182	477,849	507,190	599,461	721,573	834,036	951,339	1,242,426	1,215,993	1,377,265
GDP (constant 2005 PPP $ million)	1,056,496	1,067,733	1,126,248	1,179,943	1,258,458	1,353,714	1,456,017	1,515,052	1,608,887	1,727,741	1,797,376	1,891,143	1,962,379	2,126,648	2,302,695	2,517,282	2,750,680	3,020,714	3,169,707	3,458,307
GDP/capita (constant 2000 $)	318	315	327	336	352	372	393	402	419	443	453	469	479	512	546	589	635	688	712	766
GDP/capita (current $)	374	309	278	307	353	382	409	426	424	451	453	463	484	563	668	762	857	1,105	1,067	1,192
GDP – Manufacturing (% of GDP)	13.8	13.4	13.1	13.5	14.1	15.1	15.4	14.8	14.4	13.8	14.3	13.9	14.3	14.1	14.2	14.3	14.9	15.0	14.9	14.8
Car Ownership (car/1,000 persons)	5	5	6	6	6	6	7	8	8	9	9	10	11	13	13	14	15	16	16	17
Basic Energy Indicators																				
TPES/capita (toe/person)	0.37	0.38	0.39	0.39	0.40	0.41	0.42	0.43	0.43	0.45	0.45	0.45	0.46	0.46	0.48	0.49	0.51	0.53	0.54	0.58
TFEC/capita (toe/person)	0.30	0.30	0.30	0.30	0.30	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.32	0.33	0.34	0.35	0.36	0.39
TPES/GDP (toe/constant 2000 $ million)	1,171	1,205	1,188	1,160	1,130	1,109	1,064	1,063	1,025	1,014	994	959	950	899	880	835	802	771	763	763
TFEC/GDP (toe/constant 2000 $ million)	930	949	921	885	862	825	778	778	734	706	692	656	655	616	592	556	536	510	505	507
Import Dependency (%)	7.9	8.5	10.6	11.6	11.8	12.6	13.7	14.3	16.7	19.8	19.9	19.4	19.7	19.0	21.1	21.5	22.5	24.1	24.3	25.7
Oil Import Dependency (%)	42.5	47.6	54.8	55.8	51.1	52.4	57.6	58.6	62.7	66.4	67.0	67.2	67.4	68.4	68.8	70.6	70.7	72.4	73.8	75.8
Electricity/capita (kWh/ person)	249	268	280	296	316	332	332	346	357	360	362	361	374	391	412	431	470	514	541	608
CO_2 Intensity (t C/constant 2000 $ million)	585	620	617	612	606	606	594	601	574	574	564	545	541	511	510	485	479	473	477	484
CO_2/capita (t C)	0.19	0.20	0.20	0.21	0.21	0.23	0.23	0.24	0.24	0.25	0.26	0.26	0.26	0.26	0.28	0.29	0.30	0.33	0.34	0.37
CO_2/TPES (t C/toe)	0.50	0.51	0.52	0.53	0.54	0.55	0.56	0.57	0.56	0.57	0.57	0.57	0.57	0.57	0.58	0.58	0.60	0.61	0.63	0.63

CO_2 = carbon dioxide, GDP = gross domestic product, GWh = gigawatt–hour, kt C = thousand tons of carbon equivalent, ktoe = thousand tons of oil equivalent, kWh = kilowatt–hour, PPP = purchasing power parity, t C = ton of carbon equivalent, TFEC = total final energy consumption, toe = ton of oil equivalent, TPES = total primary energy supply.

Note: Figures may not add up to total because of rounding.

Sources: APERC estimates, IEA (2011b), JAMA (2012), and World Bank.

6.4 Maldives

Country Profile (2009)		Energy Reserves (year-end 2008)	
Total Surface Area (square kilometer)	300	Coal (million ton) - Recoverable	–
Population (thousand)	312	Gas (trillion cubic feet) - Proven	–
GDP (constant 2000 $ billion)	1.2	Oil (billion barrel) - Proven	–
Electrification Rate (%)	100.0		

– = no data or not applicable, GDP = gross domestic product.
Sources ADB (2012), SAARC (2010), and World Bank.

2008 Energy Supply and Demand Flow (ktoe)

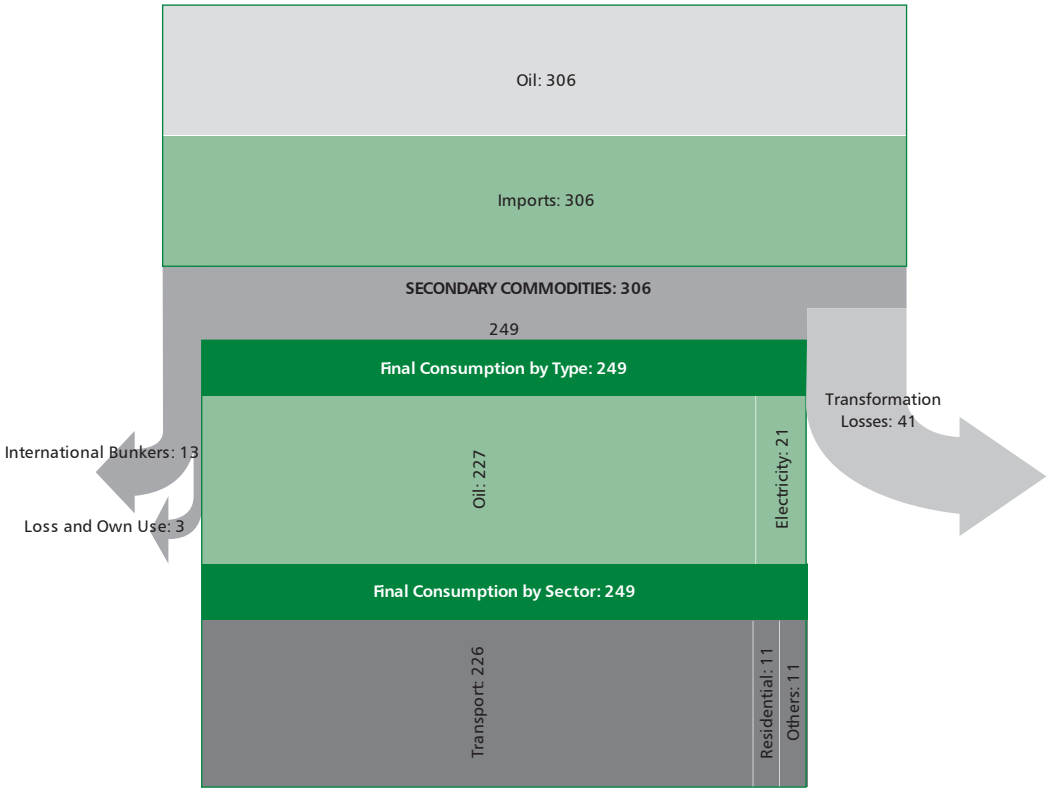


Table 6.4.1 Key Data and Economic Profile

	1990	1995	2000	2005	2008
Socioeconomic Data					
Population (thousand)	219	249	273	295	308
GDP (constant 2000 $ billion)	–	0.4	0.6	0.8	1.2
GDP (constant 2005 PPP $ billion)	–	0.8	1.2	1.5	2.4
GDP/capita (constant 2000 $)	–	1,690	2,285	2,759	4,038
GDP/capita (constant 2005 PPP $)	0	3,198	4,323	5,221	7,640

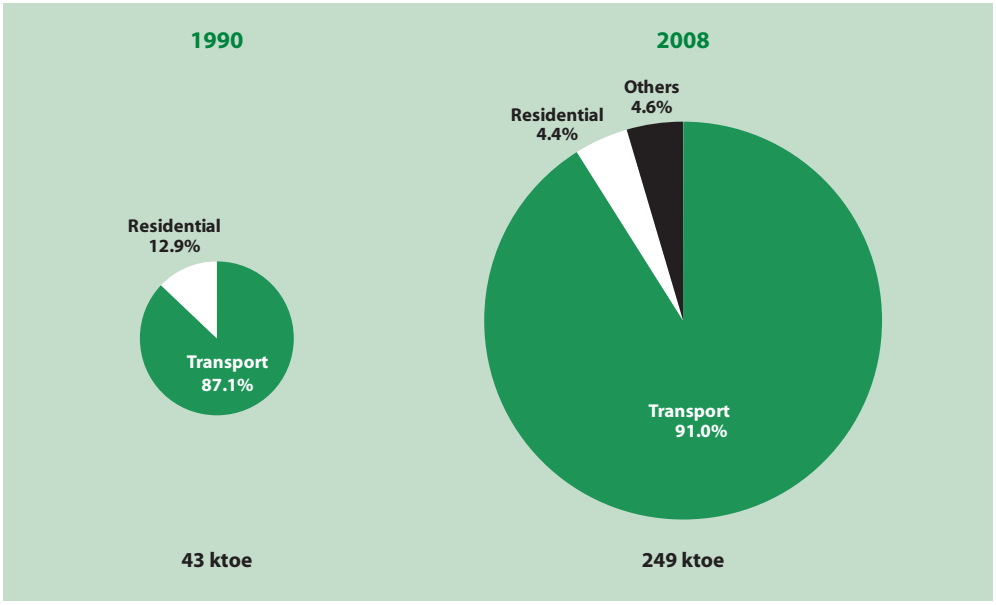
– = no data or not applicable, GDP = gross domestic product, PPP = purchasing power parity.
Source: World Bank.

Table 6.4.2 Energy Supply and Demand

	1990	1995	2000	2005	2008
Primary Energy Supply (ktoe)					
Indigenous Production	0	0	0	0	0
Net Imports	48	85	158	212	292
Total PES	48	85	158	212	292
Coal	0	0	0	0	0
Oil	48	85	158	212	292
Gas	0	0	0	0	0
Biomass	0	0	0	0	0
Others	0	0	0	0	0
TPES/capita (toe)	0.22	0.34	0.58	0.72	0.95
TPES/GDP (toe/constant 2005 PPP $ million)	–	107	134	137	124
Final Energy Consumption (ktoe)					
Industry	0	0	0	0	0
Transportation	37	74	126	165	226
Other Sectors	6	4	13	16	23
Total FEC	43	79	139	181	249
Coal	0	0	0	0	0
Oil	41	74	131	166	227
Gas	0	0	0	0	0
Electricity	2	4	8	15	21
Biomass	0	0	0	0	0
Others	0	0	0	0	0

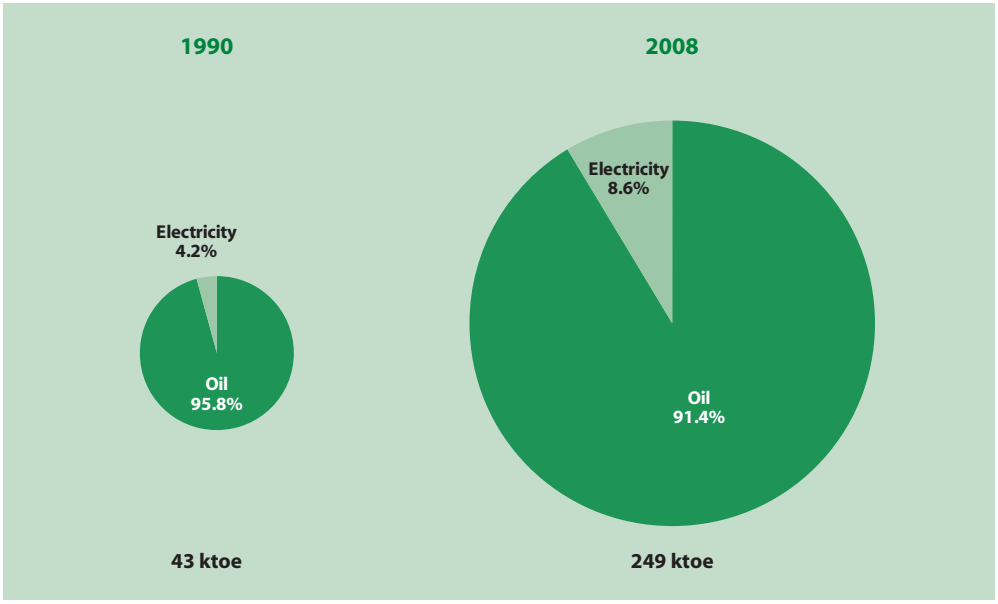
– = no data or not applicable, FEC = final energy consumption, GDP = gross domestic product, ktoe = thousand tons of oil equivalent, PES = primary energy supply, PPP = purchasing power parity, toe = ton of oil equivalent, TPES = total primary energy supply.
Source: UNSD (2011a).

Figure 6.4.1 Final Energy Consumption by Sector, 1990 and 2008



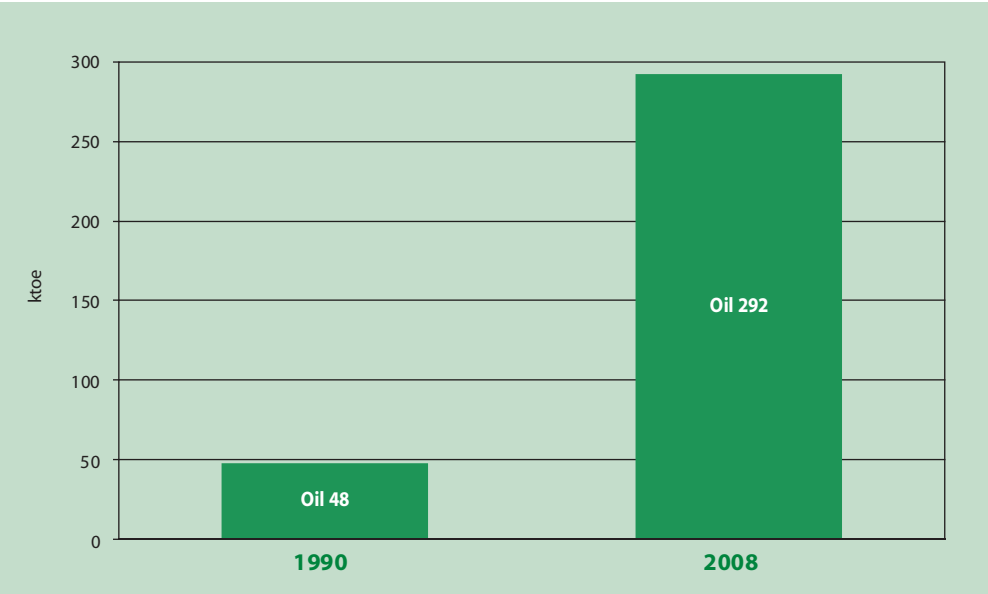
ktoe = thousand tons of oil equivalent.
Source: UNSD (2011a).

Figure 6.4.2 Final Energy Consumption by Type of Energy, 1990 and 2008



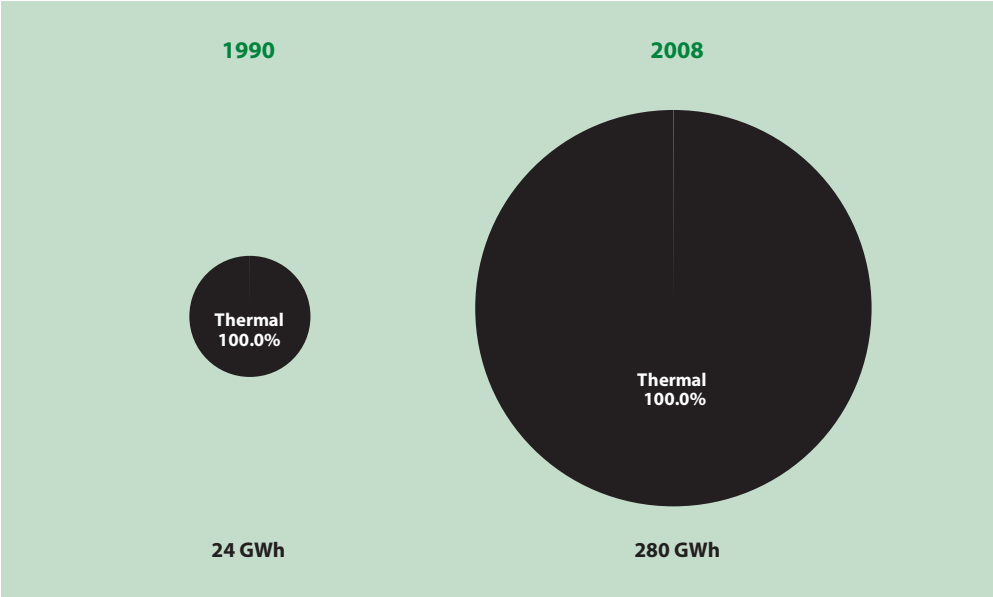
ktoe = thousand tons of oil equivalent.
Source: UNSD (2011a).

Figure 6.4.3 Total Primary Energy Supply, 1990 and 2008



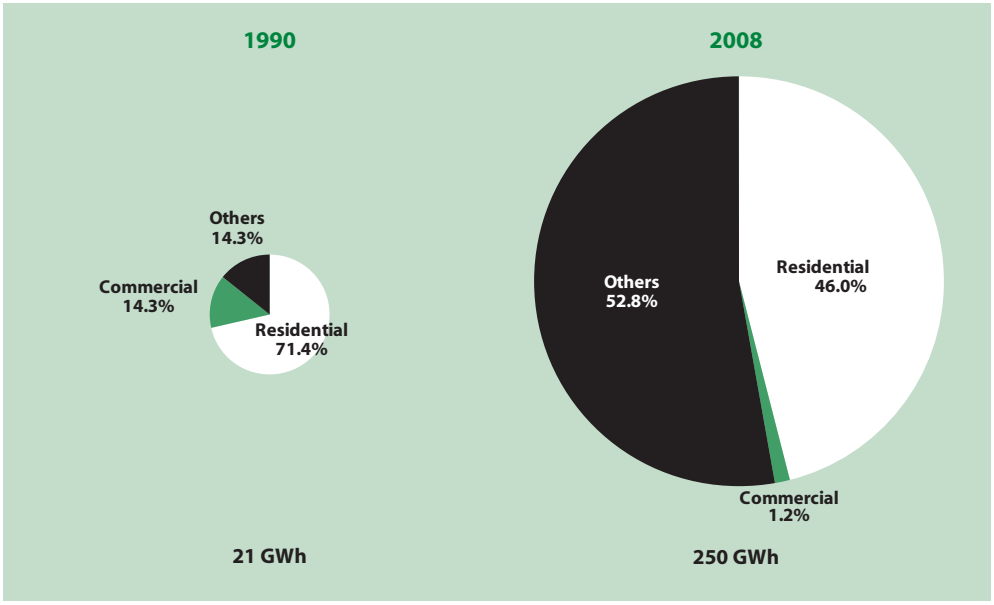
ktoe = thousand tons of oil equivalent.
Source: UNSD (2011a).

Figure 6.4.4 Electricity Generation by Plant Type, 1990 and 2008



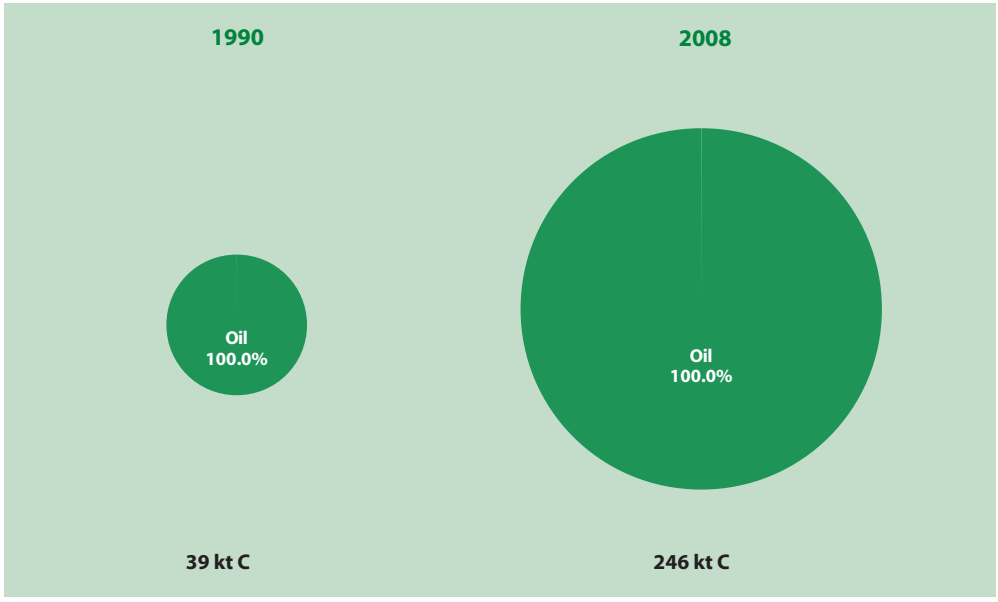
GWh = gigawatt-hour.
Source: UNSD (2011a).

Figure 6.4.5 Electricity Consumption by Sector, 1990 and 2008



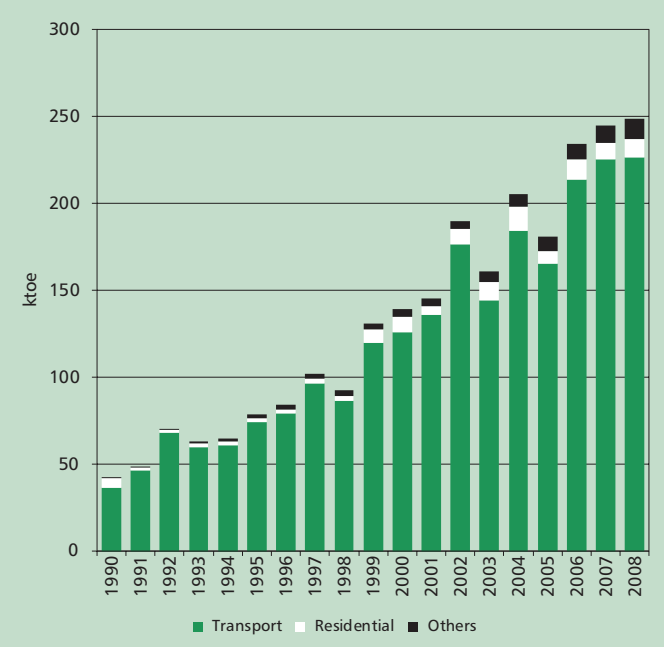
GWh = gigawatt-hour.
Source: UNSD (2011a).

Figure 6.4.6 Carbon Dioxide Emissions from Fuel Combustion, 1990 and 2008



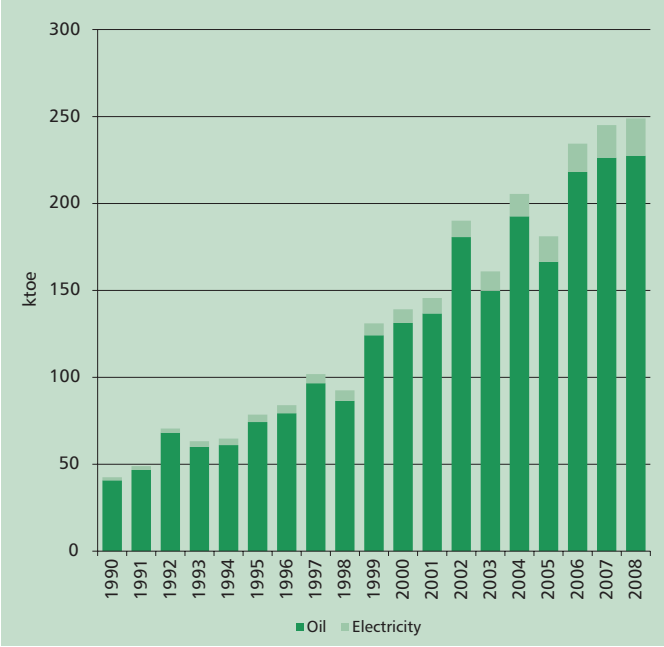
kt C = thousand tons of carbon equivalent.
Source: APERC estimates.

Figure 6.4.7 Final Energy Consumption by Sector, 1990–2008



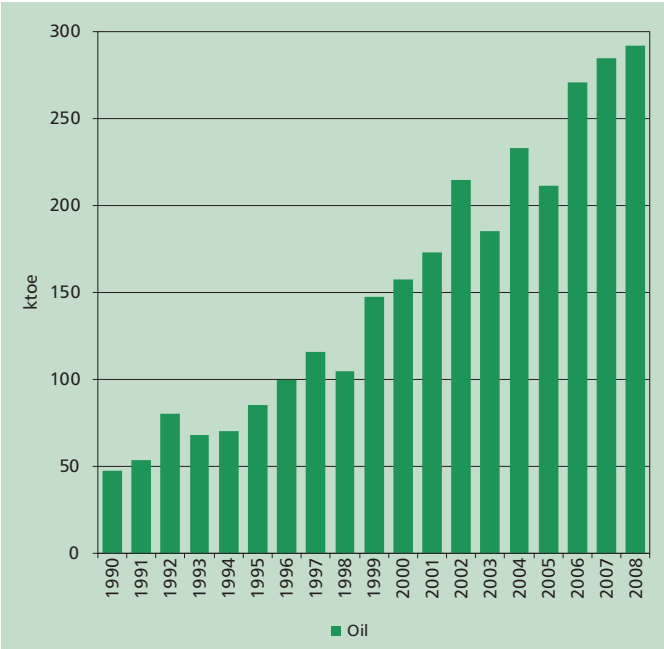
ktoe = thousand tons of oil equivalent.
Source: UNSD (2011a).

Figure 6.4.8 Final Energy Consumption by Type, 1990–2008



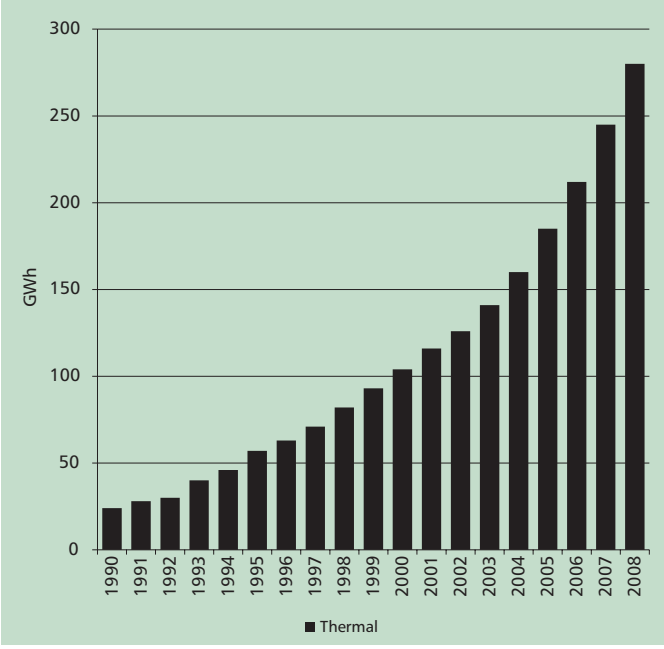
ktoe = thousand tons of oil equivalent.
Source: UNSD (2011a).

Figure 6.4.9 Total Primary Energy Supply, 1990–2008



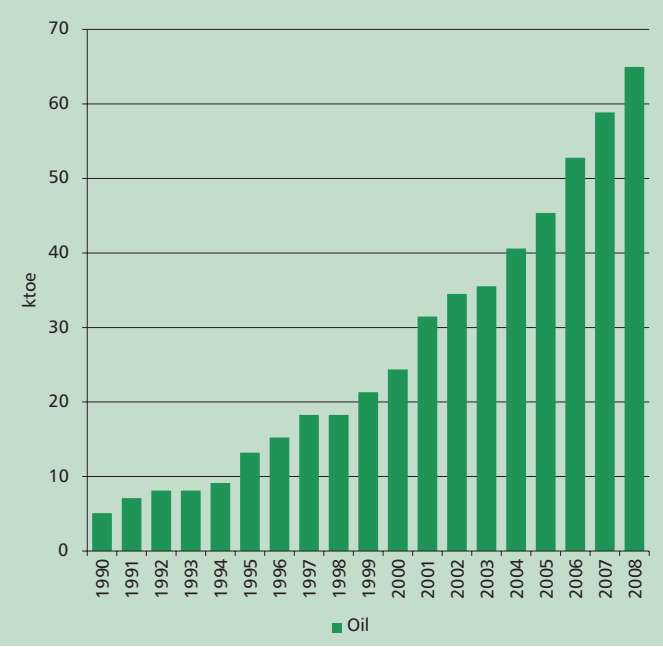
ktoe = thousand tons of oil equivalent.
Source: UNSD (2011a).

Figure 6.4.10 Electricity Generation by Source, 1990–2008



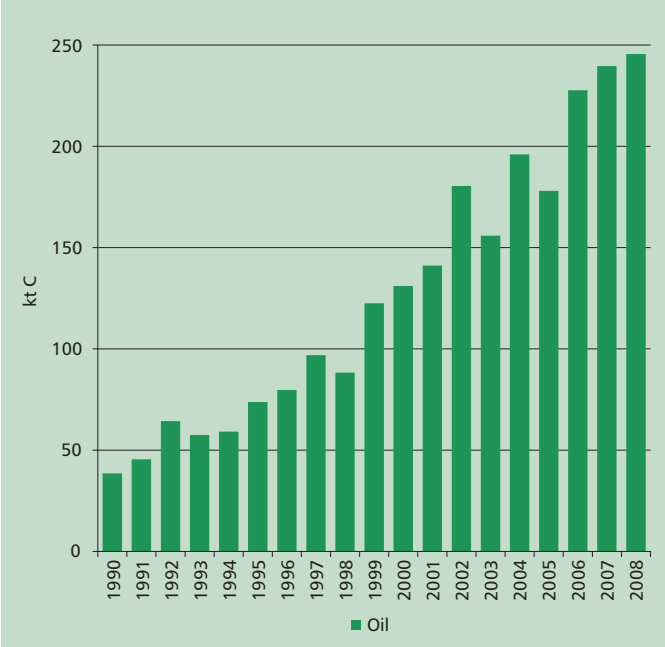
GWh = gigawatt-hour.
Source: UNSD (2011a).

Figure 6.4.11 Fuel Input for Electricity Generation, 1990–2008



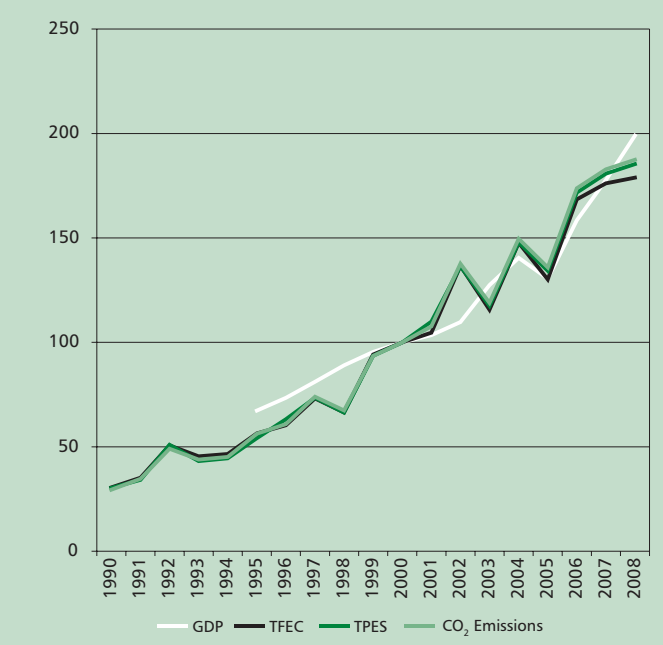
ktoe = thousand tons of oil equivalent.
Source: UNSD (2011a).

Figure 6.4.12 Carbon Dioxide Emissions from Fuel Combustion, 1990–2008



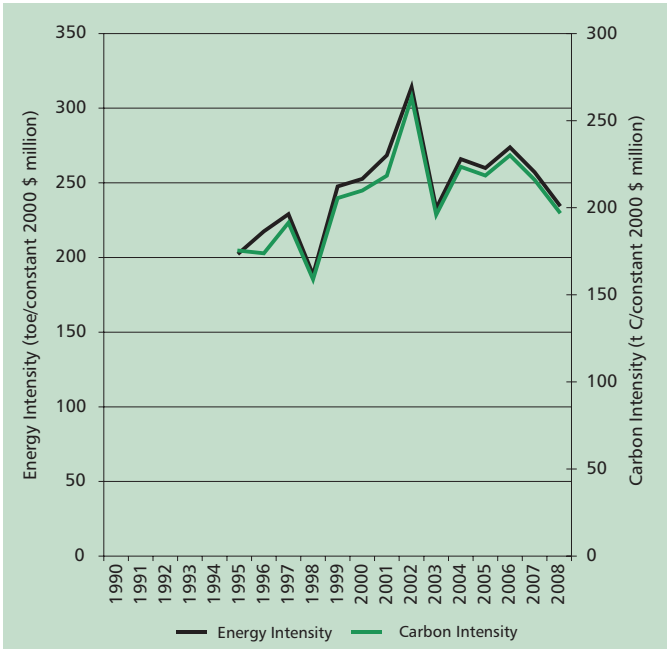
kt C = thousand tons of carbon equivalent.
Source: APERC estimates.

Figure 6.4.13 Growth of GDP, TFEC, TPES, and CO_2 (indexed to year 2000), 1990–2008



CO_2 = carbon dioxide, GDP = gross domestic product, TFEC = total final energy consumption, TPES = total primary energy supply.
Note: Indices are measured relative to the base year 2000 (2000 = 100).
Source: APERC estimates.

Figure 6.4.14 Energy and Carbon Intensities, 1990–2008



t C = ton of carbon equivalent, toe = ton of oil equivalent.
Source: APERC estimates.

Table 6.4.3 Maldives Energy Balance Table, 2005

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.	Imports	0	0	0	225	20	1	191	0	0	13	0	0	0	0	0	0	0	0	0	0	225
3.	Exports	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.	International Bunkers	0	0	0	–13	0	0	0	0	0	–13	0	0	0	0	0	0	0	0	0	0	–13
5.	Stock Changes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6.	Total Primary Energy Supply	0	0	0	212	20	1	191	0	0	0	0	0	0	0	0	0	0	0	0	0	212
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	0	0	0	–45	0	0	–45	0	0	0	0	0	0	0	0	0	0	0	16	0	–29
8.1	Power Generation	0	0	0	–45	0	0	–45	0	0	0	0	0	0	0	0	0	0	0	16	0	–29
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–1	0	–1
10.	Discrepancy	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11.	Total Final Energy Consumption	0	0	0	166	20	1	145	0	0	0	0	0	0	0	0	0	0	0	15	0	181
12.	Industry Sector	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13.	Transport Sector	0	0	0	165	20	0	145	0	0	0	0	0	0	0	0	0	0	0	0	0	165
14.	Other Sectors	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	15	0	16
14.1	Residential and Commercial	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	7	0	8
14.1.1	Commerce and Public Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14.1.2	Residential	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	6	0	7
14.2	Non–Specified Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	0	8
15.	Non–Energy Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16.	Electricity Output (GWh)	0	0	0	185	0	0	185	0	0	0	0	0	0	0	0	0	0	0	0	0	185
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.
Note: Figures may not add up to total because of rounding.
Source: UNSD (2011a).

Table 6.4.4 Maldives Energy Balance Table, 2006

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.	Imports	0	0	0	288	24	4	243	0	0	18	0	0	0	0	0	0	0	0	0	0	288
3.	Exports	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.	International Bunkers	0	0	0	–18	0	0	0	0	0	–18	0	0	0	0	0	0	0	0	0	0	–18
5.	Stock Changes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6.	Total Primary Energy Supply	0	0	0	271	24	4	243	0	0	0	0	0	0	0	0	0	0	0	0	0	271
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	0	0	0	–53	0	0	–53	0	0	0	0	0	0	0	0	0	0	0	18	0	–35
8.1	Power Generation	0	0	0	–53	0	0	–53	0	0	0	0	0	0	0	0	0	0	0	18	0	–35
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–2	0	–2
10.	Discrepancy	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11.	Total Final Energy Consumption	0	0	0	218	24	4	190	0	0	0	0	0	0	0	0	0	0	0	16	0	234
12.	Industry Sector	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13.	Transport Sector	0	0	0	214	24	0	190	0	0	0	0	0	0	0	0	0	0	0	0	0	214
14.	Other Sectors	0	0	0	4	0	4	0	0	0	0	0	0	0	0	0	0	0	0	16	0	20
14.1	Residential and Commercial	0	0	0	4	0	4	0	0	0	0	0	0	0	0	0	0	0	0	8	0	12
14.1.1	Commerce and Public Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14.1.2	Residential	0	0	0	4	0	4	0	0	0	0	0	0	0	0	0	0	0	0	8	0	12
14.2	Non–Specified Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9	0	9
15.	Non–Energy Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16.	Electricity Output (GWh)	0	0	0	212	0	0	212	0	0	0	0	0	0	0	0	0	0	0	0	0	212
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Source: UNSD (2011a).

Table 6.4.5 Maldives Energy Balance Table, 2007

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.	Imports	0	0	0	299	29	1	255	0	0	13	0	0	0	0	0	0	0	0	0	0	299
3.	Exports	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.	International Bunkers	0	0	0	–13	0	0	0	0	0	–13	0	0	0	0	0	0	0	0	0	0	–13
5.	Stock Changes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6.	Total Primary Energy Supply	0	0	0	285	29	1	255	0	0	0	0	0	0	0	0	0	0	0	0	0	285
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	0	0	0	–59	0	0	–59	0	0	0	0	0	0	0	0	0	0	0	21	0	–38
8.1	Power Generation	0	0	0	–59	0	0	–59	0	0	0	0	0	0	0	0	0	0	0	21	0	–38
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–2	0	–2
10.	Discrepancy	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11.	Total Final Energy Consumption	0	0	0	226	29	1	196	0	0	0	0	0	0	0	0	0	0	0	19	0	245
12.	Industry Sector	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13.	Transport Sector	0	0	0	225	29	0	196	0	0	0	0	0	0	0	0	0	0	0	0	0	225
14.	Other Sectors	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	19	0	20
14.1	Residential and Commercial	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	9	0	10
14.1.1	Commerce and Public Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14.1.2	Residential	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	9	0	10
14.2	Non–Specified Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0	10
15.	Non–Energy Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16.	Electricity Output (GWh)	0	0	0	245	0	0	245	0	0	0	0	0	0	0	0	0	0	0	0	0	245
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.
Note: Figures may not add up to total because of rounding.
Source: UNSD (2011a).

Table 6.4.6 Maldives Energy Balance Table, 2008

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.	Imports	0	0	0	306	32	1	260	0	0	13	0	0	0	0	0	0	0	0	0	0	306
3.	Exports	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.	International Bunkers	0	0	0	–13	0	0	0	0	0	–13	0	0	0	0	0	0	0	0	0	0	–13
5.	Stock Changes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6.	Total Primary Energy Supply	0	0	0	292	32	1	260	0	0	0	0	0	0	0	0	0	0	0	0	0	292
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	0	0	0	–65	0	0	–65	0	0	0	0	0	0	0	0	0	0	0	24	0	–41
8.1	Power Generation	0	0	0	–65	0	0	–65	0	0	0	0	0	0	0	0	0	0	0	24	0	–41
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–3	0	–3
10.	Discrepancy	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11.	Total Final Energy Consumption	0	0	0	227	32	1	195	0	0	0	0	0	0	0	0	0	0	0	21	0	249
12.	Industry Sector	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13.	Transport Sector	0	0	0	226	32	0	195	0	0	0	0	0	0	0	0	0	0	0	0	0	226
14.	Other Sectors	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	21	0	23
14.1	Residential and Commercial	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	10	0	11
14.1.1	Commerce and Public Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14.1.2	Residential	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	10	0	11
14.2	Non-Specified Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	0	11
15.	Non-Energy Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16.	Electricity Output (GWh)	0	0	0	280	0	0	280	0	0	0	0	0	0	0	0	0	0	0	0	0	280
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Source: UNSD (2011a).

Table 6.4.7 Maldives Summary Table, 1990–2009

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Indigenous Production (ktoe)																				
Coal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Oil	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Gas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Hydro	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Geothermal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Solar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Wind	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Biomass	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Primary Energy Supply (ktoe)																				
Coal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Oil	48	54	80	68	70	85	100	116	105	148	158	173	215	185	233	212	271	285	292	–
Gas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Hydro	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Geothermal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Solar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Wind	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Biomass	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Total	48	54	80	68	70	85	100	116	105	148	158	173	215	185	233	212	271	285	292	–
Final Energy Consumption by Sector (ktoe)																				
Industry	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Transport	37	47	68	60	61	74	79	97	86	120	126	136	177	145	184	165	214	225	226	–
Residential	5	2	2	2	2	2	2	3	3	7	9	5	9	10	14	7	12	10	11	–
Commercial	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Others	0	0	0	1	2	2	2	3	3	4	4	4	5	6	7	8	9	10	11	–
Total	43	49	71	63	65	79	84	102	92	131	139	146	190	161	205	181	234	245	249	–

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Table 6.4.7 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Final Energy Consumption by Type (ktoe)																				
Coal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Oil	41	47	68	60	61	74	79	97	86	124	131	137	181	150	193	166	218	226	227	–
Gas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Electricity	2	2	2	3	4	4	5	5	6	7	8	9	9	11	13	15	16	19	21	–
Heat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Biomass	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Total	43	49	71	63	65	79	84	102	92	131	139	146	190	161	205	181	234	245	249	–
Power Generation (GWh)																				
Thermal	24	28	30	40	46	57	63	71	82	93	104	116	126	141	160	185	212	245	280	–
Hydro	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Geothermal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Solar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Wind	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Total	24	28	30	40	46	57	63	71	82	93	104	116	126	141	160	185	212	245	280	–
Loss and Own Use of Electricity (GWh)																				
Transmission and Distribution Losses	3	2	2	2	2	7	9	10	12	13	13	18	14	10	16	16	21	26	30	–
Own Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Total	3	2	2	2	2	7	9	10	12	13	13	18	14	10	16	16	21	26	30	–
Fuel Input for Power Generation (ktoe)																				
Coal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Oil	5	7	8	8	9	13	15	18	18	21	24	31	35	36	41	45	53	59	65	–
Gas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Total	5	7	8	8	9	13	15	18	18	21	24	31	35	36	41	45	53	59	65	–
CO_2 Emissions (kt C)																				
Coal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Oil	39	45	64	57	59	74	80	97	88	122	131	141	180	156	196	178	228	240	246	–
Gas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–
Total	39	45	64	57	59	74	80	97	88	122	131	141	180	156	196	178	228	240	246	–

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Table 6.4.7 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Macroeconomic Indicators																				
Population (thousand)	219	226	232	238	243	249	254	259	264	269	273	278	282	287	291	295	299	304	308	312
Urban Population, %	25.8	25.8	25.7	25.7	25.6	25.6	26.0	26.4	26.9	27.3	27.7	28.9	30.2	31.4	32.7	33.9	35.2	36.5	37.9	39.2
GDP (constant 2000 $ million)	–	–	–	–	–	420	458	506	556	596	624	646	685	795	877	815	989	1,109	1,242	1,162
GDP (current $ million)	215	244	285	322	356	399	450	508	540	589	624	788	814	932	1,059	980	1,282	1,511	1,790	1,742
GDP (constant 2005 PPP $ million)	–	–	–	–	–	795	868	958	1,052	1,128	1,181	1,222	1,296	1,505	1,660	1,542	1,872	2,099	2,350	2,198
GDP/capita (constant 2000 $)	–	–	–	–	–	1,690	1,805	1,954	2,106	2,219	2,285	2,325	2,427	2,775	3,014	2,759	3,304	3,654	4,038	3,727
GDP/capita (current $)	980	1,083	1,229	1,357	1,463	1,604	1,773	1,962	2,047	2,194	2,285	2,838	2,885	3,252	3,639	3,318	4,283	4,977	5,818	5,587
GDP - Manufacturing (% of GDP)	–	–	–	–	–	7.9	7.2	7.6	7.7	8.0	8.0	8.1	7.9	8.0	8.3	8.7	7.7	7.2	6.5	5.9
Car Ownership (car/1,000 persons)	–	–	–	–	–	–	–	–	–	–	9	9	15	15	15	14	14	14	15	15
Basic Energy Indicators																				
TPES/capita (toe/person)	0.22	0.24	0.35	0.29	0.29	0.34	0.39	0.45	0.40	0.55	0.58	0.62	0.76	0.65	0.80	0.72	0.90	0.94	0.95	–
TFEC/capita (toe/person)	0.19	0.22	0.30	0.27	0.27	0.32	0.33	0.39	0.35	0.49	0.51	0.52	0.67	0.56	0.71	0.61	0.78	0.81	0.81	–
TPES/GDP (toe/constant 2000 $ million)	–	–	–	–	–	203	218	229	188	248	253	268	314	233	266	260	274	257	235	–
TFEC/GDP (toe/constant 2000 $ million)	–	–	–	–	–	187	183	201	166	220	223	225	278	202	234	222	237	221	200	–
Import Dependency (%)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	–
Oil Import Dependency (%)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	–
Electricity/capita (kWh/person)	96	115	121	160	181	201	213	236	265	298	333	371	390	453	515	579	635	718	813	–
CO_2 Intensity (t C/constant 2000 $ million)	–	–	–	–	–	175	174	191	159	206	210	218	263	196	223	219	230	216	198	–
CO_2/capita (t C)	0.18	0.20	0.28	0.24	0.24	0.30	0.31	0.37	0.33	0.46	0.48	0.51	0.64	0.54	0.67	0.60	0.76	0.79	0.80	–
CO_2/TPES (t C/toe)	0.81	0.84	0.80	0.84	0.84	0.86	0.80	0.84	0.84	0.83	0.83	0.81	0.84	0.84	0.84	0.84	0.84	0.84	0.84	–

– = no data or not applicable, CO_2 = carbon dioxide, GDP = gross domestic product, GWh = gigawatt–hour, kt C = thousand tons of carbon equivalent, ktoe = thousand tons of oil equivalent, kWh = kilowatt–hour, PPP = purchasing power parity, t C = ton of carbon equivalent, TFEC = total final energy consumption, toe = ton of oil equivalent, TPES = total primary energy supply.

Note: Figures may not add up to total because of rounding.

Sources: APERC estimates, JAMA (2012), UNSD (2011a), and World Bank.

6.5 Nepal

Country Profile (2009)		Energy Reserves (year-end 2008)	
Total Surface Area (square kilometer)	147,180	Coal (million ton) - Recoverable	1.0
Population (thousand)	29,433	Gas (trillion cubic feet) - Proven	–
GDP (constant 2000 $ billion)	7.7	Oil (billion barrel) - Proven	–
Electrification Rate (%)	43.6		

– = no data or not applicable, GDP = gross domestic product.

Sources: ADB (2012), IEA (2011c), Word Bank, and WEC (2010).

2009 Energy Supply and Demand Flow (ktoe)

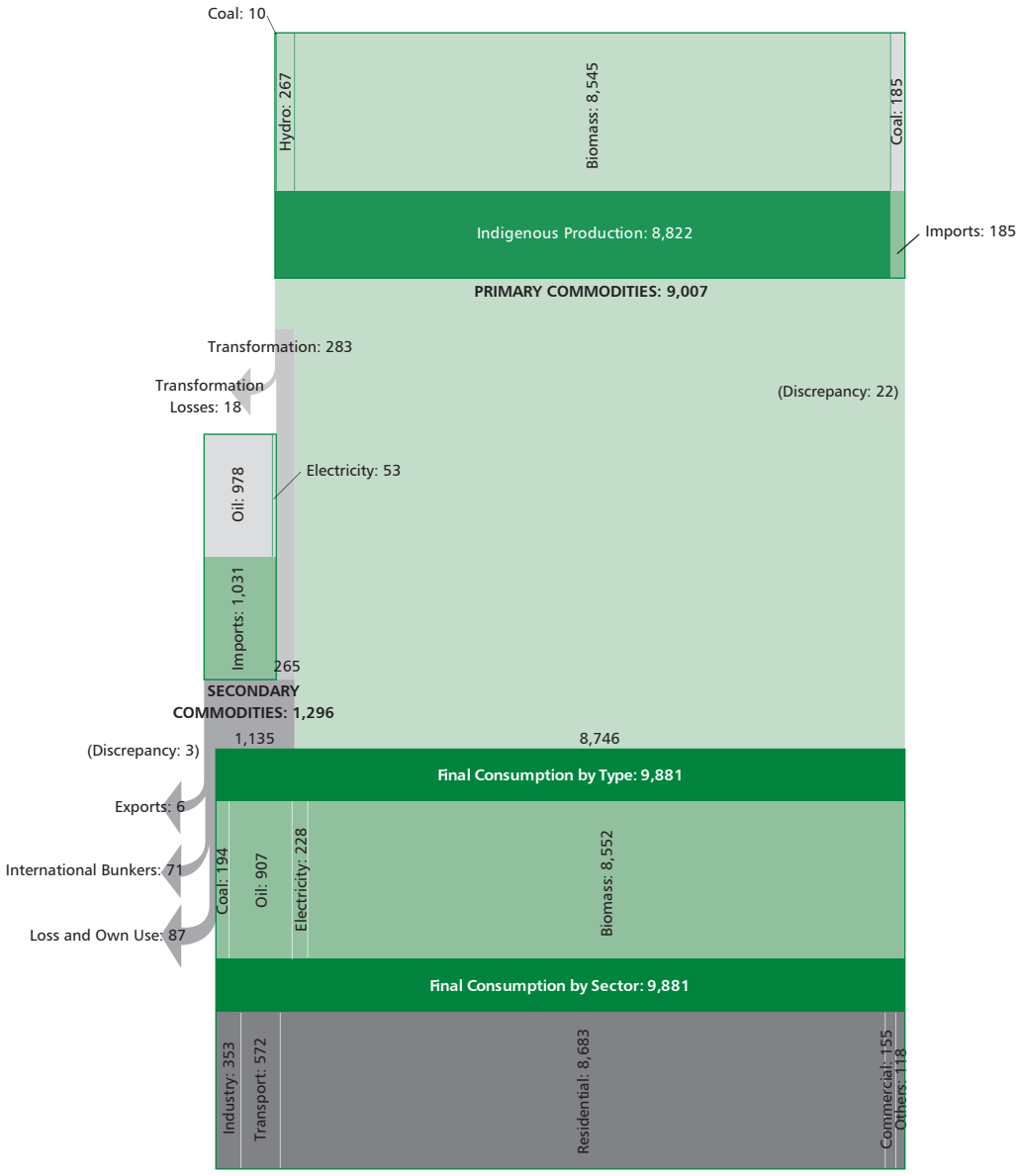


Table 6.5.1 Key Data and Economic Profile

	1990	1995	2000	2005	2009
Socioeconomic Data					
Population (thousand)	19,081	21,595	24,401	27,282	29,433
GDP (constant 2000 $ billion)	3.4	4.3	5.5	6.5	7.7
GDP (constant 2005 PPP $ billion)	13.5	17.4	22.0	26.0	30.8
GDP/capita (constant 2000 $)	177	201	225	238	261
GDP/capita (constant 2005 PPP $)	709	807	903	954	1,047

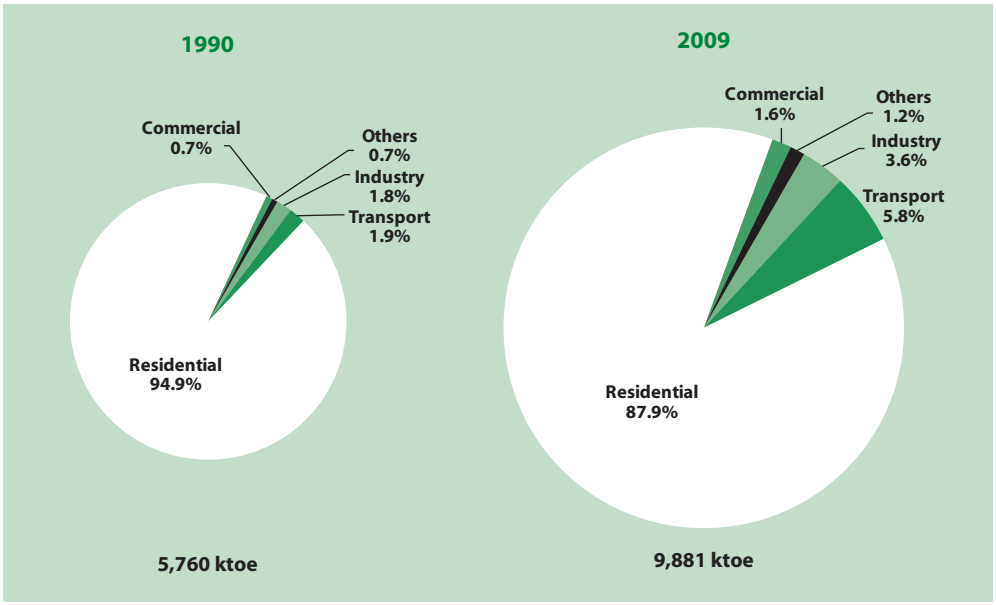
GDP = gross domestic product, PPP = purchasing power parity.
Source: World Bank.

Table 6.5.2 Energy Supply and Demand

	1990	1995	2000	2005	2009
Primary Energy Supply (ktoe)					
Indigenous Production	5,500	6,139	7,138	8,152	8,822
Net Imports	289	574	969	980	1,139
Total PES	5,789	6,713	8,107	9,132	9,961
Coal	49	74	258	248	195
Oil	244	501	712	724	907
Gas	0	0	0	0	0
Biomass	5,425	6,039	6,988	7,929	8,545
Others	71	99	149	231	314
TPES/capita (toe)	0.30	0.31	0.33	0.33	0.34
TPES/GDP (toe/constant 2005 PPP $ million)	428	385	368	351	323
Final Energy Consumption (ktoe)					
Industry	105	161	378	408	353
Transportation	110	203	270	276	572
Other Sectors	5,545	6,303	7,391	8,367	8,956
Total FEC	5,760	6,667	8,039	9,051	9,881
Coal	42	74	258	246	194
Oil	241	481	691	720	907
Gas	0	0	0	0	0
Electricity	52	73	112	169	228
Biomass	5,425	6,039	6,978	7,916	8,552
Others	0	0	0	0	0

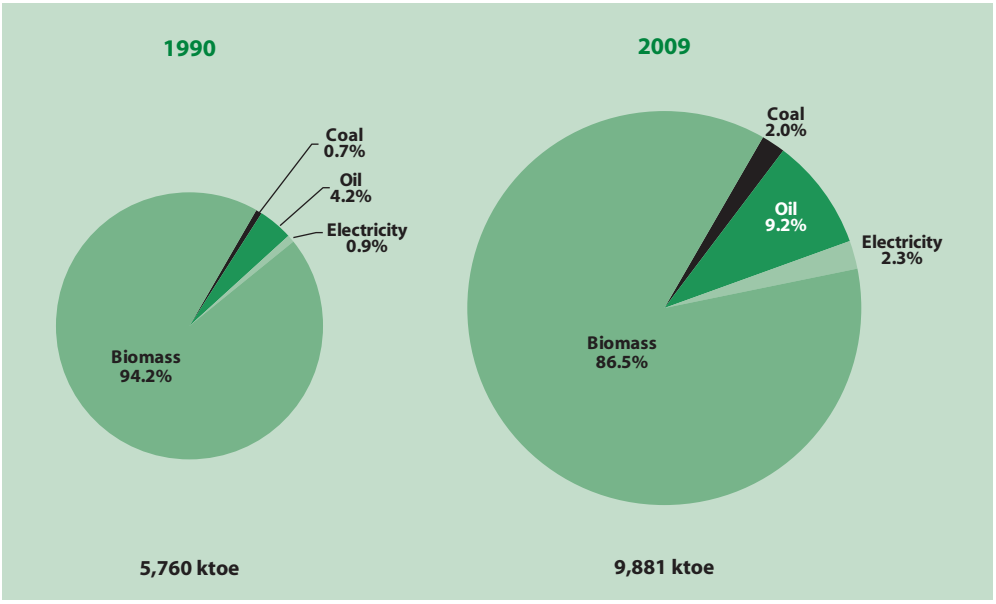
FEC = final energy consumption, GDP = gross domestic product, ktoe = thousand tons of oil equivalent, PES = primary energy supply, PPP = purchasing power parity, toe = ton of oil equivalent, TPES = total primary energy supply.
Source: IEA (2011b).

Figure 6.5.1 Final Energy Consumption by Sector, 1990 and 2009



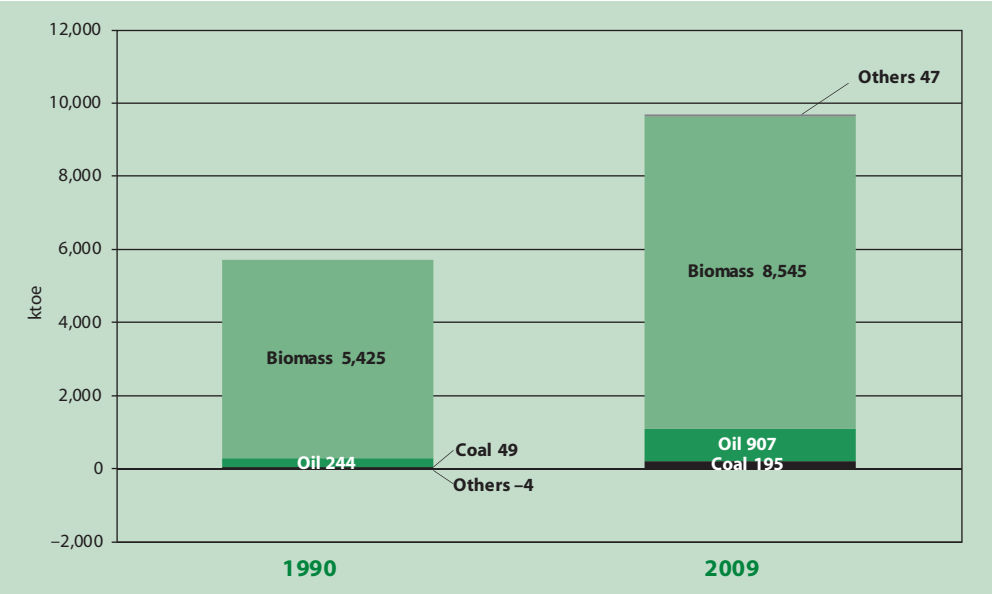
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 6.5.2 Final Energy Consumption by Type of Energy, 1990 and 2009



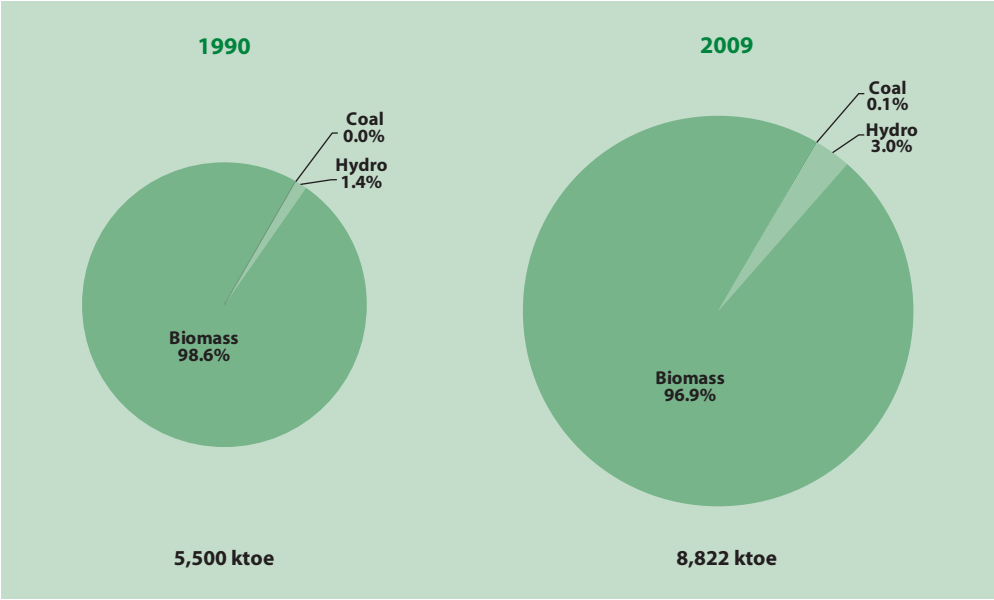
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 6.5.3 Total Primary Energy Supply, 1990 and 2009



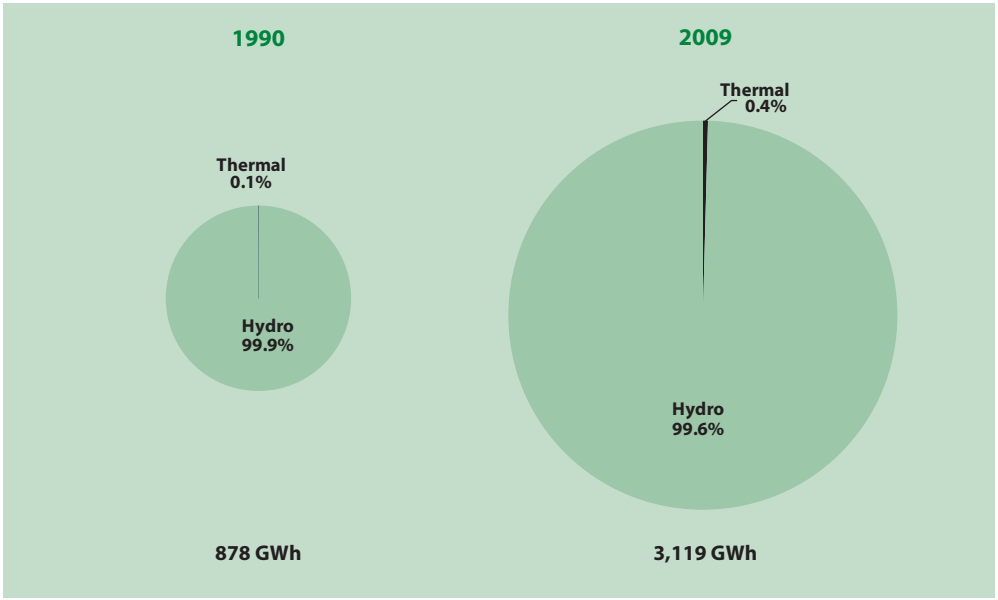
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 6.5.4 Indigenous Energy Production, 1990 and 2009



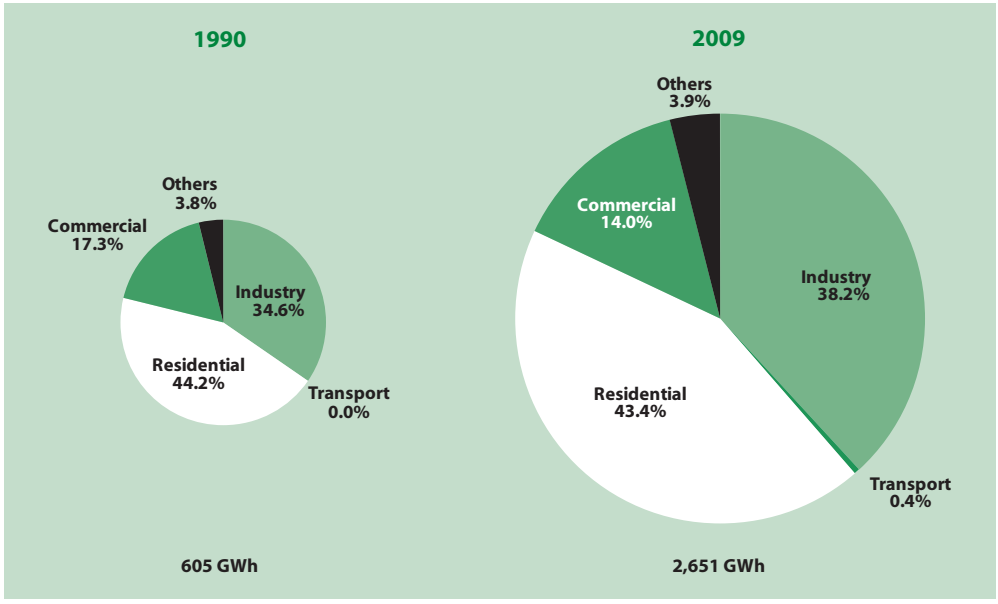
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 6.5.5 Electricity Generation by Plant Type, 1990 and 2009



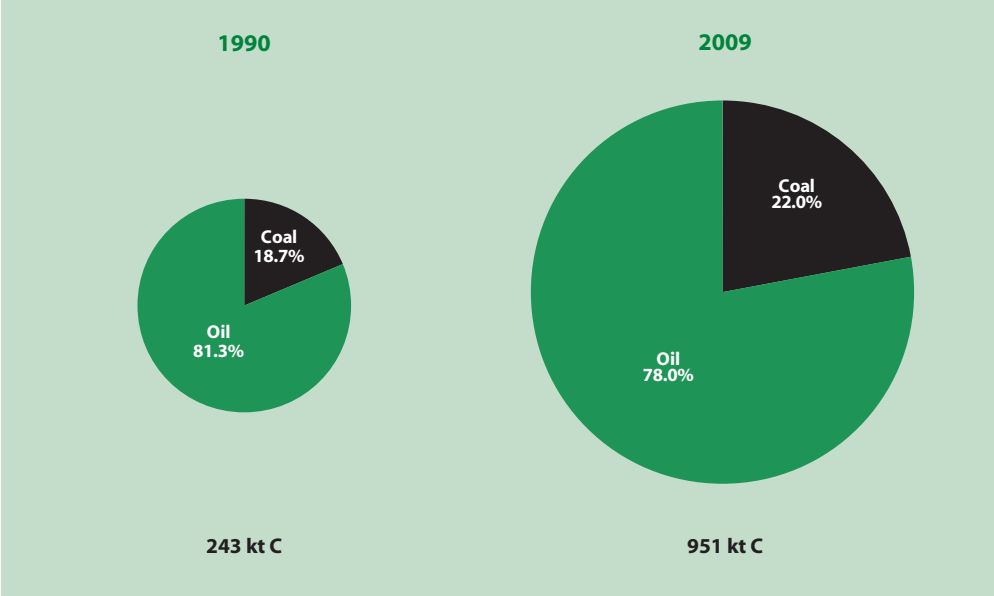
GWh = gigawatt-hour.
Source: IEA (2011b).

Figure 6.5.6 Electricity Consumption by Sector, 1990 and 2009



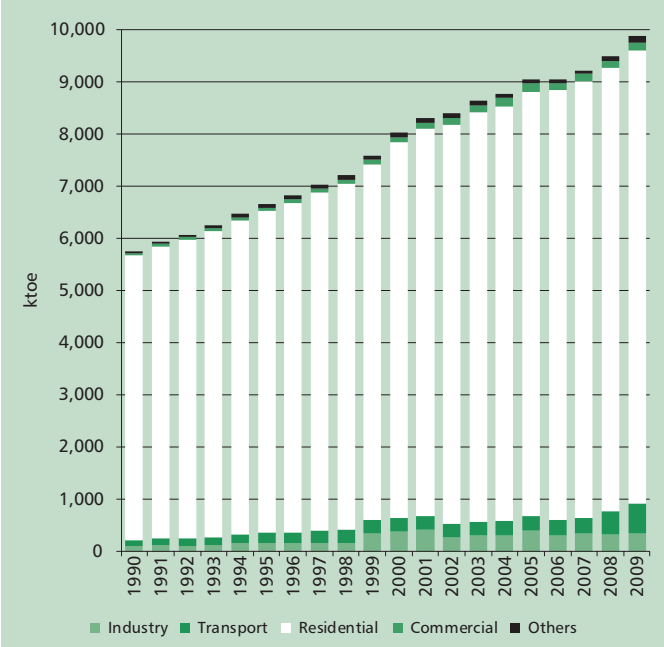
GWh = gigawatt-hour.
Source: IEA (2011b).

Figure 6.5.7 Carbon Dioxide Emissions from Fuel Combustion, 1990 and 2009



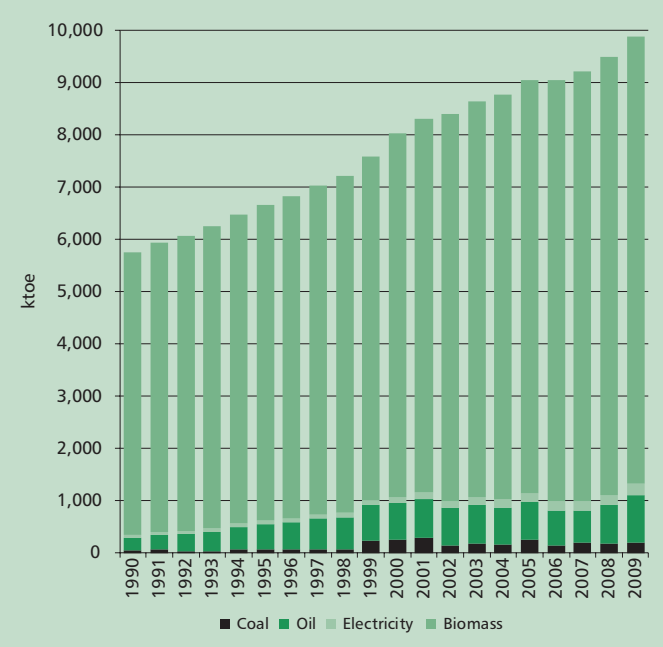
kt C = thousand tons of carbon equivalent.
Source: APERC estimates.

Figure 6.5.8 Final Energy Consumption by Sector, 1990–2009



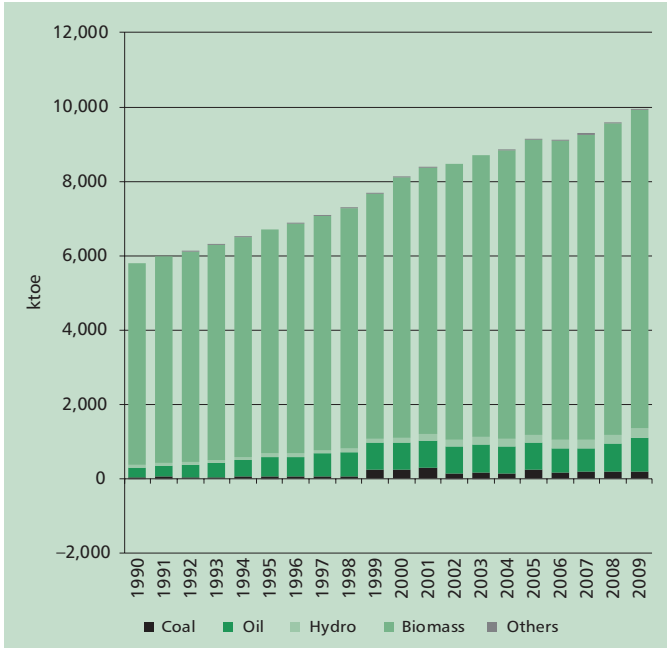
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 6.5.9 Final Energy Consumption by Type, 1990–2009



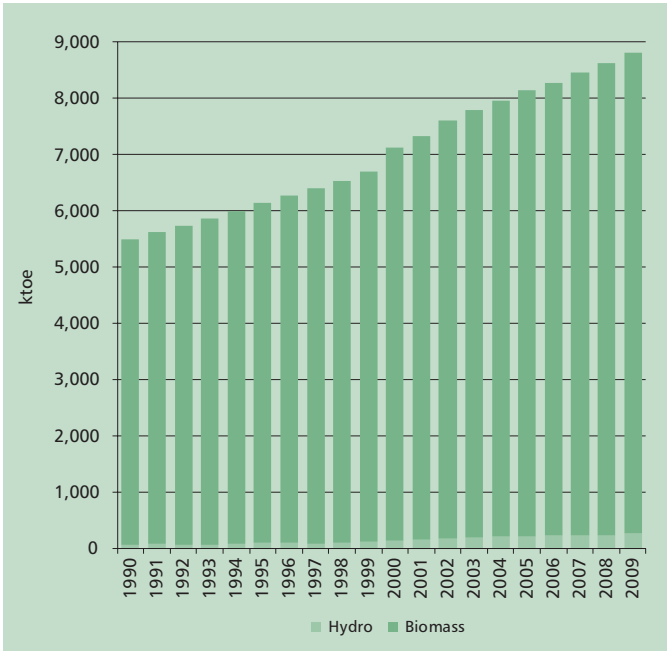
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 6.5.10 Total Primary Energy Supply, 1990–2009



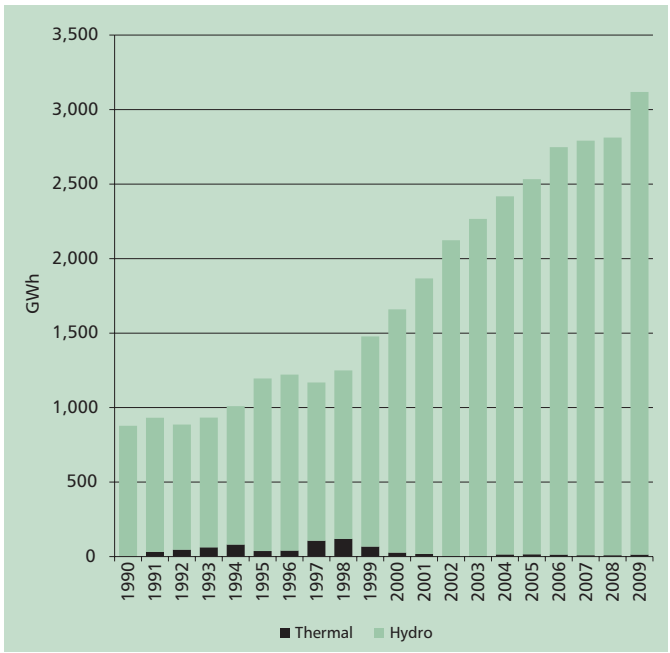
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 6.5.11 Indigenous Energy Production, 1990–2009



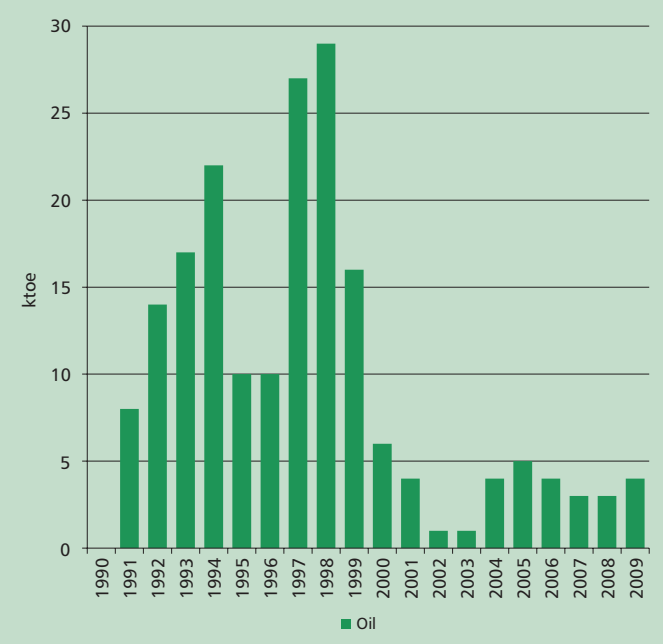
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 6.5.12 Electricity Generation by Source, 1990–2009



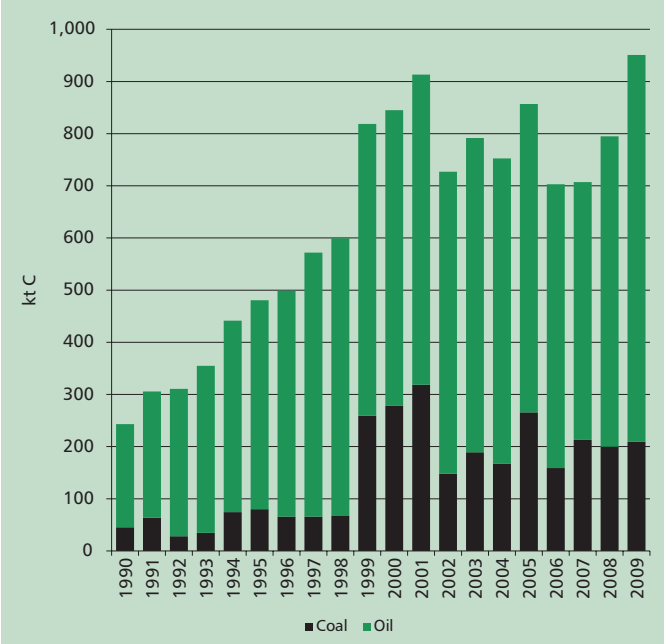
GWh = gigawatt-hour.
Source: IEA (2011b).

Figure 6.5.13 Fuel Input for Electricity Generation, 1990–2009



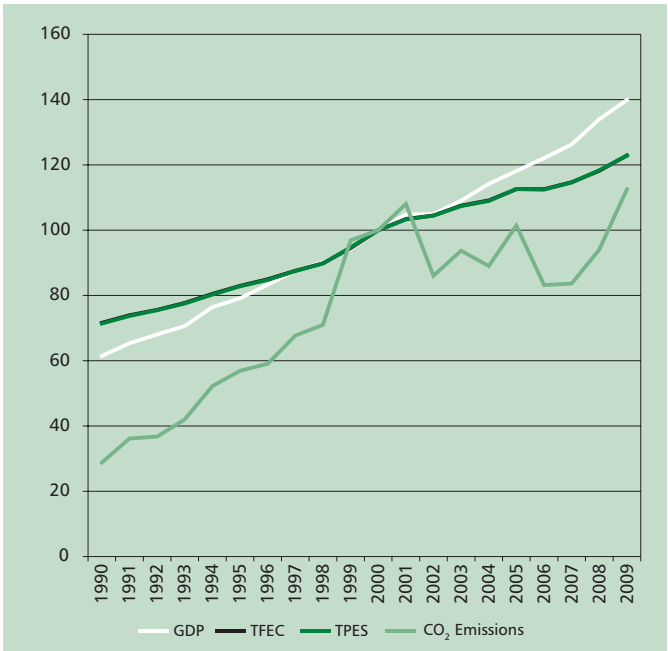
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 6.5.14 Carbon Dioxide Emissions from Fuel Combustion, 1990–2009



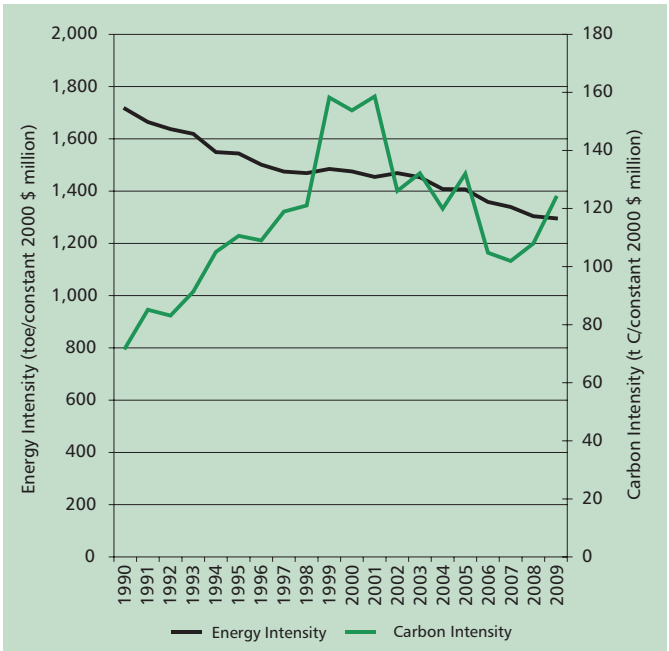
kt C = thousand tons of carbon equivalent.
Source: APERC estimates.

Figure 6.5.15 Growth of GDP, TFEC, TPES, and CO_2 (indexed to year 2000), 1990–2009



CO_2 = carbon dioxide, GDP = gross domestic product, TFEC = total final energy consumption, TPES = total primary energy supply.
Note: Indices are measured relative to the base year 2000 (2000 = 100).
Source: APERC estimates.

Figure 6.5.16 Energy and Carbon Intensities, 1990–2009



t C = ton of carbon equivalent, toe = ton of oil equivalent.
Source: APERC estimates.

Table 6.5.3 Nepal Energy Balance Table, 2006

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	12	0	0	0	0	0	0	0	0	0	0	235	0	0	0	0	8,047	0	0	0	8,294
2.	Imports	143	0	0	714	81	169	272	4	111	77	0	0	0	0	0	0	0	0	28	0	885
3.	Exports	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–7	0	–7
4.	International Bunkers	0	0	0	–56	0	0	0	0	0	–56	0	0	0	0	0	0	0	0	0	0	–56
5.	Stock Changes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6.	Total Primary Energy Supply	155	0	0	658	81	169	272	4	111	21	0	235	0	0	0	0	8,047	0	21	0	9,116
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	0	0	0	–4	0	0	0	–4	0	0	0	–235	0	0	0	0	–13	0	236	0	–16
8.1	Power Generation	0	0	0	–4	0	0	0	–4	0	0	0	–235	0	0	0	0	0	0	236	0	–3
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–13	0	0	0	–13
9.	Loss and Own Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–73	0	–73
10.	Discrepancy	–8	0	0	10	0	2	6	1	0	1	0	0	0	0	0	0	21	0	1	0	24
11.	Total Final Energy Consumption	147	0	0	664	81	171	278	1	111	22	0	0	0	0	0	0	8,055	0	185	0	9,051
12.	Industry Sector	146	0	0	35	0	8	4	1	0	22	0	0	0	0	0	0	52	0	73	0	306
13.	Transport Sector	0	0	0	291	81	0	206	0	4	0	0	0	0	0	0	0	0	0	1	0	292
14.	Other Sectors	1	0	0	338	0	163	68	0	107	0	0	0	0	0	0	0	8,003	0	111	0	8,453
14.1	Residential and Commercial	1	0	0	270	0	163	0	0	107	0	0	0	0	0	0	0	8,003	0	106	0	8,380
14.1.1	Commerce and Public Services	0	0	0	61	0	19	0	0	42	0	0	0	0	0	0	0	44	0	27	0	132
14.1.2	Residential	1	0	0	209	0	144	0	0	65	0	0	0	0	0	0	0	7,959	0	79	0	8,248
14.2	Non–Specified Others	0	0	0	68	0	0	68	0	0	0	0	0	0	0	0	0	0	0	5	0	73
15.	Non–Energy Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16.	Electricity Output (GWh)	0	0	0	13	0	0	0	0	0	0	0	2,735	0	0	0	0	0	0	0	0	2,748
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.
Note: Figures may not add up to total because of rounding.
Source: IEA (2011b).

Table 6.5.4 Nepal Energy Balance Table, 2007

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	8	0	0	0	0	0	0	0	0	0	0	239	0	0	0	0	8,215	0	0	0	8,462
2.	Imports	188	0	0	668	80	133	275	3	114	63	0	0	0	0	0	0	0	0	37	0	893
3.	Exports	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–5	0	–5
4.	International Bunkers	0	0	0	–60	0	0	0	0	0	–60	0	0	0	0	0	0	0	0	0	0	–60
5.	Stock Changes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6.	Total Primary Energy Supply	196	0	0	608	80	133	275	3	114	3	0	239	0	0	0	0	8,215	0	32	0	9,290
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	0	0	0	–3	0	0	0	–3	0	0	0	–240	0	0	0	0	–14	0	240	0	–17
8.1	Power Generation	0	0	0	–3	0	0	0	–3	0	0	0	–240	0	0	0	0	0	0	240	0	–3
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–14	0	0	0	–14
9.	Loss and Own Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–76	0	–76
10.	Discrepancy	1	0	0	2	0	1	0	1	0	0	0	1	0	0	0	0	21	0	0	0	25
11.	Total Final Energy Consumption	197	0	0	607	80	134	275	1	114	3	0	0	0	0	0	0	8,222	0	196	0	9,222
12.	Industry Sector	196	0	0	14	0	6	4	1	0	3	0	0	0	0	0	0	51	0	77	0	338
13.	Transport Sector	0	0	0	299	80	0	215	0	4	0	0	0	0	0	0	0	0	0	1	0	300
14.	Other Sectors	1	0	0	294	0	128	56	0	110	0	0	0	0	0	0	0	8,171	0	118	0	8,584
14.1	Residential and Commercial	1	0	0	238	0	128	0	0	110	0	0	0	0	0	0	0	8,171	0	112	0	8,522
14.1.1	Commerce and Public Services	0	0	0	60	0	15	0	0	45	0	0	0	0	0	0	0	47	0	29	0	136
14.1.2	Residential	1	0	0	178	0	113	0	0	65	0	0	0	0	0	0	0	8,124	0	83	0	8,386
14.2	Non-Specified Others	0	0	0	56	0	0	56	0	0	0	0	0	0	0	0	0	0	0	6	0	62
15.	Non-Energy Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16.	Electricity Output (GWh)	0	0	0	9	0	0	0	0	0	0	0	2,783	0	0	0	0	0	0	0	0	2,792
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Source: IEA (2011b).

Table 6.5.5 Nepal Energy Balance Table, 2008

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	9	0	0	0	0	0	0	0	0	0	0	241	0	0	0	0	8,393	0	0	0	8,643
2.	Imports	176	0	0	812	99	61	444	2	136	70	0	0	0	0	0	0	0	0	31	0	1,019
3.	Exports	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–4	0	–4
4.	International Bunkers	0	0	0	–60	0	0	0	0	0	–60	0	0	0	0	0	0	0	0	0	0	–60
5.	Stock Changes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6.	Total Primary Energy Supply	185	0	0	752	99	61	444	2	136	10	0	241	0	0	0	0	8,393	0	27	0	9,598
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	0	0	0	–3	0	0	0	–3	0	0	0	–241	0	0	0	0	–14	0	242	0	–16
8.1	Power Generation	0	0	0	–3	0	0	0	–3	0	0	0	–241	0	0	0	0	0	0	242	0	–2
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–14	0	0	0	–14
9.	Loss and Own Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–80	0	–80
10.	Discrepancy	0	0	0	–21	0	0	–22	1	0	0	0	0	0	0	0	0	21	0	–1	0	–1
11.	Total Final Energy Consumption	185	0	0	728	99	61	422	0	136	10	0	0	0	0	0	0	8,400	0	188	0	9,501
12.	Industry Sector	184	0	0	17	0	2	5	0	0	10	0	0	0	0	0	0	51	0	73	0	325
13.	Transport Sector	0	0	0	438	99	0	334	0	5	0	0	0	0	0	0	0	0	0	0	0	438
14.	Other Sectors	1	0	0	273	0	59	83	0	131	0	0	0	0	0	0	0	8,349	0	115	0	8,738
14.1	Residential and Commercial	1	0	0	190	0	59	0	0	131	0	0	0	0	0	0	0	8,349	0	108	0	8,648
14.1.1	Commerce and Public Services	0	0	0	63	0	8	0	0	55	0	0	0	0	0	0	0	49	0	27	0	139
14.1.2	Residential	1	0	0	127	0	51	0	0	76	0	0	0	0	0	0	0	8,300	0	81	0	8,509
14.2	Non–Specified Others	0	0	0	83	0	0	83	0	0	0	0	0	0	0	0	0	0	0	7	0	90
15.	Non–Energy Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16.	Electricity Output (GWh)	0	0	0	9	0	0	0	0	0	0	0	2,803	0	0	0	0	0	0	0	0	2,812
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.
Note: Figures may not add up to total because of rounding.
Source: IEA (2011b).

Table 6.5.6 Nepal Energy Balance Table, 2009

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	10	0	0	0	0	0	0	0	0	0	0	267	0	0	0	0	8,545	0	0	0	8,822
2.	Imports	185	0	0	978	130	47	551	2	166	82	0	0	0	0	0	0	0	0	53	0	1,216
3.	Exports	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–6	0	–6
4.	International Bunkers	0	0	0	–71	0	0	0	0	0	–71	0	0	0	0	0	0	0	0	0	0	–71
5.	Stock Changes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6.	Total Primary Energy Supply	195	0	0	907	130	47	551	2	166	11	0	267	0	0	0	0	8,545	0	47	0	9,961
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	0	0	0	–4	0	0	0	–4	0	0	0	–268	0	0	0	0	–15	0	269	0	–18
8.1	Power Generation	0	0	0	–4	0	0	0	–4	0	0	0	–268	0	0	0	0	0	0	269	0	–3
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–15	0	0	0	–15
9.	Loss and Own Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–87	0	–87
10.	Discrepancy	–1	0	0	4	0	1	1	2	0	0	0	1	0	0	0	0	22	0	–1	0	25
11.	Total Final Energy Consumption	194	0	0	907	130	48	552	0	166	11	0	0	0	0	0	0	8,552	0	228	0	9,881
12.	Industry Sector	193	0	0	21	0	2	8	0	0	11	0	0	0	0	0	0	52	0	87	0	353
13.	Transport Sector	0	0	0	571	130	0	435	0	6	0	0	0	0	0	0	0	0	0	1	0	572
14.	Other Sectors	1	0	0	315	0	46	109	0	160	0	0	0	0	0	0	0	8,500	0	140	0	8,956
14.1	Residential and Commercial	1	0	0	206	0	46	0	0	160	0	0	0	0	0	0	0	8,500	0	131	0	8,838
14.1.1	Commerce and Public Services	0	0	0	73	0	6	0	0	67	0	0	0	0	0	0	0	50	0	32	0	155
14.1.2	Residential	1	0	0	133	0	40	0	0	93	0	0	0	0	0	0	0	8,450	0	99	0	8,683
14.2	Non–Specified Others	0	0	0	109	0	0	109	0	0	0	0	0	0	0	0	0	0	0	9	0	118
15.	Non–Energy Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16.	Electricity Output (GWh)	0	0	0	13	0	0	0	0	0	0	0	3,106	0	0	0	0	0	0	0	0	3,119
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Source: IEA (2011b).

Table 6.5.7 Nepal Summary Table, 1990–2009

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Indigenous Production (ktoe)																				
Coal	0	0	0	0	0	0	0	0	0	0	10	6	7	6	5	7	12	8	9	10
Oil	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hydro	75	77	72	75	80	100	102	91	97	121	140	159	182	195	207	216	235	239	241	267
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Geothermal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Solar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wind	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Biomass	5,425	5,542	5,662	5,783	5,909	6,039	6,171	6,306	6,445	6,586	6,988	7,173	7,429	7,594	7,757	7,929	8,047	8,215	8,393	8,545
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	5,500	5,619	5,734	5,858	5,989	6,139	6,273	6,397	6,542	6,707	7,138	7,338	7,618	7,795	7,969	8,152	8,294	8,462	8,643	8,822
Primary Energy Supply (ktoe)																				
Coal	49	61	34	33	68	74	61	62	62	241	258	295	137	174	154	248	155	196	185	195
Oil	244	298	351	389	444	501	534	623	660	720	712	740	724	749	703	724	658	608	752	907
Gas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hydro	75	77	72	75	80	100	102	91	97	121	140	159	182	195	207	216	235	239	241	267
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Geothermal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Solar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wind	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Biomass	5,425	5,542	5,662	5,783	5,909	6,039	6,171	6,306	6,445	6,586	6,988	7,173	7,429	7,594	7,757	7,929	8,047	8,215	8,393	8,545
Others	–4	–2	3	5	7	–1	4	12	14	12	9	8	–3	–5	11	15	21	32	27	47
Total	5,789	5,976	6,122	6,285	6,508	6,713	6,872	7,094	7,278	7,680	8,107	8,375	8,469	8,707	8,832	9,132	9,116	9,290	9,598	9,961
Final Energy Consumption by Sector (ktoe)																				
Industry	105	123	99	114	153	161	152	152	159	352	378	427	272	312	311	408	306	338	325	353
Transport	110	131	143	157	181	203	209	240	252	253	270	246	259	257	275	276	292	300	438	572
Residential	5,464	5,601	5,736	5,871	6,016	6,171	6,330	6,496	6,647	6,824	7,198	7,439	7,648	7,846	7,958	8,128	8,248	8,386	8,509	8,683
Commercial	43	42	46	49	54	59	65	69	74	79	97	112	130	140	154	165	132	136	139	155
Others	38	48	53	57	67	73	75	85	90	91	96	91	93	91	74	74	73	62	90	118
Total	5,760	5,945	6,077	6,248	6,471	6,667	6,831	7,042	7,222	7,599	8,039	8,315	8,402	8,646	8,772	9,051	9,051	9,222	9,501	9,881

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Table 6.5.7 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Final Energy Consumption by Type (ktoe)																				
Coal	42	59	26	32	69	74	61	61	62	240	258	295	137	175	155	246	147	197	185	194
Oil	241	287	332	372	426	481	520	590	624	671	691	734	717	749	711	720	664	607	728	907
Gas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Electricity	52	56	58	61	67	73	78	85	91	102	112	125	133	142	162	169	185	196	188	228
Heat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Biomass	5,425	5,543	5,661	5,783	5,909	6,039	6,172	6,306	6,445	6,586	6,978	7,161	7,415	7,580	7,744	7,916	8,055	8,222	8,400	8,552
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	5,760	5,945	6,077	6,248	6,471	6,667	6,831	7,042	7,222	7,599	8,039	8,315	8,402	8,646	8,772	9,051	9,051	9,222	9,501	9,881
Power Generation (GWh)																				
Thermal	1	32	47	62	81	37	40	107	119	67	27	18	4	4	14	16	13	9	9	13
Hydro	877	900	839	871	929	1,159	1,181	1,062	1,131	1,411	1,632	1,849	2,119	2,263	2,404	2,517	2,735	2,783	2,803	3,106
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Geothermal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Solar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wind	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	878	932	886	933	1,010	1,196	1,221	1,169	1,250	1,478	1,659	1,867	2,123	2,267	2,418	2,533	2,748	2,792	2,812	3,119
Loss and Own Use of Electricity (GWh)																				
Transmission and Distribution Losses	163	174	186	198	221	233	256	267	279	326	349	395	419	442	651	721	814	849	895	977
Own Use	70	70	70	81	81	93	105	58	81	105	105	116	140	116	23	35	35	35	35	35
Total	233	244	256	279	302	326	360	326	360	430	453	512	558	558	674	756	849	884	930	1,012
Fuel Input for Power Generation (ktoe)																				
Coal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Oil	0	8	14	17	22	10	10	27	29	16	6	4	1	1	4	5	4	3	3	4
Gas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	8	14	17	22	10	10	27	29	16	6	4	1	1	4	5	4	3	3	4
CO_2 Emissions (kt C)																				
Coal	45	64	28	35	75	80	66	66	67	259	279	319	148	189	167	266	159	213	200	210
Oil	198	242	283	320	367	401	433	506	533	559	566	595	579	603	585	591	544	494	595	741
Gas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	243	306	311	355	441	481	499	572	600	819	845	913	727	792	752	857	703	707	795	951

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Table 6.5.7 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Macroeconomic Indicators																				
Population (thousand)	19,081	19,554	20,043	20,546	21,064	21,595	22,138	22,692	23,255	23,825	24,401	24,980	25,563	26,144	26,718	27,282	27,834	28,374	28,905	29,433
Urban Population, %	8.9	9.3	9.7	10.1	10.5	10.9	11.4	11.9	12.4	12.9	13.4	13.9	14.4	14.8	15.3	15.8	16.3	16.8	17.2	17.7
GDP (constant 2000 $ million)	3,376	3,591	3,738	3,882	4,201	4,347	4,579	4,810	4,955	5,173	5,494	5,758	5,765	5,992	6,273	6,491	6,710	6,938	7,362	7,687
GDP (current $ million)	3,628	3,921	3,401	3,660	4,067	4,401	4,522	4,919	4,856	5,034	5,494	6,007	6,051	6,330	7,274	8,130	9,075	10,278	12,573	12,897
GDP (constant 2005 PPP $ million)	13,534	14,395	14,986	15,563	16,842	17,426	18,355	19,281	19,863	20,740	22,025	23,083	23,110	24,022	25,147	26,022	26,897	27,815	29,513	30,815
GDP/capita (constant 2000 $)	177	184	187	189	199	201	207	212	213	217	225	231	226	229	235	238	241	245	255	261
GDP/capita (current $)	190	201	170	178	193	204	204	217	209	211	225	240	237	242	272	298	326	362	435	438
GDP – Manufacturing (% of GDP)	5.6	6.2	7.8	8 .0	8.3	8.2	8.5	8.7	8.7	8.8	8.8	8.7	8.3	8.0	7.8	7.7	7.6	7.5	7.0	6.6
Car Ownership (car/1,000 persons)	–	–	–	–	–	–	–	–	–	–	–	–	9	9	9	9	7	7	6	6
Basic Energy Indicators																				
TPES/capita (toe/person)	0.30	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.32	0.33	0.34	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.34
TFEC/capita (toe/person)	0.30	0.30	0.30	0.30	0.31	0.31	0.31	0.31	0.31	0.32	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.34
TPES/GDP (toe/constant 2000 $ million)	1,715	1,664	1,638	1,619	1,549	1,544	1,501	1,475	1,469	1,484	1,476	1,455	1,469	1,453	1,408	1,407	1,359	1,339	1,304	1,296
TFEC/GDP (toe/constant 2000 $ million)	1,706	1,656	1,626	1,609	1,540	1,534	1,492	1,464	1,458	1,469	1,463	1,444	1,457	1,443	1,398	1,394	1,349	1,329	1,291	1,285
Import Dependency (%)	5.0	6.0	6.3	6.8	8.0	8.6	8.7	9.8	10.1	12.7	12.0	12.4	10.0	10.5	9.8	10.7	9.0	8.9	9.9	11.4
Oil Import Dependency (%)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Electricity/capita (kWh/person)	32	33	34	35	37	39	41	44	46	50	53	58	61	63	71	72	77	80	76	90
CO_2 Intensity (t C/constant 2000 $ million)	72	85	83	91	105	111	109	119	121	158	154	159	126	132	120	132	105	102	108	124
CO_2/capita (t C)	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.03	0.03	0.03	0.04	0.03	0.03	0.03	0.03	0.03	0.02	0.03	0.03
CO_2/TPES (t C/toe)	0.04	0.05	0.05	0.06	0.07	0.07	0.07	0.08	0.08	0.11	0.10	0.11	0.09	0.09	0.09	0.09	0.08	0.08	0.08	0.10

– = no data or not applicable, CO_2 = carbon dioxide, GDP = gross domestic product, GWh = gigawatt–hour, kt C = thousand tons of carbon equivalent, ktoe = thousand tons of oil equivalent, kWh = kilowatt–hour, PPP = purchasing power parity, t C = ton of carbon equivalent, TFEC = total final energy consumption, toe = ton of oil equivalent, TPES = total primary energy supply.

Note: Figures may not add up to total because of rounding.

Sources: APERC estimates, IEA (2011b), JAMA (2012), and World Bank.

6.6 Sri Lanka

Country Profile (2009)		Energy Reserves (year-end 2008)	
Total Surface Area (square kilometer)	65,610	Coal (million ton) - Recoverable	–
Population (thousand)	20,669	Gas (trillion cubic feet) - Proven	–
GDP (constant 2000 $ billion)	25.0	Oil (billion barrel) - Proven	–
Electrification Rate (%)	76.6		

– = no data or not applicable, GDP = gross domestic product.

Sources: ADB (2012), IEA (2011c), and World Bank.

2009 Energy Supply and Demand Flow (ktoe)

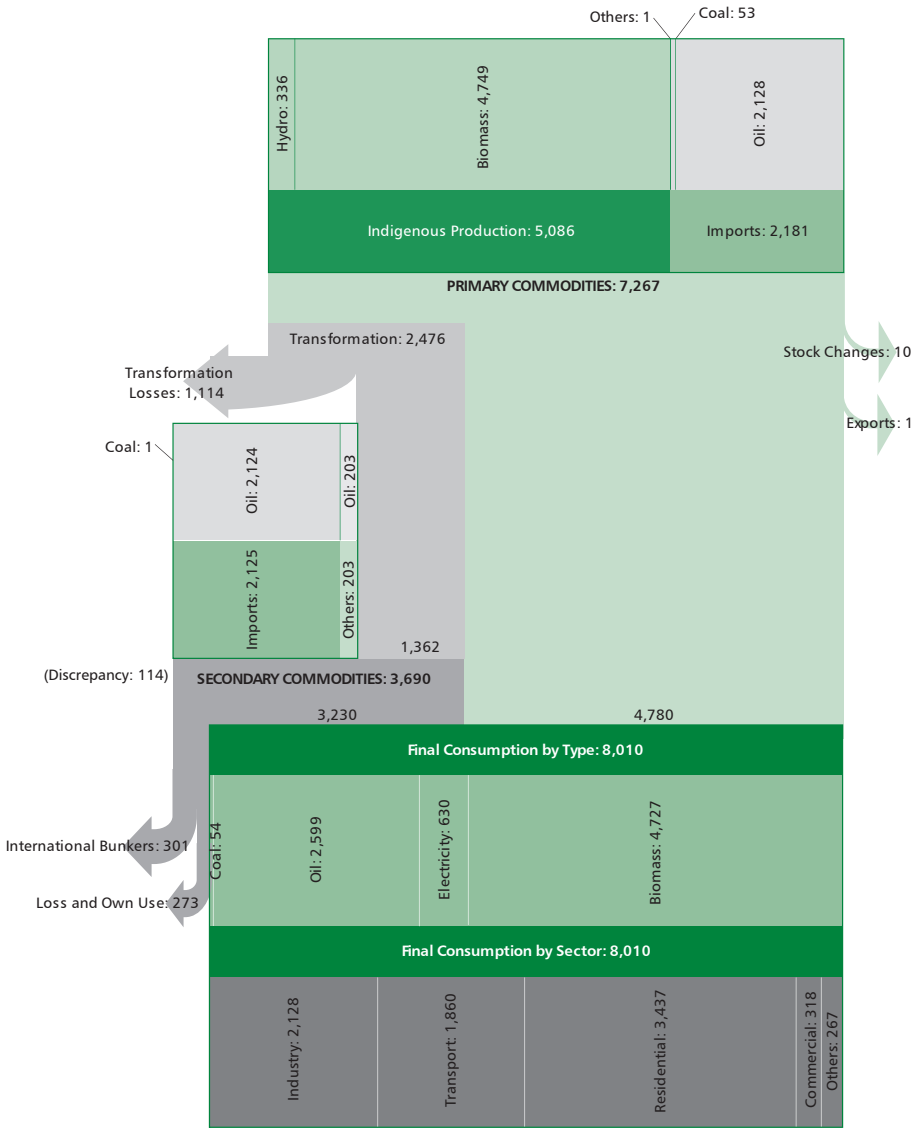


Table 6.6.1 Key Data and Economic Profile

	1990	1995	2000	2005	2009
Socioeconomic Data					
Population (thousand)	17,337	18,229	18,745	19,843	20,669
GDP (constant 2000 $ billion)	9.8	12.8	16.3	19.8	25.0
GDP (constant 2005 PPP $ billion)	34.5	44.9	57.4	69.7	88.0
GDP/capita (constant 2000 $)	567	701	871	1,000	1,211
GDP/capita (constant 2005 PPP $)	1,992	2,463	3,063	3,515	4,256

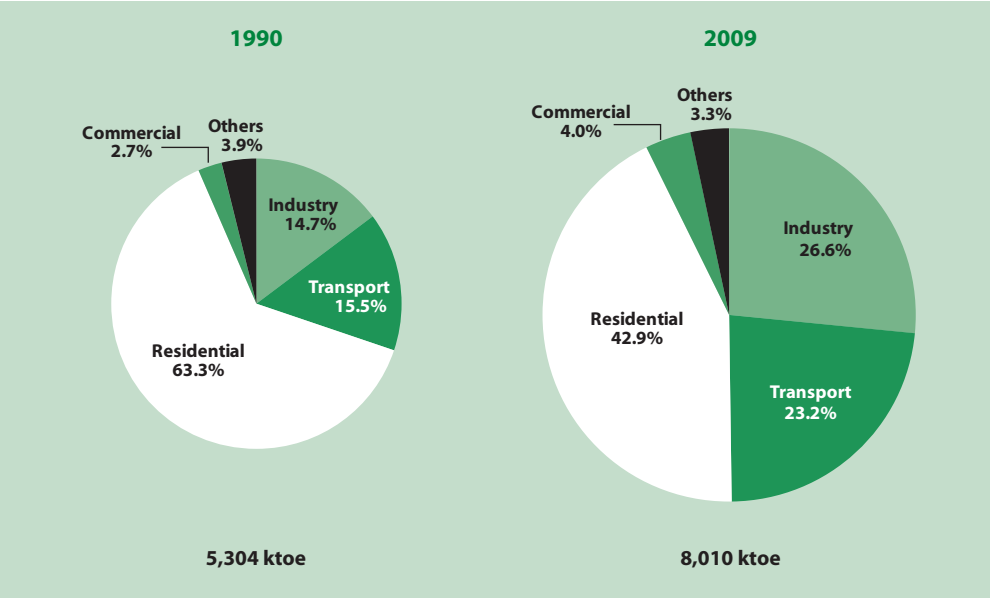
GDP = gross domestic product, PPP = purchasing power parity.
Source: World Bank.

Table 6.6.2 Energy Supply and Demand

	1990	1995	2000	2005	2009
Primary Energy Supply (ktoe)					
Indigenous Production	4,191	4,022	4,748	4,920	5,086
Net Imports	1,326	1,927	3,577	4,082	4,197
Total PES	5,517	5,949	8,325	9,002	9,283
Coal	5	4	1	66	54
Oil	1,326	1,925	3,580	4,012	4,154
Gas	0	0	0	0	0
Biomass	3,916	3,637	4,468	4,626	4,738
Others	270	383	276	298	337
TPES/capita (toe)	0.32	0.33	0.44	0.45	0.45
TPES/GDP (toe/constant 2005 PPP $ million)	160	132	145	129	106
Final Energy Consumption (ktoe)					
Industry	782	706	1,712	2,011	2,128
Transportation	820	1,211	1,684	2,073	1,860
Other Sectors	3,702	3,775	3,965	3,966	4,022
Total FEC	5,304	5,692	7,361	8,050	8,010
Coal	5	5	1	66	54
Oil	1,182	1,711	2,501	2,845	2,599
Gas	0	0	0	0	0
Electricity	224	324	416	532	630
Biomass	3,893	3,652	4,443	4,607	4,727
Others	0	0	0	0	0

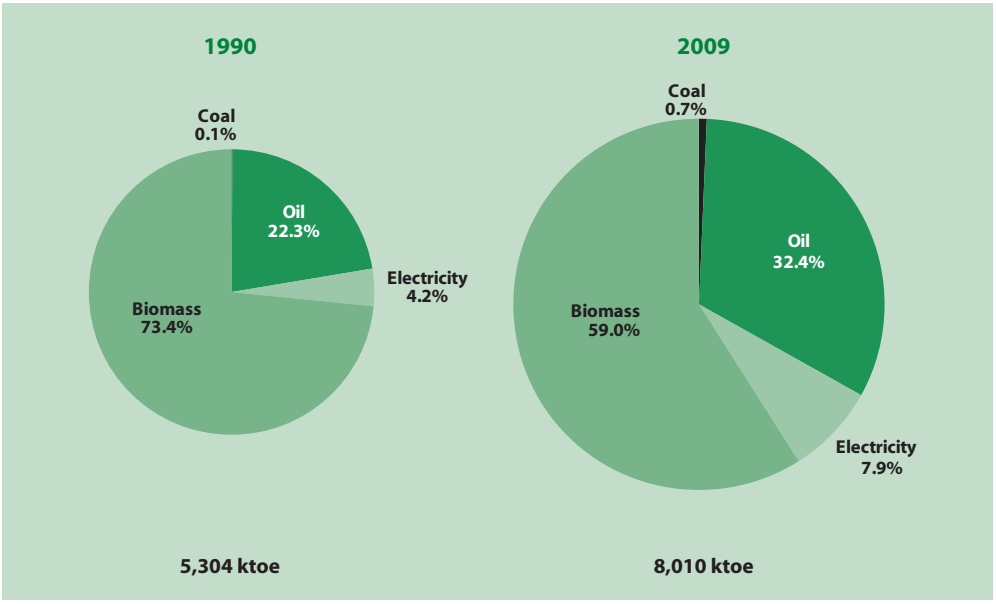
FEC = final energy consumption, GDP = gross domestic product, ktoe = thousand tons of oil equivalent, PES = primary energy supply, PPP = purchasing power parity, toe = ton of oil equivalent, TPES = total primary energy supply.
Source: IEA (2011b).

Figure 6.6.1 Final Energy Consumption by Sector, 1990 and 2009



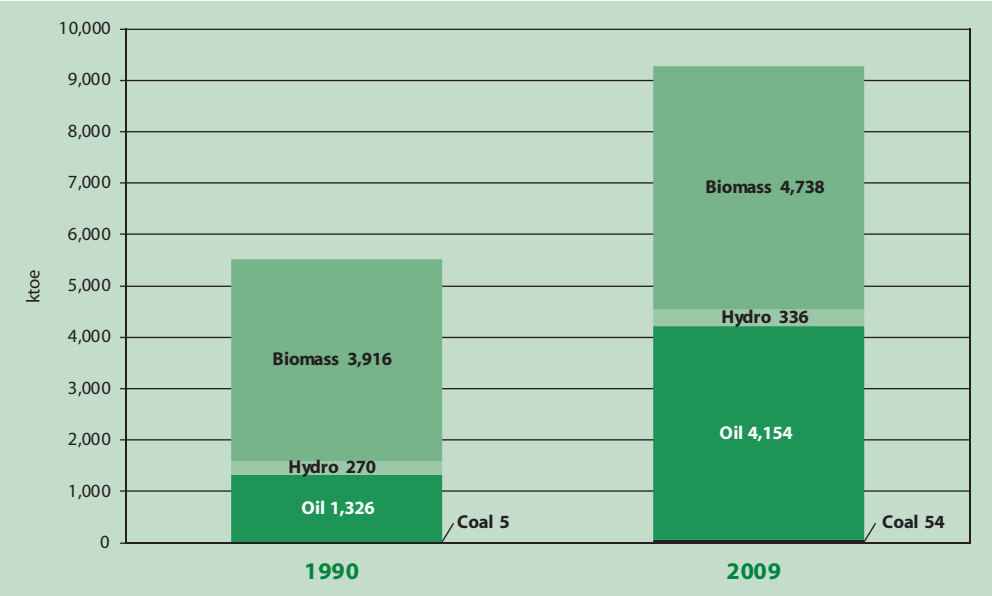
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 6.6.2 Final Energy Consumption by Type of Energy, 1990 and 2009



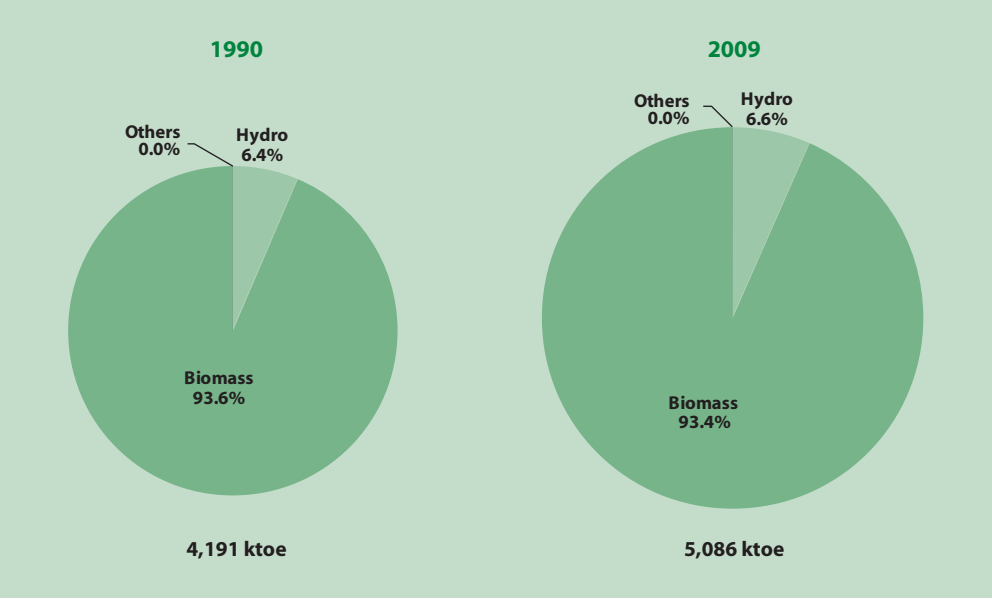
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 6.6.3 Total Primary Energy Supply, 1990 and 2009



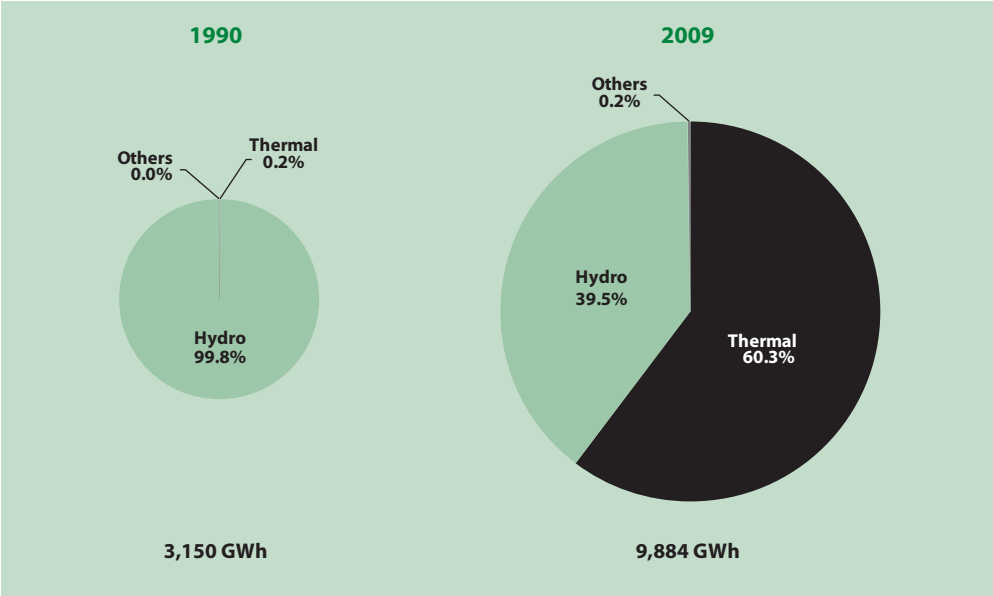
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 6.6.4 Indigenous Energy Production, 1990 and 2009



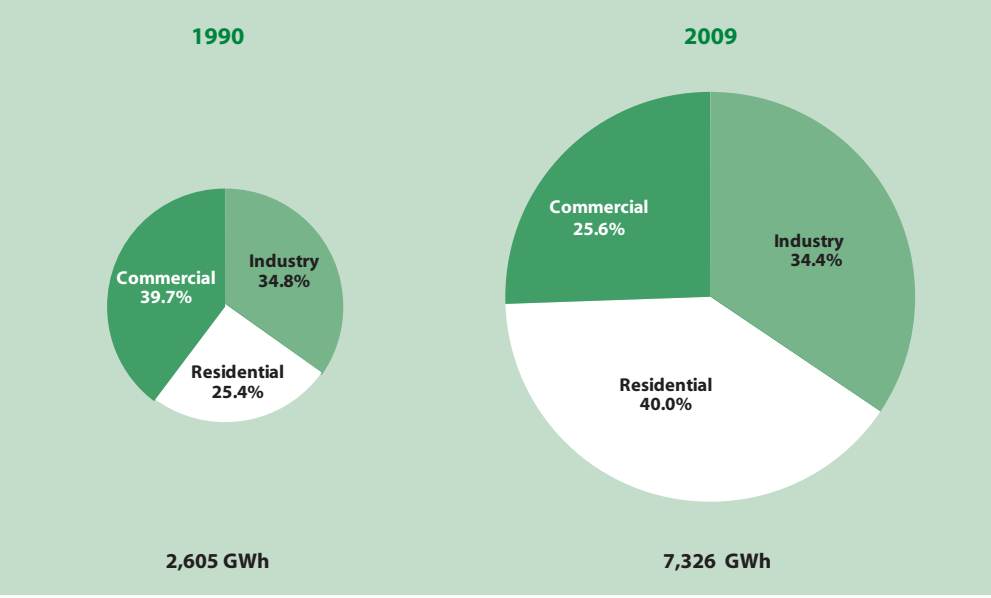
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 6.6.5 Electricity Generation by Plant Type, 1990 and 2009



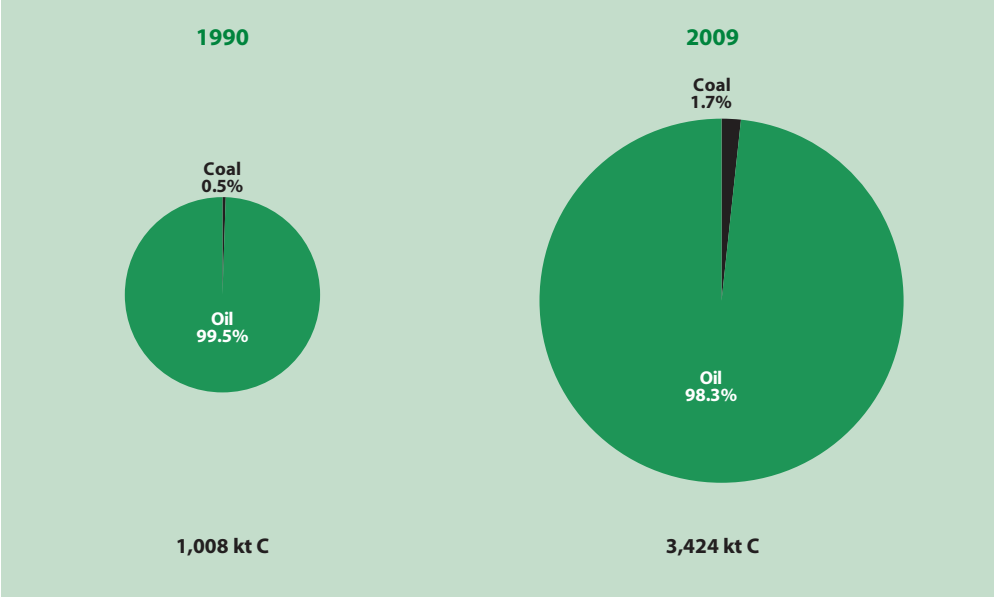
GWh = gigawatt-hour.
Source: IEA (2011b).

Figure 6.6.6 Electricity Consumption by Sector, 1990 and 2009



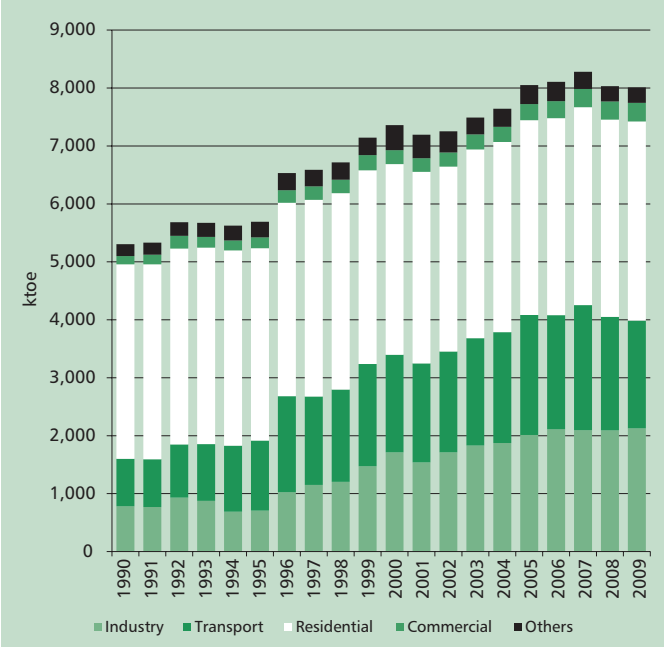
GWh = gigawatt-hour.
Source: IEA (2011b).

Figure 6.6.7 Carbon Dioxide Emissions from Fuel Combustion, 1990 and 2009



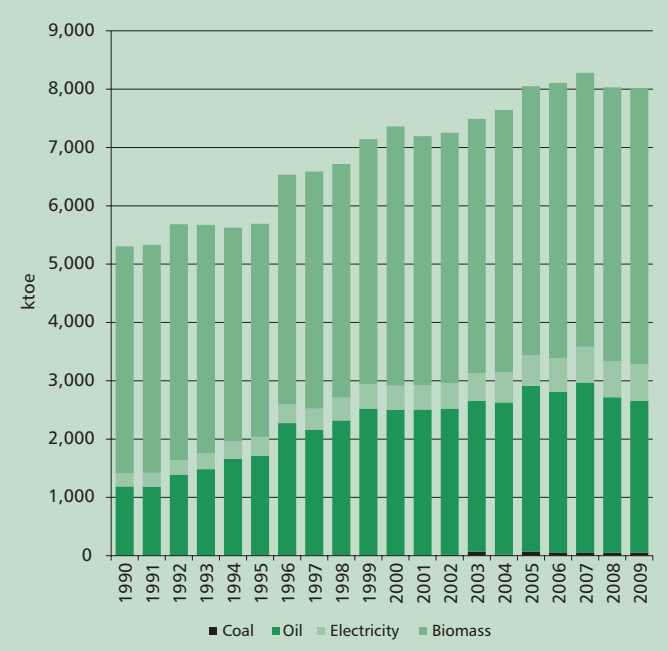
kt C = thousand tons of carbon equivalent.
Source: APERC estimates.

Figure 6.6.8 Final Energy Consumption by Sector, 1990–2009



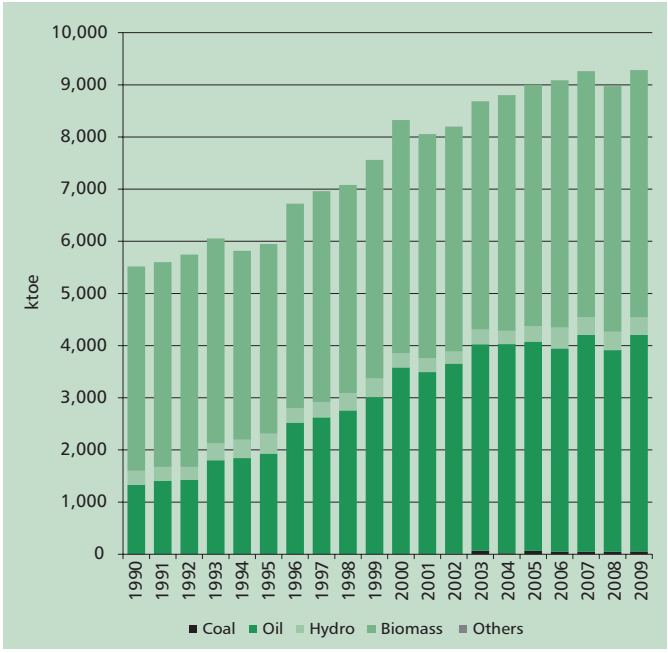
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 6.6.9 Final Energy Consumption by Type, 1990–2009



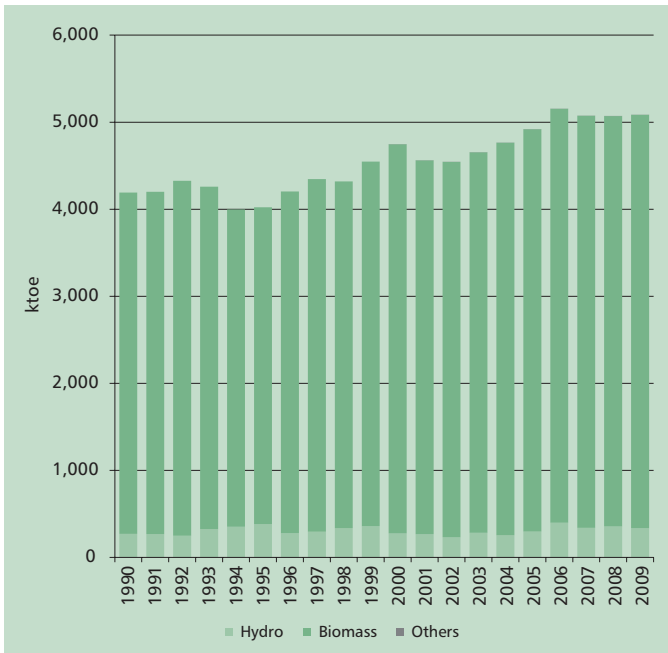
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 6.6.10 Total Primary Energy Supply, 1990–2009



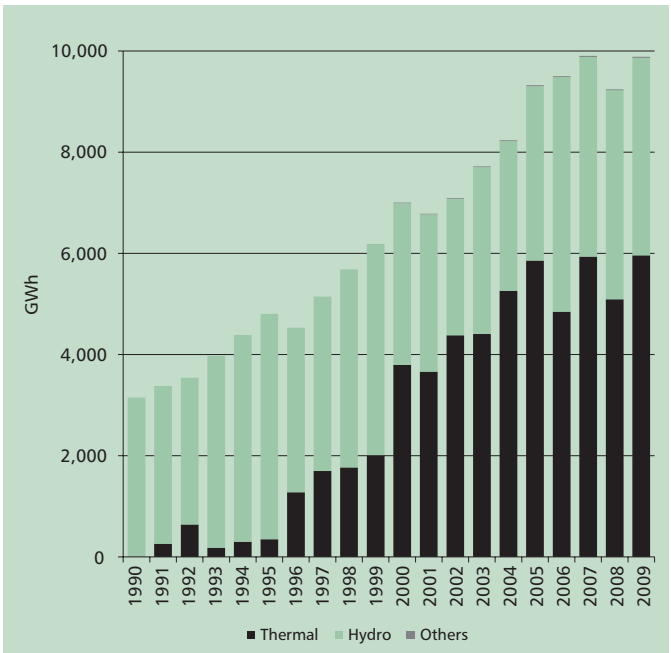
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 6.6.11 Indigenous Energy Production, 1990–2009



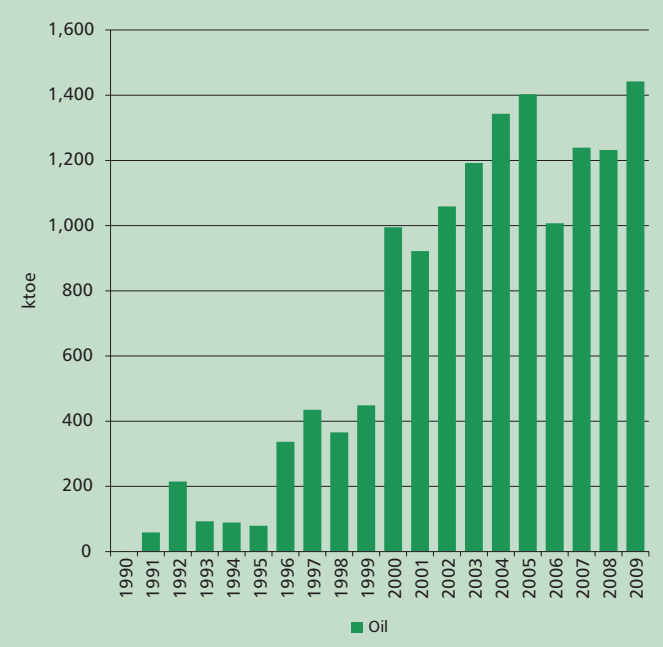
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 6.6.12 Electricity Generation by Source, 1990–2009



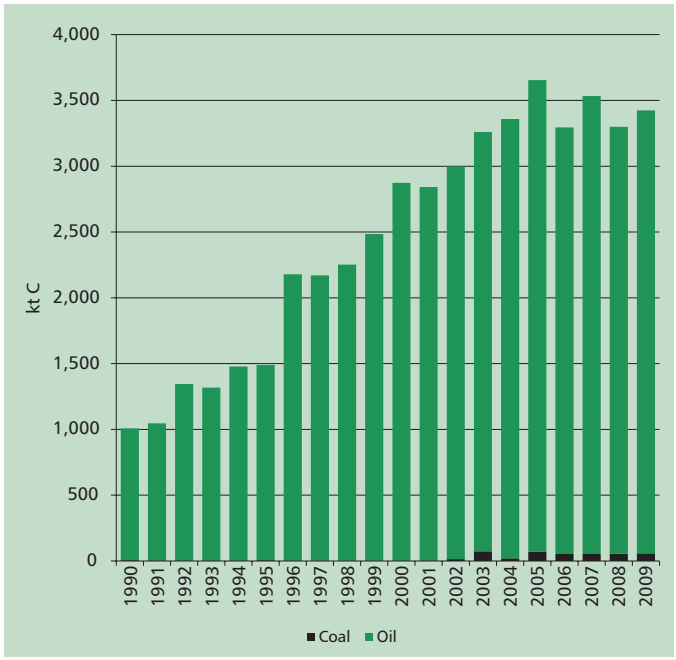
GWh = gigawatt-hour.
Source: IEA (2011b).

Figure 6.6.13 Fuel Input for Electricity Generation, 1990–2009



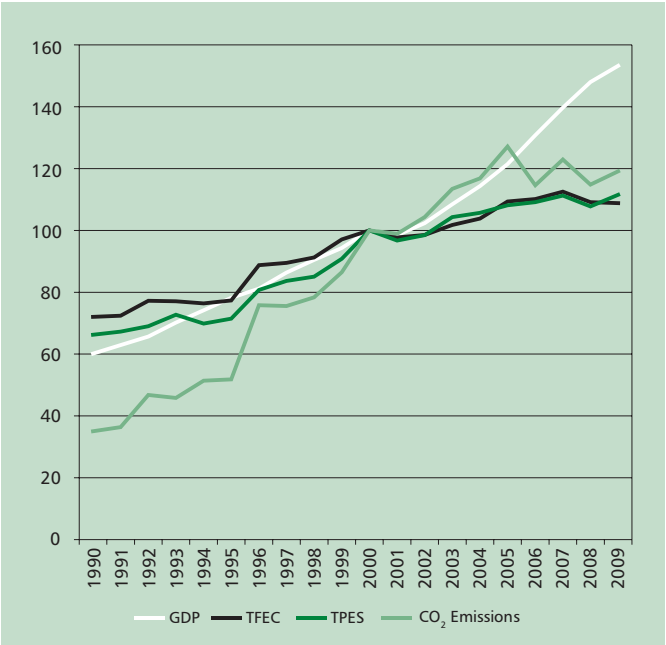
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 6.6.14 Carbon Dioxide Emissions from Fuel Combustion, 1990–2009



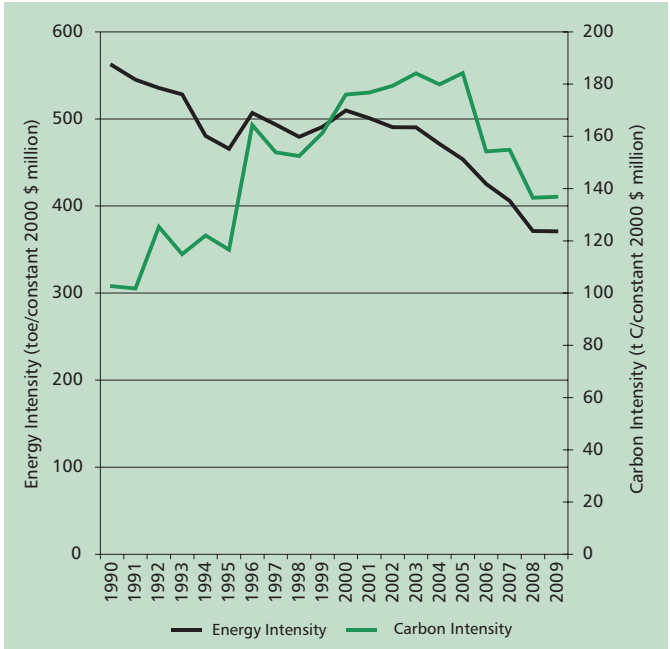
kt C = thousand tons of carbon equivalent.
Source: APERC estimates.

Figure 6.6.15 Growth of GDP, TFEC, TPES, and CO_2 (indexed to year 2000), 1990–2009



CO_2 = carbon dioxide, GDP = gross domestic product, TFEC = total final energy consumption, TPES = total primary energy supply.
Note: Indices are measured relative to the base year 2000 (2000 = 100).
Source: APERC estimates.

Figure 6.6.16 Energy and Carbon Intensities, 1990–2009



t C = ton of carbon equivalent, toe = ton of oil equivalent.
Source: APERC estimates.

Table 6.6.3 Sri Lanka Energy Balance Table, 2006

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	0	0	0	0	0	0	0	0	0	0	0	399	0	0	1	0	4,755	0	0	0	5,155
2.	Imports	49	1	2,222	1,997	251	40	1,123	158	167	258	0	0	0	0	0	0	5	0	0	0	4,274
3.	Exports	0	0	0	–47	0	0	0	0	0	–47	0	0	0	0	0	0	–2	0	0	0	–49
4.	International Bunkers	0	0	0	–457	0	0	–43	–94	0	–320	0	0	0	0	0	0	0	0	0	0	–457
5.	Stock Changes	0	0	–18	201	63	34	–43	74	–2	75	0	0	0	0	0	0	–21	0	0	0	162
6.	Total Primary Energy Supply	49	1	2,204	1,694	314	74	1,037	138	165	–34	0	399	0	0	1	0	4,737	0	0	0	9,085
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	0	0	–2,204	1,068	211	151	403	65	16	222	0	–399	0	0	–1	0	–17	0	817	0	–736
8.1	Power Generation	0	0	0	–1,007	0	0	–256	–686	0	–65	0	–399	0	0	–1	0	–2	0	817	0	–592
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	–2,204	2,075	211	151	659	751	16	287	0	0	0	0	0	0	0	0	0	0	–129
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–15	0	0	0	–15
9.	Loss and Own Use	0	0	0	–156	–11	–7	–34	–79	0	–25	0	0	0	0	0	0	0	0	–243	0	–399
10.	Discrepancy	–1	0	0	158	–1	–2	29	95	–2	39	0	0	0	0	0	0	0	0	0	0	157
11.	Total Final Energy Consumption	48	1	0	2,764	513	216	1,435	219	179	202	0	0	0	0	0	0	4,720	0	574	0	8,107
12.	Industry Sector	48	1	0	310	1	20	81	185	23	0	0	0	0	0	0	0	1,528	0	224	0	2,111
13.	Transport Sector	0	0	0	1,968	511	0	1,317	0	4	136	0	0	0	0	0	0	0	0	0	0	1,968
14.	Other Sectors	0	0	0	420	1	196	37	34	152	0	0	0	0	0	0	0	3,192	0	350	0	3,962
14.1	Residential and Commercial	0	0	0	152	0	0	0	0	152	0	0	0	0	0	0	0	3,192	0	350	0	3,694
14.1.1	Commerce and Public Services	0	0	0	39	0	0	0	0	39	0	0	0	0	0	0	0	125	0	128	0	292
14.1.2	Residential	0	0	0	113	0	0	0	0	113	0	0	0	0	0	0	0	3,067	0	222	0	3,402
14.2	Non–Specified Others	0	0	0	268	1	196	37	34	0	0	0	0	0	0	0	0	0	0	0	0	268
15.	Non–Energy Use	0	0	0	66	0	0	0	0	0	66	0	0	0	0	0	0	0	0	0	0	66
16.	Electricity Output (GWh)	0	0	0	4,847	0	0	0	0	0	0	0	4,634	0	0	15	2	2	0	0	0	9,500
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.
Note: Figures may not add up to total because of rounding.
Source: IEA (2011b).

Table 6.6.4 Sri Lanka Energy Balance Table, 2007

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	0	0	0	0	0	0	0	0	0	0	0	339	0	0	1	0	4,735	0	0	0	5,075
2.	Imports	48	1	1,997	2,318	359	22	1,387	188	165	197	0	0	0	0	0	0	4	0	0	0	4,368
3.	Exports	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–1	0	0	0	–1
4.	International Bunkers	0	0	0	–277	0	0	–48	–122	0	–107	0	0	0	0	0	0	0	0	0	0	–277
5.	Stock Changes	0	0	–41	161	19	54	0	62	8	18	0	0	0	0	0	0	–23	0	0	0	97
6.	Total Primary Energy Supply	48	1	1,956	2,202	378	76	1,339	128	173	108	0	339	0	0	1	0	4,715	0	0	0	9,262
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	0	0	–1,956	620	178	102	87	4	17	232	0	–339	0	0	–1	0	–17	0	851	0	–842
8.1	Power Generation	0	0	0	–1,239	0	0	–380	–753	0	–106	0	–339	0	0	–1	0	–1	0	851	0	–729
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	–1,956	1,859	178	102	467	757	17	338	0	0	0	0	0	0	0	0	0	0	–97
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–16	0	0	0	–16
9.	Loss and Own Use	0	0	0	–56	0	0	0	–40	0	–16	0	0	0	0	0	0	0	0	–238	0	–294
10.	Discrepancy	0	0	0	156	–1	–1	84	120	1	–47	0	0	0	0	0	0	0	0	0	0	156
11.	Total Final Energy Consumption	48	1	0	2,922	555	177	1,510	212	191	277	0	0	0	0	0	0	4,698	0	613	0	8,282
12.	Industry Sector	48	1	0	303	1	17	76	182	27	0	0	0	0	0	0	0	1,516	0	226	0	2,094
13.	Transport Sector	0	0	0	2,161	553	0	1,395	0	4	209	0	0	0	0	0	0	0	0	0	0	2,161
14.	Other Sectors	0	0	0	390	1	160	39	30	160	0	0	0	0	0	0	0	3,182	0	387	0	3,959
14.1	Residential and Commercial	0	0	0	160	0	0	0	0	160	0	0	0	0	0	0	0	3,182	0	387	0	3,729
14.1.1	Commerce and Public Services	0	0	0	41	0	0	0	0	41	0	0	0	0	0	0	0	125	0	149	0	315
14.1.2	Residential	0	0	0	119	0	0	0	0	119	0	0	0	0	0	0	0	3,057	0	238	0	3,414
14.2	Non-Specified Others	0	0	0	230	1	160	39	30	0	0	0	0	0	0	0	0	0	0	0	0	230
15.	Non-Energy Use	0	0	0	68	0	0	0	0	0	68	0	0	0	0	0	0	0	0	0	0	68
16.	Electricity Output (GWh)	0	0	0	5,935	0	0	0	0	0	0	0	3,947	0	0	16	2	1	0	0	0	9,901
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Source: IEA (2011b).

Table 6.6.5 Sri Lanka Energy Balance Table, 2008

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	0	0	0	0	0	0	0	0	0	0	0	355	0	0	1	0	4,715	0	0	0	5,071
2.	Imports	50	1	1,910	2,316	329	56	1,139	348	167	277	0	0	0	0	0	0	0	0	0	0	4,277
3.	Exports	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–1	0	0	0	–1
4.	International Bunkers	0	0	0	–300	0	0	–60	–138	0	–102	0	0	0	0	0	0	0	0	0	0	–300
5.	Stock Changes	0	0	–24	–40	–26	–14	6	5	0	–11	0	0	0	0	0	0	–10	0	0	0	–74
6.	Total Primary Energy Supply	50	1	1,886	1,976	303	42	1,085	215	167	164	0	355	0	0	1	0	4,704	0	0	0	8,973
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	0	0	–1,929	606	179	117	195	–80	17	178	0	–355	0	0	–1	0	–11	0	795	0	–895
8.1	Power Generation	0	0	0	–1,232	0	0	–281	–796	0	–155	0	–355	0	0	–1	0	–1	0	795	0	–794
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	–1,929	1,838	179	117	476	716	17	333	0	0	0	0	0	0	0	0	0	0	–91
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–10	0	0	0	–10
9.	Loss and Own Use	0	0	0	–52	–1	0	0	–35	0	–16	0	0	0	0	0	0	0	0	–172	0	–224
10.	Discrepancy	0	0	43	135	57	–1	47	80	0	–48	0	0	0	0	0	0	0	0	0	0	178
11.	Total Final Energy Consumption	50	1	0	2,665	538	158	1,327	180	184	278	0	0	0	0	0	0	4,693	0	623	0	8,032
12.	Industry Sector	50	1	0	280	0	22	85	154	19	0	0	0	0	0	0	0	1,530	0	230	0	2,091
13.	Transport Sector	0	0	0	1,959	538	0	1,220	0	3	198	0	0	0	0	0	0	0	0	0	0	1,959
14.	Other Sectors	0	0	0	346	0	136	22	26	162	0	0	0	0	0	0	0	3,163	0	393	0	3,902
14.1	Residential and Commercial	0	0	0	162	0	0	0	0	162	0	0	0	0	0	0	0	3,163	0	393	0	3,718
14.1.1	Commerce and Public Services	0	0	0	31	0	0	0	0	31	0	0	0	0	0	0	0	126	0	156	0	313
14.1.2	Residential	0	0	0	131	0	0	0	0	131	0	0	0	0	0	0	0	3,037	0	237	0	3,405
14.2	Non-Specified Others	0	0	0	184	0	136	22	26	0	0	0	0	0	0	0	0	0	0	0	0	184
15.	Non-Energy Use	0	0	0	80	0	0	0	0	0	80	0	0	0	0	0	0	0	0	0	0	80
16.	Electricity Output (GWh)	0	0	0	5,092	0	0	0	0	0	0	0	4,129	0	0	16	3	2	0	0	0	9,242
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.
Note: Figures may not add up to total because of rounding.
Source: IEA (2011b).

Table 6.6.6 Sri Lanka Energy Balance Table, 2009

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	0	0	0	0	0	0	0	0	0	0	0	336	0	0	1	0	4,749	0	0	0	5,086
2.	Imports	53	1	2,128	2,124	298	50	1,029	314	152	281	0	0	0	0	0	0	0	0	0	0	4,306
3.	Exports	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–1	0	0	0	–1
4.	International Bunkers	0	0	0	–301	0	0	–57	–140	0	–104	0	0	0	0	0	0	0	0	0	0	–301
5.	Stock Changes	0	0	0	203	0	0	0	262	0	–59	0	0	0	0	0	0	–10	0	0	0	193
6.	Total Primary Energy Supply	53	1	2,128	2,026	298	50	972	436	152	118	0	336	0	0	1	0	4,738	0	0	0	9,283
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	0	0	–2,128	512	195	87	179	–169	25	195	0	–336	0	0	–1	0	–11	0	850	0	–1,114
8.1	Power Generation	0	0	0	–1,442	0	0	–330	–931	0	–181	0	–336	0	0	–1	0	–1	0	850	0	–930
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	–2,128	1,954	195	87	509	762	25	376	0	0	0	0	0	0	0	0	0	0	–174
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–10	0	0	0	–10
9.	Loss and Own Use	0	0	0	–52	0	0	0	–35	0	–17	0	0	0	0	0	0	0	0	–221	0	–273
10.	Discrepancy	0	0	0	113	0	1	113	–1	0	0	0	0	0	0	0	0	0	0	1	0	114
11.	Total Final Energy Consumption	53	1	0	2,599	493	138	1,264	231	177	296	0	0	0	0	0	0	4,727	0	630	0	8,010
12.	Industry Sector	53	1	0	316	0	19	81	198	18	0	0	0	0	0	0	0	1,541	0	217	0	2,128
13.	Transport Sector	0	0	0	1,860	493	0	1,162	0	3	202	0	0	0	0	0	0	0	0	0	0	1,860
14.	Other Sectors	0	0	0	329	0	119	21	33	156	0	0	0	0	0	0	0	3,186	0	413	0	3,928
14.1	Residential and Commercial	0	0	0	156	0	0	0	0	156	0	0	0	0	0	0	0	3,186	0	413	0	3,755
14.1.1	Commerce and Public Services	0	0	0	30	0	0	0	0	30	0	0	0	0	0	0	0	127	0	161	0	318
14.1.2	Residential	0	0	0	126	0	0	0	0	126	0	0	0	0	0	0	0	3,059	0	252	0	3,437
14.2	Non–Specified Others	0	0	0	173	0	119	21	33	0	0	0	0	0	0	0	0	0	0	0	0	173
15.	Non–Energy Use	0	0	0	94	0	0	0	0	0	94	0	0	0	0	0	0	0	0	0	0	94
16.	Electricity Output (GWh)	0	0	0	5,959	0	0	0	0	0	0	0	3,904	0	0	16	3	2	0	0	0	9,884
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Source: IEA (2011b).

Table 6.6.7 Sri Lanka Summary Table, 1990–2009

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Indigenous Production (ktoe)																				
Coal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Oil	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hydro	270	268	249	326	352	383	280	296	337	359	275	267	232	283	255	297	399	339	355	336
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Geothermal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Solar	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1
Wind	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Biomass	3,921	3,932	4,078	3,933	3,645	3,639	3,924	4,050	3,982	4,189	4,472	4,295	4,311	4,371	4,509	4,622	4,755	4,735	4,715	4,749
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	4,191	4,200	4,327	4,259	3,997	4,022	4,204	4,346	4,319	4,548	4,748	4,563	4,544	4,655	4,765	4,920	5,155	5,075	5,071	5,086
Primary Energy Supply (ktoe)																				
Coal	5	0	0	0	0	4	2	2	2	2	1	1	13	68	19	66	50	49	51	54
Oil	1,326	1,407	1,425	1,803	1,844	1,925	2,522	2,621	2,755	3,011	3,580	3,492	3,642	3,958	4,012	4,012	3,898	4,158	3,862	4,154
Gas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hydro	270	268	249	326	352	383	280	296	337	359	275	267	232	283	255	297	399	339	355	336
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Geothermal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Solar	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1
Wind	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Biomass	3,916	3,925	4,071	3,926	3,621	3,637	3,917	4,044	3,987	4,190	4,468	4,292	4,310	4,372	4,513	4,626	4,737	4,715	4,704	4,738
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	5,517	5,600	5,745	6,055	5,817	5,949	6,721	6,963	7,081	7,562	8,325	8,053	8,198	8,682	8,800	9,002	9,085	9,262	8,973	9,283
Final Energy Consumption by Sector (ktoe)																				
Industry	782	768	932	874	688	706	1,024	1,151	1,204	1,472	1,712	1,541	1,714	1,830	1,873	2,011	2,111	2,094	2,091	2,128
Transport	820	824	917	980	1,141	1,211	1,657	1,525	1,593	1,765	1,684	1,706	1,739	1,853	1,915	2,073	1,968	2,161	1,959	1,860
Residential	3,356	3,365	3,381	3,392	3,369	3,318	3,339	3,394	3,389	3,343	3,292	3,306	3,192	3,259	3,281	3,362	3,402	3,414	3,405	3,437
Commercial	141	168	218	184	172	187	216	233	233	261	241	237	243	258	262	278	292	315	313	318
Others	205	206	237	243	255	270	297	285	298	304	432	404	365	290	311	326	334	298	264	267
Total	5,304	5,331	5,685	5,673	5,625	5,692	6,533	6,588	6,717	7,145	7,361	7,194	7,253	7,490	7,642	8,050	8,107	8,282	8,032	8,010

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Table 6.6.7 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Final Energy Consumption by Type (ktoe)																				
Coal	5	1	1	1	1	5	2	2	2	2	1	1	13	68	19	66	49	49	51	54
Oil	1,182	1,185	1,390	1,483	1,659	1,711	2,272	2,160	2,317	2,521	2,501	2,506	2,510	2,585	2,610	2,845	2,764	2,922	2,665	2,599
Gas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Electricity	224	236	251	278	308	324	320	362	394	418	416	416	438	478	521	532	574	613	623	630
Heat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Biomass	3,893	3,909	4,043	3,911	3,657	3,652	3,939	4,064	4,004	4,204	4,443	4,271	4,292	4,359	4,492	4,607	4,720	4,698	4,693	4,727
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	5,304	5,331	5,685	5,673	5,625	5,692	6,533	6,588	6,717	7,145	7,361	7,194	7,253	7,490	7,642	8,050	8,107	8,282	8,032	8,010
Power Generation (GWh)																				
Thermal	5	261	640	183	298	350	1,278	1,698	1,768	2,011	3,796	3,661	4,381	4,406	5,259	5,855	4,847	5,935	5,092	5,959
Hydro	3,145	3,116	2,900	3,796	4,089	4,452	3,252	3,447	3,915	4,170	3,197	3,109	2,692	3,296	2,961	3,451	4,634	3,947	4,129	3,904
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Geothermal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Solar	0	0	0	0	0	0	0	0	0	0	8	8	10	11	12	14	15	16	16	16
Wind	0	0	0	0	0	0	0	0	0	3	3	3	4	3	3	2	2	2	3	3
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	1	2	2
Total	3,150	3,377	3,540	3,979	4,387	4,802	4,530	5,145	5,683	6,184	7,004	6,781	7,087	7,716	8,235	9,324	9,500	9,901	9,242	9,884
Loss and Own Use of Electricity (GWh)																				
Transmission and Distribution Losses	523	616	593	709	779	860	779	895	1,058	1,279	1,465	1,279	1,314	1,442	1,360	1,500	1,558	1,558	1,488	1,442
Own Use	12	23	35	35	23	23	35	35	47	47	686	663	686	721	802	1,640	1,267	1,209	512	1,128
Total	535	640	628	744	802	884	814	930	1,105	1,326	2,151	1,942	2,000	2,163	2,163	3,140	2,826	2,767	2,000	2,570
Fuel Input for Power Generation (ktoe)																				
Coal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Oil	2	59	215	93	89	79	337	435	366	449	995	922	1,059	1,192	1,343	1,403	1,007	1,239	1,232	1,442
Gas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	2	59	215	93	89	79	337	435	366	449	995	922	1,059	1,192	1,343	1,403	1,007	1,239	1,232	1,442
CO_2 Emissions (kt C)																				
Coal	5	1	1	1	1	6	2	2	2	2	1	1	14	74	21	71	53	53	55	58
Oil	1,003	1,044	1,343	1,317	1,476	1,484	2,177	2,169	2,250	2,483	2,873	2,841	2,984	3,187	3,338	3,583	3,241	3,480	3,244	3,366
Gas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	1,008	1,046	1,344	1,318	1,478	1,489	2,179	2,171	2,253	2,485	2,874	2,842	2,998	3,260	3,359	3,654	3,294	3,533	3,300	3,424

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Table 6.6.7 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Macroeconomic Indicators																				
Population (thousand)	17,337	17,543	17,741	17,926	18,090	18,229	18,341	18,428	18,510	18,610	18,745	18,922	19,134	19,370	19,611	19,843	20,062	20,272	20,474	20,669
Urban Population, %	17.2	17.0	16.9	16.7	16.6	16.4	16.3	16.1	16.0	15.8	15.7	15.6	15.5	15.3	15.2	15.1	15.1	15.1	15.1	15.1
GDP (constant 2000 $ million)	9,822	10,274	10,726	11,466	12,108	12,774	13,259	14,108	14,771	15,406	16,331	16,078	16,716	17,709	18,673	19,839	21,360	22,812	24,169	25,024
GDP (current $ million)	8,033	9,000	9,703	10,339	11,718	13,030	13,898	15,092	15,795	15,656	16,331	15,746	17,103	18,882	20,663	24,406	28,267	32,351	40,715	42,068
GDP (constant 2005 PPP $ million)	34,527	36,115	37,704	40,306	42,563	44,904	46,610	49,596	51,926	54,159	57,409	56,522	58,763	62,253	65,643	69,740	75,088	80,192	84,963	87,970
GDP/capita (constant 2000 $)	567	586	605	640	669	701	723	766	798	828	871	850	874	914	952	1,000	1,065	1,125	1,180	1,211
GDP/capita (current $)	463	513	547	577	648	715	758	819	853	841	871	832	894	975	1,054	1,230	1,409	1,596	1,989	2,035
GDP – Manufacturing (% of GDP)	11.6	11.9	12.4	12.8	13.2	13.7	14.0	14.4	14.6	14.6	15.1	14.7	14.4	14.1	14.1	14.1	13.8	13.7	13.6	13.6
Car Ownership (car/1,000 persons)	18	19	19	23	24	21	25	32	34	25	25	26	42	36	36	37	37	37	37	37
Basic Energy Indicators																				
TPES/capita (toe/person)	0.32	0.32	0.32	0.34	0.32	0.33	0.37	0.38	0.38	0.41	0.44	0.43	0.43	0.45	0.45	0.45	0.45	0.46	0.44	0.45
TFEC/capita (toe/person)	0.31	0.30	0.32	0.32	0.31	0.31	0.36	0.36	0.36	0.38	0.39	0.38	0.38	0.39	0.39	0.41	0.40	0.41	0.39	0.39
TPES/GDP (toe/constant 2000 $ million)	562	545	536	528	480	466	507	494	479	491	510	501	490	490	471	454	425	406	371	371
TFEC/GDP (toe/constant 2000 $ million)	540	519	530	495	465	446	493	467	455	464	451	447	434	423	409	406	380	363	332	320
Import Dependency (%)	24.0	25.0	24.7	29.7	31.3	32.4	37.4	37.6	39.0	39.9	43.0	43.3	44.6	46.4	45.9	45.3	43.3	45.2	43.5	45.2
Oil Import Dependency (%)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Electricity/capita (kWh/person)	150	156	165	180	198	207	203	228	248	261	258	256	266	287	309	312	333	352	354	354
CO_2 Intensity (t C/constant 2000 $ million)	103	102	125	115	122	117	164	154	152	161	176	177	179	184	180	184	154	155	137	137
CO_2/capita (t C)	0.06	0.06	0.08	0.07	0.08	0.08	0.12	0.12	0.12	0.13	0.15	0.15	0.16	0.17	0.17	0.18	0.16	0.17	0.16	0.17
CO_2/TPES (t C/toe)	0.18	0.19	0.23	0.22	0.25	0.25	0.32	0.31	0.32	0.33	0.35	0.35	0.37	0.38	0.38	0.41	0.36	0.38	0.37	0.37

CO_2 = carbon dioxide, GDP = gross domestic product, GWh = gigawatt–hour, kt C = thousand tons of carbon equivalent, ktoe = thousand tons of oil equivalent, kWh = kilowatt–hour, PPP = purchasing power parity, t C = ton of carbon equivalent, TFEC = total final energy consumption, toe = ton of oil equivalent, TPES = total primary energy supply.

Note: Figures may not add up to total because of rounding.

Sources: APERC estimates, IEA (2011b), JAMA (2012), and World Bank.

Chapter 7

Southeast Asia

Southeast Asia

Regional Profile (2009)		Energy Reserves (year-end 2008)	
Total Surface Area (square kilometer)	4,480,454	Coal (million ton) - Recoverable	7,743.0
Population (thousand)	584,869	Gas (trillion cubic feet) - Proven	250.9
GDP (constant 2000 $ billion)	930.7	Oil (billion barrel) - Proven	15,648.0
Electrification Rate (%)	74.1		

GDP = gross domestic product.

Sources: ADB (2011 and 2012), APERC estimates, World Bank, and WEC (2010).

2009 Energy Supply and Demand Flow (ktoe)

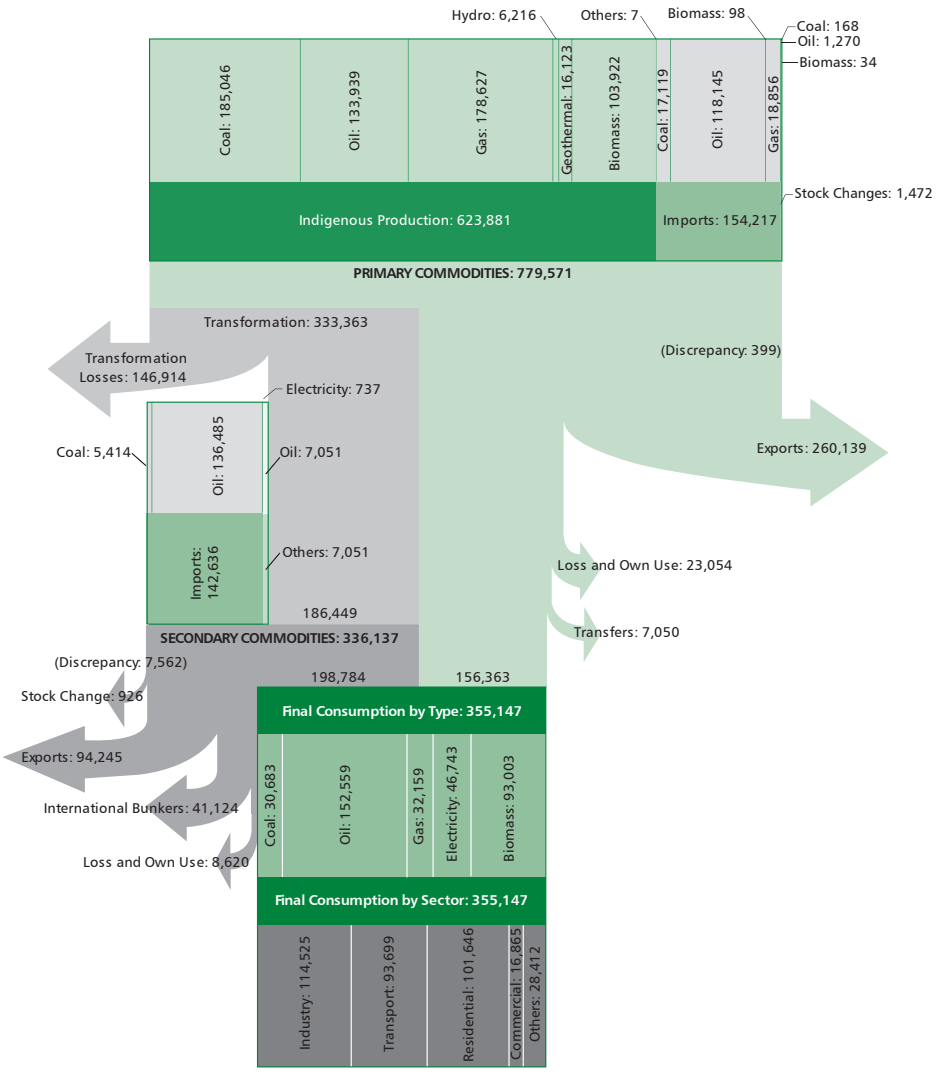


Table 7.1 Key Data and Economic Profile

	1990	1995	2000	2005	2009
Socioeconomic Data					
Population (thousand)	443,564	482,934	521,983	558,103	584,869
GDP (constant 2000 $ billion)	369.3	530.6	608.3	778.9	930.7
GDP (constant 2005 PPP $ billion)	1,038.8	1,495.5	1,694.4	2,180.9	2,625.2
GDP/capita (constant 2000 $)	851	1,099	1,165	1,396	1,591
GDP/capita (constant 2005 PPP $)	2,393	3,097	3,246	3,908	4,489

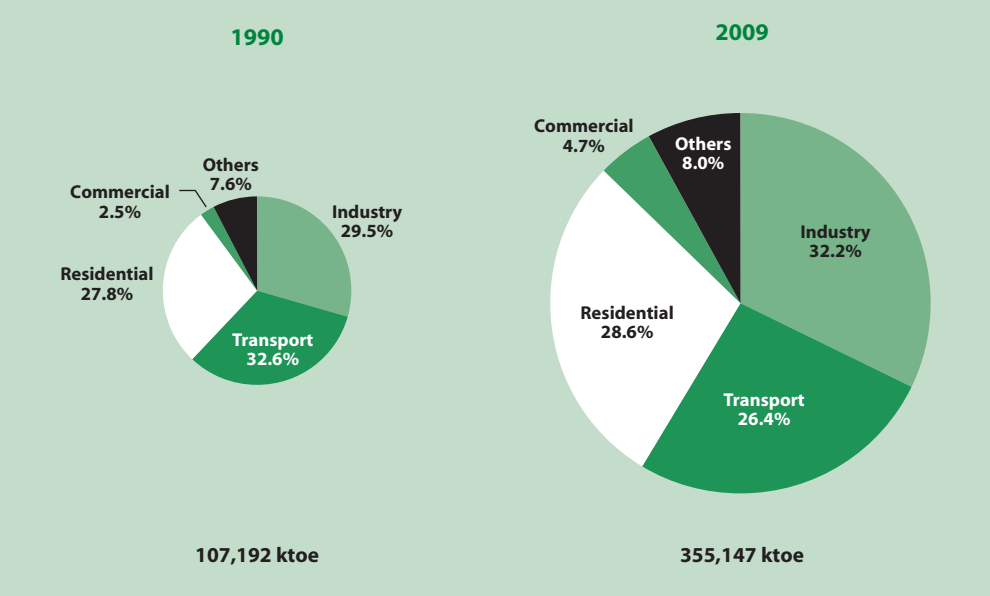
GDP = gross domestic product, PPP = purchasing power parity.
Note: In the computation of GDP per capita (at 2000 PPP $) for 1990, population of Cambodia was not included in the denominator due to unavailability of GDP data.
Sources: ADB (2011) and World Bank.

Table 7.2 Energy Supply and Demand

	1990	1995	2000	2005	2009
Primary Energy Supply (ktoe)					
Indigenous Production	227,868	310,978	375,153	523,584	623,881
Net Imports	–68,180	–69,465	–66,987	–66,948	–98,108
Total PES	159,689	241,514	308,166	456,637	525,773
Coal	12,877	20,168	30,054	53,471	74,509
Oil	84,933	120,235	151,771	181,689	197,385
Gas	32,196	67,348	85,738	104,561	127,258
Biomass	21,178	22,664	22,043	97,861	103,879
Others	8,505	11,099	18,561	19,054	22,743
TPES/capita (toe)	0.37	0.50	0.59	0.82	0.90
TPES/GDP (toe/constant 2005 PPP $ million)	154	161	182	209	200
Final Energy Consumption (ktoe)					
Industry	31,576	51,497	61,334	100,441	114,525
Transportation	34,949	55,419	67,070	83,223	93,699
Other Sectors	40,667	53,157	65,273	129,125	146,923
Total FEC	107,192	160,074	193,677	312,790	355,147
Coal	5,089	8,999	10,807	22,854	30,683
Oil	65,053	97,430	118,526	140,154	152,559
Gas	7,167	10,978	13,810	21,926	32,159
Electricity	11,458	21,947	30,346	38,072	46,743
Biomass	18,425	20,719	20,187	89,751	93,003
Others	0	0	0	33	0

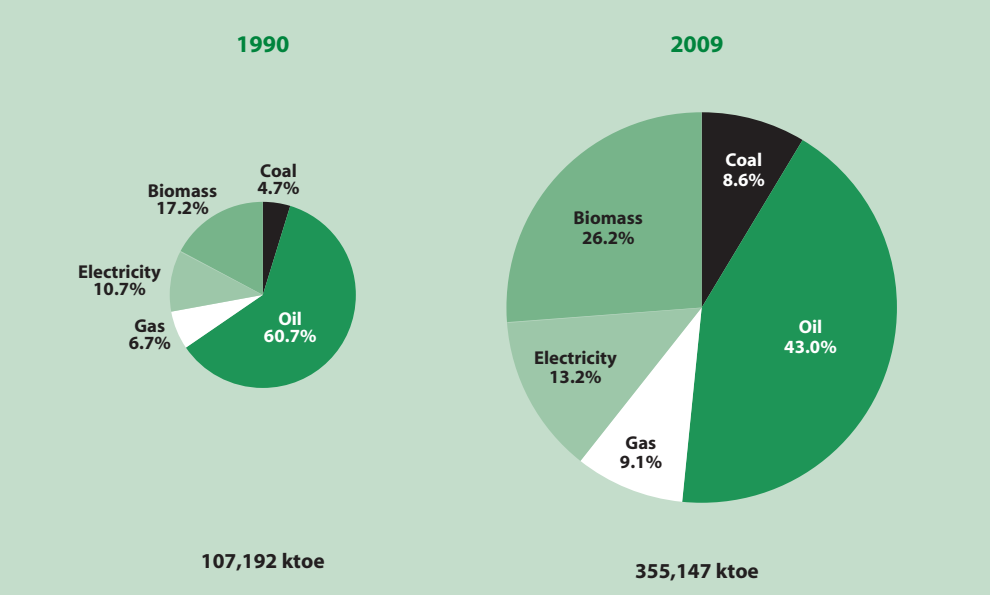
FEC = final energy consumption, GDP = gross domestic product, ktoe = thousand tons of oil equivalent, PES = primary energy supply, PPP = purchasing power parity, toe = ton of oil equivalent, TPES = total primary energy supply.
Sources: APERC (APEC Energy Database), IEA (2011b), and Lao PDR Ministry of Energy and Mines (unpublished).

Figure 7.1 Final Energy Consumption by Sector, 1990 and 2009



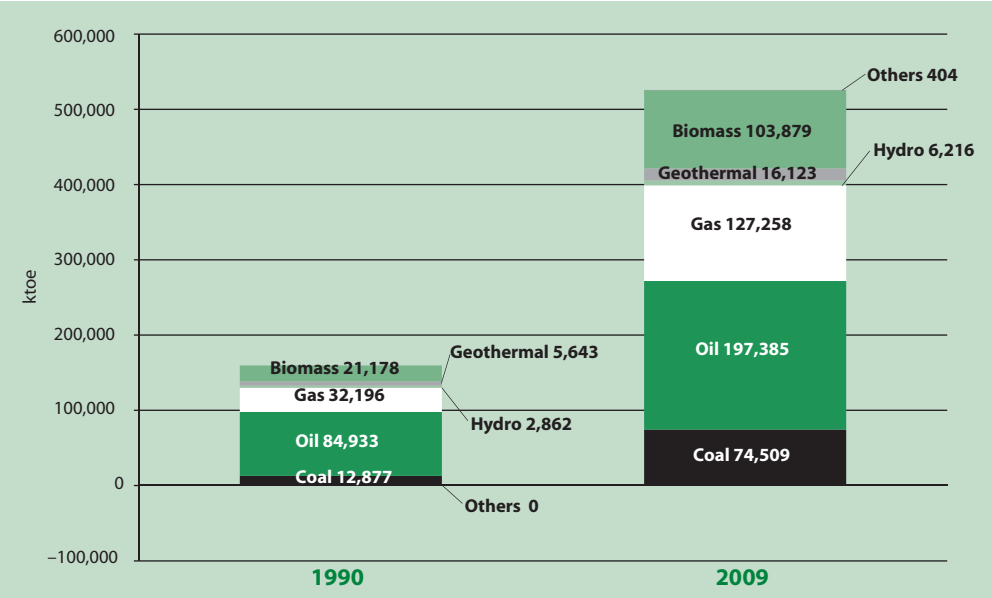
ktoe = thousand tons of oil equivalent.
Sources: APERC (APEC Energy Database), IEA (2011b), and Lao PDR Ministry of Energy and Mines (unpublished).

Figure 7.2 Final Energy Consumption by Type of Energy, 1990 and 2009



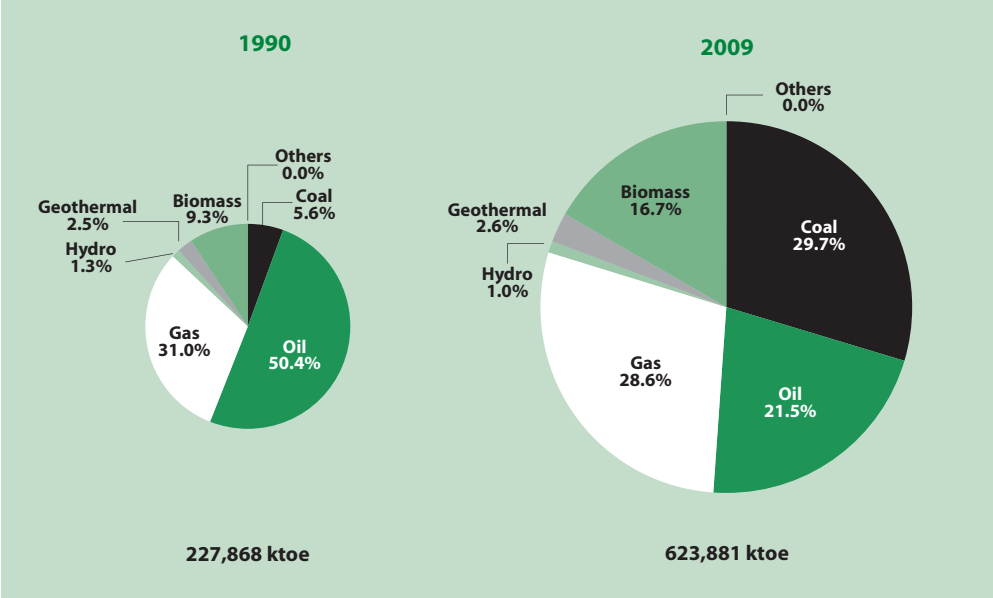
ktoe = thousand tons of oil equivalent.
Sources: APERC (APEC Energy Database), IEA (2011b), and Lao PDR Ministry of Energy and Mines (unpublished).

Figure 7.3 Total Primary Energy Supply, 1990 and 2009



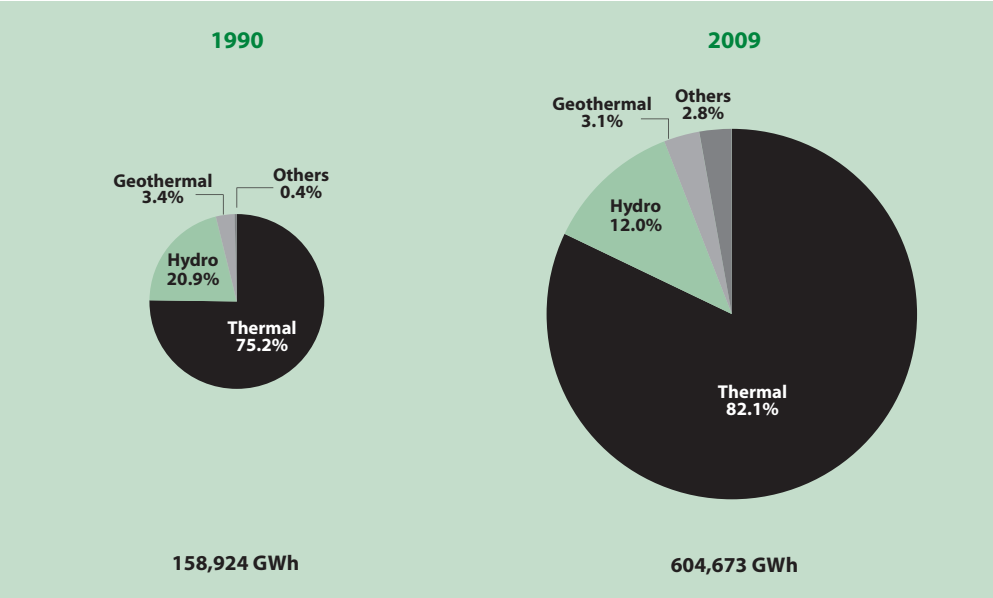
ktoe = thousand tons of oil equivalent.
Sources: APERC (APEC Energy Database), IEA (2011b), and Lao PDR Ministry of Energy and Mines (unpublished).

Figure 7.4 Indigenous Energy Production, 1990 and 2009



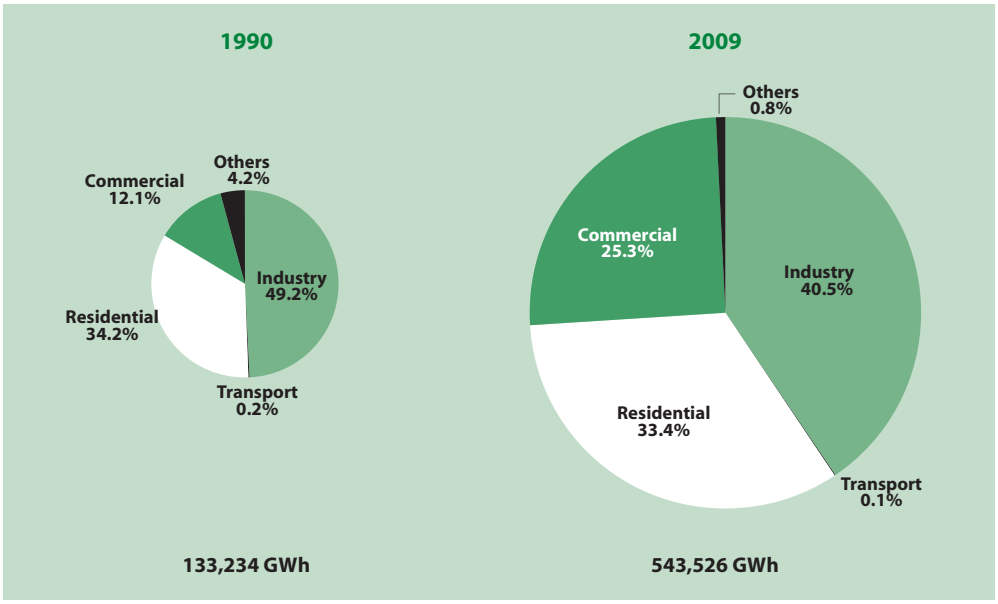
ktoe = thousand tons of oil equivalent.
Sources: APERC (APEC Energy Database), IEA (2011b), and Lao PDR Ministry of Energy and Mines (unpublished).

Figure 7.5 Electricity Generation by Plant Type, 1990 and 2009



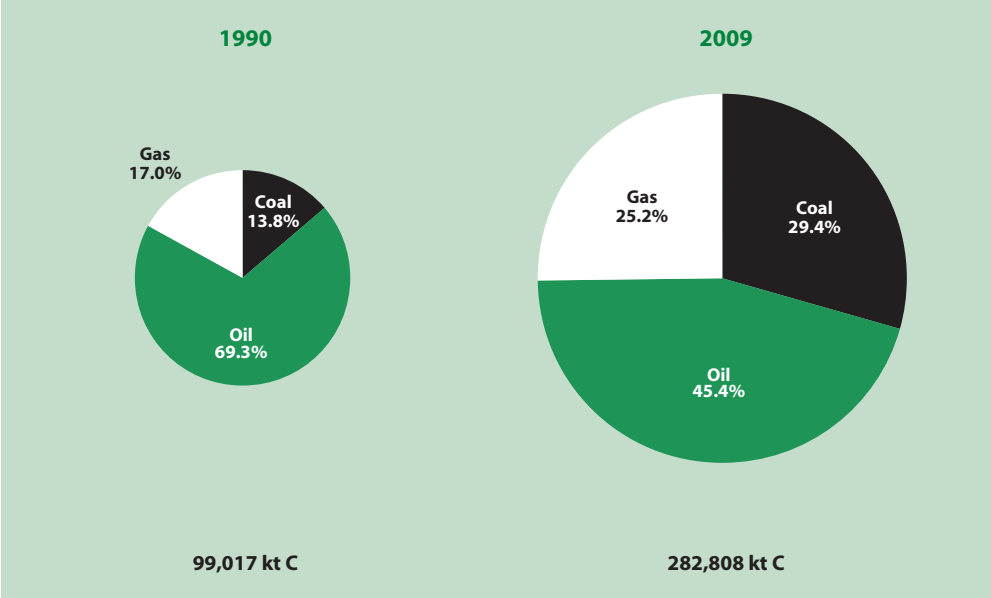
GWh = gigawatt-hour.
Sources: APERC (APEC Energy Database), IEA (2011b), and Lao PDR Ministry of Energy and Mines (unpublished).

Figure 7.6 Electricity Consumption by Sector, 1990 and 2009



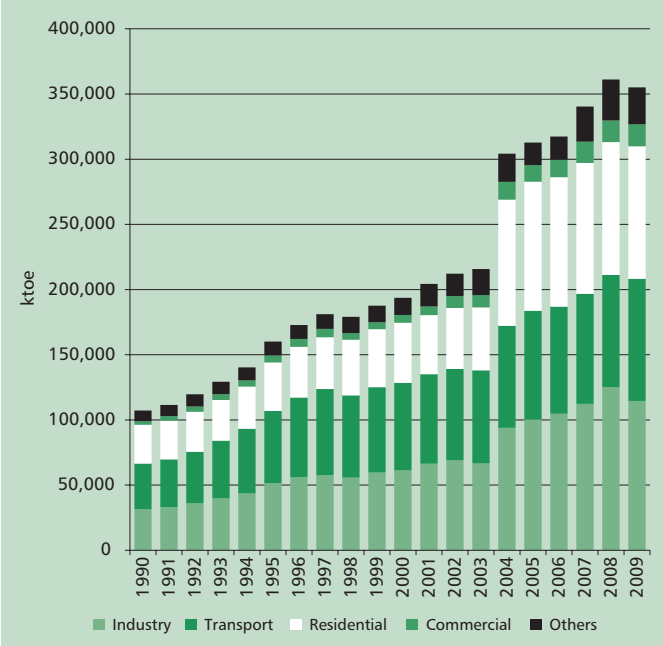
GWh = gigawatt-hour.
Sources: APERC (APEC Energy Database), IEA (2011b), and Lao PDR Ministry of Energy and Mines (unpublished).

Figure 7.7 Carbon Dioxide Emissions from Fuel Combustion, 1990 and 2009



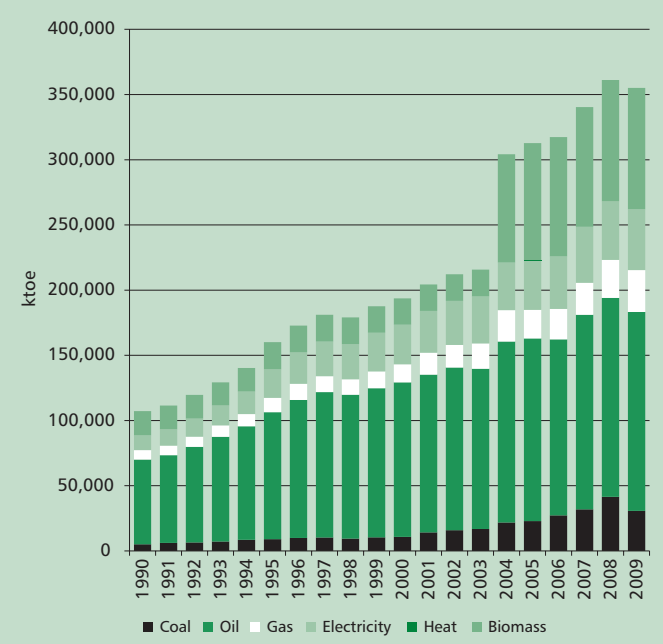
kt C = thousand tons of carbon equivalent.
Source: APERC estimates.

Figure 7.8 Final Energy Consumption by Sector, 1990–2009



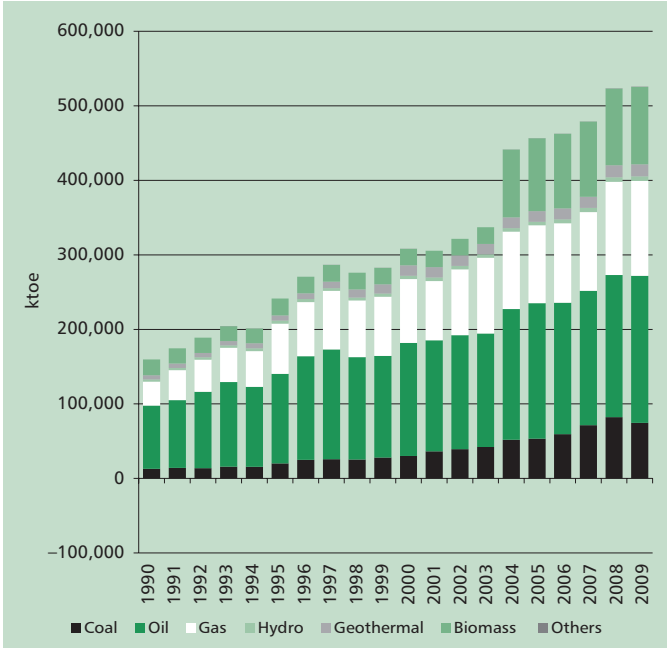
ktoe = thousand tons of oil equivalent.
Sources: APERC (APEC Energy Database), IEA (2011b), and Lao PDR Ministry of Energy and Mines (unpublished).

Figure 7.9 Final Energy Consumption by Type, 1990–2009



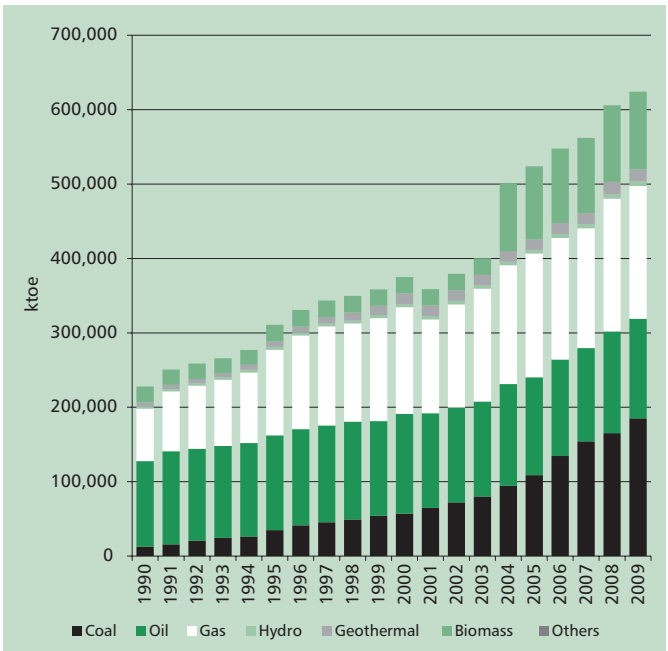
ktoe = thousand tons of oil equivalent.
Sources: APERC (APEC Energy Database), IEA (2011b), and Lao PDR Ministry of Energy and Mines (unpublished).

Figure 7.10 Total Primary Energy Supply, 1990–2009



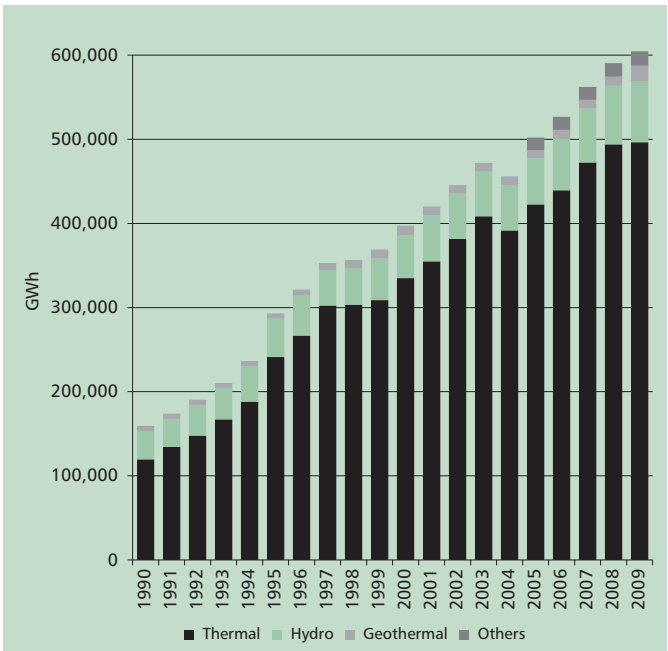
ktoe = thousand tons of oil equivalent.
Sources: APERC (APEC Energy Database), IEA (2011b), and Lao PDR Ministry of Energy and Mines (unpublished).

Figure 7.11 Indigenous Energy Production, 1990–2009



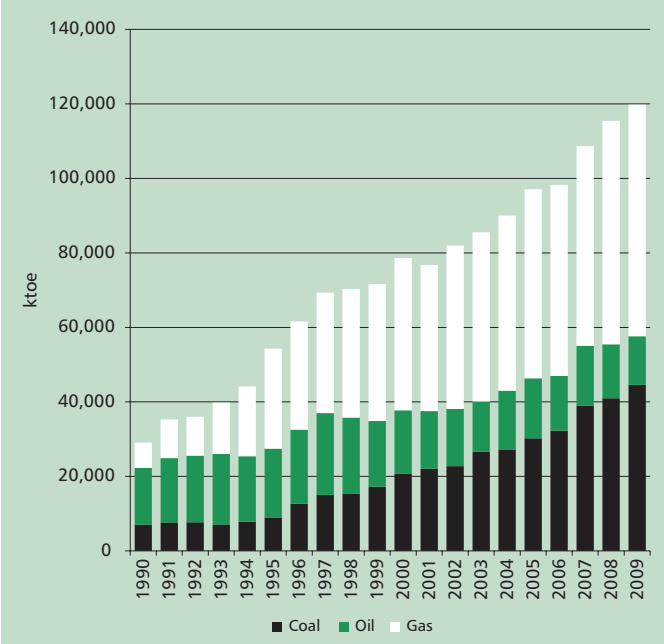
ktoe = thousand tons of oil equivalent.
Sources: APERC (APEC Energy Database), IEA (2011b), and Lao PDR Ministry of Energy and Mines (unpublished).

Figure 7.12 Electricity Generation by Source, 1990–2009



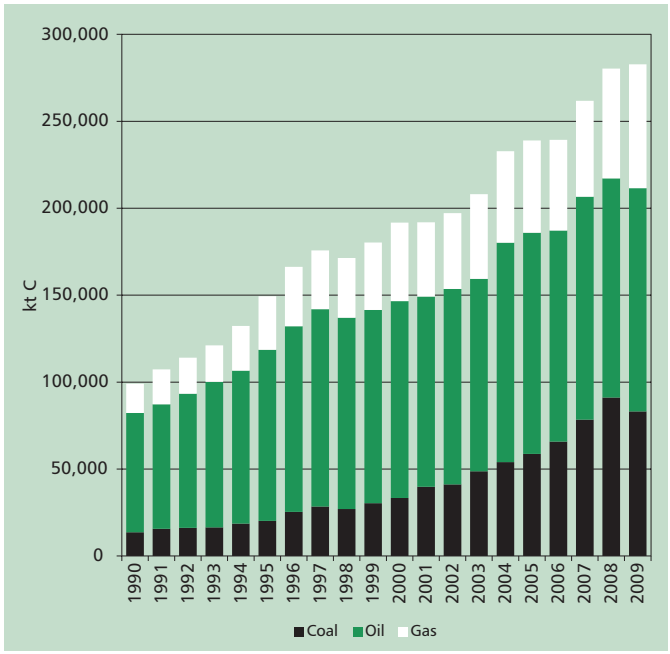
GWh = gigawatt-hour.
Sources: APERC (APEC Energy Database), IEA (2011b), and Lao PDR Ministry of Energy and Mines (unpublished).

Figure 7.13 Fuel Input for Electricity Generation, 1990–2009



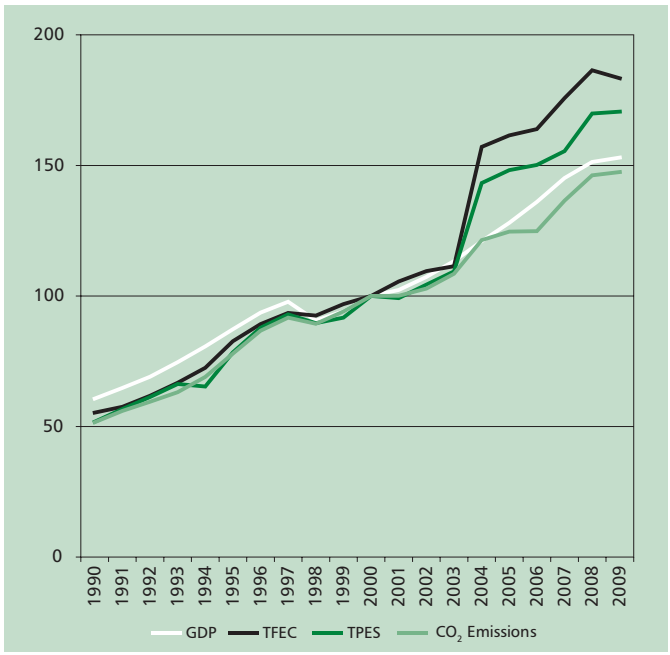
ktoe = thousand tons of oil equivalent.
Sources: APERC (APEC Energy Database), IEA (2011b), and Lao PDR Ministry of Energy and Mines (unpublished).

Figure 7.14 Carbon Dioxide Emissions from Fuel Combustion, 1990–2009



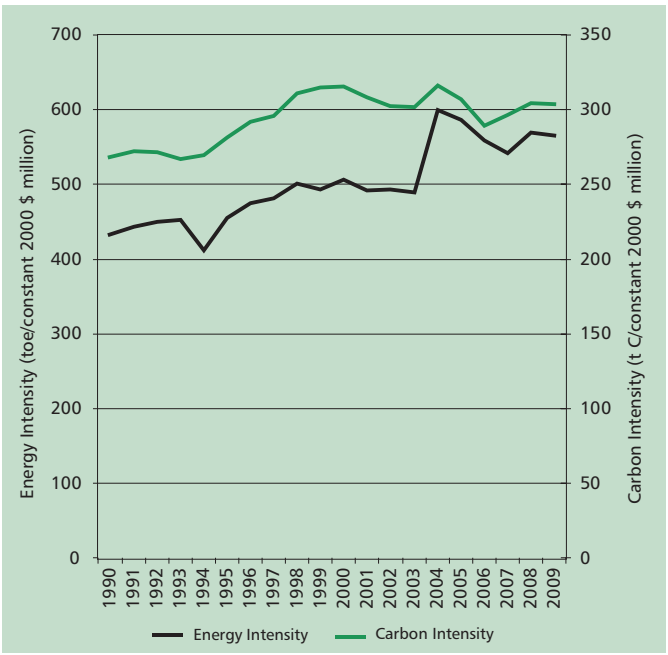
kt C = thousand tons of carbon equivalent.
Source: APERC estimates.

Figure 7.15 Growth of GDP, TFEC, TPES, and CO_2 (indexed to year 2000), 1990–2009



CO_2 = carbon dioxide, GDP = gross domestic product, TFEC = total final energy consumption, TPES = total primary energy supply.
Note: Indices are measured relative to the base year 2000 (2000 = 100).
Source: APERC estimates.

Figure 7.16 Energy and Carbon Intensities, 1990–2009



t C = ton of carbon equivalent , toe = ton of oil equivalent.
Source: APERC estimates.

Table 7.3 Southeast Asia Energy Balance Table, 2006

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	134,475	0	129,839	0	0	0	0	0	0	0	163,309	5,283	0	14,728	0	5	99,901	0	0	0	547,539
2.	Imports	14,031	3,096	128,683	100,988	21,425	1,518	26,211	41,002	1,972	8,859	16,496	0	0	0	0	0	25	0	590	0	263,910
3.	Exports	–91,111	0	–67,533	–82,132	–13,569	–1,652	–20,672	–21,390	–3,253	–21,596	–73,193	0	0	0	0	0	–3	0	–278	0	–314,251
4.	International Bunkers	0	0	0	–35,609	0	0	–109	–31,108	0	–4,392	0	0	0	0	0	0	0	0	0	0	–35,609
5.	Stock Changes	–1,106	0	2,428	–140	129	–921	1,058	–166	–127	–113	–10	0	0	0	0	0	0	0	0	0	1,171
6.	Total Primary Energy Supply	56,289	3,096	193,416	–16,894	7,985	–1,056	6,489	–11,661	–1,408	–17,243	106,602	5,283	0	14,728	0	5	99,922	0	311	0	462,760
7.	Transfers	0	0	–5,170	5,171	4	48	99	0	4,426	593	0	0	0	0	0	0	0	0	0	0	1
8.	Total Transformation Sector	–32,253	12	–181,704	150,962	29,421	9,255	46,185	23,048	5,276	37,777	–64,701	–5,283	0	–14,728	0	–5	–8,493	0	45,878	0	–110,315
8.1	Power Generation	–32,235	0	0	–14,720	0	0	–7,976	–6,744	0	0	–51,298	–5,283	0	–14,728	0	–5	–1,530	0	45,878	0	–73,921
8.2	Gas Processing	0	–5	0	–128	0	0	0	0	0	–128	–12,687	0	0	0	0	0	0	0	0	0	–12,819
8.3	Refineries	0	0	–181,704	166,654	29,421	9,255	54,161	29,792	5,281	38,744	0	0	0	0	0	0	0	0	0	0	–15,050
8.4	Coal Transformation	–19	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–2
8.5.	Other Transformation	0	0	0	–844	0	0	0	0	–4	–839	–716	0	0	0	0	0	–6,963	0	0	0	–8,523
9.	Loss and Own Use	0	0	–324	–958	–2	0	–38	–103	0	–814	–13,129	0	0	0	0	0	0	0	–5,474	0	–19,885
10.	Discrepancy	323	–231	–3,417	–6,094	–1,161	375	531	–6	–79	–5,753	–5,351	0	0	0	0	0	6	0	–374	0	–15,139
11.	Total Final Energy Consumption	24,359	2,877	2,801	132,187	36,246	8,622	53,266	11,278	8,215	14,560	23,421	0	0	0	0	0	91,435	0	40,342	0	317,422
12.	Industry Sector	22,833	2,861	0	27,682	46	188	12,018	8,015	706	6,708	15,547	0	0	0	0	0	18,256	0	17,502	0	104,680
13.	Transport Sector	0	0	0	81,953	36,002	1	36,331	2,639	539	6,442	226	0	0	0	0	0	0	0	18	0	82,197
14.	Other Sectors	1,376	16	0	21,206	199	8,433	4,918	624	6,361	672	1,214	0	0	0	0	0	73,179	0	22,821	0	119,814
14.1	Residential and Commercial	1,331	16	0	16,068	0	8,429	734	579	6,326	0	118	0	0	0	0	0	73,179	0	22,058	0	112,770
14.1.1	Commerce and Public Services	327	0	0	3,044	0	124	510	558	1,851	0	27	0	0	0	0	0	767	0	9,257	0	13,422
14.1.2	Residential	1,004	16	0	13,024	0	8,304	224	21	4,475	0	91	0	0	0	0	0	72,412	0	12,801	0	99,348
14.2	Non-Specified Others	46	0	0	5,138	199	5	4,183	45	35	672	1,096	0	0	0	0	0	0	0	764	0	7,043
15.	Non-Energy Use	149	0	2,801	1,346	0	0	0	0	608	738	6,434	0	0	0	0	0	0	0	0	0	10,731
16.	Electricity Output (GWh)	129,309	0	65,229	1,849	0	0	28	0	0	1,821	242,959	61,505	0	10,465	1	53	15,433	0	0	0	526,804
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Sources: APERC (APEC Energy Database), IEA (2011b), and Lao PDR Ministry of Energy and Mines (unpublished).

Table 7.4 Southeast Asia Energy Balance Table, 2007

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	154,170	0	125,339	0	0	0	0	0	0	0	161,104	5,536	0	14,825	0	5	100,883	0	0	0	561,861
2.	Imports	16,721	4,069	126,874	114,947	24,485	1,559	30,049	45,804	2,214	10,836	19,195	0	0	0	0	0	26	0	695	0	282,526
3.	Exports	−108,948	0	−62,464	−88,584	−15,387	−1,337	−21,310	−23,903	−3,428	−23,218	−74,651	0	0	0	0	0	−3	0	−424	0	−335,075
4.	International Bunkers	0	0	0	−37,754	−905	0	−67	−31,781	0	−5,001	0	0	0	0	0	0	0	0	0	0	−37,754
5.	Stock Changes	5,518	0	2,689	−690	−826	456	451	−873	−173	275	12	0	0	0	0	0	0	0	0	0	7,530
6.	Total Primary Energy Supply	67,460	4,069	192,438	−12,081	7,367	678	9,123	−10,754	−1,387	−17,109	105,661	5,536	0	14,825	0	5	100,905	0	270	0	479,087
7.	Transfers	0	0	−6,852	6,853	4	37	91	0	6,068	652	0	0	0	0	0	0	0	0	0	0	1
8.	Total Transformation Sector	−38,952	−74	−181,418	151,380	31,828	8,030	47,184	21,370	4,987	37,982	−67,141	−5,536	0	−14,825	0	−5	−9,036	0	48,956	0	−116,650
8.1	Power Generation	−38,924	−98	0	−16,020	0	0	−8,766	−7,254	0	0	−53,645	−5,536	0	−14,825	0	−5	−1,620	0	48,956	0	−81,716
8.2	Gas Processing	0	0	0	−128	0	0	0	0	0	−128	−13,496	0	0	0	0	0	0	0	0	0	−13,624
8.3	Refineries	0	0	−181,418	168,372	31,828	8,030	55,950	28,624	4,992	38,949	0	0	0	0	0	0	0	0	0	0	−13,046
8.4	Coal Transformation	−28	24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	−4
8.5.	Other Transformation	0	0	0	−844	0	0	0	0	−4	−839	0	0	0	0	0	0	−7,416	0	0	0	−8,259
9.	Loss and Own Use	0	−6	−472	−1,047	−33	−16	−71	−98	0	−829	−12,196	0	0	0	0	0	0	0	−6,158	0	−19,880
10.	Discrepancy	−466	−83	−352	664	−8	−71	230	85	−97	525	−1,757	0	0	0	0	0	−90	0	−85	0	−2,169
11.	Total Final Energy Consumption	28,043	3,905	3,345	145,768	39,157	8,658	56,557	10,604	9,572	21,220	24,567	0	0	0	0	0	91,779	0	42,984	0	340,390
12.	Industry Sector	26,480	3,905	0	29,089	64	619	12,068	7,544	2,010	6,784	16,661	0	0	0	0	0	17,678	0	18,536	0	112,349
13.	Transport Sector	0	0	0	83,911	38,894	3	35,624	2,145	711	6,534	392	0	0	0	0	0	0	0	69	0	84,372
14.	Other Sectors	1,381	0	0	24,843	200	8,035	8,864	915	6,829	0	3,179	0	0	0	0	0	74,101	0	24,378	0	127,884
14.1	Residential and Commercial	1,336	0	0	16,964	0	7,722	1,878	542	6,822	0	174	0	0	0	0	0	74,101	0	24,197	0	116,771
14.1.1	Commerce and Public Services	328	0	0	4,643	0	488	1,652	526	1,976	0	60	0	0	0	0	0	789	0	10,584	0	16,404
14.1.2	Residential	1,008	0	0	12,321	0	7,234	226	16	4,845	0	114	0	0	0	0	0	73,312	0	13,613	0	100,368
14.2	Non-Specified Others	45	0	0	7,880	200	314	6,986	373	8	0	3,006	0	0	0	0	0	0	0	182	0	11,112
15.	Non-Energy Use	181	0	3,345	7,925	0	0	0	0	23	7,902	4,334	0	0	0	0	0	0	0	0	0	15,785
16.	Electricity Output (GWh)	156,410	0	61,390	2,182	0	0	34	0	0	2,148	252,403	64,376	0	10,215	1	58	15,204	0	0	0	562,239
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Sources: APERC (APEC Energy Database), IEA (2011b), and Lao PDR Ministry of Energy and Mines (unpublished).

Table 7.5 Southeast Asia Energy Balance Table, 2008

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	165,275	0	136,755	0	0	0	0	0	0	0	178,456	6,000	0	16,368	0	5	102,768	0	0	0	605,627
2.	Imports	18,350	5,404	121,868	124,815	26,361	964	30,629	52,651	2,406	11,805	18,876	0	0	0	0	0	52	0	630	0	289,995
3.	Exports	−106,353	47	−61,667	−91,552	−15,729	−1,351	−24,790	−25,145	−2,339	−22,196	−72,295	0	0	0	0	0	−63	0	−351	0	−332,232
4.	International Bunkers	0	0	0	−39,961	0	0	−64	−35,162	0	−4,736	0	0	0	0	0	0	0	0	0	0	−39,961
5.	Stock Changes	−567	0	−562	1,160	207	151	231	365	288	−82	16	0	0	0	0	0	0	0	0	0	48
6.	Total Primary Energy Supply	76,705	5,451	196,394	−5,538	10,839	−236	6,006	−7,291	354	−15,209	125,053	6,000	0	16,368	0	5	102,757	0	280	0	523,476
7.	Transfers	0	0	−7,762	7,761	4	38	113	0	6,492	1,115	0	0	0	0	0	0	0	0	0	0	−1
8.	Total Transformation Sector	−40,980	7	−184,471	151,803	28,183	7,721	47,341	19,276	5,054	44,228	−79,765	−6,000	0	−16,368	0	−5	−9,992	0	51,503	0	−134,268
8.1	Power Generation	−40,955	−14	0	−14,502	0	0	−7,639	−6,863	0	0	−59,993	−6,000	0	−16,368	0	−5	−1,873	0	51,503	0	−88,208
8.2	Gas Processing	0	0	0	−128	0	0	0	0	0	−128	−19,771	0	0	0	0	0	0	0	0	0	−19,899
8.3	Refineries	0	0	−184,471	166,720	28,183	7,721	54,980	26,139	5,341	44,356	0	0	0	0	0	0	0	0	0	0	−17,751
8.4	Coal Transformation	−25	21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	−5
8.5.	Other Transformation	0	0	0	−287	0	0	0	0	−287	0	0	0	0	0	0	0	−8,119	0	0	0	−8,406
9.	Loss and Own Use	0	0	−939	−2,248	−33	−14	−60	−4	−2	−2,134	−14,657	0	0	0	0	0	0	0	−5,782	0	−23,625
10.	Discrepancy	453	−73	−98	−2,443	−252	455	−589	−2,463	−825	1,231	−1,429	0	0	0	0	0	168	0	−1,047	0	−4,468
11.	Total Final Energy Consumption	36,177	5,385	3,125	149,336	38,741	7,964	52,810	9,518	11,073	29,231	29,203	0	0	0	0	0	92,933	0	44,954	0	361,113
12.	Industry Sector	34,561	5,385	0	26,414	71	1,012	10,496	6,411	1,394	7,029	21,583	0	0	0	0	0	18,446	0	18,826	0	125,215
13.	Transport Sector	0	0	0	84,996	38,476	2	34,235	2,221	1,054	9,008	940	0	0	0	0	0	0	0	81	0	86,017
14.	Other Sectors	1,464	0	0	24,030	193	6,949	8,079	887	7,889	33	1,397	0	0	0	0	0	74,487	0	26,047	0	127,426
14.1	Residential and Commercial	1,417	0	0	16,633	0	6,693	1,541	517	7,882	0	197	0	0	0	0	0	74,487	0	25,766	0	118,499
14.1.1	Commerce and Public Services	347	0	0	4,036	0	409	1,361	501	1,764	0	80	0	0	0	0	0	814	0	11,306	0	16,584
14.1.2	Residential	1,070	0	0	12,596	0	6,284	180	15	6,117	0	117	0	0	0	0	0	73,673	0	14,460	0	101,915
14.2	Non-Specified Others	47	0	0	7,398	193	256	6,538	370	8	33	1,200	0	0	0	0	0	0	0	281	0	8,926
15.	Non-Energy Use	152	0	3,125	13,896	0	0	0	0	735	13,161	5,283	0	0	0	0	0	0	0	0	0	22,455
16.	Electricity Output (GWh)	151,594	0	59,213	2,064	0	0	40	0	0	2,024	281,072	69,764	0	10,723	1	61	16,069	0	0	0	590,561
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Sources: APERC (APEC Energy Database), IEA (2011b), and Lao PDR Ministry of Energy and Mines (unpublished).

Table 7.6 Southeast Asia Energy Balance Table, 2009

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	185,046	0	133,939	0	0	0	0	0	0	0	178,627	6,216	0	16,123	2	6	103,922	0	0	0	623,881
2.	Imports	17,119	5,414	118,145	136,485	29,305	643	34,818	57,232	3,573	10,914	18,856	0	0	0	0	0	98	0	737	0	296,853
3.	Exports	−132,395	−16	−57,344	−93,889	−16,320	−1,718	−30,294	−25,344	−2,127	−18,086	−70,225	0	0	0	0	0	−175	0	−340	0	−354,384
4.	International Bunkers	0	0	0	−41,124	0	0	−36	−36,551	0	−4,536	0	0	0	0	0	0	0	0	0	0	−41,124
5.	Stock Changes	168	−827	1,270	−99	−662	−23	808	38	−523	264	0	0	0	0	0	0	34	0	0	0	547
6.	Total Primary Energy Supply	69,938	4,571	196,011	1,374	12,323	−1,098	5,296	−4,625	922	−11,444	127,258	6,216	0	16,123	2	6	103,879	0	396	0	525,773
7.	Transfers	0	0	−7,050	7,051	4	34	105	0	6,179	730	0	0	0	0	0	0	0	0	0	0	1
8.	Total Transformation Sector	−44,608	29	−181,055	134,418	27,387	5,490	49,894	12,567	4,791	34,289	−74,471	−6,216	0	−16,123	−2	−6	−10,882	0	52,002	0	−146,914
8.1	Power Generation	−44,572	0	0	−13,053	0	0	−6,416	−6,637	0	0	−62,178	−6,216	0	−16,123	−2	−6	−2,357	0	52,002	0	−92,505
8.2	Gas Processing	0	0	0	−128	0	0	0	0	0	−128	−12,293	0	0	0	0	0	0	0	0	0	−12,421
8.3	Refineries	0	0	−181,311	148,023	27,387	5,490	56,310	19,203	5,215	34,417	0	0	0	0	0	0	0	0	0	0	−33,288
8.4	Coal Transformation	−36	29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	−7
8.5.	Other Transformation	0	0	256	−424	0	0	0	0	−424	0	0	0	0	0	0	0	−8,524	0	0	0	−8,692
9.	Loss and Own Use	0	0	0	−3,703	−32	−8	−66	−4	0	−3,592	−23,054	0	0	0	0	0	0	0	−4,918	0	−31,675
10.	Discrepancy	753	0	−2,786	8,299	3,078	933	1,371	−6	871	2,053	2,426	0	0	0	0	0	6	0	−737	0	7,961
11.	Total Final Energy Consumption	26,083	4,600	5,119	147,440	42,760	5,350	56,600	7,932	12,763	22,035	32,159	0	0	0	0	0	93,003	0	46,743	0	355,147
12.	Industry Sector	24,443	4,600	0	25,073	111	952	10,727	5,197	1,167	6,919	23,074	0	0	0	0	0	18,396	0	18,939	0	114,525
13.	Transport Sector	0	0	0	92,105	42,448	1	37,316	2,150	868	9,320	1,559	0	0	0	0	0	0	0	35	0	93,699
14.	Other Sectors	1,485	0	0	22,224	201	4,397	8,556	584	8,453	33	1,365	0	0	0	0	0	74,607	0	27,769	0	127,449
14.1	Residential and Commercial	1,439	0	0	14,821	0	4,228	1,869	278	8,446	0	236	0	0	0	0	0	74,607	0	27,408	0	118,511
14.1.1	Commerce and Public Services	350	0	0	3,764	0	213	1,730	271	1,551	0	125	0	0	0	0	0	821	0	11,805	0	16,865
14.1.2	Residential	1,089	0	0	11,057	0	4,016	140	7	6,895	0	111	0	0	0	0	0	73,785	0	15,603	0	101,646
14.2	Non-Specified Others	46	0	0	7,402	201	168	6,687	307	7	33	1,129	0	0	0	0	0	0	0	361	0	8,938
15.	Non-Energy Use	155	0	5,119	8,039	0	0	0	0	2,274	5,764	6,161	0	0	0	0	0	0	0	0	0	19,474
16.	Electricity Output (GWh)	156,800	0	51,134	1,676	0	0	29	0	0	1,647	286,940	72,276	0	18,748	13	64	17,021	0	0	0	604,673
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Sources: APERC (APEC Energy Database), IEA (2011b), and Lao PDR Ministry of Energy and Mines (unpublished).

Table 7.7 Southeast Asia Summary Table, 1990–2009

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Indigenous Production (ktoe)																				
Coal	12,740	15,732	20,797	24,452	26,386	34,935	41,385	45,429	49,195	54,187	57,064	64,729	72,296	80,063	94,412	108,802	134,475	154,170	165,275	185,046
Oil	114,864	125,142	123,446	123,439	125,485	127,413	129,263	130,112	131,547	127,116	134,192	127,188	127,421	127,626	136,764	131,543	129,839	125,339	136,755	133,939
Gas	70,582	80,592	84,994	89,198	94,929	114,868	126,036	133,406	132,062	138,475	143,308	126,215	138,645	151,800	159,824	166,491	163,309	161,104	178,456	178,627
Hydro	2,862	2,854	3,128	3,227	3,618	3,927	4,133	3,618	3,681	4,259	4,360	4,713	4,627	4,627	4,614	4,711	5,283	5,536	6,000	6,216
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Geothermal	5,643	5,914	5,784	5,810	6,814	7,172	7,644	8,652	10,977	12,462	14,187	14,064	14,175	13,862	14,568	14,197	14,728	14,825	16,368	16,123
Solar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Wind	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	5	5	5	6
Biomass	21,178	20,486	20,634	19,788	19,836	22,664	22,364	22,324	22,375	22,047	22,043	22,009	22,184	22,460	90,920	97,838	99,901	100,883	102,768	103,922
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	227,868	250,720	258,784	265,914	277,068	310,978	330,825	343,540	349,836	358,547	375,153	358,918	379,347	400,437	501,101	523,584	547,539	561,861	605,627	623,881
Primary Energy Supply (ktoe)																				
Coal	12,877	14,108	13,790	15,876	15,612	20,168	25,009	25,717	25,281	27,968	30,054	36,362	39,332	42,276	51,953	53,471	59,385	71,529	82,156	74,509
Oil	84,933	90,977	102,460	113,429	107,314	120,235	139,000	147,524	137,552	136,524	151,771	149,061	152,877	152,204	175,416	181,689	176,523	180,357	190,856	197,385
Gas	32,196	40,346	43,135	46,054	48,037	67,348	72,618	78,576	76,161	79,330	85,738	79,452	88,415	101,710	103,843	104,561	106,602	105,661	125,053	127,258
Hydro	2,862	2,854	3,128	3,227	3,618	3,927	4,133	3,618	3,681	4,259	4,360	4,713	4,627	4,627	4,614	4,711	5,283	5,536	6,000	6,216
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Geothermal	5,643	5,914	5,784	5,810	6,814	7,172	7,644	8,652	10,977	12,462	14,187	14,064	14,175	13,862	14,568	14,197	14,728	14,825	16,368	16,123
Solar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Wind	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	5	5	5	6
Biomass	21,178	20,486	20,634	19,788	19,836	22,664	22,364	22,324	22,375	22,047	22,043	22,009	22,184	22,460	90,940	97,861	99,922	100,905	102,757	103,879
Others	0	0	0	6	9	0	0	4	0	2	14	−5	−8	−5	80	145	311	270	280	396
Total	159,689	174,685	188,931	204,191	201,240	241,514	270,768	286,416	276,025	282,592	308,166	305,657	321,601	337,133	441,414	456,637	462,760	479,087	523,476	525,773
Final Energy Consumption by Sector (ktoe)																				
Industry	31,576	33,079	36,065	39,821	43,690	51,497	56,066	57,813	55,686	59,654	61,334	66,390	69,077	66,620	93,936	100,441	104,680	112,349	125,215	114,525
Transport	34,949	36,717	39,541	44,252	49,491	55,419	61,108	65,866	63,140	65,502	67,070	68,715	70,081	71,486	78,286	83,223	82,197	84,372	86,017	93,699
Residential	29,815	29,577	30,633	31,185	32,397	37,129	38,948	39,698	42,753	44,437	46,226	45,321	46,719	48,252	96,819	99,052	99,348	100,368	101,915	101,646
Commercial	2,685	3,557	4,018	4,582	4,726	5,436	6,047	6,440	5,056	5,303	5,868	6,570	9,125	9,313	13,560	12,710	13,422	16,404	16,584	16,865
Others	8,167	8,517	9,422	9,495	10,058	10,593	10,608	11,249	12,456	12,683	13,178	17,380	17,157	20,033	21,674	17,363	17,774	26,897	31,382	28,412
Total	107,192	111,447	119,678	129,335	140,361	160,074	172,777	181,067	179,090	187,580	193,677	204,376	212,160	215,704	304,275	312,790	317,422	340,390	361,113	355,147

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Table 7.7 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Final Energy Consumption by Type (ktoe)																				
Coal	5,089	6,188	6,471	7,215	8,478	8,999	9,906	10,282	9,498	10,408	10,807	14,275	15,884	16,836	21,850	22,854	27,235	31,948	41,563	30,683
Oil	65,053	67,199	73,387	80,349	87,160	97,430	105,830	111,561	110,299	114,397	118,526	120,931	124,770	122,913	138,789	140,154	134,988	149,113	152,461	152,559
Gas	7,167	7,436	7,833	8,726	9,275	10,978	12,532	12,193	11,905	12,904	13,810	16,895	17,325	19,370	24,081	21,926	23,421	24,567	29,203	32,159
Electricity	11,458	12,521	13,852	15,275	17,397	21,947	24,072	26,591	26,945	29,645	30,346	32,018	33,842	36,101	36,421	38,072	40,342	42,984	44,954	46,743
Heat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	33	0	0	0	0
Biomass	18,425	18,103	18,135	17,771	18,051	20,719	20,438	20,439	20,443	20,226	20,187	20,257	20,339	20,484	83,135	89,751	91,435	91,779	92,933	93,003
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	107,192	111,447	119,678	129,335	140,361	160,074	172,777	181,067	179,090	187,580	193,677	204,376	212,160	215,704	304,275	312,790	317,422	340,390	361,113	355,147
Power Generation (GWh)																				
Thermal	119,530	134,590	147,870	167,107	188,036	241,212	266,726	302,481	303,544	308,907	335,067	354,866	381,621	408,369	391,730	422,637	439,346	472,386	493,943	496,550
Hydro	33,277	33,182	36,368	37,523	42,072	45,661	48,054	42,072	42,793	49,530	50,690	54,801	53,807	53,786	53,655	54,775	61,505	64,376	69,764	72,276
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Geothermal	5,466	5,758	5,700	5,667	6,320	6,135	6,534	7,237	8,914	10,594	11,626	10,442	10,242	9,822	10,282	9,902	10,465	10,215	10,723	18,748
Solar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	1	1	13
Wind	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	17	53	58	61	64
Others	651	223	391	0	0	0	0	710	739	0	0	0	0	0	225	14,803	15,433	15,204	16,069	17,021
Total	158,924	173,753	190,329	210,297	236,429	293,008	321,314	352,500	355,990	369,031	397,383	420,110	445,671	471,978	455,892	502,136	526,804	562,239	590,561	604,673
Loss and Own Use of Electricity (GWh)																				
Transmission and Distribution Losses	4,631	4,141	5,187	5,447	5,990	7,363	7,570	7,653	7,105	7,359	8,031	7,306	7,435	8,252	39,032	40,071	42,516	50,816	43,379	36,607
Own Use	1,227	1,156	1,201	1,272	1,283	1,377	1,538	1,703	1,846	1,780	2,943	2,750	4,387	3,871	14,891	21,208	20,660	20,323	23,382	20,106
Total	5,858	5,297	6,388	6,719	7,273	8,740	9,108	9,356	8,951	9,139	10,974	10,055	11,822	12,123	53,923	61,280	63,176	71,138	66,762	56,713
Fuel Input for Power Generation (ktoe)																				
Coal	6,996	7,633	7,680	7,116	7,848	8,986	12,716	15,011	15,402	17,208	20,681	22,060	22,760	26,620	27,224	30,207	32,235	39,022	40,969	44,572
Oil	15,273	17,275	17,885	18,913	17,568	18,461	19,831	21,992	20,373	17,667	17,068	15,471	15,327	13,485	15,777	16,110	14,720	16,020	14,502	13,053
Gas	6,780	10,385	10,409	13,772	18,694	26,860	29,066	32,317	34,541	36,736	40,858	39,206	43,889	45,465	47,022	50,769	51,298	53,645	59,993	62,178
Total	29,049	35,293	35,974	39,801	44,111	54,307	61,613	69,321	70,316	71,611	78,607	76,737	81,976	85,569	90,023	97,086	98,253	108,687	115,464	119,802
CO_2 Emissions (kt C)																				
Coal	13,620	15,637	16,175	16,418	18,637	20,143	25,326	28,479	26,962	30,366	33,393	39,801	41,190	48,723	54,025	58,710	65,772	78,394	91,156	83,170
Oil	68,580	71,599	77,158	83,763	87,986	98,407	106,818	113,427	110,091	111,098	113,143	109,410	112,344	110,672	126,174	127,191	121,409	128,217	126,031	128,386
Gas	16,817	20,062	20,720	20,906	25,654	30,884	34,105	33,875	34,300	38,846	45,219	42,699	43,649	48,691	52,598	53,091	52,152	55,137	63,142	71,251
Total	99,017	107,298	114,053	121,087	132,277	149,434	166,249	175,781	171,354	180,310	191,754	191,910	197,183	208,086	232,798	238,992	239,332	261,749	280,329	282,808

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Table 7.7 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Macroeconomic Indicators																				
Population (thousand)	443,564	451,691	459,615	467,387	475,142	482,934	490,821	498,713	506,618	514,374	521,983	529,511	536,823	543,946	551,086	558,103	564,945	571,666	578,336	584,869
Urban Population, %	31.7	32.4	33.2	33.9	34.7	35.4	36.3	37.2	38.1	39.0	39.8	40.7	41.6	42.5	43.3	44.2	45.1	45.9	46.8	47.6
GDP (constant 2000 $ million)	369,256	394,121	420,082	454,079	490,750	530,571	569,617	594,755	551,295	572,568	608,323	622,189	652,635	689,735	735,910	778,907	827,623	883,361	920,544	930,713
GDP (current $ million)	340,228	383,684	432,891	491,885	560,807	652,320	731,269	699,990	489,098	555,569	608,323	587,846	652,708	727,728	815,033	910,137	1,086,201	1,297,922	1,504,137	1,509,612
GDP (constant 2005 PPP $ million)	1,038,757	1,110,610	1,185,021	1,280,202	1,381,899	1,495,482	1,605,641	1,673,227	1,543,458	1,598,443	1,694,438	1,741,241	1,828,387	1,934,308	2,060,074	2,180,891	2,315,378	2,469,558	2,582,951	2,625,209
GDP/capita (constant 2000 $)	851	892	935	972	1,033	1,099	1,161	1,193	1,088	1,113	1,165	1,175	1,216	1,268	1,335	1,396	1,465	1,545	1,592	1,591
GDP/capita (current $)	784	868	963	1,052	1,180	1,351	1,490	1,404	965	1,080	1,165	1,110	1,216	1,338	1,479	1,631	1,923	2,270	2,601	2,581
GDP – Manufacturing (% of GDP)	23.3	23.6	23.7	24.3	24.8	25.4	25.9	26.0	25.7	26.8	27.6	26.9	27.2	27.6	28.0	28.1	28.2	27.9	27.5	26.2
Car Ownership (car/1,000 persons)	23	23	24	26	28	30	34	36	37	38	39	41	46	49	47	49	51	53	56	57
Basic Energy Indicators																				
TPES/capita (toe/person)	0.37	0.40	0.42	0.45	0.43	0.50	0.55	0.57	0.54	0.55	0.59	0.58	0.60	0.62	0.80	0.82	0.82	0.84	0.91	0.90
TFEC/capita (toe/person)	0.25	0.25	0.27	0.28	0.30	0.33	0.35	0.36	0.35	0.36	0.37	0.39	0.40	0.40	0.55	0.56	0.56	0.60	0.62	0.61
TPES/GDP (toe/constant 2000 $ million)	432	443	450	452	412	455	475	482	501	494	507	491	493	489	600	586	559	542	569	565
TFEC/GDP (toe/constant 2000 $ million)	290	283	285	286	287	302	303	304	325	328	318	328	325	313	413	402	384	385	392	382
Import Dependency (%)	–42.7	–43.5	–37.0	–30.2	–37.7	–28.8	–22.2	–19.9	–26.7	–26.9	–21.7	–17.4	–18.0	–18.8	–13.5	–14.7	–18.3	–17.3	–15.7	–18.7
Oil Import Dependency (%)	–35.2	–37.6	–20.5	–8.8	–16.9	–6.0	7.0	11.8	4.4	6.9	11.6	14.7	16.7	16.1	22.0	27.6	26.4	30.5	28.3	32.1
Electricity/capita (kWh/person)	307	330	358	389	436	529	570	620	619	670	676	703	733	772	769	793	830	874	904	929
CO_2 Intensity (t C/constant 2000 $ million)	268	272	272	267	270	282	292	296	311	315	315	308	302	302	316	307	289	296	305	304
CO_2/capita (t C)	0.22	0.24	0.25	0.26	0.28	0.31	0.34	0.35	0.34	0.35	0.37	0.36	0.37	0.38	0.42	0.43	0.42	0.46	0.48	0.48
CO_2/TPES (t C/toe)	0.62	0.61	0.60	0.59	0.66	0.62	0.61	0.61	0.62	0.64	0.62	0.63	0.61	0.62	0.53	0.52	0.52	0.55	0.54	0.54

CO_2 = carbon dioxide, GDP = gross domestic product, GWh = gigawatt-hour, kt C = thousand tons of carbon equivalent, ktoe = thousand tons of oil equivalent, kWh = kilowatt-hour, PPP = purchasing power parity, t C = ton of carbon equivalent, TFEC = total final energy consumption, toe = ton of oil equivalent, TPES = total primary energy supply.

Note: Figures may not add up to total because of rounding.

Sources: ADB (2011), APERC (APEC Energy Database), APERC estimates, JAMA (2012), Lao PDR Ministry of Energy and Mines (unpublished), and World Bank.

7.1 Brunei Darussalam

Country Profile (2009)		Energy Reserves (year-end 2008)	
Total Surface Area (square kilometer)	5,770	Coal (million ton) - Recoverable	–
Population (thousand)	392	Gas (trillion cubic feet) - Proven	12.4
GDP (constant 2000 $ billion)	6.7	Oil (billion barrel) - Proven	1,200.0
Electrification Rate (%)	99.7		

– = no data or not applicable, GDP = gross domestic product.

Sources: ADB (2012), IEA (2011c), World Bank, and WEC (2010).

2009 Energy Supply and Demand Flow (ktoe)

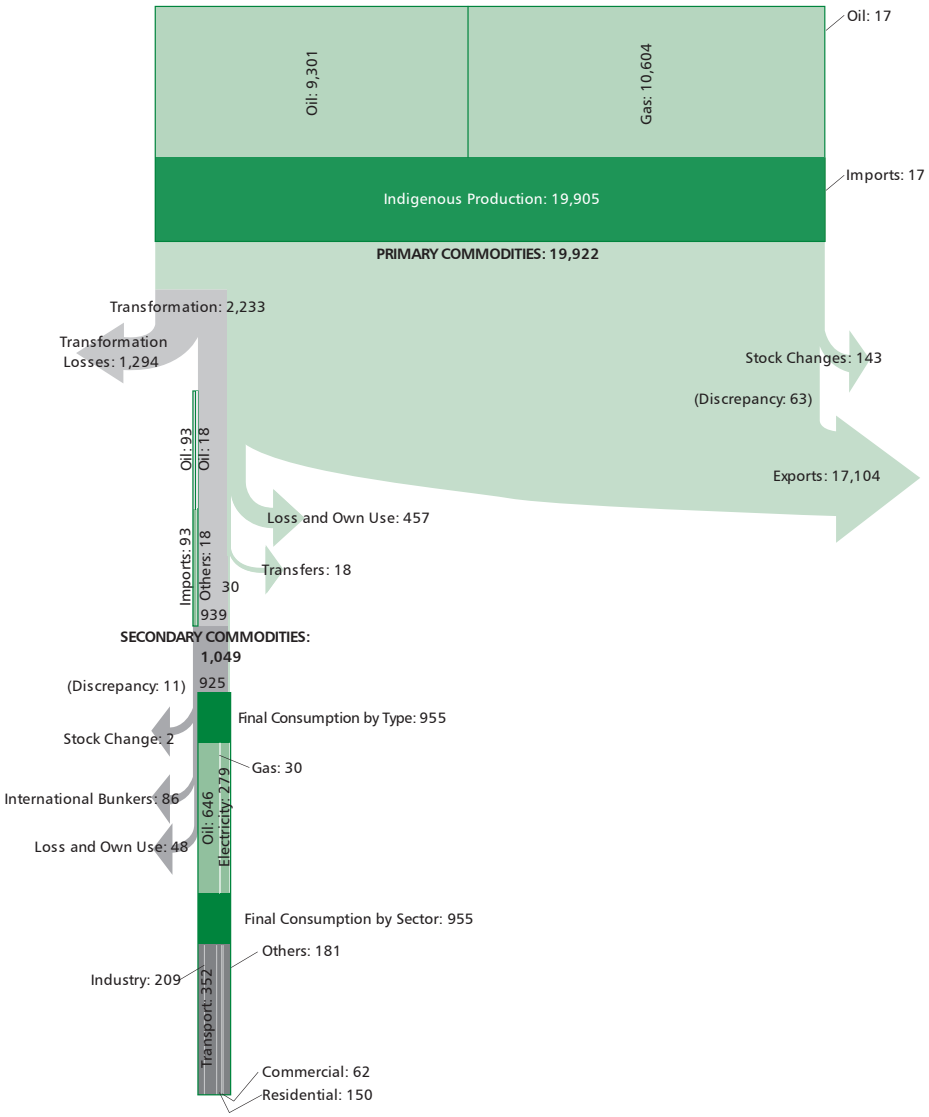


Table 7.1.1 Key Data and Economic Profile

	1990	1995	2000	2005	2009
Socioeconomic Data					
Population (thousand)	252	290	327	363	392
GDP (constant 2000 $ billion)	4.8	5.6	6.0	6.6	6.7
GDP (constant 2005 PPP $ billion)	12.7	14.8	15.9	17.6	17.7
GDP/capita (constant 2000 $)	19,075	19,396	18,350	18,312	17,092
GDP/capita (constant 2005 PPP $)	50,393	51,240	48,478	48,377	45,156

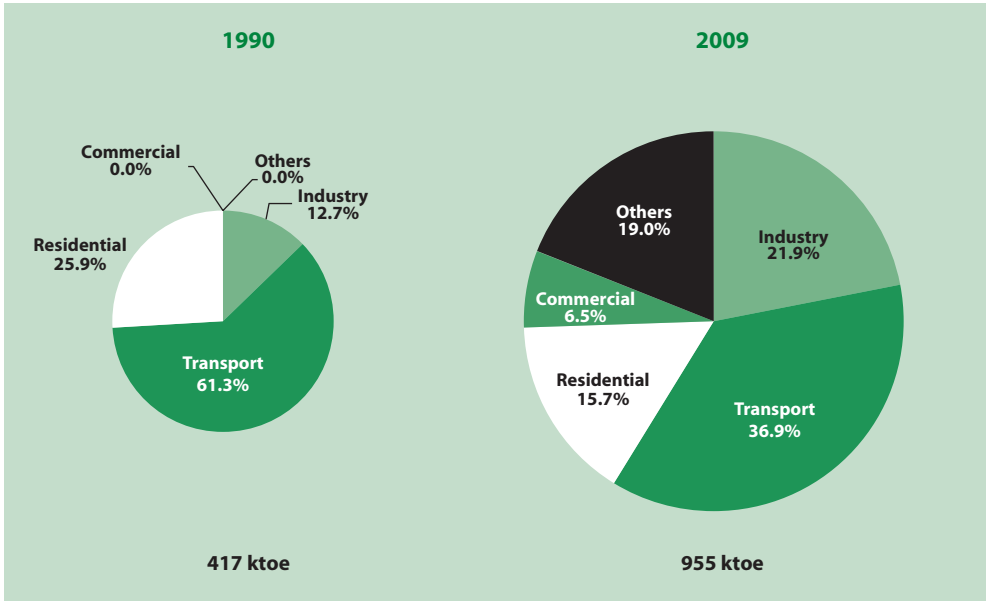
GDP = gross domestic product, PPP = purchasing power parity.
Source: World Bank.

Table 7.1.2 Energy Supply and Demand

	1990	1995	2000	2005	2009
Primary Energy Supply (ktoe)					
Indigenous Production	15,259	17,395	17,411	21,630	19,905
Net Imports	–13,188	–14,683	–14,710	–19,507	–17,226
Total PES	2,071	2,712	2,701	2,123	2,679
Coal	0	0	0	0	0
Oil	38	574	588	536	811
Gas	2,033	2,138	2,113	1,587	1,868
Biomass	0	0	0	0	0
Others	0	0	0	0	0
TPES/capita (toe)	8.22	9.36	8.26	5.85	6.84
TPES/GDP (toe/constant 2005 PPP $ million)	163	183	170	121	151
Final Energy Consumption (ktoe)					
Industry	53	109	91	96	209
Transportation	255	330	324	219	352
Other Sectors	108	194	220	263	393
Total FEC	417	632	636	577	955
Coal	0	0	0	0	0
Oil	309	451	401	300	646
Gas	25	33	22	13	30
Electricity	82	149	213	264	279
Biomass	0	0	0	0	0
Others	0	0	0	0	0

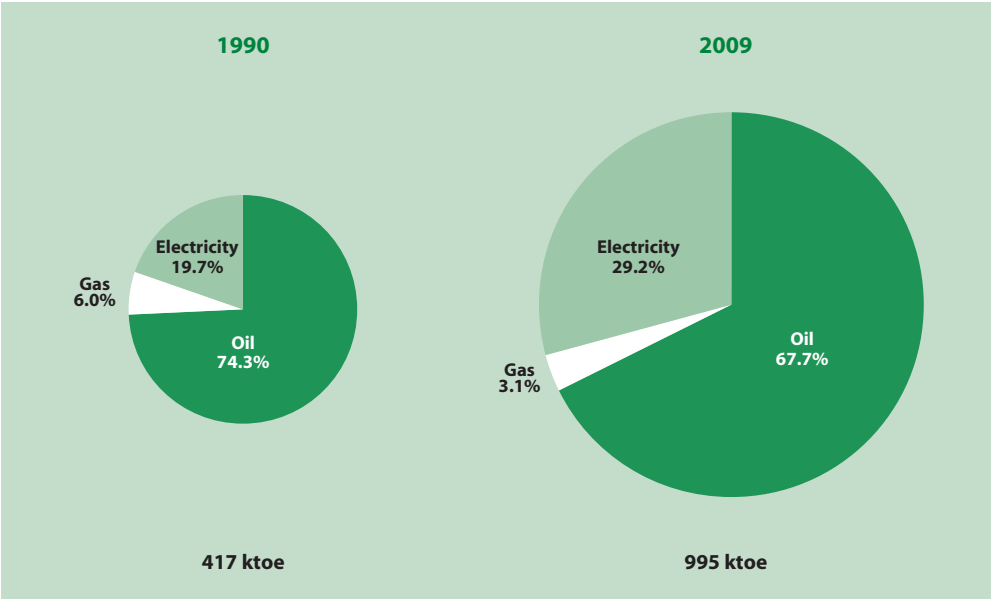
FEC = final energy consumption, GDP = gross domestic product, ktoe = thousand tons of oil equivalent, PES = primary energy supply, PPP = purchasing power parity, toe = ton of oil equivalent, TPES = total primary energy supply.
Source: APERC (APEC Energy Database).

Figure 7.1.1 Final Energy Consumption by Sector, 1990 and 2009



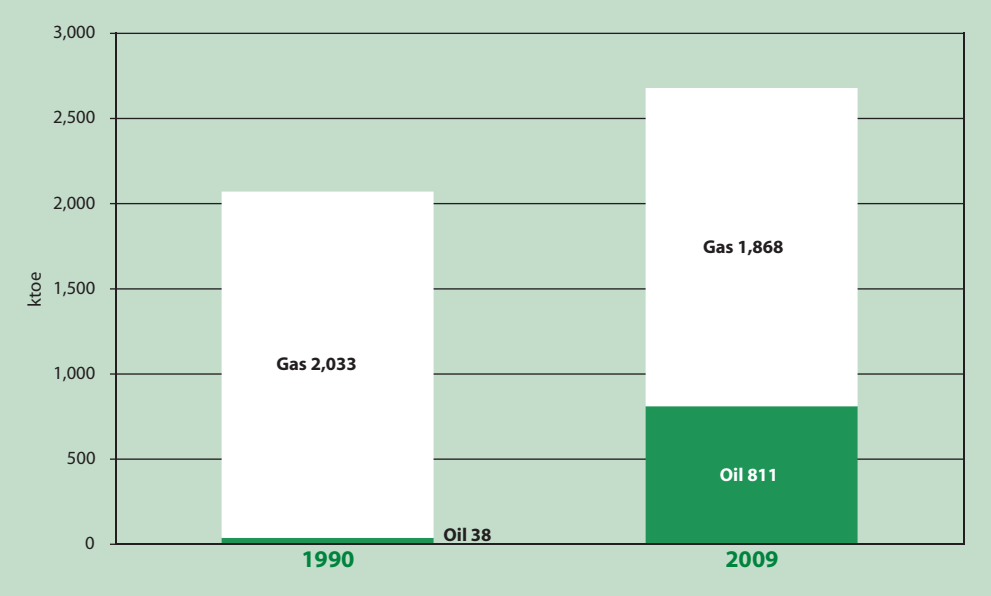
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 7.1.2 Final Energy Consumption by Type of Energy, 1990 and 2009



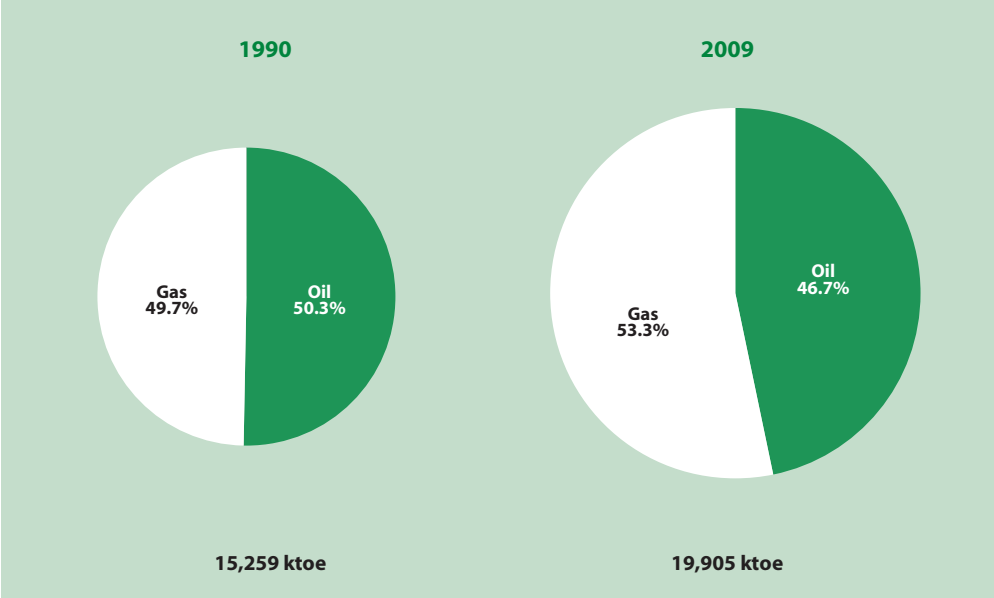
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 7.1.3 Total Primary Energy Supply, 1990 and 2009



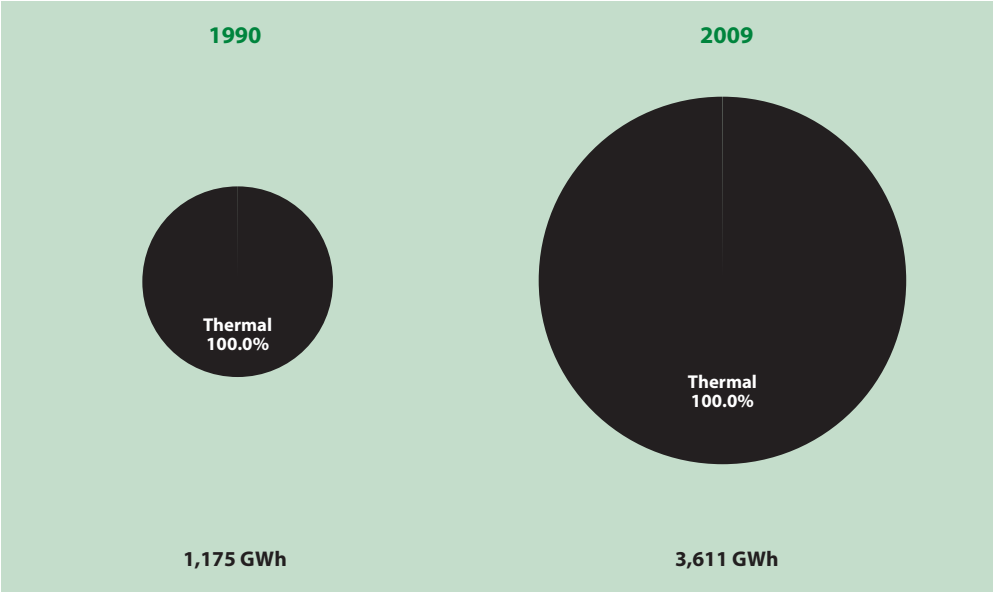
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 7.1.4 Indigenous Energy Production, 1990 and 2009



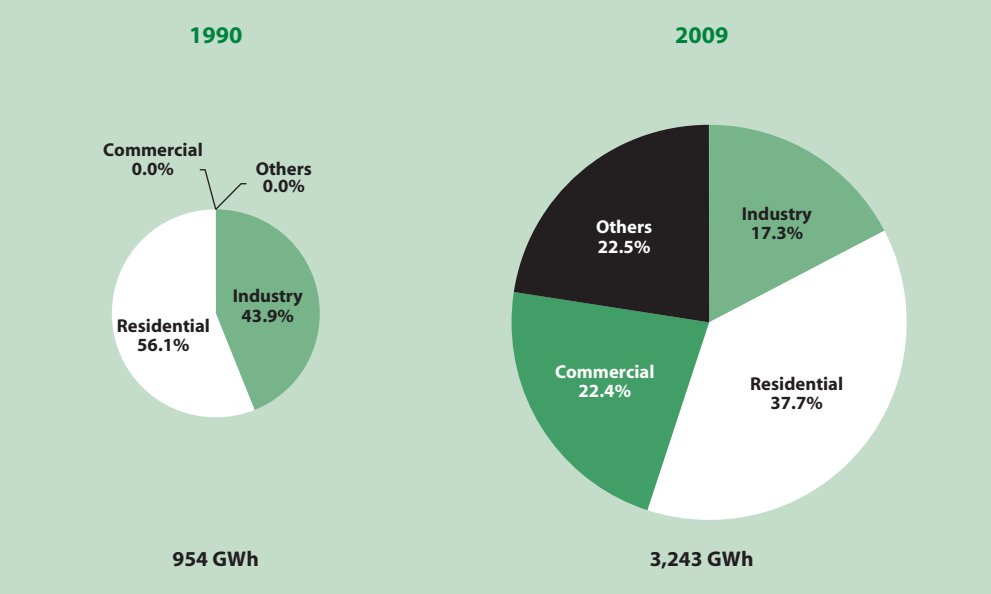
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 7.1.5 Electricity Generation by Plant Type, 1990 and 2009



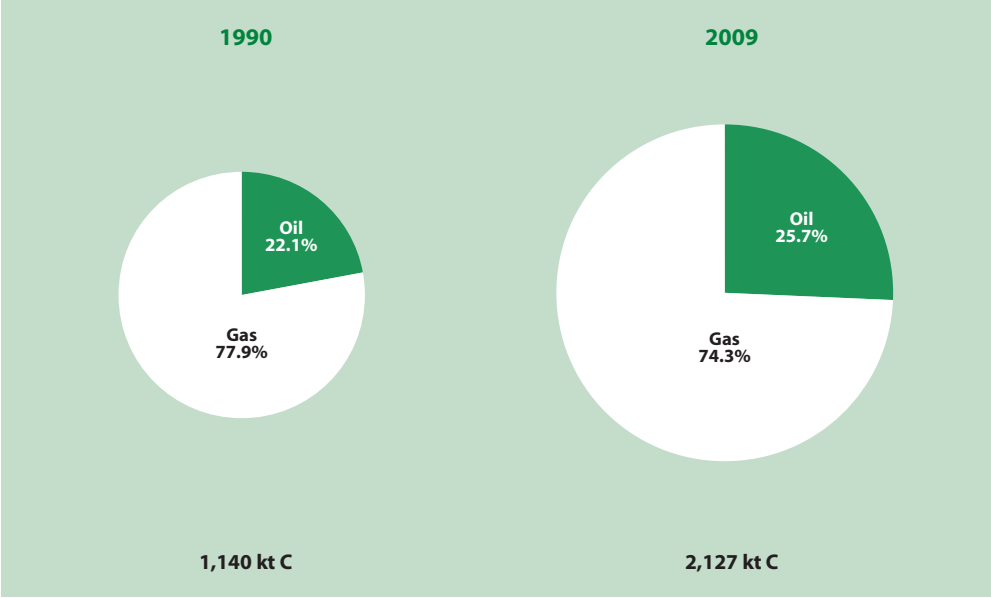
GWh = gigawatt-hour.
Source: APERC (APEC Energy Database).

Figure 7.1.6 Electricity Consumption by Sector, 1990 and 2009



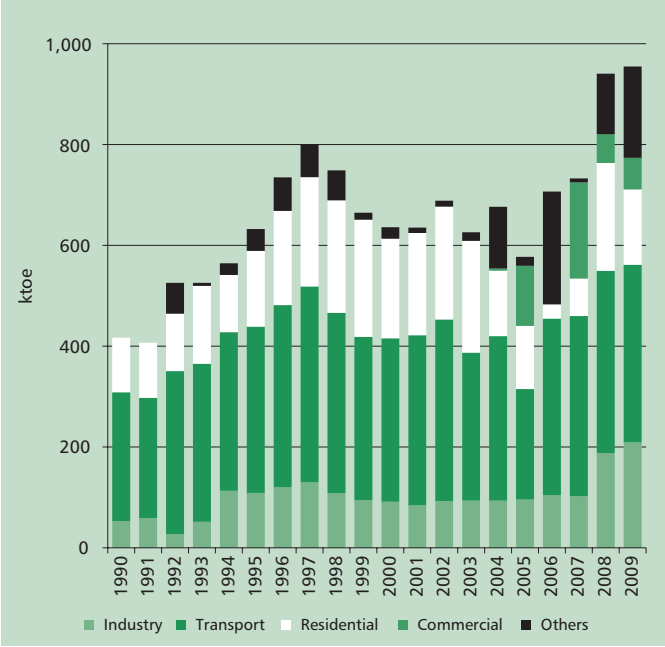
GWh = gigawatt-hour.
Source: APERC (APEC Energy Database).

Figure 7.1.7 Carbon Dioxide Emissions from Fuel Combustion, 1990 and 2009



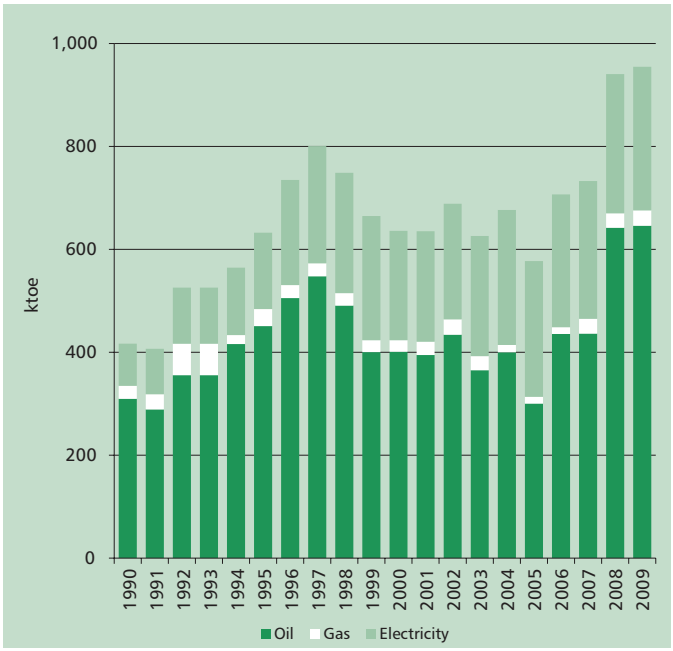
kt C = thousand tons of carbon equivalent.
Source: APERC estimates.

Figure 7.1.8 Final Energy Consumption by Sector, 1990–2009



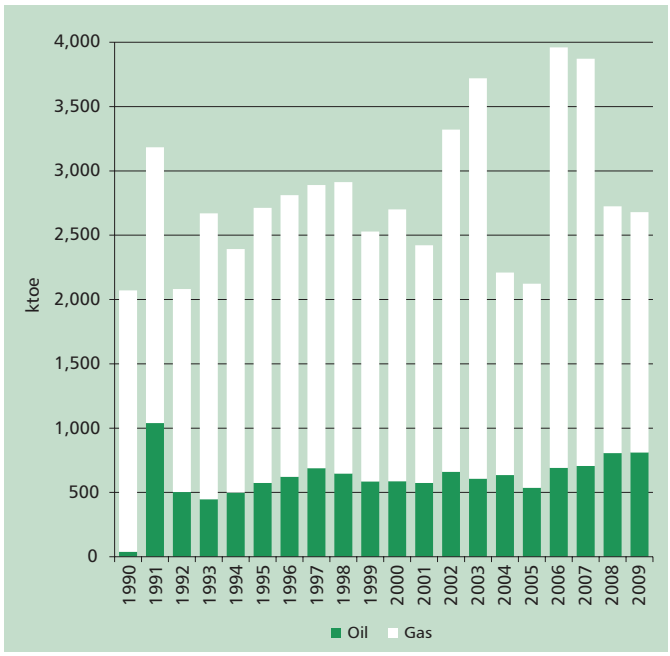
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 7.1.9 Final Energy Consumption by Type, 1990–2009



ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 7.1.10 Total Primary Energy Supply, 1990–2009

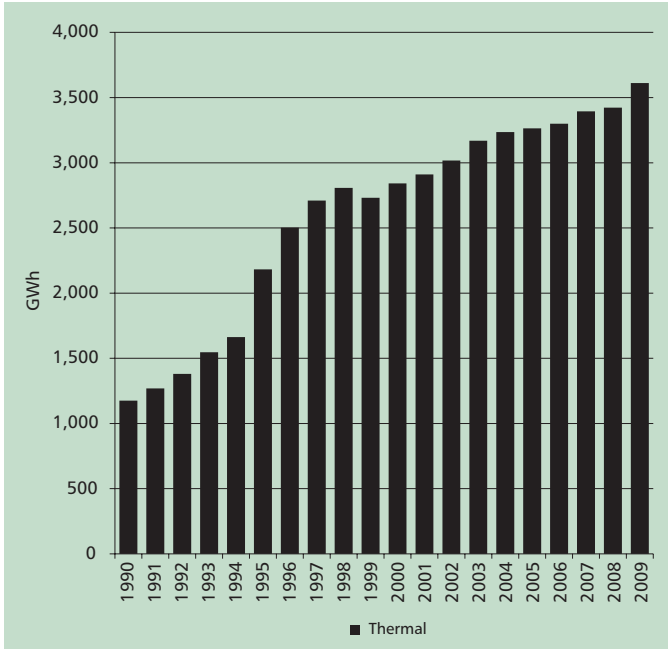


ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 7.1.11 Indigenous Energy Production, 1990–2009

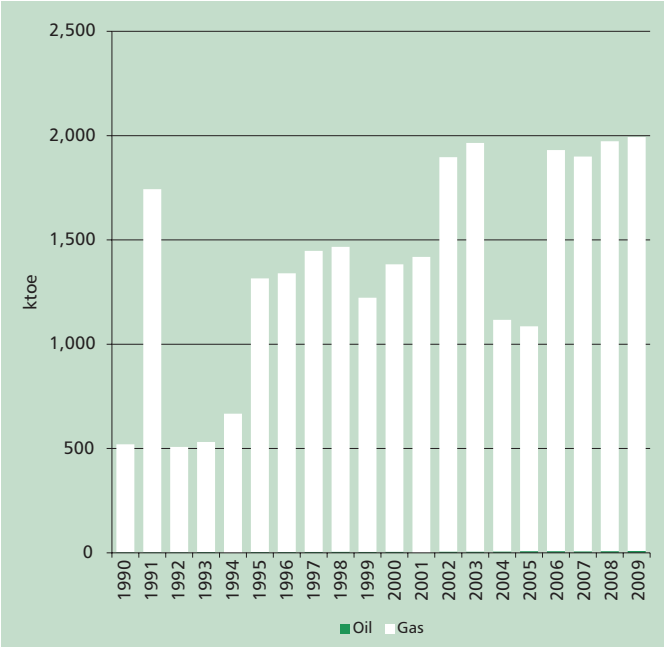
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 7.1.12 Electricity Generation by Source, 1990–2009



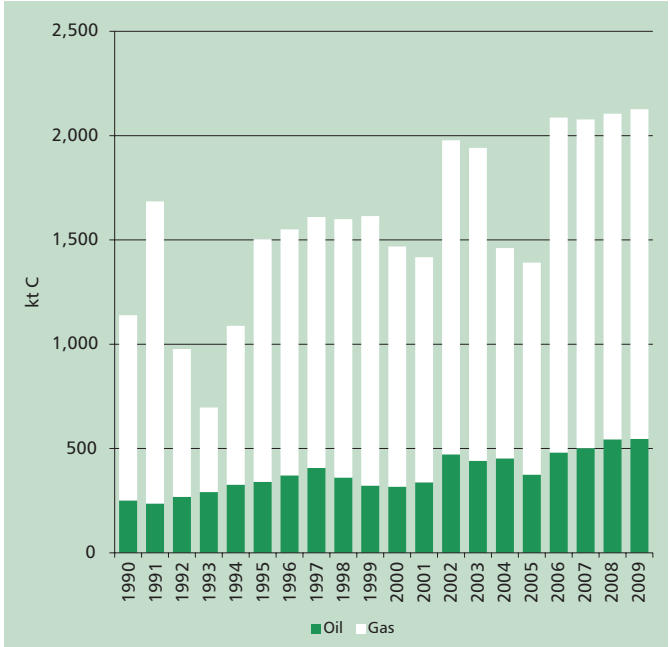
GWh = gigawatt-hour.
Source: APERC (APEC Energy Database).

Figure 7.1.13 Fuel Input for Electricity Generation, 1990–2009



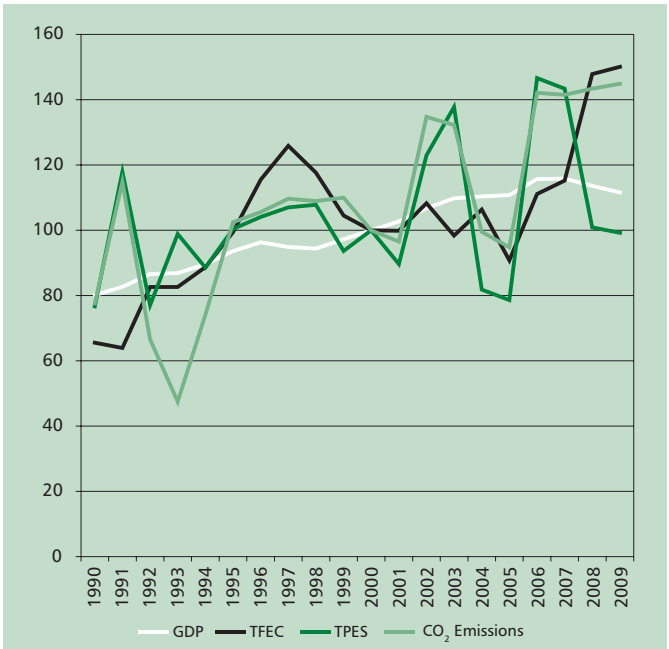
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 7.1.14 Carbon Dioxide Emissions from Fuel Combustion, 1990–2009



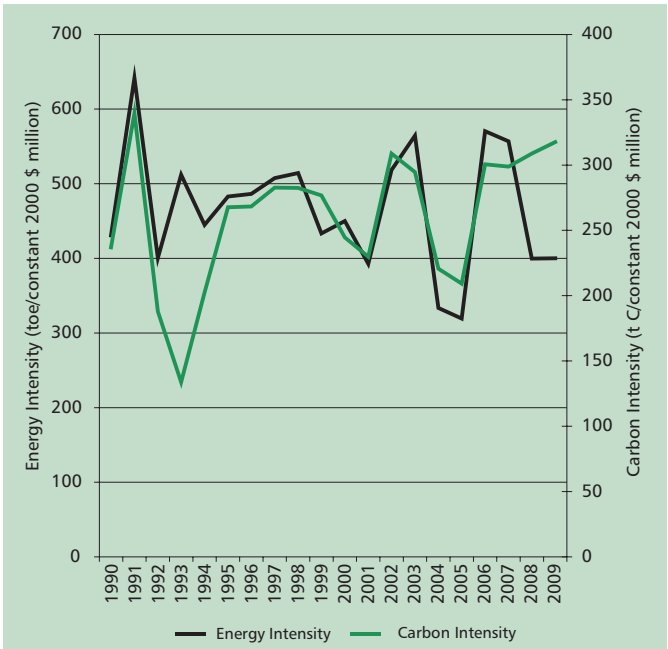
kt C = thousand tons of carbon equivalent.
Source: APERC (APEC Energy Database).

Figure 7.1.15 Growth of GDP, TFEC, TPES, and CO_2 (indexed to year 2000), 1990–2009



CO_2=carbon dioxide, GDP=gross domestic product, TFEC=total final energy consumption, TPES = total primary energy supply.
Note: Indices are measured relative to the base year 2000 (2000 = 100).
Source: APERC estimates.

Figure 7.1.16 Energy and Carbon Intensities, 1990–2009



t C = ton of carbon equivalent , toe = ton of oil equivalent.
Source: APERC estimates.

Table 7.1.3 Brunei Darussalam Energy Balance Table, 2006

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	0	0	11,222	0	0	0	0	0	0	0	11,816	0	0	0	0	0	0	0	0	0	23,038
2.	Imports	0	0	0	13	0	0	0	0	0	13	0	0	0	0	0	0	0	0	0	0	13
3.	Exports	0	0	–10,536	0	0	0	0	0	0	0	–8,537	0	0	0	0	0	0	0	0	0	–19,073
4.	International Bunkers	0	0	0	–78	0	0	0	0	0	–78	0	0	0	0	0	0	0	0	0	0	–78
5.	Stock Changes	0	0	77	–7	–2	0	–6	0	0	1	–10	0	0	0	0	0	0	0	0	0	60
6.	Total Primary Energy Supply	0	0	763	–72	–2	0	–6	0	0	–64	3,269	0	0	0	0	0	0	0	0	0	3,960
7.	Transfers	0	0	–15	15	0	4	0	0	15	–4	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	0	0	–735	631	222	0	185	102	0	121	–2,002	0	0	0	0	0	0	0	284	0	–1,823
8.1	Power Generation	0	0	0	–8	0	0	–8	0	0	0	–1,923	0	0	0	0	0	0	0	284	0	–1,647
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	–80	0	0	0	0	0	0	0	0	0	–80
8.3	Refineries	0	0	–735	639	222	0	193	102	0	121	0	0	0	0	0	0	0	0	0	0	–96
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	0	0	0	–155	–2	0	–10	–102	0	–40	–571	0	0	0	0	0	0	0	–26	0	–751
10.	Discrepancy	0	0	–13	16	1	0	16	0	–1	0	–682	0	0	0	0	0	0	0	0	0	–679
11.	Total Final Energy Consumption	0	0	0	436	220	4	185	0	14	14	13	0	0	0	0	0	0	0	258	0	707
12.	Industry Sector	0	0	0	56	0	3	53	0	0	0	0	0	0	0	0	0	0	0	48	0	104
13.	Transport Sector	0	0	0	350	220	0	131	0	0	0	0	0	0	0	0	0	0	0	0	0	350
14.	Other Sectors	0	0	0	15	0	1	0	0	14	0	13	0	0	0	0	0	0	0	210	0	238
14.1	Residential and Commercial	0	0	0	15	0	1	0	0	14	0	13	0	0	0	0	0	0	0	0	0	28
14.1.1	Commerce and Public Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14.1.2	Residential	0	0	0	15	0	1	0	0	14	0	13	0	0	0	0	0	0	0	0	0	28
14.2	Non–Specified Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	210	0	210
15.	Non–Energy Use	0	0	0	14	0	0	0	0	0	14	0	0	0	0	0	0	0	0	0	0	14
16.	Electricity Output (GWh)	0	0	24	0	0	0	0	0	0	0	3,275	0	0	0	0	0	0	0	0	0	3,299
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.
Note: Figures may not add up to total because of rounding.
Source: APERC (APEC Energy Database).

Table 7.1.4 Brunei Darussalam Energy Balance Table, 2007

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	0	0	9,440	0	0	0	0	0	0	0	11,394	0	0	0	0	0	0	0	0	0	20,834
2.	Imports	0	0	0	8	0	0	0	0	0	8	0	0	0	0	0	0	0	0	0	0	8
3.	Exports	0	0	–8,704	0	0	0	0	0	0	0	–8,240	0	0	0	0	0	0	0	0	0	–16,944
4.	International Bunkers	0	0	0	–77	0	0	0	0	0	–77	0	0	0	0	0	0	0	0	0	0	–77
5.	Stock Changes	0	0	40	–1	–2	0	0	0	0	1	12	0	0	0	0	0	0	0	0	0	51
6.	Total Primary Energy Supply	0	0	776	–70	–2	0	0	0	0	–68	3,166	0	0	0	0	0	0	0	0	0	3,872
7.	Transfers	0	0	–16	16	0	4	0	0	16	–4	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	0	0	–696	644	217	0	180	92	0	155	–1,984	0	0	0	0	0	0	0	292	0	–1,745
8.1	Power Generation	0	0	0	–8	0	0	–8	0	0	0	–1,893	0	0	0	0	0	0	0	292	0	–1,608
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	–92	0	0	0	0	0	0	0	0	0	–92
8.3	Refineries	0	0	–696	652	217	0	188	92	0	155	0	0	0	0	0	0	0	0	0	0	–45
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	0	0	0	–176	–2	0	–8	–92	0	–74	–539	0	0	0	0	0	0	0	–24	0	–740
10.	Discrepancy	0	0	–63	23	1	0	23	0	–1	–1	–614	0	0	0	0	0	0	0	0	0	–655
11.	Total Final Energy Consumption	0	0	0	436	214	4	196	0	15	8	29	0	0	0	0	0	0	0	268	0	733
12.	Industry Sector	0	0	0	54	0	3	52	0	0	0	0	0	0	0	0	0	0	0	48	0	102
13.	Transport Sector	0	0	0	357	214	0	144	0	0	0	0	0	0	0	0	0	0	0	0	0	357
14.	Other Sectors	0	0	0	17	0	1	0	0	15	0	29	0	0	0	0	0	0	0	220	0	265
14.1	Residential and Commercial	0	0	0	17	0	1	0	0	15	0	29	0	0	0	0	0	0	0	220	0	265
14.1.1	Commerce and Public Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	191	0	191
14.1.2	Residential	0	0	0	17	0	1	0	0	15	0	29	0	0	0	0	0	0	0	29	0	74
14.2	Non-Specified Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15.	Non-Energy Use	0	0	0	8	0	0	0	0	0	8	0	0	0	0	0	0	0	0	0	0	8
16.	Electricity Output (GWh)	0	0	33	0	0	0	0	0	0	0	3,362	0	0	0	0	0	0	0	0	0	3,395
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Source: APERC (APEC Energy Database).

Table 7.1.5 Brunei Darussalam Energy Balance Table, 2008

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	0	0	9,710	0	0	0	0	0	0	0	11,291	0	0	0	0	0	0	0	0	0	21,001
2.	Imports	0	0	17	48	12	0	26	0	0	10	0	0	0	0	0	0	0	0	0	0	65
3.	Exports	0	0	–8,770	0	0	0	0	0	0	0	–9,390	0	0	0	0	0	0	0	0	0	–18,160
4.	International Bunkers	0	0	0	–90	0	0	0	0	0	–90	0	0	0	0	0	0	0	0	0	0	–90
5.	Stock Changes	0	0	–111	4	5	0	0	0	0	–2	16	0	0	0	0	0	0	0	0	0	–91
6.	Total Primary Energy Supply	0	0	845	–38	17	0	27	0	0	–82	1,918	0	0	0	0	0	0	0	0	0	2,724
7.	Transfers	0	0	–17	17	0	0	0	0	17	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	0	0	–804	661	206	0	176	83	0	196	–1,443	0	0	0	0	0	0	0	294	0	–1,292
8.1	Power Generation	0	0	0	–8	0	0	–8	0	0	0	–1,966	0	0	0	0	0	0	0	294	0	–1,679
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	522	0	0	0	0	0	0	0	0	0	522
8.3	Refineries	0	0	–804	669	206	0	184	83	0	196	0	0	0	0	0	0	0	0	0	0	–135
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	0	0	0	–19	–1	–1	–1	0	0	–17	–443	0	0	0	0	0	0	0	–24	0	–486
10.	Discrepancy	0	0	–23	21	3	4	1	0	0	12	–3	0	0	0	0	0	0	0	0	0	–6
11.	Total Final Energy Consumption	0	0	0	642	225	3	204	83	18	109	28	0	0	0	0	0	0	0	270	0	940
12.	Industry Sector	0	0	0	141	0	2	67	0	0	72	0	0	0	0	0	0	0	0	47	0	188
13.	Transport Sector	0	0	0	362	225	0	137	0	0	0	0	0	0	0	0	0	0	0	0	0	362
14.	Other Sectors	0	0	0	135	0	1	0	83	18	33	28	0	0	0	0	0	0	0	224	0	387
14.1	Residential and Commercial	0	0	0	19	0	1	0	0	18	0	28	0	0	0	0	0	0	0	224	0	271
14.1.1	Commerce and Public Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	57	0	57
14.1.2	Residential	0	0	0	19	0	1	0	0	18	0	28	0	0	0	0	0	0	0	166	0	214
14.2	Non-Specified Others	0	0	0	116	0	0	0	83	0	33	0	0	0	0	0	0	0	0	0	0	116
15.	Non-Energy Use	0	0	0	4	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	4
16.	Electricity Output (GWh)	0	0	0	0	0	0	0	0	0	0	3,423	0	0	0	0	0	0	0	0	0	3,423
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.
Note: Figures may not add up to total because of rounding.
Source: APERC (APEC Energy Database).

Table 7.1.6 Brunei Darussalam Energy Balance Table, 2009

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	0	0	9,301	0	0	0	0	0	0	0	10,604	0	0	0	0	0	0	0	0	0	19,905
2.	Imports	0	0	17	93	22	0	61	0	0	10	0	0	0	0	0	0	0	0	0	0	109
3.	Exports	0	0	–8,369	0	0	0	0	0	0	0	–8,735	0	0	0	0	0	0	0	0	0	–17,104
4.	International Bunkers	0	0	0	–86	0	0	0	0	0	–86	0	0	0	0	0	0	0	0	0	0	–86
5.	Stock Changes	0	0	–143	–2	–3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–145
6.	Total Primary Energy Supply	0	0	806	5	19	0	61	0	0	–76	1,868	0	0	0	0	0	0	0	0	0	2,679
7.	Transfers	0	0	–18	18	0	0	0	0	18	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	0	0	–769	628	197	0	160	79	0	192	–1,464	0	0	0	0	0	0	0	311	0	–1,294
8.1	Power Generation	0	0	0	–9	0	0	–9	0	0	0	–1,985	0	0	0	0	0	0	0	311	0	–1,682
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	521	0	0	0	0	0	0	0	0	0	521
8.3	Refineries	0	0	–769	637	197	0	169	79	0	192	0	0	0	0	0	0	0	0	0	0	–132
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	0	0	0	–16	0	0	0	0	0	–16	–457	0	0	0	0	0	0	0	–32	0	–504
10.	Discrepancy	0	0	–19	11	9	3	–8	0	0	8	82	0	0	0	0	0	0	0	0	0	74
11.	Total Final Energy Consumption	0	0	0	646	225	3	213	79	18	108	30	0	0	0	0	0	0	0	279	0	955
12.	Industry Sector	0	0	0	161	0	3	86	0	0	72	0	0	0	0	0	0	0	0	48	0	209
13.	Transport Sector	0	0	0	352	225	0	127	0	0	0	0	0	0	0	0	0	0	0	0	0	352
14.	Other Sectors	0	0	0	130	0	0	0	79	18	33	26	0	0	0	0	0	0	0	231	0	387
14.1	Residential and Commercial	0	0	0	18	0	0	0	0	18	0	26	0	0	0	0	0	0	0	168	0	212
14.1.1	Commerce and Public Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	62	0	62
14.1.2	Residential	0	0	0	18	0	0	0	0	18	0	26	0	0	0	0	0	0	0	105	0	150
14.2	Non–Specified Others	0	0	0	112	0	0	0	79	0	33	0	0	0	0	0	0	0	0	63	0	175
15.	Non–Energy Use	0	0	0	3	0	0	0	0	0	3	3	0	0	0	0	0	0	0	0	0	7
16.	Electricity Output (GWh)	0	0	0	0	0	0	0	0	0	0	3,611	0	0	0	0	0	0	0	0	0	3,611
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Source: APERC (APEC Energy Database).

Table 7.1.7 Brunei Darussalam Summary Table, 1990–2009

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Indigenous Production (ktoe)																				
Coal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Oil	7,677	9,031	8,892	8,535	8,676	8,465	8,027	7,912	7,664	8,386	9,006	9,072	10,124	10,296	10,741	10,487	11,222	9,440	9,710	9,301
Gas	7,583	7,778	7,893	7,927	8,210	8,931	8,861	8,862	8,573	8,101	8,405	8,448	10,644	11,479	11,401	11,143	11,816	11,394	11,291	10,604
Hydro	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Geothermal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Solar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wind	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Biomass	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	15,259	16,808	16,785	16,463	16,886	17,395	16,889	16,774	16,238	16,486	17,411	17,519	20,769	21,774	22,142	21,630	23,038	20,834	21,001	19,905
Primary Energy Supply (ktoe)																				
Coal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Oil	38	1,040	503	447	499	574	621	688	648	586	588	574	661	607	636	536	691	706	806	811
Gas	2,033	2,144	1,579	2,222	1,893	2,138	2,190	2,202	2,265	1,943	2,113	1,847	2,660	3,113	1,574	1,587	3,269	3,166	1,918	1,868
Hydro	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Geothermal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Solar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wind	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Biomass	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	2,071	3,184	2,081	2,669	2,392	2,712	2,811	2,890	2,912	2,529	2,701	2,422	3,320	3,720	2,210	2,123	3,960	3,872	2,724	2,679
Final Energy Consumption by Sector (ktoe)																				
Industry	53	59	27	52	113	109	120	130	108	94	91	84	93	94	93	96	104	102	188	209
Transport	255	238	323	314	314	330	361	389	358	324	324	337	360	293	326	219	350	357	362	352
Residential	108	109	114	155	113	150	187	217	223	233	198	203	224	222	130	126	28	74	214	150
Commercial	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	119	0	191	57	62
Others	0	0	61	6	23	43	66	66	59	14	23	11	12	17	123	18	224	8	120	181
Total	417	407	526	526	564	632	735	801	748	665	636	635	689	626	676	577	707	733	940	955

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Table 7.1.7 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Final Energy Consumption by Type (ktoe)																				
Coal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Oil	309	289	355	355	416	451	505	548	491	400	401	395	434	365	400	300	436	436	642	646
Gas	25	30	61	61	17	33	26	25	24	23	22	26	30	27	14	13	13	29	28	30
Electricity	82	88	109	109	131	149	204	228	234	241	213	214	225	233	262	264	258	268	270	279
Heat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Biomass	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	417	407	526	526	564	632	735	801	748	665	636	635	689	626	676	577	707	733	940	955
Power Generation (GWh)																				
Thermal	1,175	1,269	1,380	1,547	1,663	2,182	2,502	2,710	2,807	2,731	2,842	2,910	3,017	3,169	3,236	3,264	3,299	3,395	3,423	3,611
Hydro	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Geothermal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Solar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wind	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	1,175	1,269	1,380	1,547	1,663	2,182	2,502	2,710	2,807	2,731	2,842	2,910	3,017	3,169	3,236	3,264	3,299	3,395	3,423	3,611
Loss and Own Use of Electricity (GWh)																				
Transmission and Distribution Losses	–	–	–	–	–	–	–	–	–	–	–	–	–	–	121	130	298	280	278	368
Own Use	–	–	–	–	–	–	–	–	–	–	–	–	–	–	65	65	–	–	–	–
Total	–	–	–	–	–	–	–	–	–	–	–	–	–	–	186	195	298	280	278	368
Fuel Input for Power Generation (ktoe)																				
Coal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Oil	3	3	3	4	0	4	4	5	5	4	5	0	6	6	7	8	8	8	8	9
Gas	517	1,740	505	527	667	1,312	1,336	1,443	1,462	1,219	1,378	1,419	1,891	1,959	1,110	1,078	1,923	1,893	1,966	1,985
Total	520	1,743	508	531	667	1,316	1,340	1,448	1,467	1,223	1,383	1,419	1,897	1,965	1,117	1,086	1,931	1,900	1,974	1,993
CO_2 Emissions (kt C)																				
Coal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Oil	251	236	268	291	327	340	371	407	361	323	317	338	472	441	453	375	481	502	544	546
Gas	888	1,449	708	406	762	1,164	1,179	1,203	1,239	1,292	1,151	1,079	1,506	1,500	1,008	1,017	1,606	1,576	1,561	1,581
Total	1,140	1,685	977	697	1,089	1,504	1,551	1,610	1,600	1,615	1,468	1,417	1,978	1,942	1,461	1,392	2,087	2,078	2,105	2,127

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Table 7.1.7 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Macroeconomic Indicators																				
Population (thousand)	252	259	267	274	282	290	297	305	312	320	327	334	342	349	356	363	370	378	385	392
Urban Population, %	65.8	66.4	66.9	67.5	68.0	68.6	69.1	69.6	70.1	70.6	71.1	71.6	72.1	72.5	73.0	73.5	73.9	74.4	74.8	75.3
GDP (constant 2000 $ million)	4,809	4,961	5,197	5,212	5,376	5,617	5,779	5,694	5,662	5,835	6,001	6,166	6,405	6,591	6,624	6,649	6,942	6,953	6,818	6,697
GDP (current $ million)	3,521	3,702	4,184	4,106	4,087	4,734	5,116	5,197	4,051	4,600	6,001	5,601	5,843	6,557	7,872	9,531	11,471	12,248	14,393	10,732
GDP (constant 2005 PPP $ million)	12,705	13,105	13,729	13,771	14,204	14,840	15,267	15,042	14,958	15,415	15,854	16,289	16,920	17,411	17,499	17,567	18,339	18,368	18,012	17,694
GDP/capita (constant 2000 $)	19,075	19,126	19,478	18,998	19,065	19,396	19,445	18,685	18,135	18,254	18,350	18,441	18,750	18,897	18,609	18,312	18,746	18,417	17,723	17,092
GDP/capita (current $)	13,964	14,272	15,681	14,964	14,494	16,346	17,213	17,056	12,975	14,391	18,350	16,752	17,107	18,801	22,117	26,248	30,975	32,443	37,414	27,390
GDP - Manufacturing (% of GDP)	14.0	14 .1	13.5	13.2	13.8	14.5	14.1	14.3	15 .4	15 .3	15 .4	15.0	15 .4	15 .4	15 .2	14.8	14.3	13.8	14.5	–
Car Ownership (car/1,000 persons)	477	496	454	529	545	544	562	399	347	490	555	588	621	656	693	733	776	821	869	921
Basic Energy Indicators																				
TPES/capita (toe/person)	8.22	12.28	7.80	9.73	8.48	9.36	9.46	9.48	9.33	7.91	8.26	7.24	9.72	10.67	6.21	5.85	10.69	10.26	7.08	6.84
TFEC/capita (toe/person)	1.65	1.57	1.97	1.92	2.00	2.18	2.47	2.63	2.40	2.08	1.94	1.90	2.02	1.79	1.90	1.59	1.91	1.94	2.44	2.44
TPES/GDP (toe/constant 2000 $ million)	431	642	401	512	445	483	486	508	514	433	450	393	518	564	334	319	570	557	400	400
TFEC/GDP (toe/constant 2000 $ million)	87	82	101	101	105	113	127	141	132	114	106	103	108	95	102	87	102	105	138	143
Import Dependency (%)	–636.7	–427.9	–706.5	–516.7	–605.9	–541.4	–500.8	–480.4	–457.6	–551.9	–544.7	–623.4	–525.5	–485.3	–902.0	–918.8	–481.8	–438.0	–670.9	–642.9
Oil Import Dependency (%)	–19,954.1	–768.4	–1,668.9	–1,807.8	–1,637.1	–1,374.6	–1,191.8	–1,049.6	–1,083.3	–1,330.5	–1,432.4	–1,479.6	–1,432.0	–1,595.6	–1,589.5	–1,856.6	–1,523.0	–1,237.5	–1,103.9	–1,047.1
Electricity/capita (kWh/ person)	3,784	3,960	4,751	4,620	5,403	5,969	7,984	8,686	8,702	8,776	7,563	7,458	7,646	7,782	8,572	8,452	8,104	8,252	8,177	8,278
CO_2 Intensity (t C/constant 2000 $ million)	237	340	188	134	202	268	268	283	283	277	245	230	309	295	221	209	301	299	309	318
CO_2/capita (t C)	4.52	6.50	3.66	2.54	3.86	5.19	5.22	5.28	5.12	5.05	4.49	4.24	5.79	5.57	4.11	3.83	5.63	5.50	5.47	5.43
CO_2/TPES (t C/toe)	0.55	0.53	0.47	0.26	0.46	0.55	0.55	0.56	0.55	0.64	0.54	0.59	0.60	0.52	0.66	0.66	0.53	0.54	0.77	0.79

– = no data or not applicable, CO_2 = carbon dioxide, GDP = gross domestic product, GWh = gigawatt-hour, kt C = thousand tons of carbon equivalent, ktoe = thousand tons of oil equivalent, kWh = kilowatt-hour, PPP = purchasing power parity, t C = ton of carbon equivalent, TFEC = total final energy consumption, toe = ton of oil equivalent, TPES = total primary energy supply.

Note: Figures may not add up to total because of rounding.

Sources: APERC (APEC Energy Database), APERC estimates, JAMA (2012), and World Bank.

7.2 Cambodia

Country Profile (2009)		Energy Reserves (year-end 2008)	
Total Surface Area (square kilometer)	181,040	Coal (million ton) - Recoverable	–
Population (thousand)	13,978	Gas (trillion cubic feet) - Proven	–
GDP (constant 2000 $ billion)	7.4	Oil (billion barrel) - Proven	–
Electrification Rate (%)	24.0		

– = no data or not applicable, GDP = gross domestic product.

Sources: ADB (2012), IEA (2011c), and World Bank.

2009 Energy Supply and Demand Flow (ktoe)

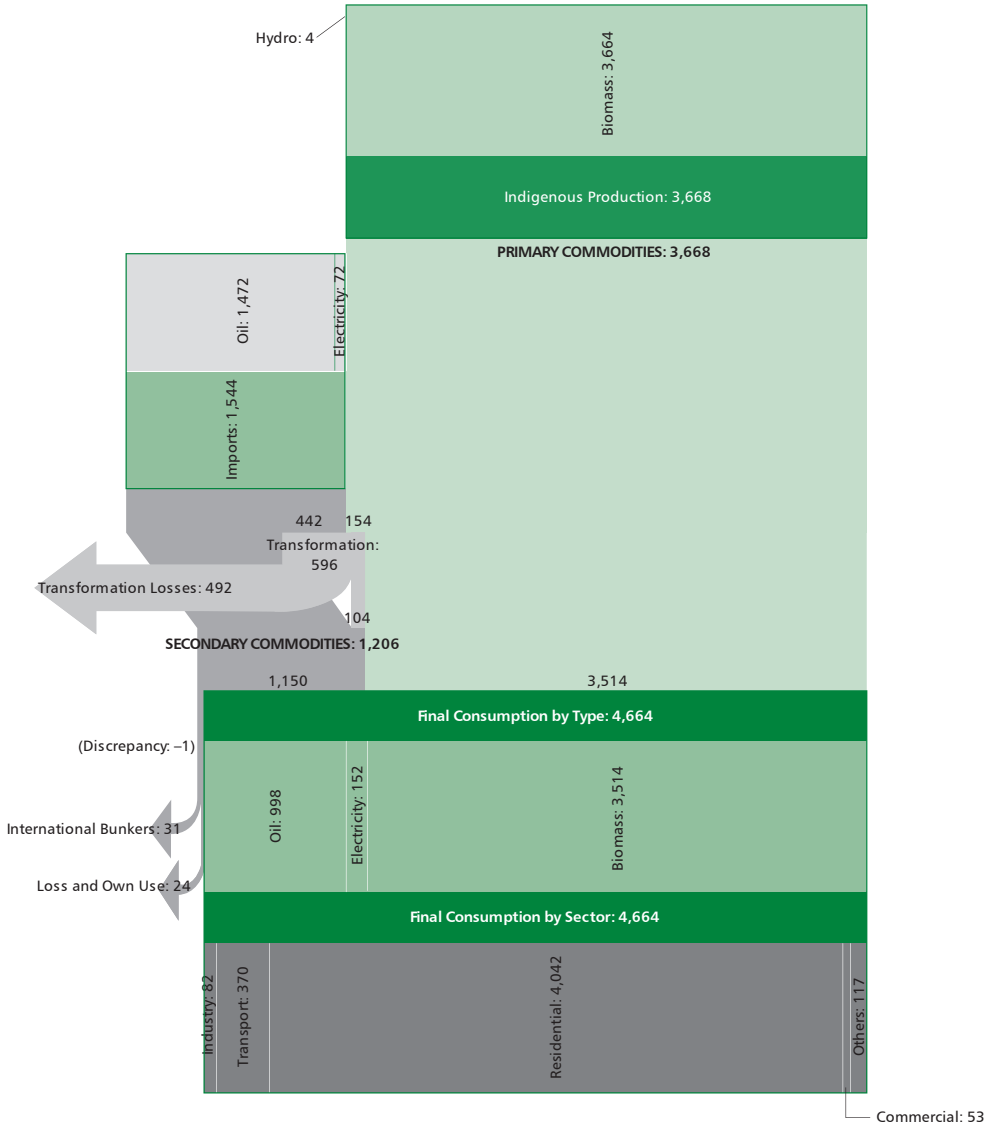


Table 7.2.1 Key Data and Economic Profile

	1990	1995	2000	2005	2009
Socioeconomic Data					
Population (thousand)	9,532	11,169	12,447	13,358	13,978
GDP (constant 2000 $ billion)	–	2.6	3.7	5.7	7.4
GDP (constant 2005 PPP $ billion)	–	9.1	12.9	20.1	26.3
GDP/capita (constant 2000 $)	–	230	294	428	533
GDP/capita (constant 2005 PPP $)	–	811	1,035	1,508	1,879

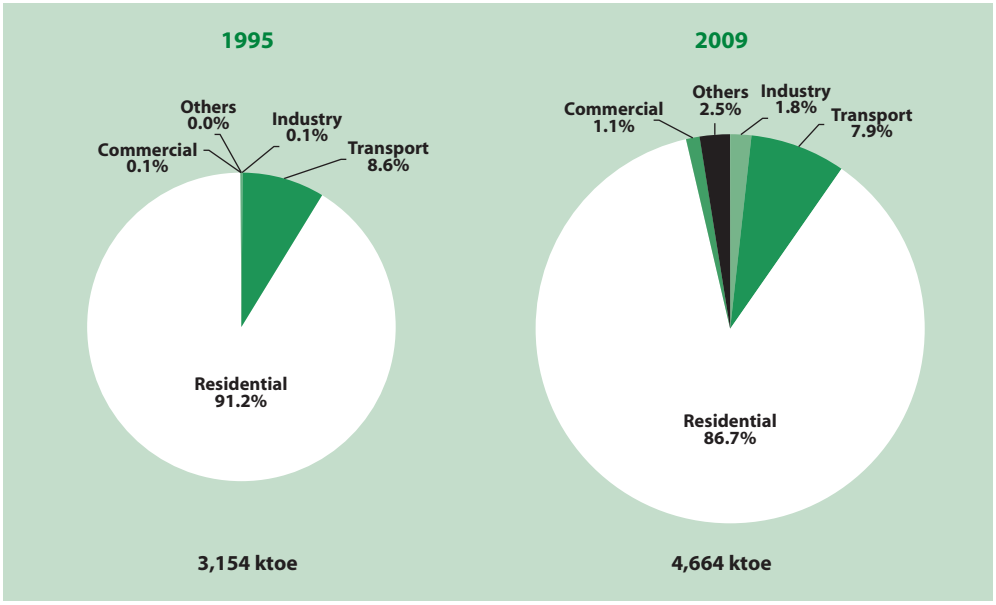
– = no data available; GDP = gross domestic product, PPP = purchasing power parity.
Source: World Bank.

Table 7.2.2 Energy Supply and Demand

	1990	1995	2000	2005	2009
Primary Energy Supply (ktoe)					
Indigenous Production	–	2,901	3,203	3,479	3,668
Net Imports	–	472	776	1,277	1,513
Total PES	–	3,373	3,979	4,756	5,181
Coal	–	0	0	0	0
Oil	–	472	776	1,270	1,441
Gas	–	0	0	0	0
Biomass	–	2,901	3,203	3,475	3,664
Others	–	0	0	11	76
TPES/capita (toe)	–	0.30	0.32	0.36	0.37
TPES/GDP (toe/constant 2005 PPP $ million)	–	372	309	236	197
Final Energy Consumption (ktoe)					
Industry	–	4	30	51	82
Transportation	–	272	287	420	370
Other Sectors	–	2,878	3,348	3,852	4,212
Total FEC	–	3,154	3,665	4,323	4,664
Coal	–	0	0	0	0
Oil	–	357	557	921	998
Gas	–	0	0	0	0
Electricity	–	10	31	64	152
Biomass	–	2,787	3,077	3,338	3,514
Others	–	0	0	0	0

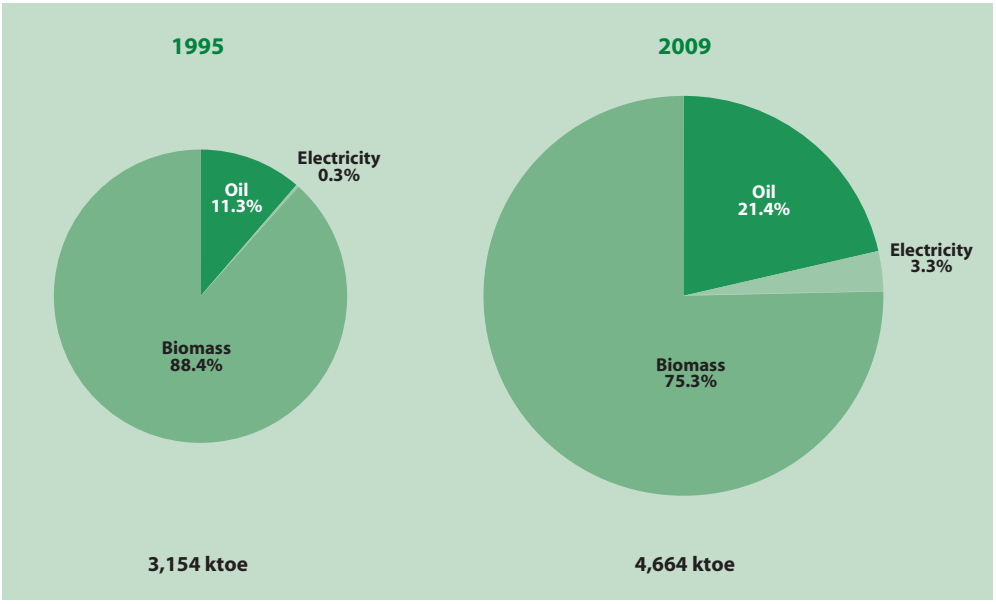
– = no data or not applicable, FEC = final energy consumption, GDP = gross domestic product, ktoe = thousand tons of oil equivalent, PES = primary energy supply, PPP = purchasing power parity, toe = ton of oil equivalent, TPES = total primary energy supply.
Source: IEA (2011b).

Figure 7.2.1 Final Energy Consumption by Sector, 1995 and 2009



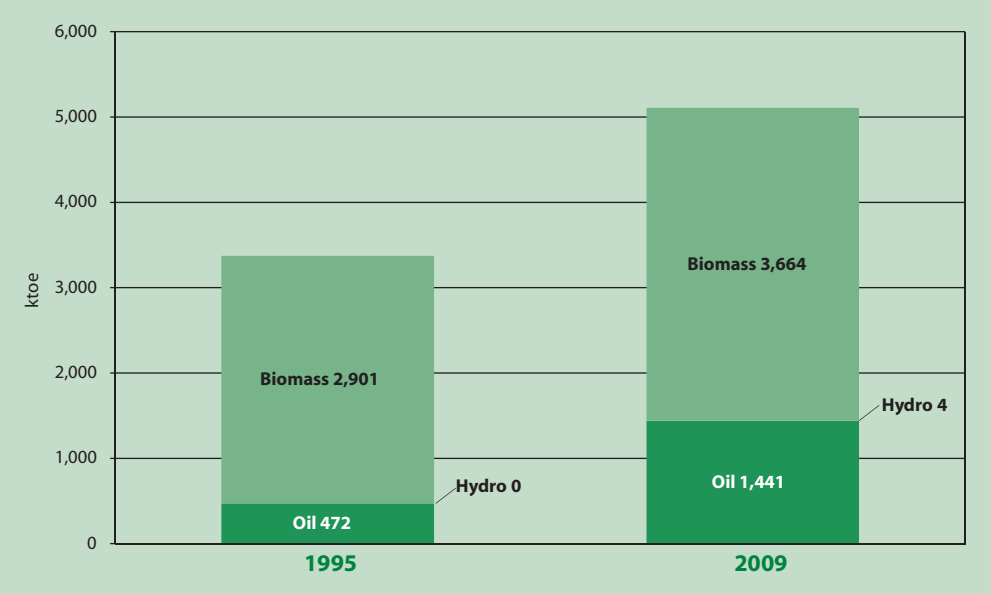
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 7.2.2 Final Energy Consumption by Type of Energy, 1995 and 2009



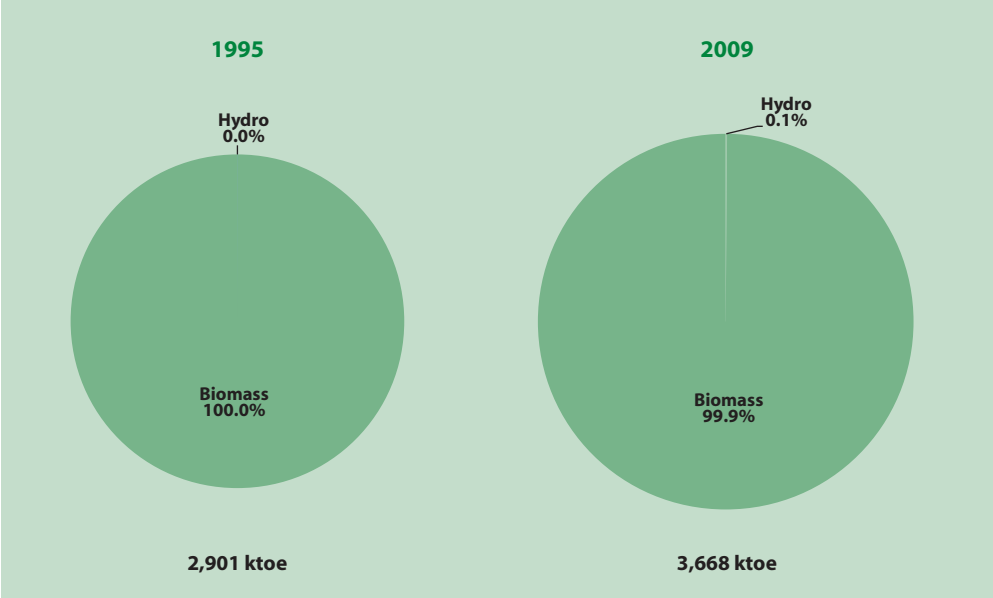
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 7.2.3 Total Primary Energy Supply, 1995 and 2009



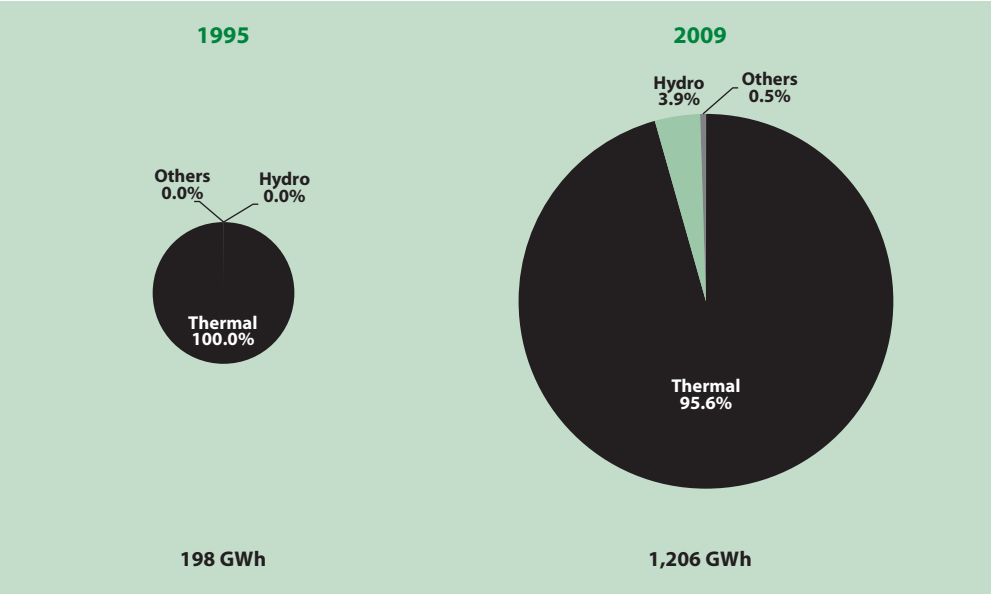
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 7.2.4 Indigenous Energy Production, 1995 and 2009



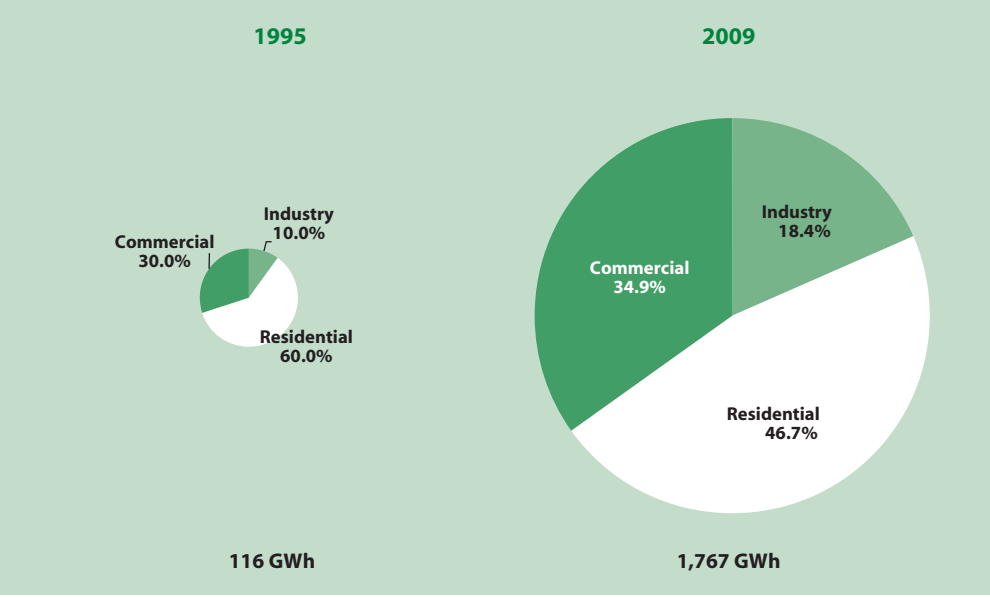
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 7.2.5 Electricity Generation by Plant Type, 1995 and 2009



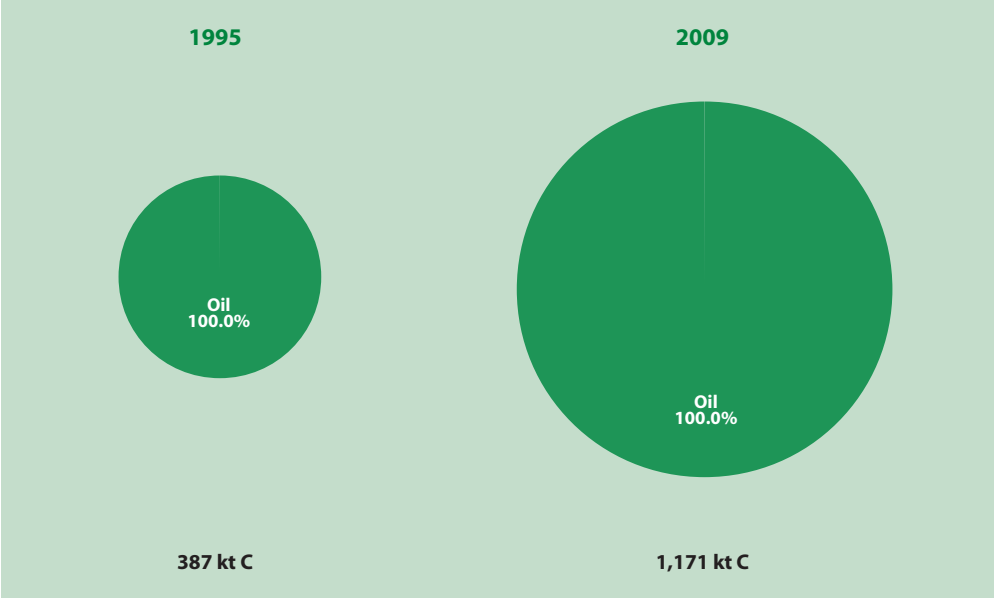
GWh = gigawatt-hour.
Source: IEA (2011b).

Figure 7.2.6 Electricity Consumption by Sector, 1995 and 2009



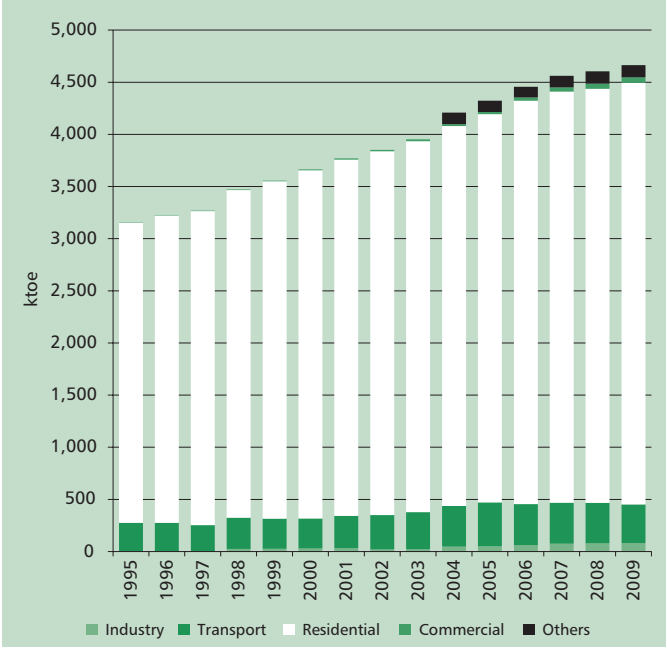
GWh = gigawatt-hour.
Source: IEA (2011b).

Figure 7.2.7 Carbon Dioxide Emissions from Fuel Combustion, 1995 and 2009



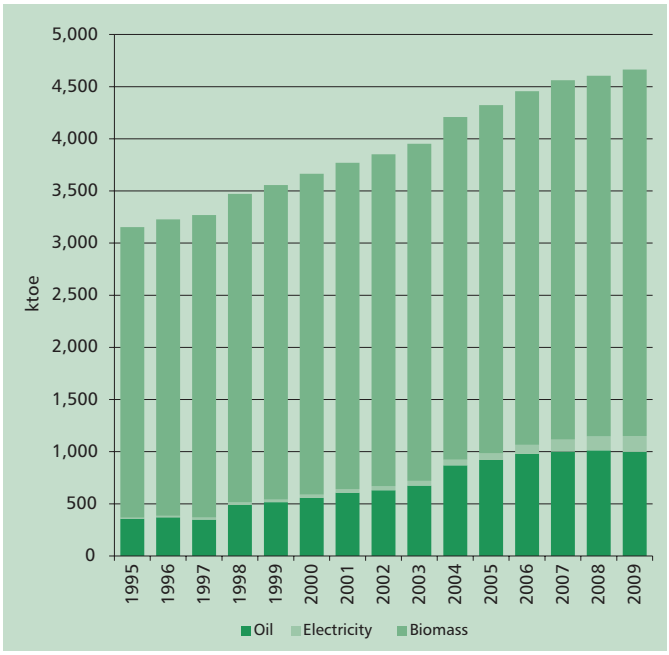
kt C = thousand tons of carbon equivalent.
Source: APERC estimates.

Figure 7.2.8 Final Energy Consumption by Sector, 1995–2009



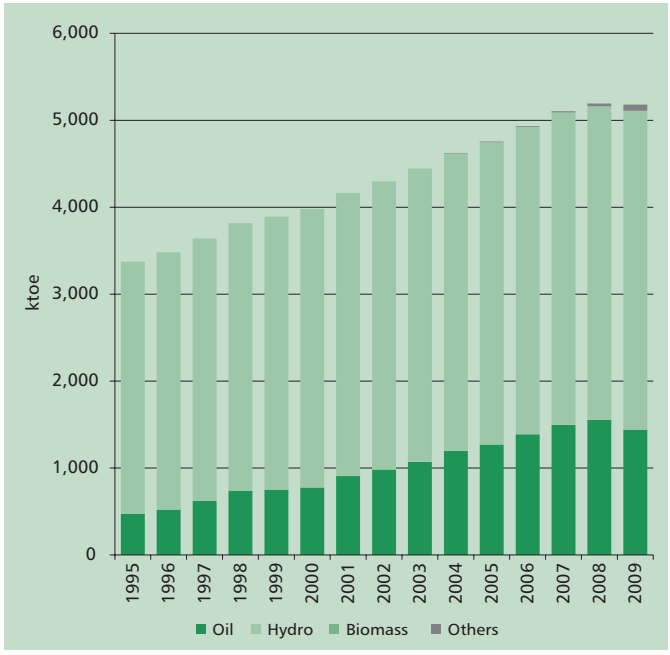
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 7.2.9 Final Energy Consumption by Type, 1995–2009



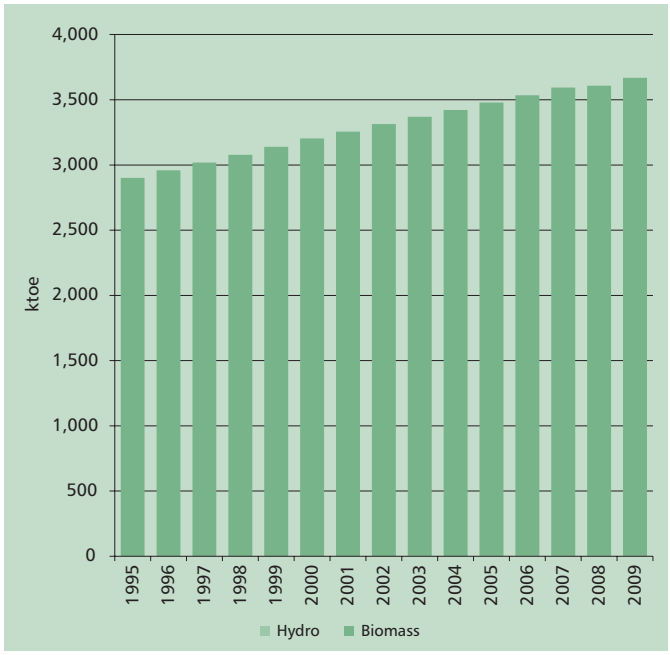
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 7.2.10 Total Primary Energy Supply, 1995–2009



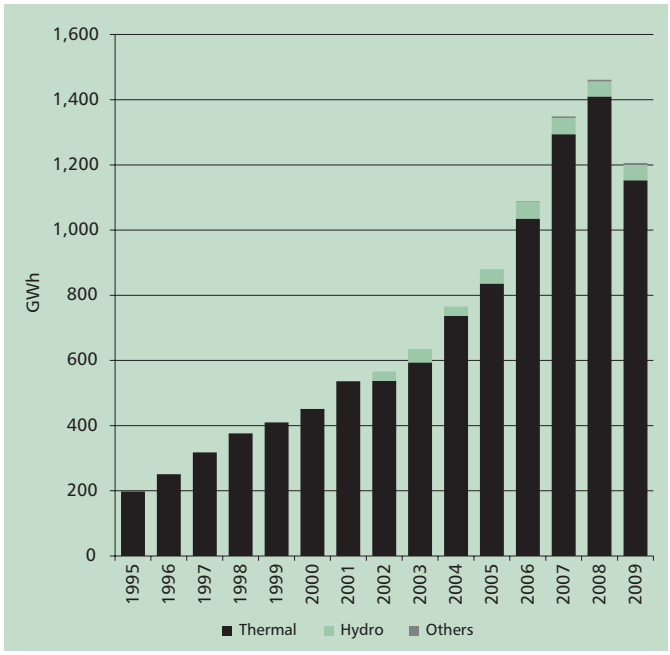
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 7.2.11 Indigenous Energy Production, 1995–2009



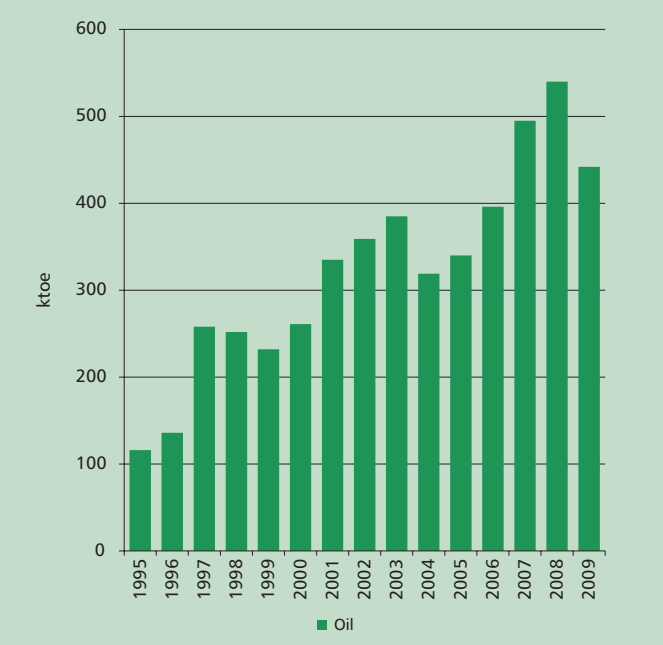
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 7.2.12 Electricity Generation by Source, 1995–2009



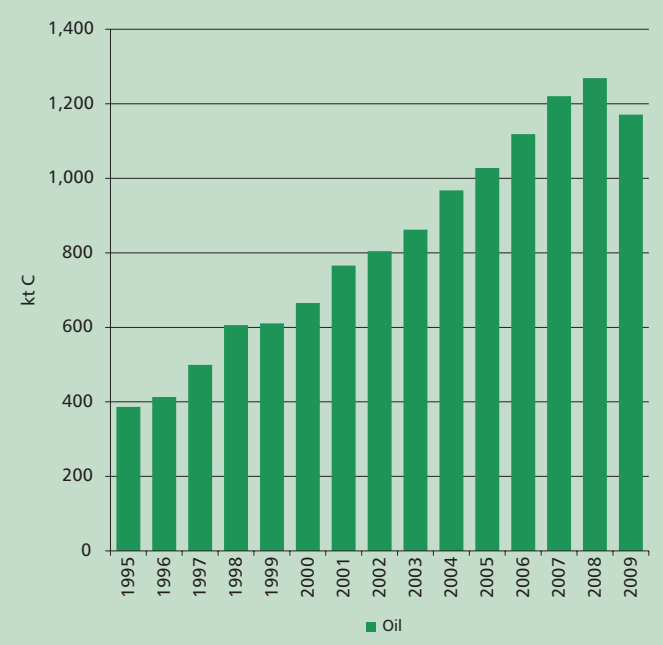
GWh = gigawatt-hour.
Source: IEA (2011b).

Figure 7.2.13 Fuel Input for Electricity Generation, 1995–2009



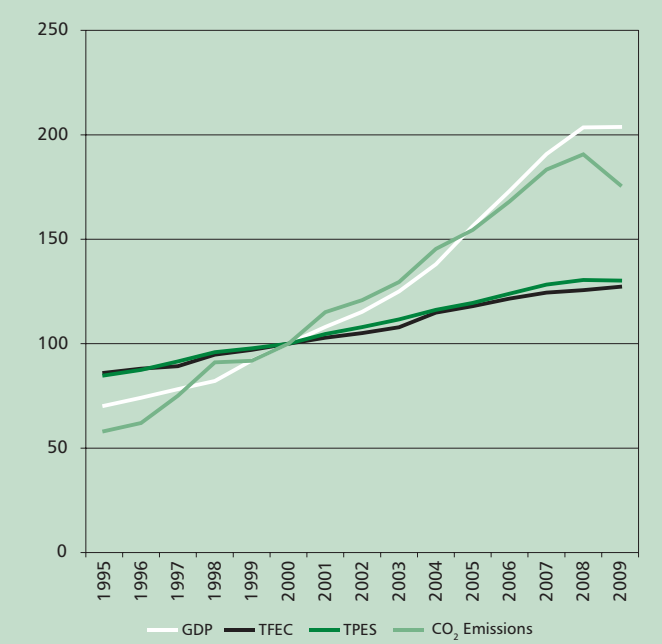
ktoe = thousand tons of oil equivalent.
Sources: IEA (2011b).

Figure 7.2.14 Carbon Dioxide Emissions from Fuel Combustion, 1995–2009



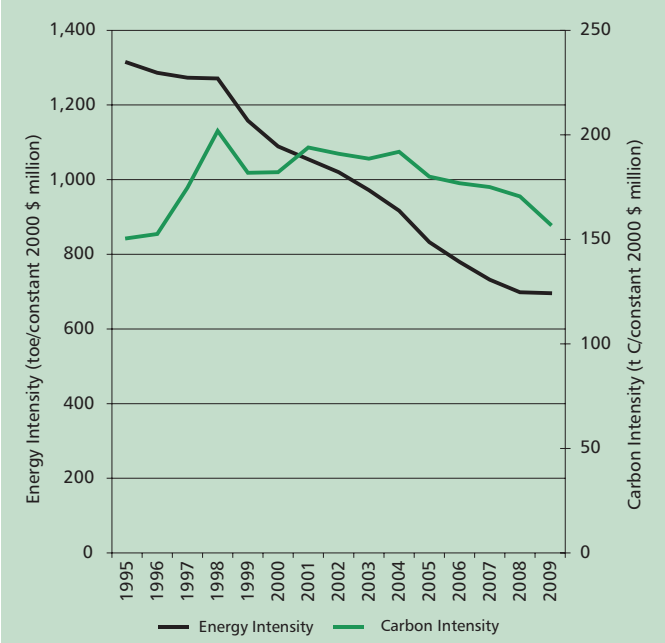
kt C = thousand tons of carbon equivalent.
Source: APERC estimates.

Figure 7.2.15 Growth of GDP, TFEC, TPES, and CO_2 (indexed to year 2000), 1995–2009



CO_2 = carbon dioxide, GDP = gross domestic product, TFEC = total final energy consumption, TPES = total primary energy supply.
Note: Indices are measured relative to the base year 2000 (2000 = 100).
Source: APERC estimates.

Figure 7.2.16 Energy and Carbon Intensities, 1995–2009



t C = ton of carbon equivalent, toe = ton of oil equivalent.
Source: APERC estimates.

Table 7.2.3 Cambodia Energy Balance Table, 2006

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	3,531	0	0	0	3,535
2.	Imports	0	0	0	1,415	163	72	587	233	333	27	0	0	0	0	0	0	0	0	9	0	1,424
3.	Exports	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.	International Bunkers	0	0	0	–27	0	0	0	0	0	–27	0	0	0	0	0	0	0	0	0	0	–27
5.	Stock Changes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6.	Total Primary Energy Supply	0	0	0	1,388	163	72	587	233	333	0	0	4	0	0	0	0	3,531	0	9	0	4,932
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	0	0	0	–396	0	0	–202	–194	0	0	0	–4	0	0	0	0	–140	0	94	0	–446
8.1	Power Generation	0	0	0	–396	0	0	–202	–194	0	0	0	–4	0	0	0	0	–1	0	94	0	–307
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–139	0	0	0	–139
9.	Loss and Own Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–17	0	–17
10.	Discrepancy	0	0	0	–13	0	0	1	–14	0	0	0	0	0	0	0	0	0	0	1	0	–12
11.	Total Final Energy Consumption	0	0	0	979	163	72	386	25	333	0	0	0	0	0	0	0	3,391	0	87	0	4,457
12.	Industry Sector	0	0	0	47	0	0	25	22	0	0	0	0	0	0	0	0	0	0	14	0	61
13.	Transport Sector	0	0	0	394	150	0	241	3	0	0	0	0	0	0	0	0	0	0	0	0	394
14.	Other Sectors	0	0	0	538	13	72	120	0	333	0	0	0	0	0	0	0	3,391	0	73	0	4,002
14.1	Residential and Commercial	0	0	0	436	0	72	31	0	333	0	0	0	0	0	0	0	3,391	0	73	0	3,900
14.1.1	Commerce and Public Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	32	0	32
14.1.2	Residential	0	0	0	436	0	72	31	0	333	0	0	0	0	0	0	0	3,391	0	41	0	3,868
14.2	Non–Specified Others	0	0	0	102	13	0	89	0	0	0	0	0	0	0	0	0	0	0	0	0	102
15.	Non–Energy Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16.	Electricity Output (GWh)	0	0	0	1,035	0	0	0	0	0	1,035	0	51	0	0	0	0	2	0	0	0	1,088
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.
Note: Figures may not add up to total because of rounding.
Source: IEA (2011b).

Table 7.2.4 Cambodia Energy Balance Table, 2007

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	3,590	0	0	0	3,594
2.	Imports	0	0	0	1,526	180	73	633	271	339	30	0	0	0	0	0	0	0	0	14	0	1,540
3.	Exports	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.	International Bunkers	0	0	0	–30	0	0	0	0	0	–30	0	0	0	0	0	0	0	0	0	0	–30
5.	Stock Changes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6.	Total Primary Energy Supply	0	0	0	1,496	180	73	633	271	339	0	0	4	0	0	0	0	3,590	0	14	0	5,104
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	0	0	0	–495	0	0	–252	–243	0	0	0	–4	0	0	0	0	–144	0	116	0	–527
8.1	Power Generation	0	0	0	–495	0	0	–252	–243	0	0	0	–4	0	0	0	0	–2	0	116	0	–385
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–142	0	0	0	–142
9.	Loss and Own Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–20	0	–20
10.	Discrepancy	0	0	0	–1	0	0	–1	0	0	0	0	0	0	0	0	0	0	0	6	0	5
11.	Total Final Energy Consumption	0	0	0	1,000	180	73	380	28	339	0	0	0	0	0	0	0	3,446	0	116	0	4,562
12.	Industry Sector	0	0	0	52	0	0	27	25	0	0	0	0	0	0	0	0	0	0	24	0	76
13.	Transport Sector	0	0	0	393	166	0	224	3	0	0	0	0	0	0	0	0	0	0	0	0	393
14.	Other Sectors	0	0	0	555	14	73	129	0	339	0	0	0	0	0	0	0	3,446	0	92	0	4,093
14.1	Residential and Commercial	0	0	0	443	0	73	31	0	339	0	0	0	0	0	0	0	3,446	0	92	0	3,981
14.1.1	Commerce and Public Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	39	0	39
14.1.2	Residential	0	0	0	443	0	73	31	0	339	0	0	0	0	0	0	0	3,446	0	53	0	3,942
14.2	Non–Specified Others	0	0	0	112	14	0	98	0	0	0	0	0	0	0	0	0	0	0	0	0	112
15.	Non–Energy Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16.	Electricity Output (GWh)	0	0	0	1,294	0	0	0	0	0	1,294	0	50	0	0	0	0	5	0	0	0	1,349
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Source: IEA (2011b).

Table 7.2.5 Cambodia Energy Balance Table, 2008

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	3,604	0	0	0	3,608
2.	Imports	0	0	0	1,585	192	74	648	294	345	32	0	0	0	0	0	0	0	0	32	0	1,617
3.	Exports	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.	International Bunkers	0	0	0	–32	0	0	0	0	0	–32	0	0	0	0	0	0	0	0	0	0	–32
5.	Stock Changes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6.	Total Primary Energy Supply	0	0	0	1,553	192	74	648	294	345	0	0	4	0	0	0	0	3,604	0	32	0	5,193
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	0	0	0	–540	0	0	–275	–265	0	0	0	–4	0	0	0	0	–147	0	126	0	–565
8.1	Power Generation	0	0	0	–540	0	0	–275	–265	0	0	0	–4	0	0	0	0	–2	0	126	0	–420
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–145	0	0	0	–145
9.	Loss and Own Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–23	0	–23
10.	Discrepancy	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11.	Total Final Energy Consumption	0	0	0	1,013	192	74	373	29	345	0	0	0	0	0	0	0	3,457	0	135	0	4,605
12.	Industry Sector	0	0	0	55	0	0	29	26	0	0	0	0	0	0	0	0	0	0	23	0	78
13.	Transport Sector	0	0	0	389	177	0	209	3	0	0	0	0	0	0	0	0	0	0	0	0	389
14.	Other Sectors	0	0	0	569	15	74	135	0	345	0	0	0	0	0	0	0	3,457	0	112	0	4,138
14.1	Residential and Commercial	0	0	0	450	0	74	31	0	345	0	0	0	0	0	0	0	3,457	0	112	0	4,019
14.1.1	Commerce and Public Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	48	0	48
14.1.2	Residential	0	0	0	450	0	74	31	0	345	0	0	0	0	0	0	0	3,457	0	64	0	3,971
14.2	Non–Specified Others	0	0	0	119	15	0	104	0	0	0	0	0	0	0	0	0	0	0	0	0	119
15.	Non–Energy Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16.	Electricity Output (GWh)	0	0	0	1,410	0	0	0	0	0	1,410	0	46	0	0	0	0	5	0	0	0	1,461
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.
Note: Figures may not add up to total because of rounding.
Source: IEA (2011b).

Table 7.2.6 Cambodia Energy Balance Table, 2009

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	3,664	0	0	0	3,668
2.	Imports	0	0	0	1,472	188	75	582	246	350	31	0	0	0	0	0	0	0	0	72	0	1,544
3.	Exports	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.	International Bunkers	0	0	0	–31	0	0	0	0	0	–31	0	0	0	0	0	0	0	0	0	0	–31
5.	Stock Changes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6.	Total Primary Energy Supply	0	0	0	1,441	188	75	582	246	350	0	0	4	0	0	0	0	3,664	0	72	0	5,181
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	0	0	0	–442	0	0	–225	–217	0	0	0	–4	0	0	0	0	–150	0	104	0	–492
8.1	Power Generation	0	0	0	–442	0	0	–225	–217	0	0	0	–4	0	0	0	0	–2	0	104	0	–344
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–148	0	0	0	–148
9.	Loss and Own Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–24	0	–24
10.	Discrepancy	0	0	0	–1	0	0	–1	0	0	0	0	0	0	0	0	0	0	0	0	0	–1
11.	Total Final Energy Consumption	0	0	0	998	188	75	356	29	350	0	0	0	0	0	0	0	3,514	0	152	0	4,664
12.	Industry Sector	0	0	0	54	0	0	28	26	0	0	0	0	0	0	0	0	0	0	28	0	82
13.	Transport Sector	0	0	0	370	173	0	194	3	0	0	0	0	0	0	0	0	0	0	0	0	370
14.	Other Sectors	0	0	0	574	15	75	134	0	350	0	0	0	0	0	0	0	3,514	0	124	0	4,212
14.1	Residential and Commercial	0	0	0	457	0	75	32	0	350	0	0	0	0	0	0	0	3,514	0	124	0	4,095
14.1.1	Commerce and Public Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	53	0	53
14.1.2	Residential	0	0	0	457	0	75	32	0	350	0	0	0	0	0	0	0	3,514	0	71	0	4,042
14.2	Non–Specified Others	0	0	0	117	15	0	102	0	0	0	0	0	0	0	0	0	0	0	0	0	117
15.	Non–Energy Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16.	Electricity Output (GWh)	0	0	0	1,153	0	0	0	0	0	1,153	0	47	0	0	0	0	6	0	0	0	1,206
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Source: IEA (2011b).

Table 7.2.7 Cambodia Summary Table, 1990–2009

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Indigenous Production (ktoe)																				
Coal	–	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Oil	–	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gas	–	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hydro	–	–	–	–	–	0	0	0	0	0	0	0	2	4	2	4	4	4	4	4
Nuclear	–	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Geothermal	–	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Solar	–	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wind	–	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Biomass	–	–	–	–	–	2,901	2,959	3,018	3,078	3,140	3,203	3,256	3,312	3,366	3,420	3,475	3,531	3,590	3,604	3,664
Others	–	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	–	–	–	–	–	2,901	2,959	3,018	3,078	3,140	3,203	3,256	3,314	3,370	3,422	3,479	3,535	3,594	3,608	3,668
Primary Energy Supply (ktoe)																				
Coal	–	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Oil	–	–	–	–	–	472	522	622	738	750	776	907	982	1,070	1,196	1,270	1,388	1,496	1,553	1,441
Gas	–	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hydro	–	–	–	–	–	0	0	0	0	0	0	0	2	4	2	4	4	4	4	4
Nuclear	–	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Geothermal	–	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Solar	–	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wind	–	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Biomass	–	–	–	–	–	2,901	2,959	3,018	3,078	3,140	3,203	3,256	3,312	3,366	3,420	3,475	3,531	3,590	3,604	3,664
Others	–	–	–	–	–	0	0	0	0	0	0	0	0	1	5	7	9	14	32	72
Total	–	–	–	–	–	3,373	3,481	3,640	3,816	3,890	3,979	4,163	4,296	4,441	4,623	4,756	4,932	5,104	5,193	5,181
Final Energy Consumption by Sector (ktoe)																				
Industry	–	–	–	–	–	4	4	5	25	27	30	33	20	22	48	51	61	76	78	82
Transport	–	–	–	–	–	272	272	248	300	289	287	310	330	356	390	420	394	393	389	370
Residential	–	–	–	–	–	2,875	2,947	3,011	3,141	3,234	3,339	3,416	3,489	3,557	3,642	3,723	3,868	3,942	3,971	4,042
Commercial	–	–	–	–	–	3	4	5	6	7	9	11	13	18	18	21	32	39	48	53
Others	–	–	–	–	–	0	0	0	0	0	0	0	0	0	111	108	102	112	119	117
Total	–	–	–	–	–	3,154	3,227	3,269	3,472	3,557	3,665	3,770	3,852	3,953	4,209	4,323	4,457	4,562	4,605	4,664

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Table 7.2.7 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Final Energy Consumption by Type (ktoe)																				
Coal	–	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Oil	–	–	–	–	–	357	370	348	489	516	557	606	630	674	869	921	979	1,000	1,013	998
Gas	–	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Electricity	–	–	–	–	–	10	15	21	25	25	31	36	40	46	55	64	87	116	135	152
Heat	–	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Biomass	–	–	–	–	–	2,787	2,842	2,900	2,958	3,016	3,077	3,128	3,182	3,233	3,285	3,338	3,391	3,446	3,457	3,514
Others	–	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	–	–	–	–	–	3,154	3,227	3,269	3,472	3,557	3,665	3,770	3,852	3,953	4,209	4,323	4,457	4,562	4,605	4,664
Power Generation (GWh)																				
Thermal	–	–	–	–	–	198	251	318	376	410	451	536	537	594	737	836	1,035	1,294	1,410	1,153
Hydro	–	–	–	–	–	0	0	0	0	0	0	0	29	41	28	44	51	50	46	47
Nuclear	–	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Geothermal	–	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Solar	–	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wind	–	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Others	–	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	2	5	5	6
Total	–	–	–	–	–	198	251	318	376	410	451	536	566	635	765	880	1,088	1,349	1,461	1,206
Loss and Own Use of Electricity (GWh)																				
Transmission and Distribution Losses	–	–	–	–	–	81	58	70	81	116	81	128	93	93	174	198	140	163	198	221
Own Use	–	–	–	–	–	12	12	12	12	12	12	12	12	12	12	23	58	70	70	58
Total	–	–	–	–	–	93	70	81	93	128	93	140	105	105	186	221	198	233	267	279
Fuel Input for Power Generation (ktoe)																				
Coal	–	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Oil	–	–	–	–	–	116	136	258	252	232	261	335	359	385	319	340	396	495	540	442
Gas	–	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	–	–	–	–	–	116	136	258	252	232	261	335	359	385	319	340	396	495	540	442
CO_2 Emissions (kt C)																				
Coal	–	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Oil	–	–	–	–	–	387	413	499	606	611	665	766	804	862	968	1,028	1,119	1,220	1,269	1,171
Gas	–	–	–	–	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	–	–	–	–	–	387	413	499	606	611	665	766	804	862	968	1,028	1,119	1,220	1,269	1,171

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Table 7.2.7 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Macroeconomic Indicators																				
Population (thousand)	9,532	9,868	10,206	10,539	10,862	11,169	11,459	11,731	11,986	12,224	12,447	12,654	12,845	13,024	13,194	13,358	13,516	13,670	13,823	13,978
Urban Population, %	12.6	12.9	13.2	13.6	13.9	14.2	14.7	15.3	15.8	16.4	16.9	17.5	18.0	18.6	19.1	19.7	20.3	20.9	21.6	22.2
GDP (constant 2000 $ million)	–	–	–	2,211	2,412	2,568	2,707	2,859	3,002	3,360	3,654	3,948	4,212	4,570	5,043	5,711	6,326	6,972	7,438	7,445
GDP (current $ million)	–	–	–	2,534	2,791	3,441	3,507	3,443	3,120	3,517	3,654	3,980	4,284	4,658	5,338	6,293	7,274	8,639	10,352	10,402
GDP (constant 2005 PPP $ million)	–	–	–	7,799	8,509	9,057	9,547	10,084	10,589	11,850	12,889	13,925	14,856	16,120	17,787	20,143	22,313	24,592	26,237	26,260
GDP/capita (constant 2000 $)	–	–	–	210	222	230	236	244	250	275	294	312	328	351	382	428	468	510	538	533
GDP/capita (current $)	–	–	–	240	257	308	306	294	260	288	294	315	334	358	405	471	538	632	749	744
GDP – Manufacturing (% of GDP)	–	–	–	8.0	8.0	8.8	9.4	11.4	12.5	13.4	16.0	17.1	18.3	18.9	20.2	19.6	20.8	20.5	19.8	16.7
Car Ownership (car/1,000 persons)	3	1	3	3	4	5	5	6	6	7	7	8	13	12	13	13	13	14	14	14
Basic Energy Indicators																				
TPES/capita (toe/person)	–	–	–	–	–	0.30	0.30	0.31	0.32	0.32	0.32	0.33	0.33	0.34	0.35	0.36	0.36	0.37	0.38	0.37
TFEC/capita (toe/person)	–	–	–	–	–	0.28	0.28	0.28	0.29	0.29	0.29	0.30	0.30	0.30	0.32	0.32	0.33	0.33	0.33	0.33
TPES/GDP (toe/constant 2000 $ million)	–	–	–	–	–	1,314	1,286	1,273	1,271	1,158	1,089	1,055	1,020	972	917	833	780	732	698	696
TFEC/GDP (toe/constant 2000 $ million)	–	–	–	–	–	1,228	1,192	1,143	1,157	1,059	1,003	955	915	865	835	757	705	654	619	626
Import Dependency (%)	–	–	–	–	–	14.0	15.0	17.1	19.3	19.3	19.5	21.8	22.9	24.1	26.0	26.9	28.3	29.6	30.5	29.2
Oil Import Dependency (%)	–	–	–	–	–	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Electricity/capita (kWh/ person)	–	–	–	–	–	10	15	21	24	24	29	33	36	41	48	56	75	99	114	126
CO_2 Intensity (t C/constant 2000 $ million)	–	–	–	–	–	151	153	175	202	182	182	194	191	189	192	180	177	175	171	157
CO_2/capita (t C)	–	–	–	–	–	0.03	0.04	0.04	0.05	0.05	0.05	0.06	0.06	0.07	0.07	0.08	0.08	0.09	0.09	0.08
CO_2/TPES (t C/toe)	–	–	–	–	–	0.11	0.12	0.14	0.16	0.16	0.17	0.18	0.19	0.19	0.21	0.22	0.23	0.24	0.24	0.23

– = no data or not applicable, CO_2 = carbon dioxide, GDP = gross domestic product, GWh = gigawatt–hour, kt C = thousand tons of carbon equivalent, ktoe = thousand tons of oil equivalent, kWh = kilowatt–hour, PPP = purchasing power parity, t C = ton of carbon equivalent, TFEC = total final energy consumption, toe = ton of oil equivalent, TPES = total primary energy supply.

Note: Figures may not add up to total because of rounding.

Sources: APERC estimates, IEA (2011b), JAMA (2012), and World Bank.

7.3 Indonesia

Country Profile (2009)		Energy Reserves (year-end 2008)	
Total Surface Area (square kilometer)	1,904,570	Coal (million ton) - Recoverable	5,529.0
Population (thousand)	237,414	Gas (trillion cubic feet) - Proven	112.5
GDP (constant 2000 $ billion)	258.6	Oil (billion barrel) - Proven	3,750.0
Electrification Rate (%)	64.5		

GDP = gross domestic product.

Sources: ADB (2012), IEA (2011c), World Bank, and WEC (2010).

2009 Energy Supply and Demand Flow (ktoe)

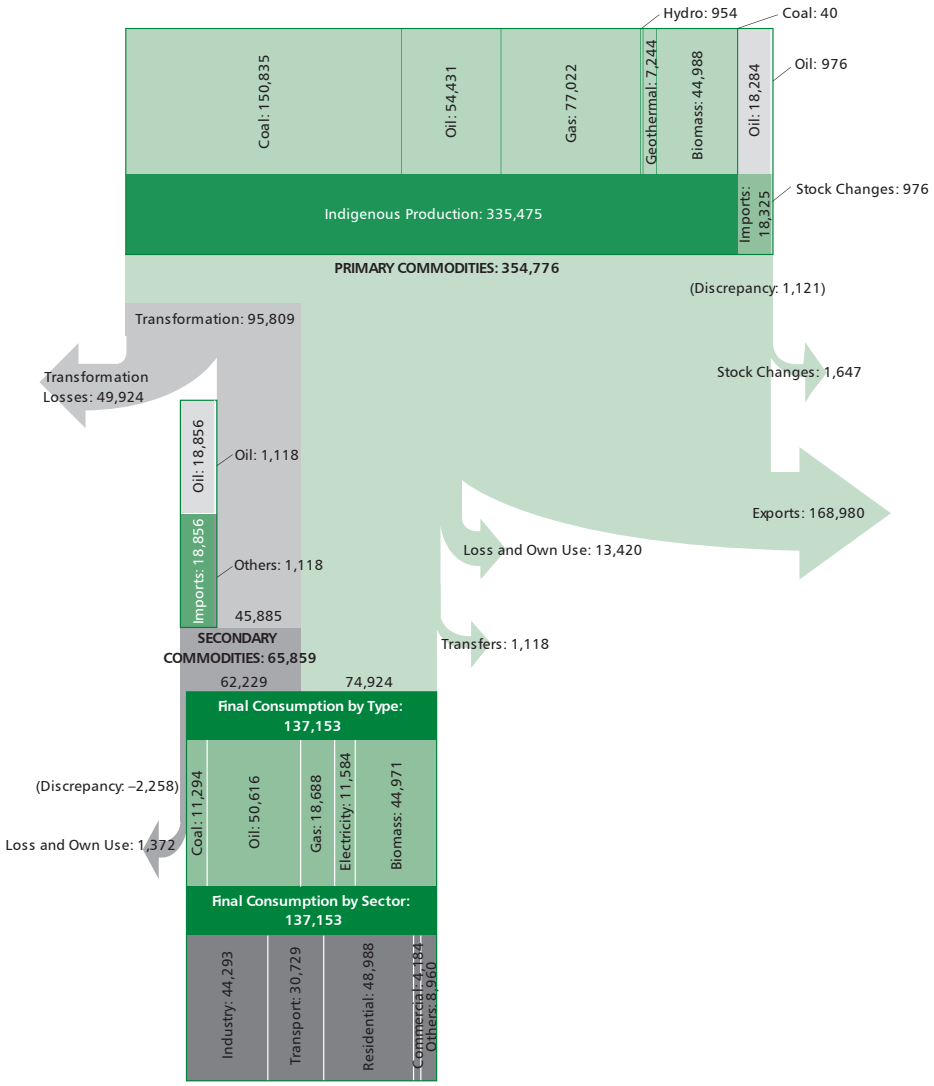


Table 7.3.1 Key Data and Economic Profile

	1990	1995	2000	2005	2009
Socioeconomic Data					
Population (thousand)	184,346	199,400	213,395	227,303	237,414
GDP (constant 2000 $ billion)	109.2	159.4	165.0	207.9	258.6
GDP (constant 2005 PPP $ billion)	370.2	540.6	559.7	705.2	877.1
GDP/capita (constant 2000 $)	592	799	773	915	1,089
GDP/capita (constant 2005 PPP $)	2,008	2,711	2,623	3,102	3,694

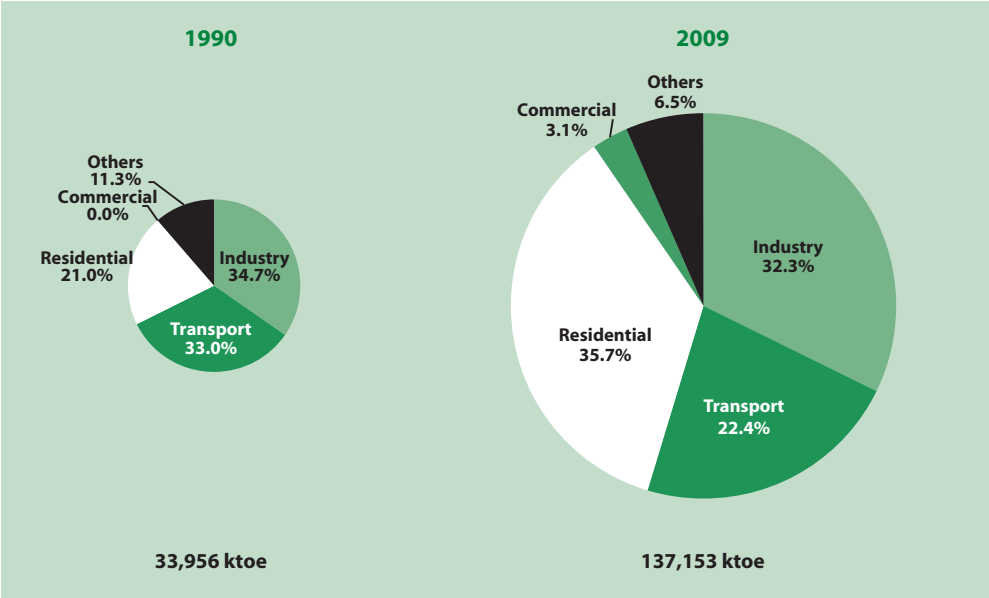
GDP = gross domestic product, PPP = purchasing power parity.
Source: World Bank.

Table 7.3.2 Energy Supply and Demand

	1990	1995	2000	2005	2009
Primary Energy Supply (ktoe)					
Indigenous Production	119,434	168,134	183,995	249,683	335,475
Net Imports	–66,183	–85,556	–82,759	–75,188	–132,470
Total PES	53,252	82,578	101,236	174,495	203,005
Coal	4,056	6,579	10,956	23,742	32,805
Oil	30,430	33,909	51,023	62,914	72,172
Gas	16,889	38,832	34,048	37,710	44,842
Biomass	–	228	160	43,525	44,988
Others	1,876	3,030	5,049	6,604	8,198
TPES/capita (toe)	0.29	0.41	0.47	0.77	0.86
TPES/GDP (toe/constant 2005 PPP $ million)	144	153	181	247	231
Final Energy Consumption (ktoe)					
Industry	11,767	19,678	22,658	36,023	44,293
Transportation	11,205	16,673	21,452	25,858	30,729
Other Sectors	10,985	12,920	19,459	56,387	62,132
Total FEC	33,956	49,272	63,569	118,267	137,153
Coal	1,149	1,116	2,053	8,499	11,294
Oil	24,681	33,260	44,061	45,952	50,616
Gas	5,504	7,831	8,089	11,093	18,688
Electricity	2,624	7,065	9,365	9,205	11,584
Biomass	–	–	–	43,518	44,971
Others	0	0	0	0	0

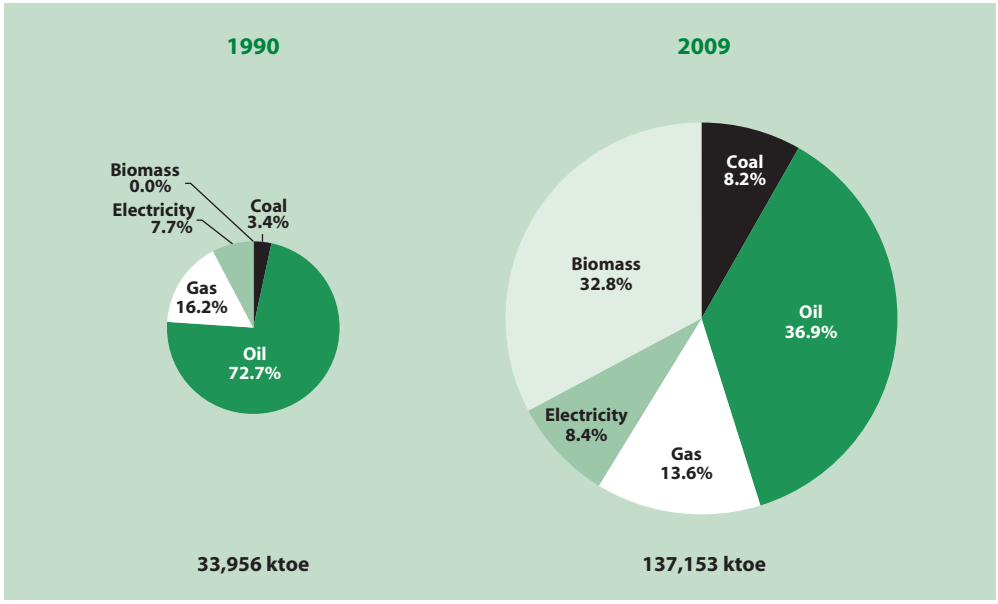
– = no data or not applicable, FEC = final energy consumption, GDP = gross domestic product, ktoe = thousand tons of oil equivalent, PES = primary energy supply, PPP = purchasing power parity, toe = ton of oil equivalent, TPES = total primary energy supply.
Source: APERC (APEC Energy Database).

Figure 7.3.1 Final Energy Consumption by Sector, 1990 and 2009



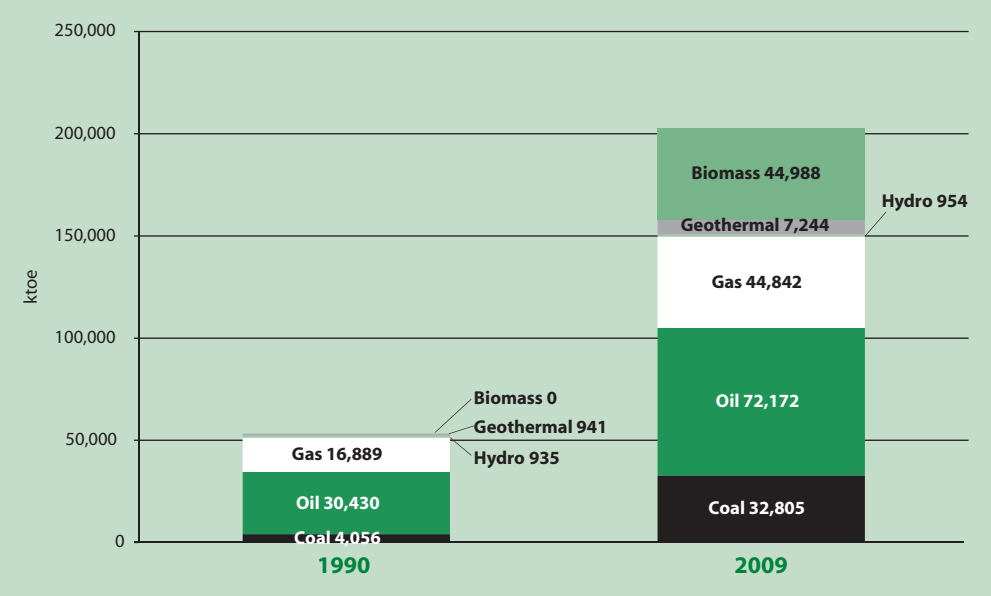
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 7.3.2 Final Energy Consumption by Type of Energy, 1990 and 2009



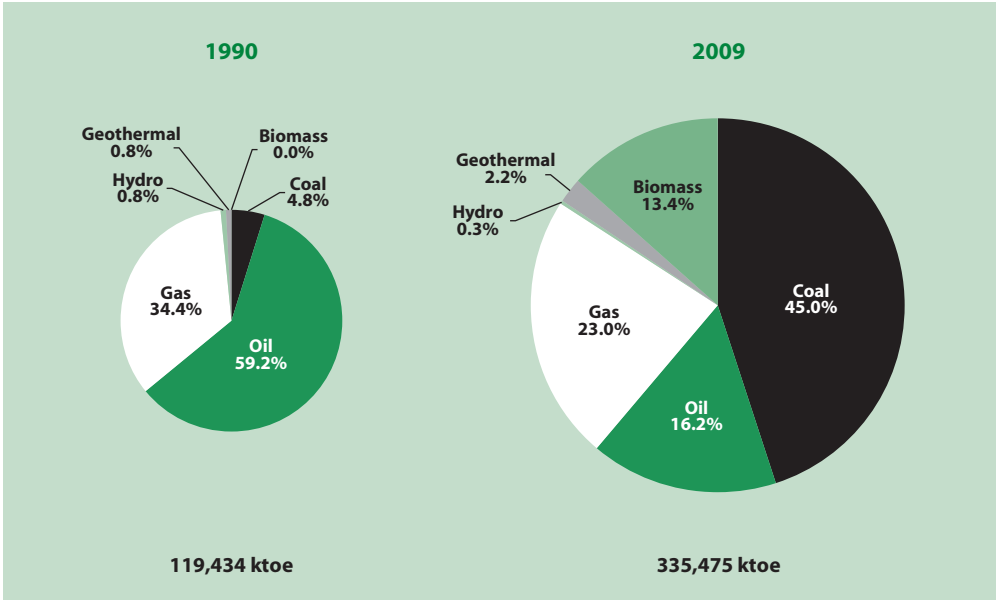
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 7.3.3 Total Primary Energy Supply, 1990 and 2009



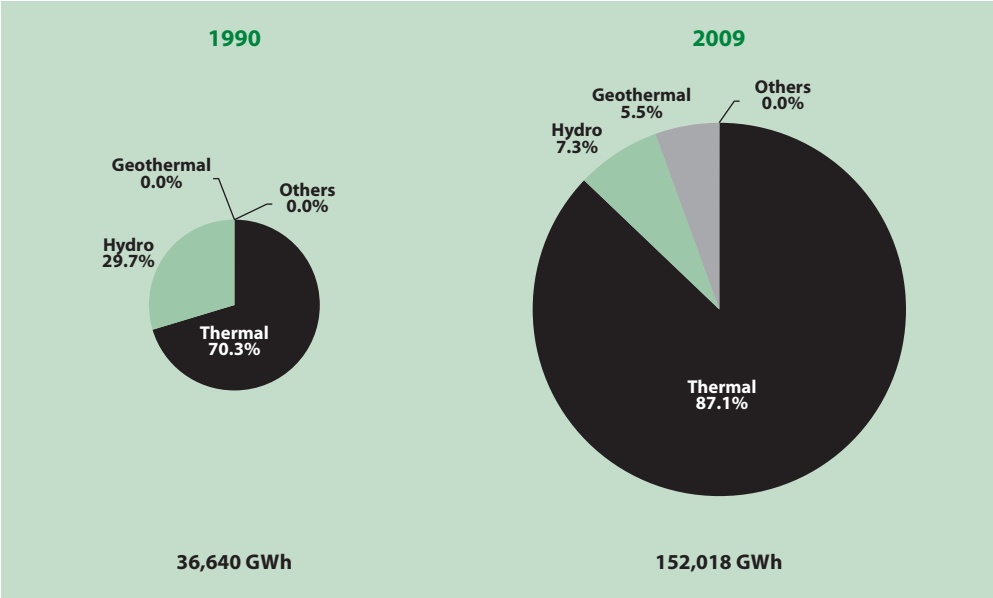
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 7.3.4 Indigenous Energy Production, 1990 and 2009



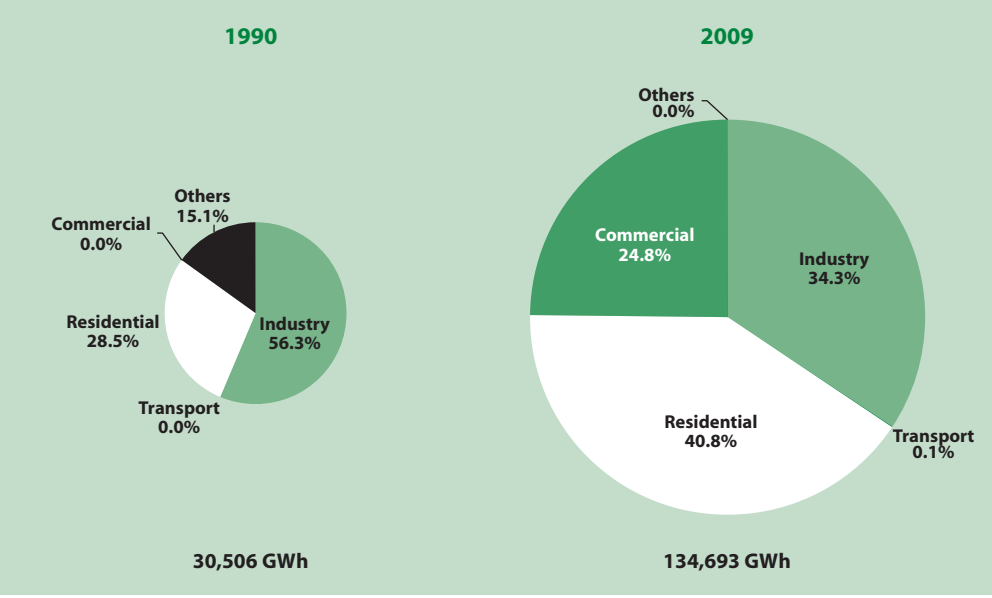
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 7.3.5 Electricity Generation by Plant Type, 1990 and 2009



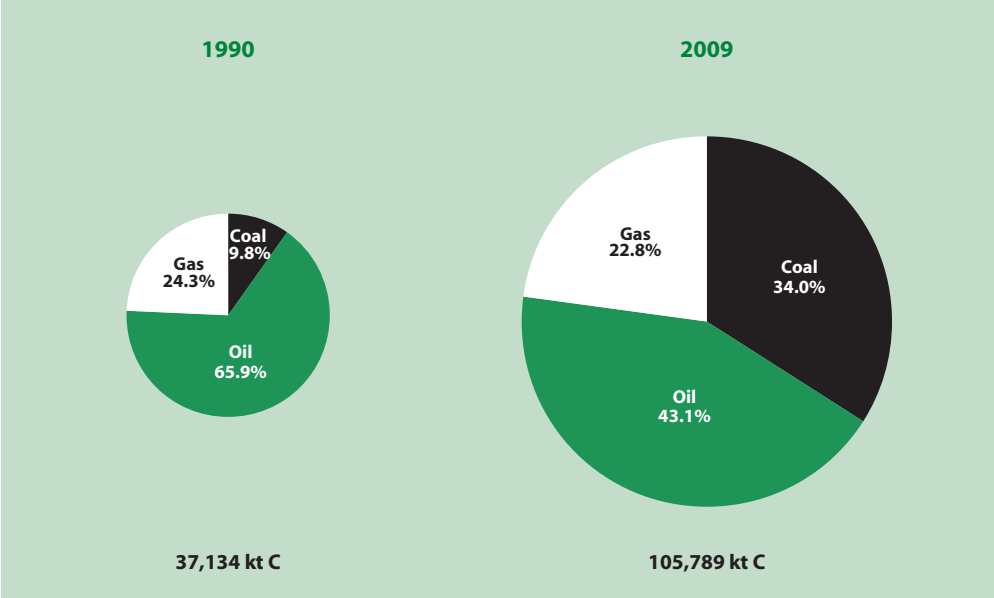
GWh = gigawatt-hour.
Source: APERC (APEC Energy Database).

Figure 7.3.6 Electricity Consumption by Sector, 1990 and 2009



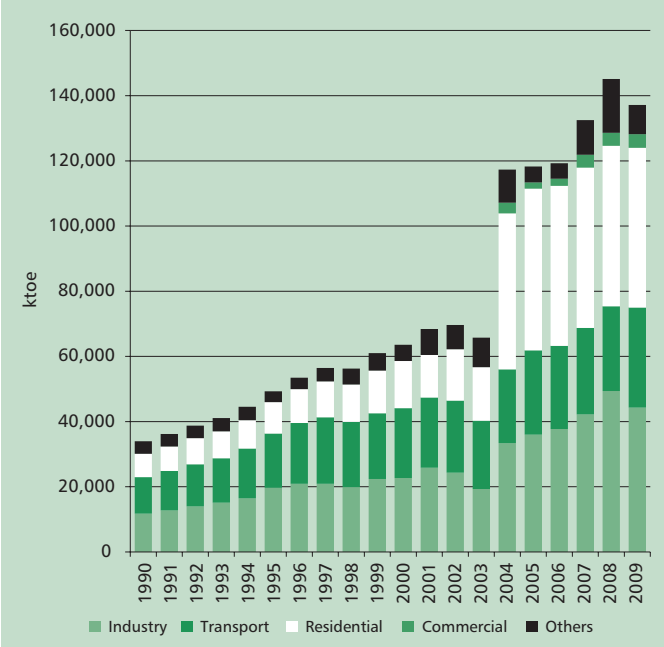
GWh = gigawatt-hour.
Source: APERC (APEC Energy Database).

Figure 7.3.7 Carbon Dioxide Emissions from Fuel Combustion, 1990 and 2009



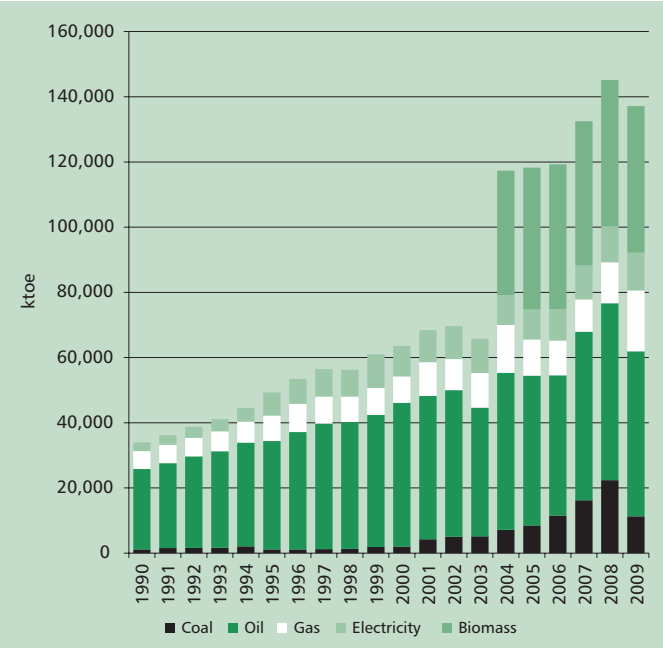
kt C = thousand tons of carbon equivalent.
Source: APERC estimates.

Figure 7.3.8 Final Energy Consumption by Sector, 1990–2009



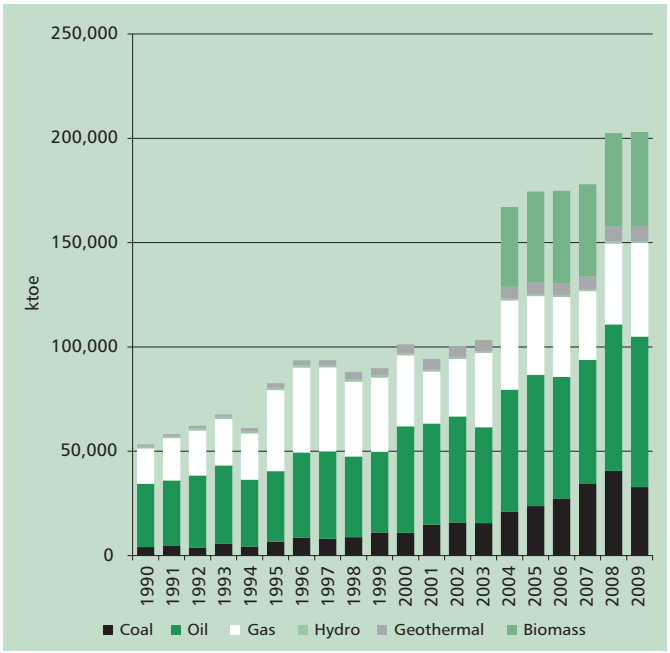
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 7.3.9 Final Energy Consumption by Type, 1990–2009



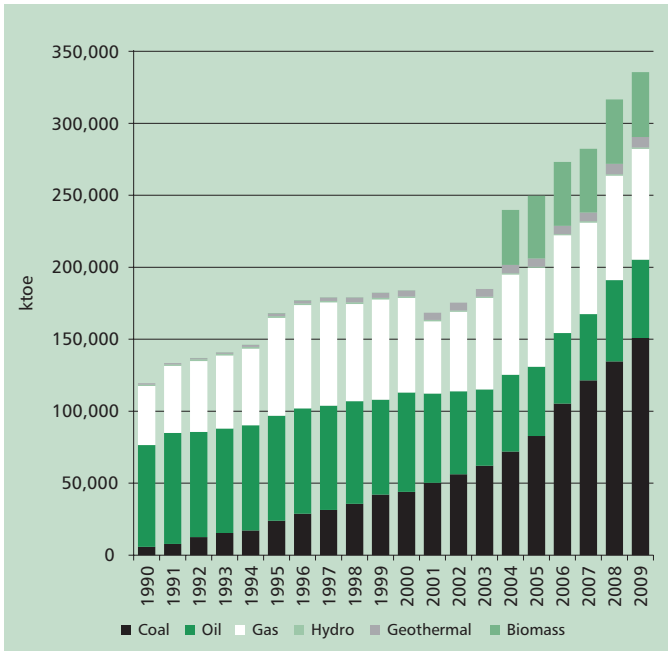
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 7.3.10 Total Primary Energy Supply, 1990–2009



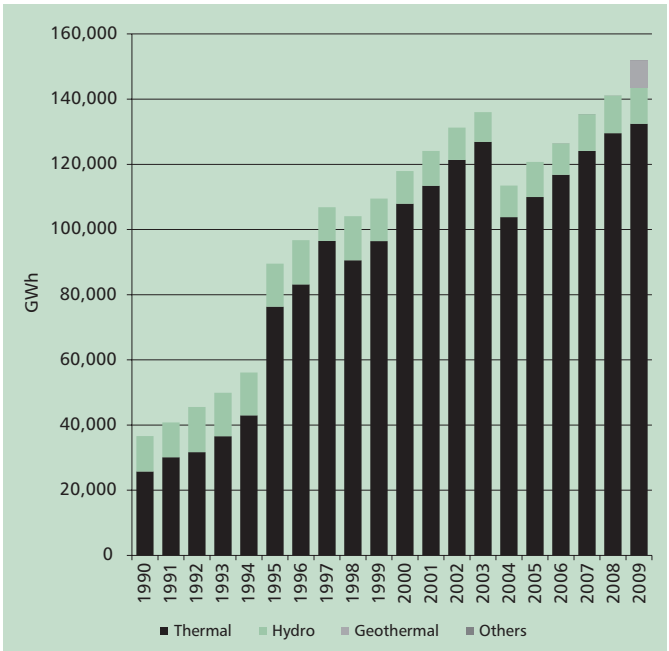
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 7.3.11 Indigenous Energy Production, 1990–2009



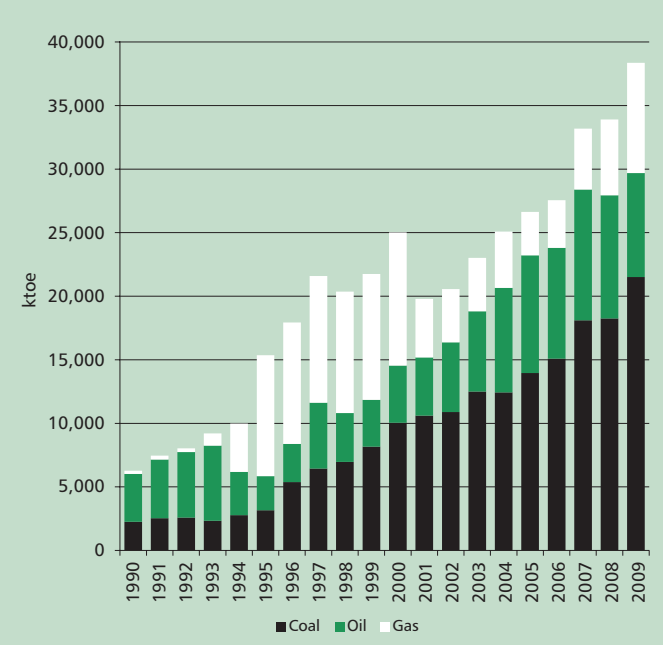
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 7.3.12 Electricity Generation by Source, 1990–2009



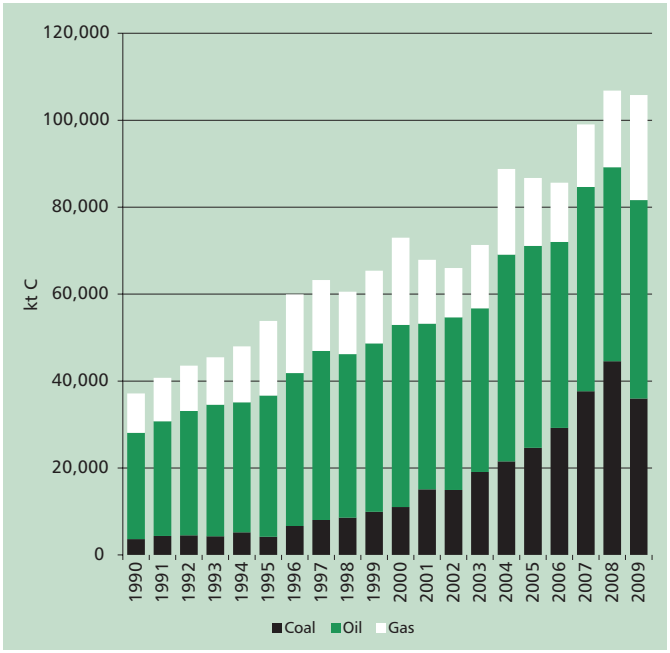
GWh = gigawatt-hour.
Source: APERC (APEC Energy Database).

Figure 7.3.13 Fuel Input for Electricity Generation, 1990–2009



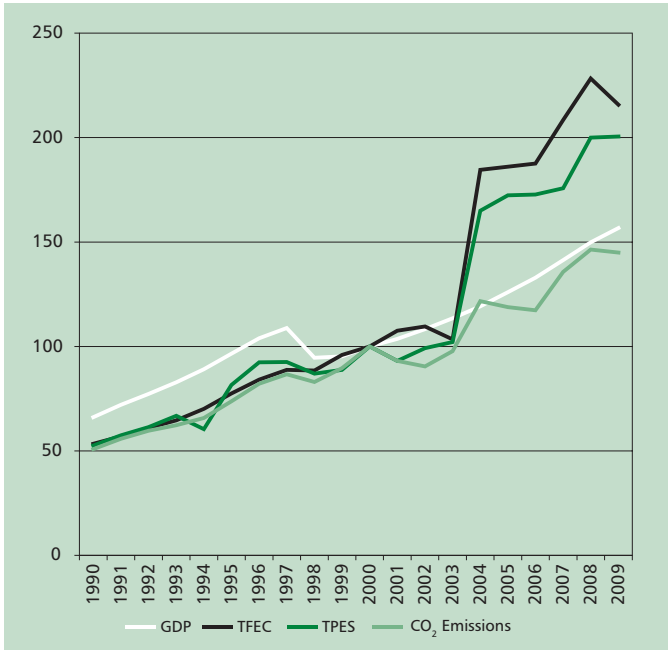
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 7.3.14 Carbon Dioxide Emissions from Fuel Combustion, 1990–2009



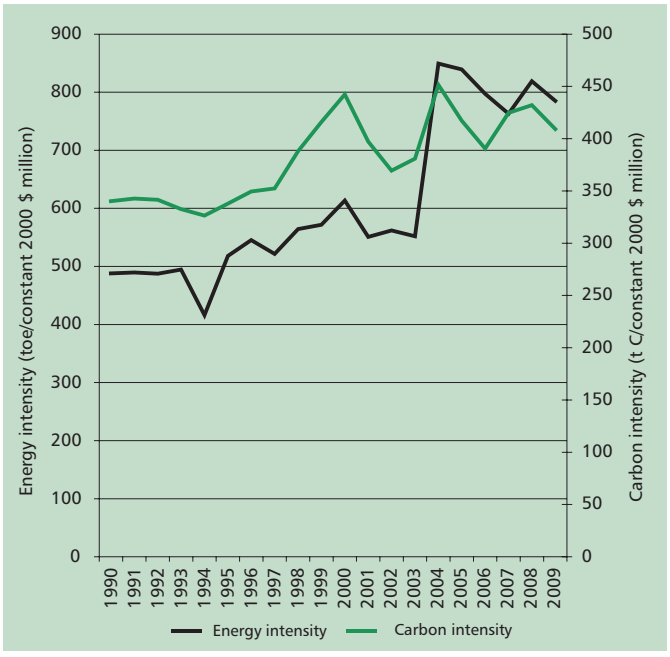
kt C = thousand tons of carbon equivalent.
Source: APERC estimates.

Figure 7.3.15 Growth of GDP, TFEC, TPES, and CO_2 (indexed to year 2000), 1990–2009



CO_2 = carbon dioxide, GDP = gross domestic product, TFEC = total final energy consumption, TPES = total primary energy supply.
Note: Indices are measured relative to the base year 2000 (2000 = 100).
Source: APERC estimates.

Figure 7.3.16 Energy and Carbon Intensities, 1990–2009



t C = ton of carbon equivalent, toe = ton of oil equivalent.
Source: APERC estimates.

Table 7.3.3 Indonesia Energy Balance Table, 2006

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	105,348	0	48,922	0	0	0	0	0	0	0	67,942	821	0	5,726	0	0	44,365	0	0	0	273,125
2.	Imports	60	0	15,768	17,462	5,787	739	8,871	1,331	68	667	0	0	0	0	0	0	0	0	0	0	33,291
3.	Exports	–78,093	0	–18,019	–5,829	0	0	0	0	–285	–5,543	–29,590	0	0	0	0	0	0	0	0	0	–131,531
4.	International Bunkers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5.	Stock Changes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6.	Total Primary Energy Supply	27,315	0	46,672	11,634	5,787	739	8,871	1,331	–217	–4,876	38,352	821	0	5,726	0	0	44,365	0	0	0	174,885
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	–15,111	16	–44,402	37,131	8,827	6,753	6,294	1,376	1,260	12,621	–11,659	–821	0	–5,726	0	0	–9	0	11,447	0	–29,134
8.1	Power Generation	–15,092	0	0	–8,709	0	0	–6,648	–2,061	0	0	–3,752	–821	0	–5,726	0	0	–9	0	11,447	0	–22,664
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	–7,906	0	0	0	0	0	0	0	0	0	–7,906
8.3	Refineries	0	0	–44,402	45,840	8,827	6,753	12,942	3,437	1,260	12,621	0	0	0	0	0	0	0	0	0	0	1,438
8.4	Coal Transformation	–19	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–2
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	0	0	0	0	0	0	0	0	0	0	–11,230	0	0	0	0	0	0	0	–1,687	0	–12,917
10.	Discrepancy	–677	0	–2,270	–5,744	–915	427	794	–255	45	–5,839	–4,806	0	0	0	0	0	0	0	–76	0	–13,572
11.	Total Final Energy Consumption	11,527	16	0	43,021	13,699	7,918	15,959	2,451	1,088	1,907	10,657	0	0	0	0	0	44,356	0	9,684	0	119,262
12.	Industry Sector	11,527	0	0	8,717	0	40	6,287	2,223	168	0	6,244	0	0	0	0	0	7,494	0	3,751	0	37,733
13.	Transport Sector	0	0	0	25,507	13,699	1	9,672	228	0	1,907	5	0	0	0	0	0	0	0	0	0	25,512
14.	Other Sectors	0	16	0	8,797	0	7,877	0	0	920	0	43	0	0	0	0	0	36,862	0	5,934	0	51,651
14.1	Residential and Commercial	0	16	0	8,797	0	7,877	0	0	920	0	43	0	0	0	0	0	36,862	0	5,554	0	51,272
14.1.1	Commerce and Public Services	0	0	0	143	0	0	0	0	143	0	26	0	0	0	0	0	226	0	1,791	0	2,187
14.1.2	Residential	0	16	0	8,653	0	7,877	0	0	776	0	16	0	0	0	0	0	36,636	0	3,763	0	49,085
14.2	Non–Specified Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	379	0	379
15.	Non–Energy Use	0	0	0	0	0	0	0	0	0	0	4,366	0	0	0	0	0	0	0	0	0	4,366
16.	Electricity Output (GWh)	58,630	0	41,126	0	0	0	0	0	0	0	17,039	9,623	0	0	0	0	32	0	0	0	126,450
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.
Note: Figures may not add up to total because of rounding.
Source: APERC (APEC Energy Database).

Table 7.3.4 Indonesia Energy Balance Table, 2007

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	121,445	0	46,073	0	0	0	0	0	0	0	63,537	971	0	6,038	0	0	44,214	0	0	0	282,278
2.	Imports	38	0	15,483	21,743	6,115	826	11,608	2,066	78	1,050	0	0	0	0	0	0	0	0	0	0	37,263
3.	Exports	–89,646	0	–17,633	–6,284	–6	0	–147	–129	–328	–5,672	–30,563	0	0	0	0	0	0	0	0	0	–144,127
4.	International Bunkers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5.	Stock Changes	2,501	0	212	–167	–723	511	683	–778	105	35	0	0	0	0	0	0	0	0	0	0	2,546
6.	Total Primary Energy Supply	34,337	0	44,134	15,292	5,385	1,337	12,144	1,159	–145	–4,588	32,975	971	0	6,038	0	0	44,214	0	0	0	177,960
7.	Transfers	0	0	–620	620	0	0	0	0	620	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	–18,138	24	–43,789	35,908	10,237	6,648	5,013	1,090	978	11,942	–11,707	–971	0	–6,038	0	0	–12	0	12,250	0	–32,474
8.1	Power Generation	–18,110	0	0	–10,278	0	0	–7,602	–2,676	0	0	–4,793	–971	0	–6,038	0	0	–12	0	12,250	0	–27,952
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	–6,915	0	0	0	0	0	0	0	0	0	–6,915
8.3	Refineries	0	0	–43,789	46,186	10,237	6,648	12,615	3,767	978	11,942	0	0	0	0	0	0	0	0	0	0	2,397
8.4	Coal Transformation	–28	24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–4
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	0	–6	–61	–86	–31	–16	–34	–4	0	0	–9,966	0	0	0	0	0	0	0	–2,036	0	–12,154
10.	Discrepancy	0	0	336	0	0	0	0	0	0	0	–1,390	0	0	0	0	0	0	0	221	0	–833
11.	Total Final Energy Consumption	16,199	17	0	51,733	15,591	7,969	17,123	2,244	1,453	7,354	9,912	0	0	0	0	0	44,202	0	10,435	0	132,499
12.	Industry Sector	16,199	17	0	7,613	0	455	5,091	1,902	165	0	7,658	0	0	0	0	0	6,784	0	3,939	0	42,211
13.	Transport Sector	0	0	0	26,501	15,591	3	8,818	37	0	2,053	6	0	0	0	0	0	0	0	7	0	26,515
14.	Other Sectors	0	0	0	12,318	0	7,510	3,214	306	1,288	0	51	0	0	0	0	0	37,418	0	6,488	0	56,275
14.1	Residential and Commercial	0	0	0	9,191	0	7,199	705	0	1,288	0	51	0	0	0	0	0	37,418	0	6,488	0	53,148
14.1.1	Commerce and Public Services	0	0	0	1,259	0	377	705	0	178	0	35	0	0	0	0	0	226	0	2,418	0	3,938
14.1.2	Residential	0	0	0	7,932	0	6,822	0	0	1,110	0	17	0	0	0	0	0	37,192	0	4,070	0	49,211
14.2	Non-Specified Others	0	0	0	3,127	0	312	2,509	306	0	0	0	0	0	0	0	0	0	0	0	0	3,127
15.	Non-Energy Use	0	0	0	5,301	0	0	0	0	0	5,301	2,197	0	0	0	0	0	0	0	0	0	7,498
16.	Electricity Output (GWh)	63,817	0	37,776	0	0	0	0	0	0	0	22,504	11,287	0	0	0	0	36	0	0	0	135,420
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Source: APERC (APEC Energy Database).

Table 7.3.5 Indonesia Energy Balance Table, 2008

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	134,652	0	56,405	0	0	0	0	0	0	0	72,604	991	0	7,146	0	0	44,781	0	0	0	316,579
2.	Imports	63	0	12,839	20,618	7,075	275	9,525	2,588	499	656	0	0	0	0	0	0	0	0	0	0	33,520
3.	Exports	–94,080	0	–20,619	0	0	0	0	0	0	0	–33,873	0	0	0	0	0	0	0	0	0	–148,572
4.	International Bunkers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5.	Stock Changes	0	0	976	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	976
6.	Total Primary Energy Supply	40,635	0	49,601	20,618	7,075	275	9,525	2,588	499	656	38,731	991	0	7,146	0	0	44,781	0	0	0	202,503
7.	Transfers	0	0	–1,087	1,087	0	0	0	0	1,087	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	–18,277	21	–47,601	34,958	9,691	6,317	5,229	509	931	12,281	–12,689	–991	0	–7,146	0	0	–14	0	12,852	0	–38,889
8.1	Power Generation	–18,252	0	0	–9,692	0	0	–6,508	–3,183	0	0	–5,961	–991	0	–7,146	0	0	–14	0	12,852	0	–29,205
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	–6,727	0	0	0	0	0	0	0	0	0	–6,727
8.3	Refineries	0	0	–47,601	44,650	9,691	6,317	11,737	3,693	931	12,281	0	0	0	0	0	0	0	0	0	0	–2,952
8.4	Coal Transformation	–25	21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–5
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	0	0	–939	–78	–32	–13	–29	–3	0	0	–12,030	0	0	0	0	0	0	0	–1,498	0	–14,545
10.	Discrepancy	0	0	26	–2,309	–582	–43	–26	–1,395	–316	54	–1,424	0	0	0	0	0	0	0	–251	0	–3,958
11.	Total Final Energy Consumption	22,357	21	0	54,276	16,152	6,536	14,698	1,699	2,200	12,990	12,589	0	0	0	0	0	44,767	0	11,103	0	145,112
12.	Industry Sector	22,357	21	0	6,288	0	373	4,318	1,440	157	0	9,452	0	0	0	0	0	7,126	0	4,125	0	49,370
13.	Transport Sector	0	0	0	26,001	16,152	2	7,618	28	0	2,201	17	0	0	0	0	0	0	0	7	0	26,025
14.	Other Sectors	0	0	0	11,197	0	6,160	2,763	232	2,043	0	68	0	0	0	0	0	37,640	0	6,970	0	55,876
14.1	Residential and Commercial	0	0	0	8,555	0	5,904	608	0	2,043	0	68	0	0	0	0	0	37,640	0	6,970	0	53,234
14.1.1	Commerce and Public Services	0	0	0	1,060	0	309	608	0	144	0	50	0	0	0	0	0	225	0	2,654	0	3,990
14.1.2	Residential	0	0	0	7,495	0	5,595	0	0	1,900	0	18	0	0	0	0	0	37,415	0	4,316	0	49,244
14.2	Non–Specified Others	0	0	0	2,642	0	256	2,155	232	0	0	0	0	0	0	0	0	0	0	0	0	2,642
15.	Non–Energy Use	0	0	0	10,790	0	0	0	0	0	10,790	3,051	0	0	0	0	0	0	0	0	0	13,841
16.	Electricity Output (GWh)	61,392	0	40,449	0	0	0	0	0	0	0	27,711	11,528	0	0	0	0	47	0	0	0	141,127
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.
Note: Figures may not add up to total because of rounding.
Source: APERC (APEC Energy Database).

Table 7.3.6 Indonesia Energy Balance Table, 2009

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	150,835	0	54,431	0	0	0	0	0	0	0	77,022	954	0	7,244	0	0	44,988	0	0	0	335,475
2.	Imports	40	0	18,284	18,856	8,539	0	6,601	2,588	1,095	32	0	0	0	0	0	0	0	0	0	0	37,181
3.	Exports	−116,424	0	−20,376	0	0	0	0	0	0	0	−32,180	0	0	0	0	0	0	0	0	0	−168,980
4.	International Bunkers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5.	Stock Changes	−1,647	0	976	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	−671
6.	Total Primary Energy Supply	32,805	0	53,316	18,856	8,539	0	6,601	2,588	1,095	32	44,842	954	0	7,244	0	0	44,988	0	0	0	203,005
7.	Transfers	0	0	−1,118	1,118	0	0	0	0	1,118	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	−21,539	29	−50,975	32,783	9,609	3,843	8,910	642	918	8,862	−15,079	−954	0	−7,244	0	0	−17	0	13,074	0	−49,924
8.1	Power Generation	−21,503	0	0	−8,188	0	0	−5,137	−3,051	0	0	−8,674	−954	0	−7,244	0	0	−17	0	13,074	0	−33,506
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	−6,406	0	0	0	0	0	0	0	0	0	−6,406
8.3	Refineries	0	0	−50,975	40,971	9,609	3,843	14,047	3,693	918	8,862	0	0	0	0	0	0	0	0	0	0	−10,005
8.4	Coal Transformation	−36	29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	−7
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	0	0	0	−78	−32	−8	−35	−3	0	0	−13,420	0	0	0	0	0	0	0	−1,294	0	−14,792
10.	Discrepancy	0	0	−1,223	−2,062	762	119	1,862	−1,796	406	−3,414	2,344	0	0	0	0	0	0	0	−196	0	−1,136
11.	Total Final Energy Consumption	11,265	29	0	50,616	18,879	3,954	17,338	1,430	3,536	5,480	18,688	0	0	0	0	0	44,971	0	11,584	0	137,153
12.	Industry Sector	11,265	29	0	6,347	0	226	4,776	1,212	134	0	15,509	0	0	0	0	0	7,169	0	3,974	0	44,293
13.	Transport Sector	0	0	0	30,711	18,879	1	9,503	24	0	2,305	8	0	0	0	0	0	0	0	10	0	30,729
14.	Other Sectors	0	0	0	10,383	0	3,726	3,059	195	3,403	0	121	0	0	0	0	0	37,803	0	7,600	0	55,907
14.1	Residential and Commercial	0	0	0	7,648	0	3,572	674	0	3,403	0	121	0	0	0	0	0	37,803	0	7,600	0	53,172
14.1.1	Commerce and Public Services	0	0	0	983	0	187	674	0	122	0	102	0	0	0	0	0	224	0	2,875	0	4,184
14.1.2	Residential	0	0	0	6,665	0	3,385	0	0	3,281	0	18	0	0	0	0	0	37,579	0	4,725	0	48,988
14.2	Non-Specified Others	0	0	0	2,735	0	155	2,385	195	0	0	0	0	0	0	0	0	0	0	0	0	2,735
15.	Non-Energy Use	0	0	0	3,175	0	0	0	0	0	3,175	3,051	0	0	0	0	0	0	0	0	0	6,226
16.	Electricity Output (GWh)	63,218	0	31,900	0	0	0	0	0	0	0	37,334	11,095	0	8,423	0	0	47	0	0	0	152,018
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Source: APERC (APEC Energy Database).

Table 7.3.7 Indonesia Summary Table, 1990–2009

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Indigenous Production (ktoe)																				
Coal	5,785	7,828	12,612	15,443	17,138	23,955	28,820	31,412	35,642	42,158	44,007	50,316	56,206	62,138	71,960	82,754	105,348	121,445	134,652	150,835
Oil	70,733	77,067	73,000	72,587	73,146	72,904	73,127	72,474	71,293	65,928	68,981	61,956	57,692	53,003	53,388	48,137	48,922	46,073	56,405	54,431
Gas	41,040	46,671	49,234	50,710	53,230	68,017	71,754	71,800	67,555	69,584	65,798	50,189	55,246	63,621	69,693	68,663	67,942	63,537	72,604	77,022
Hydro	935	916	1,189	1,147	1,128	1,136	1,169	892	1,160	1,119	862	916	855	783	832	925	821	971	991	954
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Geothermal	941	961	882	936	1,378	1,895	2,024	2,427	3,309	3,349	4,187	5,082	5,364	5,413	5,723	5,679	5,726	6,038	7,146	7,244
Solar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wind	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Biomass	0	0	98	77	123	228	185	126	154	160	160	0	0	0	38,199	43,525	44,365	44,214	44,781	44,988
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	119,434	133,444	137,015	140,898	146,142	168,134	177,079	179,130	179,114	182,300	183,995	168,460	175,363	184,957	239,795	249,683	273,125	282,278	316,579	335,475
Primary Energy Supply (ktoe)																				
Coal	4,056	4,564	3,826	5,625	4,268	6,579	8,565	8,064	8,830	11,056	10,956	14,822	15,873	15,551	20,983	23,742	27,315	34,337	40,635	32,805
Oil	30,430	31,439	34,563	37,595	32,092	33,909	40,911	41,832	38,693	38,713	51,023	48,488	50,841	45,939	58,570	62,914	58,305	59,425	70,219	72,172
Gas	16,889	20,337	21,598	22,236	22,201	38,832	40,683	40,333	35,897	35,523	34,048	24,905	27,483	35,667	42,748	37,710	38,352	32,975	38,731	44,842
Hydro	935	916	1,189	1,147	1,128	1,136	1,169	892	1,160	1,119	862	916	855	783	832	925	821	971	991	954
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Geothermal	941	961	882	936	1,378	1,895	2,024	2,427	3,309	3,349	4,187	5,082	5,364	5,413	5,723	5,679	5,726	6,038	7,146	7,244
Solar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wind	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Biomass	0	0	98	77	123	228	185	126	154	160	160	0	0	0	38,199	43,525	44,365	44,214	44,781	44,988
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	53,252	58,217	62,157	67,615	61,190	82,578	93,537	93,673	88,044	89,922	101,236	94,213	100,416	103,353	167,054	174,495	174,885	177,960	202,503	203,005
Final Energy Consumption by Sector (ktoe)																				
Industry	11,767	12,766	13,997	15,109	16,453	19,678	20,934	20,920	19,900	22,415	22,658	25,878	24,357	19,289	33,383	36,023	37,733	42,211	49,370	44,293
Transport	11,205	12,116	12,910	13,652	15,309	16,673	18,609	20,411	19,985	20,136	21,452	21,538	22,085	20,965	22,623	25,858	25,512	26,515	26,025	30,729
Residential	7,133	7,462	7,996	8,219	8,662	9,628	10,429	10,975	11,508	13,102	14,457	13,032	15,741	16,439	47,870	49,597	49,085	49,211	49,244	48,988
Commercial	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3,297	1,907	2,187	3,938	3,990	4,184
Others	3,852	3,875	3,865	4,121	4,139	3,292	3,503	4,139	4,865	5,349	5,003	7,939	7,458	9,047	10,143	4,883	4,745	10,624	16,483	8,960
Total	33,956	36,218	38,767	41,102	44,562	49,272	53,475	56,446	56,256	61,002	63,569	68,387	69,641	65,741	117,315	118,267	119,262	132,499	145,112	137,153

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Table 7.3.7 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Final Energy Consumption by Type (ktoe)																				
Coal	1,149	1,562	1,594	1,653	2,075	1,116	1,117	1,221	1,315	1,874	2,053	4,272	5,020	5,189	7,186	8,499	11,543	16,217	22,378	11,294
Oil	24,681	26,047	28,106	29,613	31,858	33,260	36,022	38,528	38,893	40,531	44,061	43,974	44,999	39,434	48,138	45,952	43,021	51,733	54,276	50,616
Gas	5,504	5,664	5,703	6,134	6,422	7,831	8,699	8,306	7,837	8,296	8,089	10,345	9,529	10,637	14,682	11,093	10,657	9,912	12,589	18,688
Electricity	2,624	2,945	3,363	3,701	4,207	7,065	7,637	8,390	8,212	10,301	9,365	9,795	10,093	10,481	9,117	9,205	9,684	10,435	11,103	11,584
Heat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Biomass	0	0	0	0	0	0	0	0	0	0	0	0	0	0	38,192	43,518	44,356	44,202	44,767	44,971
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	33,956	36,218	38,767	41,102	44,562	49,272	53,475	56,446	56,256	61,002	63,569	68,387	69,641	65,741	117,315	118,267	119,262	132,499	145,112	137,153
Power Generation (GWh)																				
Thermal	25,771	30,134	31,710	36,596	42,990	76,329	83,153	96,489	90,584	96,463	107,909	113,437	121,339	126,889	103,812	109,964	116,795	124,097	129,552	132,453
Hydro	10,869	10,651	13,831	13,331	13,118	13,204	13,590	10,369	13,491	13,015	10,022	10,651	9,940	9,106	9,674	10,759	9,623	11,287	11,528	11,095
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Geothermal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8,423
Solar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wind	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	32	36	47	47
Total	36,640	40,785	45,541	49,927	56,108	89,533	96,743	106,858	104,075	109,478	117,931	124,088	131,279	135,995	113,486	120,723	126,450	135,420	141,127	152,018
Loss and Own Use of Electricity (GWh)																				
Transmission and Distribution Losses	–	–	–	–	–	–	–	–	–	–	–	–	–	–	15,501	14,237	15,338	20,469	12,348	15,048
Own Use	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	4,019	4,274	3,206	5,069	–
Total	–	–	–	–	–	–	–	–	–	–	–	–	–	–	15,501	18,256	19,611	23,675	17,417	15,048
Fuel Input for Power Generation (ktoe)																				
Coal	2,252	2,531	2,592	2,337	2,777	3,163	5,378	6,439	6,965	8,161	10,048	10,612	10,884	12,503	12,441	13,956	15,092	18,110	18,252	21,503
Oil	3,764	4,624	5,147	5,914	3,401	2,676	3,003	5,183	3,846	3,693	4,501	4,570	5,485	6,314	8,214	9,259	8,709	10,278	9,692	8,188
Gas	249	300	289	952	3,798	9,515	9,557	9,962	9,554	9,898	10,468	4,604	4,190	4,205	4,427	3,423	3,752	4,793	5,961	8,674
Total	6,266	7,455	8,027	9,202	9,976	15,354	17,938	21,584	20,364	21,753	25,017	19,786	20,559	23,022	25,082	26,638	27,554	33,181	33,905	38,365
CO_2 Emissions (kt C)																				
Coal	3,649	4,382	4,507	4,300	5,216	4,173	6,644	8,037	8,594	9,938	11,012	15,096	14,941	19,101	21,529	24,633	29,218	37,662	44,569	35,977
Oil	24,467	26,389	28,606	30,271	29,907	32,522	35,188	38,876	37,618	38,717	41,915	38,126	39,711	37,631	47,581	46,463	42,783	46,978	44,624	45,642
Gas	9,017	9,983	10,434	10,909	12,869	17,124	18,105	16,347	14,330	16,738	20,042	14,680	11,347	14,592	19,688	15,628	13,628	14,396	17,635	24,169
Total	37,134	40,754	43,548	45,480	47,992	53,819	59,936	63,260	60,541	65,393	72,969	67,902	66,000	71,325	88,798	86,723	85,629	99,035	106,828	105,789

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Table 7.3.7 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Macroeconomic Indicators																				
Population (thousand)	184,346	187,452	190,512	193,526	196,488	199,400	202,257	205,063	207,839	210,611	213,395	216,203	219,026	221,839	224,607	227,303	229,919	232,462	234,951	237,414
Urban Population, %	30.6	31.6	32.6	33.6	34.6	35.6	36.9	38.2	39.4	40.7	42.0	43.2	44.4	45.7	46.9	48.1	49.2	50.3	51.5	52.6
GDP (constant 2000 $ million)	109,151	118,895	127,480	136,728	147,037	159,383	171,564	179,627	156,048	157,283	165,021	171,033	178,729	187,273	196,694	207,891	219,327	233,244	247,270	258,585
GDP (current $ million)	114,426	128,168	139,116	158,007	176,892	202,132	227,370	215,749	95,446	140,001	165,021	160,447	195,661	234,772	256,837	285,869	364,571	432,217	510,245	539,355
GDP (constant 2005 PPP $ million)	370,234	403,288	432,407	463,774	498,743	540,619	581,938	609,288	529,308	533,496	559,744	580,138	606,241	635,222	667,179	705,159	743,949	791,153	838,731	877,108
GDP/capita (constant 2000 $)	592	634	669	707	748	799	848	876	751	747	773	791	816	844	876	915	954	1,003	1,052	1,089
GDP/capita (current $)	621	684	730	816	900	1,014	1,124	1,052	459	665	773	742	893	1,058	1,143	1,258	1,586	1,859	2,172	2,272
GDP – Manufacturing (% of GDP)	22.1	22.3	22.9	23.5	24.5	25.1	26.0	26.1	26.6	27.5	27.7	27.7	27.9	28.0	28.4	28.1	27.8	27.4	26.8	26.2
Car Ownership (car/1,000 persons)	15	16	16	17	18	20	22	23	24	25	24	24	27	28	29	30	32	33	35	36
Basic Energy Indicators																				
TPES/capita (toe/person)	0.29	0.31	0.33	0.35	0.31	0.41	0.46	0.46	0.42	0.43	0.47	0.44	0.46	0.47	0.74	0.77	0.76	0.77	0.86	0.86
TFEC/capita (toe/person)	0.18	0.19	0.20	0.21	0.23	0.25	0.26	0.28	0.27	0.29	0.30	0.32	0.32	0.30	0.52	0.52	0.52	0.57	0.62	0.58
TPES/GDP (toe/constant 2000 $ million)	488	490	488	495	416	518	545	521	564	572	613	551	562	552	849	839	797	763	819	785
TFEC/GDP (toe/constant 2000 $ million)	311	305	304	301	303	309	312	314	361	388	385	400	390	351	596	569	544	568	587	530
Import Dependency (%)	–124.3	–129.2	–120.4	–108.4	–138.8	–103.6	–89.3	–91.2	–103.4	–102.7	–81.7	–78.8	–74.6	–79.0	–43.5	–43.1	–56.2	–58.6	–56.3	–65.3
Oil Import Dependency (%)	–132.4	–145.1	–111.2	–93.1	–127.9	–115.0	–78.7	–73.3	–84.3	–70.3	–35.2	–27.8	–13.5	–15.4	8.8	23.5	16.1	22.5	19.7	24.6
Electricity/capita (kWh/person)	166	183	205	222	249	412	439	476	460	569	510	527	536	549	472	471	490	522	550	567
CO_2 Intensity (t C/constant 2000 $ million)	340	343	342	333	326	338	349	352	388	416	442	397	369	381	451	417	390	425	432	409
CO_2/capita (t C)	0.20	0.22	0.23	0.24	0.24	0.27	0.30	0.31	0.29	0.31	0.34	0.31	0.30	0.32	0.40	0.38	0.37	0.43	0.45	0.45
CO_2/TPES (t C/toe)	0.70	0.70	0.70	0.67	0.78	0.65	0.64	0.68	0.69	0.73	0.72	0.72	0.66	0.69	0.53	0.50	0.49	0.56	0.53	0.52

– = no data or not applicable, CO_2 = carbon dioxide, GDP = gross domestic product, GWh = gigawatt–hour, kt C = thousand tons of carbon equivalent, ktoe = thousand tons of oil equivalent, kWh = kilowatt–hour, PPP = purchasing power parity, t C = ton of carbon equivalent, TFEC = total final energy consumption, toe = ton of oil equivalent, TPES = total primary energy supply.

Note: Figures may not add up to total because of rounding.

Sources: APERC (APEC Energy Database), APERC estimates, JAMA (2012), and World Bank.

7.4 Lao People's Democratic Republic

Country Profile (2009)		Energy Reserves (year-end 2008)	
Total Surface Area (square kilometer)	236,800	Coal (million ton) - Recoverable	503.0
Population (thousand)	6,112	Gas (trillion cubic feet) - Proven	–
GDP (constant 2000 $ billion)	3.2	Oil (billion barrel) - Proven	–
Electrification Rate (%)	55.0		

– = no data or not applicable, GDP = gross domestic product.

Sources: ADB (2012), IEA (2011c), World Bank, and WEC (2010).

2009 Energy Supply and Demand Flow (ktoe)

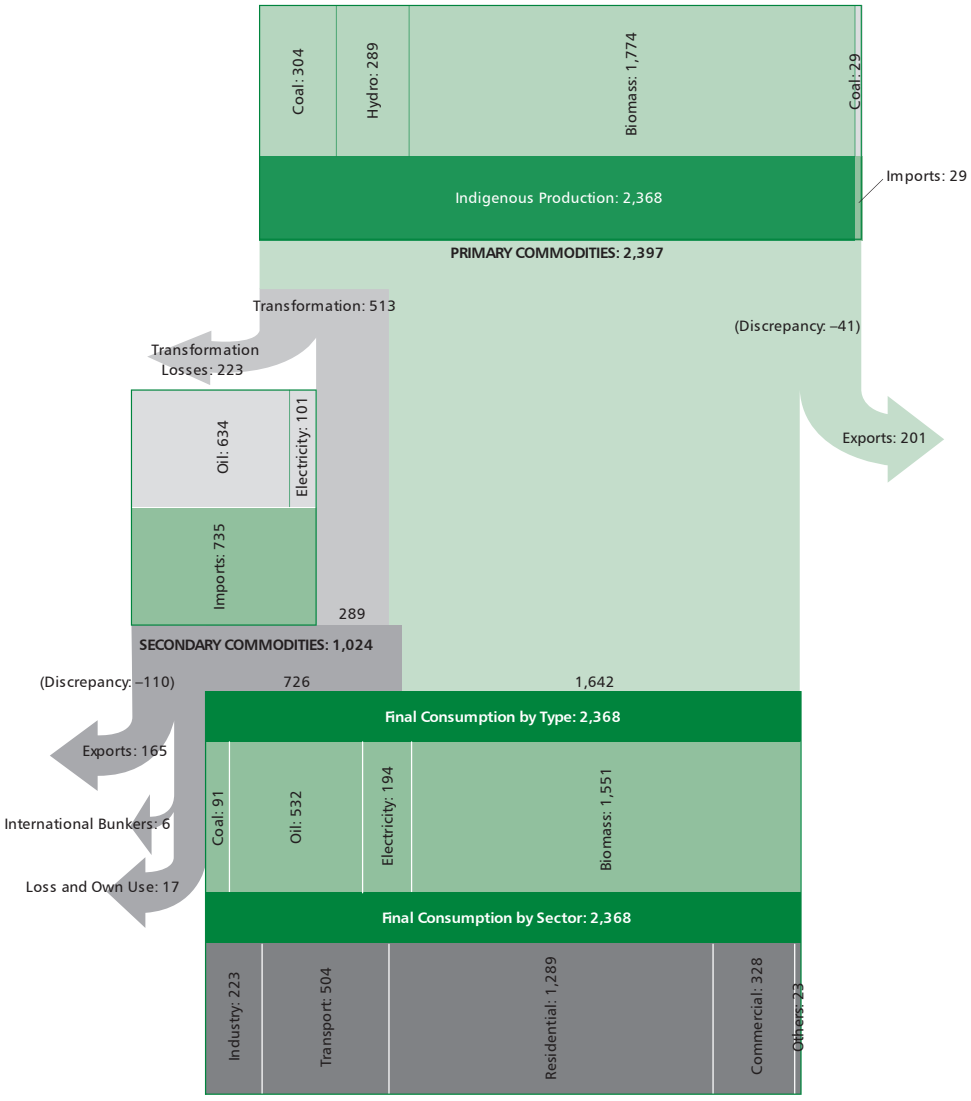


Table 7.4.1 Key Data and Economic Profile

	1990	1995	2000	2005	2009
Socioeconomic Data					
Population (thousand)	4,192	4,795	5,317	5,753	6,112
GDP (constant 2000 $ billion)	1.0	1.3	1.7	2.4	3.2
GDP (constant 2005 PPP $ billion)	3.9	5.3	7.2	9.7	13.1
GDP/capita (constant 2000 $)	227	268	326	409	519
GDP/capita (constant 2005 PPP $)	937	1,106	1,346	1,685	2,139

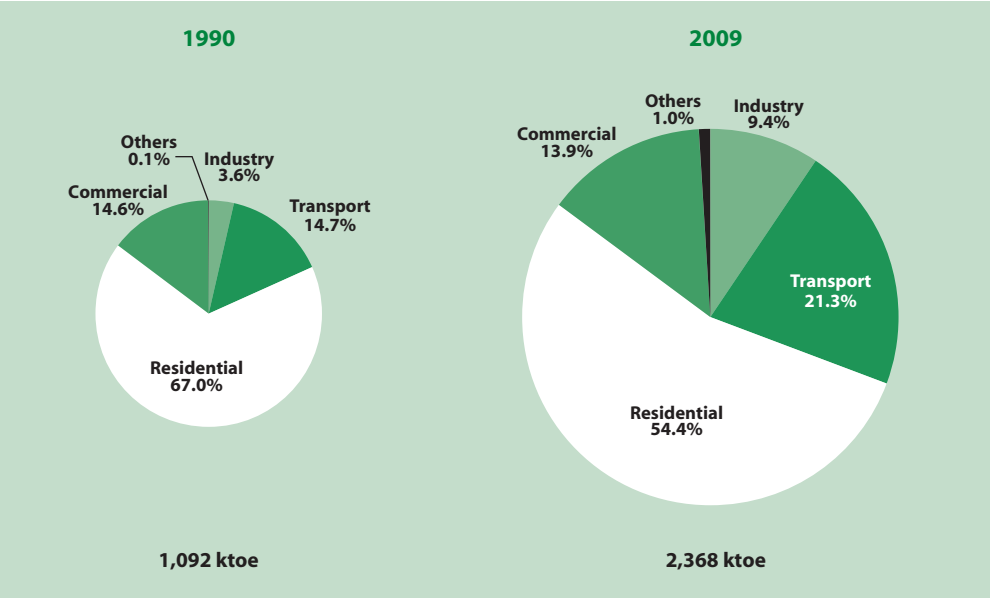
GDP = gross domestic product, PPP = purchasing power parity.
Source: World Bank.

Table 7.4.2 Energy Supply and Demand

	1990	1995	2000	2005	2009
Primary Energy Supply (ktoe)					
Indigenous Production	1,085	1,244	1,678	1,934	2,368
Net Imports	114	152	–24	28	391
Total PES	1,199	1,396	1,654	1,962	2,759
Coal	0	0	0	1	132
Oil	163	204	284	385	627
Gas	0	0	0	0	0
Biomass	1,015	1,151	1,299	1,462	1,774
Others	22	42	71	115	225
TPES/capita (toe)	0.29	0.29	0.31	0.34	0.45
TPES/GDP (toe/constant 2005 PPP $ million)	305	263	231	202	211
Final Energy Consumption (ktoe)					
Industry	39	48	63	79	223
Transportation	160	197	266	370	504
Other Sectors	893	1,022	1,173	1,338	1,640
Total FEC	1,092	1,268	1,502	1,787	2,368
Coal	0	0	0	1	91
Oil	163	200	272	377	532
Gas	0	0	0	0	0
Electricity	14	29	55	87	194
Biomass	915	1,039	1,174	1,322	1,551
Others	0	0	0	0	0

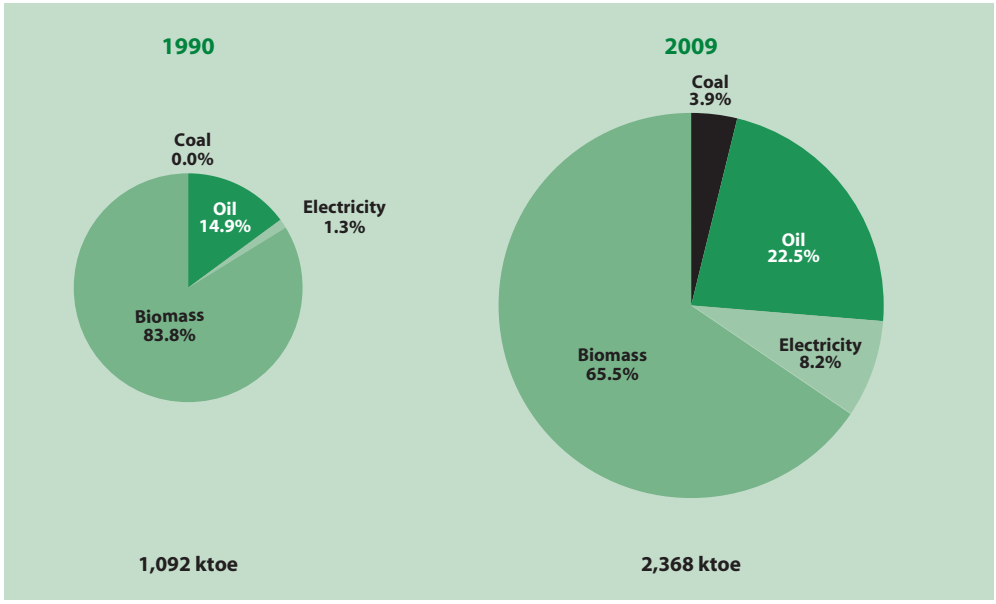
FEC = final energy consumption, GDP = gross domestic product, ktoe = thousand tons of oil equivalent, PES = primary energy supply, PPP = purchasing power parity, toe = ton of oil equivalent, TPES = total primary energy supply.
Source: Lao PDR Ministry of Energy and Mines (unpublished).

Figure 7.4.1 Final Energy Consumption by Sector, 1990 and 2009



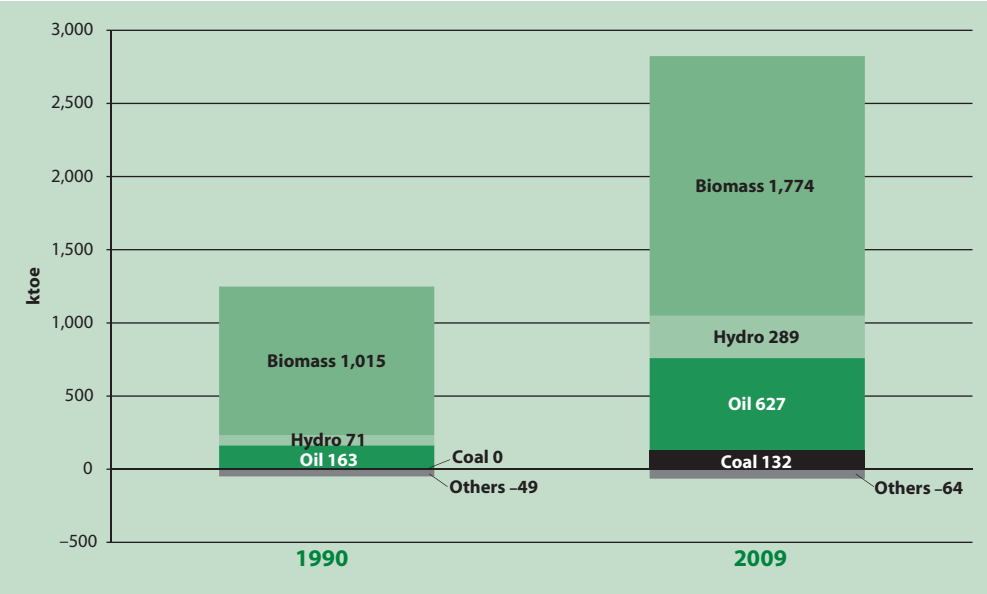
ktoe = thousand tons of oil equivalent.
Source: Lao PDR Ministry of Energy and Mines (unpublished).

Figure 7.4.2 Final Energy Consumption by Type of Energy, 1990 and 2009



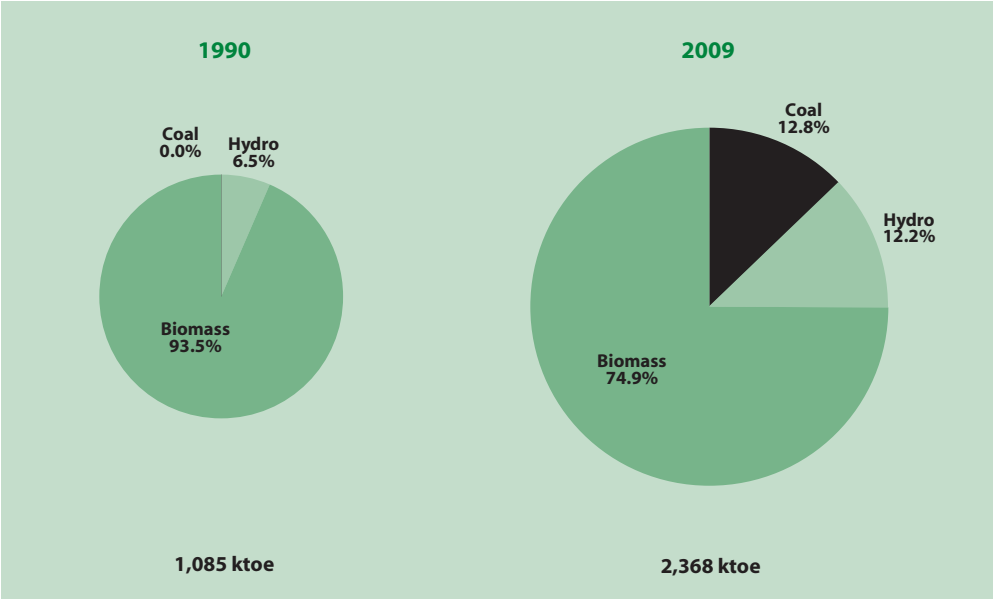
ktoe = thousand tons of oil equivalent.
Source: Lao PDR Ministry of Energy and Mines (unpublished).

Figure 7.4.3 Total Primary Energy Supply, 1990 and 2009



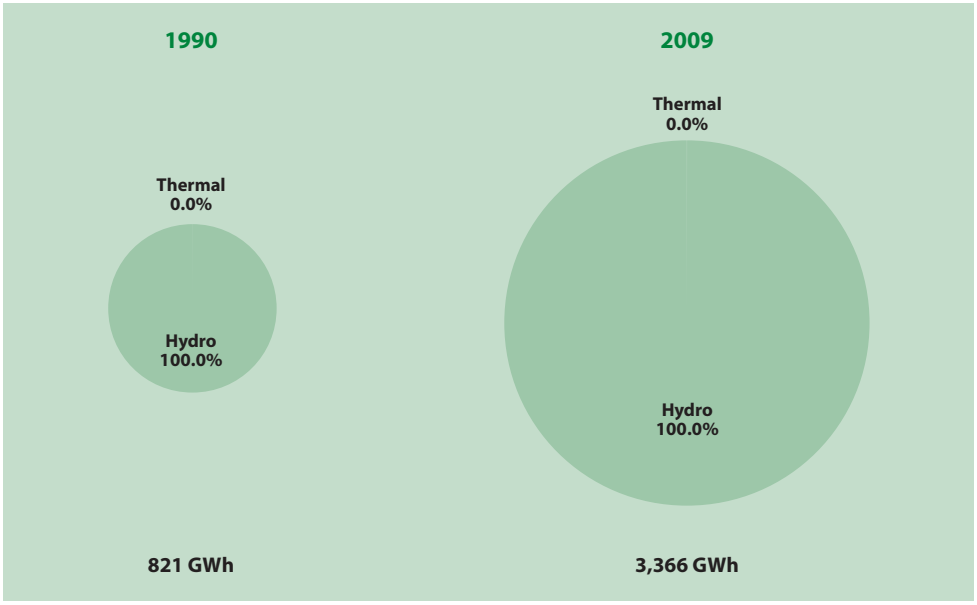
ktoe = thousand tons of oil equivalent.
Source: Lao PDR Ministry of Energy and Mines (unpublished).

Figure 7.4.4 Indigenous Energy Production, 1990 and 2009



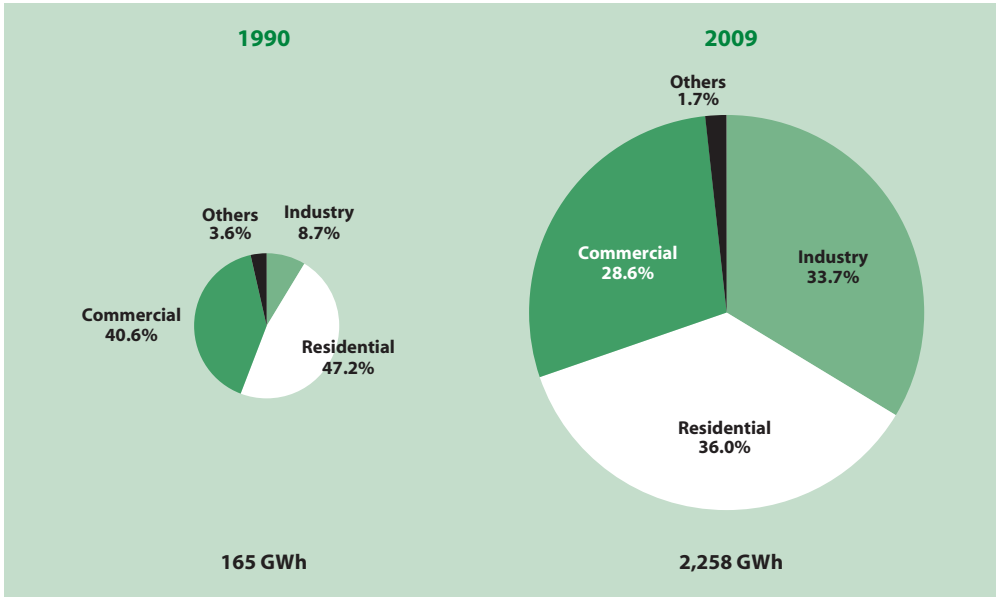
ktoe = thousand tons of oil equivalent.
Source: Lao PDR Ministry of Energy and Mines (unpublished).

Figure 7.4.5 Electricity Generation by Plant Type, 1990 and 2009



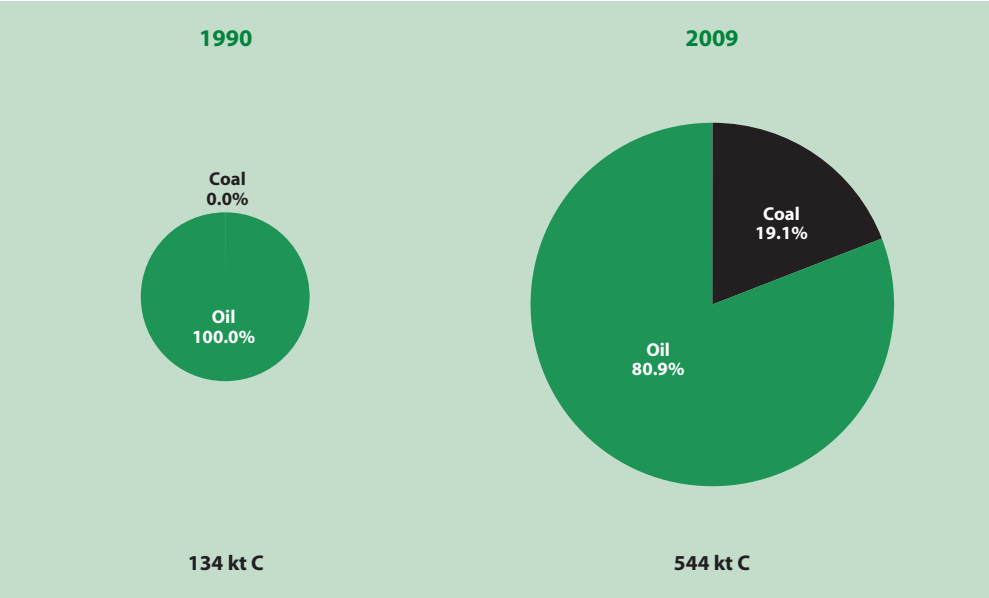
GWh = gigawatt-hour.
Source: Lao PDR Ministry of Energy and Mines (unpublished).

Figure 7.4.6 Electricity Consumption by Sector, 1990 and 2009



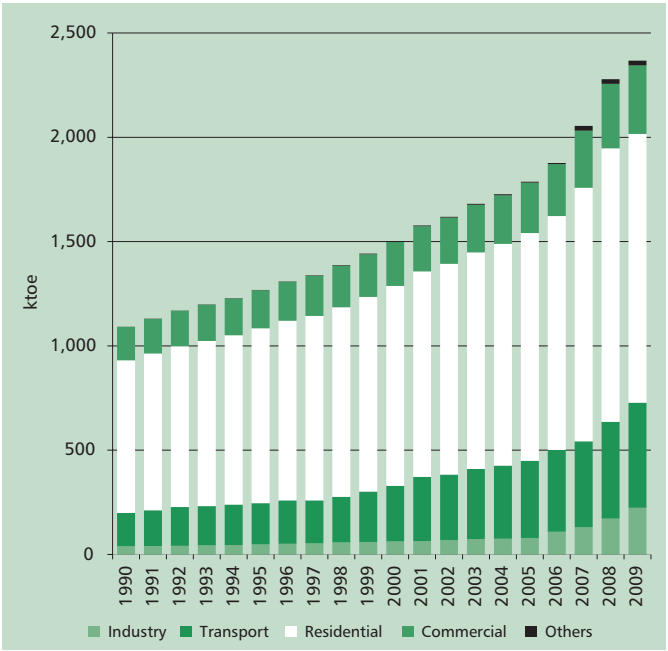
GWh = gigawatt-hour.
Source: Lao PDR Ministry of Energy and Mines (unpublished).

Figure 7.4.7 Carbon Dioxide Emission from Fuel Combustion, 1990 and 2009



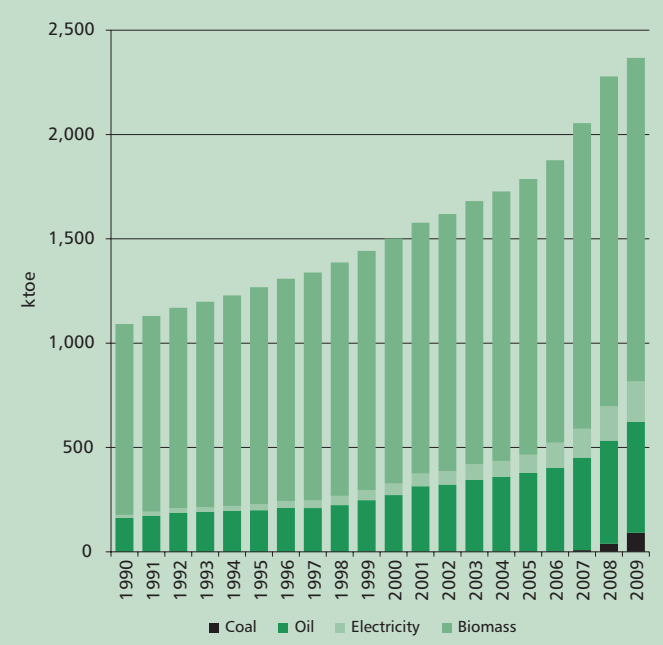
kt C = thousand tons of carbon equivalent.
Source: APERC estimates.

Figure 7.4.8 Final Energy Consumption by Sector, 1990–2009



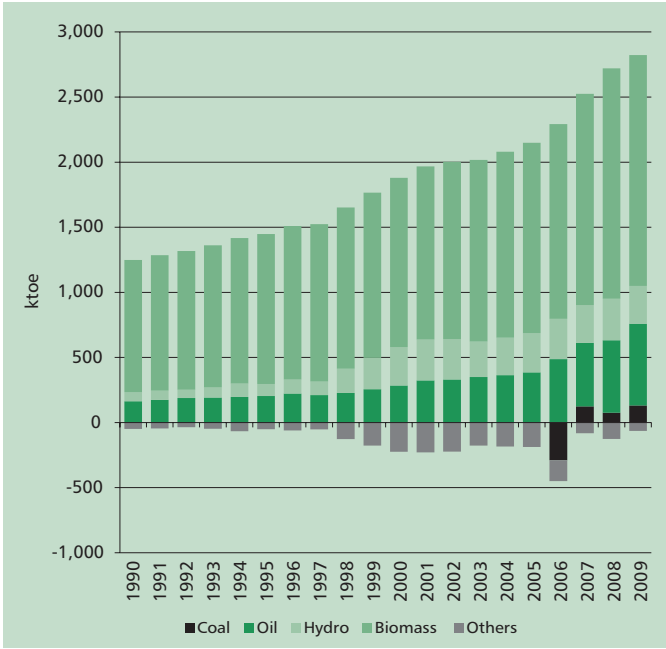
ktoe = thousand tons of oil equivalent.
Source: Lao PDR Ministry of Energy and Mines (unpublished).

Figure 7.4.9 Final Energy Consumption by Type, 1990–2009



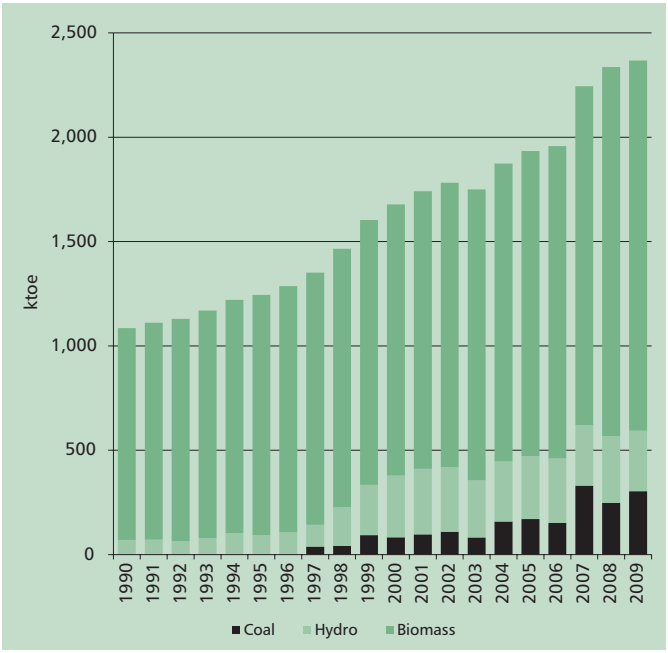
ktoe = thousand tons of oil equivalent.
Source: Lao PDR Ministry of Energy and Mines (unpublished).

Figure 7.4.10 Total Primary Energy Supply, 1990–2009



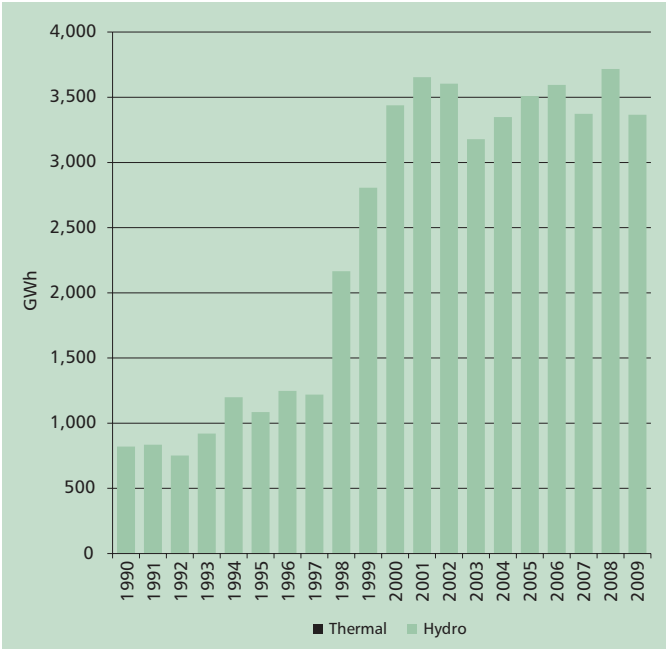
ktoe = thousand tons of oil equivalent.
Source: Lao PDR Ministry of Energy and Mines (unpublished).

Figure 7.4.11 Indigenous Energy Production, 1990–2009



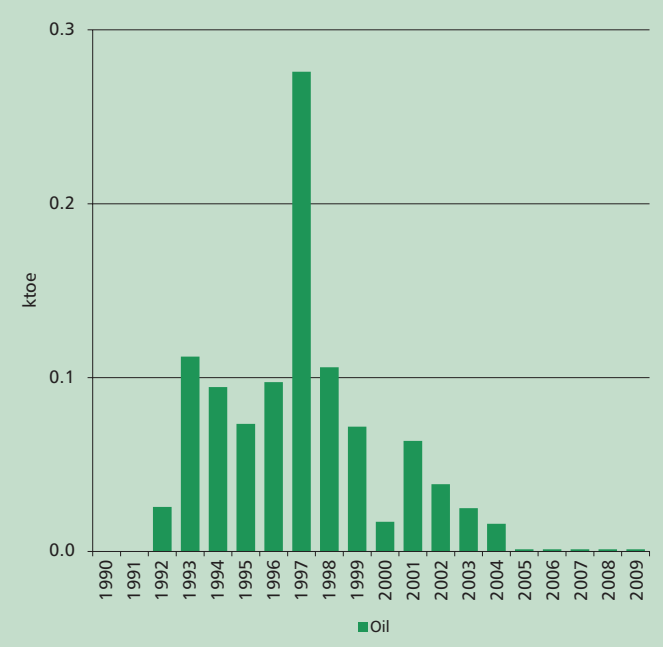
ktoe = thousand tons of oil equivalent.
Source: Lao PDR Ministry of Energy and Mines (unpublished).

Figure 7.4.12 Electricity Generation by Source, 1990–2009



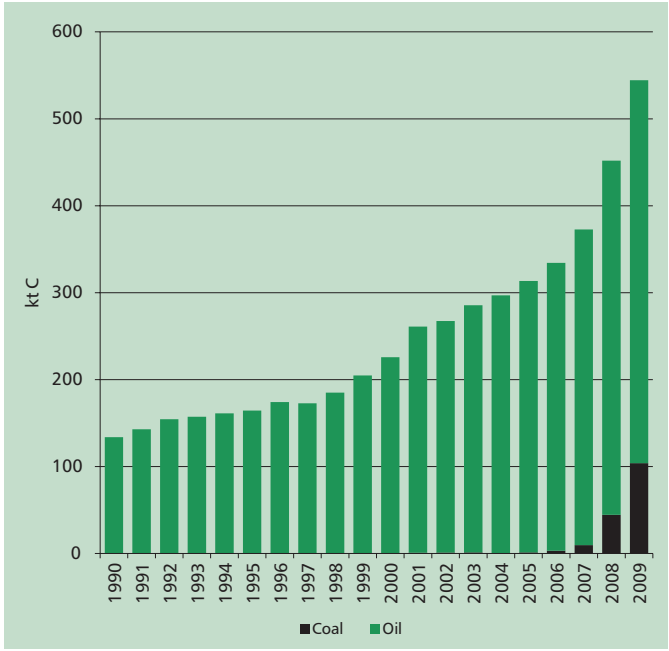
GWh = gigawatt-hour.
Source: Lao PDR Ministry of Energy and Mines (unpublished).

Figure 7.4.13 Fuel Input for Electricity Generation, 1990–2009



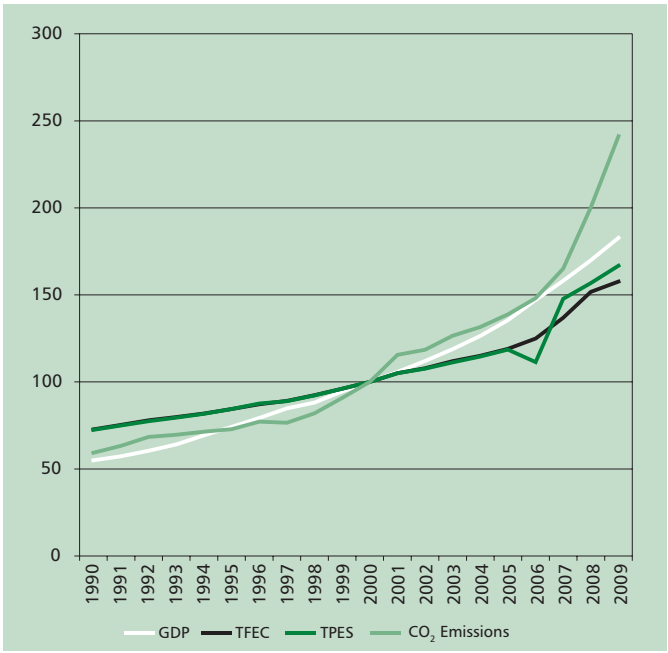
ktoe = thousand tons of oil equivalent.
Source: Lao PDR Ministry of Energy and Mines (unpublished).

Figure 7.4.14 Carbon Dioxide Emission from Fuel Combustion, 1990–2009



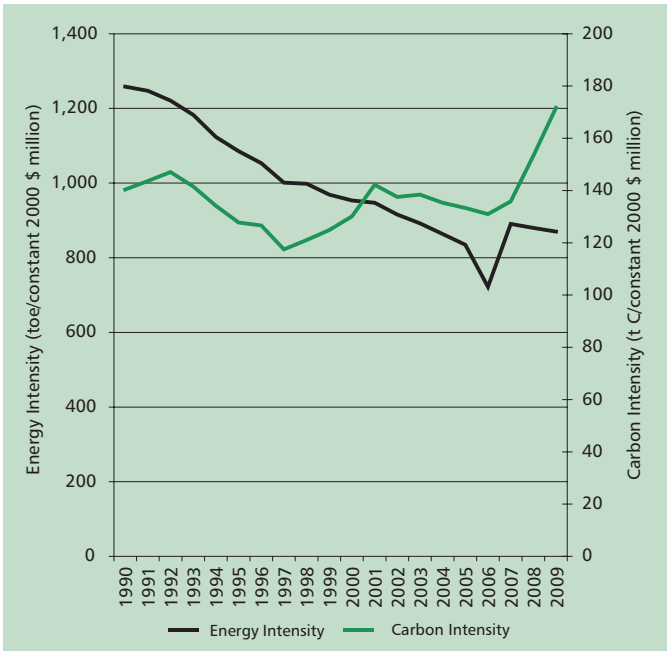
kt C = thousand tons of carbon equivalent.
Source: APERC estimates.

Figure 7.4.15 Growth of GDP, TFEC, TPES, and CO_2 (indexed to year 2000), 1990–2009



CO_2 = carbon dioxide, GDP = gross domestic product, TFEC = total final energy consumption, TPES = total primary energy supply.
Note: Indices are measured relative to the base year 2000 (2000 = 100).
Source: APERC estimates.

Figure 7.4.16 Energy and Carbon Intensities, 1990–2009



t C = ton of carbon equivalent, toe = ton of oil equivalent.
Source: APERC estimates.

Table 7.4.3 Lao People's Democratic Republic Energy Balance Table, 2006

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	152	0	0	0	0	0	0	0	0	0	0	309	0	0	0	0	1,497	0	0	0	1,957
2.	Imports	0	0	0	525	114	0	328	4	2	76	0	0	0	0	0	0	0	0	54	0	579
3.	Exports	–442	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–214	0	–656
4.	International Bunkers	0	0	0	–38	0	0	0	0	0	–38	0	0	0	0	0	0	0	0	0	0	–38
5.	Stock Changes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6.	Total Primary Energy Supply	–290	0	0	487	114	0	328	4	2	39	0	309	0	0	0	0	1,497	0	–160	0	1,843
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	0	0	0	0	0	0	0	0	0	0	0	–309	0	0	0	0	–143	0	309	0	–143
8.1	Power Generation	0	0	0	0	0	0	0	0	0	0	0	–309	0	0	0	0	0	0	309	0	0
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–143	0	0	0	–143
9.	Loss and Own Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–25	0	–25
10.	Discrepancy	293	0	0	–87	–7	0	–80	0	0	0	0	0	0	0	0	0	0	0	–4	0	202
11.	Total Final Energy Consumption	3	0	0	400	107	0	248	4	2	39	0	0	0	0	0	0	1,353	0	120	0	1,877
12.	Industry Sector	3	0	0	5	0	0	0	4	0	0	0	0	0	0	0	0	54	0	47	0	109
13.	Transport Sector	0	0	0	392	107	0	247	0	0	38	0	0	0	0	0	0	0	0	0	0	392
14.	Other Sectors	0	0	0	3	0	0	1	0	2	0	0	0	0	0	0	0	1,299	0	73	0	1,375
14.1	Residential and Commercial	0	0	0	2	0	0	0	0	2	0	0	0	0	0	0	0	1,299	0	70	0	1,370
14.1.1	Commerce and Public Services	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	226	0	21	0	249
14.1.2	Residential	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	1,072	0	48	0	1,121
14.2	Non–Specified Others	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	3	0	4
15.	Non–Energy Use	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
16.	Electricity Output (GWh)	0	0	0	0	0	0	0	0	0	0	0	3,595	0	0	0	0	0	0	0	0	3,595
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.
Note: Figures may not add up to total because of rounding.
Source: Lao PDR Ministry of Energy and Mines (unpublished).

Table 7.4.4 Lao People's Democratic Republic Energy Balance Table, 2007

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	331	0	0	0	0	0	0	0	0	0	0	290	0	0	0	0	1,624	0	0	0	2,244
2.	Imports	0	0	0	504	121	0	334	10	2	37	0	0	0	0	0	0	0	0	68	0	572
3.	Exports	–206	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–150	0	–356
4.	International Bunkers	0	0	0	–17	0	0	0	0	0	–17	0	0	0	0	0	0	0	0	0	0	–17
5.	Stock Changes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6.	Total Primary Energy Supply	125	0	0	487	121	0	334	10	2	20	0	290	0	0	0	0	1,624	0	–82	0	2,444
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	0	0	0	0	0	0	0	0	0	0	0	–290	0	0	0	0	–159	0	290	0	–159
8.1	Power Generation	0	0	0	0	0	0	0	0	0	0	0	–290	0	0	0	0	0	0	290	0	0
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–159	0	0	0	–159
9.	Loss and Own Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–19	0	–19
10.	Discrepancy	–116	0	0	–44	7	0	–51	0	0	0	0	0	0	0	0	0	0	0	–51	0	–211
11.	Total Final Energy Consumption	8	0	0	443	128	0	283	10	2	20	0	0	0	0	0	0	1,464	0	139	0	2,055
12.	Industry Sector	8	0	0	10	0	0	0	10	0	0	0	0	0	0	0	0	59	0	54	0	131
13.	Transport Sector	0	0	0	411	128	0	269	0	0	15	0	0	0	0	0	0	0	0	0	0	411
14.	Other Sectors	0	0	0	16	0	0	14	0	2	0	0	0	0	0	0	0	1,406	0	85	0	1,507
14.1	Residential and Commercial	0	0	0	2	0	0	0	0	2	0	0	0	0	0	0	0	1,406	0	81	0	1,489
14.1.1	Commerce and Public Services	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	246	0	26	0	273
14.1.2	Residential	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	1,160	0	55	0	1,216
14.2	Non–Specified Others	0	0	0	14	0	0	14	0	0	0	0	0	0	0	0	0	0	0	4	0	18
15.	Non–Energy Use	0	0	0	5	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	5
16.	Electricity Output (GWh)	0	0	0	0	0	0	0	0	0	0	0	3,374	0	0	0	0	0	0	0	0	3,374
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Source: Lao PDR Ministry of Energy and Mines (unpublished).

Table 7.4.5 Lao People's Democratic Republic Energy Balance Table, 2008

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	248	0	0	0	0	0	0	0	0	0	0	320	0	0	0	0	1,769	0	0	0	2,337
2.	Imports	20	0	0	573	126	0	400	9	2	35	0	0	0	0	0	0	0	0	73	0	665
3.	Exports	–192	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–199	0	–391
4.	International Bunkers	0	0	0	–17	0	0	0	0	0	–17	0	0	0	0	0	0	0	0	0	0	–17
5.	Stock Changes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6.	Total Primary Energy Supply	76	0	0	556	126	0	400	9	2	19	0	320	0	0	0	0	1,769	0	–126	0	2,594
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	0	0	0	0	0	0	0	0	0	0	0	–320	0	0	0	0	–188	0	320	0	–188
8.1	Power Generation	0	0	0	0	0	0	0	0	0	0	0	–320	0	0	0	0	0	0	320	0	0
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–188	0	0	0	–188
9.	Loss and Own Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–20	0	–20
10.	Discrepancy	–37	0	0	–62	5	0	–66	0	0	0	0	0	0	0	0	0	0	0	–8	0	–107
11.	Total Final Energy Consumption	39	0	0	494	131	0	334	9	2	19	0	0	0	0	0	0	1,581	0	165	0	2,279
12.	Industry Sector	39	0	0	9	0	0	0	9	0	0	0	0	0	0	0	0	63	0	60	0	172
13.	Transport Sector	0	0	0	465	131	0	319	0	0	15	0	0	0	0	0	0	0	0	0	0	465
14.	Other Sectors	0	0	0	16	0	0	14	0	2	0	0	0	0	0	0	0	1,518	0	104	0	1,639
14.1	Residential and Commercial	0	0	0	2	0	0	0	0	2	0	0	0	0	0	0	0	1,518	0	100	0	1,620
14.1.1	Commerce and Public Services	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	269	0	40	0	310
14.1.2	Residential	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	1,249	0	61	0	1,311
14.2	Non–Specified Others	0	0	0	14	0	0	14	0	0	0	0	0	0	0	0	0	0	0	4	0	18
15.	Non–Energy Use	0	0	0	4	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	4
16.	Electricity Output (GWh)	0	0	0	0	0	0	0	0	0	0	0	3,717	0	0	0	0	0	0	0	0	3,717
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.
Note: Figures may not add up to total because of rounding.
Source: Lao PDR Ministry of Energy and Mines (unpublished).

Table 7.4.6 Lao People's Democratic Republic Energy Balance Table, 2009

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	304	0	0	0	0	0	0	0	0	0	0	289	0	0	0	0	1,774	0	0	0	2,368
2.	Imports	29	0	0	634	141	0	471	6	2	14	0	0	0	0	0	0	0	0	101	0	764
3.	Exports	–201	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–165	0	–367
4.	International Bunkers	0	0	0	–6	0	0	0	0	0	–6	0	0	0	0	0	0	0	0	0	0	–6
5.	Stock Changes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6.	Total Primary Energy Supply	132	0	0	627	141	0	471	6	2	8	0	289	0	0	0	0	1,774	0	–64	0	2,759
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	0	0	0	0	0	0	0	0	0	0	0	–289	0	0	0	0	–223	0	289	0	–223
8.1	Power Generation	0	0	0	0	0	0	0	0	0	0	0	–289	0	0	0	0	0	0	289	0	0
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–223	0	0	0	–223
9.	Loss and Own Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–17	0	–17
10.	Discrepancy	–41	0	0	–96	–18	0	–78	0	0	1	0	0	0	0	0	0	0	0	–14	0	–151
11.	Total Final Energy Consumption	91	0	0	532	123	0	393	6	2	8	0	0	0	0	0	0	1,551	0	194	0	2,368
12.	Industry Sector	91	0	0	6	0	0	0	6	0	0	0	0	0	0	0	0	61	0	65	0	223
13.	Transport Sector	0	0	0	504	123	0	376	0	0	6	0	0	0	0	0	0	0	0	0	0	504
14.	Other Sectors	0	0	0	19	0	0	17	0	2	0	0	0	0	0	0	0	1,490	0	129	0	1,637
14.1	Residential and Commercial	0	0	0	2	0	0	0	0	2	0	0	0	0	0	0	0	1,490	0	125	0	1,617
14.1.1	Commerce and Public Services	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	272	0	55	0	328
14.1.2	Residential	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	1,218	0	70	0	1,289
14.2	Non-Specified Others	0	0	0	17	0	0	17	0	0	0	0	0	0	0	0	0	0	0	3	0	20
15.	Non-Energy Use	0	0	0	3	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	3
16.	Electricity Output (GWh)	0	0	0	0	0	0	0	0	0	0	0	3,366	0	0	0	0	0	0	0	0	3,366
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Source: Lao PDR Ministry of Energy and Mines (unpublished).

Table 7.4.7 Lao People's Democratic Republic Summary Table, 1990–2009

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Indigenous Production (ktoe)																				
Coal	0	0	0	0	0	0	0	38	41	93	83	97	110	83	158	171	152	331	248	304
Oil	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hydro	71	72	65	79	103	93	107	105	186	241	296	314	310	273	288	302	309	290	320	289
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Geothermal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Solar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wind	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Biomass	1,015	1,039	1,065	1,091	1,118	1,151	1,179	1,208	1,238	1,269	1,299	1,330	1,362	1,394	1,428	1,462	1,497	1,624	1,769	1,774
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	1,085	1,111	1,129	1,170	1,221	1,244	1,287	1,352	1,466	1,604	1,678	1,741	1,782	1,750	1,874	1,934	1,957	2,244	2,337	2,368
Primary Energy Supply (ktoe)																				
Coal	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	−290	125	76	132
Oil	163	174	188	191	196	204	223	211	227	255	284	323	330	349	364	385	487	487	556	627
Gas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hydro	71	72	65	79	103	93	107	105	186	241	296	314	310	273	288	302	309	290	320	289
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Geothermal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Solar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wind	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Biomass	1,015	1,039	1,065	1,091	1,118	1,151	1,179	1,208	1,238	1,269	1,299	1,330	1,362	1,394	1,428	1,462	1,497	1,624	1,769	1,774
Others	−49	−45	−36	−47	−66	−51	−61	−52	−127	−177	−225	−230	−223	−177	−184	−187	−160	−82	−126	−64
Total	1,199	1,240	1,281	1,314	1,351	1,396	1,449	1,472	1,526	1,589	1,654	1,738	1,779	1,841	1,895	1,962	1,843	2,444	2,594	2,759
Final Energy Consumption by Sector (ktoe)																				
Industry	39	40	42	43	46	48	51	54	58	60	63	65	69	74	76	79	109	131	172	223
Transport	160	171	185	189	194	197	209	206	219	241	266	307	315	336	351	370	392	411	465	504
Residential	732	752	771	792	812	838	861	884	909	934	959	985	1,010	1,039	1,063	1,092	1,121	1,216	1,311	1,289
Commercial	160	165	170	173	177	182	187	193	199	204	210	216	222	229	233	242	249	273	310	328
Others	1	1	1	1	1	1	2	2	3	3	3	4	4	4	5	4	5	23	22	23
Total	1,092	1,130	1,170	1,198	1,229	1,268	1,309	1,338	1,387	1,443	1,502	1,578	1,619	1,681	1,727	1,787	1,877	2,055	2,279	2,368

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Table 7.4.7 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Final Energy Consumption by Type (ktoe)																				
Coal	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	3	8	39	91
Oil	163	174	188	191	196	200	211	209	224	247	272	313	321	343	358	377	400	443	494	532
Gas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Electricity	14	19	22	23	24	29	33	37	44	49	55	61	66	76	78	87	120	139	165	194
Heat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Biomass	915	938	961	984	1,009	1,039	1,065	1,092	1,119	1,147	1,174	1,202	1,231	1,261	1,291	1,322	1,353	1,464	1,581	1,551
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	1,092	1,130	1,170	1,198	1,229	1,268	1,309	1,338	1,387	1,443	1,502	1,578	1,619	1,681	1,727	1,787	1,877	2,055	2,279	2,368
Power Generation (GWh)																				
Thermal	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Hydro	821	835	752	920	1,198	1,085	1,248	1,219	2,166	2,806	3,438	3,654	3,604	3,178	3,348	3,509	3,595	3,374	3,717	3,366
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Geothermal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Solar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wind	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	821	835	752	920	1,199	1,085	1,248	1,219	2,166	2,806	3,438	3,654	3,604	3,178	3,348	3,509	3,595	3,374	3,717	3,366
Loss and Own Use of Electricity (GWh)																				
Transmission and Distribution Losses	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Own Use	–	–	–	–	–	–	–	–	–	–	297	274	293	216	269	331	293	221	234	198
Total	–	–	–	–	–	–	–	–	–	–	297	274	293	216	269	331	293	221	234	198
Fuel Input for Power Generation (ktoe)																				
Coal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Oil	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CO_2 Emissions (kt C)																				
Coal	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	3	10	45	104
Oil	134	143	154	157	161	164	174	173	185	204	225	260	266	284	296	312	331	363	407	440
Gas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	134	143	154	157	161	164	174	173	185	205	226	261	267	286	297	313	334	373	452	544

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Table 7.4.7 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Macroeconomic Indicators																				
Population (thousand)	4,192	4,312	4,435	4,557	4,678	4,795	4,908	5,017	5,121	5,221	5,317	5,409	5,497	5,582	5,667	5,753	5,842	5,931	6,022	6,112
Urban Population, %	15.4	15.8	16.2	16.6	17.0	17.4	18.3	19.2	20.2	21.1	22.0	23.1	24.2	25.2	26.3	27.4	28.6	29.7	30.9	32.0
GDP (constant 2000 $ million)	953	994	1,049	1,111	1,202	1,287	1,376	1,470	1,529	1,640	1,735	1,835	1,944	2,063	2,195	2,350	2,551	2,744	2,948	3,171
GDP (current $ million)	866	1,028	1,128	1,328	1,544	1,764	1,874	1,747	1,280	1,454	1,735	1,769	1,830	2,149	2,507	2,718	3,490	4,260	5,478	5,907
GDP (constant 2005 PPP $ million)	3,930	4,099	4,327	4,583	4,957	5,305	5,673	6,062	6,303	6,763	7,155	7,567	8,015	8,505	9,049	9,692	10,520	11,314	12,157	13,075
GDP/capita (constant 2000 $)	227	231	237	244	257	268	280	293	298	314	326	339	354	370	387	409	437	463	490	519
GDP/capita (current $)	206	238	254	291	330	368	382	348	250	279	326	327	333	385	442	472	597	718	910	966
GDP – Manufacturing (% of GDP)	9.8	12.2	12.7	12.9	12.7	14 .0	15.6	15.8	16.7	16.6	16.9	17.9	19.1	19 .1	20.2	12.3	9.9	10.4	10.8	12.1
Car Ownership (car/1,000 persons)	4	4	4	5	5	5	4	7	7	3	3	4	4	7	7	7	7	7	7	7
Basic Energy Indicators																				
TPES/capita (toe/person)	0.29	0.29	0.29	0.29	0.29	0.29	0.30	0.29	0.30	0.30	0.31	0.32	0.32	0.33	0.33	0.34	0.32	0.41	0.43	0.45
TFEC/capita (toe/person)	0.26	0.26	0.26	0.26	0.26	0.26	0.27	0.27	0.27	0.28	0.28	0.29	0.29	0.30	0.30	0.31	0.32	0.35	0.38	0.39
TPES/GDP (toe/constant 2000 $ million)	1,258	1,247	1,221	1,183	1,124	1,085	1,053	1,001	998	969	954	947	915	892	864	835	722	891	880	870
TFEC/GDP (toe/constant 2000 $ million)	1,146	1,137	1,115	1,078	1,022	986	952	910	907	880	865	860	833	815	787	760	736	749	773	747
Import Dependency (%)	9.5	10.4	11.9	11.0	9.6	10.9	11.2	8.2	3.9	-0.9	-1.4	-0.2	-0.1	4.9	1.1	1.4	-6.2	8.2	9.9	14.2
Oil Import Dependency (%)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Electricity/capita (kWh/ person)	39	51	57	58	60	70	77	87	100	108	120	131	140	158	159	176	239	272	318	369
CO_2 Intensity (t C/constant 2000 $ million)	140	144	147	142	134	128	127	118	121	125	130	142	138	138	135	133	131	136	153	172
CO_2/capita (t C)	0.03	0.03	0.03	0.03	0.03	0.03	0.04	0.03	0.04	0.04	0.04	0.05	0.05	0.05	0.05	0.05	0.06	0.06	0.08	0.09
CO_2/TPES (t C/toe)	0.11	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.13	0.14	0.15	0.15	0.16	0.16	0.16	0.18	0.15	0.17	0.20

– = no data or not applicable, CO_2 = carbon dioxide, GDP = gross domestic product, GWh = gigawatt–hour, kt C = thousand tons of carbon equivalent, ktoe = thousand tons of oil equivalent, kWh = kilowatt–hour, PPP = purchasing power parity, t C = ton of carbon equivalent, TFEC = total final energy consumption, toe = ton of oil equivalent, TPES = total primary energy supply.

Note: Figures may not add up to total because of rounding.

Sources: APERC estimates, JAMA (2012), Lao PDR Ministry of Energy and Mines (unpublished), and World Bank.

7.5 Malaysia

Country Profile (2009)		Energy Reserves (year-end 2008)	
Total Surface Area (square kilometer)	330,800	Coal (million ton) - Recoverable	4.0
Population (thousand)	27,949	Gas (trillion cubic feet) - Proven	82.3
GDP (constant 2000 $ billion)	137.4	Oil (billion barrel) - Proven	5,357.0
Electrification Rate (%)	99.4		

GDP = gross domestic product.

Sources: ADB (2012), IEA (2011c), World Bank, and WEC (2010).

2009 Energy Supply and Demand Flow (ktoe)

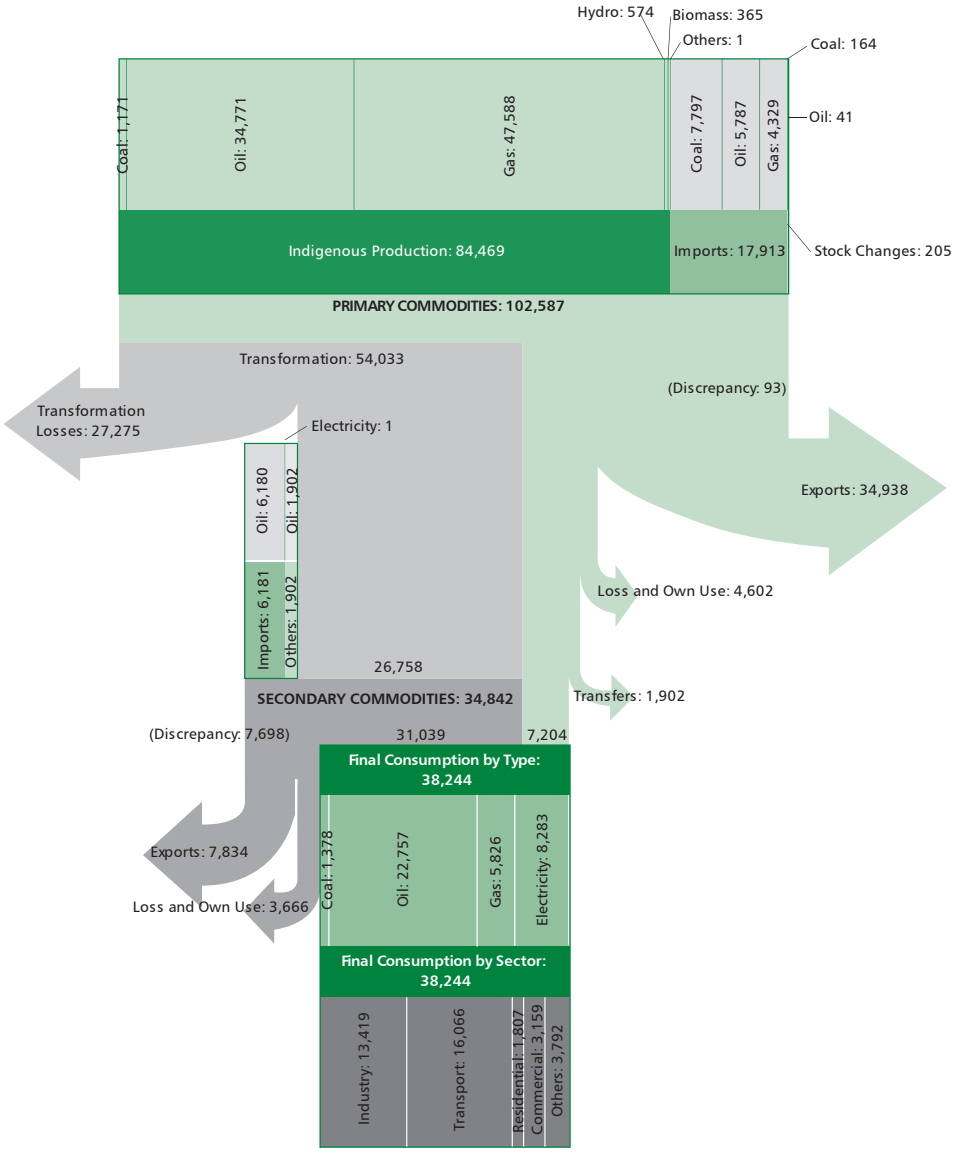


Table 7.5.1 Key Data and Economic Profile

	1990	1995	2000	2005	2009
Socioeconomic Data					
Population (thousand)	18,209	20,721	23,415	26,100	27,949
GDP (constant 2000 $ billion)	47.2	74.2	93.8	118.2	137.4
GDP (constant 2005 PPP $ billion)	120.3	189.2	239.0	301.3	350.1
GDP/capita (constant 2000 $)	2,593	3,582	4,006	4,530	4,915
GDP/capita (constant 2005 PPP $)	6,607	9,129	10,209	11,544	12,526

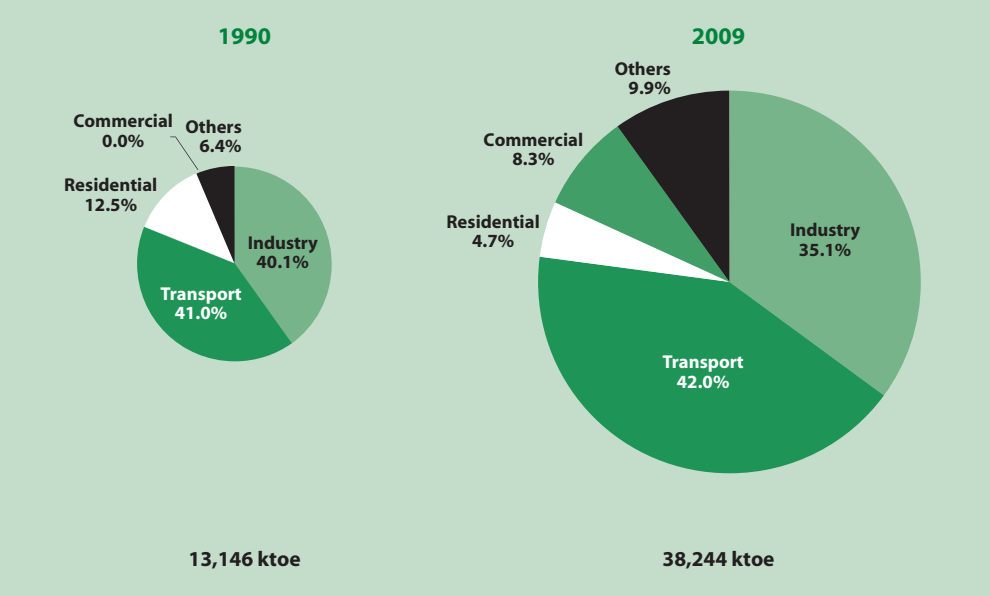
GDP = gross domestic product, PPP = purchasing power parity.
Source: World Bank.

Table 7.5.2 Energy Supply and Demand

	1990	1995	2000	2005	2009
Primary Energy Supply (ktoe)					
Indigenous Production	46,529	62,388	79,473	91,969	84,469
Net Imports	–25,557	–28,998	–27,981	–30,239	–18,473
Total PES	20,972	33,390	51,492	61,730	65,996
Coal	1,355	1,612	2,308	6,620	9,030
Oil	12,478	17,285	22,215	28,198	26,577
Gas	6,801	13,960	26,370	26,414	29,603
Biomass	0	0	0	0	219
Others	338	533	599	497	566
TPES/capita (toe)	1.15	1.61	2.20	2.37	2.36
TPES/GDP (toe/constant 2005 PPP $ million)	174	177	215	205	189
Final Energy Consumption (ktoe)					
Industry	5,276	8,060	11,401	14,960	13,419
Transportation	5,386	7,827	12,070	15,319	16,066
Other Sectors	2,484	6,277	6,226	7,257	8,758
Total FEC	13,146	22,164	29,697	37,536	38,244
Coal	513	712	991	1,280	1,378
Oil	9,825	16,142	19,581	22,995	22,757
Gas	1,093	1,935	3,862	6,322	5,826
Electricity	1,715	3,375	5,263	6,940	8,283
Biomass	0	0	0	0	0
Others	0	0	0	0	0

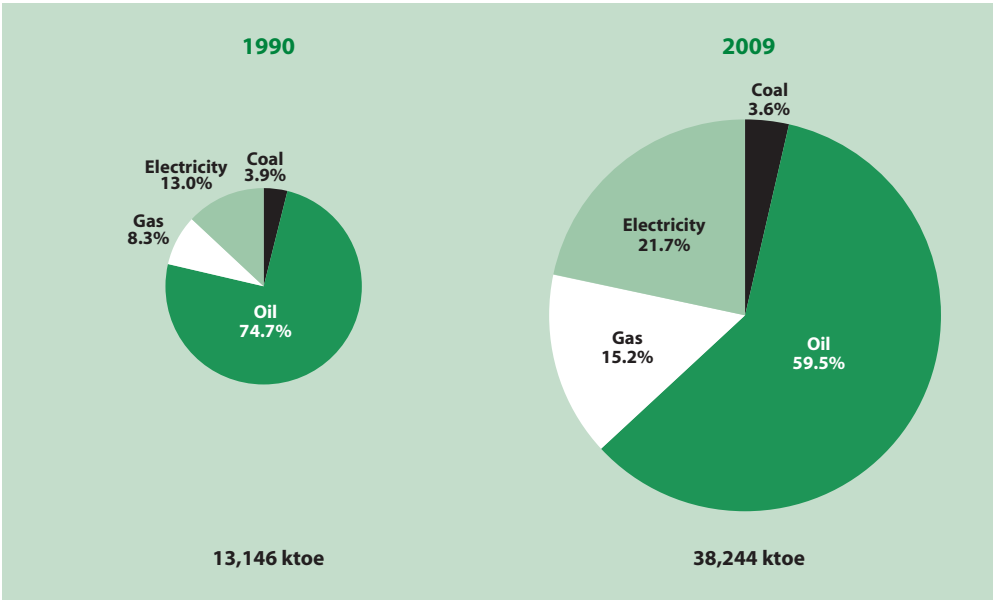
FEC = final energy consumption, GDP = gross domestic product, ktoe = thousand tons of oil equivalent, PES = primary energy supply, PPP = purchasing power parity, toe = ton of oil equivalent, TPES = total primary energy supply.
Source: APERC (APEC Energy Database).

Figure 7.5.1 Final Energy Consumption by Sector, 1990 and 2009



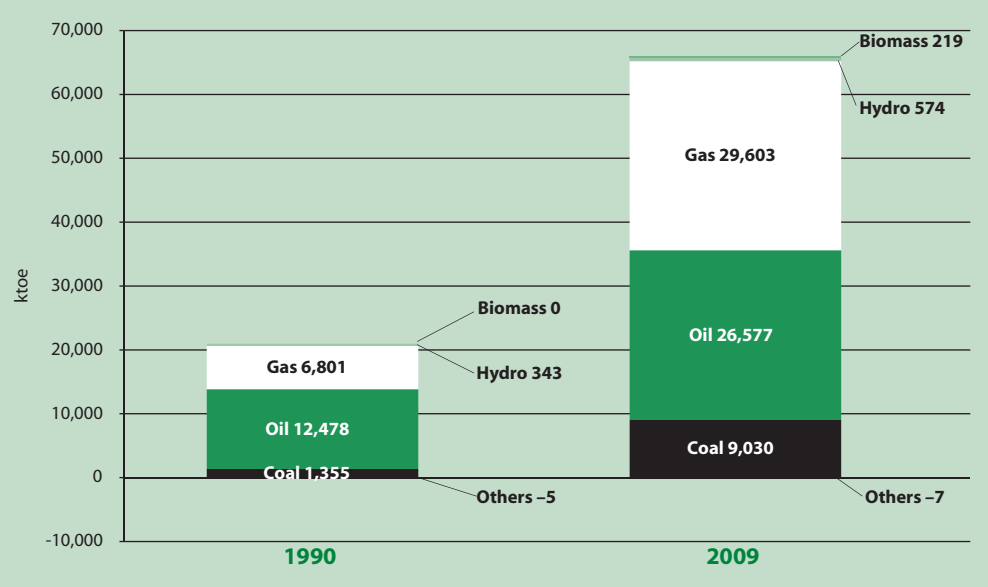
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 7.5.2 Final Energy Consumption by Type of Energy, 1990 and 2009



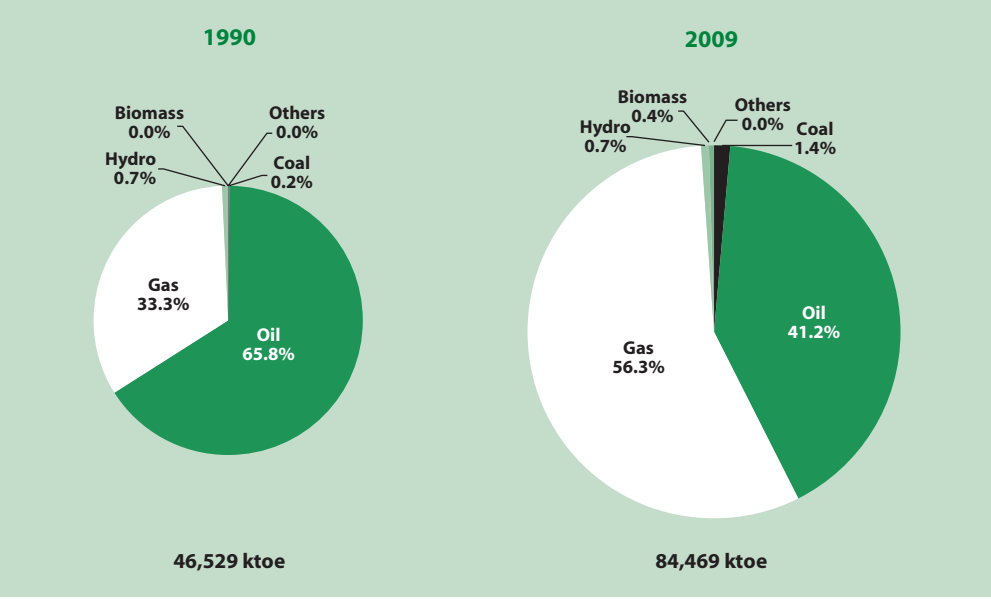
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 7.5.3 Total Primary Energy Supply, 1990 and 2009



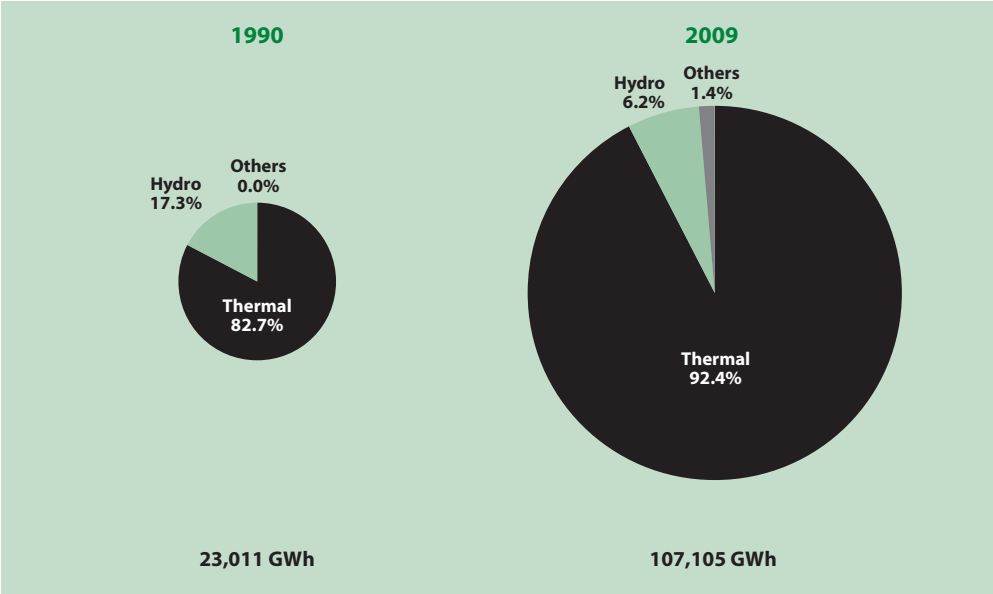
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 7.5.4 Indigenous Energy Production, 1990 and 2009



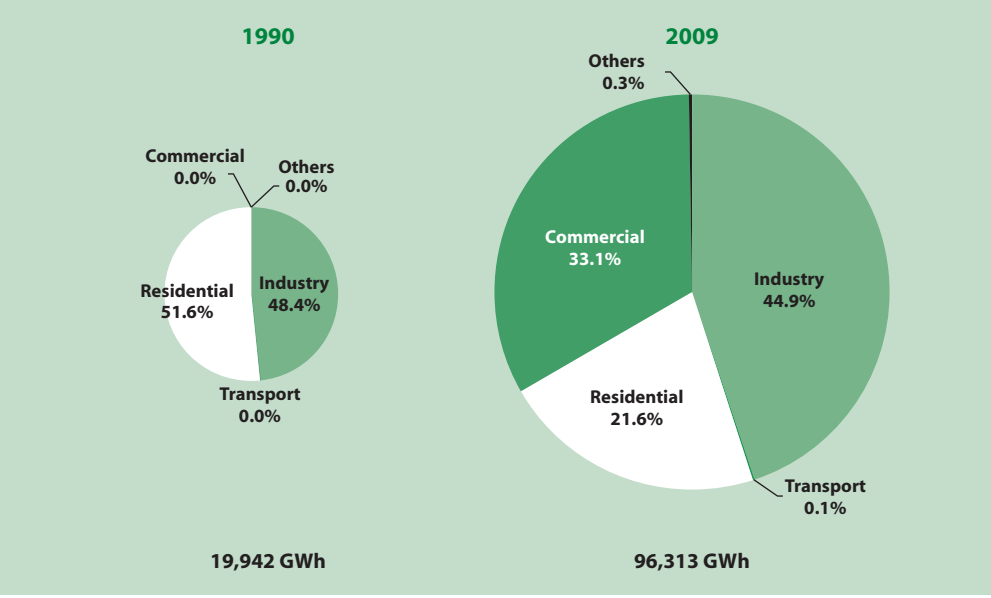
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 7.5.5 Electricity Generation by Plant Type, 1990 and 2009



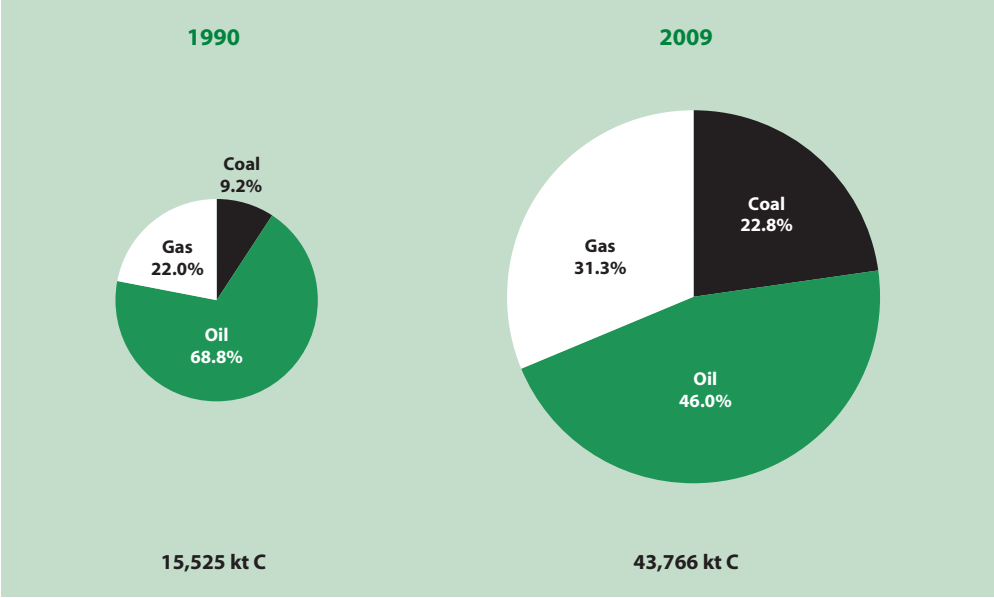
GWh = gigawatt-hour.
Source: APERC (APEC Energy Database).

Figure 7.5.6 Electricity Consumption by Sector, 1990 and 2009



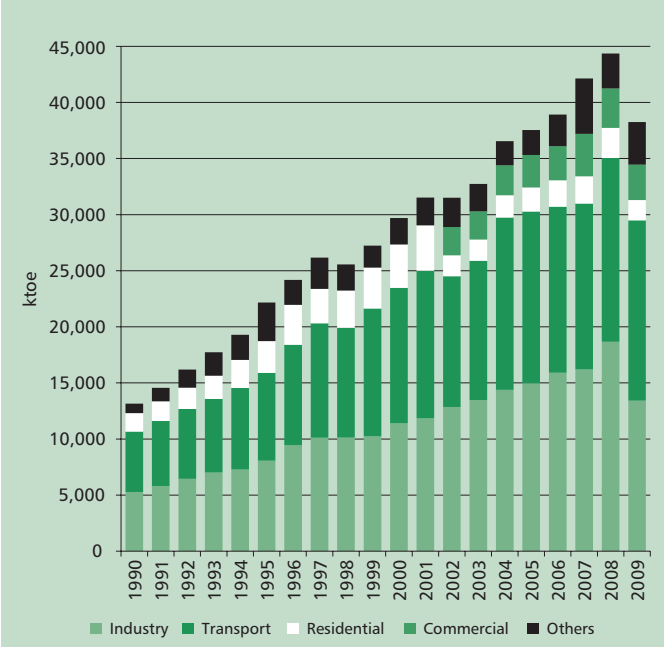
GWh = gigawatt-hour.
Source: APERC (APEC Energy Database).

Figure 7.5.7 Carbon Dioxide Emissions from Fuel Combustion, 1990 and 2009



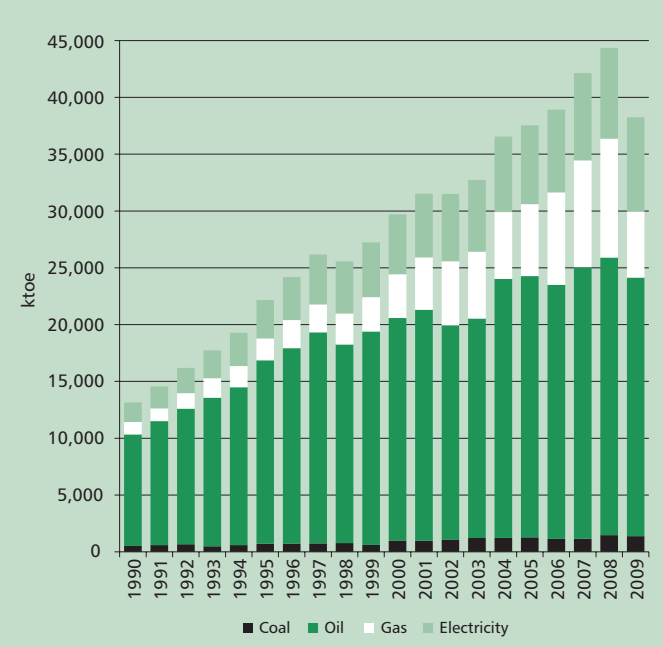
kt C = thousand tons of carbon equivalent.
Source: APERC estimates.

Figure 7.5.8 Final Energy Consumption by Sector, 1990–2009



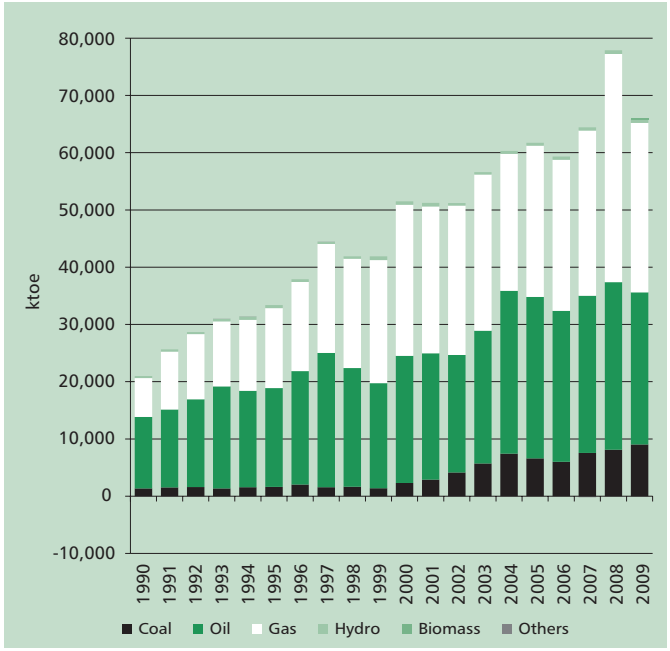
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 7.5.9 Final Energy Consumption by Type, 1990–2009



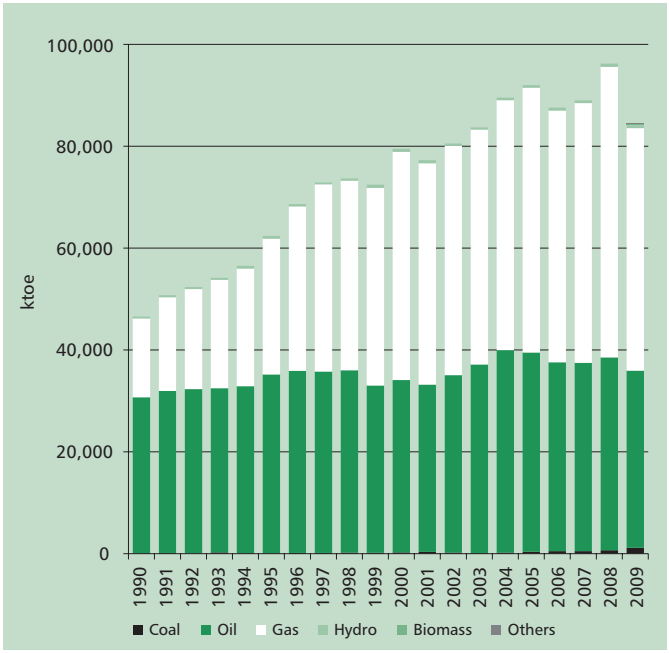
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 7.5.10 Total Primary Energy Supply, 1990–2009



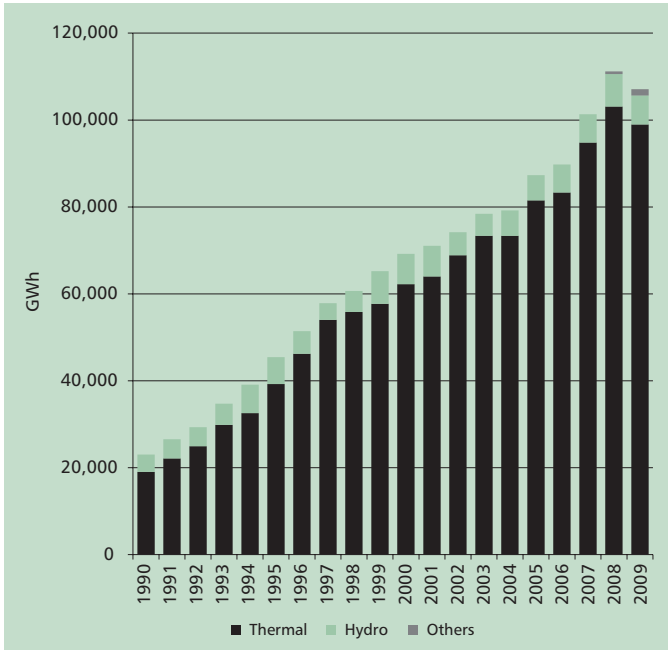
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 7.5.11 Indigenous Energy Production, 1990–2009



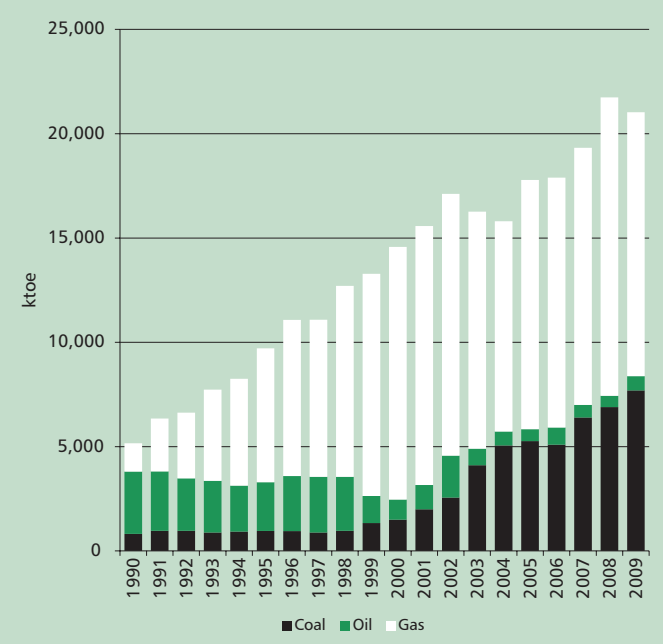
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 7.5.12 Electricity Generation by Source, 1990–2009



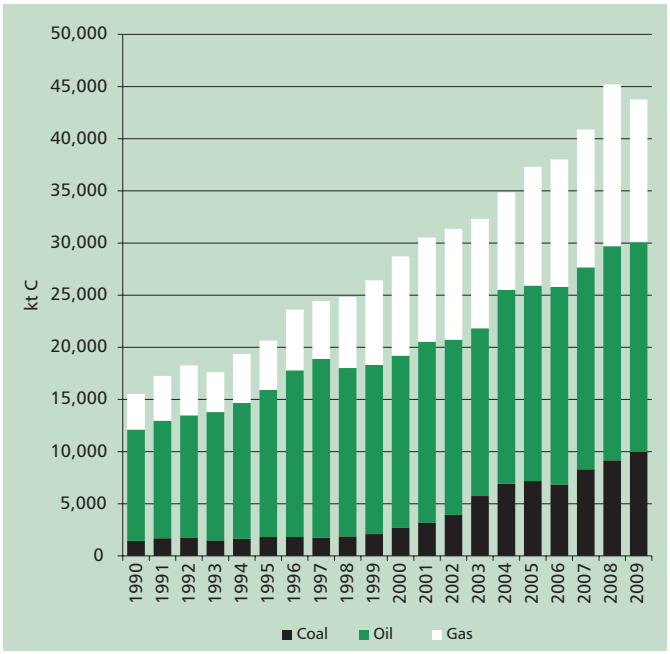
GWh = gigawatt-hour.
Source: APERC (APEC Energy Database).

Figure 7.5.13 Fuel Input for Electricity Generation, 1990–2009



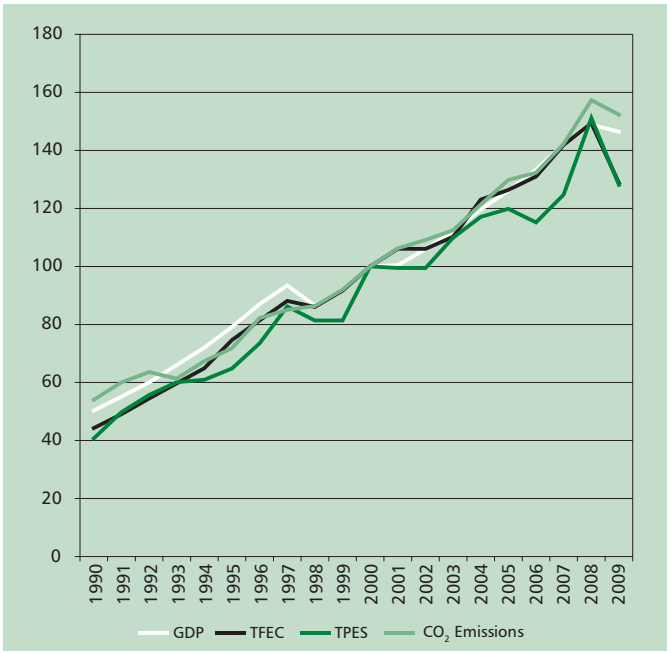
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 7.5.14 Carbon Dioxide Emissions from Fuel Combustion, 1990–2009



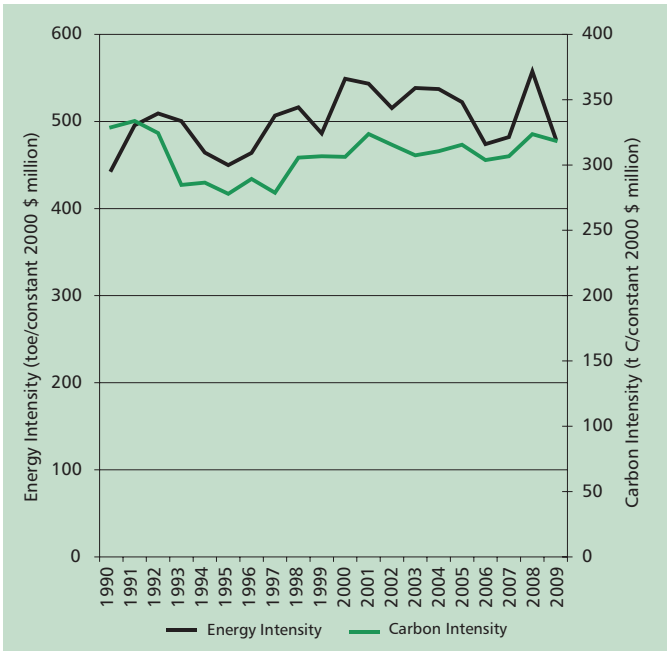
kt C = thousand tons of carbon equivalent.
Source: APERC estimates.

Figure 7.5.15 Growth of GDP, TFEC, TPES, and CO_2 (indexed to year 2000), 1990–2009



CO_2 = carbon dioxide, GDP = gross domestic product, TFEC = total final energy consumption, TPES = total primary energy supply.
Note: Indices are measured relative to the base year 2000 (2000 = 100).
Source: APERC estimates.

Figure 7.5.16 Energy and Carbon Intensities, 1990–2009



t C = ton of carbon equivalent, toe = ton of oil equivalent.
Source: APERC estimates.

Table 7.5.3 Malaysia Energy Balance Table, 2006

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	486	0	37,073	0	0	0	0	0	0	0	49,449	554	0	0	0	0	0	0	0	0	87,561
2.	Imports	5,829	0	8,043	7,726	3,482	90	1,273	2,225	308	348	2,895	0	0	0	0	0	0	0	0	0	24,493
3.	Exports	–60	0	–17,330	–9,520	–1,237	–544	–1,162	–2,197	–1,590	–2,790	–25,957	0	0	0	0	0	0	0	0	0	–52,868
4.	International Bunkers	0	0	0	–88	0	0	–64	–24	0	0	0	0	0	0	0	0	0	0	0	0	–88
5.	Stock Changes	–234	0	103	351	29	6	314	–10	–11	22	0	0	0	0	0	0	0	0	0	0	220
6.	Total Primary Energy Supply	6,020	0	27,889	–1,531	2,274	–448	360	–5	–1,293	–2,420	26,386	554	0	0	0	0	0	0	0	0	59,318
7.	Transfers	0	0	–2,087	2,087	0	45	99	0	1,624	319	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	–5,095	0	–24,971	21,795	7,540	528	8,095	1,762	1,113	2,758	–17,507	–554	0	0	0	0	0	0	7,721	0	–18,610
8.1	Power Generation	–5,095	0	0	–820	0	0	–651	–169	0	0	–11,982	–554	0	0	0	0	0	0	7,721	0	–10,729
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	–4,809	0	0	0	0	0	0	0	0	0	–4,809
8.3	Refineries	0	0	–24,971	23,459	7,540	528	8,745	1,932	1,117	3,597	0	0	0	0	0	0	0	0	0	0	–1,512
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	–844	0	0	0	0	–4	–839	–716	0	0	0	0	0	0	0	0	0	–1,560
9.	Loss and Own Use	0	0	0	0	0	0	0	0	0	0	–784	0	0	0	0	0	0	0	–273	0	–1,057
10.	Discrepancy	215	0	–831	11	–152	–48	–19	126	76	27	46	0	0	0	0	0	0	0	–180	0	–739
11.	Total Final Energy Consumption	1,141	0	0	22,362	9,662	77	8,535	1,883	1,520	684	8,142	0	0	0	0	0	0	0	7,268	0	38,912
12.	Industry Sector	1,141	0	0	5,130	16	29	3,258	1,645	169	12	6,168	0	0	0	0	0	0	0	3,473	0	15,911
13.	Transport Sector	0	0	0	14,689	9,643	0	5,043	3	0	0	105	0	0	0	0	0	0	0	5	0	14,799
14.	Other Sectors	0	0	0	2,543	3	48	234	235	1,351	672	25	0	0	0	0	0	0	0	3,790	0	6,359
14.1	Residential and Commercial	0	0	0	1,606	0	48	0	235	1,324	0	0	0	0	0	0	0	0	0	3,790	0	5,397
14.1.1	Commerce and Public Services	0	0	0	765	0	0	0	235	530	0	0	0	0	0	0	0	0	0	2,276	0	3,041
14.1.2	Residential	0	0	0	842	0	48	0	0	794	0	0	0	0	0	0	0	0	0	1,514	0	2,356
14.2	Non–Specified Others	0	0	0	937	3	0	234	0	27	672	25	0	0	0	0	0	0	0	0	0	962
15.	Non–Energy Use	0	0	0	0	0	0	0	0	0	0	1,844	0	0	0	0	0	0	0	0	0	1,844
16.	Electricity Output (GWh)	19,430	0	2,556	0	0	0	0	0	0	0	61,358	6,439	0	0	0	0	0	0	0	0	89,783
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.
Note: Figures may not add up to total because of rounding.
Source: APERC (APEC Energy Database).

Table 7.5.4 Malaysia Energy Balance Table, 2007

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	492	0	36,989	0	0	0	0	0	0	0	50,961	558	0	0	0	0	0	0	0	0	89,000
2.	Imports	7,203	0	9,597	8,445	4,021	47	1,456	1,922	320	680	4,922	0	0	0	0	0	0	0	0	0	30,167
3.	Exports	–233	0	–17,023	–9,768	–1,555	–194	–872	–1,340	–2,083	–3,724	–27,016	0	0	0	0	0	0	0	–195	0	–54,236
4.	International Bunkers	0	0	0	–975	–905	0	–17	–48	0	–5	0	0	0	0	0	0	0	0	0	0	–975
5.	Stock Changes	108	0	–155	329	68	7	45	0	3	206	0	0	0	0	0	0	0	0	0	0	282
6.	Total Primary Energy Supply	7,570	0	29,408	–1,968	1,630	–140	611	534	–1,760	–2,843	28,866	558	0	0	0	0	0	0	–195	0	64,239
7.	Transfers	0	0	–2,475	2,475	0	34	91	0	2,059	291	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	–6,400	0	–26,667	23,840	8,416	230	8,627	1,789	1,223	3,555	–18,930	–558	0	0	0	0	0	0	8,714	0	–20,001
8.1	Power Generation	–6,400	0	0	–596	0	0	–397	–199	0	0	–12,330	–558	0	0	0	0	0	0	8,714	0	–11,170
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	–6,600	0	0	0	0	0	0	0	0	0	–6,600
8.3	Refineries	0	0	–26,667	25,280	8,416	230	9,024	1,988	1,227	4,394	0	0	0	0	0	0	0	0	0	0	–1,387
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	–844	0	0	0	0	–4	–839	0	0	0	0	0	0	0	0	0	0	–844
9.	Loss and Own Use	0	0	0	0	0	0	0	0	0	0	–791	0	0	0	0	0	0	0	–610	0	–1,401
10.	Discrepancy	–6	0	–266	–449	–205	–50	172	–123	–72	–172	247	0	0	0	0	0	0	0	–230	0	–704
11.	Total Final Energy Consumption	1,163	0	0	23,898	9,841	74	9,501	2,200	1,450	831	9,392	0	0	0	0	0	0	0	7,680	0	42,133
12.	Industry Sector	1,163	0	0	6,059	47	26	3,981	1,903	92	9	5,403	0	0	0	0	0	0	0	3,585	0	16,210
13.	Transport Sector	0	0	0	14,646	9,790	0	4,854	3	0	0	133	0	0	0	0	0	0	0	3	0	14,783
14.	Other Sectors	0	0	0	2,348	4	48	667	294	1,335	0	1,943	0	0	0	0	0	0	0	4,091	0	8,382
14.1	Residential and Commercial	0	0	0	2,082	0	48	422	278	1,335	0	31	0	0	0	0	0	0	0	4,091	0	6,204
14.1.1	Commerce and Public Services	0	0	0	1,264	0	0	422	278	565	0	25	0	0	0	0	0	0	0	2,494	0	3,784
14.1.2	Residential	0	0	0	818	0	48	0	0	770	0	5	0	0	0	0	0	0	0	1,597	0	2,420
14.2	Non-Specified Others	0	0	0	266	4	0	245	17	0	0	1,913	0	0	0	0	0	0	0	0	0	2,178
15.	Non-Energy Use	0	0	0	845	0	0	0	0	23	822	1,913	0	0	0	0	0	0	0	0	0	2,758
16.	Electricity Output (GWh)	32,840	0	2,601	0	0	0	0	0	0	0	59,399	6,485	0	0	0	0	0	0	0	0	101,325
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Source: APERC (APEC Energy Database).

Table 7.5.5 Malaysia Energy Balance Table, 2008

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	676	0	37,870	0	0	0	0	0	0	0	57,022	642	0	0	0	0	0	0	0	0	96,208
2.	Imports	8,310	0	8,565	7,370	3,509	98	1,502	1,060	171	1,030	4,447	0	0	0	0	0	0	0	9	0	28,701
3.	Exports	−176	0	−14,994	−9,517	−176	−149	−1,150	−533	−1,652	−5,856	−21,600	0	0	0	0	0	0	0	−50	0	−46,337
4.	International Bunkers	0	0	0	−66	0	0	−16	−44	0	−6	0	0	0	0	0	0	0	0	0	0	−66
5.	Stock Changes	−695	0	144	−115	42	−18	−98	6	−10	−37	0	0	0	0	0	0	0	0	0	0	−666
6.	Total Primary Energy Supply	8,114	0	31,585	−2,329	3,375	−69	238	489	−1,491	−4,869	39,869	642	0	0	0	0	0	0	−41	0	77,839
7.	Transfers	0	0	−2,356	2,356	0	38	113	0	1,876	330	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	−6,894	0	−26,740	25,917	5,063	241	8,996	1,812	1,207	8,599	−27,982	−642	0	0	0	0	0	0	9,563	0	−26,778
8.1	Power Generation	−6,894	0	0	−542	0	0	−361	−180	0	0	−14,304	−642	0	0	0	0	0	0	9,563	0	−12,818
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	−13,679	0	0	0	0	0	0	0	0	0	−13,679
8.3	Refineries	0	0	−26,740	26,459	5,063	241	9,357	1,992	1,207	8,599	0	0	0	0	0	0	0	0	0	0	−281
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	0	0	0	−993	0	0	0	0	−2	−990	−1,411	0	0	0	0	0	0	0	−772	0	−3,175
10.	Discrepancy	244	0	−2,488	−519	398	−136	−186	−338	−116	−141	−1	0	0	0	0	0	0	0	−768	0	−3,532
11.	Total Final Energy Consumption	1,464	0	0	24,433	8,835	73	9,160	1,963	1,474	2,928	10,474	0	0	0	0	0	0	0	7,983	0	44,354
12.	Industry Sector	1,464	0	0	5,262	49	25	3,387	1,701	99	0	8,257	0	0	0	0	0	0	0	3,685	0	18,667
13.	Transport Sector	0	0	0	16,175	8,782	0	5,279	3	0	2,111	189	0	0	0	0	0	0	0	15	0	16,378
14.	Other Sectors	0	0	0	2,167	4	48	494	259	1,362	0	36	0	0	0	0	0	0	0	4,283	0	6,486
14.1	Residential and Commercial	0	0	0	1,900	0	48	250	241	1,362	0	36	0	0	0	0	0	0	0	4,264	0	6,200
14.1.1	Commerce and Public Services	0	0	0	893	0	0	250	241	402	0	30	0	0	0	0	0	0	0	2,597	0	3,520
14.1.2	Residential	0	0	0	1,007	0	48	0	0	959	0	6	0	0	0	0	0	0	0	1,667	0	2,680
14.2	Non−Specified Others	0	0	0	267	4	0	245	18	0	0	0	0	0	0	0	0	0	0	19	0	286
15.	Non−Energy Use	0	0	0	830	0	0	0	0	13	817	1,993	0	0	0	0	0	0	0	0	0	2,823
16.	Electricity Output (GWh)	30,235	0	2,090	0	0	0	0	0	0	0	70,805	7,460	0	0	0	0	610	0	0	0	111,200
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.
Note: Figures may not add up to total because of rounding.
Source: APERC (APEC Energy Database).

Table 7.5.6 Malaysia Energy Balance Table, 2009

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	1,171	0	34,771	0	0	0	0	0	0	0	47,588	574	0	0	1	0	365	0	0	0	84,469
2.	Imports	7,797	0	5,787	6,180	3,297	145	1,976	0	394	368	4,329	0	0	0	0	0	0	0	1	0	24,095
3.	Exports	–102	0	–12,378	–7,825	0	–590	–1,414	0	–1,517	–4,304	–22,314	0	0	0	0	0	–145	0	–9	0	–42,772
4.	International Bunkers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5.	Stock Changes	164	0	41	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	205
6.	Total Primary Energy Supply	9,030	0	28,222	–1,645	3,297	–445	562	0	–1,124	–3,936	29,603	574	0	0	1	0	219	0	–8	0	65,996
7.	Transfers	0	0	–1,902	1,902	0	34	105	0	1,477	287	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	–7,698	0	–26,363	17,547	4,049	555	8,933	–205	731	3,484	–19,175	–574	0	0	–1	0	–223	0	9,211	0	–27,275
8.1	Power Generation	–7,698	0	0	–681	0	0	–476	–205	0	0	–12,653	–574	0	0	–1	0	–223	0	9,211	0	–12,619
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	–6,522	0	0	0	0	0	0	0	0	0	–6,522
8.3	Refineries	0	0	–26,505	18,228	4,049	555	9,409	0	731	3,484	0	0	0	0	0	0	0	0	0	0	–8,277
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	142	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	142
9.	Loss and Own Use	0	0	0	–2,868	0	0	0	0	0	–2,868	–4,602	0	0	0	0	0	0	0	–798	0	–8,268
10.	Discrepancy	47	0	43	7,820	1,414	–115	–970	1,495	53	5,943	0	0	0	0	0	0	3	0	–123	0	7,791
11.	Total Final Energy Consumption	1,378	0	0	22,757	8,760	29	8,630	1,290	1,138	2,910	5,826	0	0	0	0	0	0	0	8,283	0	38,244
12.	Industry Sector	1,378	0	0	4,433	98	15	3,061	1,195	63	0	3,891	0	0	0	0	0	0	0	3,717	0	13,419
13.	Transport Sector	0	0	0	15,853	8,661	0	5,060	21	0	2,112	202	0	0	0	0	0	0	0	11	0	16,066
14.	Other Sectors	0	0	0	597	1	14	509	73	0	0	23	0	0	0	0	0	0	0	4,555	0	5,175
14.1	Residential and Commercial	0	0	0	408	0	14	328	66	0	0	23	0	0	0	0	0	0	0	4,534	0	4,966
14.1.1	Commerce and Public Services	0	0	0	394	0	0	328	66	0	0	22	0	0	0	0	0	0	0	2,743	0	3,159
14.1.2	Residential	0	0	0	14	0	14	0	0	0	0	2	0	0	0	0	0	0	0	1,791	0	1,807
14.2	Non–Specified Others	0	0	0	189	1	0	181	7	0	0	0	0	0	0	0	0	0	0	21	0	210
15.	Non–Energy Use	0	0	0	1,873	0	0	0	0	1,075	799	1,709	0	0	0	0	0	0	0	0	0	3,582
16.	Electricity Output (GWh)	36,250	0	2,813	0	0	0	0	0	0	0	59,924	6,671	0	0	9	0	1,438	0	0	0	107,105
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Source: APERC (APEC Energy Database).

Table 7.5.7 Malaysia Summary Table, 1990–2009

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Indigenous Production (ktoe)																				
Coal	70	126	53	264	89	85	153	153	221	174	242	344	223	107	229	408	486	492	676	1,171
Oil	30,629	31,843	32,264	32,218	32,798	35,090	35,744	35,600	35,784	32,835	33,835	32,851	34,838	37,026	39,744	39,072	37,073	36,989	37,870	34,771
Gas	15,487	18,390	19,644	21,272	23,068	26,678	32,292	36,777	37,233	38,783	44,797	43,462	45,002	46,123	49,046	51,992	49,449	50,961	57,022	47,588
Hydro	343	379	375	419	561	535	446	333	417	647	599	607	456	435	501	497	554	558	642	574
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Geothermal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Solar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Wind	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Biomass	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	365
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	46,529	50,738	52,336	54,173	56,516	62,388	68,635	72,863	73,655	72,439	79,473	77,264	80,519	83,691	89,520	91,969	87,561	89,000	96,208	84,469
Primary Energy Supply (ktoe)																				
Coal	1,355	1,532	1,587	1,352	1,563	1,612	2,053	1,569	1,660	1,376	2,308	2,911	4,133	5,717	7,451	6,620	6,020	7,570	8,114	9,030
Oil	12,478	13,609	15,331	17,825	16,855	17,285	19,808	23,459	20,727	18,364	22,215	22,054	20,523	23,201	28,418	28,198	26,358	27,439	29,256	26,577
Gas	6,801	10,112	11,381	11,360	12,392	13,960	15,567	19,041	19,101	21,506	26,370	25,648	26,101	27,257	23,924	26,414	26,386	28,866	39,869	29,603
Hydro	343	379	375	419	561	535	446	333	417	647	599	607	456	435	501	497	554	558	642	574
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Geothermal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Solar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Wind	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Biomass	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	219
Others	–5	–2	–2	2	4	–2	–1	1	0	0	0	0	–3	–17	0	0	0	–195	–41	–8
Total	20,972	25,630	28,672	30,958	31,375	33,390	37,873	44,403	41,905	41,893	51,492	51,220	51,210	56,593	60,293	61,730	59,318	64,239	77,839	65,996
Final Energy Consumption by Sector (ktoe)																				
Industry	5,276	5,809	6,455	7,012	7,283	8,060	9,443	10,106	10,122	10,239	11,401	11,853	12,853	13,473	14,375	14,960	15,911	16,210	18,667	13,419
Transport	5,386	5,806	6,226	6,557	7,262	7,827	8,951	10,201	9,793	11,393	12,070	13,138	11,656	12,419	15,365	15,319	14,799	14,783	16,378	16,066
Residential	1,646	1,747	1,891	2,070	2,503	2,837	3,557	3,072	3,313	3,653	3,867	4,047	1,867	1,890	1,993	2,138	2,356	2,420	2,680	1,807
Commercial	0	0	0	0	0	0	0	0	0	0	0	0	2,519	2,509	2,655	2,901	3,041	3,784	3,520	3,159
Others	838	1,201	1,613	2,090	2,239	3,440	2,231	2,789	2,330	1,943	2,359	2,478	2,609	2,444	2,151	2,218	2,805	4,936	3,109	3,792
Total	13,146	14,563	16,185	17,729	19,287	22,164	24,182	26,168	25,558	27,228	29,697	31,516	31,504	32,735	36,539	37,536	38,912	42,133	44,354	38,244

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Table 7.5.7 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Final Energy Consumption by Type (ktoe)																				
Coal	513	599	672	487	598	712	727	740	767	608	991	977	1,086	1,212	1,239	1,280	1,141	1,163	1,464	1,378
Oil	9,825	10,914	11,927	13,076	13,894	16,142	17,203	18,578	17,488	18,782	19,581	20,324	18,853	19,324	22,785	22,995	22,362	23,898	24,433	22,757
Gas	1,093	1,125	1,368	1,716	1,863	1,935	2,475	2,466	2,726	3,023	3,862	4,621	5,643	5,886	5,877	6,322	8,142	9,392	10,474	5,826
Electricity	1,715	1,925	2,218	2,450	2,932	3,375	3,777	4,384	4,577	4,815	5,263	5,594	5,922	6,313	6,638	6,940	7,268	7,680	7,983	8,283
Heat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Biomass	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	13,146	14,563	16,185	17,729	19,287	22,164	24,182	26,168	25,558	27,228	29,697	31,516	31,504	32,735	36,539	37,536	38,912	42,133	44,354	38,244
Power Generation (GWh)																				
Thermal	19,023	22,140	24,953	29,860	32,570	39,233	46,221	53,999	55,821	57,698	62,248	64,011	68,898	73,370	73,371	81,523	83,344	94,840	103,130	98,987
Hydro	3,988	4,407	4,360	4,872	6,523	6,221	5,186	3,872	4,849	7,523	6,962	7,058	5,300	5,056	5,823	5,784	6,439	6,485	7,460	6,671
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Geothermal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Solar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9
Wind	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	610	1,438
Total	23,011	26,547	29,313	34,732	39,093	45,454	51,407	57,871	60,670	65,221	69,210	71,069	74,198	78,426	79,194	87,307	89,783	101,325	111,200	107,105
Loss and Own Use of Electricity (GWh)																				
Transmission and Distribution Losses	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	3,545	4,486	3,289
Own Use	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1,557	2,977	3,175	3,545	4,486	5,985
Total	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1,557	2,977	3,175	7,090	8,972	9,274
Fuel Input for Power Generation (ktoe)																				
Coal	813	963	968	884	925	957	950	882	964	1,332	1,495	1,994	2,556	4,104	5,057	5,260	5,095	6,400	6,894	7,698
Oil	2,989	2,851	2,512	2,475	2,206	2,338	2,638	2,667	2,584	1,301	966	1,167	2,011	799	669	575	820	596	542	681
Gas	1,361	2,533	3,144	4,374	5,119	6,414	7,489	7,531	9,158	10,650	12,110	12,417	12,552	11,362	10,082	11,948	11,982	12,330	14,304	12,653
Total	5,163	6,347	6,624	7,733	8,250	9,709	11,077	11,080	12,706	13,283	14,571	15,578	17,119	16,265	15,807	17,783	17,897	19,327	21,739	21,033
CO_2 Emissions (kt C)																				
Coal	1,432	1,687	1,772	1,481	1,645	1,803	1,811	1,752	1,870	2,096	2,685	3,209	3,934	5,742	6,907	7,174	6,840	8,297	9,168	9,957
Oil	10,681	11,271	11,713	12,310	13,016	14,110	15,980	17,139	16,138	16,210	16,513	17,326	16,789	16,087	18,589	18,744	18,957	19,374	20,529	20,118
Gas	3,411	4,296	4,779	3,826	4,697	4,720	5,825	5,538	6,807	8,116	9,526	9,988	10,629	10,478	9,367	11,378	12,212	13,196	15,499	13,691
Total	15,525	17,254	18,264	17,616	19,359	20,632	23,617	24,430	24,815	26,421	28,724	30,524	31,352	32,307	34,863	37,296	38,009	40,868	45,197	43,766

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Table 7.5.7 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Macroeconomic Indicators																				
Population (thousand)	18,209	18,708	19,204	19,701	20,205	20,721	21,247	21,781	22,322	22,868	23,415	23,965	24,515	25,060	25,590	26,100	26,586	27,051	27,502	27,949
Urban Population, %	49.8	51.0	52.2	53.3	54.5	55.7	57.0	58.2	59.5	60.7	62.0	63.1	64.2	65.4	66.5	67.6	68.5	69.4	70.4	71.3
GDP (constant 2000 $ million)	47,206	51,712	56,307	61,878	67,578	74,221	81,645	87,624	81,175	86,157	93,790	94,275	99,358	105,109	112,239	118,224	125,138	133,248	139,653	137,369
GDP (current $ million)	44,024	49,134	59,151	66,894	74,481	88,832	100,852	100,169	72,175	79,148	93,790	92,784	100,846	110,202	124,749	137,953	156,601	186,777	222,744	192,912
GDP (constant 2005 PPP $ million)	120,311	131,795	143,505	157,705	172,233	189,161	208,083	223,320	206,885	219,583	239,035	240,273	253,226	267,884	286,056	301,308	318,932	339,599	355,925	350,102
GDP/capita (constant 2000 $)	2,593	2,764	2,932	3,141	3,345	3,582	3,843	4,023	3,636	3,768	4,006	3,934	4,053	4,194	4,386	4,530	4,707	4,926	5,078	4,915
GDP/capita (current $)	2,418	2,626	3,080	3,395	3,686	4,287	4,747	4,599	3,233	3,461	4,006	3,872	4,114	4,398	4,875	5,286	5,890	6,905	8,099	6,902
GDP – Manufacturing (% of GDP)	23.8	24.7	24 .3	25 .3	25.8	26.2	28.1	28.9	27.0	28.4	30.9	29.4	29.0	30.0	30.7	30.7	30.9	29.9	28.8	26.6
Car Ownership (car/1,000 persons)	133	131	137	146	140	145	178	194	199	212	224	238	226	269	280	296	296	293	314	318
Basic Energy Indicators																				
TPES/capita (toe/person)	1.15	1.37	1.49	1.57	1.55	1.61	1.78	2.04	1.88	1.83	2.20	2.14	2.09	2.26	2.36	2.37	2.23	2.37	2.83	2.36
TFEC/capita (toe/person)	0.72	0.78	0.84	0.90	0.95	1.07	1.14	1.20	1.14	1.19	1.27	1.32	1.29	1.31	1.43	1.44	1.46	1.56	1.61	1.37
TPES/GDP (toe/constant 2000 $ million)	444	496	509	500	464	450	464	507	516	486	549	543	515	538	537	522	474	482	557	480
TFEC/GDP (toe/constant 2000 $ million)	278	282	287	287	285	299	296	299	315	316	317	334	317	311	326	318	311	316	318	278
Import Dependency (%)	–121.9	–98.0	–82.5	–75.0	–80.1	–86.8	–81.2	–64.1	–75.8	–72.9	–54.3	–50.8	–57.2	–47.9	–48.5	–49.0	–47.6	–38.5	–23.6	–28.0
Oil Import Dependency (%)	–145.5	–134.0	–110.4	–80.7	–94.6	–103.0	–80.5	–51.8	–72.6	–78.8	–52.3	–49.0	–69.8	–59.6	–39.9	–38.6	–40.7	–34.8	–29.4	–30.8
Electricity/capita (kWh/ person)	1,095	1,197	1,343	1,446	1,688	1,894	2,067	2,341	2,385	2,449	2,614	2,715	2,809	2,930	3,017	3,092	3,180	3,302	3,376	3,447
CO_2 Intensity (t C/constant 2000 $ million)	329	334	324	285	286	278	289	279	306	307	306	324	316	307	311	315	304	307	324	319
CO_2/capita (t C)	0.85	0.92	0.95	0.89	0.96	1.00	1.11	1.12	1.11	1.16	1.23	1.27	1.28	1.29	1.36	1.43	1.43	1.51	1.64	1.57
CO_2/TPES (t C/toe)	0.74	0.67	0.64	0.57	0.62	0.62	0.62	0.55	0.59	0.63	0.56	0.60	0.61	0.57	0.58	0.60	0.64	0.64	0.58	0.66

– = no data or not applicable, CO_2 = carbon dioxide, GDP = gross domestic product, GWh = gigawatt–hour, kt C = thousand tons of carbon equivalent, ktoe = thousand tons of oil equivalent, kWh = kilowatt–hour, PPP = purchasing power parity, t C = ton of carbon equivalent, TFEC = total final energy consumption, toe = ton of oil equivalent, TPES = total primary energy supply.

Note: Figures may not add up to total because of rounding.

Sources: APERC (APEC Energy Database), APERC estimates, JAMA (2012), and World Bank.

7.6 Myanmar

Country Profile (2009)		Energy Reserves (year-end 2008)	
Total Surface Area (square kilometer)	676,590	Coal (million ton) - Recoverable	2.0
Population (thousand)	47,601	Gas (trillion cubic feet) - Proven	20.8
GDP (constant 2000 $ billion)	20.5	Oil (billion barrel) - Proven	50.0
Electrification Rate (%)	13.0		

GDP = gross domestic product.

Sources: ADB (2011 and 2012), IEA (2011c), World Bank, and WEC (2010).

2009 Energy Supply and Demand Flow (ktoe)

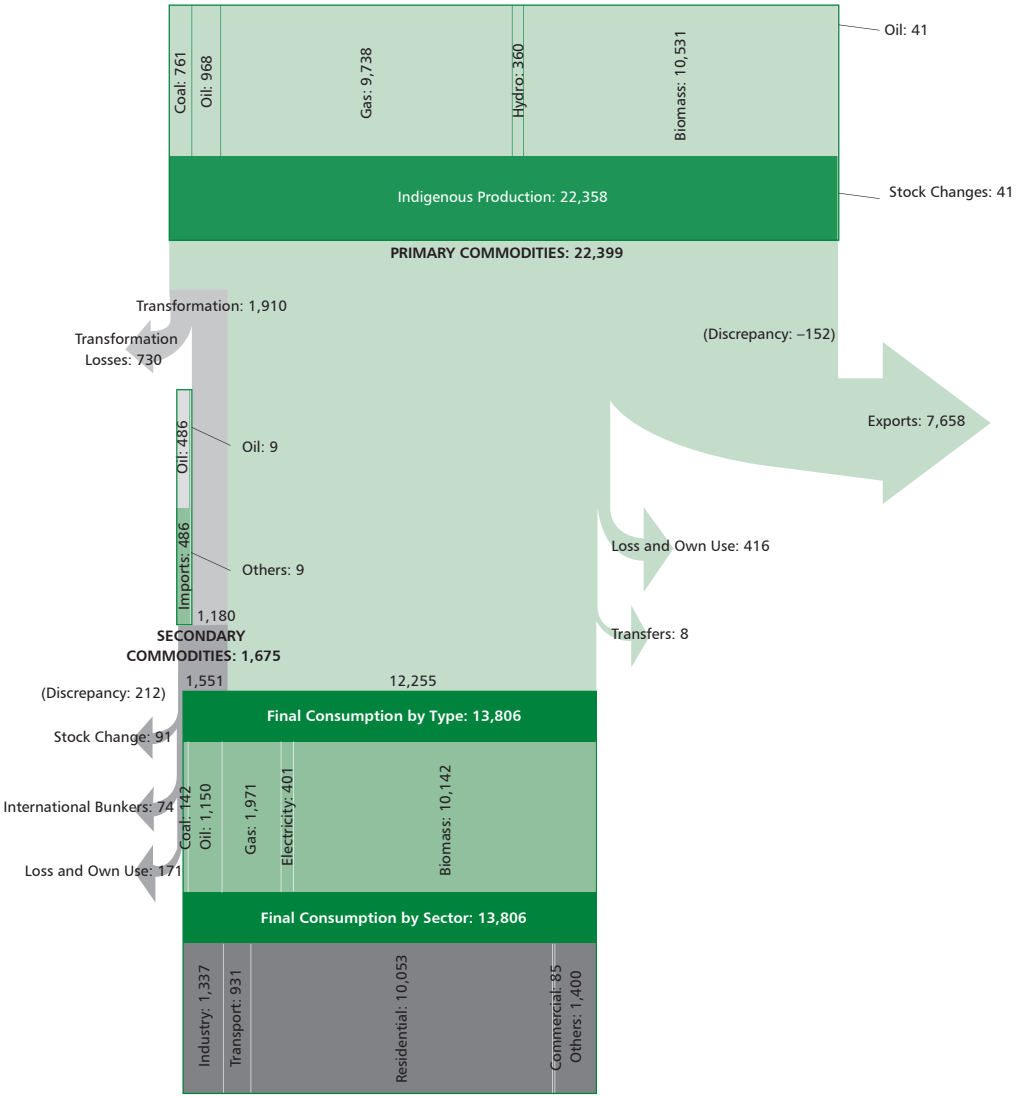


Table 7.6.1 Key Data and Economic Profile

	1990	1995	2000	2005	2009
Socioeconomic Data					
Population (thousand)	39,268	42,133	44,958	46,321	47,601
GDP (constant 2000 $ billion)	3.7	4.9	7.3	13.3	20.5
GDP (constant 2005 PPP $ billion)	13.5	17.9	26.9	49.2	76.0
GDP/capita (constant 2000 $)	94	116	162	288	431
GDP/capita (constant 2005 PPP $)	343	424	598	1,062	1,596

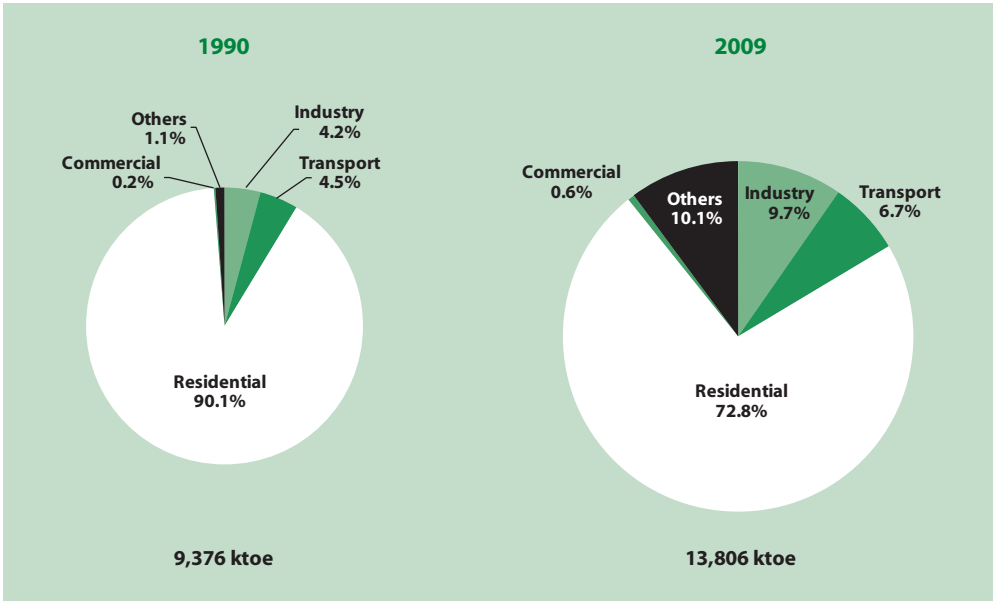
GDP = gross domestic product, PPP = purchasing power parity.
Source: ADB (2011) and World Bank.

Table 7.6.2 Energy Supply and Demand

	1990	1995	2000	2005	2009
Primary Energy Supply (ktoe)					
Indigenous Production	10,654	10,999	15,405	23,121	22,358
Net Imports	3	771	–2,904	–7,154	–7,296
Total PES	10,657	11,770	12,501	15,967	15,062
Coal	68	16	40	114	143
Oil	705	1,258	1,926	1,957	1,286
Gas	760	1,219	1,197	3,460	2,742
Biomass	9,021	9,137	9,175	10,178	10,531
Others	103	140	163	258	360
TPES/capita (toe)	0.27	0.28	0.28	0.34	0.32
TPES/GDP (toe/constant 2005 PPP $ million)	791	658	465	324	198
Final Energy Consumption (ktoe)					
Industry	393	711	877	1,426	1,337
Transportation	421	850	1,109	1,300	931
Other Sectors	8,562	8,939	9,151	11,421	11,538
Total FEC	9,376	10,500	11,137	14,147	13,806
Coal	51	16	40	113	142
Oil	563	1,168	1,481	1,694	1,150
Gas	224	287	325	2,222	1,971
Electricity	149	203	281	315	401
Biomass	8,389	8,826	9,010	9,803	10,142
Others	0	0	0	0	0

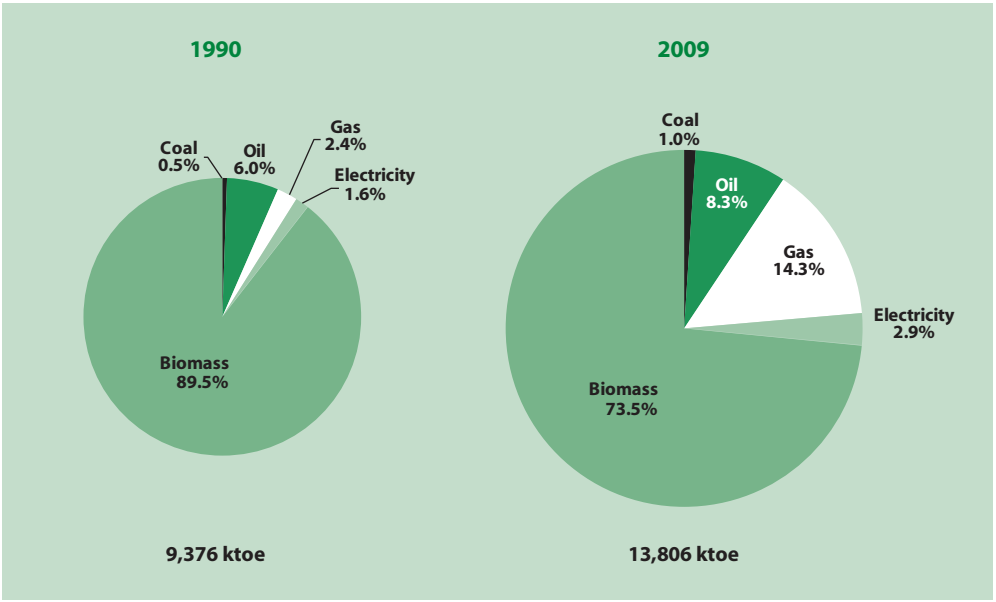
FEC = final energy consumption, GDP = gross domestic product, ktoe = thousand tons of oil equivalent, PES = primary energy supply, PPP = purchasing power parity, toe = ton of oil equivalent, TPES = total primary energy supply.
Source: IEA (2011b).

Figure 7.6.1 Final Energy Consumption by Sector, 1990 and 2009



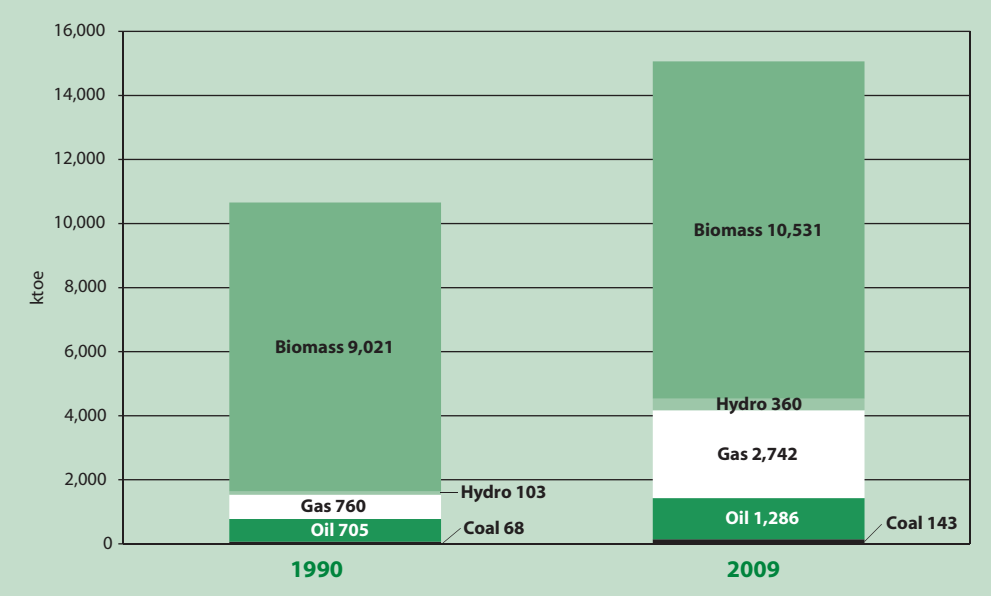
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 7.6.2 Final Energy Consumption by Type of Energy, 1990 and 2009



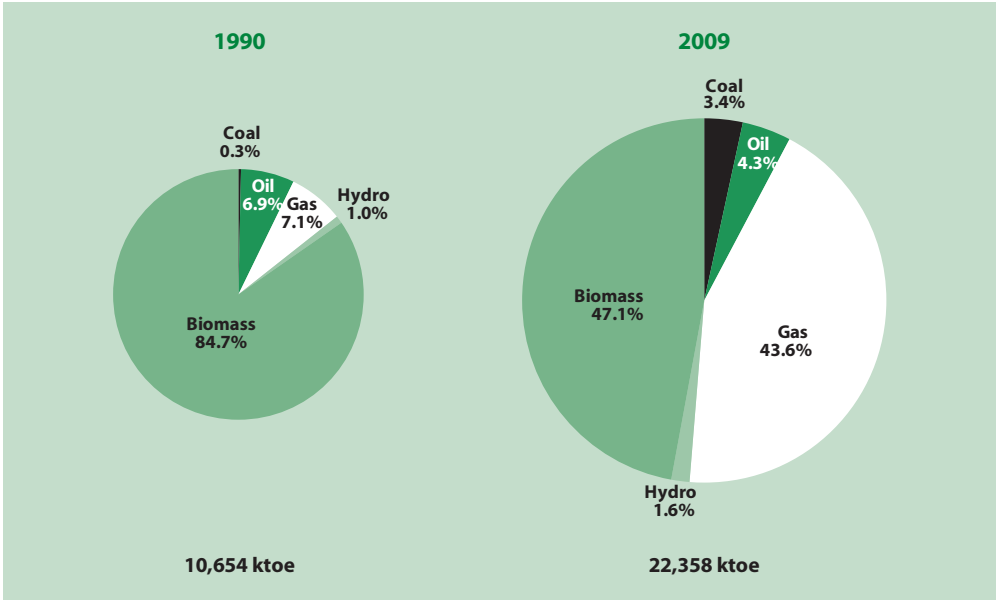
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 7.6.3 Total Primary Energy Supply, 1990 and 2009



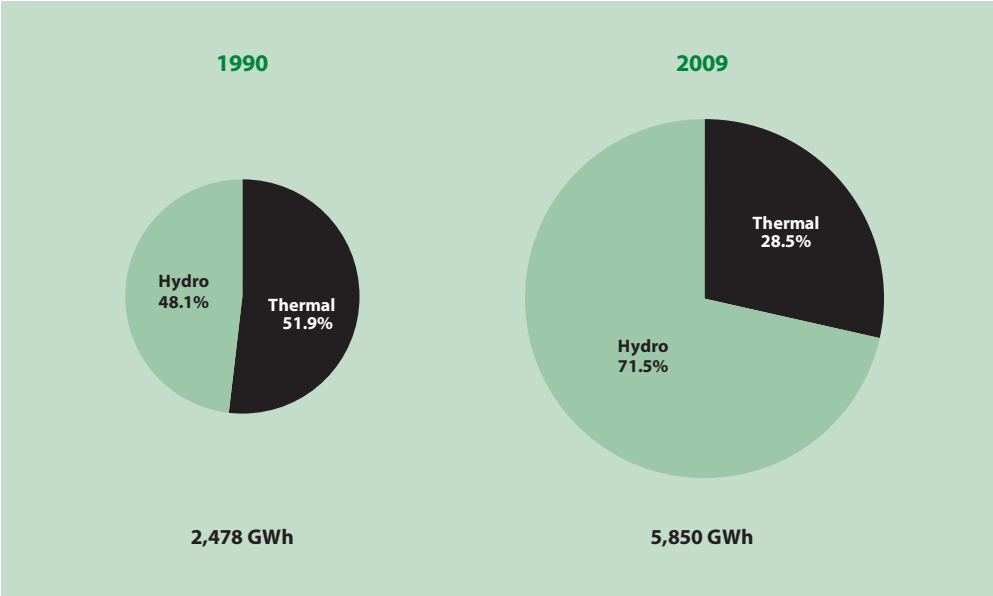
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 7.6.4 Indigenous Energy Production, 1990 and 2009



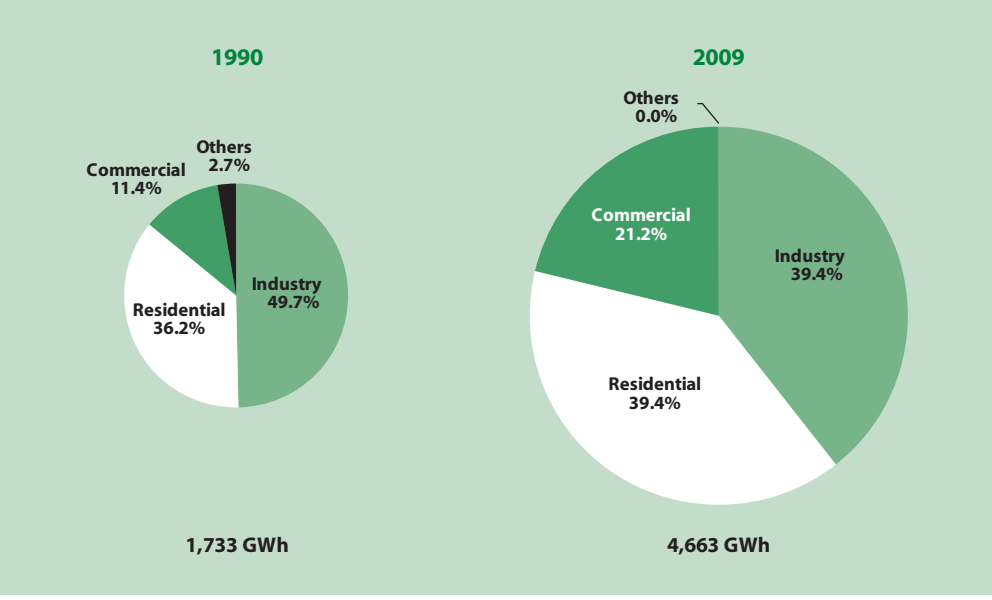
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 7.6.5 Electricity Generation by Plant Type, 1990 and 2009



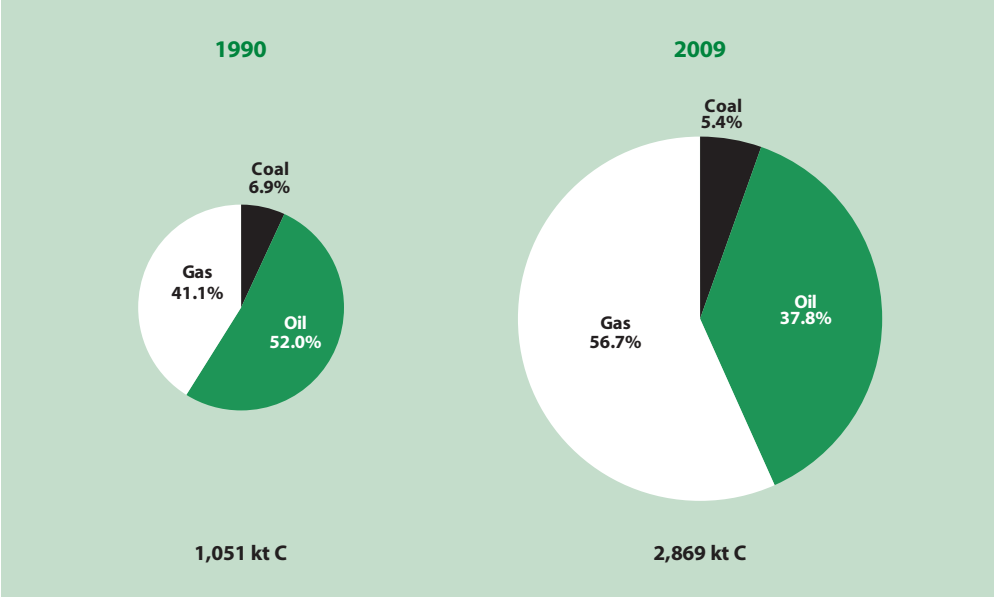
GWh = gigawatt-hour.
Source: IEA (2011b).

Figure 7.6.6 Electricity Consumption by Sector, 1990 and 2009



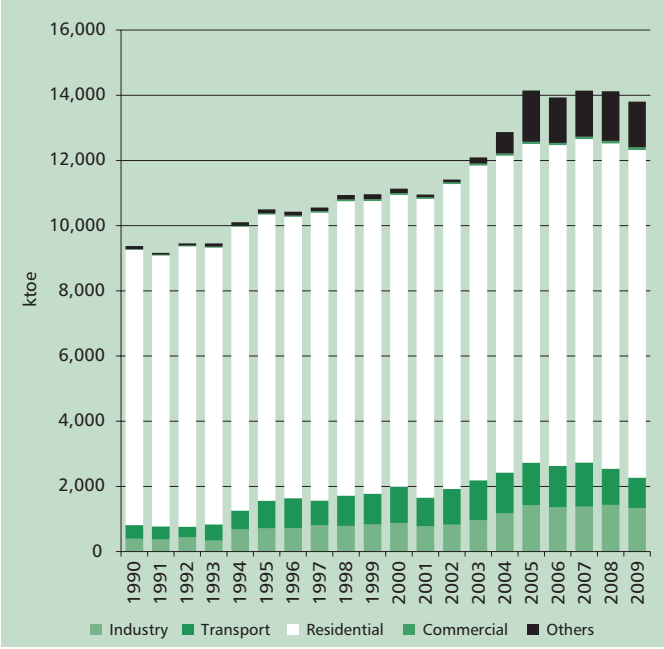
GWh = gigawatt-hour.
Source: IEA (2011b).

Figure 7.6.7 Carbon Dioxide Emissions from Fuel Combustion, 1990 and 2009



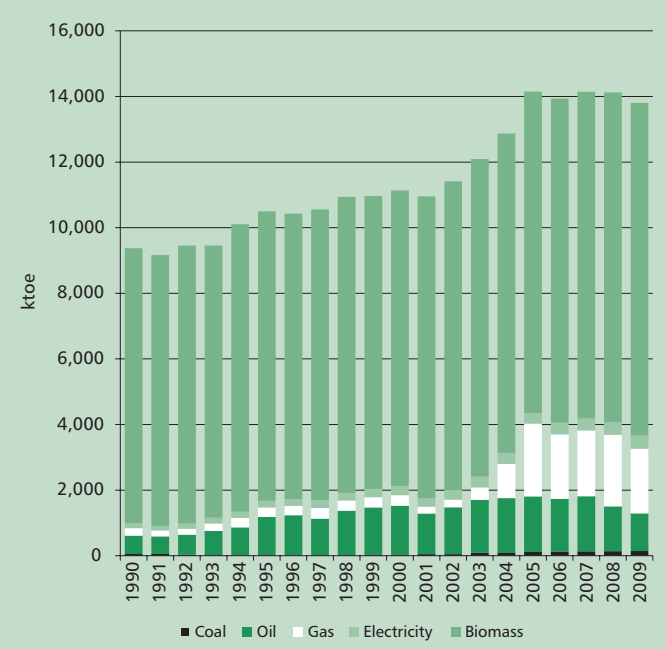
kt C = thousand tons of carbon equivalent.
Source: APERC estimates.

Figure 7.6.8 Final Energy Consumption by Sector, 1990–2009



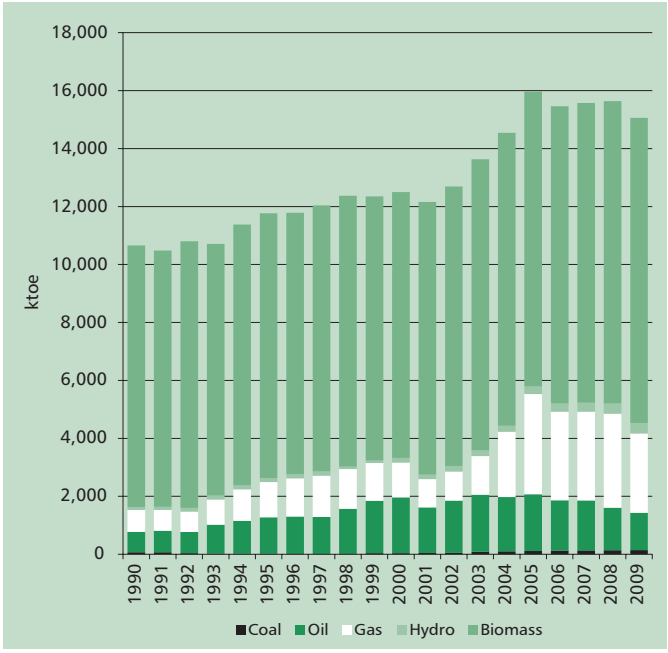
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 7.6.9 Final Energy Consumption by Type, 1990–2009



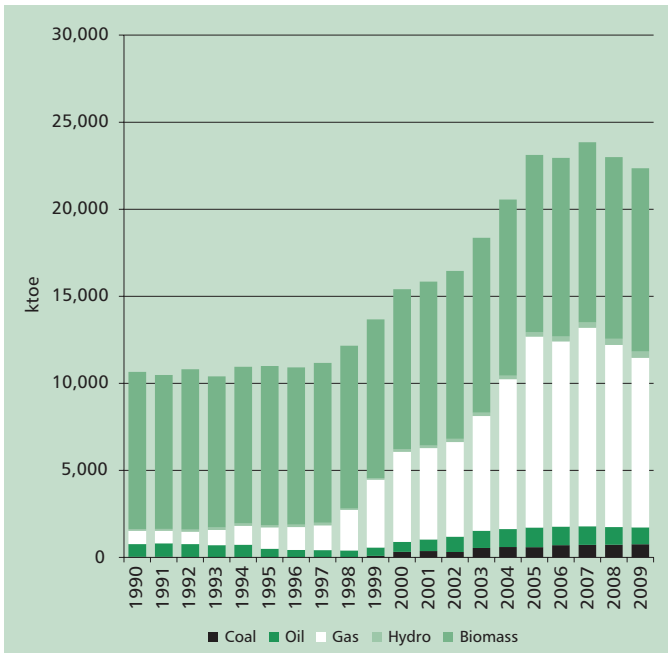
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 7.6.10 Total Primary Energy Supply, 1990–2009



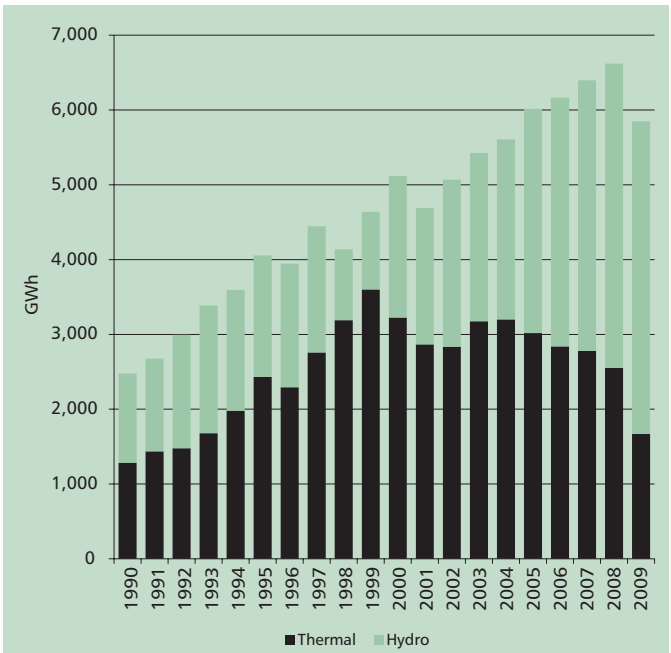
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 7.6.11 Indigenous Energy Production, 1990–2009



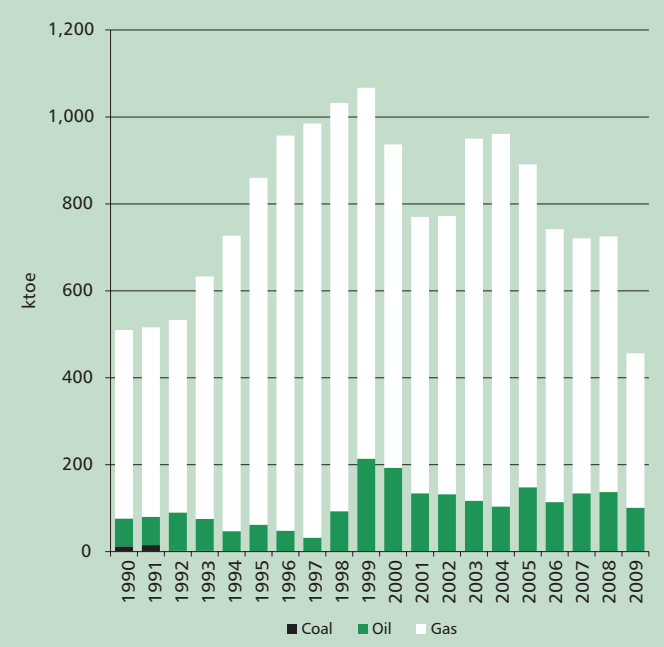
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 7.6.12 Electricity Generation by Source, 1990–2009



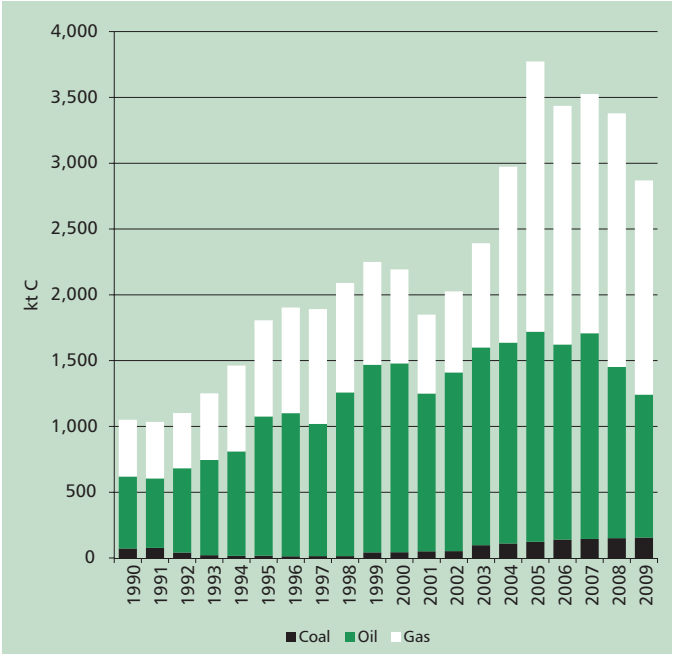
GWh = gigawatt-hour.
Source: IEA (2011b).

Figure 7.6.13 Fuel Input for Electricity Generation, 1990–2009



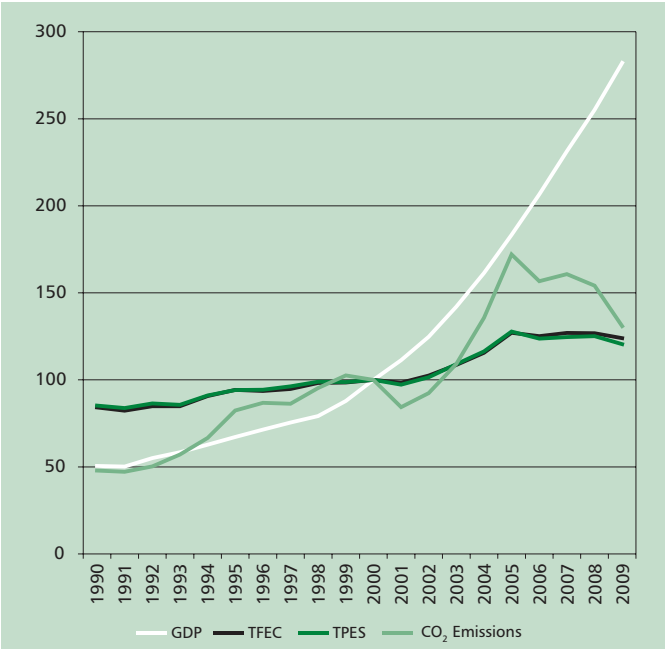
ktoe = thousand tons of oil equivalent.
Source: IEA (2011b).

Figure 7.6.14 Carbon Dioxide Emissions from Fuel Combustion, 1990–2009



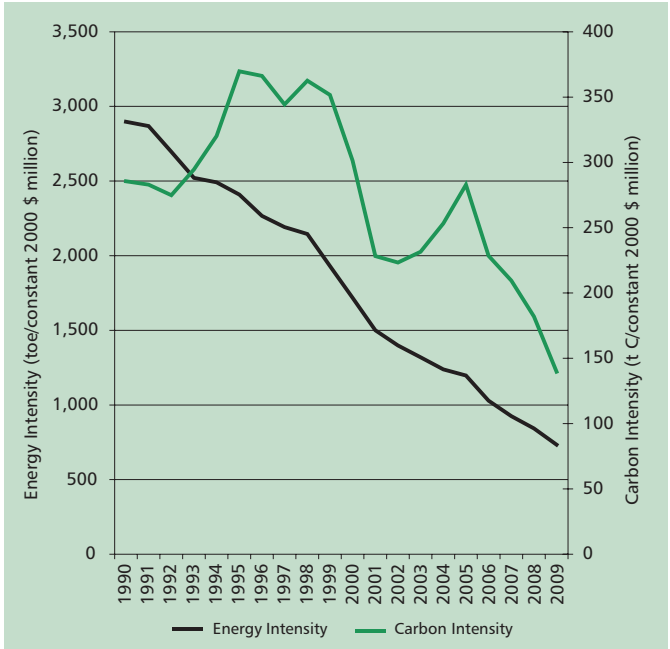
kt C = thousand tons of carbon equivalent.
Source: APERC estimates.

Figure 7.6.15 Growth of GDP, TFEC, TPES, and CO_2 (indexed to year 2000), 1990–2009



CO_2 = carbon dioxide, GDP = gross domestic product, TFEC = total final energy consumption, TPES = total primary energy supply.
Note: Indices are measured relative to the base year 2000 (2000 = 100).
Source: APERC estimates.

Figure 7.6.16 Energy and Carbon Intensities, 1990–2009



t C = ton of carbon equivalent, toe = ton of oil equivalent.
Source: APERC estimates.

Table 7.6.3 Myanmar Energy Balance Table, 2006

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	706	0	1,067	0	0	0	0	0	0	0	10,633	286	0	0	0	0	10,258	0	0	0	22,950
2.	Imports	0	0	0	923	19	0	844	35	0	25	0	0	0	0	0	0	0	0	0	0	923
3.	Exports	–579	0	–112	0	0	0	0	0	0	0	–7,578	0	0	0	0	0	0	0	0	0	–8,269
4.	International Bunkers	0	0	0	–83	0	0	–3	0	0	–80	0	0	0	0	0	0	0	0	0	0	–83
5.	Stock Changes	0	0	–87	29	2	0	11	14	6	–4	0	0	0	0	0	0	0	0	0	0	–58
6.	Total Primary Energy Supply	127	0	868	869	21	0	852	49	6	–59	3,055	286	0	0	0	0	10,258	0	0	0	15,463
7.	Transfers	0	0	–9	10	4	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	1
8.	Total Transformation Sector	0	0	–860	713	378	1	210	–2	6	120	–628	–286	0	0	0	0	–379	0	530	0	–910
8.1	Power Generation	0	0	0	–114	0	0	–73	–41	0	0	–628	–286	0	0	0	0	0	0	530	0	–498
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	–860	827	378	1	283	39	6	120	0	0	0	0	0	0	0	0	0	0	–33
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–379	0	0	0	–379
9.	Loss and Own Use	0	0	0	–67	0	0	–28	–1	0	–38	–459	0	0	0	0	0	0	0	–173	0	–699
10.	Discrepancy	0	0	1	79	–17	0	48	54	–6	0	0	0	0	0	0	0	–1	0	–1	0	78
11.	Total Final Energy Consumption	127	0	0	1,604	386	1	1,082	100	12	23	1,968	0	0	0	0	0	9,878	0	356	0	13,933
12.	Industry Sector	103	0	0	158	0	0	79	64	2	13	636	0	0	0	0	0	306	0	159	0	1,362
13.	Transport Sector	0	0	0	1,231	386	0	815	30	0	0	36	0	0	0	0	0	0	0	0	0	1,267
14.	Other Sectors	24	0	0	205	0	1	188	6	10	0	1,071	0	0	0	0	0	9,572	0	197	0	11,069
14.1	Residential and Commercial	0	0	0	143	0	1	137	0	5	0	0	0	0	0	0	0	9,572	0	197	0	9,912
14.1.1	Commerce and Public Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	69	0	69
14.1.2	Residential	0	0	0	143	0	1	137	0	5	0	0	0	0	0	0	0	9,572	0	128	0	9,843
14.2	Non-Specified Others	24	0	0	62	0	0	51	6	5	0	1,071	0	0	0	0	0	0	0	0	0	1,157
15.	Non-Energy Use	0	0	0	10	0	0	0	0	0	10	225	0	0	0	0	0	0	0	0	0	235
16.	Electricity Output (GWh)	0	0	0	814	0	0	28	0	0	786	2,025	3,325	0	0	0	0	0	0	0	0	6,164
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.
Note: Figures may not add up to total because of rounding.
Source: IEA (2011b).

Table 7.6.4 Myanmar Energy Balance Table, 2007

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	720	0	1,065	0	0	0	0	0	0	0	11,409	311	0	0	0	0	10,343	0	0	0	23,848
2.	Imports	0	0	0	996	15	0	926	36	0	19	0	0	0	0	0	0	0	0	0	0	996
3.	Exports	–587	0	–151	0	0	0	0	0	0	0	–8,346	0	0	0	0	0	0	0	0	0	–9,084
4.	International Bunkers	0	0	0	–70	0	0	–3	0	0	–67	0	0	0	0	0	0	0	0	0	0	–70
5.	Stock Changes	0	0	–81	–35	–18	0	–7	2	–1	–11	0	0	0	0	0	0	0	0	0	0	–116
6.	Total Primary Energy Supply	133	0	833	891	–3	0	916	38	–1	–59	3,063	311	0	0	0	0	10,343	0	0	0	15,574
7.	Transfers	0	0	–10	11	4	0	0	0	7	0	0	0	0	0	0	0	0	0	0	0	1
8.	Total Transformation Sector	0	0	–872	709	393	1	174	9	14	118	–587	–311	0	0	0	0	–382	0	550	0	–893
8.1	Power Generation	0	0	0	–134	0	0	–89	–45	0	0	–587	–311	0	0	0	0	0	0	550	0	–482
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	–872	843	393	1	263	54	14	118	0	0	0	0	0	0	0	0	0	0	–29
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–382	0	0	0	–382
9.	Loss and Own Use	0	0	0	–68	0	0	–29	–1	0	–38	–468	0	0	0	0	0	0	0	–188	0	–724
10.	Discrepancy	–1	0	49	136	14	0	70	60	–8	0	0	0	0	0	0	0	1	0	1	0	186
11.	Total Final Energy Consumption	132	0	0	1,679	408	1	1,131	106	12	21	2,008	0	0	0	0	0	9,962	0	363	0	14,144
12.	Industry Sector	108	0	0	164	0	0	83	68	2	11	638	0	0	0	0	0	309	0	161	0	1,380
13.	Transport Sector	0	0	0	1,299	408	0	859	32	0	0	52	0	0	0	0	0	0	0	0	0	1,351
14.	Other Sectors	24	0	0	206	0	1	189	6	10	0	1,093	0	0	0	0	0	9,653	0	202	0	11,178
14.1	Residential and Commercial	0	0	0	144	0	1	138	0	5	0	0	0	0	0	0	0	9,653	0	202	0	9,999
14.1.1	Commerce and Public Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	71	0	71
14.1.2	Residential	0	0	0	144	0	1	138	0	5	0	0	0	0	0	0	0	9,653	0	131	0	9,928
14.2	Non-Specified Others	24	0	0	62	0	0	51	6	5	0	1,093	0	0	0	0	0	0	0	0	0	1,179
15.	Non-Energy Use	0	0	0	10	0	0	0	0	0	10	225	0	0	0	0	0	0	0	0	0	235
16.	Electricity Output (GWh)	0	0	0	888	0	0	34	0	0	854	1,891	3,619	0	0	0	0	0	0	0	0	6,398
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Source: IEA (2011b).

Table 7.6.5 Myanmar Energy Balance Table, 2008

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	732	0	1,011	0	0	0	0	0	0	0	10,464	350	0	0	0	0	10,435	0	0	0	22,992
2.	Imports	0	0	0	642	19	0	576	37	0	10	0	0	0	0	0	0	0	0	0	0	642
3.	Exports	–595	0	–41	0	0	0	0	0	0	0	–7,215	0	0	0	0	0	0	0	0	0	–7,851
4.	International Bunkers	0	0	0	–67	0	0	–3	0	0	–64	0	0	0	0	0	0	0	0	0	0	–67
5.	Stock Changes	0	0	–51	–26	4	0	–22	–1	–6	–1	0	0	0	0	0	0	0	0	0	0	–77
6.	Total Primary Energy Supply	137	0	919	549	23	0	551	36	–6	–55	3,249	350	0	0	0	0	10,435	0	0	0	15,639
7.	Transfers	0	0	–9	10	4	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	1
8.	Total Transformation Sector	0	0	–841	666	366	1	148	26	12	113	–588	–350	0	0	0	0	–385	0	569	0	–929
8.1	Power Generation	0	0	0	–137	0	0	–104	–33	0	0	–588	–350	0	0	0	0	0	0	569	0	–506
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	–841	803	366	1	252	59	12	113	0	0	0	0	0	0	0	0	0	0	–38
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–385	0	0	0	–385
9.	Loss and Own Use	0	0	0	–68	0	0	–30	–1	0	–37	–476	0	0	0	0	0	0	0	–185	0	–729
10.	Discrepancy	0	0	–69	210	30	0	131	49	0	0	–1	0	0	0	0	0	0	0	0	0	140
11.	Total Final Energy Consumption	137	0	0	1,367	423	1	800	110	12	21	2,184	0	0	0	0	0	10,050	0	384	0	14,122
12.	Industry Sector	112	0	0	170	0	0	86	71	2	11	676	0	0	0	0	0	312	0	164	0	1,434
13.	Transport Sector	0	0	0	1,042	423	0	586	33	0	0	69	0	0	0	0	0	0	0	0	0	1,111
14.	Other Sectors	25	0	0	145	0	1	128	6	10	0	1,200	0	0	0	0	0	9,738	0	220	0	11,328
14.1	Residential and Commercial	0	0	0	100	0	1	94	0	5	0	0	0	0	0	0	0	9,738	0	220	0	10,058
14.1.1	Commerce and Public Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	77	0	77
14.1.2	Residential	0	0	0	100	0	1	94	0	5	0	0	0	0	0	0	0	9,738	0	143	0	9,981
14.2	Non-Specified Others	25	0	0	45	0	0	34	6	5	0	1,200	0	0	0	0	0	0	0	0	0	1,270
15.	Non-Energy Use	0	0	0	10	0	0	0	0	0	10	239	0	0	0	0	0	0	0	0	0	249
16.	Electricity Output (GWh)	0	0	0	654	0	0	40	0	0	614	1,897	4,071	0	0	0	0	0	0	0	0	6,622
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.
Note: Figures may not add up to total because of rounding.
Source: IEA (2011b).

Table 7.6.6 Myanmar Energy Balance Table, 2009

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	761	0	968	0	0	0	0	0	0	0	9,738	360	0	0	0	0	10,531	0	0	0	22,358
2.	Imports	0	0	0	486	21	0	400	39	0	26	0	0	0	0	0	0	0	0	0	0	486
3.	Exports	–618	0	–44	0	0	0	0	0	0	0	–6,996	0	0	0	0	0	0	0	0	0	–7,658
4.	International Bunkers	0	0	0	–74	0	0	–3	0	0	–71	0	0	0	0	0	0	0	0	0	0	–74
5.	Stock Changes	0	0	41	–91	3	0	–90	1	–5	0	0	0	0	0	0	0	0	0	0	0	–50
6.	Total Primary Energy Supply	143	0	965	321	24	0	307	40	–5	–45	2,742	360	0	0	0	0	10,531	0	0	0	15,062
7.	Transfers	0	0	–8	9	4	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	1
8.	Total Transformation Sector	0	0	–806	677	384	1	144	35	12	101	–355	–360	0	0	0	0	–389	0	503	0	–730
8.1	Power Generation	0	0	0	–101	0	0	–75	–26	0	0	–355	–360	0	0	0	0	0	0	503	0	–313
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	–806	778	384	1	219	61	12	101	0	0	0	0	0	0	0	0	0	0	–28
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–389	0	0	0	–389
9.	Loss and Own Use	0	0	0	–68	0	0	–31	–1	0	–36	–416	0	0	0	0	0	0	0	–103	0	–587
10.	Discrepancy	–1	0	–151	211	31	0	139	42	0	–1	0	0	0	0	0	0	0	0	1	0	60
11.	Total Final Energy Consumption	142	0	0	1,150	443	1	559	116	12	19	1,971	0	0	0	0	0	10,142	0	401	0	13,806
12.	Industry Sector	117	0	0	176	0	0	90	75	2	9	571	0	0	0	0	0	315	0	158	0	1,337
13.	Transport Sector	0	0	0	862	443	0	384	35	0	0	69	0	0	0	0	0	0	0	0	0	931
14.	Other Sectors	25	0	0	102	0	1	85	6	10	0	1,129	0	0	0	0	0	9,827	0	243	0	11,326
14.1	Residential and Commercial	0	0	0	68	0	1	62	0	5	0	0	0	0	0	0	0	9,827	0	243	0	10,138
14.1.1	Commerce and Public Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	85	0	85
14.1.2	Residential	0	0	0	68	0	1	62	0	5	0	0	0	0	0	0	0	9,827	0	158	0	10,053
14.2	Non-Specified Others	25	0	0	34	0	0	23	6	5	0	1,129	0	0	0	0	0	0	0	0	0	1,188
15.	Non-Energy Use	0	0	0	10	0	0	0	0	0	10	202	0	0	0	0	0	0	0	0	0	212
16.	Electricity Output (GWh)	0	0	0	523	0	0	29	0	0	494	1,146	4,181	0	0	0	0	0	0	0	0	5,850
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Source: IEA (2011b).

Table 7.6.7 Myanmar Summary Table, 1990–2009

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Indigenous Production (ktoe)																				
Coal	36	38	29	13	28	14	12	12	12	89	320	366	310	542	596	589	706	720	732	761
Oil	734	775	739	692	700	489	413	405	391	479	572	668	880	986	1,033	1,125	1,067	1,065	1,011	968
Gas	760	717	705	871	1,088	1,219	1,322	1,428	2,330	3,900	5,175	5,244	5,436	6,595	8,608	10,971	10,633	11,409	10,464	9,738
Hydro	103	107	131	147	139	140	142	145	82	89	163	157	192	194	207	258	286	311	350	360
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Geothermal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Solar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wind	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Biomass	9,021	8,844	9,201	8,676	8,999	9,137	9,022	9,182	9,345	9,113	9,175	9,408	9,643	10,046	10,109	10,178	10,258	10,343	10,435	10,531
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	10,654	10,481	10,805	10,399	10,954	10,999	10,911	11,172	12,160	13,670	15,405	15,843	16,461	18,363	20,553	23,121	22,950	23,848	22,992	22,358
Primary Energy Supply (ktoe)																				
Coal	68	70	36	20	17	16	12	13	13	40	40	45	50	86	100	114	127	133	137	143
Oil	705	743	731	999	1,137	1,258	1,289	1,273	1,554	1,807	1,926	1,575	1,803	1,970	1,877	1,957	1,737	1,724	1,468	1,286
Gas	760	717	705	871	1,088	1,219	1,322	1,428	1,376	1,301	1,197	972	1,005	1,335	2,253	3,460	3,055	3,063	3,249	2,742
Hydro	103	107	131	147	139	140	142	145	82	89	163	157	192	194	207	258	286	311	350	360
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Geothermal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Solar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wind	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Biomass	9,021	8,844	9,201	8,676	8,999	9,137	9,022	9,182	9,345	9,113	9,175	9,408	9,643	10,046	10,109	10,178	10,258	10,343	10,435	10,531
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	10,657	10,481	10,804	10,713	11,380	11,770	11,787	12,041	12,370	12,350	12,501	12,157	12,693	13,631	14,546	15,967	15,463	15,574	15,639	15,062
Final Energy Consumption by Sector (ktoe)																				
Industry	393	375	440	337	687	711	723	813	786	829	877	775	824	968	1,173	1,426	1,362	1,380	1,434	1,337
Transport	421	397	325	498	569	850	914	754	934	948	1,109	882	1,096	1,221	1,252	1,300	1,267	1,351	1,111	931
Residential	8,446	8,315	8,602	8,492	8,713	8,781	8,637	8,833	9,029	8,980	8,960	9,163	9,356	9,656	9,726	9,778	9,843	9,928	9,981	10,053
Commercial	17	20	21	28	32	36	37	48	54	56	53	49	55	57	60	68	69	71	77	85
Others	99	60	67	101	105	122	118	107	139	152	138	86	83	189	661	1,575	1,392	1,414	1,519	1,400
Total	9,376	9,167	9,455	9,456	10,106	10,500	10,429	10,555	10,942	10,965	11,137	10,955	11,414	12,091	12,872	14,147	13,933	14,144	14,122	13,806

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Table 7.6.7 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Final Energy Consumption by Type (ktoe)																				
Coal	51	52	33	14	11	16	12	13	13	39	40	46	48	89	101	113	127	132	137	142
Oil	563	536	610	739	854	1,168	1,224	1,116	1,360	1,430	1,481	1,239	1,428	1,615	1,655	1,694	1,604	1,679	1,367	1,150
Gas	224	181	180	230	288	287	282	330	311	314	325	209	230	380	1,043	2,222	1,968	2,008	2,184	1,971
Electricity	149	142	157	175	188	203	205	231	233	251	281	255	300	332	336	315	356	363	384	401
Heat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Biomass	8,389	8,256	8,475	8,298	8,765	8,826	8,706	8,865	9,025	8,931	9,010	9,206	9,408	9,675	9,737	9,803	9,878	9,962	10,050	10,142
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	9,376	9,167	9,455	9,456	10,106	10,500	10,429	10,555	10,942	10,965	11,137	10,955	11,414	12,091	12,872	14,147	13,933	14,144	14,122	13,806
Power Generation (GWh)																				
Thermal	1,285	1,437	1,478	1,680	1,980	2,431	2,294	2,759	3,190	3,601	3,226	2,867	2,836	3,176	3,200	3,018	2,839	2,779	2,551	1,669
Hydro	1,193	1,240	1,518	1,705	1,614	1,624	1,651	1,686	949	1,038	1,892	1,822	2,232	2,250	2,408	2,997	3,325	3,619	4,071	4,181
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Geothermal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Solar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wind	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	2,478	2,677	2,996	3,385	3,594	4,055	3,945	4,445	4,139	4,639	5,118	4,689	5,068	5,426	5,608	6,015	6,164	6,398	6,622	5,850
Loss and Own Use of Electricity (GWh)																				
Transmission and Distribution Losses	651	965	1,116	1,209	1,256	1,547	1,384	1,547	1,174	1,488	1,605	1,465	1,372	1,349	1,465	2,105	1,814	1,965	1,919	919
Own Use	93	70	47	140	151	140	186	221	244	233	244	267	209	233	233	256	198	221	233	279
Total	744	1,035	1,163	1,349	1,407	1,686	1,570	1,767	1,419	1,721	1,849	1,733	1,581	1,581	1,698	2,360	2,012	2,186	2,151	1,198
Fuel Input for Power Generation (ktoe)																				
Coal	12	15	2	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Oil	64	65	88	73	46	62	48	32	93	214	193	134	132	117	104	148	114	134	137	101
Gas	434	436	443	558	680	798	909	953	939	853	744	636	640	833	857	743	628	587	588	355
Total	510	516	533	633	727	860	957	985	1,032	1,067	937	770	772	950	961	891	742	721	725	456
CO_2 Emissions (kt C)																				
Coal	72	77	42	21	17	18	13	14	14	43	44	51	53	98	111	124	140	145	150	156
Oil	546	528	640	723	793	1,057	1,088	1,004	1,243	1,426	1,435	1,199	1,357	1,502	1,526	1,596	1,483	1,563	1,301	1,086
Gas	432	429	420	507	652	731	803	873	832	781	714	599	616	793	1,338	2,053	1,813	1,818	1,928	1,627
Total	1,051	1,034	1,102	1,252	1,462	1,806	1,904	1,892	2,090	2,250	2,193	1,849	2,026	2,393	2,974	3,773	3,436	3,526	3,379	2,869

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Table 7.6.7 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Macroeconomic Indicators																				
Population (thousand)	39,268	39,856	40,425	40,986	41,553	42,133	42,736	43,352	43,953	44,497	44,958	45,324	45,609	45,844	46,070	46,321	46,605	46,916	47,250	47,601
Urban Population, %	24.9	25.1	25.4	25.6	25.9	26.1	26.5	26.9	27.2	27.6	28.0	28.5	29.0	29.6	30.1	30.6	31.3	31.9	32.6	33.2
GDP (constant 2000 $ million)	3,678	3,654	4,007	4,249	4,567	4,884	5,199	5,493	5,765	6,396	7,275	8,101	9,075	10,331	11,741	13,337	15,031	16,833	18,560	20,524
GDP (current $ million)	5,172	5,320	5,973	6,472	7,102	7,753	8,410	9,043	5,926	6,576	7,275	7,634	10,369	9,925	10,254	11,931	13,852	18,233	25,859	32,805
GDP (constant 2005 PPP $ million)	13,467	13,379	14,672	15,558	16,721	17,883	19,035	20,111	21,291	23,621	26,868	29,916	33,513	38,153	43,358	49,207	55,653	62,327	68,719	75,990
GDP/capita (constant 2000 $)	94	92	99	104	110	116	122	127	131	144	162	179	199	225	255	288	323	359	393	431
GDP/capita (current $)	132	133	148	158	171	184	197	209	135	148	162	168	227	216	223	258	297	389	547	689
GDP – Manufacturing (% of GDP)	9.1	8.8	8.9	9.1	9.2	9.3	9.1	9.1	9.1	9.4	10.1	7.8	9.0	9.7	10.6	11.4	13.8	14.9	16.0	17.3
Car Ownership (car/1,000 persons)	2	2	2	4	4	4	5	6	6	5	6	6	6	6	6	6	6	6	6	7
Basic Energy Indicators																				
TPES/capita (toe/person)	0.27	0.26	0.27	0.26	0.27	0.28	0.28	0.28	0.28	0.28	0.28	0.27	0.28	0.30	0.32	0.34	0.33	0.33	0.33	0.32
TFEC/capita (toe/person)	0.24	0.23	0.23	0.23	0.24	0.25	0.24	0.24	0.25	0.25	0.25	0.24	0.25	0.26	0.28	0.31	0.30	0.30	0.30	0.29
TPES/GDP (toe/constant 2000 $ million)	2,897	2,868	2,696	2,521	2,492	2,410	2,267	2,192	2,146	1,931	1,718	1,501	1,399	1,319	1,239	1,197	1,029	925	843	734
TFEC/GDP (toe/constant 2000 $ million)	2,549	2,509	2,359	2,225	2,213	2,150	2,006	1,922	1,898	1,714	1,531	1,352	1,258	1,170	1,096	1,061	927	840	761	673
Import Dependency (%)	0.0	0.0	0.0	2.9	3.7	6.6	7.4	7.2	1.7	−10.7	−23.2	−30.3	−29.7	−34.7	−41.3	−44.8	−48.4	−53.1	−47.0	−48.4
Oil Import Dependency (%)	−4.1	−4.3	−1.1	30.7	38.4	61.1	68.0	68.2	74.8	73.5	70.3	57.6	51.2	49.9	45.0	42.5	38.6	38.2	31.1	24.7
Electricity/capita (kWh/ person)	44	41	45	50	53	56	56	62	62	66	73	65	76	84	85	79	89	90	95	98
CO_2 Intensity (t C/constant 2000 $ million)	286	283	275	295	320	370	366	344	363	352	301	228	223	232	253	283	229	209	182	140
CO_2/capita (t C)	0.03	0.03	0.03	0.03	0.04	0.04	0.04	0.04	0.05	0.05	0.05	0.04	0.04	0.05	0.06	0.08	0.07	0.08	0.07	0.06
CO_2/TPES (t C/toe)	0.10	0.10	0.10	0.12	0.13	0.15	0.16	0.16	0.17	0.18	0.18	0.15	0.16	0.18	0.20	0.24	0.22	0.23	0.22	0.19

GDP = gross domestic product, CO_2 = carbon dioxide, GWh = gigawatt–hour, kt C = thousand tons of carbon equivalent, ktoe = thousand tons of oil equivalent, kWh = kilowatt–hour, PPP = purchasing power parity, t C = ton of carbon equivalent, TFEC = total final energy consumption, toe = ton of oil equivalent, TPES = total primary energy supply.

Note: Figures may not add up to total because of rounding.

Sources: ADB (2011), APERC estimates, IEA (2011b), JAMA (2012), and World Bank.

7.7 Philippines

Country Profile (2009)		Energy Reserves (year-end 2008)	
Total Surface Area (square kilometer)	300,000	Coal (million ton) - Recoverable	316.0
Population (thousand)	91,703	Gas (trillion cubic feet) - Proven	3.3
GDP (constant 2000 $ billion)	119.9	Oil (billion barrel) - Proven	138.0
Electrification Rate (%)	89.7		

GDP = gross domestic product.

Sources: ADB (2012), IEA (2011c), World Bank, and WEC (2010).

2009 Energy Supply and Demand Flow (ktoe)

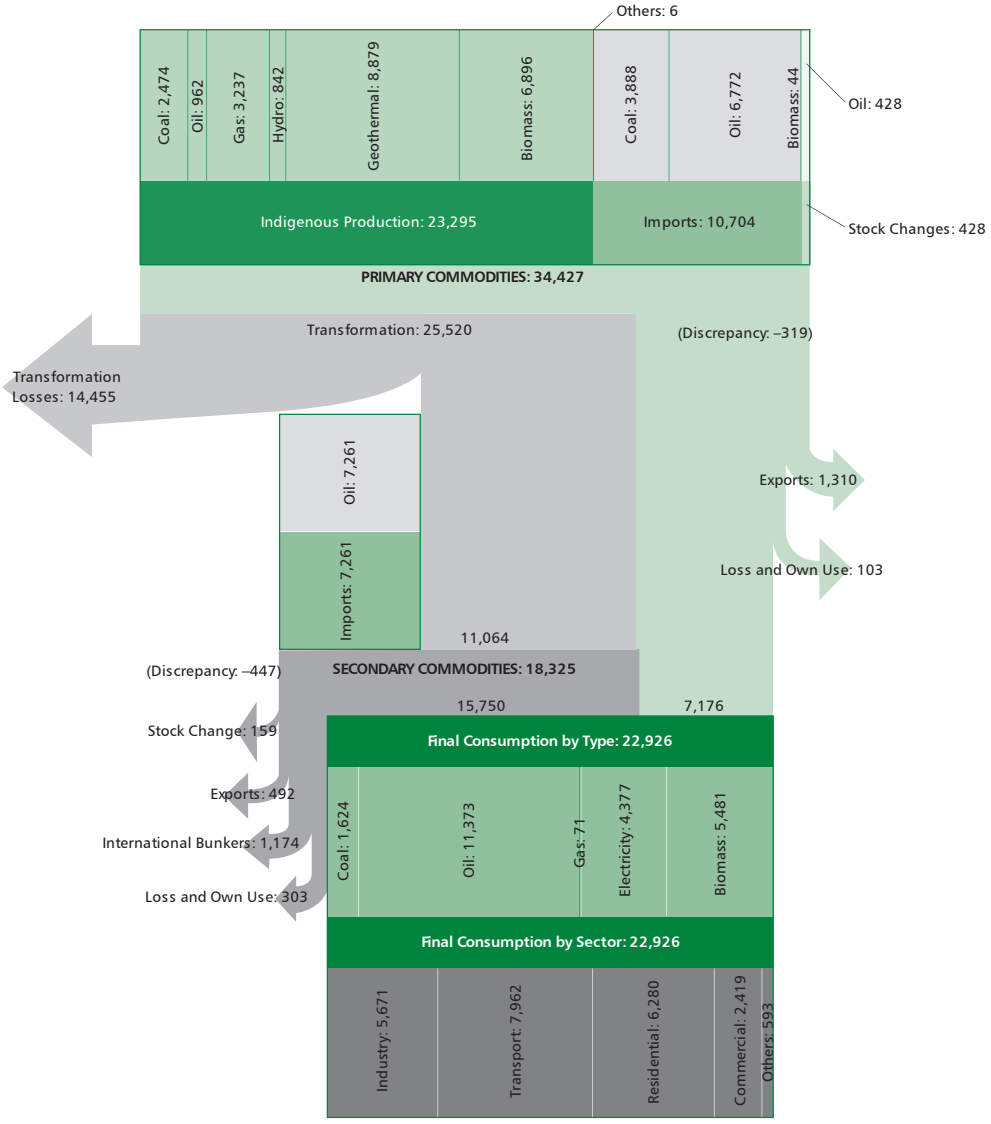


Table 7.7.1 Key Data and Economic Profile

	1990	1995	2000	2005	2009
Socioeconomic Data					
Population (thousand)	61,629	69,255	77,310	85,546	91,703
GDP (constant 2000 $ billion)	61.1	68.0	81.0	101.4	119.9
GDP (constant 2005 PPP $ billion)	157.3	175.0	208.5	261.0	308.5
GDP/capita (constant 2000 $)	991	982	1,048	1,185	1,307
GDP/capita (constant 2005 PPP $)	2,552	2,527	2,697	3,051	3,364

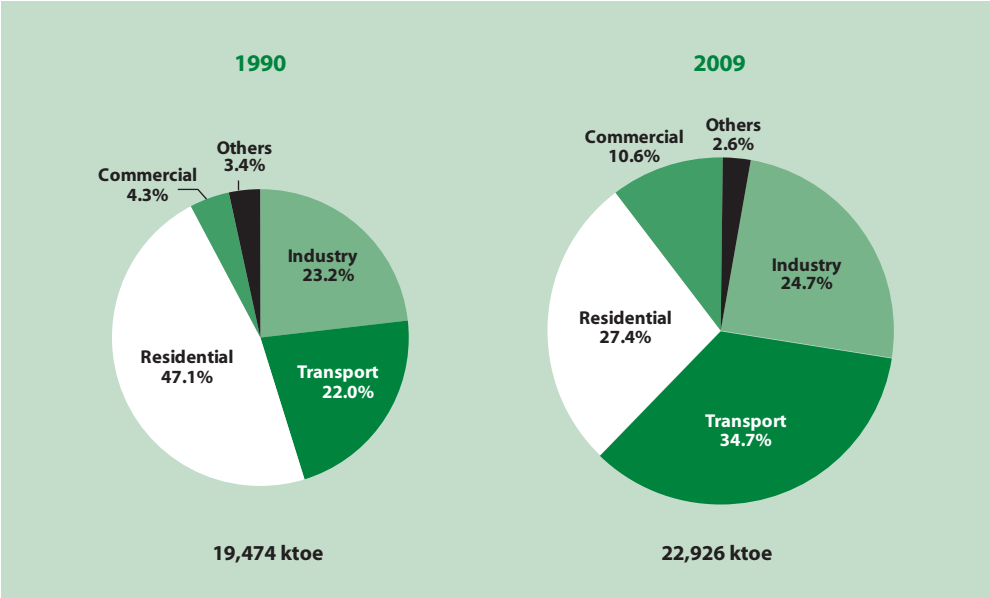
GDP = gross domestic product, PPP = purchasing power parity.
Source: World Bank.

Table 7.7.2 Energy Supply and Demand

	1990	1995	2000	2005	2009
Primary Energy Supply (ktoe)					
Indigenous Production	17,222	15,820	19,552	21,400	23,295
Net Imports	11,086	17,083	19,417	16,423	15,259
Total PES	28,309	32,903	38,969	37,823	38,554
Coal	1,358	1,584	4,539	5,230	5,310
Oil	10,606	16,306	15,648	13,478	13,342
Gas	0	4	9	2,719	3,237
Biomass	11,123	9,197	8,104	7,157	6,939
Others	5,222	5,812	10,669	9,239	9,726
TPES/capita (toe)	0.46	0.48	0.50	0.44	0.42
TPES/GDP (toe/constant 2005 PPP $ million)	180	188	187	145	125
Final Energy Consumption (ktoe)					
Industry	4,511	5,255	5,212	5,228	5,671
Transportation	4,290	6,897	7,695	7,867	7,962
Other Sectors	10,673	10,554	10,594	9,276	9,293
Total FEC	19,474	22,706	23,502	22,371	22,926
Coal	696	894	840	1,184	1,624
Oil	7,833	11,458	12,592	11,374	11,373
Gas	0	0	0	12	71
Electricity	1,824	2,287	3,144	3,884	4,377
Biomass	9,121	8,067	6,926	5,917	5,481
Others	0	0	0	0	0

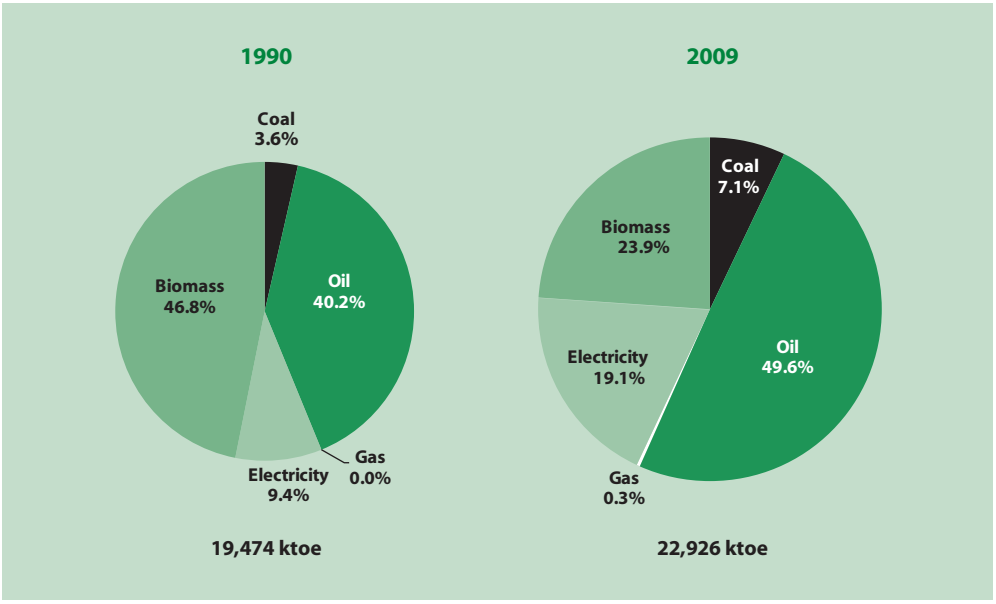
FEC = final energy consumption, GDP = gross domestic product, ktoe = thousand tons of oil equivalent, PES = primary energy supply, PPP = purchasing power parity, toe = ton of oil equivalent, TPES = total primary energy supply.
Source: APERC (APEC Energy Database).

Figure 7.7.1 Final Energy Consumption by Sector, 1990 and 2009



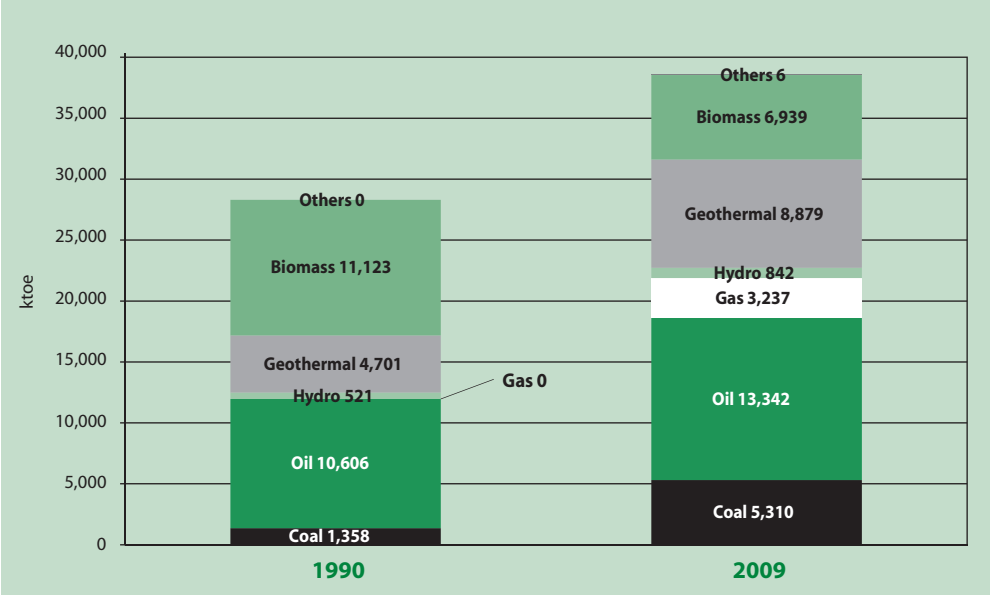
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 7.7.2 Final Energy Consumption by Type of Energy, 1990 and 2009



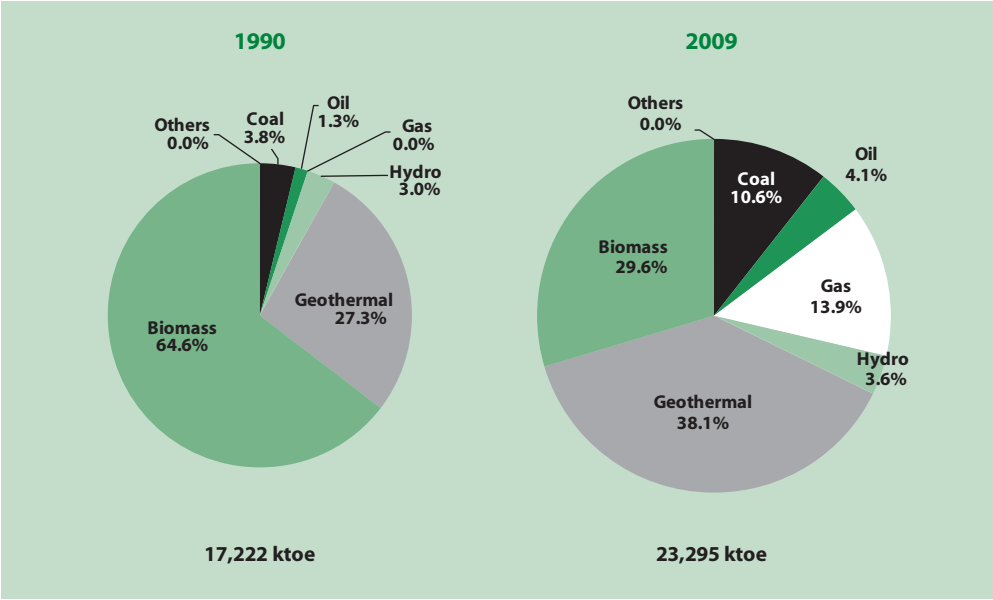
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 7.7.3 Total Primary Energy Supply, 1990 and 2009



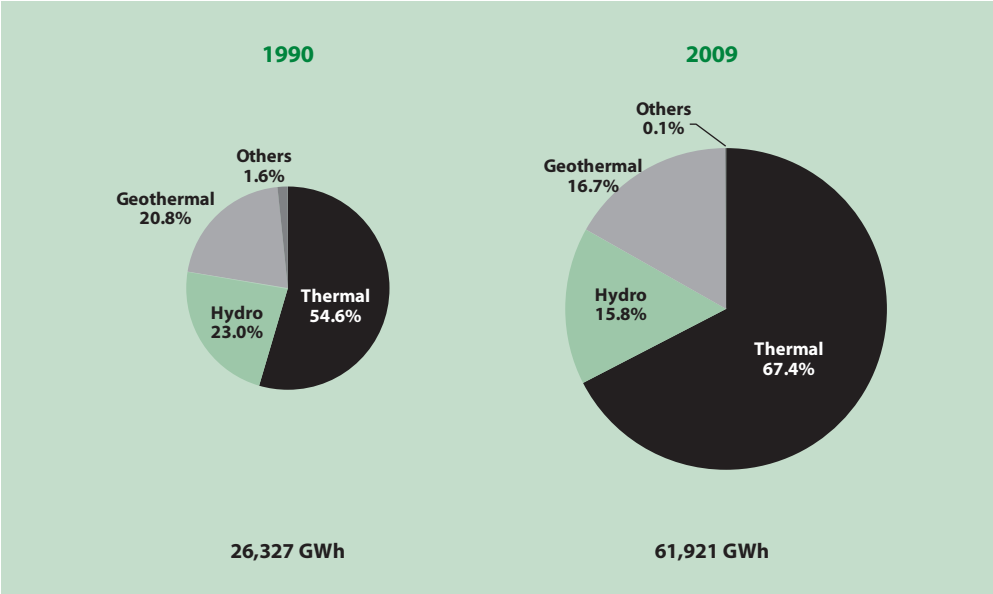
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 7.7.4 Indigenous Energy Production, 1990 and 2009



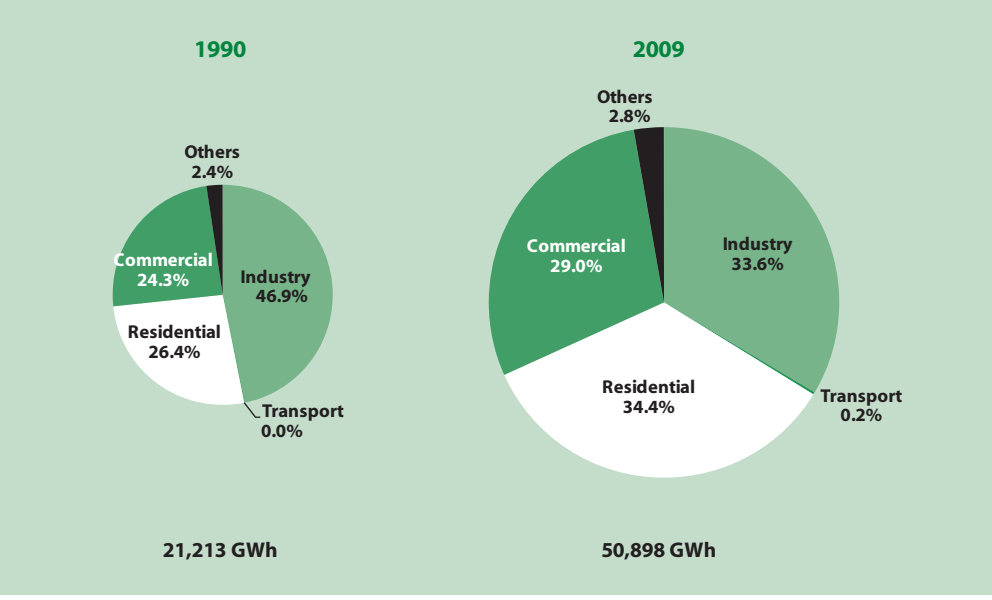
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 7.7.5 Electricity Generation by Plant Type, 1990 and 2009



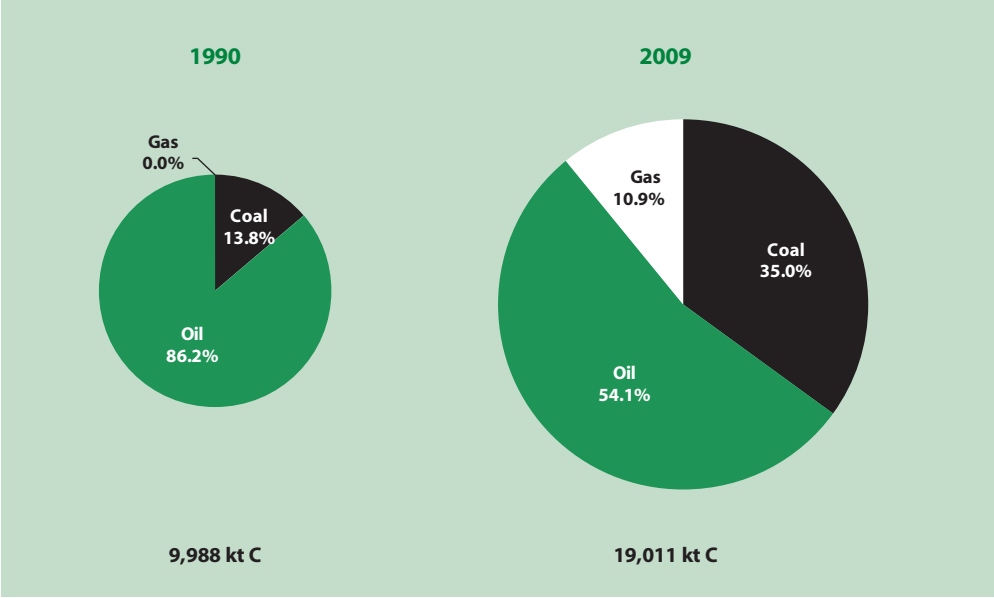
GWh = gigawatt-hour.
Source: APERC (APEC Energy Database).

Figure 7.7.6 Electricity Consumption by Sector, 1990 and 2009



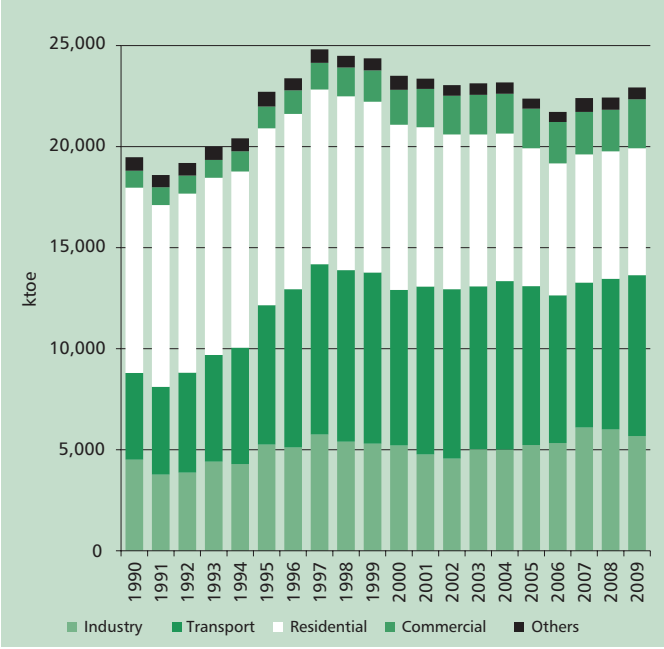
GWh = gigawatt-hour.
Source: APERC (APEC Energy Database).

Figure 7.7.7 Carbon Dioxide Emissions from Fuel Combustion, 1990 and 2009



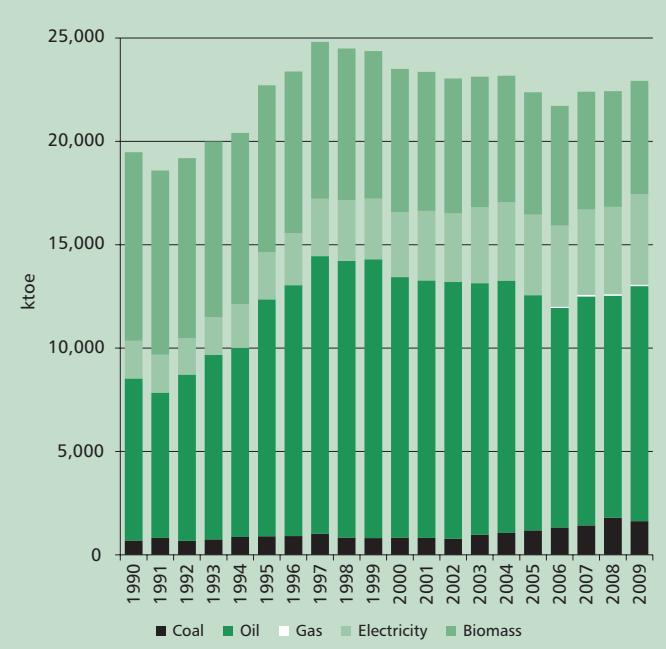
kt C = thousand tons of carbon equivalent.
Source: APERC estimates.

Figure 7.7.8 Final Energy Consumption by Sector, 1990–2009



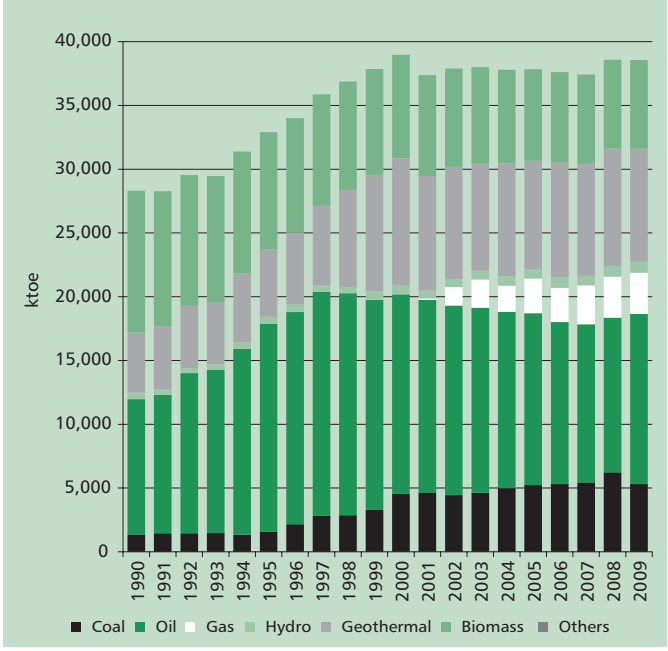
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 7.7.9 Final Energy Consumption by Type, 1990–2009



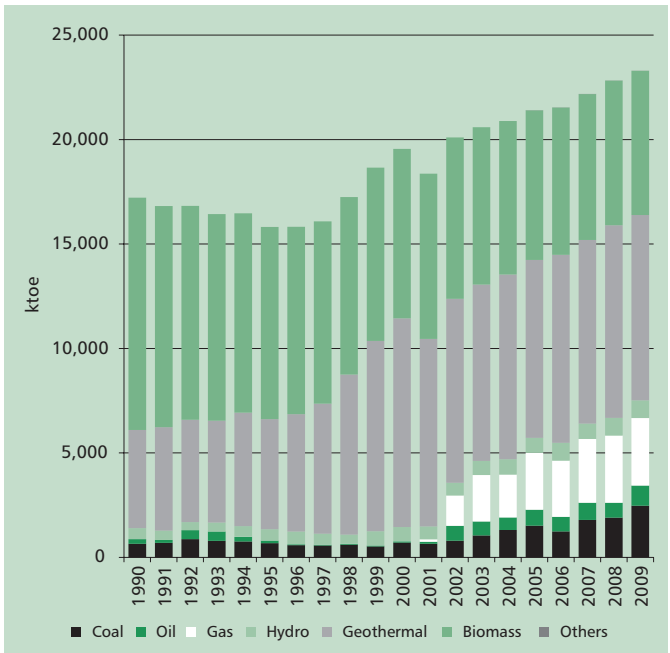
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 7.7.10 Total Primary Energy Supply, 1990–2009



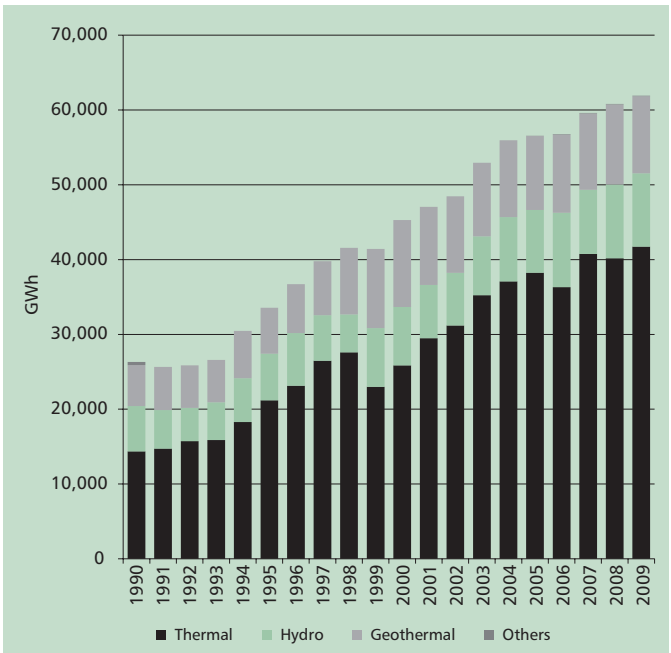
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 7.7.11 Indigenous Energy Production, 1990–2009



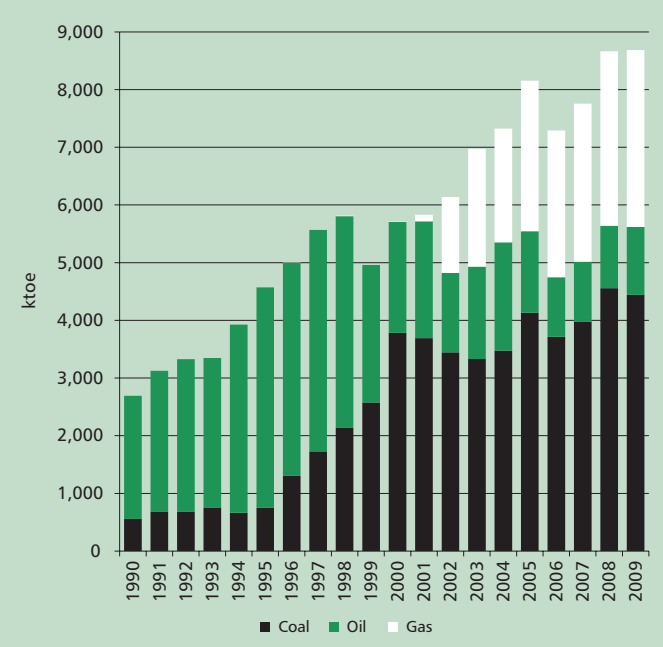
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 7.7.12 Electricity Generation by Source, 1990–2009



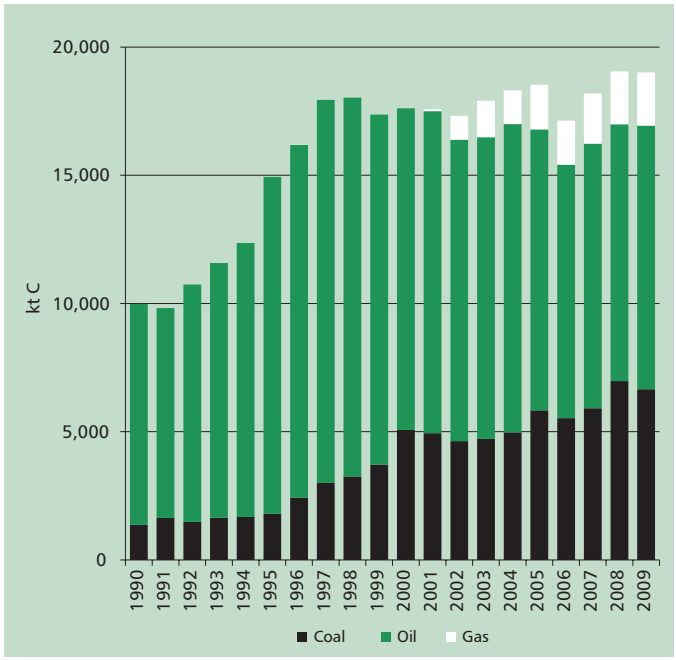
GWh = gigawatt-hour.
Source: APERC (APEC Energy Database).

Figure 7.7.13 Fuel Input for Electricity Generation, 1990–2009



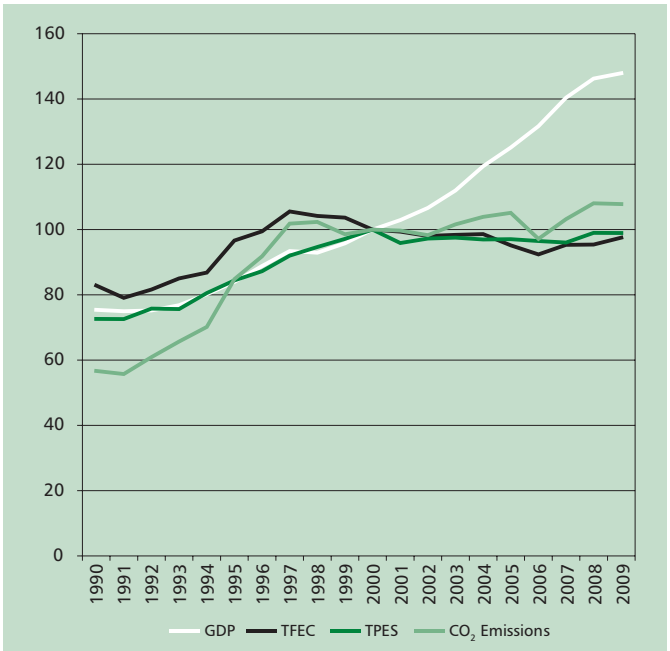
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 7.7.14 Carbon Dioxide Emissions from Fuel Combustion, 1990–2009



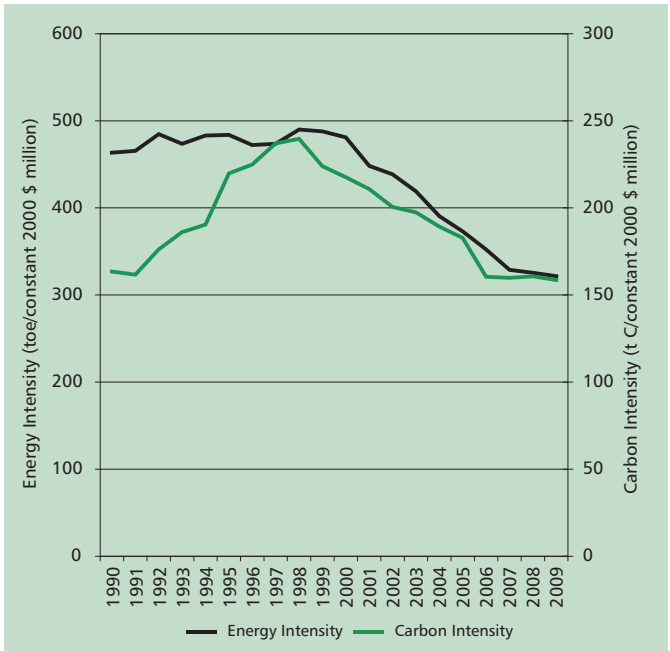
kt C = thousand tons of carbon equivalent.
Source: APERC estimates.

Figure 7.7.15 Growth of GDP, TFEC, TPES, and CO_2 (indexed to year 2000), 1990–2009



CO_2 = carbon dioxide, GDP = gross domestic product, TFEC = total final energy consumption, TPES = total primary energy supply.
Note: Indices are measured relative to the base year 2000 (2000 = 100).
Source: APERC (APEC Energy Database).

Figure 7.7.16 Energy and Carbon Intensities, 1990–2009



t C = ton of carbon equivalent, toe = ton of oil equivalent.
Source: APERC estimates.

Table 7.7.3 Philippines Energy Balance Table, 2006

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	1,243	0	702	0	0	0	0	0	0	0	2,687	855	0	9,000	0	5	7,044	0	0	0	21,535
2.	Imports	4,073	0	10,354	4,957	1,080	77	2,132	670	646	352	0	0	0	0	0	0	1	0	0	0	19,385
3.	Exports	0	0	–678	–1,687	–42	0	–303	–1,162	0	–180	0	0	0	0	0	0	0	0	0	0	–2,365
4.	International Bunkers	0	0	0	–849	0	0	–42	–82	0	–725	0	0	0	0	0	0	0	0	0	0	–849
5.	Stock Changes	0	0	–80	–24	66	–19	6	–38	13	–51	0	0	0	0	0	0	0	0	0	0	–103
6.	Total Primary Energy Supply	5,316	0	10,298	2,397	1,104	58	1,793	–612	659	–604	2,687	855	0	9,000	0	5	7,045	0	0	0	37,603
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	–3,714	0	–9,897	8,409	1,532	165	3,399	2,125	346	843	–2,545	–855	0	–9,000	0	–5	–1,252	0	4,883	0	–13,976
8.1	Power Generation	–3,714	0	0	–1,032	0	0	–145	–887	0	0	–2,545	–855	0	–9,000	0	–5	0	0	4,883	0	–12,268
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	–9,897	9,441	1,532	165	3,544	3,012	346	843	0	0	0	0	0	0	0	0	0	0	–456
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–1,252	0	0	0	–1,252
9.	Loss and Own Use	0	0	–324	0	0	0	0	0	0	0	–86	0	0	0	0	0	0	0	–956	0	–1,365
10.	Discrepancy	–278	0	–77	–190	–74	–5	–230	85	–26	60	0	0	0	0	0	0	0	0	0	0	–545
11.	Total Final Energy Consumption	1,324	0	0	10,616	2,561	218	4,962	1,597	979	299	56	0	0	0	0	0	5,793	0	3,928	0	21,717
12.	Industry Sector	1,175	0	0	1,547	0	18	474	985	71	0	56	0	0	0	0	0	1,206	0	1,344	0	5,327
13.	Transport Sector	0	0	0	7,305	2,559	0	4,111	403	4	227	0	0	0	0	0	0	0	0	8	0	7,314
14.	Other Sectors	0	0	0	1,693	2	200	378	209	904	0	0	0	0	0	0	0	4,587	0	2,576	0	8,856
14.1	Residential and Commercial	0	0	0	1,457	0	195	165	192	904	0	0	0	0	0	0	0	4,587	0	2,535	0	8,579
14.1.1	Commerce and Public Services	0	0	0	565	0	0	165	192	207	0	0	0	0	0	0	0	315	0	1,173	0	2,053
14.1.2	Residential	0	0	0	892	0	195	0	0	697	0	0	0	0	0	0	0	4,273	0	1,361	0	6,526
14.2	Non-Specified Others	0	0	0	236	2	5	213	17	0	0	0	0	0	0	0	0	0	0	41	0	277
15.	Non-Energy Use	149	0	0	71	0	0	0	0	0	71	0	0	0	0	0	0	0	0	0	0	220
16.	Electricity Output (GWh)	15,294	0	4,665	0	0	0	0	0	0	0	16,366	9,939	0	10,465	1	53	0	0	0	0	56,784
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.
Note: Figures may not add up to total because of rounding.
Source: APERC (APEC Energy Database).

Table 7.7.4 Philippines Energy Balance Table, 2007

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	1,791	0	827	0	0	0	0	0	0	0	3,054	736	0	8,785	0	5	6,985	0	0	0	22,183
2.	Imports	4,079	0	10,331	5,588	1,426	51	2,147	683	796	485	0	0	0	0	0	0	2	0	0	0	20,000
3.	Exports	–422	0	–801	–2,563	–94	0	–69	–1,399	0	–1,001	0	0	0	0	0	0	0	0	0	0	–3,786
4.	International Bunkers	0	0	0	–1,261	0	0	–46	–188	0	–1,027	0	0	0	0	0	0	0	0	0	0	–1,261
5.	Stock Changes	0	0	326	–49	–114	7	–129	156	–3	33	0	0	0	0	0	0	0	0	0	0	277
6.	Total Primary Energy Supply	5,449	0	10,683	1,715	1,218	58	1,903	–747	793	–1,510	3,054	736	0	8,785	0	5	6,987	0	0	0	37,413
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	–3,972	0	–10,045	8,445	1,559	161	3,367	2,147	264	947	–2,738	–736	0	–8,785	0	–5	–1,293	0	5,127	0	–14,003
8.1	Power Generation	–3,972	0	0	–1,045	0	0	–145	–900	0	0	–2,738	–736	0	–8,785	0	–5	0	0	5,127	0	–12,155
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	–10,045	9,490	1,559	161	3,512	3,047	264	947	0	0	0	0	0	0	0	0	0	0	–554
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–1,293	0	0	0	–1,293
9.	Loss and Own Use	0	0	–411	0	0	0	0	0	0	0	–237	0	0	0	0	0	0	0	–998	0	–1,646
10.	Discrepancy	–57	0	–227	922	97	–22	17	148	–16	697	0	0	0	0	0	0	0	0	0	0	638
11.	Total Final Energy Consumption	1,419	0	0	11,082	2,873	197	5,286	1,548	1,042	135	78	0	0	0	0	0	5,694	0	4,129	0	22,402
12.	Industry Sector	1,238	0	0	2,136	0	16	727	1,212	180	0	78	0	0	0	0	0	1,250	0	1,397	0	6,098
13.	Transport Sector	0	0	0	7,163	2,869	0	4,048	161	44	40	0	0	0	0	0	0	0	0	9	0	7,172
14.	Other Sectors	0	0	0	1,689	4	181	512	174	818	0	0	0	0	0	0	0	4,444	0	2,723	0	8,856
14.1	Residential and Commercial	0	0	0	1,320	0	179	175	148	818	0	0	0	0	0	0	0	4,444	0	2,681	0	8,445
14.1.1	Commerce and Public Services	0	0	0	515	0	0	175	148	192	0	0	0	0	0	0	0	317	0	1,272	0	2,105
14.1.2	Residential	0	0	0	805	0	179	0	0	626	0	0	0	0	0	0	0	4,127	0	1,408	0	6,340
14.2	Non-Specified Others	0	0	0	369	4	2	336	26	0	0	0	0	0	0	0	0	0	0	42	0	411
15.	Non-Energy Use	181	0	0	94	0	0	0	0	0	94	0	0	0	0	0	0	0	0	0	0	276
16.	Electricity Output (GWh)	16,837	0	5,148	0	0	0	0	0	0	0	18,789	8,563	0	10,215	1	58	0	0	0	0	59,612
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Source: APERC (APEC Energy Database).

Table 7.7.5 Philippines Energy Balance Table, 2008

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	1,905	0	715	0	0	0	0	0	0	0	3,214	846	0	9,222	0	5	6,919	0	0	0	22,827
2.	Imports	4,791	0	9,283	6,097	1,345	60	2,407	1,026	743	514	0	0	0	0	0	0	9	0	0	0	20,180
3.	Exports	–472	0	–653	–2,369	–148	0	–95	–1,096	–9	–1,020	0	0	0	0	0	0	0	0	0	0	–3,494
4.	International Bunkers	0	0	0	–1,180	0	0	–45	–182	0	–953	0	0	0	0	0	0	0	0	0	0	–1,180
5.	Stock Changes	0	0	–347	586	194	107	214	78	24	–30	0	0	0	0	0	0	0	0	0	0	239
6.	Total Primary Energy Supply	6,225	0	8,997	3,134	1,391	167	2,482	–174	758	–1,489	3,214	846	0	9,222	0	5	6,928	0	0	0	38,571
7.	Transfers	0	0	–374	373	0	0	0	0	0	373	0	0	0	0	0	0	0	0	0	0	–2
8.	Total Transformation Sector	–4,558	0	–8,718	7,509	1,611	131	3,113	1,380	328	947	–3,022	–846	0	–9,222	0	–5	–1,331	0	5,231	0	–14,964
8.1	Power Generation	–4,558	0	0	–1,083	0	0	–155	–927	0	0	–3,022	–846	0	–9,222	0	–5	0	0	5,231	0	–13,505
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	–8,718	8,591	1,611	131	3,268	2,307	328	947	0	0	0	0	0	0	0	0	0	0	–127
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–1,331	0	0	0	–1,331
9.	Loss and Own Use	0	0	0	–373	0	0	0	0	0	–373	–122	0	0	0	0	0	0	0	–999	0	–1,494
10.	Discrepancy	131	0	95	91	–257	–137	–323	30	–24	802	0	0	0	0	0	0	–5	0	0	0	313
11.	Total Final Energy Consumption	1,798	0	0	10,733	2,744	161	5,272	1,235	1,061	260	71	0	0	0	0	0	5,592	0	4,232	0	22,425
12.	Industry Sector	1,646	0	0	1,539	0	8	570	872	89	0	70	0	0	0	0	0	1,287	0	1,465	0	6,007
13.	Transport Sector	0	0	0	7,437	2,743	0	4,278	178	68	171	0	0	0	0	0	0	0	0	10	0	7,447
14.	Other Sectors	0	0	0	1,667	2	153	423	185	904	0	0	0	0	0	0	0	4,306	0	2,757	0	8,730
14.1	Residential and Commercial	0	0	0	1,413	0	152	187	170	904	0	0	0	0	0	0	0	4,306	0	2,647	0	8,366
14.1.1	Commerce and Public Services	0	0	0	519	0	0	187	170	162	0	0	0	0	0	0	0	320	0	1,216	0	2,055
14.1.2	Residential	0	0	0	894	0	152	0	0	742	0	0	0	0	0	0	0	3,985	0	1,431	0	6,311
14.2	Non-Specified Others	0	0	0	253	2	0	237	15	0	0	0	0	0	0	0	0	0	0	110	0	364
15.	Non-Energy Use	152	0	0	89	0	0	0	0	0	89	0	0	0	0	0	0	0	0	0	0	241
16.	Electricity Output (GWh)	15,749	0	4,868	0	0	0	0	0	0	0	19,576	9,843	0	10,723	1	61	0	0	0	0	60,821
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.
Note: Figures may not add up to total because of rounding.
Source: APERC (APEC Energy Database).

Table 7.7.6 Philippines Energy Balance Table, 2009

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	2,474	0	962	0	0	0	0	0	0	0	3,237	842	0	8,879	0	6	6,896	0	0	0	23,295
2.	Imports	3,888	0	6,772	7,261	1,631	61	3,211	799	887	672	0	0	0	0	0	0	44	0	0	0	17,965
3.	Exports	–1,052	0	–257	–492	–77	0	–33	–255	0	–126	0	0	0	0	0	0	0	0	0	0	–1,802
4.	International Bunkers	0	0	0	–1,174	0	0	–33	–164	0	–976	0	0	0	0	0	0	0	0	0	0	–1,174
5.	Stock Changes	0	0	428	–159	–65	–51	–98	65	–21	12	0	0	0	0	0	0	0	0	0	0	269
6.	Total Primary Energy Supply	5,310	0	7,905	5,436	1,488	10	3,046	445	866	–419	3,237	842	0	8,879	0	6	6,939	0	0	0	38,554
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	–4,442	0	–6,827	5,739	1,206	127	2,225	639	303	1,239	–3,064	–842	0	–8,879	0	–6	–1,461	0	5,325	0	–14,455
8.1	Power Generation	–4,442	0	0	–1,178	0	0	–261	–917	0	0	–3,064	–842	0	–8,879	0	–6	–6	0	5,325	0	–13,091
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	–6,940	6,917	1,206	127	2,486	1,556	303	1,239	0	0	0	0	0	0	0	0	0	0	–24
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	114	0	0	0	0	0	0	0	0	0	0	0	0	0	–1,455	0	0	0	–1,341
9.	Loss and Own Use	0	0	0	0	0	0	0	0	0	0	–103	0	0	0	0	0	0	0	–303	0	–406
10.	Discrepancy	757	0	–1,079	198	274	22	291	107	–13	–484	0	0	0	0	0	0	3	0	–645	0	–766
11.	Total Final Energy Consumption	1,624	0	0	11,373	2,968	159	5,562	1,190	1,157	336	71	0	0	0	0	0	5,481	0	4,377	0	22,926
12.	Industry Sector	1,469	0	0	1,340	0	20	466	779	75	0	70	0	0	0	0	0	1,322	0	1,469	0	5,671
13.	Transport Sector	0	0	0	7,952	2,964	0	4,450	230	84	225	0	0	0	0	0	0	0	0	10	0	7,962
14.	Other Sectors	0	0	0	1,969	4	139	646	182	998	0	0	0	0	0	0	0	4,159	0	2,898	0	9,026
14.1	Residential and Commercial	0	0	0	1,764	0	138	454	174	998	0	0	0	0	0	0	0	4,159	0	2,777	0	8,700
14.1.1	Commerce and Public Services	0	0	0	826	0	0	454	174	199	0	0	0	0	0	0	0	324	0	1,269	0	2,419
14.1.2	Residential	0	0	0	938	0	138	0	0	799	0	0	0	0	0	0	0	3,835	0	1,508	0	6,280
14.2	Non–Specified Others	0	0	0	205	4	1	192	8	0	0	0	0	0	0	0	0	0	0	121	0	326
15.	Non–Energy Use	155	0	0	112	0	0	0	0	0	112	0	0	0	0	0	0	0	0	0	0	267
16.	Electricity Output (GWh)	16,476	0	5,381	0	0	0	0	0	0	0	19,887	9,788	0	10,324	1	64	0	0	0	0	61,921
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Source: APERC (APEC Energy Database).

Table 7.7.7 Philippines Summary Table, 1990–2009

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Indigenous Production (ktoe)																				
Coal	649	696	876	797	765	681	585	568	611	528	715	649	802	1,054	1,309	1,520	1,243	1,791	1,905	2,474
Oil	229	144	432	439	221	126	43	39	38	41	55	103	708	663	601	765	702	827	715	962
Gas	0	0	0	0	5	4	7	5	8	6	9	116	1,459	2,223	2,053	2,719	2,687	3,054	3,214	3,237
Hydro	521	442	382	433	504	536	605	522	436	674	671	611	605	677	739	721	855	736	846	842
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Geothermal	4,701	4,952	4,902	4,874	5,435	5,276	5,619	6,224	7,666	9,111	9,998	8,980	8,809	8,447	8,843	8,516	9,000	8,785	9,222	8,879
Solar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wind	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	5	5	5	6
Biomass	11,123	10,583	10,237	9,890	9,543	9,197	8,963	8,729	8,495	8,299	8,104	7,911	7,720	7,530	7,342	7,156	7,044	6,985	6,919	6,896
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	17,222	16,817	16,829	16,432	16,473	15,820	15,823	16,087	17,253	18,660	19,552	18,370	20,102	20,595	20,887	21,400	21,535	22,183	22,827	23,295
Primary Energy Supply (ktoe)																				
Coal	1,358	1,453	1,459	1,469	1,350	1,584	2,160	2,810	2,870	3,279	4,539	4,661	4,446	4,641	4,990	5,230	5,316	5,449	6,225	5,310
Oil	10,606	10,843	12,557	12,808	14,548	16,306	16,641	17,572	17,407	16,488	15,648	15,089	14,855	14,489	13,829	13,478	12,695	12,397	12,131	13,342
Gas	0	0	0	0	5	4	7	5	8	6	9	116	1,459	2,223	2,053	2,719	2,687	3,054	3,214	3,237
Hydro	521	442	382	433	504	536	605	522	436	674	671	611	605	677	739	721	855	736	846	842
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Geothermal	4,701	4,952	4,902	4,874	5,435	5,276	5,619	6,224	7,666	9,111	9,998	8,980	8,809	8,447	8,843	8,516	9,000	8,785	9,222	8,879
Solar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wind	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	5	5	5	6
Biomass	11,123	10,583	10,237	9,890	9,543	9,197	8,963	8,729	8,495	8,299	8,104	7,911	7,720	7,530	7,342	7,157	7,045	6,987	6,928	6,939
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	28,309	28,274	29,537	29,473	31,385	32,903	33,995	35,862	36,881	37,857	38,969	37,368	37,893	38,007	37,796	37,823	37,603	37,413	38,571	38,554
Final Energy Consumption by Sector (ktoe)																				
Industry	4,511	3,770	3,873	4,412	4,289	5,255	5,119	5,752	5,400	5,304	5,212	4,766	4,567	5,028	5,011	5,228	5,327	6,098	6,007	5,671
Transport	4,290	4,341	4,943	5,275	5,760	6,897	7,823	8,431	8,486	8,464	7,695	8,310	8,372	8,054	8,334	7,867	7,314	7,172	7,447	7,962
Residential	9,164	8,995	8,863	8,773	8,720	8,753	8,675	8,647	8,599	8,449	8,172	7,880	7,661	7,519	7,301	6,820	6,526	6,340	6,311	6,280
Commercial	841	877	887	875	992	1,078	1,169	1,308	1,427	1,555	1,726	1,898	1,917	1,956	1,969	1,962	2,053	2,105	2,055	2,419
Others	667	610	625	653	643	723	593	668	577	595	697	501	523	568	556	494	497	687	605	593
Total	19,474	18,592	19,191	19,987	20,404	22,706	23,378	24,806	24,489	24,366	23,502	23,355	23,040	23,126	23,171	22,371	21,717	22,402	22,425	22,926

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Table 7.7.7 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Final Energy Consumption by Type (ktoe)																				
Coal	696	816	676	748	866	894	911	1,010	833	809	840	818	782	974	1,055	1,184	1,324	1,419	1,798	1,624
Oil	7,833	7,026	8,041	8,927	9,146	11,458	12,128	13,437	13,380	13,488	12,592	12,451	12,418	12,162	12,210	11,374	10,616	11,082	10,733	11,373
Gas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12	56	78	71	71
Electricity	1,824	1,839	1,775	1,824	2,115	2,287	2,515	2,777	2,936	2,936	3,144	3,366	3,322	3,674	3,791	3,884	3,928	4,129	4,232	4,377
Heat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Biomass	9,121	8,910	8,699	8,488	8,277	8,067	7,825	7,583	7,341	7,133	6,926	6,721	6,518	6,316	6,116	5,917	5,793	5,694	5,592	5,481
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	19,474	18,592	19,191	19,987	20,404	22,706	23,378	24,806	24,489	24,366	23,502	23,355	23,040	23,126	23,171	22,371	21,717	22,402	22,425	22,926
Power Generation (GWh)																				
Thermal	14,368	14,746	15,730	15,882	18,277	21,187	23,143	26,491	27,598	22,998	25,865	29,503	31,192	35,248	37,082	38,260	36,325	40,775	40,193	41,744
Hydro	6,062	5,145	4,440	5,030	5,862	6,232	7,030	6,069	5,066	7,840	7,799	7,104	7,033	7,870	8,593	8,387	9,939	8,563	9,843	9,788
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Geothermal	5,466	5,758	5,700	5,667	6,320	6,135	6,534	7,237	8,914	10,594	11,626	10,442	10,242	9,822	10,282	9,902	10,465	10,215	10,723	10,324
Solar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	1	1	1
Wind	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	17	53	58	61	64
Others	431	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	26,327	25,649	25,870	26,579	30,459	33,554	36,707	39,797	41,578	41,432	45,290	47,049	48,467	52,941	55,957	56,568	56,784	59,612	60,821	61,921
Loss and Own Use of Electricity (GWh)																				
Transmission and Distribution Losses	3,980	3,176	4,071	4,238	4,734	5,735	6,128	6,037	5,849	5,754	6,345	5,713	5,970	6,810	7,227	6,817	6,885	7,608	7,680	–
Own Use	1,134	1,086	1,154	1,132	1,132	1,226	1,340	1,471	1,590	1,536	2,390	2,196	3,873	3,410	4,654	4,591	4,227	3,994	3,935	3,524
Total	5,114	4,262	5,225	5,370	5,866	6,961	7,468	7,507	7,440	7,290	8,735	7,909	9,843	10,221	11,881	11,408	11,112	11,603	11,615	3,524
Fuel Input for Power Generation (ktoe)																				
Coal	559	679	678	755	663	750	1,304	1,729	2,135	2,577	3,784	3,692	3,444	3,329	3,476	4,134	3,714	3,972	4,558	4,442
Oil	2,135	2,446	2,649	2,592	3,265	3,825	3,698	3,839	3,671	2,386	1,925	2,024	1,378	1,601	1,876	1,411	1,032	1,045	1,083	1,178
Gas	0	0	0	0	5	4	7	5	8	6	9	114	1,317	2,044	1,971	2,610	2,545	2,738	3,022	3,064
Total	2,693	3,125	3,327	3,347	3,933	4,579	5,009	5,572	5,814	4,969	5,718	5,831	6,139	6,973	7,324	8,155	7,291	7,756	8,663	8,684
CO_2 Emissions (kt C)																				
Coal	1,377	1,640	1,485	1,648	1,677	1,804	2,430	3,004	3,256	3,715	5,073	4,947	4,636	4,720	4,971	5,833	5,527	5,914	6,972	6,655
Oil	8,611	8,184	9,258	9,934	10,689	13,140	13,755	14,943	14,777	13,659	12,550	12,552	11,756	11,767	12,028	10,956	9,881	10,320	10,019	10,283
Gas	0	0	0	0	3	3	5	3	5	4	6	74	934	1,424	1,315	1,742	1,721	1,956	2,059	2,073
Total	9,988	9,825	10,743	11,582	12,369	14,947	16,190	17,950	18,038	17,378	17,629	17,574	17,327	17,912	18,314	18,531	17,129	18,189	19,051	19,011

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Table 7.7.7 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Macroeconomic Indicators																				
Population (thousand)	61,629	63,147	64,659	66,174	67,703	69,255	70,831	72,427	74,041	75,670	77,310	78,964	80,630	82,294	83,937	85,546	87,116	88,653	90,173	91,703
Urban Population, %	48.8	49.8	50.9	51.9	53.0	54.0	54.9	55.8	56.7	57.6	58.5	59.3	60.2	61.0	61.9	62.7	63.4	64.2	64.9	65.7
GDP (constant 2000 $ million)	61,099	60,745	60,950	62,240	64,971	68,011	71,987	75,720	75,283	77,603	81,026	83,371	86,411	90,706	96,781	101,405	106,721	113,783	118,508	119,869
GDP (current $ million)	44,312	45,418	52,976	54,368	64,085	74,120	82,848	82,344	72,207	82,995	81,026	76,262	81,358	83,908	91,371	103,066	122,211	149,360	173,603	168,334
GDP (constant 2005 PPP $ million)	157,251	156,341	156,869	160,189	167,218	175,041	185,274	194,881	193,757	199,728	208,539	214,574	222,397	233,451	249,087	260,987	274,671	292,845	305,006	308,508
GDP/capita (constant 2000 $)	991	962	943	941	960	982	1,016	1,045	1,017	1,026	1,048	1,056	1,072	1,102	1,153	1,185	1,225	1,283	1,314	1,307
GDP/capita (current $)	719	719	819	822	947	1,070	1,170	1,137	975	1,097	1,048	966	1,009	1,020	1,089	1,205	1,403	1,685	1,925	1,836
GDP – Manufacturing (% of GDP)	25.1	25.2	24.7	24.3	24.5	25.0	24.9	24.7	24.5	24.2	24.5	24.4	24.3	24.0	23.7	23.7	23.5	22.8	22.8	21.5
Car Ownership (car/1,000 persons)	20	20	21	23	25	26	29	31	30	31	31	32	33	33	34	34	33	32	32	33
Basic Energy Indicators																				
TPES/capita (toe/person)	0.46	0.45	0.46	0.45	0.46	0.48	0.48	0.50	0.50	0.50	0.50	0.47	0.47	0.46	0.45	0.44	0.43	0.42	0.43	0.42
TFEC/capita (toe/person)	0.32	0.29	0.30	0.30	0.30	0.33	0.33	0.34	0.33	0.32	0.30	0.30	0.29	0.28	0.28	0.26	0.25	0.25	0.25	0.25
TPES/GDP (toe/constant 2000 $ million)	463	465	485	474	483	484	472	474	490	488	481	448	439	419	391	373	352	329	325	322
TFEC/GDP (toe/constant 2000 $ million)	319	306	315	321	314	334	325	328	325	314	290	280	267	255	239	221	203	197	189	191
Import Dependency (%)	39.2	40.5	43.0	44.2	47.5	51.9	53.5	55.1	53.2	50.7	49.8	50.8	47.0	45.8	44.7	43.4	42.7	40.7	40.8	39.6
Oil Import Dependency (%)	97.8	98.7	96.6	96.6	98.5	99.2	99.7	99.8	99.8	99.7	99.6	99.3	95.2	95.4	95.7	94.3	94.5	93.3	94.1	92.8
Electricity/capita (kWh/ person)	344	339	319	321	363	384	413	446	461	451	473	496	479	519	525	528	524	542	546	555
CO_2 Intensity (t C/constant 2000 $ million)	163	162	176	186	190	220	225	237	240	224	218	211	201	197	189	183	161	160	161	159
CO_2/capita (t C)	0.16	0.16	0.17	0.18	0.18	0.22	0.23	0.25	0.24	0.23	0.23	0.22	0.21	0.22	0.22	0.22	0.20	0.21	0.21	0.21
CO_2/TPES (t C/toe)	0.35	0.35	0.36	0.39	0.39	0.45	0.48	0.50	0.49	0.46	0.45	0.47	0.46	0.47	0.48	0.49	0.46	0.49	0.49	0.49

– = no data or not applicable, CO_2 = carbon dioxide, GDP = gross domestic product, GWh = gigawatt–hour, kt C = thousand tons of carbon equivalent, ktoe = thousand tons of oil equivalent, kWh = kilowatt–hour, PPP = purchasing power parity, t C = ton of carbon equivalent, TFEC = total final energy consumption, toe = ton of oil equivalent, TPES = total primary energy supply.

Note: Figures may not add up to total because of rounding.

Sources: APERC (APEC Energy Database), APERC estimates, JAMA (2012), and World Bank.

7.8 Singapore

Country Profile (2009)		Energy Reserves (year-end 2008)	
Total Surface Area (square kilometer)	714	Coal (million ton) - Recoverable	–
Population (thousand)	4,988	Gas (trillion cubic feet) - Proven	–
GDP (constant 2000 $ billion)	144.3	Oil (billion barrel) - Proven	–
Electrification Rate (%)	100.0		

– = no data or not applicable, GDP = gross domestic product.

Sources: ADB (2012), IEA (2011c), and World Bank.

2009 Energy Supply and Demand Flow (ktoe)

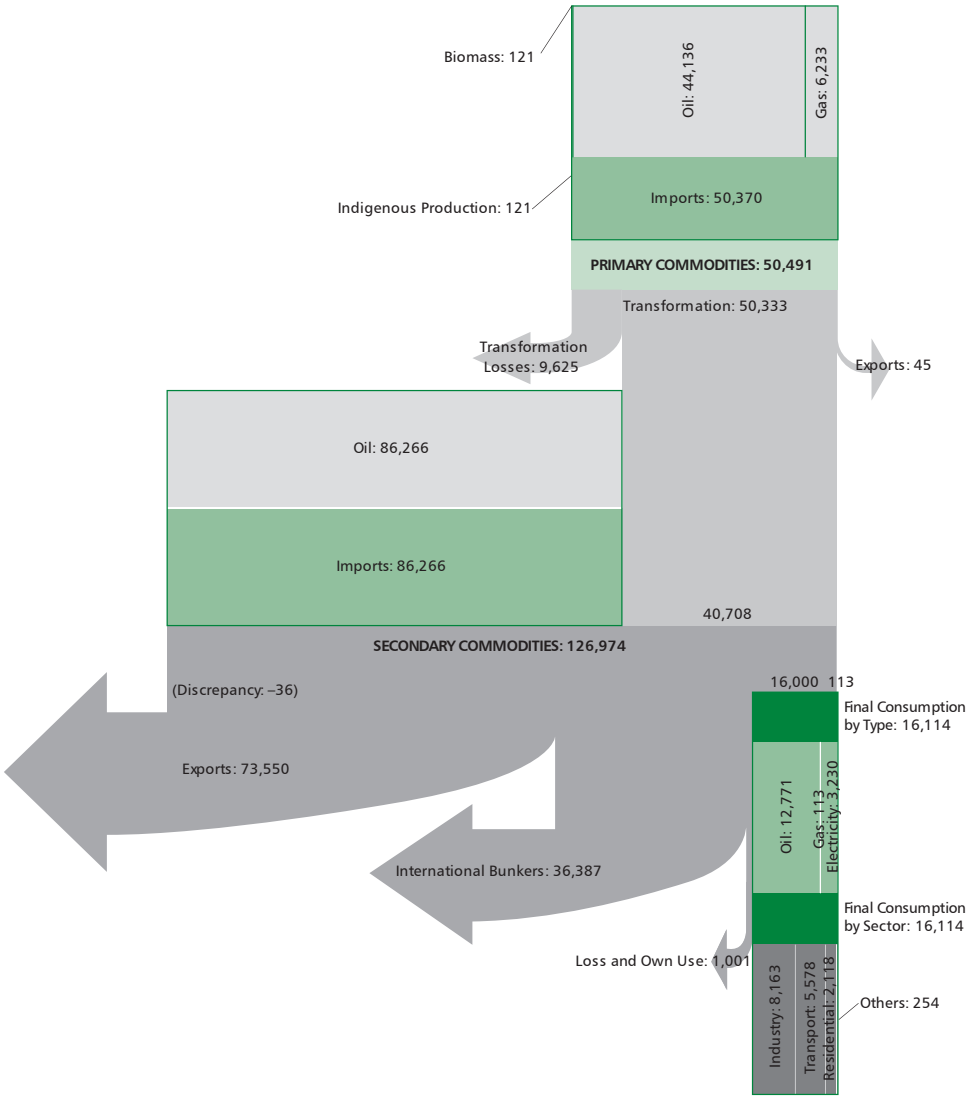


Table 7.8.1 Key Data and Economic Profile

	1990	1995	2000	2005	2009
Socioeconomic Data					
Population (thousand)	3,047	3,525	4,028	4,266	4,988
GDP (constant 2000 $ billion)	48.0	72.3	95.9	121.2	144.3
GDP (constant 2005 PPP $ billion)	76.6	115.5	153.2	193.6	230.5
GDP/capita (constant 2000 $)	15,748	20,519	23,815	28,409	28,932
GDP/capita (constant 2005 PPP $)	25,152	32,773	38,037	45,374	46,211

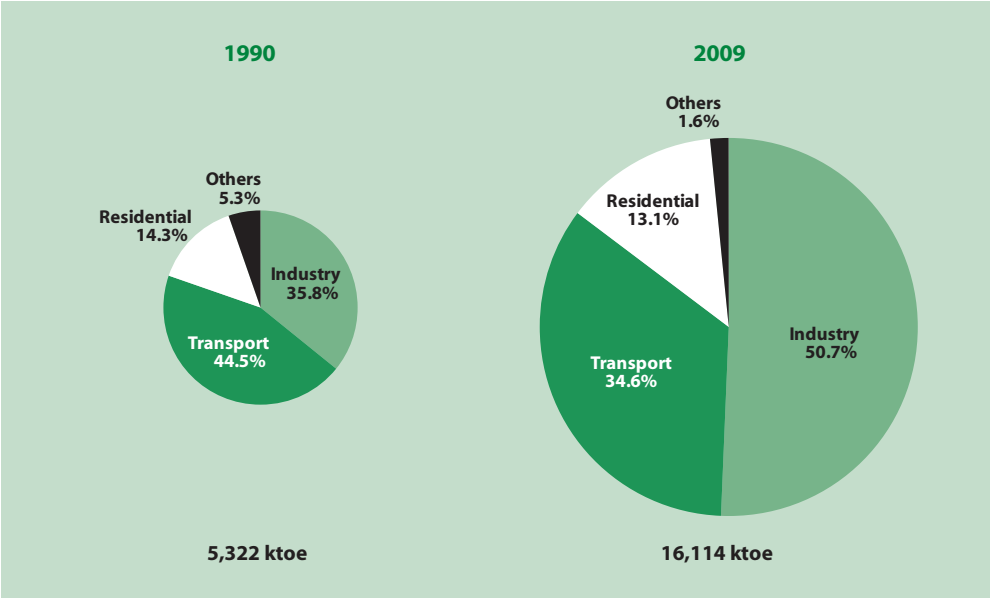
GDP = gross domestic product, PPP = purchasing power parity.
Source: World Bank.

Table 7.8.2 Energy Supply and Demand

	1990	1995	2000	2005	2009
Primary Energy Supply (ktoe)					
Indigenous Production	19	50	101	194	121
Net Imports	9,878	15,153	20,320	22,797	26,654
Total PES	9,896	15,203	20,421	22,991	26,775
Coal	0	0	0	1	0
Oil	9,878	13,977	19,378	17,562	20,421
Gas	0	1,176	942	5,234	6,233
Biomass	19	50	101	194	121
Others	0	0	0	0	0
TPES/capita (toe)	3.25	4.31	5.07	5.39	5.37
TPES/GDP (toe/constant 2005 PPP $ million)	129	132	133	119	116
Final Energy Consumption (ktoe)					
Industry	1,907	2,589	3,514	8,058	8,163
Transportation	2,368	3,680	4,159	4,726	5,578
Other Sectors	1,047	1,208	1,693	1,960	2,372
Total FEC	5,322	7,477	9,367	14,744	16,114
Coal	0	0	0	0	0
Oil	4,046	5,653	6,757	11,688	12,771
Gas	55	84	105	96	113
Electricity	1,221	1,741	2,505	2,960	3,230
Biomass	0	0	0	0	0
Others	0	0	0	0	0

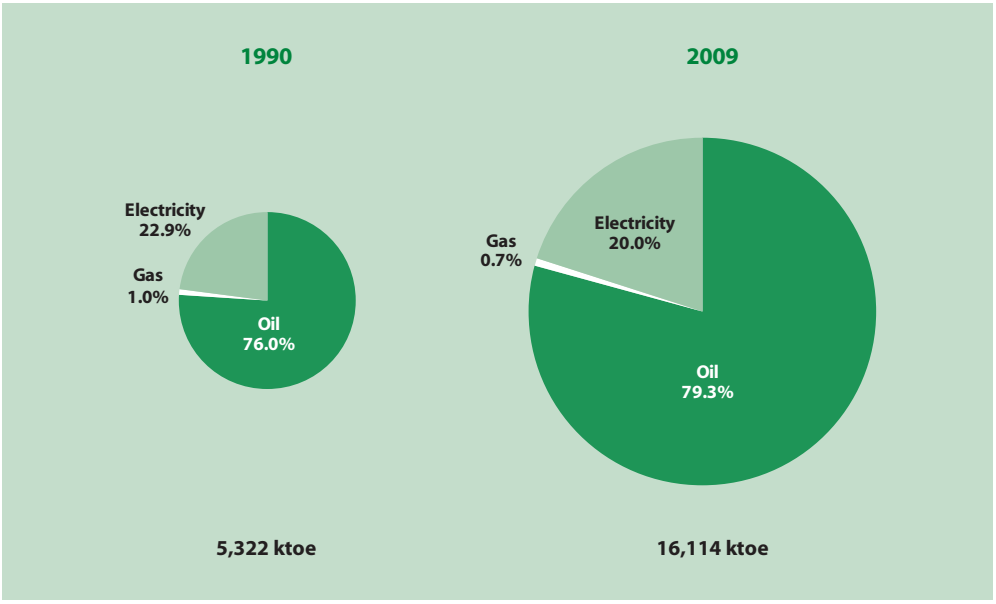
FEC = final energy consumption, GDP = gross domestic product, ktoe = thousand tons of oil equivalent, PES = primary energy supply, PPP = purchasing power parity, toe = ton of oil equivalent, TPES = total primary energy supply.
Source: APERC (APEC Energy Database).

Figure 7.8.1 Final Energy Consumption by Sector, 1990 and 2009



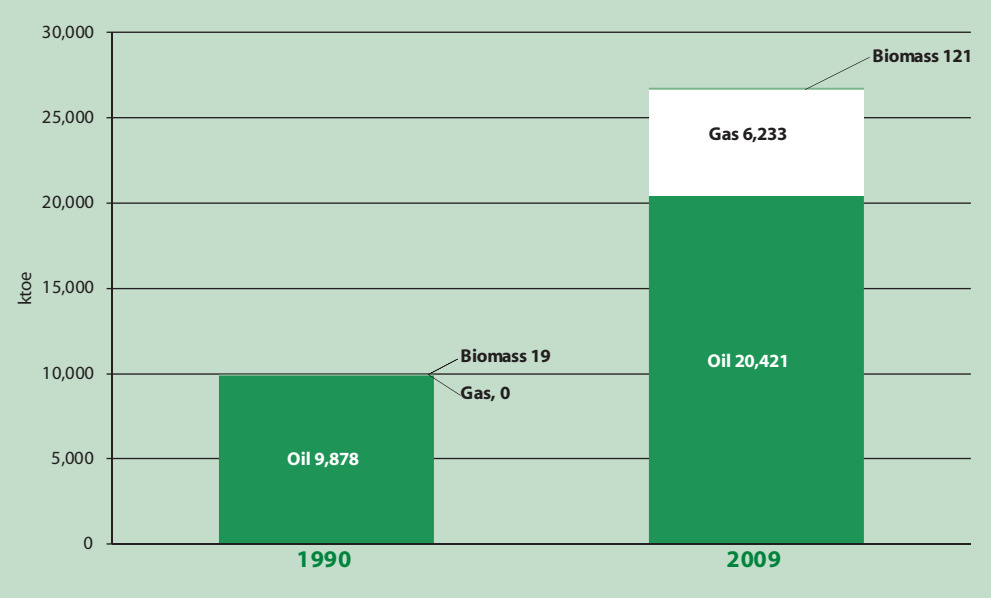
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 7.8.2 Final Energy Consumption by Type of Energy, 1990 and 2009



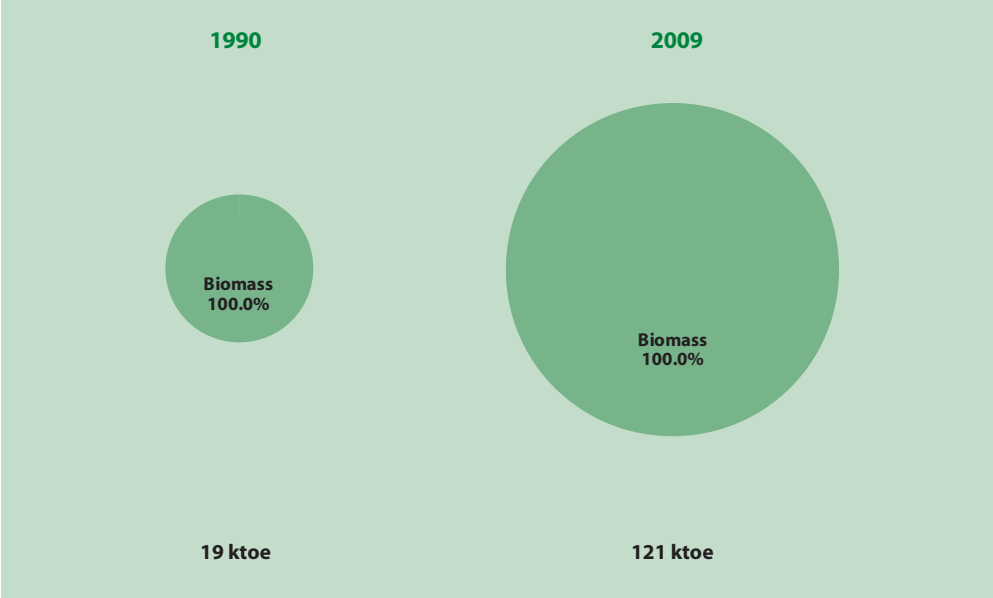
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 7.8.3 Total Primary Energy Supply, 1990 and 2009



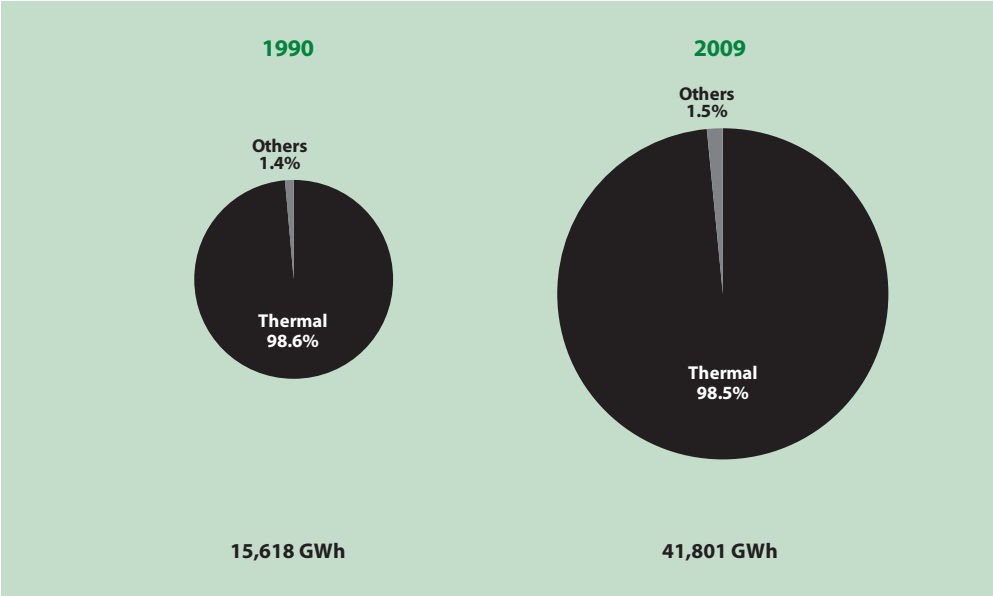
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 7.8.4 Indigenous Energy Production, 1990 and 2009



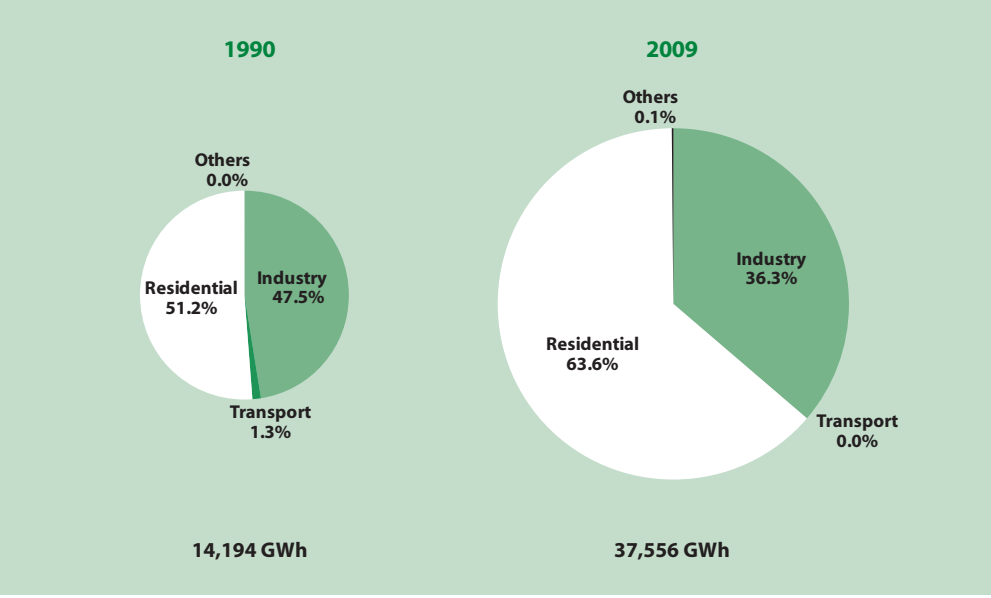
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 7.8.5 Electricity Generation by Plant Type, 1990 and 2009



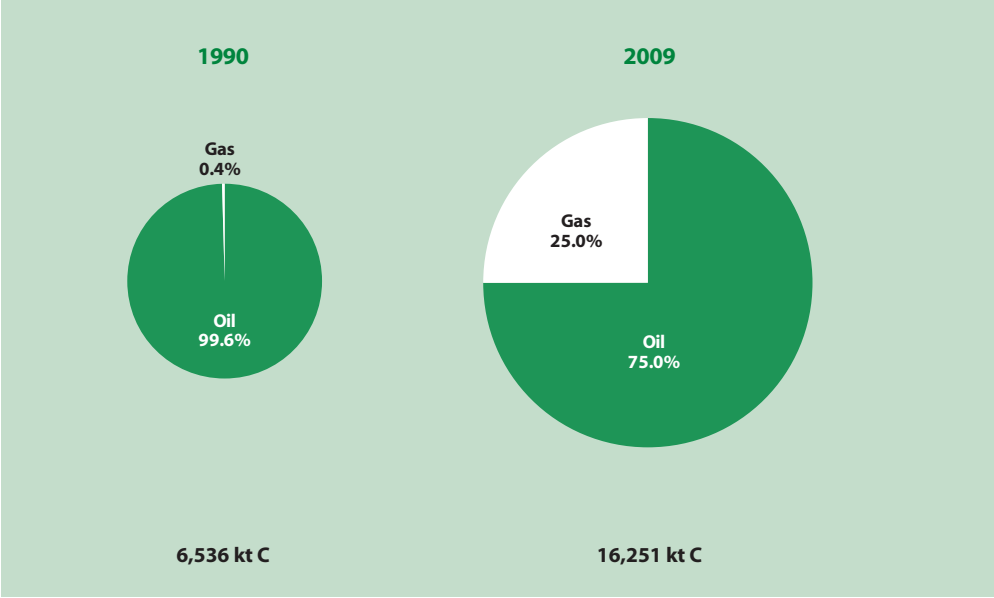
GWh = gigawatt-hour.
Source: APERC (APEC Energy Database).

Figure 7.8.6 Electricity Consumption by Sector, 1990 and 2009



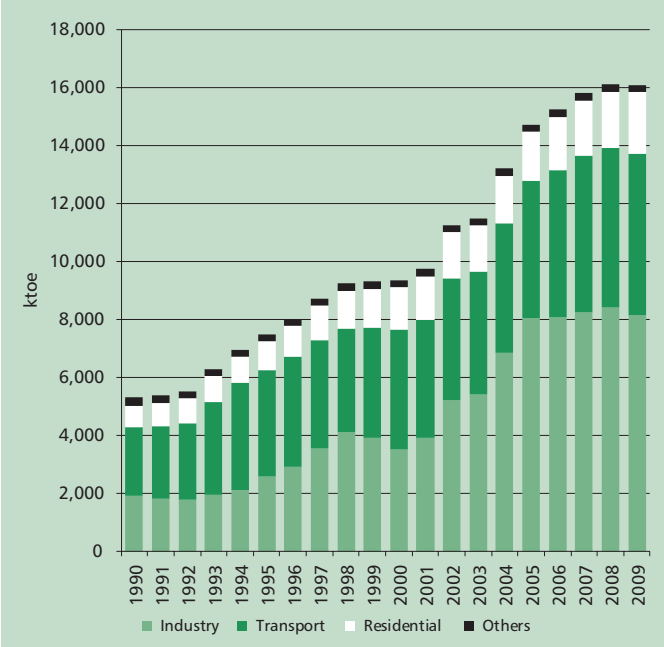
GWh = gigawatt-hour.
Source: APERC (APEC Energy Database).

Figure 7.8.7 Carbon Dioxide Emissions from Fuel Combustion, 1990 and 2009



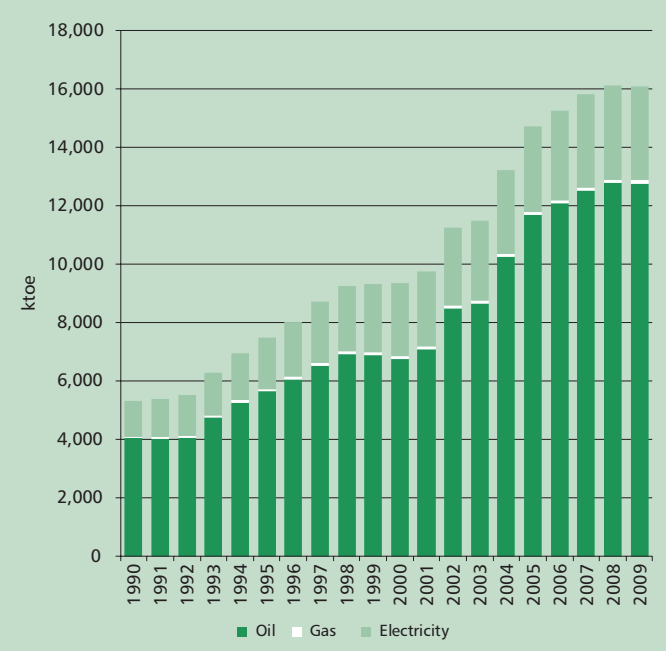
kt C = thousand tons of carbon equivalent.
Source: APERC estimates.

Figure 7.8.8 Final Energy Consumption by Sector, 1990–2009



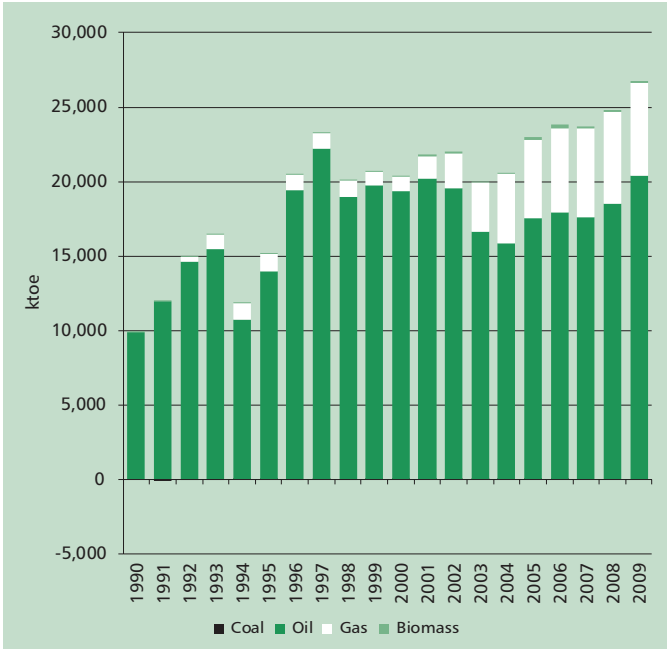
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 7.8.9 Final Energy Consumption by Type, 1990–2009



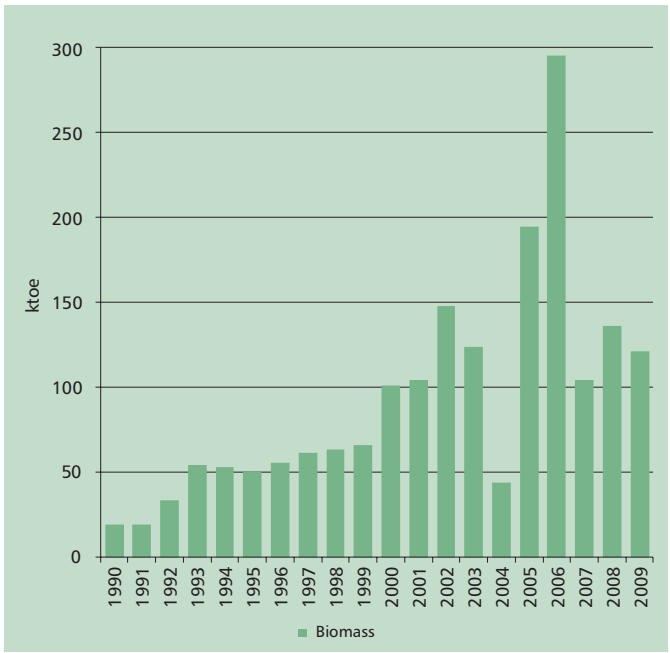
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 7.8.10 Total Primary Energy Supply, 1990–2009



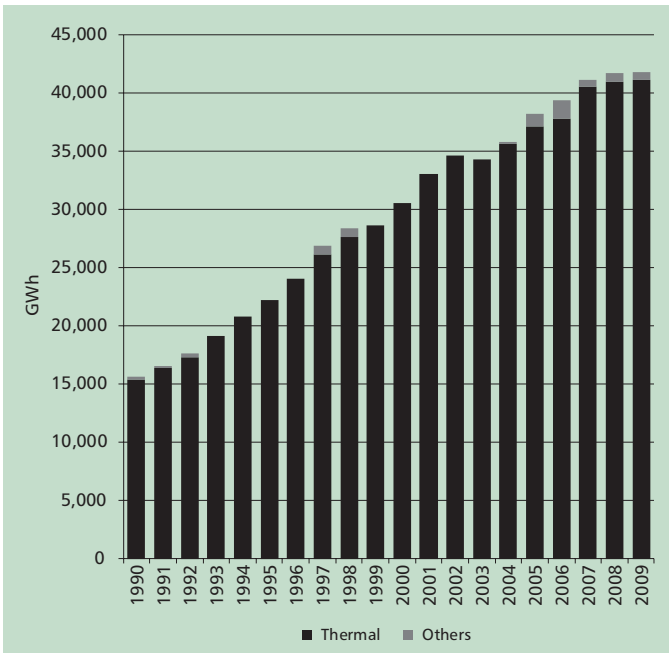
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 7.8.11 Indigenous Energy Production, 1990–2009



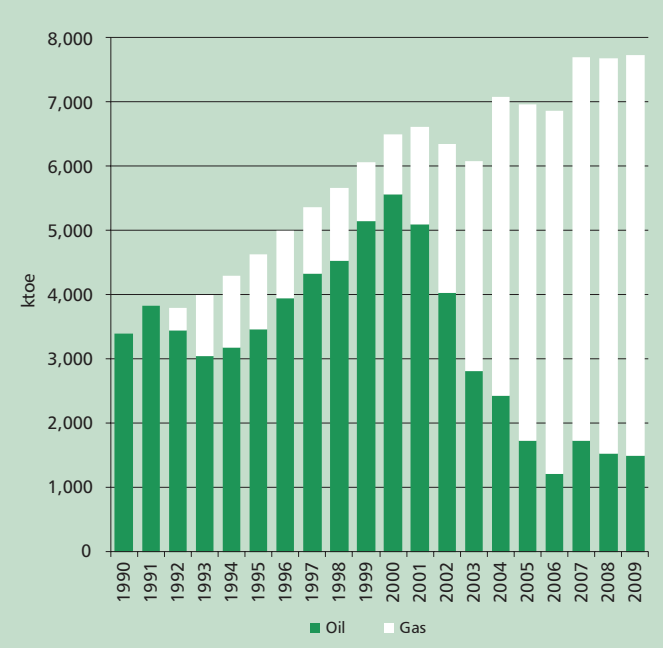
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 7.8.12 Electricity Generation by Source, 1990–2009



GWh = gigawatt-hour.
Source: APERC (APEC Energy Database).

Figure 7.8.13 Fuel Input for Electricity Generation, 1990–2009

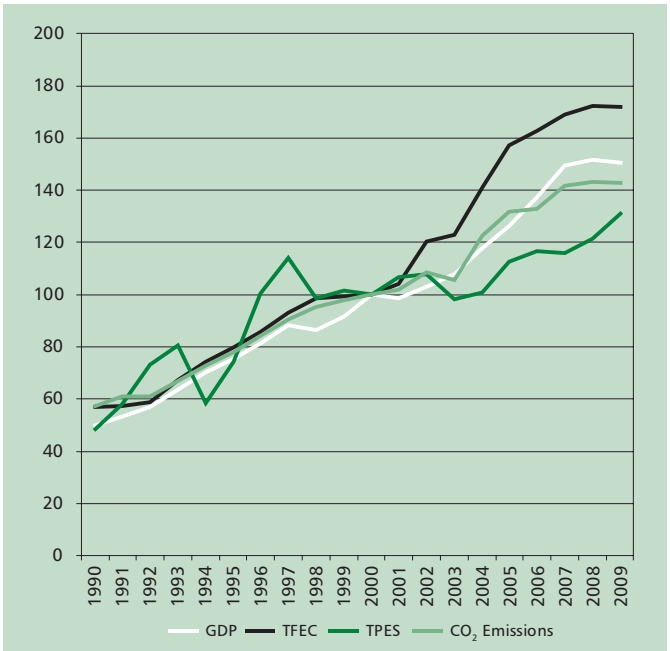


ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 7.8.14 Carbon Dioxide Emissions from Fuel Combustion, 1990–2009

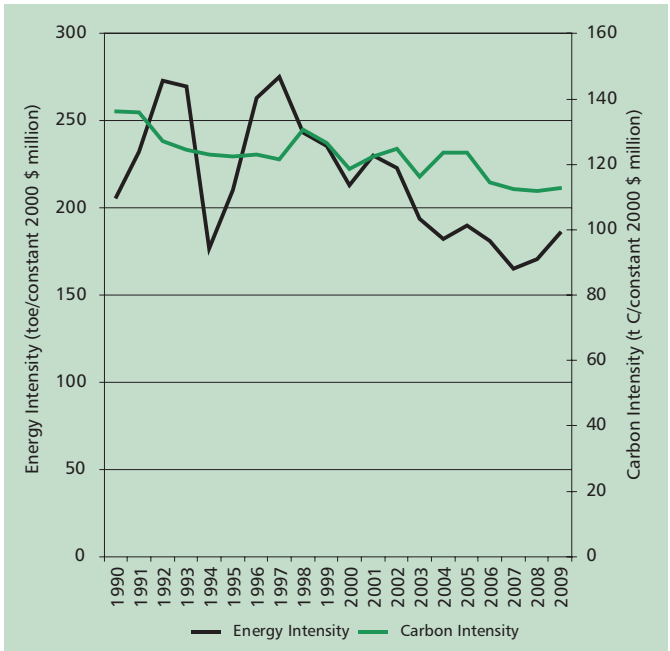
kt C = thousand tons of carbon equivalent.
Source: APERC estimates.

Figure 7.8.15 Growth of GDP, TFEC, TPES, and CO_2 (indexed to year 2000), 1990–2009



CO_2 = carbon dioxide, GDP = gross domestic product, TFEC = total final energy consumption, TPES = total primary energy supply.
Note: Indices are measured relative to the base year 2000 (2000 = 100).
Source: APERC estimates.

Figure 7.8.16 Energy and Carbon Intensities, 1990–2009



t C = ton of carbon equivalent, toe = ton of oil equivalent.
Source: APERC estimates.

Table 7.8.3 Singapore Energy Balance Table, 2006

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	295	0	0	0	295
2.	Imports	0	5	52,745	54,414	7,788	303	6,114	33,469	3	6,736	5,649	0	0	0	0	0	0	0	0	0	112,813
3.	Exports	0	0	0	−58,260	−10,858	−1,077	−16,673	−16,696	−705	−12,251	0	0	0	0	0	0	0	0	0	0	−58,260
4.	International Bunkers	0	0	0	−31,002	0	0	0	−31,002	0	0	0	0	0	0	0	0	0	0	0	0	−31,002
5.	Stock Changes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6.	Total Primary Energy Supply	0	5	52,745	−34,848	−3,070	−774	−10,558	−14,229	−702	−5,515	5,649	0	0	0	0	0	295	0	0	0	23,845
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	0	−5	−52,745	47,668	4,149	851	11,003	14,229	702	16,736	−5,541	0	0	0	0	0	−295	0	3,392	0	−7,525
8.1	Power Generation	0	0	0	−1,212	0	0	−130	−1,082	0	0	−5,649	0	0	0	0	0	−295	0	3,392	0	−3,764
8.2	Gas Processing	0	−5	0	−128	0	0	0	0	0	−128	108	0	0	0	0	0	0	0	0	0	−25
8.3	Refineries	0	0	−52,745	49,008	4,149	851	11,132	15,311	702	16,864	0	0	0	0	0	0	0	0	0	0	−3,736
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	0	0	0	−736	0	0	0	0	0	−736	0	0	0	0	0	0	0	0	−303	0	−1,039
10.	Discrepancy	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	−31	0	−31
11.	Total Final Energy Consumption	0	0	0	12,084	1,079	77	445	0	0	10,484	108	0	0	0	0	0	0	0	3,058	0	15,251
12.	Industry Sector	0	0	0	6,760	0	77	0	0	0	6,683	46	0	0	0	0	0	0	0	1,294	0	8,100
13.	Transport Sector	0	0	0	5,075	1,079	0	445	0	0	3,552	0	0	0	0	0	0	0	0	0	0	5,075
14.	Other Sectors	0	0	0	0	0	0	0	0	0	0	62	0	0	0	0	0	0	0	1,765	0	1,827
14.1	Residential and Commercial	0	0	0	0	0	0	0	0	0	0	62	0	0	0	0	0	0	0	1,761	0	1,823
14.1.1	Commerce and Public Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14.1.2	Residential	0	0	0	0	0	0	0	0	0	0	62	0	0	0	0	0	0	0	1,761	0	1,823
14.2	Non-Specified Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	4
15.	Non-Energy Use	0	0	0	250	0	0	0	0	0	250	0	0	0	0	0	0	0	0	0	0	250
16.	Electricity Output (GWh)	0	0	6,680	0	0	0	0	0	0	0	31,138	0	0	0	0	0	1,624	0	0	0	39,442
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.
Note: Figures may not add up to total because of rounding.
APERC (APEC Energy Database).

Table 7.8.4 Singapore Energy Balance Table, 2007

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	104	0	0	0	104
2.	Imports	0	0	51,246	60,479	9,026	303	6,204	38,013	8	6,925	5,960	0	0	0	0	0	0	0	0	0	117,685
3.	Exports	0	0	–94	–62,448	–12,382	–1,077	–17,556	–18,352	–692	–12,388	0	0	0	0	0	0	0	0	0	0	–62,542
4.	International Bunkers	0	0	0	–31,546	0	0	0	–31,546	0	0	0	0	0	0	0	0	0	0	0	0	–31,546
5.	Stock Changes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6.	Total Primary Energy Supply	0	0	51,152	–33,515	–3,356	–774	–11,352	–11,886	–684	–5,463	5,960	0	0	0	0	0	104	0	0	0	23,701
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	0	0	–51,152	46,760	4,522	871	11,882	11,886	684	16,915	–5,849	0	0	0	0	0	–104	0	3,538	0	–6,809
8.1	Power Generation	0	0	0	–1,734	0	0	–46	–1,688	0	0	–5,960	0	0	0	0	0	–104	0	3,538	0	–4,261
8.2	Gas Processing	0	0	0	–128	0	0	0	0	0	–128	110	0	0	0	0	0	0	0	0	0	–18
8.3	Refineries	0	0	–51,152	48,622	4,522	871	11,928	13,574	684	17,043	0	0	0	0	0	0	0	0	0	0	–2,531
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	0	0	0	–717	0	0	0	0	0	–717	0	0	0	0	0	0	0	0	–319	0	–1,036
10.	Discrepancy	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–32	0	–32
11.	Total Final Energy Consumption	0	0	0	12,527	1,166	97	530	0	0	10,735	110	0	0	0	0	0	0	0	3,186	0	15,824
12.	Industry Sector	0	0	0	6,861	0	97	0	0	0	6,764	47	0	0	0	0	0	0	0	1,343	0	8,251
13.	Transport Sector	0	0	0	5,417	1,166	0	530	0	0	3,721	0	0	0	0	0	0	0	0	0	0	5,417
14.	Other Sectors	0	0	0	0	0	0	0	0	0	0	63	0	0	0	0	0	0	0	1,843	0	1,906
14.1	Residential and Commercial	0	0	0	0	0	0	0	0	0	0	63	0	0	0	0	0	0	0	1,839	0	1,902
14.1.1	Commerce and Public Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14.1.2	Residential	0	0	0	0	0	0	0	0	0	0	63	0	0	0	0	0	0	0	1,839	0	1,902
14.2	Non-Specified Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	4
15.	Non-Energy Use	0	0	0	250	0	0	0	0	0	250	0	0	0	0	0	0	0	0	0	0	250
16.	Electricity Output (GWh)	0	0	9,148	0	0	0	0	0	0	0	31,435	0	0	0	0	0	551	0	0	0	41,134
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

APERC (APEC Energy Database).

Table 7.8.5 Singapore Energy Balance Table, 2008

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	136	0	0	0	136
2.	Imports	0	0	50,271	72,760	10,392	303	8,724	44,646	6	8,688	6,167	0	0	0	0	0	0	0	0	0	129,198
3.	Exports	0	0	–70	–69,540	–14,105	–1,077	–19,876	–19,692	–653	–14,137	0	0	0	0	0	0	0	0	0	0	–69,610
4.	International Bunkers	0	0	0	–34,936	0	0	0	–34,936	0	0	0	0	0	0	0	0	0	0	0	0	–34,936
5.	Stock Changes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6.	Total Primary Energy Supply	0	0	50,201	–31,717	–3,713	–774	–11,152	–9,982	–646	–5,449	6,167	0	0	0	0	0	136	0	0	0	24,788
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	0	0	–50,201	45,221	4,892	872	11,687	9,982	646	17,141	–6,055	0	0	0	0	0	–136	0	3,588	0	–7,584
8.1	Power Generation	0	0	0	–1,522	0	0	–60	–1,462	0	0	–6,167	0	0	0	0	0	–136	0	3,588	0	–4,238
8.2	Gas Processing	0	0	0	–128	0	0	0	0	0	–128	113	0	0	0	0	0	0	0	0	0	–15
8.3	Refineries	0	0	–50,201	46,871	4,892	872	11,747	11,445	646	17,269	0	0	0	0	0	0	0	0	0	0	–3,331
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	0	0	0	–717	0	0	0	0	0	–717	0	0	0	0	0	0	0	0	–325	0	–1,042
10.	Discrepancy	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–33	0	–33
11.	Total Final Energy Consumption	0	0	0	12,787	1,180	98	535	0	0	10,975	113	0	0	0	0	0	0	0	3,230	0	16,129
12.	Industry Sector	0	0	0	7,043	0	98	0	0	0	6,946	48	0	0	0	0	0	0	0	1,332	0	8,423
13.	Transport Sector	0	0	0	5,494	1,180	0	535	0	0	3,780	0	0	0	0	0	0	0	0	0	0	5,494
14.	Other Sectors	0	0	0	0	0	0	0	0	0	0	64	0	0	0	0	0	0	0	1,898	0	1,963
14.1	Residential and Commercial	0	0	0	0	0	0	0	0	0	0	64	0	0	0	0	0	0	0	1,894	0	1,959
14.1.1	Commerce and Public Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14.1.2	Residential	0	0	0	0	0	0	0	0	0	0	64	0	0	0	0	0	0	0	1,894	0	1,959
14.2	Non-Specified Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	4
15.	Non-Energy Use	0	0	0	250	0	0	0	0	0	250	0	0	0	0	0	0	0	0	0	0	250
16.	Electricity Output (GWh)	0	0	8,114	0	0	0	0	0	0	0	32,877	0	0	0	0	0	726	0	0	0	41,717
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.
Note: Figures may not add up to total because of rounding.
APERC (APEC Energy Database).

Table 7.8.6 Singapore Energy Balance Table, 2009

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	121	0	0	0	121
2.	Imports	0	0	44,136	86,266	11,638	303	14,582	51,637	3	8,104	6,233	0	0	0	0	0	0	0	0	0	136,636
3.	Exports	0	0	–45	–73,550	–14,948	–1,077	–23,926	–21,008	–592	–11,997	0	0	0	0	0	0	0	0	0	0	–73,595
4.	International Bunkers	0	0	0	–36,387	0	0	0	–36,387	0	0	0	0	0	0	0	0	0	0	0	0	–36,387
5.	Stock Changes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6.	Total Primary Energy Supply	0	0	44,091	–23,670	–3,311	–774	–9,344	–5,758	–590	–3,894	6,233	0	0	0	0	0	121	0	0	0	26,775
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	0	0	–44,091	37,113	4,577	880	9,910	5,758	590	15,398	–6,120	0	0	0	0	0	–121	0	3,595	0	–9,625
8.1	Power Generation	0	0	0	–1,499	0	0	–53	–1,446	0	0	–6,233	0	0	0	0	0	–121	0	3,595	0	–4,259
8.2	Gas Processing	0	0	0	–128	0	0	0	0	0	–128	113	0	0	0	0	0	0	0	0	0	–15
8.3	Refineries	0	0	–44,091	38,740	4,577	880	9,964	7,204	590	15,526	0	0	0	0	0	0	0	0	0	0	–5,351
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	0	0	0	–672	0	0	0	0	0	–672	0	0	0	0	0	0	0	0	–329	0	–1,001
10.	Discrepancy	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–36	0	–36
11.	Total Final Energy Consumption	0	0	0	12,771	1,266	105	566	0	0	10,833	113	0	0	0	0	0	0	0	3,230	0	16,114
12.	Industry Sector	0	0	0	6,943	0	105	0	0	0	6,837	48	0	0	0	0	0	0	0	1,172	0	8,163
13.	Transport Sector	0	0	0	5,578	1,266	0	566	0	0	3,746	0	0	0	0	0	0	0	0	0	0	5,578
14.	Other Sectors	0	0	0	0	0	0	0	0	0	0	65	0	0	0	0	0	0	0	2,058	0	2,123
14.1	Residential and Commercial	0	0	0	0	0	0	0	0	0	0	65	0	0	0	0	0	0	0	2,053	0	2,118
14.1.1	Commerce and Public Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14.1.2	Residential	0	0	0	0	0	0	0	0	0	0	65	0	0	0	0	0	0	0	2,053	0	2,118
14.2	Non-Specified Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	4
15.	Non-Energy Use	0	0	0	250	0	0	0	0	0	250	0	0	0	0	0	0	0	0	0	0	250
16.	Electricity Output (GWh)	0	0	7,979	0	0	0	0	0	0	0	33,176	0	0	0	0	0	645	0	0	0	41,801
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

APERC (APEC Energy Database).

Table 7.8.7 Singapore Summary Table, 1990–2009

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Indigenous Production (ktoe)																				
Coal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Oil	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hydro	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Geothermal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Solar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wind	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Biomass	19	19	34	54	53	50	55	61	64	66	101	104	147	123	44	194	295	104	136	121
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	19	19	34	54	53	50	55	61	64	66	101	104	147	123	44	194	295	104	136	121
Primary Energy Supply (ktoe)																				
Coal	0	−116	−55	−40	3	0	−2	1	0	0	0	0	7	8	6	1	5	0	0	0
Oil	9,878	11,961	14,602	15,485	10,714	13,977	19,417	22,200	18,965	19,733	19,378	20,181	19,534	16,618	15,872	17,562	17,897	17,637	18,485	20,421
Gas	0	0	353	948	1,129	1,176	1,049	1,034	1,132	922	942	1,511	2,326	3,285	4,662	5,234	5,649	5,960	6,167	6,233
Hydro	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Geothermal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Solar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wind	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Biomass	19	19	34	54	53	50	55	61	64	66	101	104	147	123	44	194	295	104	136	121
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	9,896	11,865	14,934	16,447	11,898	15,203	20,519	23,296	20,160	20,722	20,421	21,797	22,014	20,035	20,584	22,991	23,845	23,701	24,788	26,775
Final Energy Consumption by Sector (ktoe)																				
Industry	1,907	1,835	1,776	1,961	2,120	2,589	2,907	3,563	4,115	3,922	3,514	3,914	5,229	5,409	6,861	8,058	8,100	8,251	8,423	8,163
Transport	2,368	2,485	2,653	3,188	3,715	3,680	3,815	3,732	3,585	3,796	4,159	4,079	4,196	4,251	4,480	4,726	5,075	5,417	5,494	5,578
Residential	763	798	849	917	895	980	1,063	1,186	1,298	1,350	1,441	1,504	1,592	1,588	1,624	1,707	1,823	1,902	1,959	2,118
Commercial	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Others	284	269	228	233	236	228	252	252	252	252	253	253	253	253	253	253	253	254	254	254
Total	5,322	5,387	5,507	6,299	6,967	7,477	8,037	8,733	9,251	9,321	9,367	9,750	11,270	11,501	13,218	14,744	15,251	15,824	16,129	16,114

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Table 7.8.7 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Final Energy Consumption by Type (ktoe)																				
Coal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Oil	4,046	4,022	4,071	4,742	5,260	5,653	6,064	6,521	6,910	6,880	6,757	7,098	8,489	8,644	10,261	11,688	12,084	12,527	12,787	12,771
Gas	55	67	65	78	81	84	89	94	98	101	105	106	107	106	104	96	108	110	113	113
Electricity	1,221	1,298	1,372	1,479	1,626	1,741	1,884	2,118	2,243	2,340	2,505	2,545	2,674	2,751	2,853	2,960	3,058	3,186	3,230	3,230
Heat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Biomass	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	5,322	5,387	5,507	6,299	6,967	7,477	8,037	8,733	9,251	9,321	9,367	9,750	11,270	11,501	13,218	14,744	15,251	15,824	16,129	16,114
Power Generation (GWh)																				
Thermal	15,398	16,374	17,283	19,141	20,849	22,241	24,100	26,188	27,685	28,690	30,566	33,089	34,665	34,300	35,623	37,177	37,818	40,583	40,991	41,155
Hydro	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Geothermal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Solar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wind	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Others	220	223	391	0	0	0	0	710	739	0	0	0	0	0	225	1,037	1,624	551	726	645
Total	15,618	16,597	17,674	19,141	20,849	22,241	24,100	26,898	28,424	28,690	30,566	33,089	34,665	34,300	35,848	38,214	39,442	41,134	41,717	41,801
Loss and Own Use of Electricity (GWh)																				
Transmission and Distribution Losses	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Own Use	–	–	–	–	–	–	–	–	–	–	–	–	–	–	2,676	3,452	3,520	3,714	3,777	3,826
Total	–	–	–	–	–	–	–	–	–	–	–	–	–	–	2,676	3,452	3,520	3,714	3,777	3,826
Fuel Input for Power Generation (ktoe)																				
Coal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Oil	3,388	3,821	3,450	3,041	3,170	3,460	3,952	4,326	4,535	5,143	5,563	5,097	4,036	2,803	2,426	1,724	1,212	1,734	1,522	1,499
Gas	0	0	353	948	1,129	1,176	1,049	1,034	1,132	922	942	1,511	2,306	3,285	4,662	5,234	5,649	5,960	6,167	6,233
Total	3,388	3,821	3,803	3,989	4,299	4,636	5,001	5,360	5,667	6,065	6,505	6,608	6,342	6,088	7,088	6,958	6,861	7,694	7,689	7,733
CO_2 Emissions (kt C)																				
Coal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Oil	6,507	6,915	6,694	6,944	7,524	8,064	8,864	9,580	10,053	10,481	10,712	10,578	10,800	9,844	10,888	11,570	11,415	12,229	12,257	12,185
Gas	28	35	260	647	766	796	718	712	776	642	656	1,022	1,532	2,158	3,053	3,401	3,688	3,888	4,023	4,065
Total	6,536	6,950	6,954	7,591	8,290	8,860	9,582	10,293	10,829	11,123	11,368	11,599	12,332	12,002	13,941	14,971	15,103	16,117	16,279	16,251

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Table 7.8.7 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Macroeconomic Indicators																				
Population (thousand)	3,047	3,135	3,231	3,314	3,419	3,525	3,671	3,796	3,927	3,959	4,028	4,138	4,176	4,115	4,167	4,266	4,401	4,589	4,839	4,988
Urban Population, %	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
GDP (constant 2000 $ million)	47,983	51,095	54,687	60,965	67,412	72,318	77,916	84,581	82,798	87,943	95,923	94,752	98,769	103,311	112,853	121,185	131,732	143,291	145,422	144,302
GDP (current $ million)	36,093	43,066	49,043	59,984	69,231	80,789	94,689	104,562	95,824	85,964	95,923	91,148	90,583	93,363	109,336	123,507	138,730	168,197	177,792	188,479
GDP (constant 2005 PPP $ million)	76,638	81,609	87,347	97,374	107,671	115,507	124,448	135,093	132,246	140,463	153,208	151,339	157,755	165,009	180,250	193,557	210,403	228,865	232,269	230,480
GDP/capita (constant 2000 $)	15,748	16,298	16,927	18,399	19,717	20,519	21,226	22,282	21,083	22,215	23,815	22,898	23,652	25,107	27,085	28,409	29,930	31,228	30,050	28,932
GDP/capita (current $)	11,845	13,737	15,180	18,103	20,249	22,922	25,796	27,545	24,400	21,715	23,815	22,027	21,691	22,690	26,241	28,953	31,519	36,655	36,738	37,790
GDP – Manufacturing (% of GDP)	24.6	24.4	23.3	22.9	23.4	24.0	22.9	22.0	22.3	23.7	25.0	22.4	23.3	22.9	23.9	24.4	25.1	24.4	23.1	22.3
Car Ownership (car/1,000 persons)	140	135	134	137	139	142	138	138	132	140	139	140	128	140	142	144	149	154	155	156
Basic Energy Indicators																				
TPES/capita (toe/person)	3.25	3.78	4.62	4.96	3.48	4.31	5.59	6.14	5.13	5.23	5.07	5.27	5.27	4.87	4.94	5.39	5.42	5.17	5.12	5.37
TFEC/capita (toe/person)	1.75	1.72	1.70	1.90	2.04	2.12	2.19	2.30	2.36	2.35	2.33	2.36	2.70	2.79	3.17	3.46	3.46	3.45	3.33	3.23
TPES/GDP (toe/constant 2000 $ million)	206	232	273	270	177	210	263	275	243	236	213	230	223	194	182	190	181	165	170	186
TFEC/GDP (toe/constant 2000 $ million)	111	105	101	103	103	103	103	103	112	106	98	103	114	111	117	122	116	110	111	112
Import Dependency (%)	99.8	99.8	99.8	99.7	99.6	99.7	99.7	99.7	99.7	99.7	99.5	99.5	99.3	99.4	99.8	99.2	98.8	99.6	99.5	99.5
Oil Import Dependency (%)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Electricity/capita (kWh/ person)	4,659	4,814	4,937	5,190	5,529	5,744	5,969	6,489	6,642	6,876	7,234	7,154	7,446	7,775	7,962	8,071	8,081	8,075	7,762	7,531
CO_2 Intensity (t C/constant 2000 $ million)	136	136	127	125	123	123	123	122	131	126	119	122	125	116	124	124	115	112	112	113
CO_2/capita (t C)	2.14	2.22	2.15	2.29	2.42	2.51	2.61	2.71	2.76	2.81	2.82	2.80	2.95	2.92	3.35	3.51	3.43	3.51	3.36	3.26
CO_2/TPES (t C/toe)	0.66	0.59	0.47	0.46	0.70	0.58	0.47	0.44	0.54	0.54	0.56	0.53	0.56	0.60	0.68	0.65	0.63	0.68	0.66	0.61

– = no data or not applicable, CO_2 = carbon dioxide, GDP = gross domestic product, GWh = gigawatt–hour, kt C = thousand tons of carbon equivalent, ktoe = thousand tons of oil equivalent, kWh = kilowatt–hour, PPP = purchasing power parity, t C = ton of carbon equivalent, TFEC = total final energy consumption, toe = ton of oil equivalent, TPES = total primary energy supply.

Note: Figures may not add up to total because of rounding.

Sources: APERC (APEC Energy Database), APERC estimates, JAMA (2012), and World Bank.

7.9 Thailand

Country Profile (2009)		Energy Reserves (year-end 2008)	
Total Surface Area (square kilometer)	513,120	Coal (million ton) - Recoverable	1,239.0
Population (thousand)	68,706	Gas (trillion cubic feet) - Proven	12.0
GDP (constant 2000 $ billion)	173.9	Oil (billion barrel) - Proven	453.0
Electrification Rate (%)	99.3		

GDP = gross domestic product.

Sources: ADB (2012), IEA (2011c), World Bank, and WEC (2010).

2009 Energy Supply and Demand Flow (ktoe)

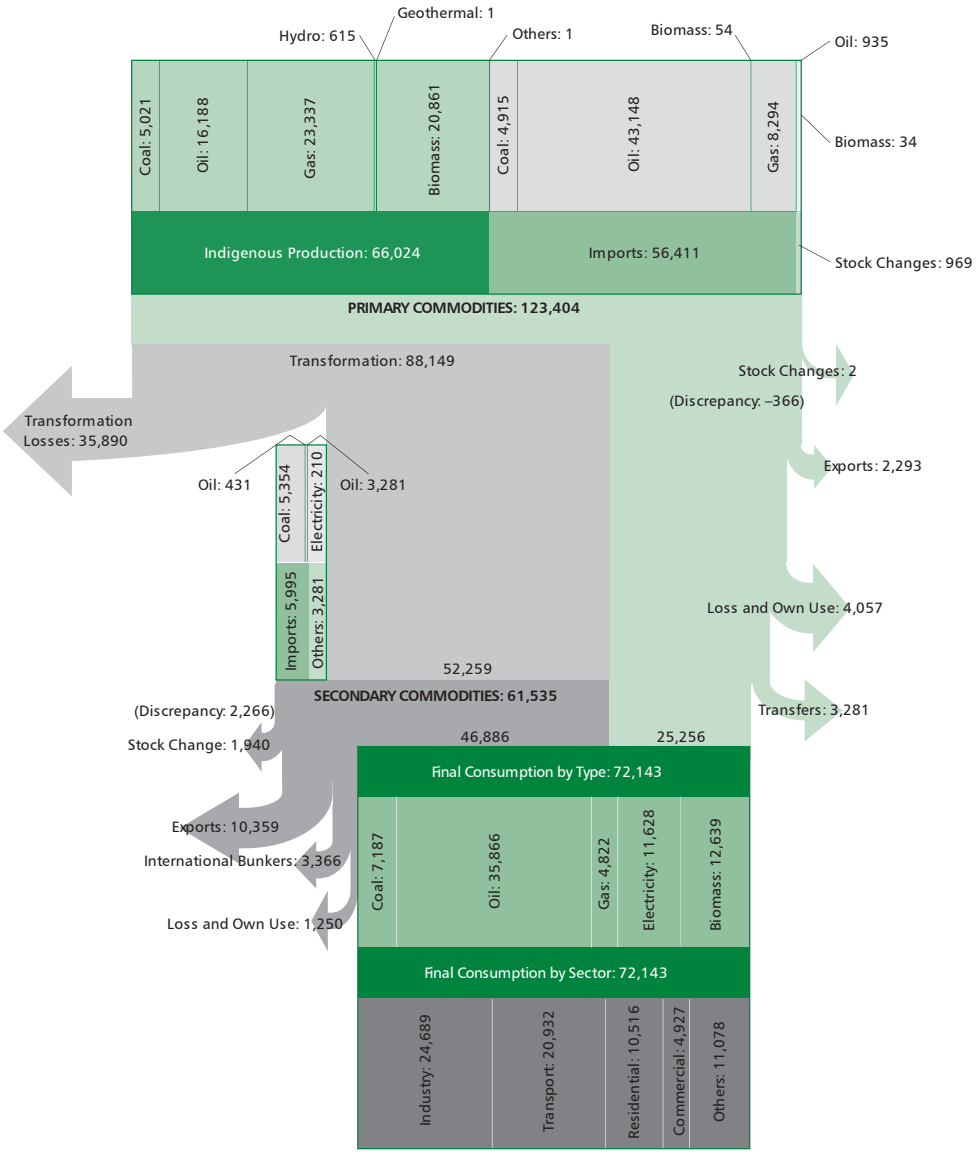


Table 7.9.1 Key Data and Economic Profile

	1990	1995	2000	2005	2009
Socioeconomic Data					
Population (thousand)	57,072	59,650	63,155	66,698	68,706
GDP (constant 2000 $ billion)	79.4	120.0	122.7	157.4	173.9
GDP (constant 2005 PPP $ billion)	224.5	339.5	347.2	445.2	491.9
GDP/capita (constant 2000 $)	1,391	2,012	1,943	2,360	2,531
GDP/capita (constant 2005 PPP $)	3,933	5,691	5,497	6,675	7,160

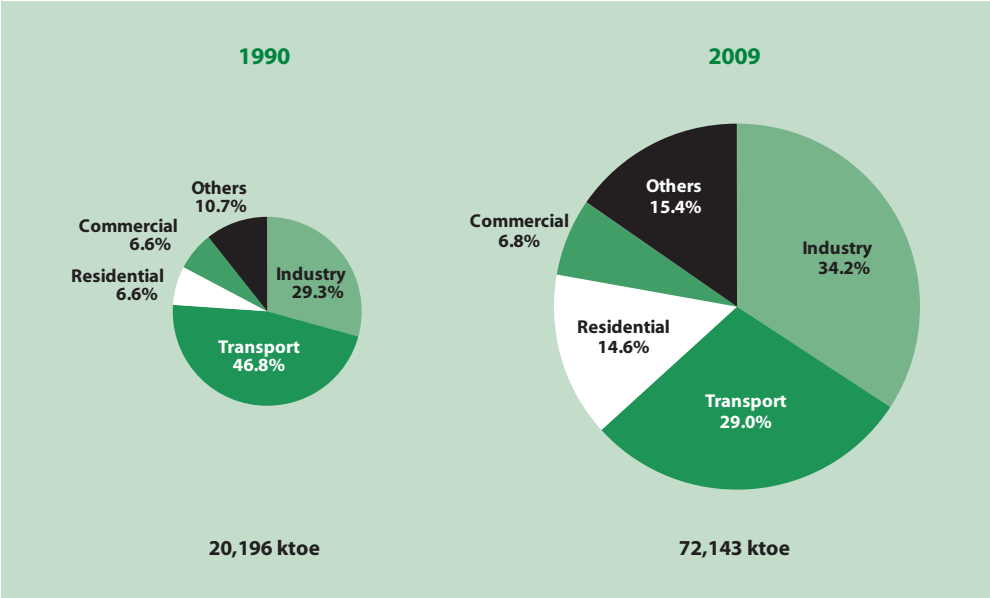
GDP = gross domestic product, PPP = purchasing power parity.
Source: World Bank.

Table 7.9.2 Energy Supply and Demand

	1990	1995	2000	2005	2009
Primary Energy Supply (ktoe)					
Indigenous Production	11,854	18,485	28,559	50,178	66,024
Net Imports	16,064	30,580	31,813	44,036	45,416
Total PES	27,918	49,065	60,372	94,214	111,440
Coal	3,828	7,064	7,838	10,680	14,444
Oil	17,898	31,537	32,156	42,857	43,754
Gas	5,710	9,833	19,620	22,788	31,631
Biomass	0	0	0	17,064	20,919
Others	482	632	758	825	692
TPES/capita (toe)	0.49	0.82	0.96	1.41	1.62
TPES/GDP (toe/constant 2005 PPP $ million)	124	145	174	212	227
Final Energy Consumption (ktoe)					
Industry	5,917	11,944	12,833	23,314	24,689
Transportation	9,452	16,167	15,945	20,247	20,932
Other Sectors	4,828	6,856	9,897	19,793	26,521
Total FEC	20,196	34,968	38,675	63,353	72,143
Coal	1,357	3,658	3,660	6,827	7,187
Oil	15,276	24,397	26,064	32,997	35,866
Gas	267	787	1,389	2,067	4,822
Electricity	3,297	6,125	7,562	10,387	11,628
Biomass	0	0	0	11,075	12,639
Others	0	0	0	0	0

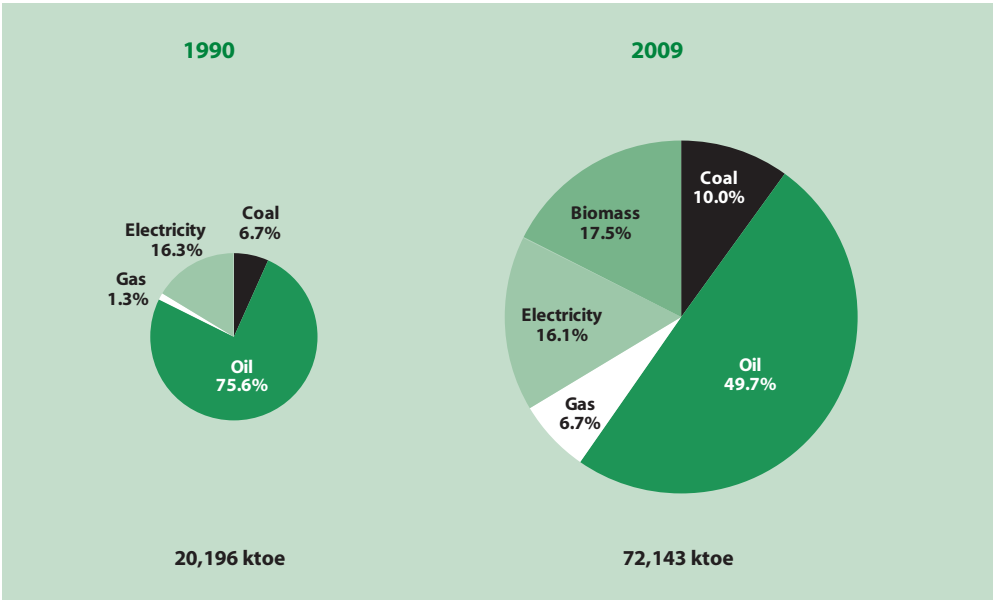
FEC = final energy consumption, GDP = gross domestic product, ktoe = thousand tons of oil equivalent, PES = primary energy supply, PPP = purchasing power parity, toe = ton of oil equivalent, TPES = total primary energy supply.
Source: APERC (APEC Energy Database).

Figure 7.9.1 Final Energy Consumption by Sector, 1990 and 2009



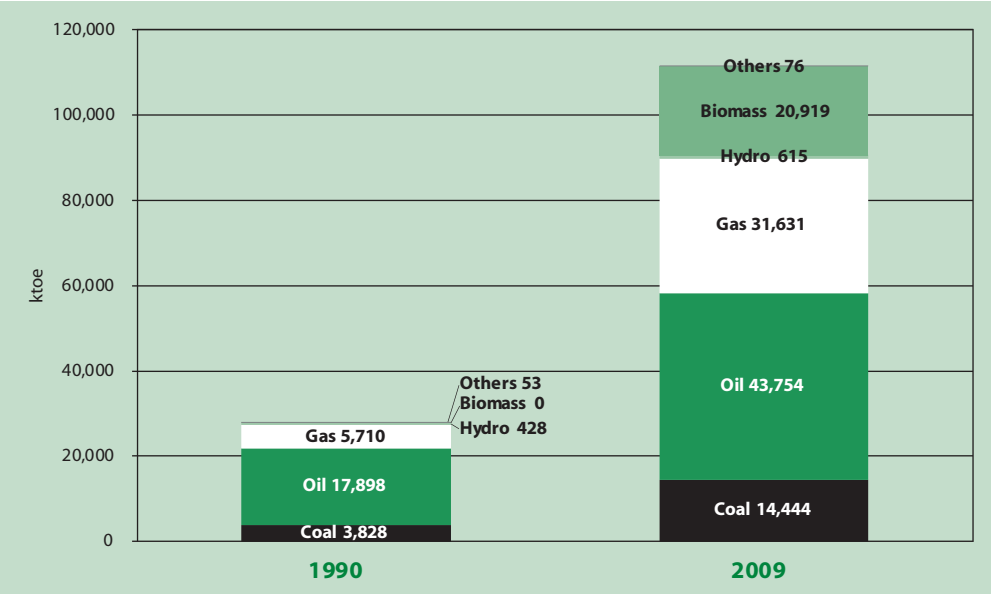
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 7.9.2 Final Energy Consumption by Type of Energy, 1990 and 2009



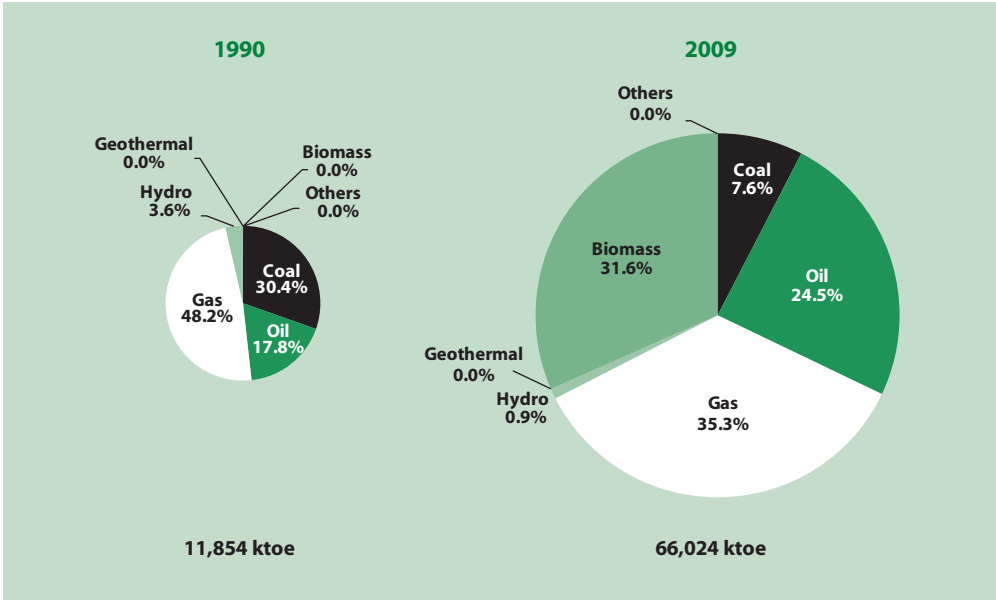
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 7.9.3 Total Primary Energy Supply, 1990 and 2009



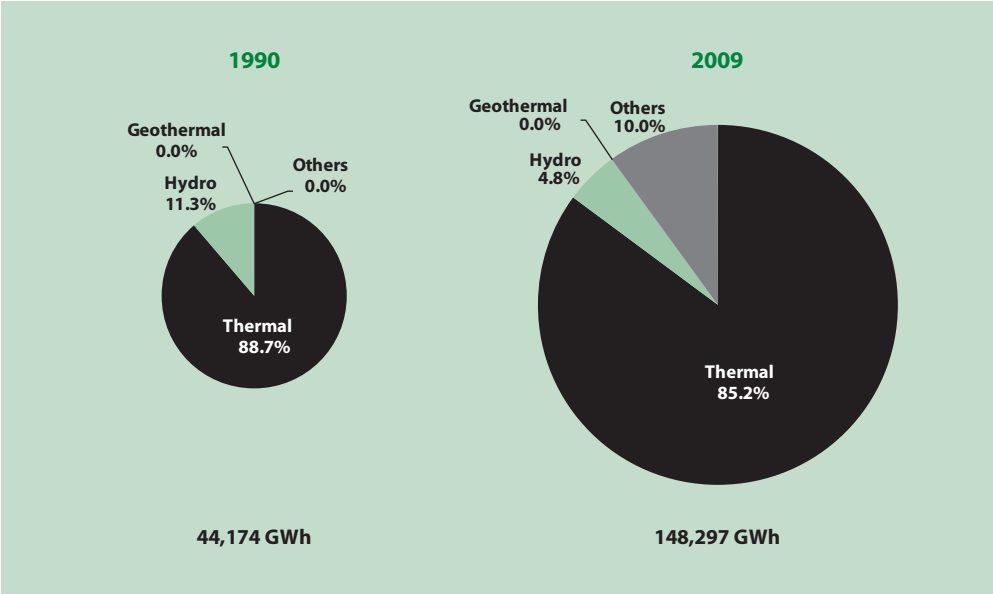
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 7.9.4 Indigenous Energy Production, 1990 and 2009



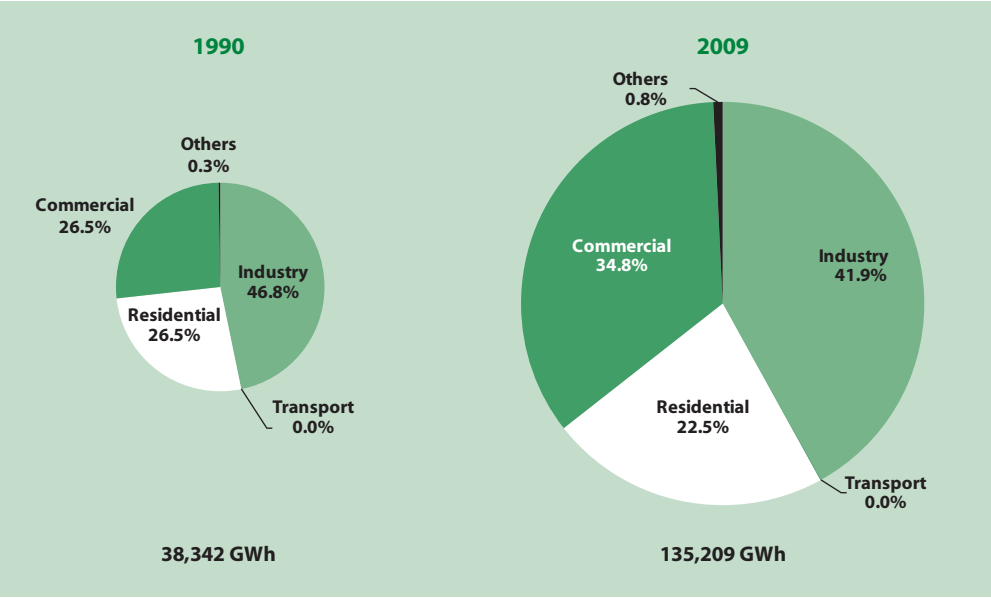
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 7.9.5 Electricity Generation by Plant Type, 1990 and 2009



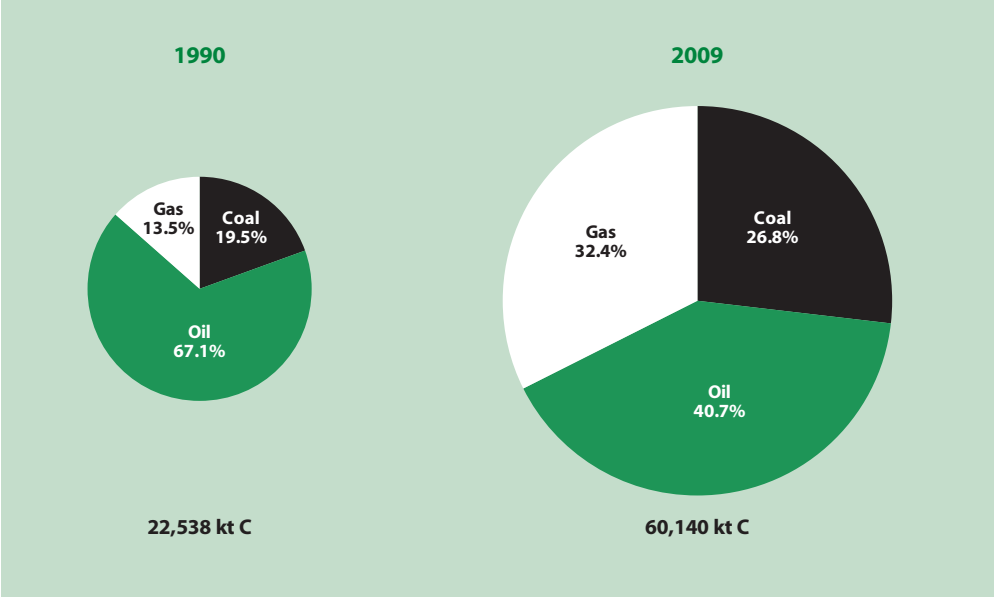
GWh = gigawatt-hour.
Source: APERC (APEC Energy Database).

Figure 7.9.6 Electricity Consumption by Sector, 1990 and 2009



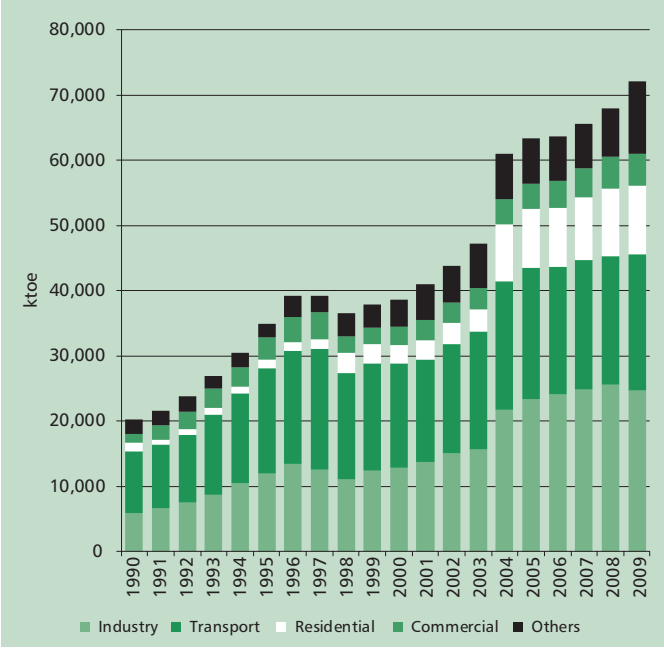
GWh = gigawatt-hour.
Source: APERC (APEC Energy Database).

Figure 7.9.7 Carbon Dioxide Emissions from Fuel Combustion, 1990 and 2009



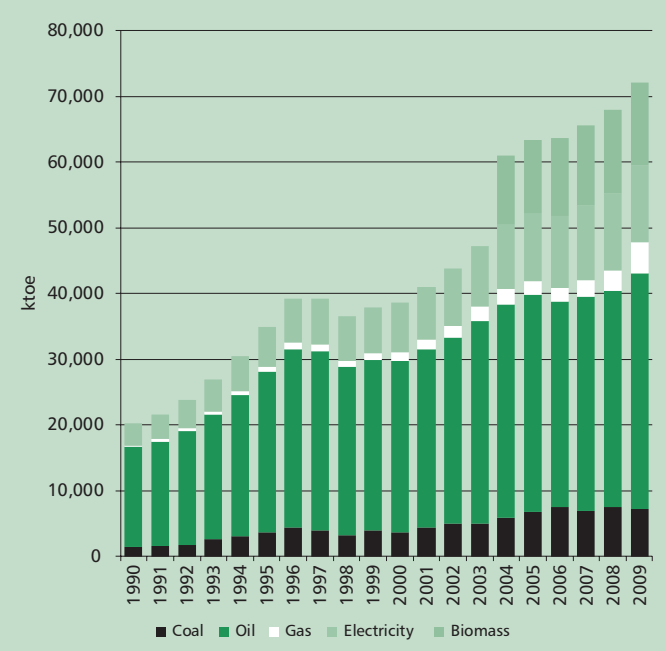
kt C = thousand tons of carbon equivalent.
Source: APERC estimates.

Figure 7.9.8 Final Energy Consumption by Sector, 1990–2009



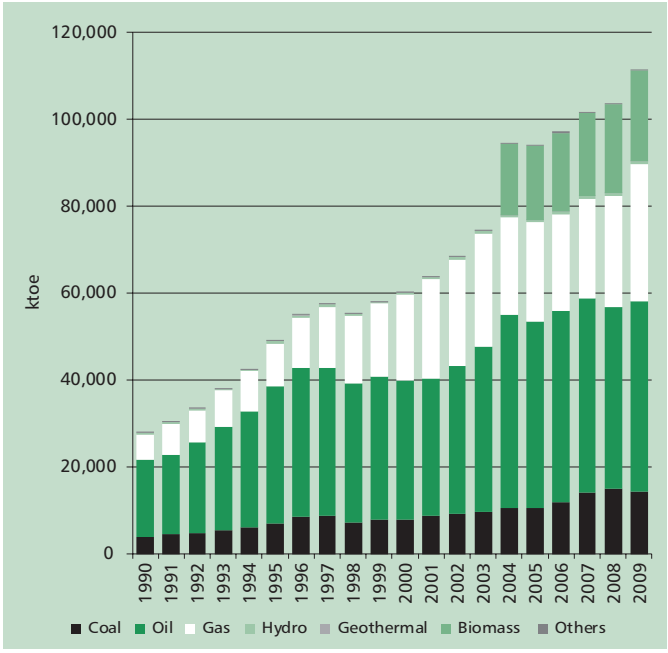
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 7.9.9 Final Energy Consumption by Type, 1990–2009



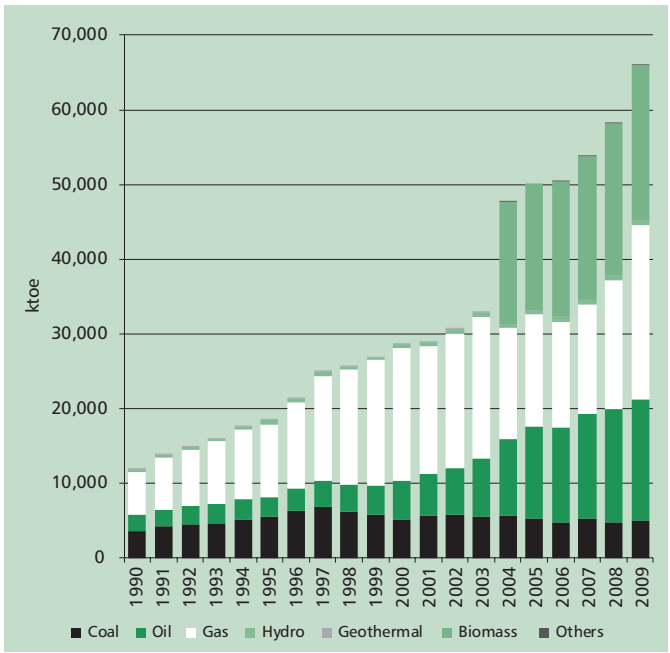
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 7.9.10 Total Primary Energy Supply, 1990–2009



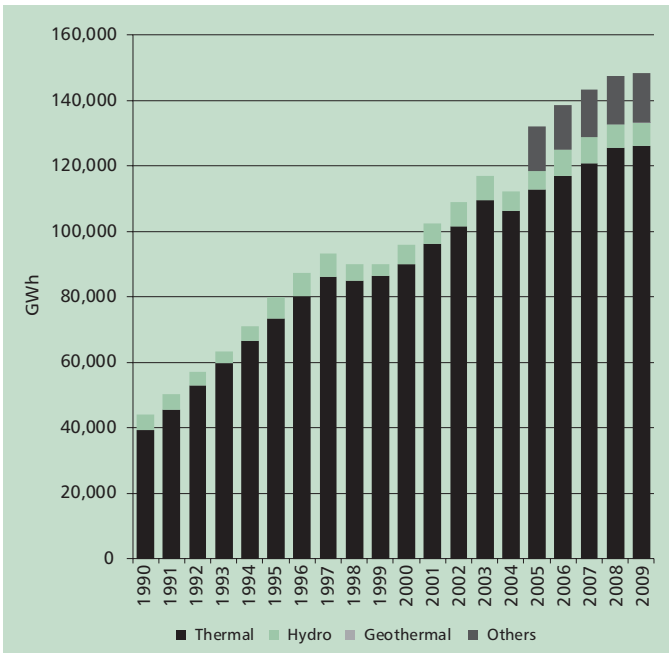
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 7.9.11 Indigenous Energy Production, 1990–2009



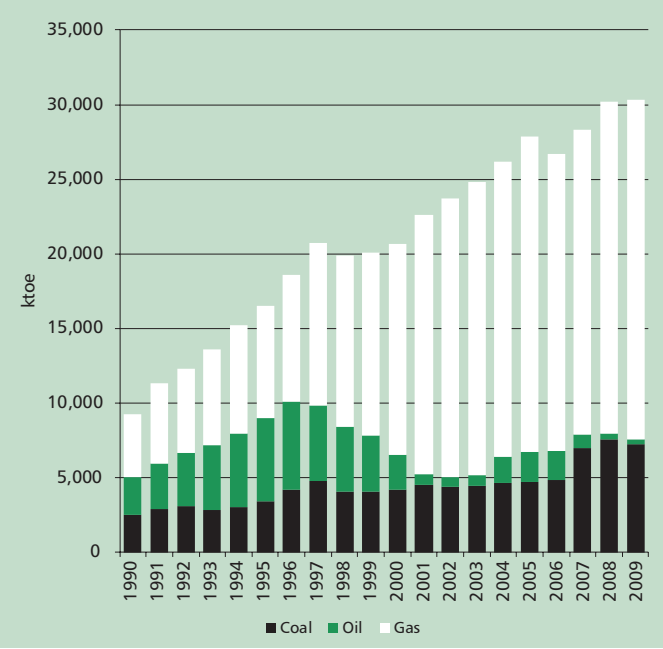
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 7.9.12 Electricity Generation by Source, 1990–2009



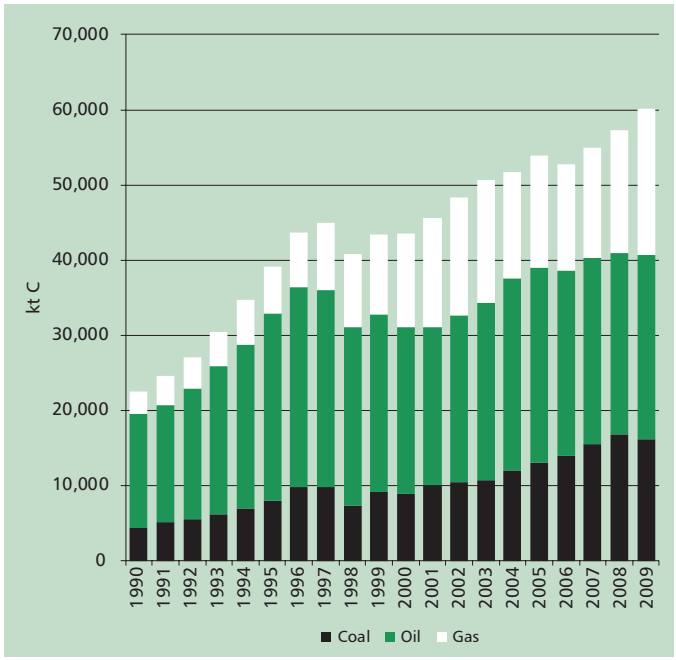
GWh = gigawatt-hour.
Source: APERC (APEC Energy Database).

Figure 7.9.13 Fuel Input for Electricity Generation, 1990–2009



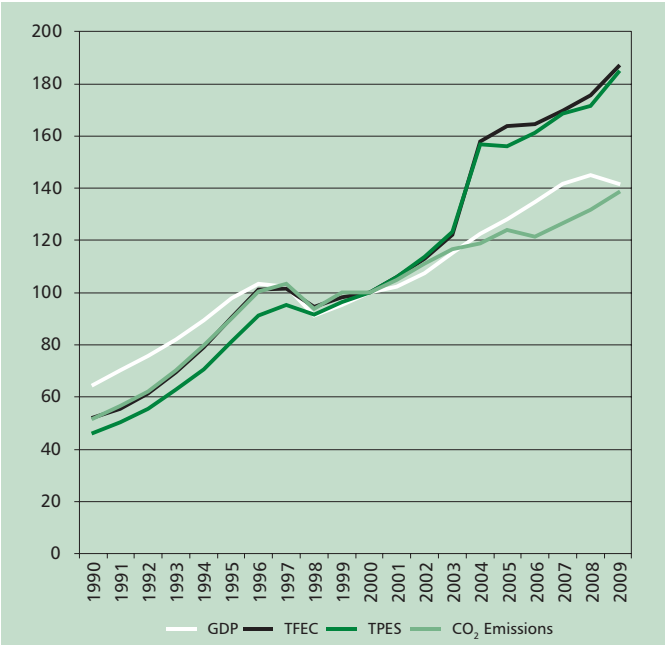
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 7.9.14 Carbon Dioxide Emissions from Fuel Combustion, 1990–2009



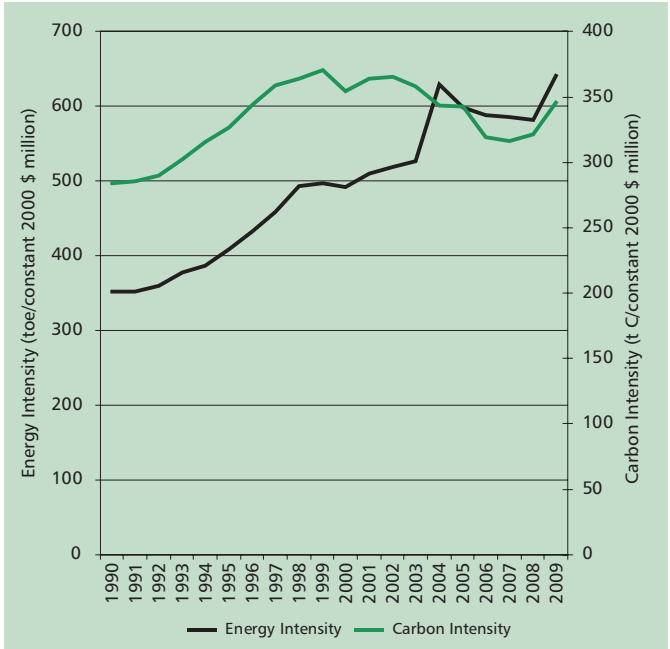
kt C = thousand tons of carbon equivalent.
Source: APERC estimates.

Figure 7.9.15 Growth of GDP, TFEC, TPES, and CO_2 (indexed to year 2000), 1990–2009



CO_2 = carbon dioxide, GDP = gross domestic product, TFEC = total final energy consumption, TPES = total primary energy supply.
Note: Indices are measured relative to the base year 2000 (2000 = 100).
Source: APERC estimates.

Figure 7.9.16 Energy and Carbon Intensities, 1990–2009



t C = ton of carbon equivalent, toe = ton of oil equivalent.
Source: APERC estimates.

Table 7.9.3 Thailand Energy Balance Table, 2006

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	4,750	0	12,736	0	0	0	0	0	0	0	14,144	699	0	2	0	0	18,053	0	0	0	50,383
2.	Imports	4,005	3,092	41,773	1,382	0	0	315	1,040	0	28	7,952	0	0	0	0	0	23	0	444	0	58,672
3.	Exports	0	0	–3,349	–6,836	–1,432	–31	–2,534	–1,336	–672	–831	0	0	0	0	0	0	–3	0	–65	0	–10,253
4.	International Bunkers	0	0	0	–3,444	0	0	0	0	0	–3,444	0	0	0	0	0	0	0	0	0	0	–3,444
5.	Stock Changes	0	0	2,414	–490	34	–908	733	–132	–135	–82	0	0	0	0	0	0	0	0	0	0	1,924
6.	Total Primary Energy Supply	8,755	3,092	53,574	–9,388	–1,398	–939	–1,486	–427	–808	–4,329	22,097	699	0	2	0	0	18,073	0	379	0	97,283
7.	Transfers	0	0	–2,453	2,453	0	0	0	0	2,453	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	–4,816	0	–48,094	35,493	6,773	958	17,286	4,049	1,849	4,578	–19,946	–699	0	–2	0	0	–6,256	0	11,932	0	–32,387
8.1	Power Generation	–4,816	0	0	–1,946	0	0	–35	–1,911	0	0	–19,946	–699	0	–2	0	0	–1,207	0	11,932	0	–16,683
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	–48,094	37,439	6,773	958	17,322	5,959	1,849	4,578	0	0	0	0	0	0	0	0	0	0	–10,655
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–5,049	0	0	0	–5,049
9.	Loss and Own Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–1,360	0	–1,360
10.	Discrepancy	769	–231	–227	–166	3	1	1	–1	–168	–3	0	0	0	0	0	0	7	0	0	0	152
11.	Total Final Energy Consumption	4,709	2,861	2,801	28,392	5,378	19	15,801	3,621	3,327	246	2,151	0	0	0	0	0	11,823	0	10,951	0	63,687
12.	Industry Sector	4,709	2,861	0	3,027	30	11	777	2,035	175	0	2,071	0	0	0	0	0	6,352	0	5,061	0	24,080
13.	Transport Sector	0	0	0	19,451	5,296	0	11,795	1,579	535	246	80	0	0	0	0	0	0	0	5	0	19,535
14.	Other Sectors	0	0	0	5,306	53	8	3,230	7	2,009	0	0	0	0	0	0	0	5,471	0	5,886	0	16,663
14.1	Residential and Commercial	0	0	0	2,016	0	8	0	2	2,006	0	0	0	0	0	0	0	5,471	0	5,808	0	13,296
14.1.1	Commerce and Public Services	0	0	0	705	0	1	0	2	703	0	0	0	0	0	0	0	0	0	3,486	0	4,191
14.1.2	Residential	0	0	0	1,311	0	7	0	0	1,304	0	0	0	0	0	0	0	5,471	0	2,322	0	9,104
14.2	Non-Specified Others	0	0	0	3,290	53	0	3,230	5	3	0	0	0	0	0	0	0	0	0	77	0	3,367
15.	Non-Energy Use	0	0	2,801	608	0	0	0	0	608	0	0	0	0	0	0	0	0	0	0	0	3,409
16.	Electricity Output (GWh)	22,051	0	8,493	0	0	0	0	0	0	0	86,339	8,125	0	0	0	0	13,732	0	0	0	138,740
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.
Note: Figures may not add up to total because of rounding.
Source: APERC (APEC Energy Database).

Table 7.9.4 Thailand Energy Balance Table, 2007

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	5,204	0	14,069	0	0	0	0	0	0	0	14,611	698	0	2	0	0	19,153	0	0	0	53,736
2.	Imports	5,026	4,004	40,217	825	121	0	165	504	0	35	8,314	0	0	0	0	0	23	0	386	0	58,795
3.	Exports	0	0	–2,724	–6,552	–1,176	–34	–2,319	–2,332	–324	–367	0	0	0	0	0	0	–3	0	–80	0	–9,359
4.	International Bunkers	0	0	0	–3,778	0	0	0	0	0	–3,778	0	0	0	0	0	0	0	0	0	0	–3,778
5.	Stock Changes	0	0	3,221	–768	–38	–69	–142	–253	–277	12	0	0	0	0	0	0	0	0	0	0	2,454
6.	Total Primary Energy Supply	10,230	4,004	54,783	–10,273	–1,094	–103	–2,296	–2,081	–601	–4,098	22,925	698	0	2	0	0	19,173	0	307	0	101,848
7.	Transfers	0	0	–3,061	3,061	0	0	0	0	3,061	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	–6,850	–98	–48,197	36,391	6,484	120	18,398	5,214	1,824	4,351	–20,428	–698	0	–2	0	0	–6,919	0	12,331	0	–34,470
8.1	Power Generation	–6,850	–98	0	–908	0	0	–21	–888	0	0	–20,428	–698	0	–2	0	0	–1,480	0	12,331	0	–18,133
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	–48,197	37,299	6,484	120	18,419	6,102	1,824	4,351	0	0	0	0	0	0	0	0	0	0	–10,898
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–5,440	0	0	0	–5,440
9.	Loss and Own Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–1,224	0	–1,224
10.	Discrepancy	–285	–83	–181	77	78	0	0	0	–1	0	0	0	0	0	0	0	–91	0	0	0	–562
11.	Total Final Energy Consumption	3,095	3,824	3,345	29,255	5,468	16	16,102	3,133	4,283	253	2,497	0	0	0	0	0	12,163	0	11,413	0	65,591
12.	Industry Sector	3,095	3,824	0	3,981	16	9	976	1,562	1,417	0	2,296	0	0	0	0	0	6,404	0	5,220	0	24,819
13.	Transport Sector	0	0	0	19,645	5,396	0	11,763	1,565	667	253	200	0	0	0	0	0	0	0	12	0	19,858
14.	Other Sectors	0	0	0	5,630	56	7	3,362	6	2,199	0	0	0	0	0	0	0	5,759	0	6,181	0	17,569
14.1	Residential and Commercial	0	0	0	2,205	0	7	0	2	2,196	0	0	0	0	0	0	0	5,759	0	6,098	0	14,062
14.1.1	Commerce and Public Services	0	0	0	771	0	0	0	2	769	0	0	0	0	0	0	0	0	0	3,686	0	4,457
14.1.2	Residential	0	0	0	1,435	0	7	0	0	1,427	0	0	0	0	0	0	0	5,759	0	2,412	0	9,605
14.2	Non-Specified Others	0	0	0	3,424	56	0	3,362	4	3	0	0	0	0	0	0	0	0	0	83	0	3,507
15.	Non-Energy Use	0	0	3,345	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3,345
16.	Electricity Output (GWh)	28,716	0	3,820	0	0	0	0	0	0	0	88,166	8,114	0	0	0	0	14,560	0	0	0	143,376
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Source: APERC (APEC Energy Database).

Table 7.9.5 Thailand Energy Balance Table, 2008

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	4,787	0	15,182	0	0	0	0	0	0	0	17,236	612	0	1	0	0	20,401	0	0	0	58,218
2.	Imports	4,781	5,338	40,893	366	0	0	78	241	8	40	8,261	0	0	0	0	0	43	0	240	0	59,922
3.	Exports	0	47	–2,520	–9,071	–1,112	–90	–3,291	–3,443	–25	–1,111	0	0	0	0	0	0	–63	0	–101	0	–11,709
4.	International Bunkers	0	0	0	–3,574	0	0	0	0	0	–3,574	0	0	0	0	0	0	0	0	0	0	–3,574
5.	Stock Changes	0	0	0	711	–38	63	137	282	280	–12	0	0	0	0	0	0	0	0	0	0	711
6.	Total Primary Energy Supply	9,568	5,385	53,555	–11,568	–1,149	–27	–3,077	–2,919	263	–4,658	25,497	612	0	1	0	0	20,381	0	138	0	103,569
7.	Transfers	0	0	–3,228	3,228	0	0	0	0	3,228	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	–7,522	–14	–49,565	38,003	6,354	160	18,395	6,213	1,929	4,952	–22,293	–612	0	–1	0	0	–7,777	0	12,679	0	–37,102
8.1	Power Generation	–7,522	–14	0	–387	0	0	–40	–348	0	0	–22,293	–612	0	–1	0	0	–1,707	0	12,679	0	–19,857
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	–49,565	38,678	6,354	160	18,435	6,560	2,216	4,952	0	0	0	0	0	0	0	0	0	0	–10,887
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	–287	0	0	0	0	–287	0	0	0	0	0	0	0	–6,070	0	0	0	–6,357
9.	Loss and Own Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–1,209	0	–1,209
10.	Discrepancy	136	–95	2,362	122	152	673	–82	–198	–379	–45	0	0	0	0	0	0	174	0	0	0	2,700
11.	Total Final Energy Consumption	2,182	5,277	3,125	29,785	5,357	807	15,236	3,096	5,040	249	3,204	0	0	0	0	0	12,779	0	11,608	0	67,959
12.	Industry Sector	2,182	5,277	0	3,880	22	494	977	1,484	904	0	2,540	0	0	0	0	0	6,816	0	4,898	0	25,593
13.	Transport Sector	0	0	0	19,011	5,285	0	10,882	1,608	986	249	664	0	0	0	0	0	0	0	5	0	19,680
14.	Other Sectors	0	0	0	6,172	50	313	3,377	4	2,428	0	0	0	0	0	0	0	5,962	0	6,705	0	18,839
14.1	Residential and Commercial	0	0	0	2,739	0	313	0	1	2,426	0	0	0	0	0	0	0	5,962	0	6,617	0	15,319
14.1.1	Commerce and Public Services	0	0	0	810	0	0	0	1	809	0	0	0	0	0	0	0	0	0	4,142	0	4,952
14.1.2	Residential	0	0	0	1,930	0	313	0	0	1,617	0	0	0	0	0	0	0	5,962	0	2,476	0	10,367
14.2	Non-Specified Others	0	0	0	3,433	50	0	3,377	3	3	0	0	0	0	0	0	0	0	0	87	0	3,520
15.	Non-Energy Use	0	0	3,125	722	0	0	0	0	722	0	0	0	0	0	0	0	0	0	0	0	3,846
16.	Electricity Output (GWh)	29,480	0	1,634	0	0	0	0	0	0	0	94,549	7,113	0	0	0	0	14,649	0	0	0	147,425
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.
Note: Figures may not add up to total because of rounding.
Source: APERC (APEC Energy Database).

Table 7.9.6 Thailand Energy Balance Table, 2009

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	5,021	0	16,188	0	0	0	0	0	0	0	23,337	615	0	1	1	0	20,861	0	0	0	66,024
2.	Imports	4,915	5,354	43,148	431	11	0	333	79	0	9	8,294	0	0	0	0	0	54	0	210	0	62,406
3.	Exports	–1	–16	–2,261	–10,209	–1,016	–16	–4,148	–3,684	–18	–1,327	0	0	0	0	0	0	–30	0	–134	0	–12,652
4.	International Bunkers	0	0	0	–3,366	0	0	0	0	0	–3,366	0	0	0	0	0	0	0	0	0	0	–3,366
5.	Stock Changes	–2	–827	935	–1,113	–596	–54	336	–345	–498	45	0	0	0	0	0	0	34	0	0	0	–972
6.	Total Primary Energy Supply	9,933	4,511	58,010	–14,256	–1,602	–70	–3,480	–3,950	–516	–4,639	31,631	615	0	1	1	0	20,919	0	76	0	111,440
7.	Transfers	0	0	–3,281	3,281	0	0	0	0	3,281	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	–7,249	0	–49,252	39,505	6,657	85	19,299	6,424	2,112	4,929	–22,751	–615	0	–1	–1	0	–8,280	0	12,754	0	–35,890
8.1	Power Generation	–7,249	0	0	–308	0	0	–158	–150	0	0	–22,751	–615	0	–1	–1	0	–1,971	0	12,754	0	–20,142
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	–49,252	40,238	6,657	85	19,457	6,574	2,536	4,929	0	0	0	0	0	0	0	0	0	0	–9,014
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	–424	0	0	0	0	–424	0	0	0	0	0	0	0	–6,309	0	0	0	–6,733
9.	Loss and Own Use	0	0	0	0	0	0	0	0	0	0	–4,057	0	0	0	0	0	0	0	–1,250	0	–5,307
10.	Discrepancy	–8	0	–358	2,217	606	904	136	147	424	0	0	0	0	0	0	0	0	0	48	0	1,899
11.	Total Final Energy Consumption	2,676	4,511	5,119	30,747	5,661	918	15,955	2,621	5,301	291	4,822	0	0	0	0	0	12,639	0	11,628	0	72,143
12.	Industry Sector	2,676	4,511	0	3,467	13	574	1,052	1,138	690	0	2,346	0	0	0	0	0	6,816	0	4,874	0	24,689
13.	Transport Sector	0	0	0	19,647	5,598	0	11,494	1,480	785	291	1,280	0	0	0	0	0	0	0	5	0	20,932
14.	Other Sectors	0	0	0	6,434	49	345	3,409	4	2,627	0	0	0	0	0	0	0	5,823	0	6,749	0	19,006
14.1	Residential and Commercial	0	0	0	2,957	0	331	0	1	2,625	0	0	0	0	0	0	0	5,823	0	6,662	0	15,443
14.1.1	Commerce and Public Services	0	0	0	876	0	0	0	1	875	0	0	0	0	0	0	0	0	0	4,050	0	4,927
14.1.2	Residential	0	0	0	2,081	0	331	0	0	1,750	0	0	0	0	0	0	0	5,823	0	2,612	0	10,516
14.2	Non-Specified Others	0	0	0	3,476	49	13	3,409	3	2	0	0	0	0	0	0	0	0	0	87	0	3,564
15.	Non-Energy Use	0	0	5,119	1,199	0	0	0	0	1,199	0	1,196	0	0	0	0	0	0	0	0	0	7,515
16.	Electricity Output (GWh)	28,020	0	683	0	0	0	0	0	0	0	97,595	7,148	0	1	2	0	14,848	0	0	0	148,297
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Source: APERC (APEC Energy Database).

Table 7.9.7 Thailand Summary Table, 1990–2009

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Indigenous Production (ktoe)																				
Coal	3,603	4,193	4,426	4,631	5,174	5,524	6,314	6,868	6,132	5,752	5,196	5,698	5,742	5,520	5,610	5,220	4,750	5,204	4,787	5,021
Oil	2,112	2,210	2,521	2,554	2,716	2,550	2,947	3,409	3,652	3,955	5,159	5,492	6,280	7,736	10,316	12,348	12,736	14,069	15,182	16,188
Gas	5,710	7,011	7,501	8,397	9,307	9,833	11,518	14,029	15,428	16,810	17,685	17,193	18,012	18,984	14,877	15,068	14,144	14,611	17,236	23,337
Hydro	428	394	364	318	388	577	631	619	445	304	518	542	643	628	519	499	699	698	612	615
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Geothermal	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	1	1
Solar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Wind	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Biomass	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16,381	17,042	18,053	19,153	20,401	20,861
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	11,854	13,809	14,813	15,901	17,586	18,485	21,411	24,926	25,658	26,823	28,559	28,926	30,679	32,868	47,706	50,178	50,383	53,736	58,218	66,024
Primary Energy Supply (ktoe)																				
Coal	3,828	4,466	4,794	5,378	6,120	7,064	8,643	8,716	7,332	7,989	7,838	8,898	9,305	9,710	10,495	10,680	11,847	14,234	14,953	14,444
Oil	17,898	18,451	20,800	23,905	26,649	31,537	34,149	34,037	32,017	32,890	32,156	31,412	33,855	37,925	44,497	42,857	44,187	44,510	41,987	43,754
Gas	5,710	7,011	7,501	8,397	9,307	9,833	11,518	14,029	15,447	16,837	19,620	22,890	24,537	26,054	22,484	22,788	22,097	22,925	25,497	31,631
Hydro	428	394	364	318	388	577	631	619	445	304	518	542	643	628	519	499	699	698	612	615
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Geothermal	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	1	1
Solar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Wind	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Biomass	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16,401	17,064	18,073	19,173	20,381	20,919
Others	53	47	38	51	71	53	62	55	126	178	238	225	218	188	259	325	379	307	138	76
Total	27,918	30,371	33,498	38,051	42,536	49,065	55,003	57,457	55,369	58,200	60,372	63,969	68,560	74,506	94,657	94,214	97,283	101,848	103,569	111,440
Final Energy Consumption by Sector (ktoe)																				
Industry	5,917	6,539	7,426	8,706	10,418	11,944	13,400	12,516	10,992	12,461	12,833	13,762	15,064	15,659	21,788	23,314	24,080	24,819	25,593	24,689
Transport	9,452	9,826	10,471	12,247	13,791	16,167	17,388	18,502	16,297	16,447	15,945	15,739	16,703	18,020	19,625	20,247	19,535	19,858	19,680	20,932
Residential	1,342	780	882	1,026	1,109	1,257	1,380	1,519	3,196	2,839	2,955	2,917	3,323	3,533	8,822	9,003	9,104	9,605	10,367	10,516
Commercial	1,333	2,142	2,598	3,040	2,978	3,477	3,789	4,095	2,445	2,519	2,775	3,122	3,077	3,202	3,851	3,826	4,191	4,457	4,952	4,927
Others	2,153	2,235	2,405	1,870	2,245	2,122	3,199	2,655	3,672	3,680	4,166	5,462	5,581	6,847	6,988	6,963	6,776	6,852	7,366	11,078
Total	20,196	21,522	23,782	26,890	30,541	34,968	39,156	39,287	36,602	37,946	38,675	41,003	43,748	47,261	61,074	63,353	63,687	65,591	67,959	72,143

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Table 7.9.7 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Final Energy Consumption by Type (ktoe)																				
Coal	1,357	1,559	1,727	2,531	3,106	3,658	4,446	3,971	3,268	3,912	3,660	4,418	4,930	5,034	5,935	6,827	7,569	6,918	7,459	7,187
Oil	15,276	15,905	17,374	19,027	21,472	24,397	27,118	27,276	25,526	25,902	26,064	27,075	28,436	30,713	32,428	32,997	31,193	32,600	32,909	35,866
Gas	267	360	441	492	587	787	940	951	890	1,127	1,389	1,572	1,767	2,316	2,341	2,067	2,151	2,497	3,204	4,822
Electricity	3,297	3,698	4,240	4,840	5,376	6,125	6,652	7,089	6,917	7,005	7,562	7,937	8,615	9,198	9,854	10,387	10,951	11,413	11,608	11,628
Heat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Biomass	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10,517	11,075	11,823	12,163	12,779	12,639
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	20,196	21,522	23,782	26,890	30,541	34,968	39,156	39,287	36,602	37,946	38,675	41,003	43,748	47,261	61,074	63,353	63,687	65,591	67,959	72,143
Power Generation (GWh)																				
Thermal	39,199	45,598	52,860	59,705	66,661	73,346	80,125	86,052	84,890	86,532	89,949	96,115	101,539	109,684	106,171	112,695	116,883	120,702	125,663	126,298
Hydro	4,975	4,587	4,239	3,700	4,514	6,713	7,341	7,200	5,177	3,534	6,026	6,303	7,471	7,299	6,040	5,798	8,125	8,114	7,113	7,148
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Geothermal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Solar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Wind	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13,700	13,732	14,560	14,649	14,848
Total	44,174	50,185	57,099	63,405	71,175	80,059	87,466	93,252	90,067	90,066	95,975	102,418	109,010	116,983	112,211	132,193	138,740	143,376	147,425	148,297
Loss and Own Use of Electricity (GWh)																				
Transmission and Distribution Losses	–	–	–	–	–	–	–	–	–	–	–	–	–	–	9,981	10,715	11,180	9,268	8,954	8,776
Own Use	–	–	–	–	–	–	–	–	–	–	–	–	–	–	3,718	4,030	4,160	4,497	4,629	5,284
Total	–	–	–	–	–	–	–	–	–	–	–	–	–	–	13,699	14,745	15,340	13,765	13,583	14,060
Fuel Input for Power Generation (ktoe)																				
Coal	2,472	2,907	3,067	2,848	3,014	3,406	4,197	4,745	4,063	4,077	4,204	4,480	4,375	4,459	4,656	4,725	4,816	6,948	7,536	7,249
Oil	2,548	3,034	3,565	4,320	4,920	5,611	5,918	5,053	4,339	3,726	2,344	738	664	715	1,715	1,967	1,946	908	387	308
Gas	4,216	5,359	5,672	6,407	7,290	7,476	8,466	10,910	11,479	12,263	14,106	17,399	18,698	19,642	19,786	21,185	19,946	20,428	22,293	22,751
Total	9,236	11,300	12,304	13,575	15,224	16,493	18,581	20,708	19,881	20,066	20,654	22,617	23,738	24,816	26,156	27,877	26,708	28,284	30,217	30,309
CO_2 Emissions (kt C)																				
Coal	4,386	5,070	5,505	6,166	7,011	8,049	9,757	9,839	7,367	9,089	8,901	10,059	10,507	10,651	11,944	12,999	13,895	15,499	16,757	16,145
Oil	15,114	15,674	17,400	19,685	21,736	24,891	26,654	26,217	23,697	23,665	22,147	21,040	22,173	23,643	25,617	26,006	24,710	24,818	24,175	24,500
Gas	3,038	3,859	4,117	4,608	5,902	6,241	7,308	8,892	9,793	10,681	12,418	14,548	15,614	16,377	14,174	14,895	14,155	14,685	16,333	19,496
Total	22,538	24,604	27,022	30,459	34,649	39,181	43,719	44,948	40,857	43,434	43,465	45,647	48,294	50,671	51,735	53,900	52,759	55,003	57,266	60,140

continued on next page

Table 7.9.7 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Macroeconomic Indicators																				
Population (thousand)	57,072	57,712	58,226	58,671	59,127	59,650	60,258	60,934	61,660	62,409	63,155	63,899	64,643	65,370	66,060	66,698	67,276	67,796	68,268	68,706
Urban Population, %	29.4	29.6	29.8	29.9	30.1	30.3	30.5	30.6	30.8	30.9	31.1	31.3	31.6	31.8	32.1	32.3	32.6	33.0	33.3	33.7
GDP (constant 2000 $ million)	79,360	86,152	93,116	100,799	109,858	120,006	127,088	125,345	112,171	117,160	122,725	125,385	132,052	141,481	150,457	157,385	165,400	173,743	178,060	173,911
GDP (current $ million)	85,343	98,235	111,453	125,011	144,308	168,019	181,948	150,891	111,860	122,630	122,725	115,536	126,877	142,640	161,340	176,352	207,089	246,977	272,578	263,505
GDP (constant 2005 PPP $ million)	224,486	243,698	263,397	285,130	310,755	339,461	359,494	354,564	317,299	331,411	347,154	354,677	373,538	400,208	425,598	445,195	467,868	491,469	503,679	491,944
GDP/capita (constant 2000 $)	1,391	1,493	1,599	1,718	1,858	2,012	2,109	2,057	1,819	1,877	1,943	1,962	2,043	2,164	2,278	2,360	2,459	2,563	2,608	2,531
GDP/capita (current $)	1,495	1,702	1,914	2,131	2,441	2,817	3,019	2,476	1,814	1,965	1,943	1,808	1,963	2,182	2,442	2,644	3,078	3,643	3,993	3,835
GDP – Manufacturing (% of GDP)	25.6	26.4	27.2	29.2	29.3	30.0	30.2	31.1	31.0	33.2	33.6	33.3	33.9	35.0	35.7	35.8	36.1	36.5	37.0	35.6
Car Ownership (car/1,000 persons)	49	47	52	61	67	76	85	94	99	98	97	101	142	141	110	120	131	143	143	148
Basic Energy Indicators																				
TPES/capita (toe/person)	0.49	0.53	0.58	0.65	0.72	0.82	0.91	0.94	0.90	0.93	0.96	1.00	1.06	1.14	1.43	1.41	1.45	1.50	1.52	1.62
TFEC/capita (toe/person)	0.35	0.37	0.41	0.46	0.52	0.59	0.65	0.64	0.59	0.61	0.61	0.64	0.68	0.72	0.92	0.95	0.95	0.97	1.00	1.05
TPES/GDP (toe/constant 2000 $ million)	352	353	360	377	387	409	433	458	494	497	492	510	519	527	629	599	588	586	582	641
TFEC/GDP (toe/constant 2000 $ million)	254	250	255	267	278	291	308	313	326	324	315	327	331	334	406	403	385	378	382	415
Import Dependency (%)	57.5	54.5	55.8	58.2	58.7	62.3	61.1	56.6	53.7	53.9	52.7	54.8	55.3	55.9	49.6	46.7	48.2	47.2	43.8	40.8
Oil Import Dependency (%)	88.2	88.0	87.9	89.3	89.8	91.9	91.4	90.0	88.6	88.0	84.0	82.5	81.5	79.6	76.8	71.2	71.2	68.4	63.8	63.0
Electricity/capita (kWh/ person)	672	745	847	959	1,057	1,194	1,284	1,353	1,305	1,305	1,393	1,445	1,550	1,636	1,735	1,811	1,893	1,958	1,978	1,968
CO_2 Intensity (t C/constant 2000 $ million)	284	286	290	302	315	326	344	359	364	371	354	364	366	358	344	342	319	317	322	346
CO_2/capita (t C)	0.39	0.43	0.46	0.52	0.59	0.66	0.73	0.74	0.66	0.70	0.69	0.71	0.75	0.78	0.78	0.81	0.78	0.81	0.84	0.88
CO_2/TPES (t C/toe)	0.81	0.81	0.81	0.80	0.81	0.80	0.79	0.78	0.74	0.75	0.72	0.71	0.70	0.68	0.55	0.57	0.54	0.54	0.55	0.54

– = no data or not applicable, CO_2 = carbon dioxide, GDP = gross domestic product, GWh = gigawatt–hour, kt C = thousand tons of carbon equivalent, ktoe = thousand tons of oil equivalent, kWh = kilowatt–hour, PPP = purchasing power parity, t C = ton of carbon equivalent, TFEC = total final energy consumption, toe = ton of oil equivalent, TPES = total primary energy supply.

Note: Figures may not add up to total because of rounding.

Sources: APERC (APEC Energy Database), APERC estimates, JAMA (2012), and World Bank.

7.10 Viet Nam

Country Profile (2009)		Energy Reserves (year-end 2008)	
Total Surface Area (square kilometer)	331,050	Coal (million ton) - Recoverable	150.0
Population (thousand)	86,025	Gas (trillion cubic feet) - Proven	7.7
GDP (constant 2000 $ billion)	58.8	Oil (billion barrel) - Proven	4,700.0
Electrification Rate (%)	97.6		

GDP = gross domestic product.

Sources: ADB (2012), IEA (2011c), World Bank, and WEC (2010).

2009 Energy Supply and Demand Flow (ktoe)

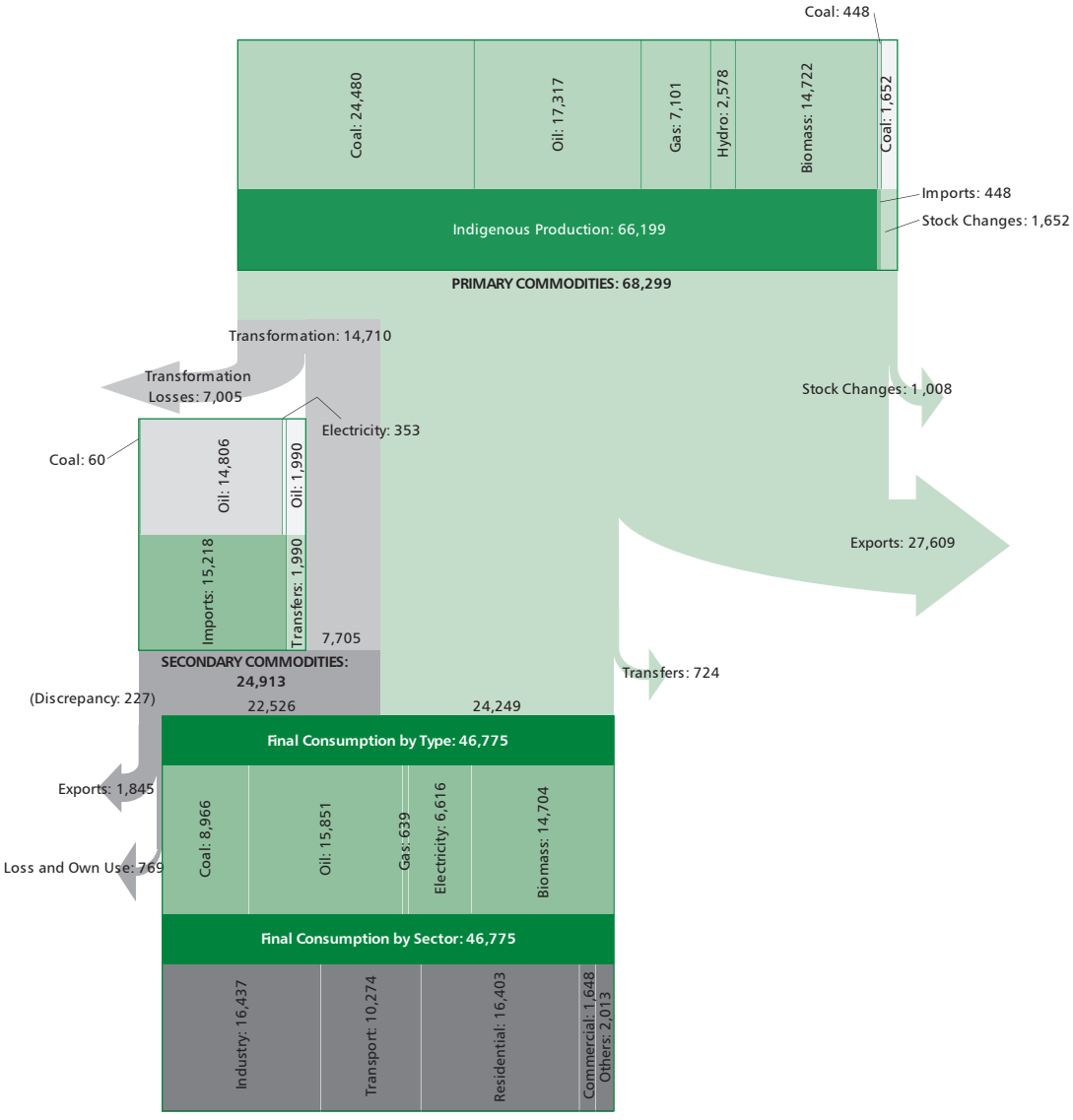


Table 7.10.1 Key Data and Economic Profile

	1990	1995	2000	2005	2009
Socioeconomic Data					
Population (thousand)	66,017	71,996	77,631	82,394	86,025
GDP (constant 2000 $ billion)	15.0	22.3	31.2	44.8	58.8
GDP (constant 2005 PPP $ billion)	59.7	88.6	124.0	178.1	234.0
GDP/capita (constant 2000 $)	227	309	402	543	684
GDP/capita (constant 2005 PPP $)	905	1,231	1,597	2,161	2,721

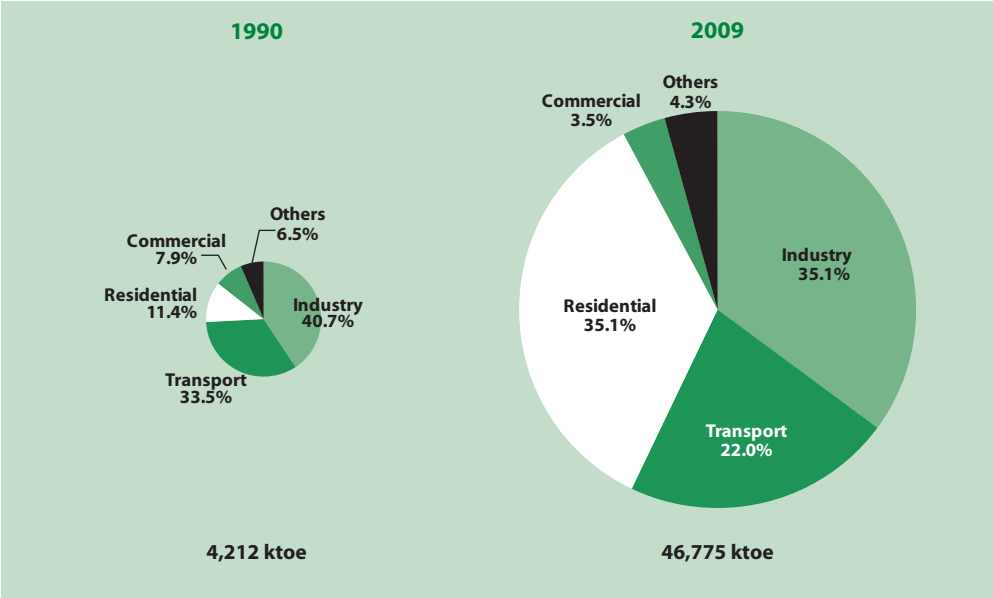
GDP = gross domestic product, PPP = purchasing power parity.
Source: World Bank.

Table 7.10.2 Energy Supply and Demand

	1990	1995	2000	2005	2009
Primary Energy Supply (ktoe)					
Indigenous Production	5,811	13,562	25,777	59,997	66,199
Net Imports	–397	–4,439	–10,936	–19,421	–11,877
Total PES	5,414	9,123	14,841	40,575	54,322
Coal	2,212	3,314	4,372	7,082	12,645
Oil	2,737	4,713	7,777	12,533	16,954
Gas	3	186	1,440	4,649	7,101
Biomass	0	0	0	14,807	14,722
Others	462	910	1,251	1,505	2,899
TPES/capita (toe)	0.08	0.13	0.19	0.49	0.63
TPES/GDP (toe/constant 2005 PPP $ million)	91	103	120	228	232
Final Energy Consumption (ktoe)					
Industry	1,713	3,099	4,653	11,207	16,437
Transportation	1,412	2,525	3,763	6,898	10,274
Other Sectors	1,087	2,309	3,511	17,578	20,064
Total FEC	4,212	7,932	11,927	35,683	46,775
Coal	1,324	2,603	3,223	4,950	8,966
Oil	2,356	4,344	6,759	11,855	15,851
Gas	0	22	18	100	639
Electricity	532	963	1,927	3,967	6,616
Biomass	0	0	0	14,778	14,704
Others	0	0	0	33	0

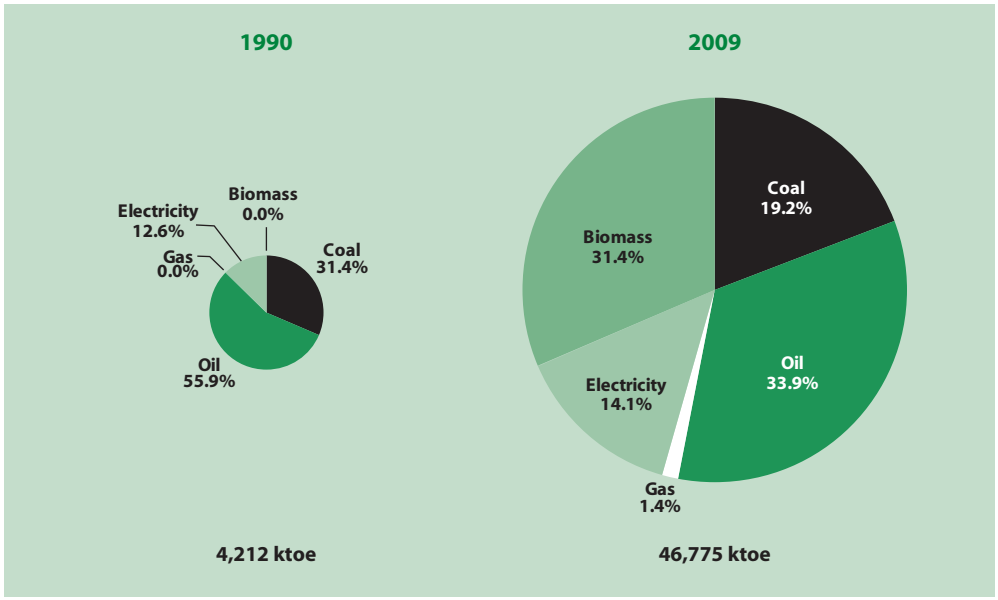
FEC = final energy consumption, GDP = gross domestic product, ktoe = thousand tons of oil equivalent, PES = primary energy supply, PPP = purchasing power parity, toe = ton of oil equivalent, TPES = total primary energy supply.
Source: APERC (APEC Energy Database).

Figure 7.10.1 Final Energy Consumption by Sector, 1990 and 2009



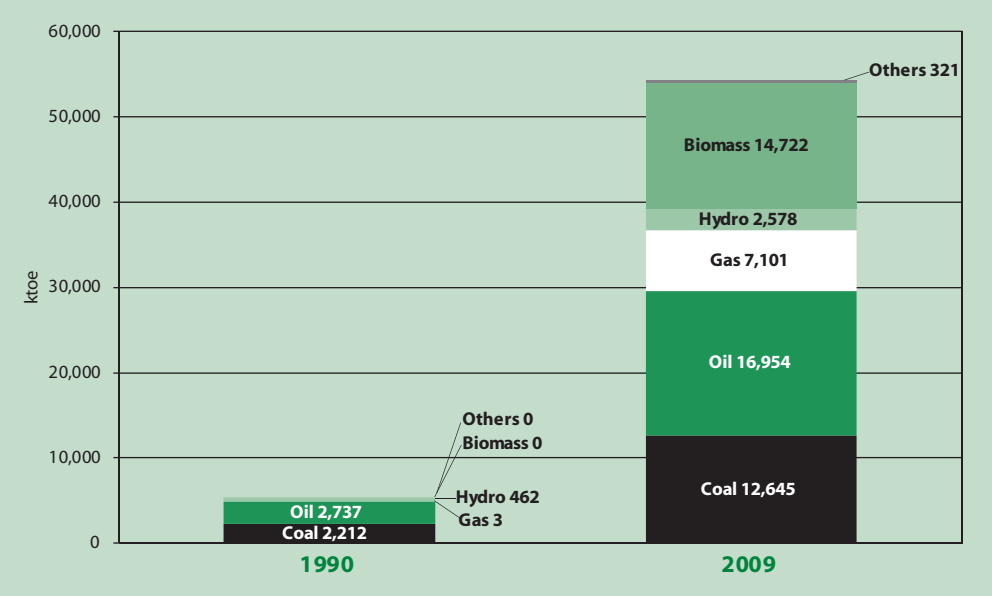
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 7.10.2 Final Energy Consumption by Type of Energy, 1990 and 2009



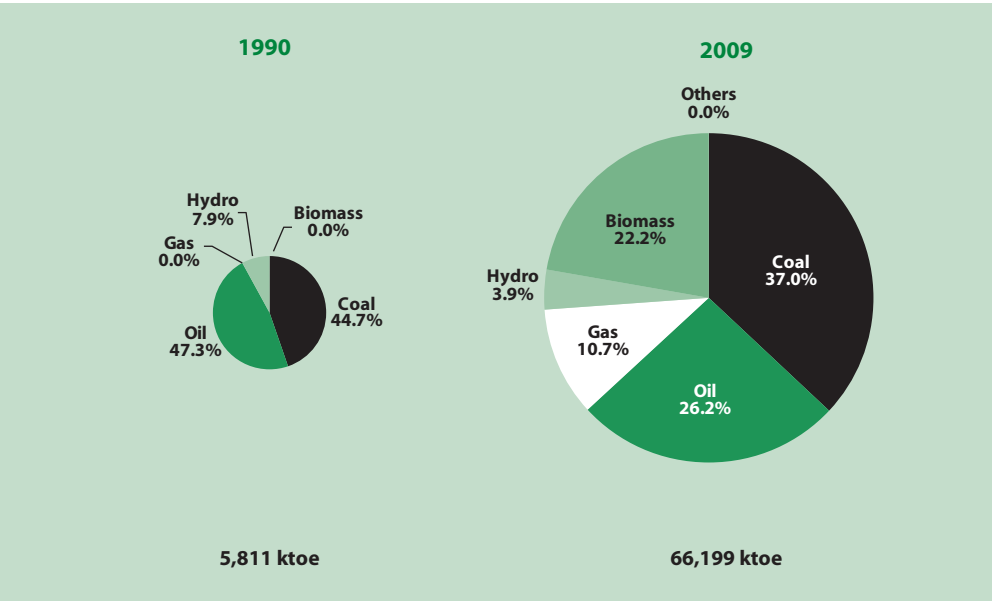
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 7.10.3 Total Primary Energy Supply, 1990 and 2009



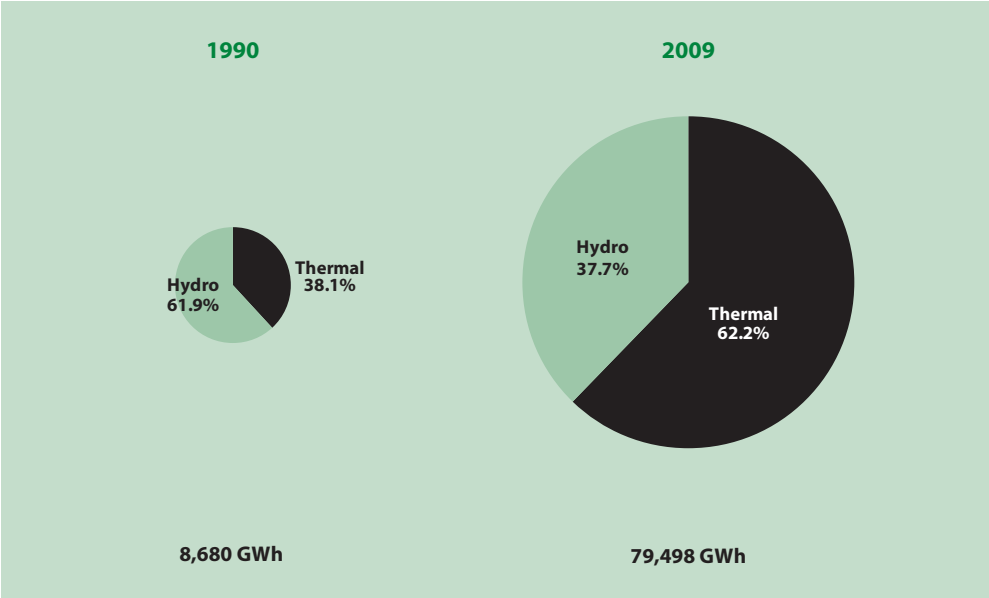
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 7.10.4 Indigenous Energy Production, 1990 and 2009



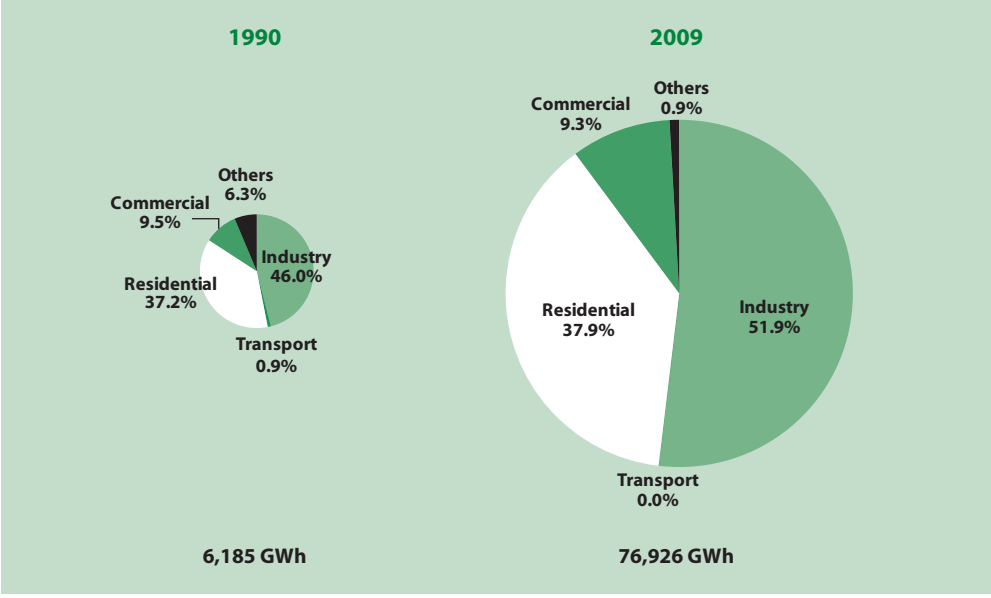
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 7.10.5 Electricity Generation by Plant Type, 1990 and 2009



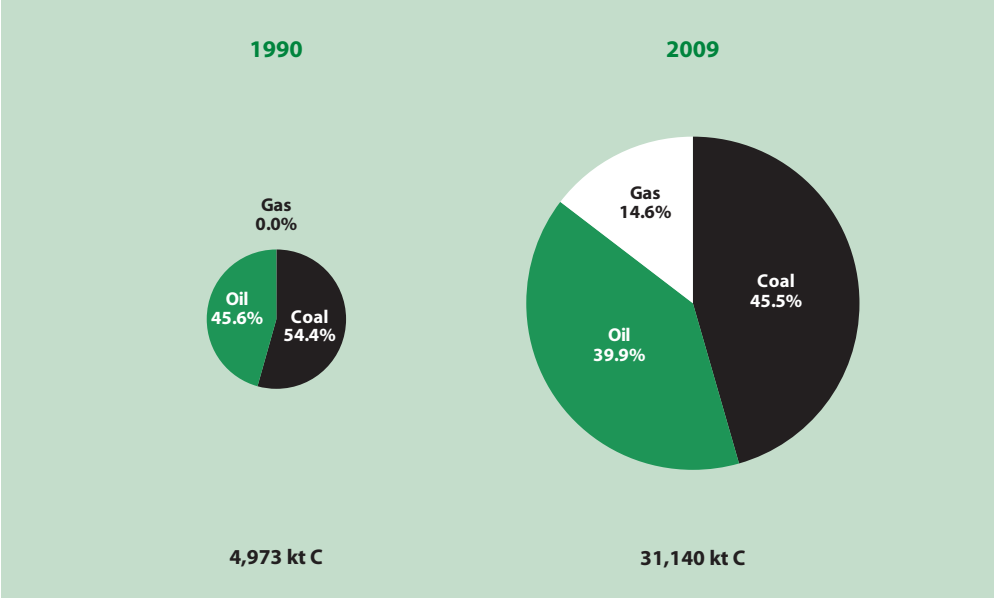
GWh = gigawatt-hour.
Source: APERC (APEC Energy Database).

Figure 7.10.6 Electricity Consumption by Sector, 1990 and 2009



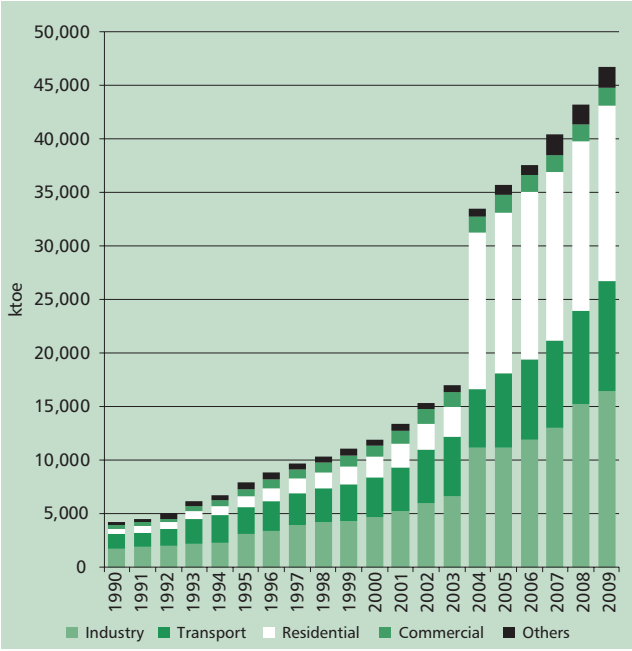
GWh = gigawatt-hour.
Source: APERC (APEC Energy Database).

Figure 7.10.7 Carbon Dioxide Emissions from Fuel Combustion, 1990 and 2009



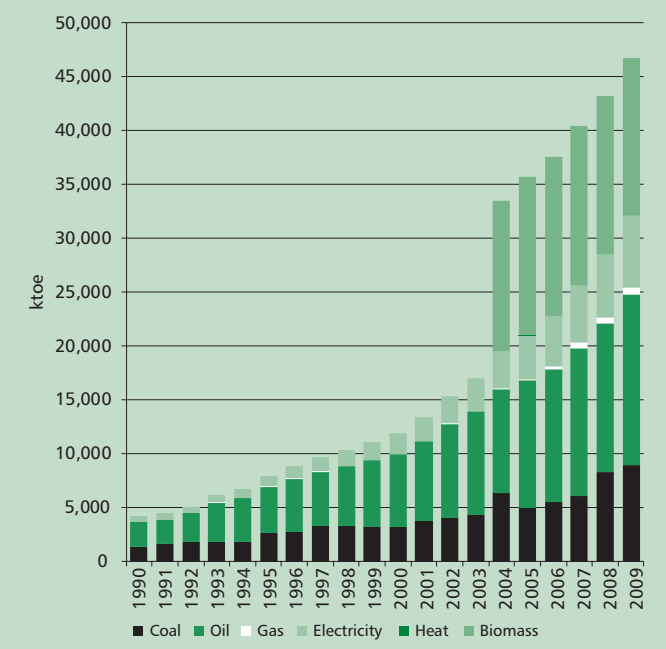
kt C = thousand tons of carbon equivalent.
Source: APERC estimates.

Figure 7.10.8 Final Energy Consumption by Sector, 1990–2009



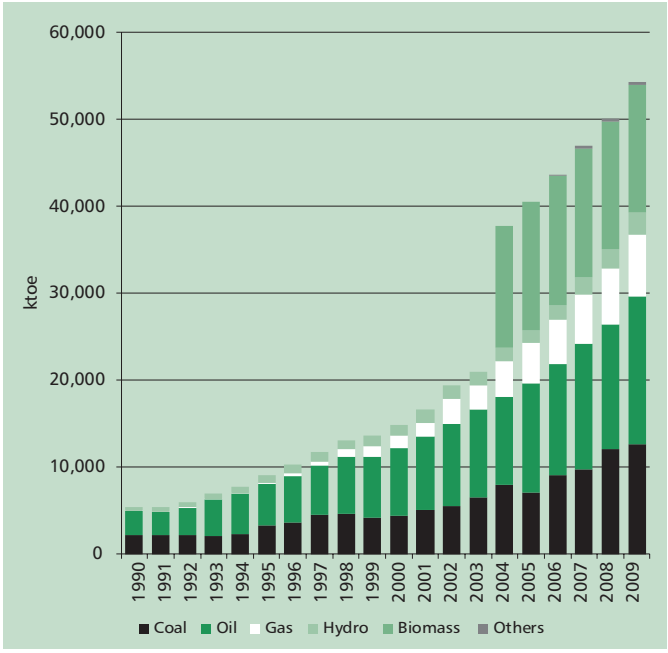
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 7.10.9 Final Energy Consumption by Type, 1990–2009



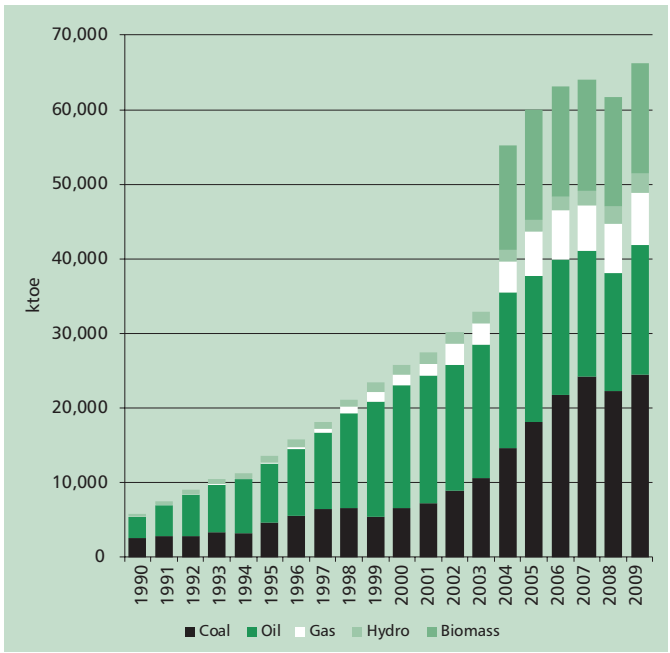
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 7.10.10 Total Primary Energy Supply, 1990–2009



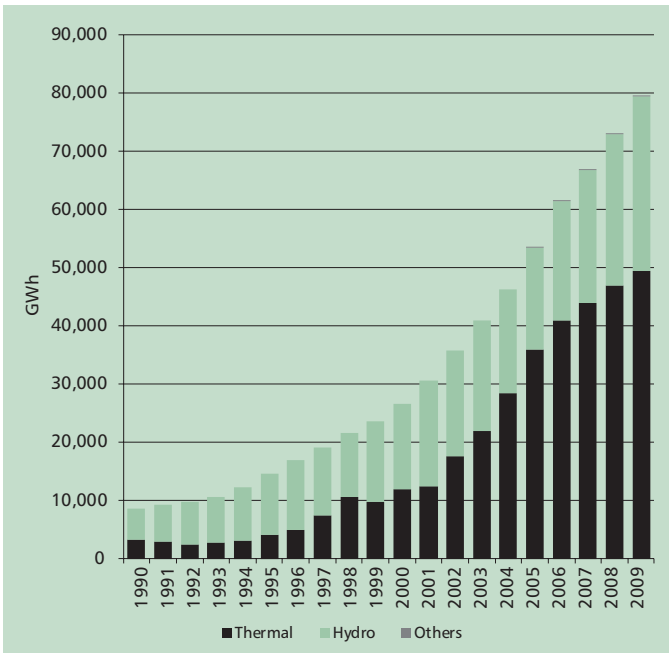
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 7.10.11 Indigenous Energy Production, 1990–2009



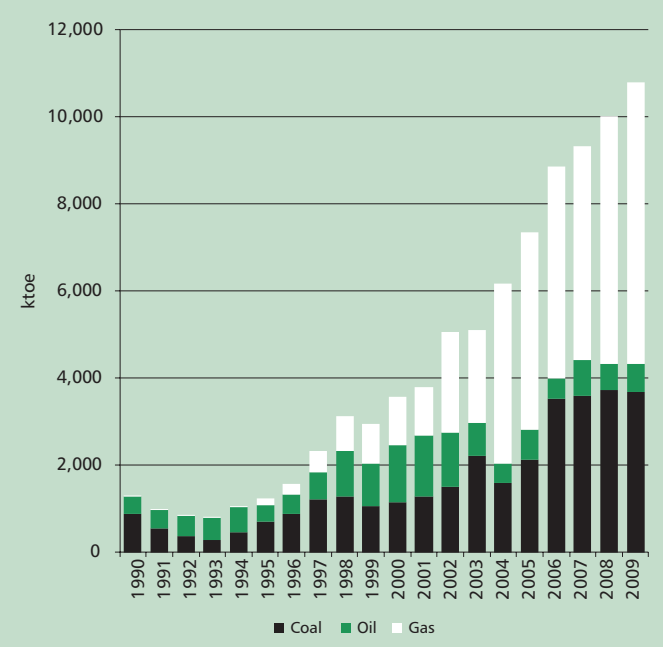
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 7.10.12 Electricity Generation by Source, 1990–2009



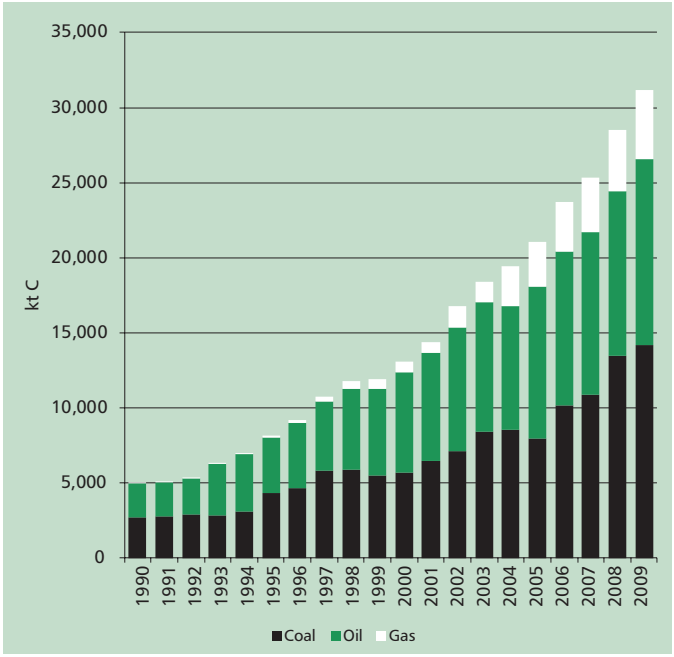
GWh = gigawatt-hour.
Source: APERC (APEC Energy Database).

Figure 7.10.13 Fuel Input for Electricity Generation, 1990–2009



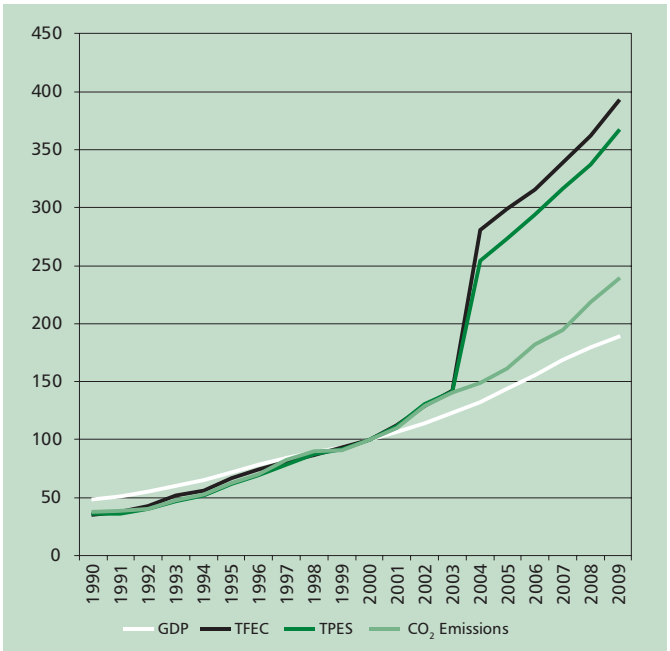
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 7.10.14 Carbon Dioxide Emissions from Fuel Combustion, 1990–2009



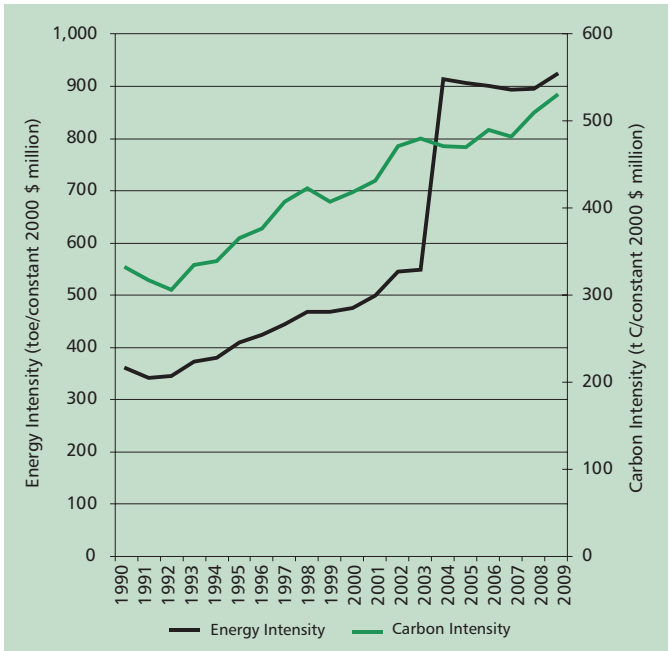
kt C = thousand tons of carbon equivalent.
Source: APERC estimates.

Figure 7.10.15 Growth of GDP, TFEC, TPES, and CO_2 (indexed to year 2000), 1990–2009



CO_2 = carbon dioxide, GDP = gross domestic product, TFEC = total final energy consumption, TPES = total primary energy supply.
Note: Indices are measured relative to the base year 2000 (2000 = 100).
Source: APERC estimates.

Figure 7.10.16 Energy and Carbon Intensities, 1990–2009



t C = ton of carbon equivalent, toe = ton of oil equivalent.
Source: APERC estimates.

Table 7.10.3 Viet Nam Energy Balance Table, 2006

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	21,790	0	18,117	0	0	0	0	0	0	0	6,638	1,755	0	0	0	0	14,860	0	0	0	63,159
2.	Imports	64	0	0	12,170	2,992	236	5,748	1,995	612	587	0	0	0	0	0	0	0	0	83	0	12,317
3.	Exports	–11,936	0	–17,510	0	0	0	0	0	0	0	–1,530	0	0	0	0	0	0	0	0	0	–30,976
4.	International Bunkers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5.	Stock Changes	–872	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–872
6.	Total Primary Energy Supply	9,045	0	607	12,170	2,992	236	5,748	1,995	612	587	5,108	1,755	0	0	0	0	14,860	0	83	0	43,628
7.	Transfers	0	0	–607	607	0	0	0	0	329	278	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	–3,517	0	0	–483	0	0	–85	–398	0	0	–4,872	–1,755	0	0	0	0	–18	0	5,285	0	–5,360
8.1	Power Generation	–3,517	0	0	–483	0	0	–85	–398	0	0	–4,872	–1,755	0	0	0	0	–18	0	5,285	0	–5,360
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–655	0	–655
10.	Discrepancy	0	0	0	0	0	0	0	0	0	0	90	0	0	0	0	0	0	0	–83	0	7
11.	Total Final Energy Consumption	5,528	0	0	12,294	2,992	236	5,663	1,597	941	865	326	0	0	0	0	0	14,841	0	4,630	0	37,620
12.	Industry Sector	4,176	0	0	2,235	0	10	1,066	1,038	122	0	326	0	0	0	0	0	2,844	0	2,312	0	11,893
13.	Transport Sector	0	0	0	7,560	2,864	0	3,831	392	0	473	0	0	0	0	0	0	0	0	0	0	7,560
14.	Other Sectors	1,352	0	0	2,106	128	227	766	167	818	0	0	0	0	0	0	0	11,998	0	2,318	0	17,774
14.1	Residential and Commercial	1,331	0	0	1,596	0	227	401	150	818	0	0	0	0	0	0	0	11,998	0	2,270	0	17,193
14.1.1	Commerce and Public Services	327	0	0	864	0	123	345	129	267	0	0	0	0	0	0	0	0	0	408	0	1,600
14.1.2	Residential	1,004	0	0	731	0	103	56	21	552	0	0	0	0	0	0	0	11,998	0	1,862	0	15,594
14.2	Non-Specified Others	22	0	0	511	128	0	365	17	0	0	0	0	0	0	0	0	0	0	49	0	581
15.	Non-Energy Use	0	0	0	393	0	0	0	0	0	393	0	0	0	0	0	0	0	0	0	0	393
16.	Electricity Output (GWh)	13,904	0	1,685	0	0	0	0	0	0	0	25,419	20,408	0	0	0	0	43	0	0	0	61,459
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.
Note: Figures may not add up to total because of rounding.
Source: APERC (APEC Energy Database).

Table 7.10.4 Viet Nam Energy Balance Table, 2007

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	24,186	0	16,876	0	0	0	0	0	0	0	6,139	1,968	0	0	0	0	14,870	0	0	0	64,040
2.	Imports	375	64	0	14,834	3,461	259	6,578	2,299	670	1,566	0	0	0	0	0	0	0	0	226	0	15,499
3.	Exports	–17,854	0	–15,333	–969	–174	–32	–347	–350	0	–66	–486	0	0	0	0	0	0	0	0	0	–34,642
4.	International Bunkers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5.	Stock Changes	2,910	0	–874	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2,036
6.	Total Primary Energy Supply	9,617	64	670	13,864	3,287	227	6,231	1,949	670	1,500	5,653	1,968	0	0	0	0	14,870	0	226	0	46,933
7.	Transfers	0	0	–670	670	0	0	0	0	306	364	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	–3,592	0	0	–821	0	0	–206	–615	0	0	–4,916	–1,968	0	0	0	0	–22	0	5,750	0	–5,570
8.1	Power Generation	–3,592	0	0	–821	0	0	–206	–615	0	0	–4,916	–1,968	0	0	0	0	–22	0	5,750	0	–5,570
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	0	0	0	0	0	0	0	0	0	0	–195	0	0	0	0	0	0	0	–720	0	–915
10.	Discrepancy	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11.	Total Final Energy Consumption	6,025	64	0	13,713	3,287	227	6,025	1,334	976	1,864	542	0	0	0	0	0	14,848	0	5,256	0	40,448
12.	Industry Sector	4,668	64	0	2,158	0	13	1,132	861	152	0	542	0	0	0	0	0	2,873	0	2,765	0	13,070
13.	Transport Sector	0	0	0	8,078	3,166	0	4,116	344	0	452	0	0	0	0	0	0	0	0	37	0	8,115
14.	Other Sectors	1,357	0	0	2,065	121	214	777	129	823	0	0	0	0	0	0	0	11,975	0	2,454	0	17,851
14.1	Residential and Commercial	1,336	0	0	1,559	0	214	407	115	823	0	0	0	0	0	0	0	11,975	0	2,405	0	17,276
14.1.1	Commerce and Public Services	328	0	0	832	0	111	350	99	272	0	0	0	0	0	0	0	0	0	386	0	1,546
14.1.2	Residential	1,008	0	0	727	0	103	57	16	551	0	0	0	0	0	0	0	11,975	0	2,019	0	15,730
14.2	Non-Specified Others	21	0	0	506	121	0	370	14	0	0	0	0	0	0	0	0	0	0	49	0	576
15.	Non-Energy Use	0	0	0	1,412	0	0	0	0	0	1,412	0	0	0	0	0	0	0	0	0	0	1,412
16.	Electricity Output (GWh)	14,200	0	2,864	0	0	0	0	0	0	0	26,857	22,884	0	0	0	0	52	0	0	0	66,857
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Source: APERC (APEC Energy Database).

Table 7.10.5 Viet Nam Energy Balance Table, 2008

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	22,275	0	15,863	0	0	0	0	0	0	0	6,624	2,235	0	0	0	0	14,724	0	0	0	61,721
2.	Imports	385	66	0	14,757	3,691	153	6,741	2,749	631	791	0	0	0	0	0	0	0	0	277	0	15,485
3.	Exports	–10,839	0	–14,000	–1,053	–189	–35	–377	–381	0	–72	–216	0	0	0	0	0	0	0	0	0	–26,108
4.	International Bunkers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5.	Stock Changes	129	0	–1,173	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–1,044
6.	Total Primary Energy Supply	11,951	66	691	13,704	3,502	118	6,364	2,368	631	719	6,408	2,235	0	0	0	0	14,724	0	277	0	50,055
7.	Transfers	0	0	–691	691	0	0	0	0	278	412	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	–3,728	0	0	–592	0	0	–128	–464	0	0	–5,693	–2,235	0	0	0	0	–14	0	6,282	0	–5,979
8.1	Power Generation	–3,728	0	0	–592	0	0	–128	–464	0	0	–5,693	–2,235	0	0	0	0	–14	0	6,282	0	–5,979
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	0	0	0	0	0	0	0	0	0	0	–175	0	0	0	0	0	0	0	–728	0	–903
10.	Discrepancy	–22	21	0	3	–1	94	–38	–610	10	548	0	0	0	0	0	0	–2	0	13	0	15
11.	Total Final Energy Consumption	8,201	88	0	13,806	3,501	212	6,199	1,294	920	1,680	540	0	0	0	0	0	14,708	0	5,844	0	43,187
12.	Industry Sector	6,762	88	0	2,025	0	12	1,062	808	143	0	540	0	0	0	0	0	2,842	0	3,026	0	15,283
13.	Transport Sector	0	0	0	8,622	3,379	0	4,393	367	0	483	0	0	0	0	0	0	0	0	44	0	8,666
14.	Other Sectors	1,439	0	0	1,962	122	200	744	119	777	0	0	0	0	0	0	0	11,866	0	2,774	0	18,041
14.1	Residential and Commercial	1,417	0	0	1,453	0	200	371	105	777	0	0	0	0	0	0	0	11,866	0	2,717	0	17,454
14.1.1	Commerce and Public Services	347	0	0	753	0	100	317	90	246	0	0	0	0	0	0	0	0	0	476	0	1,576
14.1.2	Residential	1,070	0	0	701	0	99	55	15	531	0	0	0	0	0	0	0	11,866	0	2,242	0	15,878
14.2	Non-Specified Others	22	0	0	508	122	0	372	14	0	0	0	0	0	0	0	0	0	0	57	0	587
15.	Non-Energy Use	0	0	0	1,197	0	0	0	0	0	1,197	0	0	0	0	0	0	0	0	0	0	1,197
16.	Electricity Output (GWh)	14,738	0	2,058	0	0	0	0	0	0	0	30,234	25,986	0	0	0	0	32	0	0	0	73,048
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.
Note: Figures may not add up to total because of rounding.
Source: APERC (APEC Energy Database).

Table 7.10.6 Viet Nam Energy Balance Table, 2009

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	24,480	0	17,317	0	0	0	0	0	0	0	7,101	2,578	0	0	0	0	14,722	0	0	0	66,199
2.	Imports	448	60	0	14,806	3,818	58	6,601	1,838	843	1,648	0	0	0	0	0	0	0	0	353	0	15,667
3.	Exports	–13,995	0	–13,614	–1,813	–279	–35	–772	–397	0	–331	0	0	0	0	0	0	0	0	–32	0	–29,454
4.	International Bunkers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5.	Stock Changes	1,652	0	–1,008	1,266	0	83	660	317	0	206	0	0	0	0	0	0	0	0	0	0	1,910
6.	Total Primary Energy Supply	12,585	60	2,696	14,259	3,539	106	6,489	1,758	843	1,523	7,101	2,578	0	0	0	0	14,722	0	321	0	54,322
7.	Transfers	0	0	–724	724	0	0	0	0	281	443	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	–3,680	0	–1,972	868	708	0	539	–587	125	84	–6,462	–2,578	0	0	0	0	–18	0	6,837	0	–7,005
8.1	Power Generation	–3,680	0	0	–646	0	0	–22	–624	0	0	–6,462	–2,578	0	0	0	0	–18	0	6,837	0	–6,547
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	–1,972	1,515	708	0	561	37	125	84	0	0	0	0	0	0	0	0	0	0	–458
8.4	Coal Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–769	0	–769
10.	Discrepancy	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	227	0	227
11.	Total Final Energy Consumption	8,906	60	0	15,851	4,247	106	7,027	1,171	1,249	2,050	639	0	0	0	0	0	14,704	0	6,616	0	46,775
12.	Industry Sector	7,446	60	0	2,146	0	9	1,167	766	203	0	639	0	0	0	0	0	2,713	0	3,434	0	16,437
13.	Transport Sector	0	0	0	10,274	4,116	0	5,163	359	0	636	0	0	0	0	0	0	0	0	0	0	10,274
14.	Other Sectors	1,460	0	0	2,017	131	96	697	46	1,046	0	0	0	0	0	0	0	11,991	0	3,182	0	18,650
14.1	Residential and Commercial	1,439	0	0	1,499	0	96	320	37	1,046	0	0	0	0	0	0	0	11,991	0	3,122	0	18,051
14.1.1	Commerce and Public Services	350	0	0	683	0	26	274	30	354	0	0	0	0	0	0	0	2	0	613	0	1,648
14.1.2	Residential	1,089	0	0	816	0	71	46	7	692	0	0	0	0	0	0	0	11,989	0	2,509	0	16,403
14.2	Non-Specified Others	21	0	0	518	131	0	378	9	0	0	0	0	0	0	0	0	0	0	60	0	599
15.	Non-Energy Use	0	0	0	1,414	0	0	0	0	0	1,414	0	0	0	0	0	0	0	0	0	0	1,414
16.	Electricity Output (GWh)	12,836	0	2,378	0	0	0	0	0	0	0	34,267	29,981	0	0	0	0	37	0	0	0	79,498
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Source: APERC (APEC Energy Database).

Table 7.10.7 Viet Nam Summary Table, 1990–2009

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Indigenous Production (ktoe)																				
Coal	2,597	2,851	2,800	3,304	3,192	4,676	5,501	6,377	6,536	5,392	6,501	7,259	8,904	10,619	14,550	18,142	21,790	24,186	22,275	24,480
Oil	2,750	4,072	5,599	6,413	7,228	7,790	8,961	10,272	12,725	15,491	16,584	17,046	16,899	17,917	20,940	19,609	18,117	16,876	15,863	17,317
Gas	3	25	17	21	23	186	282	506	935	1,292	1,440	1,563	2,845	2,776	4,146	5,935	6,638	6,139	6,624	7,101
Hydro	462	543	622	685	795	910	1,033	1,002	954	1,185	1,251	1,566	1,565	1,633	1,526	1,505	1,755	1,968	2,235	2,578
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Geothermal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Solar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wind	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Biomass	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13,997	14,807	14,860	14,870	14,724	14,722
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	5,811	7,492	9,038	10,423	11,237	13,562	15,777	18,157	21,151	23,359	25,777	27,434	30,213	32,944	55,158	59,997	63,159	64,040	61,721	66,199
Primary Energy Supply (ktoe)																				
Coal	2,212	2,138	2,143	2,073	2,291	3,314	3,579	4,544	4,577	4,227	4,372	5,024	5,517	6,562	7,928	7,082	9,045	9,681	12,017	12,645
Oil	2,737	2,717	3,186	4,172	4,624	4,713	5,420	5,630	6,576	6,938	7,777	8,457	9,493	10,037	10,159	12,533	12,777	14,534	14,394	16,954
Gas	3	25	17	21	23	186	282	506	935	1,292	1,440	1,563	2,845	2,776	4,146	4,649	5,108	5,653	6,408	7,101
Hydro	462	543	622	685	795	910	1,033	1,002	954	1,185	1,251	1,566	1,565	1,633	1,526	1,505	1,755	1,968	2,235	2,578
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Geothermal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Solar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wind	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Biomass	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13,997	14,807	14,860	14,870	14,724	14,722
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	83	226	277	321
Total	5,414	5,423	5,968	6,951	7,732	9,123	10,313	11,682	13,042	13,641	14,841	16,611	19,419	21,007	37,755	40,575	43,628	46,933	50,055	54,322
Final Energy Consumption by Sector (ktoe)																				
Industry	1,713	1,886	2,029	2,189	2,281	3,099	3,365	3,956	4,179	4,302	4,653	5,259	6,001	6,604	11,126	11,207	11,893	13,070	15,283	16,437
Transport	1,412	1,336	1,504	2,333	2,576	2,525	2,767	2,992	3,183	3,464	3,763	4,075	4,969	5,571	5,540	6,898	7,560	8,115	8,666	10,274
Residential	481	618	664	742	870	1,029	1,213	1,354	1,538	1,663	1,878	2,174	2,456	2,809	14,649	15,068	15,594	15,730	15,878	16,403
Commercial	334	353	342	465	547	659	860	791	924	962	1,095	1,274	1,322	1,342	1,472	1,665	1,600	1,546	1,576	1,648
Others	272	267	556	420	427	621	644	571	558	695	537	647	635	664	684	846	974	1,988	1,785	2,013
Total	4,212	4,461	5,096	6,148	6,701	7,932	8,849	9,664	10,383	11,087	11,927	13,428	15,383	16,989	33,471	35,683	37,620	40,448	43,187	46,775

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Table 7.10.7 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Final Energy Consumption by Type (ktoe)																				
Coal	1,324	1,600	1,770	1,782	1,823	2,603	2,692	3,327	3,302	3,166	3,223	3,743	4,017	4,337	6,334	4,950	5,528	6,089	8,289	8,966
Oil	2,356	2,286	2,716	3,677	4,064	4,344	4,985	5,001	5,538	6,221	6,759	7,456	8,761	9,639	9,684	11,855	12,294	13,713	13,806	15,851
Gas	0	9	15	14	16	22	21	20	19	19	18	15	19	18	19	100	326	542	540	639
Electricity	532	566	596	674	798	963	1,150	1,316	1,524	1,681	1,927	2,214	2,586	2,996	3,437	3,967	4,630	5,256	5,844	6,616
Heat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	33	0	0	0	0
Biomass	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13,997	14,778	14,841	14,848	14,708	14,704
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	4,212	4,461	5,096	6,148	6,701	7,932	8,849	9,664	10,383	11,087	11,927	13,428	15,383	16,989	33,471	35,683	37,620	40,448	43,187	46,775
Power Generation (GWh)																				
Thermal	3,311	2,892	2,476	2,696	3,046	4,065	4,937	7,475	10,593	9,784	12,011	12,398	17,598	21,939	28,498	35,900	41,008	43,921	47,030	49,480
Hydro	5,369	6,317	7,228	7,965	9,243	10,582	12,008	11,657	11,095	13,774	14,551	18,210	18,198	18,986	17,741	17,497	20,408	22,884	25,986	29,981
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Geothermal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Solar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wind	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	66	43	52	32	37
Total	8,680	9,209	9,704	10,661	12,289	14,647	16,945	19,132	21,688	23,558	26,562	30,608	35,796	40,925	46,239	53,463	61,459	66,857	73,048	79,498
Loss and Own Use of Electricity (GWh)																				
Transmission and Distribution Losses	–	–	–	–	–	–	–	–	–	–	–	–	–	–	4,562	5,870	6,863	7,517	7,517	7,987
Own Use	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1,708	1,464	755	855	950	950
Total	–	–	–	–	–	–	–	–	–	–	–	–	–	–	6,270	7,334	7,618	8,372	8,467	8,937
Fuel Input for Power Generation (ktoe)																				
Coal	888	538	374	290	468	710	886	1,217	1,275	1,062	1,150	1,281	1,500	2,225	1,594	2,132	3,517	3,592	3,728	3,680
Oil	381	431	470	494	560	369	434	629	1,048	967	1,310	1,407	1,257	744	447	678	483	821	592	646
Gas	3	16	3	6	6	165	253	479	810	924	1,102	1,106	2,295	2,136	4,127	4,549	4,872	4,916	5,693	6,462
Total	1,272	986	847	791	1,035	1,244	1,574	2,325	3,133	2,953	3,561	3,794	5,052	5,105	6,168	7,359	8,872	9,329	10,013	10,788
CO_2 Emissions (kt C)																				
Coal	2,704	2,780	2,864	2,801	3,071	4,297	4,670	5,832	5,860	5,487	5,678	6,438	7,117	8,410	8,564	7,947	10,149	10,868	13,494	14,177
Oil	2,268	2,259	2,425	3,447	3,832	3,731	4,331	4,588	5,414	5,802	6,663	7,224	8,215	8,610	8,228	10,140	10,248	10,851	10,905	12,414
Gas	2	10	2	4	4	106	162	307	519	592	706	709	1,470	1,368	2,656	2,978	3,330	3,621	4,105	4,549
Total	4,973	5,049	5,291	6,253	6,907	8,133	9,164	10,726	11,793	11,880	13,046	14,370	16,802	18,387	19,448	21,065	23,728	25,340	28,504	31,140

continued on next page

Table 7.10.7 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Macroeconomic Indicators																				
Population (thousand)	66,017	67,242	68,450	69,645	70,825	71,996	73,157	74,307	75,456	76,597	77,631	78,621	79,539	80,468	81,438	82,394	83,313	84,221	85,122	86,025
Urban Population, %	20.3	20.7	21.1	21.4	21.8	22.2	22.6	23.0	23.5	23.9	24.3	24.7	25.1	25.6	26.0	26.4	26.9	27.4	27.8	28.3
GDP (constant 2000 $ million)	15,018	15,913	17,289	18,685	20,336	22,276	24,357	26,343	27,861	29,191	31,173	33,322	35,681	38,300	41,284	44,769	48,453	52,550	55,867	58,841
GDP (current $ million)	6,472	9,613	9,867	13,181	16,286	20,736	24,657	26,844	27,210	28,684	31,173	32,685	35,058	39,553	45,428	52,917	60,914	71,016	91,094	97,180
GDP (constant 2005 PPP $ million)	59,736	63,297	68,770	74,321	80,890	88,608	96,884	104,782	110,822	116,112	123,993	132,542	141,926	152,345	164,212	178,075	192,728	209,026	222,217	234,047
GDP/capita (constant 2000 $)	227	237	253	268	287	309	333	355	369	381	402	424	449	476	507	543	582	624	656	684
GDP/capita (current $)	98	143	144	189	230	288	337	361	361	374	402	416	441	492	558	642	731	843	1,070	1,130
GDP – Manufacturing (% of GDP)	13.9	13.8	14.5	14.6	14.7	15.2	15.8	16.5	17.2	17.7	18.6	19.3	20.2	20.9	21.4	22.4	23.3	24.3	25.1	24.5
Car Ownership (car/1,000 persons)	4	4	4	4	3	2	2	2	2	3	5	5	5	6	7	7	8	9	11	12
Basic Energy Indicators																				
TPES/capita (toe/person)	0.08	0.08	0.09	0.10	0.11	0.13	0.14	0.16	0.17	0.18	0.19	0.21	0.24	0.26	0.46	0.49	0.52	0.56	0.59	0.63
TFEC/capita (toe/person)	0.06	0.07	0.07	0.09	0.09	0.11	0.12	0.13	0.14	0.14	0.15	0.17	0.19	0.21	0.41	0.43	0.45	0.48	0.51	0.54
TPES/GDP (toe/constant 2000 $ million)	361	341	345	372	380	410	423	443	468	467	476	498	544	548	915	906	900	893	896	923
TFEC/GDP (toe/constant 2000 $ million)	280	280	295	329	330	356	363	367	373	380	383	403	431	444	811	797	776	770	773	795
Import Dependency (%)	–7.3	–38.1	–51.4	–50.0	–45.3	–48.7	–53.0	–55.4	–62.2	–71.2	–73.7	–65.2	–55.6	–56.8	–46.1	–47.9	–44.8	–36.5	–23.3	–21.9
Oil Import Dependency (%)	–0.4	–49.9	–75.7	–53.7	–56.3	–65.3	–65.3	–82.4	–93.5	–123.3	–113.2	–101.6	–78.0	–78.5	–106.1	–56.5	–41.8	–16.1	–10.2	–2.1
Electricity/capita (kWh/person)	94	98	101	113	131	156	183	206	235	255	289	328	378	433	491	560	646	726	798	894
CO_2 Intensity (t C/constant 2000 $ million)	331	317	306	335	340	365	376	407	423	407	419	431	471	480	471	471	490	482	510	529
CO_2/capita (t C)	0.08	0.08	0.08	0.09	0.10	0.11	0.13	0.14	0.16	0.16	0.17	0.18	0.21	0.23	0.24	0.26	0.28	0.30	0.33	0.36
CO_2/TPES (t C/toe)	0.92	0.93	0.89	0.90	0.89	0.89	0.89	0.92	0.90	0.87	0.88	0.87	0.87	0.88	0.52	0.52	0.54	0.54	0.57	0.57

– = no data or not applicable, CO_2 = carbon dioxide, GDP = gross domestic product, GWh = gigawatt–hour, kt C = thousand tons of carbon equivalent, ktoe = thousand tons of oil equivalent, kWh = kilowatt–hour, PPP = purchasing power parity, t C = ton of carbon equivalent, TFEC = total final energy consumption, toe = ton of oil equivalent, TPES = total primary energy supply.

Note: Figures may not add up to total because of rounding.

Sources: APERC (APEC Energy Database), APERC estimates, JAMA (2012), and World Bank.

Chapter 8

Developed Group

Developed Group

Regional Profile (2009)		Energy Reserves (year-end 2008)	
Total Surface Area (square kilometer)	8,310,110	Coal (million ton) - Recoverable	77,321.0
Population (thousand)	153,825	Gas (trillion cubic feet) - Proven	32.3
GDP (constant 2000 $ billion)	5,431.7	Oil (billion barrel) - Proven	2,565.0
Electrification Rate (%)	100.0		

GDP = gross domestic product.

Sources: ADB (2012), APERC estimates, World Bank, and WEC (2010).

2009 Energy Supply and Demand Flow (ktoe)

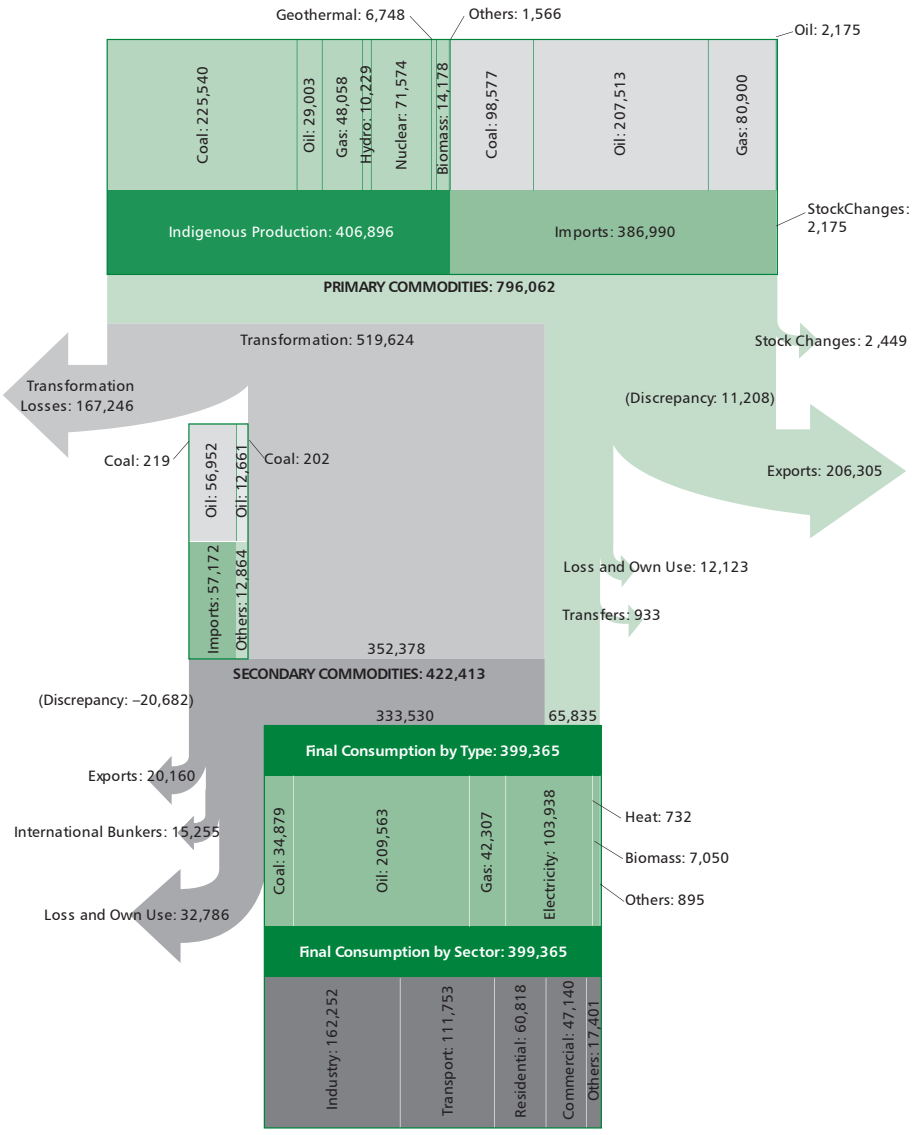


Table 8.1 Key Data and Economic Profile

	1990	1995	2000	2005	2009
Socioeconomic Data					
Population (thousand)	144,050	147,184	149,881	152,302	153,825
GDP (constant 2000 $ billion)	4,487.6	4,832.1	5,135.9	5,531.9	5,431.7
GDP (constant 2005 PPP $ billion)	3,699.4	3,995.3	4,284.3	4,644.7	4,603.5
GDP/capita (constant 2000 $)	31,153	32,830	34,267	36,322	35,311
GDP/capita (constant 2005 PPP $)	25,682	27,145	28,585	30,497	29,926

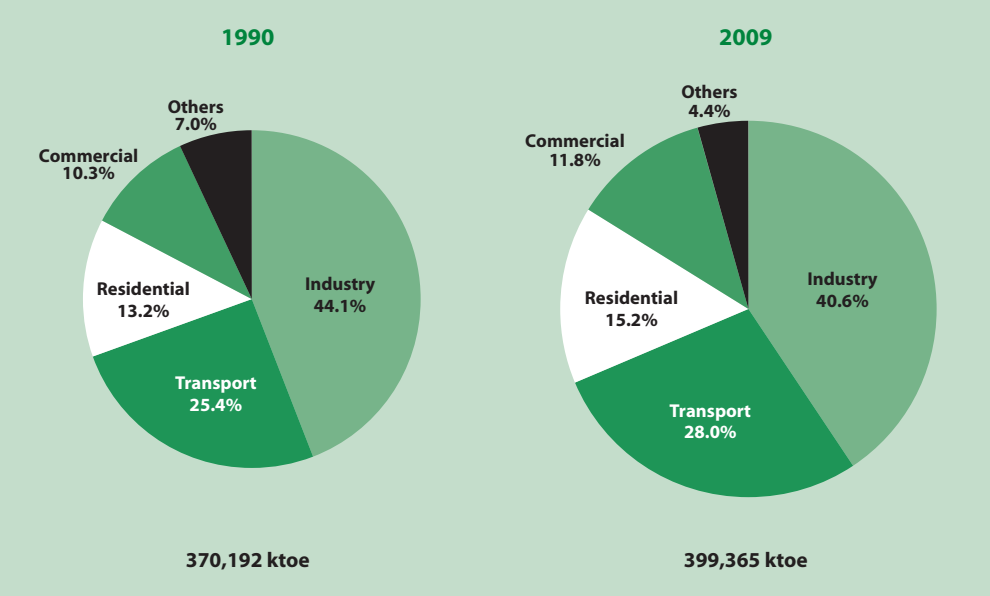
GDP = gross domestic product, PPP = purchasing power parity.
Source: World Bank.

Table 8.2 Energy Supply and Demand

	1990	1995	2000	2005	2009
Primary Energy Supply (ktoe)					
Indigenous Production	246,247	299,336	355,265	381,163	406,896
Net Imports	289,710	303,786	285,941	275,720	204,037
Total PES	535,957	603,122	641,206	656,883	610,933
Coal	111,613	121,526	141,028	165,696	151,057
Oil	284,499	305,400	296,289	285,914	244,716
Gas	62,740	72,844	89,070	97,108	110,866
Biomass	10,281	11,300	13,195	14,181	14,178
Others	66,823	92,052	101,624	93,983	90,117
TPES/capita (toe)	3.72	4.10	4.28	4.31	3.97
TPES/GDP (toe/constant 2005 PPP $ million)	145	151	150	141	133
Final Energy Consumption (ktoe)					
Industry	163,531	175,111	188,426	185,105	162,252
Transportation	94,159	108,009	116,863	118,756	111,753
Other Sectors	113,222	129,723	136,966	138,529	125,360
Total FEC	370,912	412,844	442,256	442,390	399,365
Coal	44,469	42,902	44,351	40,143	34,879
Oil	216,266	241,845	251,572	246,358	209,563
Gas	24,187	30,356	36,053	39,550	42,307
Electricity	77,590	88,931	100,715	107,371	103,938
Biomass	6,757	7,002	7,756	7,304	7,050
Others	1,643	1,808	1,810	1,664	1,627

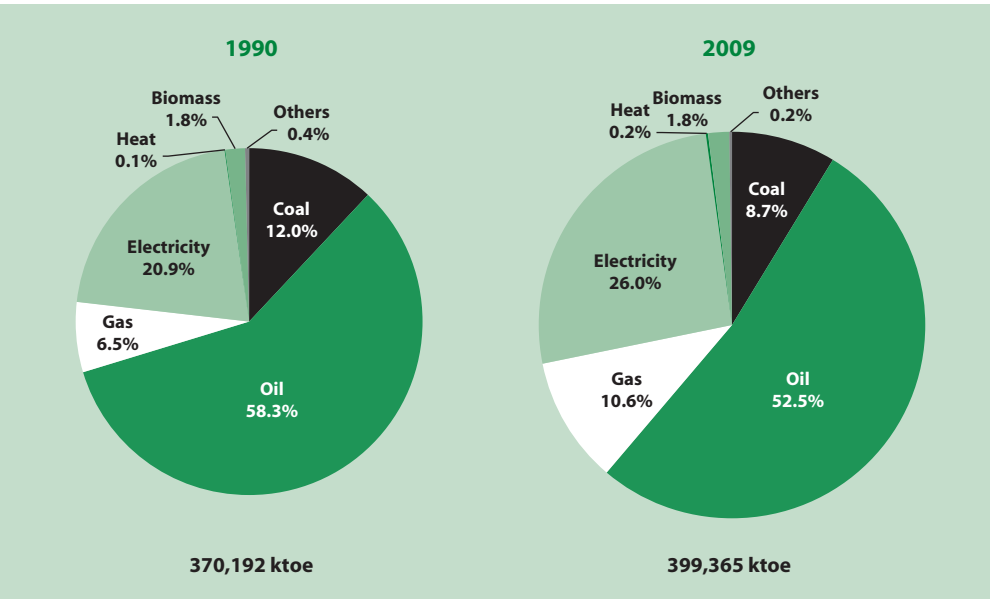
FEC = final energy consumption, GDP = gross domestic product, ktoe = thousand tons of oil equivalent, PES = primary energy supply, PPP = purchasing power parity, toe = ton of oil equivalent, TPES = total primary energy supply.
Sources: APERC (APEC Energy Database).

Figure 8.1 Final Energy Consumption by Sector, 1990 and 2009



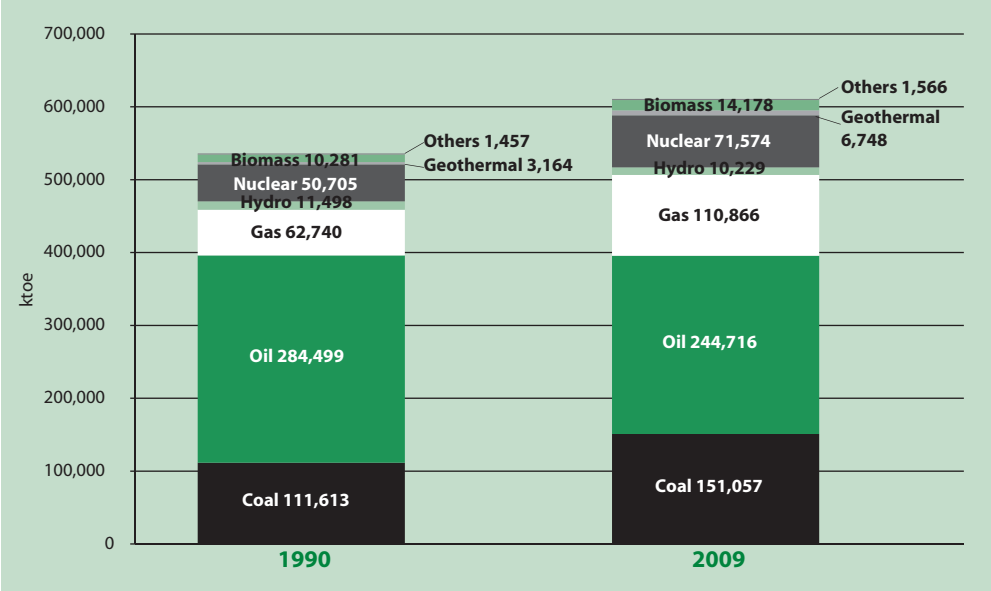
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 8.2 Final Energy Consumption by Type of Energy, 1990 and 2009



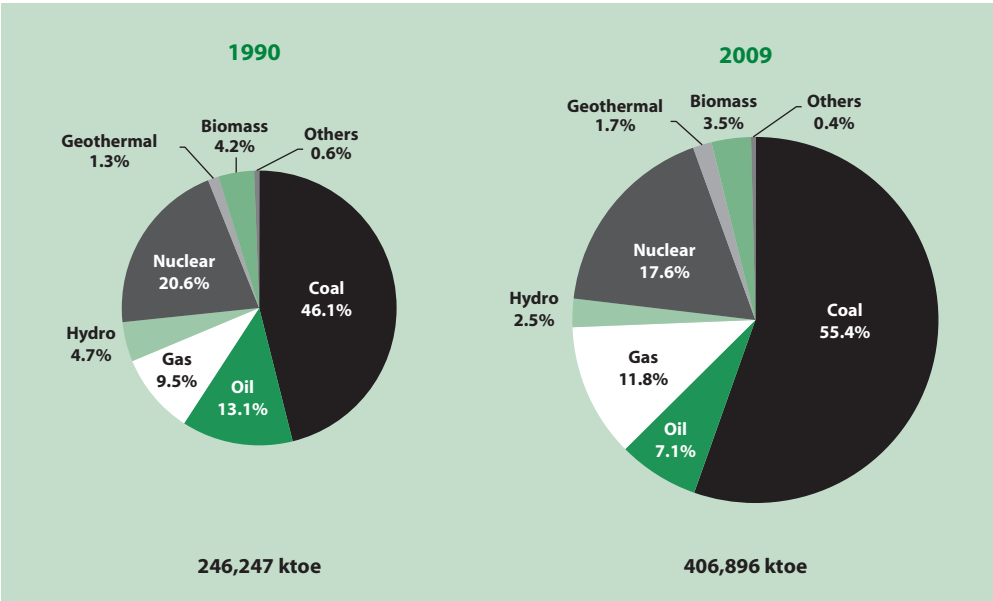
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 8.3 Total Primary Energy Supply, 1990 and 2009



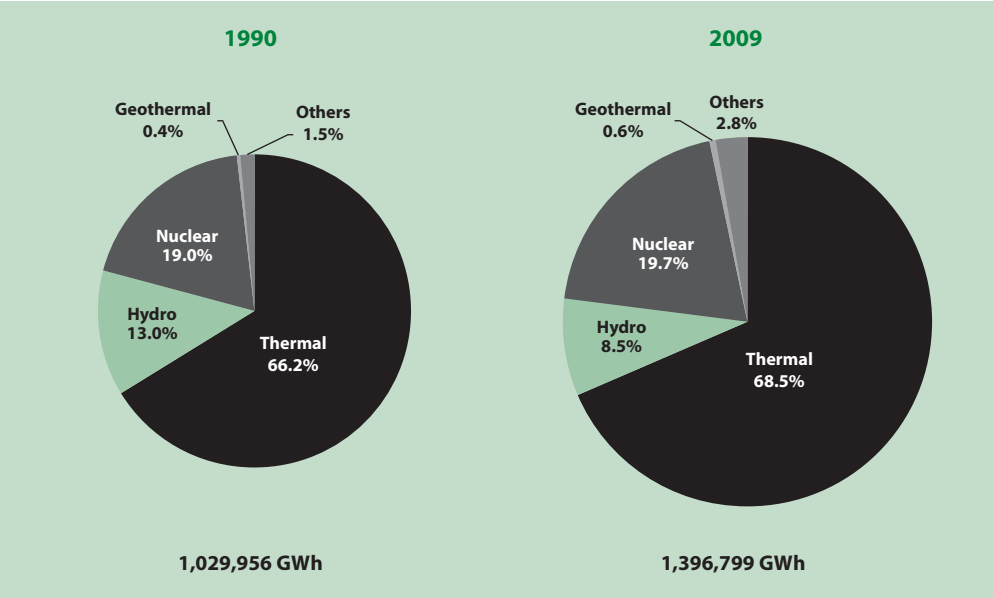
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 8.4 Indigenous Energy Production, 1990 and 2009



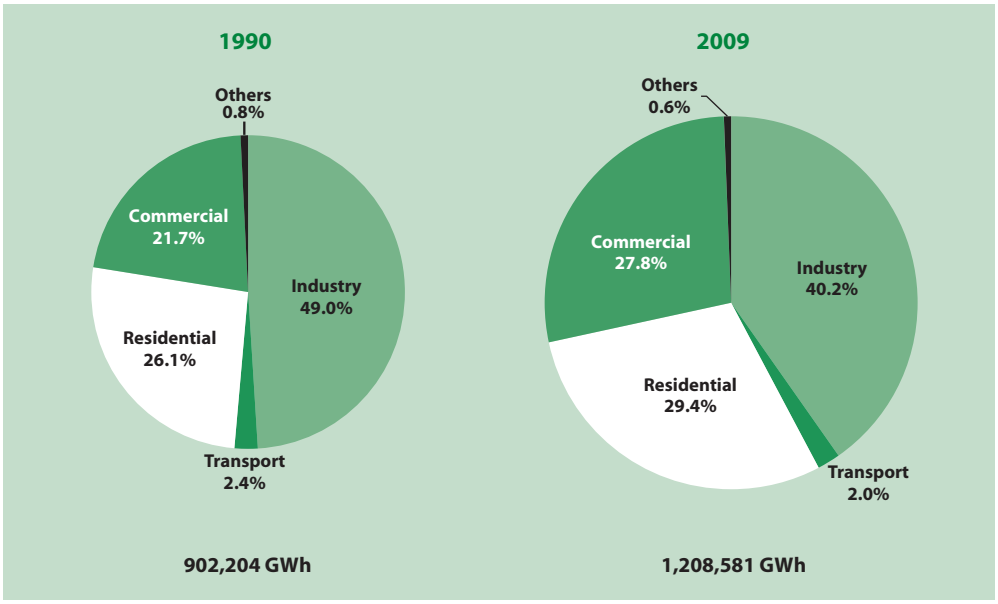
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 8.5 Electricity Generation by Plant Type, 1990 and 2009



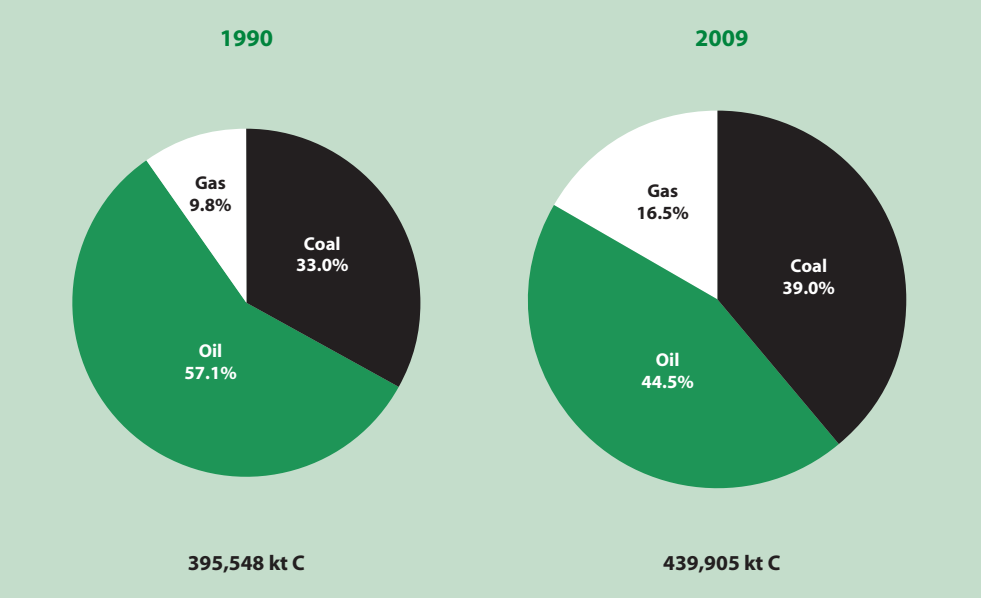
GWh = gigawatt-hour.
Source: APERC (APEC Energy Database).

Figure 8.6 Electricity Consumption by Sector, 1990 and 2009



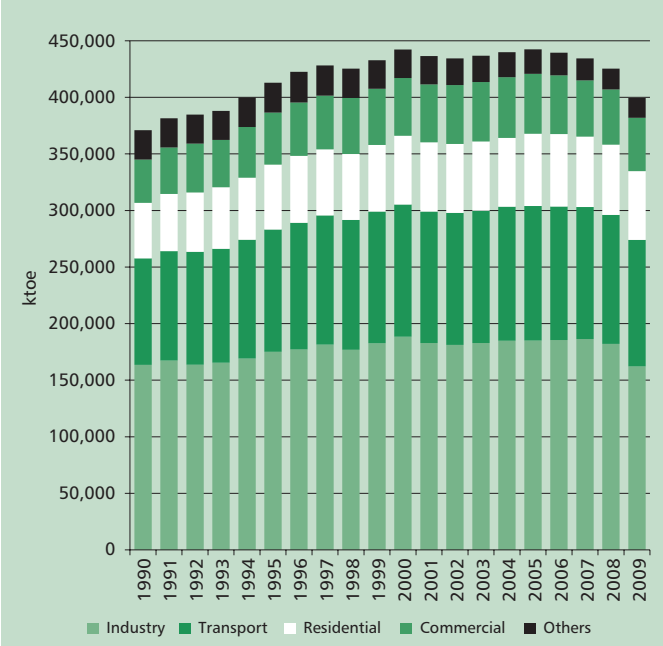
GWh = gigawatt-hour.
Source: APERC (APEC Energy Database).

Figure 8.7 Carbon Dioxide Emissions from Fuel Combustion, 1990 and 2009



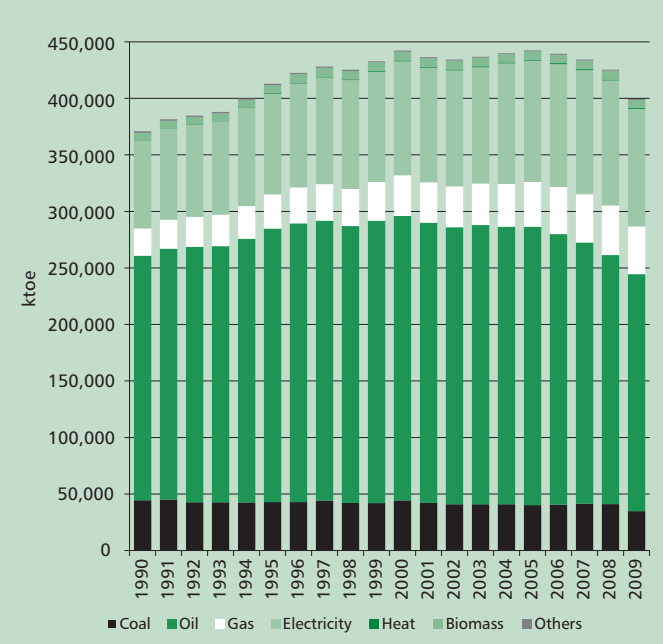
kt C = thousand tons of carbon equivalent.
Source: APERC estimates.

Figure 8.8 Final Energy Consumption by Sector, 1990–2009



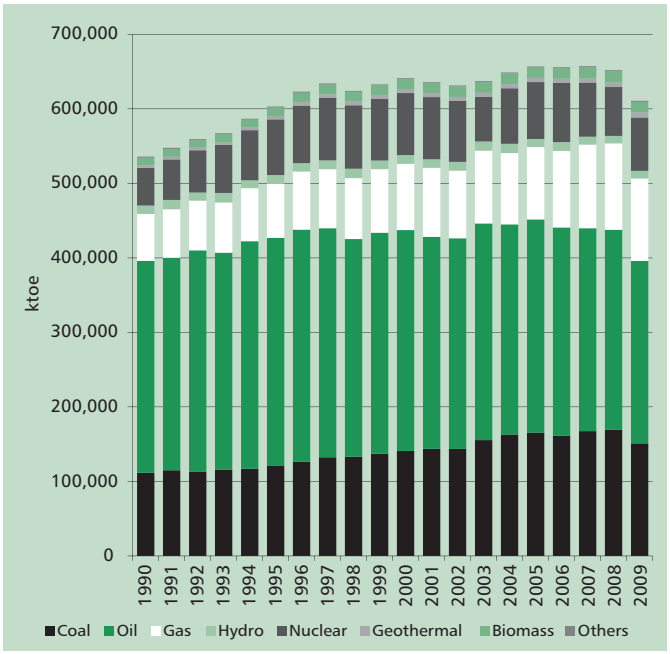
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 8.9 Final Energy Consumption by Type, 1990–2009



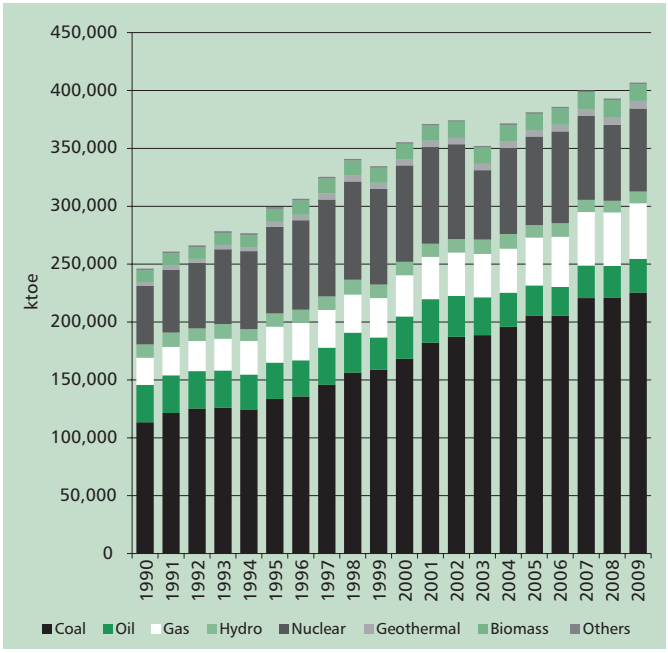
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 8.10 Total Primary Energy Supply, 1990–2009



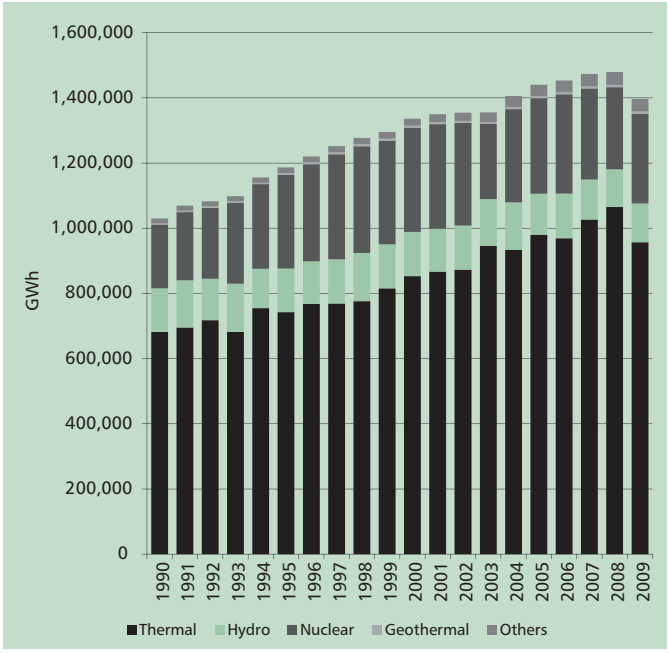
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 8.11 Indigenous Energy Production, 1990–2009



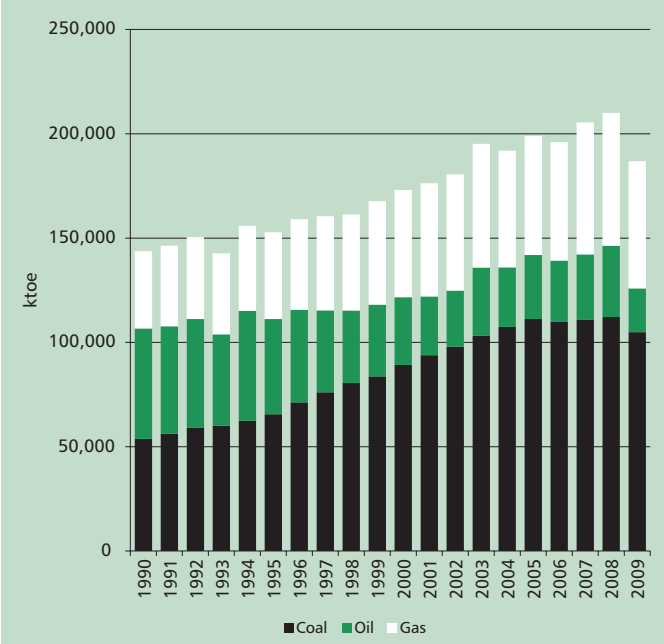
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 8.12 Electricity Generation by Source, 1990–2009



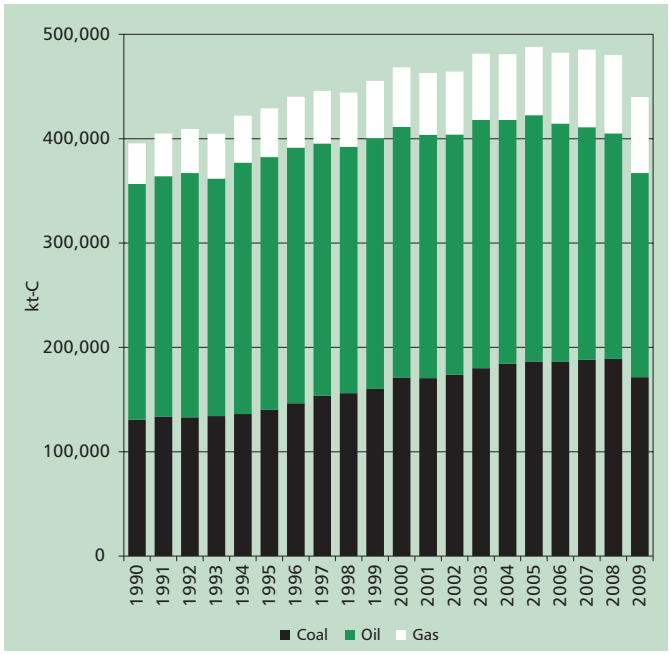
GWh = gigawatt-hour.
Source: APERC (APEC Energy Database).

Figure 8.13 Fuel Input for Electricity Generation, 1990–2009



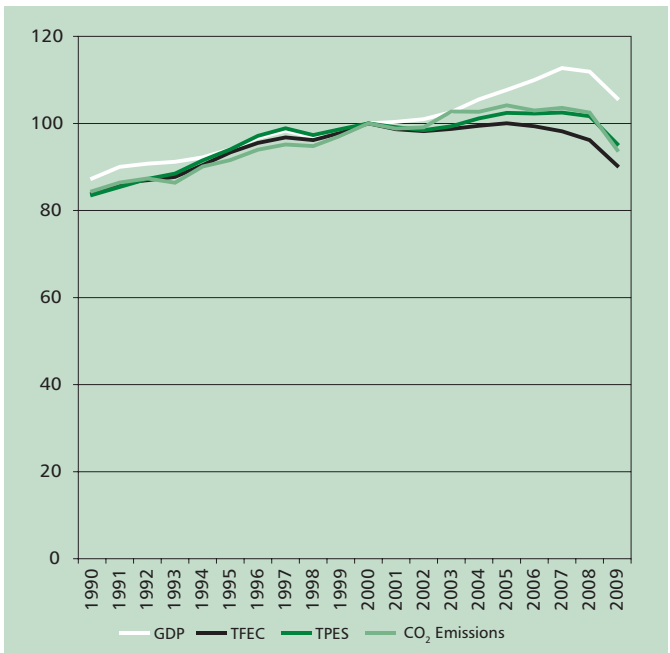
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 8.14 Carbon Dioxide Emissions from Fuel Combustion, 1990–2009



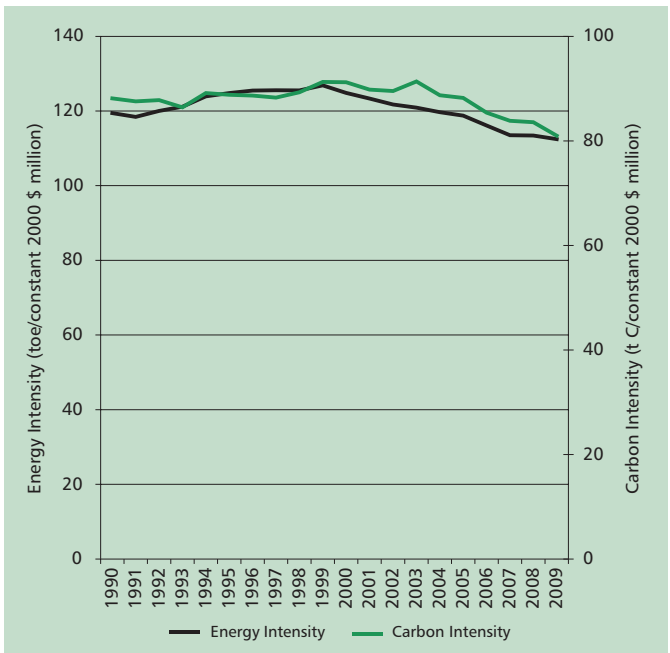
kt C = thousand tons of carbon equivalent.
Source: APERC estimates.

Figure 8.15 Growth of GDP, TFEC, TPES, and CO_2 (indexed to year 2000), 1990–2009



CO_2 = carbon dioxide, GDP = gross domestic product, TFEC = total final energy consumption, TPES = total primary energy supply.
Note: Indices are measured relative to the base year 2000 (2000 = 100).
Source: APERC estimates.

Figure 8.16 Energy and Carbon Intensities, 1990–2009



t C = ton of carbon equivalent, toe = ton of oil equivalent.
Source: APERC estimates.

Table 8.3 Developed Group Energy Balance Table, 2006

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	205,394	0	24,919	0	0	0	0	0	0	0	43,305	11,803	79,298	5,673	9	201	14,268	1,042	0	0	385,912
2.	Imports	108,991	1,218	235,095	64,320	5,628	973	6,303	5,143	16,751	29,522	74,208	0	0	0	0	0	2	0	0	0	483,833
3.	Exports	−151,919	−1,321	−13,230	−11,037	−850	−295	−3,877	−3,755	−86	−2,173	−14,611	0	0	0	0	0	0	0	0	0	−192,118
4.	International Bunkers	0	0	0	−17,989	0	0	−276	−7,319	0	−10,394	0	0	0	0	0	0	0	0	0	0	−17,989
5.	Stock Changes	−383	−527	−1,029	−1,706	−21	−780	−177	−456	−367	95	−25	0	0	0	0	0	0	0	0	0	−3,670
6.	Total Primary Energy Supply	162,084	−631	245,755	33,587	4,757	−102	1,973	−6,387	16,297	17,049	102,877	11,803	79,298	5,673	9	201	14,269	1,042	0	0	655,968
7.	Transfers	0	0	−1,303	7,246	−18	1	0	0	824	6,439	0	0	0	0	0	0	0	0	0	0	5,943
8.	Total Transformation Sector	−146,376	30,776	−247,828	219,270	60,121	22,174	45,058	37,602	4,490	49,824	−56,524	−11,803	−79,298	−5,673	−9	−201	−9,828	−207	124,995	911	−181,794
8.1	Power Generation	−102,402	−7,658	−6,557	−22,630	0	−139	−633	−18,605	−598	−2,654	−57,413	−11,803	−79,298	−5,673	−9	−201	−9,780	−207	124,995	911	−177,725
8.2	Gas Processing	0	−13	0	−1,144	0	0	0	0	−1,144	0	969	0	0	0	0	0	0	0	0	0	−187
8.3	Refineries	0	0	−246,890	249,290	60,121	22,313	45,692	56,229	6,232	58,703	0	0	0	0	0	0	0	0	0	0	2,400
8.4	Coal Transformation	−43,974	38,447	0	−568	0	0	−1	−21	0	−546	−79	0	0	0	0	0	0	0	0	0	−6,175
8.5.	Other Transformation	0	0	5,619	−5,679	0	0	0	0	0	−5,679	0	0	0	0	0	0	−48	0	0	0	−107
9.	Loss and Own Use	−172	−3,684	−22	−15,486	0	−147	−1,012	−2,043	−745	−11,539	−9,016	0	0	0	0	0	0	0	−15,599	0	−43,978
10.	Discrepancy	2,439	−3,843	3,435	−5,282	402	−121	888	211	1,880	−8,542	4,401	0	0	0	0	0	3,044	0	−787	−133	3,273
11.	Total Final Energy Consumption	17,975	22,619	37	239,335	65,262	21,805	46,907	29,384	22,746	53,231	41,738	0	0	0	0	0	7,486	835	108,609	778	439,412
12.	Industry Sector	17,724	21,603	37	72,131	120	4,738	6,434	12,880	9,502	38,457	21,102	0	0	0	0	0	5,879	141	46,914	0	185,531
13.	Transport Sector	81	0	0	115,394	64,980	0	35,896	4,792	3,056	6,670	380	0	0	0	0	0	0	0	2,084	0	117,939
14.	Other Sectors	171	1,016	0	43,406	162	17,062	4,577	11,712	9,895	0	19,318	0	0	0	0	0	1,607	694	59,611	778	126,601
14.1	Residential and Commercial	125	1,016	0	33,622	3	14,823	804	8,134	9,858	0	19,277	0	0	0	0	0	1,607	681	58,902	695	115,925
14.1.1	Commerce and Public Services	108	995	0	13,978	3	2,104	762	8,134	2,975	0	7,431	0	0	0	0	0	14	86	28,622	664	51,899
14.1.2	Residential	17	21	0	19,644	0	12,719	43	0	6,883	0	11,846	0	0	0	0	0	1,593	595	30,279	31	64,026
14.2	Non-Specified Others	45	0	0	9,784	159	2,239	3,772	3,578	36	0	41	0	0	0	0	0	0	13	709	83	10,676
15.	Non-Energy Use	0	0	0	8,403	0	5	0	0	294	8,104	937	0	0	0	0	0	0	0	0	0	9,340
16.	Electricity Output (GWh)	527,078	0	145,416	0	0	0	0	0	0	0	296,768	137,250	304,291	6,508	111	4,431	24,431	6,869	0	0	1,453,151
17.	Heat Output (TJ)	784	0	1,098	0	0	0	0	0	0	0	20,848	0	0	0	0	0	0	13,573	0	0	36,303

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Source: APERC (APEC Energy Database).

Table 8.4 Developed Group Energy Balance Table, 2007

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	220,687	0	28,220	0	0	0	0	0	0	0	46,066	10,594	72,710	5,733	11	304	14,662	1,103	0	0	400,090
2.	Imports	114,203	1,419	231,902	58,762	4,135	283	5,845	4,974	16,023	27,501	83,035	0	0	0	0	0	0	0	0	0	489,321
3.	Exports	−159,759	−1,073	−16,767	−15,180	−1,012	−607	−6,959	−3,376	−129	−3,097	−16,760	0	0	0	0	0	0	0	0	0	−209,539
4.	International Bunkers	0	0	0	−17,276	0	0	−216	−6,875	0	−10,186	0	0	0	0	0	0	0	0	0	0	−17,276
5.	Stock Changes	−7,443	−506	1,981	647	−96	466	−45	236	290	−205	−20	0	0	0	0	0	0	0	0	0	−5,341
6.	Total Primary Energy Supply	167,688	−160	245,336	26,953	3,028	142	−1,375	−5,040	16,184	14,014	112,321	10,594	72,710	5,733	11	304	14,662	1,103	0	0	657,255
7.	Transfers	0	0	−1,096	8,639	0	1	1	0	728	7,909	0	0	0	0	0	0	0	0	0	0	7,543
8.	Total Transformation Sector	−147,076	30,850	−248,833	217,081	61,420	19,199	47,573	31,605	4,706	52,578	−63,167	−10,594	−72,710	−5,733	−11	−304	−10,015	−205	126,741	895	−183,080
8.1	Power Generation	−103,226	−7,761	−7,787	−23,473	0	−52	−497	−19,658	−634	−2,631	−63,917	−10,594	−72,710	−5,733	−11	−304	−9,915	−205	126,741	895	−178,000
8.2	Gas Processing	0	0	0	−981	0	0	−13	0	−967	0	833	0	0	0	0	0	0	0	0	0	−147
8.3	Refineries	0	0	−246,861	247,925	61,420	19,251	48,084	51,284	6,307	61,578	0	0	0	0	0	0	0	0	0	0	1,064
8.4	Coal Transformation	−43,850	38,611	0	−581	0	0	0	−21	0	−560	−82	0	0	0	0	0	0	0	0	0	−5,903
8.5.	Other Transformation	0	0	5,815	−5,809	0	0	0	0	0	−5,809	0	0	0	0	0	0	−100	0	0	0	−94
9.	Loss and Own Use	−223	−3,759	−92	−15,270	0	−105	−828	−1,999	−743	−11,594	−11,356	0	0	0	0	0	0	0	−16,214	0	−46,913
10.	Discrepancy	−1,665	−4,337	4,724	−6,256	230	−107	1,591	−313	1,393	−9,051	4,947	0	0	0	0	0	3,095	0	−809	−112	−414
11.	Total Final Energy Consumption	18,724	22,594	38	231,147	64,678	19,130	46,962	24,252	22,268	53,856	42,746	0	0	0	0	0	7,742	898	109,719	784	434,390
12.	Industry Sector	18,481	21,705	38	69,053	158	3,911	6,534	10,612	9,319	38,519	22,828	0	0	0	0	0	6,095	145	47,950	0	186,295
13.	Transport Sector	87	0	0	114,176	64,352	1	35,913	4,206	2,692	7,012	397	0	0	0	0	0	0	0	2,066	0	116,725
14.	Other Sectors	156	889	0	39,245	167	15,215	4,516	9,435	9,913	0	18,573	0	0	0	0	0	1,647	752	59,703	784	121,749
14.1	Residential and Commercial	123	889	0	30,352	9	13,249	814	6,406	9,875	0	18,532	0	0	0	0	0	1,647	739	58,990	701	111,975
14.1.1	Commerce and Public Services	110	870	0	12,024	9	1,892	770	6,406	2,948	0	7,101	0	0	0	0	0	14	86	28,800	670	49,677
14.1.2	Residential	14	19	0	18,328	0	11,357	44	0	6,927	0	11,431	0	0	0	0	0	1,633	653	30,190	31	62,298
14.2	Non-Specified Others	33	0	0	8,893	159	1,966	3,701	3,029	38	0	40	0	0	0	0	0	0	13	713	82	9,775
15.	Non-Energy Use	0	0	0	8,672	0	3	0	0	344	8,325	948	0	0	0	0	0	0	0	0	0	9,620
16.	Electricity Output (GWh)	536,912	0	158,444	0	0	0	0	0	0	0	331,205	123,188	279,009	6,580	135	6,061	25,071	6,853	0	0	1,473,457
17.	Heat Output (TJ)	783	0	679	0	0	0	0	0	0	0	21,263	0	0	0	0	0	0	13,406	0	0	36,130

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Source: APERC (APEC Energy Database).

Table 8.5 Developed Group Energy Balance Table, 2008

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	220,864	0	27,630	0	0	0	0	0	0	0	46,312	9,976	65,605	6,103	14	357	15,206	1,077	0	0	393,143
2.	Imports	117,333	1,110	236,397	60,971	4,128	222	7,450	6,819	16,643	25,708	85,653	0	0	0	0	0	1	0	0	0	501,466
3.	Exports	−165,745	−650	−17,624	−20,861	−1,185	−444	−11,069	−3,863	−166	−4,135	−15,995	0	0	0	0	0	0	0	0	0	−220,875
4.	International Bunkers	0	0	0	−16,787	0	0	−125	−6,676	0	−9,986	0	0	0	0	0	0	0	0	0	0	−16,787
5.	Stock Changes	−2,783	−456	−1,629	−54	98	703	−423	72	−426	−76	−10	0	0	0	0	0	0	0	0	0	−4,932
6.	Total Primary Energy Supply	169,669	4	244,775	23,269	3,041	481	−4,167	−3,649	16,051	11,511	115,960	9,976	65,605	6,103	14	357	15,207	1,077	0	0	652,015
7.	Transfers	0	0	−868	9,399	−22	9	−1	−1	485	8,929	0	0	0	0	0	0	0	0	0	0	8,531
8.	Total Transformation Sector	−148,436	31,085	−246,463	213,175	59,900	17,194	51,280	27,927	4,576	52,298	−63,626	−9,976	−65,605	−6,103	−14	−357	−10,471	−189	127,254	865	−178,859
8.1	Power Generation	−104,741	−7,434	−9,439	−24,720	0	−42	−667	−20,798	−721	−2,492	−64,336	−9,976	−65,605	−6,103	−14	−357	−10,319	−189	127,254	865	−175,113
8.2	Gas Processing	0	0	0	−946	0	0	0	0	−946	0	793	0	0	0	0	0	0	0	0	0	−154
8.3	Refineries	0	0	−242,371	244,850	59,900	17,235	51,947	48,746	6,243	60,779	0	0	0	0	0	0	0	0	0	0	2,480
8.4	Coal Transformation	−43,694	38,519	0	−727	0	0	0	−21	0	−706	−82	0	0	0	0	0	0	0	0	0	−5,984
8.5.	Other Transformation	0	0	5,347	−5,282	0	0	0	0	0	−5,282	0	0	0	0	0	0	−152	0	0	0	−87
9.	Loss and Own Use	−299	−3,856	−92	−14,535	−1	−72	−839	−1,865	−725	−11,035	−11,091	0	0	0	0	0	0	0	−16,056	0	−45,930
10.	Discrepancy	−1,825	−5,192	2,687	−11,172	−324	−171	84	−271	419	−10,908	2,768	0	0	0	0	0	3,032	0	−657	−112	−10,471
11.	Total Final Energy Consumption	19,109	22,041	39	220,135	62,593	17,441	46,357	22,142	20,807	50,795	44,011	0	0	0	0	0	7,768	888	110,541	754	425,286
12.	Industry Sector	18,868	21,330	39	64,085	104	3,264	6,431	9,941	8,597	35,748	23,670	0	0	0	0	0	6,159	146	47,785	0	182,081
13.	Transport Sector	73	0	0	111,483	62,329	1	35,515	3,873	2,559	7,206	404	0	0	0	0	0	0	0	2,096	0	114,057
14.	Other Sectors	168	712	0	36,434	160	14,171	4,411	8,327	9,365	0	18,863	0	0	0	0	0	1,609	743	60,660	754	119,941
14.1	Residential and Commercial	128	712	0	28,127	4	12,383	785	5,627	9,328	0	18,825	0	0	0	0	0	1,609	725	59,965	679	110,770
14.1.1	Commerce and Public Services	119	694	0	10,840	4	1,623	750	5,627	2,835	0	7,189	0	0	0	0	0	14	85	29,086	648	48,675
14.1.2	Residential	9	18	0	17,287	0	10,759	35	0	6,493	0	11,636	0	0	0	0	0	1,595	640	30,879	31	62,096
14.2	Non-Specified Others	40	0	0	8,308	156	1,788	3,626	2,700	38	0	37	0	0	0	0	0	0	17	695	74	9,171
15.	Non-Energy Use	0	0	0	8,132	0	5	0	0	286	7,841	1,074	0	0	0	0	0	0	0	0	0	9,206
16.	Electricity Output (GWh)	550,994	0	172,700	0	0	0	0	0	0	0	341,211	115,998	251,744	7,018	170	6,898	25,953	6,699	0	0	1,479,387
17.	Heat Output (TJ)	693	0	587	0	0	0	0	0	0	0	20,767	0	0	0	0	0	0	12,733	0	0	34,780

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.
Note: Figures may not add up to total because of rounding.
Source: APERC (APEC Energy Database).

Table 8.6 Developed Group Energy Balance Table, 2009

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	225,540	0	29,003	0	0	0	0	0	0	0	48,058	10,229	71,574	6,748	24	454	14,178	1,088	0	0	406,896
2.	Imports	98,577	219	207,513	56,952	4,962	309	7,992	4,054	14,311	25,325	80,900	0	0	0	0	0	0	0	0	0	444,162
3.	Exports	−170,526	−580	−17,759	−19,581	−1,033	−290	−10,584	−4,054	−202	−3,418	−18,020	0	0	0	0	0	0	0	0	0	−226,465
4.	International Bunkers	0	0	0	−15,255	0	0	−103	−6,024	0	−9,128	0	0	0	0	0	0	0	0	0	0	−15,255
5.	Stock Changes	−2,376	202	2,175	1,667	−17	203	36	421	575	449	−73	0	0	0	0	0	0	0	0	0	1,596
6.	Total Primary Energy Supply	151,215	−158	220,932	23,784	3,911	222	−2,659	−5,603	14,684	13,228	110,866	10,229	71,574	6,748	24	454	14,178	1,088	0	0	610,933
7.	Transfers	0	0	−933	10,994	−1	0	0	0	619	10,377	0	0	0	0	0	0	0	0	0	0	10,061
8.	Total Transformation Sector	−135,421	25,530	−224,120	205,850	60,086	16,931	48,746	27,179	4,702	48,204	−61,016	−10,229	−71,574	−6,748	−24	−454	−9,845	−193	120,153	845	−167,246
8.1	Power Generation	−98,498	−6,375	−3,352	−17,637	0	−26	−659	−13,620	−613	−2,720	−61,655	−10,229	−71,574	−6,748	−24	−454	−9,624	−193	120,153	845	−165,365
8.2	Gas Processing	0	0	0	−875	0	0	0	0	−875	0	706	0	0	0	0	0	0	0	0	0	−169
8.3	Refineries	0	0	−226,117	230,220	60,086	16,957	49,405	40,816	6,190	56,764	0	0	0	0	0	0	0	0	0	0	4,102
8.4	Coal Transformation	−36,923	31,905	0	−653	0	0	0	−17	0	−636	−67	0	0	0	0	0	0	0	0	0	−5,739
8.5.	Other Transformation	0	0	5,350	−5,205	0	0	0	0	0	−5,205	0	0	0	0	0	0	−220	0	0	0	−76
9.	Loss and Own Use	−302	−3,257	−110	−14,118	0	−76	−906	−1,665	−791	−10,679	−11,712	0	0	0	0	0	0	0	−15,412	0	−44,910
10.	Discrepancy	53	−2,781	4,268	−16,984	−1,534	−344	−633	−1,457	223	−13,240	4,169	0	0	0	0	0	2,717	0	−804	−113	−9,474
11.	Total Final Energy Consumption	15,544	19,334	38	209,525	62,462	16,734	44,548	18,455	19,437	47,890	42,307	0	0	0	0	0	7,050	895	103,938	732	399,365
12.	Industry Sector	15,365	18,770	38	58,558	103	3,140	6,064	7,889	7,681	33,681	22,029	0	0	0	0	0	5,511	151	41,829	0	162,252
13.	Transport Sector	79	0	0	109,199	62,183	0	34,219	3,422	2,531	6,844	418	0	0	0	0	0	0	0	2,057	0	111,753
14.	Other Sectors	100	564	0	34,099	177	13,588	4,264	7,143	8,927	0	18,716	0	0	0	0	0	1,539	744	60,052	732	116,547
14.1	Residential and Commercial	83	564	0	26,307	4	11,868	723	4,828	8,884	0	18,674	0	0	0	0	0	1,539	727	59,406	658	107,959
14.1.1	Commerce and Public Services	64	549	0	9,803	4	1,580	689	4,828	2,702	0	7,129	0	0	0	0	0	13	84	28,872	627	47,140
14.1.2	Residential	19	15	0	16,505	0	10,288	34	0	6,183	0	11,546	0	0	0	0	0	1,526	643	30,534	31	60,818
14.2	Non-Specified Others	17	0	0	7,791	173	1,720	3,541	2,315	42	0	42	0	0	0	0	0	0	17	646	74	8,588
15.	Non-Energy Use	0	0	0	7,669	0	5	0	0	299	7,366	1,143	0	0	0	0	0	0	0	0	0	8,813
16.	Electricity Output (GWh)	517,382	0	111,038	0	0	0	0	0	0	0	328,484	118,947	274,651	7,764	292	8,704	22,866	6,670	0	0	1,396,799
17.	Heat Output (TJ)	273	0	436	0	0	0	0	0	0	0	20,344	0	0	0	0	0	0	12,824	0	0	33,877

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Source: APERC (APEC Energy Database).

Table 8.7 Developed Group Summary Table, 1990–2009

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Indigenous Production (ktoe)																				
Coal	113,459	121,497	125,278	126,089	124,498	133,613	135,726	145,690	156,362	158,784	168,371	182,282	187,270	188,615	195,865	205,683	205,394	220,687	220,864	225,540
Oil	32,272	32,449	32,273	32,029	30,144	31,298	31,253	32,188	34,415	27,843	36,499	37,525	35,290	32,700	29,537	26,007	24,919	28,220	27,630	29,003
Gas	23,412	24,551	26,104	27,460	28,901	31,073	32,399	32,545	33,034	34,136	35,576	36,541	37,526	37,542	38,037	41,309	43,305	46,066	46,312	48,058
Hydro	11,498	12,421	10,941	12,695	10,395	11,508	11,266	11,699	12,722	11,620	11,643	11,334	11,609	12,399	12,591	10,836	11,803	10,594	9,976	10,229
Nuclear	50,705	54,386	56,559	64,551	67,299	74,763	77,268	83,693	84,949	82,671	83,163	83,532	81,896	59,958	74,497	76,366	79,298	72,710	65,605	71,574
Geothermal	3,164	3,439	3,453	3,494	3,487	4,321	4,885	5,154	5,217	5,329	5,501	5,382	5,407	5,397	5,403	5,560	5,673	5,733	6,103	6,748
Solar	0	0	1	1	1	2	2	2	3	3	4	4	5	6	7	8	9	11	14	24
Wind	0	0	0	0	0	1	1	2	3	6	15	30	45	73	92	129	201	304	357	454
Biomass	10,281	10,593	10,148	10,749	10,594	11,300	12,279	12,950	12,828	12,973	13,195	13,202	14,061	14,251	14,397	14,181	14,268	14,662	15,206	14,178
Others	1,457	1,486	1,445	1,416	1,415	1,458	1,466	1,470	1,379	1,292	1,299	1,260	1,222	1,157	1,116	1,085	1,042	1,103	1,077	1,088
Total	246,247	260,821	266,202	278,484	276,734	299,336	306,546	325,393	340,911	334,658	355,265	371,092	374,331	352,099	371,542	381,163	385,912	400,090	393,143	406,896
Primary Energy Supply (ktoe)																				
Coal	111,613	114,931	113,256	115,604	117,162	121,526	126,601	132,397	133,265	137,120	141,028	143,888	143,602	155,474	163,011	165,696	161,453	167,528	169,673	151,057
Oil	284,499	285,315	296,944	291,419	305,179	305,400	311,451	307,469	292,081	296,628	296,289	284,374	282,783	290,779	282,097	285,914	279,342	272,289	268,044	244,716
Gas	62,740	65,134	66,714	67,412	71,341	72,844	77,845	79,329	81,750	85,290	89,070	92,799	90,774	97,673	95,537	97,108	102,877	112,321	115,960	110,866
Hydro	11,498	12,421	10,941	12,695	10,395	11,508	11,266	11,699	12,722	11,620	11,643	11,334	11,609	12,399	12,591	10,836	11,803	10,594	9,976	10,229
Nuclear	50,705	54,386	56,559	64,551	67,299	74,763	77,268	83,693	84,949	82,671	83,163	83,532	81,896	59,958	74,497	76,366	79,298	72,710	65,605	71,574
Geothermal	3,164	3,439	3,453	3,494	3,487	4,321	4,885	5,154	5,217	5,329	5,501	5,382	5,407	5,397	5,403	5,560	5,673	5,733	6,103	6,748
Solar	0	0	1	1	1	2	2	2	3	3	4	4	5	6	7	8	9	11	14	24
Wind	0	0	0	0	0	1	1	2	3	6	15	30	45	73	92	129	201	304	357	454
Biomass	10,281	10,593	10,148	10,749	10,594	11,300	12,279	12,950	12,828	12,973	13,195	13,202	14,061	14,251	14,397	14,181	14,269	14,662	15,207	14,178
Others	1,457	1,486	1,445	1,416	1,415	1,458	1,466	1,470	1,379	1,292	1,299	1,260	1,222	1,157	1,116	1,085	1,042	1,103	1,077	1,088
Total	535,957	547,704	559,461	567,341	586,874	603,122	623,065	634,165	624,196	632,932	641,206	635,805	631,404	637,168	648,748	656,883	655,968	657,255	652,015	610,933
Final Energy Consumption by Sector (ktoe)																				
Industry	163,531	167,429	163,629	165,525	169,230	175,111	177,125	181,506	176,866	182,615	188,426	182,802	181,219	182,800	184,823	185,105	185,531	186,295	182,081	162,252
Transport	94,159	96,633	99,795	100,627	104,880	108,009	111,914	114,067	114,698	116,369	116,863	116,168	116,602	117,003	118,476	118,756	117,939	116,725	114,057	111,753
Residential	49,021	50,530	52,513	54,437	54,909	57,402	59,264	58,460	58,372	58,906	60,772	61,234	61,011	61,201	60,891	63,919	64,026	62,298	62,096	60,818
Commercial	38,306	41,103	43,207	41,688	44,768	45,956	47,165	47,515	49,395	49,710	51,057	51,252	52,054	52,533	53,601	53,006	51,899	49,677	48,675	47,140
Others	25,895	25,838	25,541	25,699	26,106	26,365	27,067	26,603	26,015	25,118	25,138	24,981	23,578	23,216	22,046	21,604	20,016	19,395	18,377	17,401
Total	370,912	381,533	384,684	387,977	399,894	412,844	422,535	428,152	425,347	432,718	442,256	436,437	434,464	436,753	439,836	442,390	439,412	434,390	425,286	399,365

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Table 8.7 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Final Energy Consumption by Type (ktoe)																				
Coal	44,469	45,035	42,661	42,644	42,507	42,902	42,854	44,150	42,149	41,905	44,351	42,136	40,995	40,953	40,993	40,143	40,594	41,318	41,150	34,879
Oil	216,266	221,952	226,029	226,667	233,282	241,845	246,560	247,603	244,841	249,816	251,572	247,806	245,033	246,927	245,406	246,358	239,372	231,185	220,174	209,563
Gas	24,187	25,612	26,542	27,807	28,872	30,356	31,796	32,384	33,017	34,264	36,053	35,793	36,093	36,771	37,906	39,550	41,738	42,746	44,011	42,307
Electricity	77,590	80,420	81,368	82,218	86,829	88,931	91,913	94,335	96,082	97,575	100,715	101,389	102,670	102,863	106,697	107,371	108,609	109,719	110,541	103,938
Heat	261	317	347	372	438	540	612	661	688	717	741	748	758	760	788	797	778	784	754	732
Biomass	6,757	6,812	6,401	6,958	6,670	7,002	7,573	7,804	7,432	7,379	7,756	7,530	7,922	7,556	7,157	7,304	7,486	7,742	7,768	7,050
Others	1,383	1,386	1,337	1,311	1,295	1,268	1,227	1,216	1,138	1,062	1,069	1,035	995	923	889	867	835	898	888	895
Total	370,912	381,533	384,684	387,977	399,894	412,844	422,535	428,152	425,347	432,718	442,256	436,437	434,464	436,753	439,836	442,390	439,412	434,390	425,286	399,365
Power Generation (GWh)																				
Thermal	681,779	695,671	717,597	681,945	754,774	742,382	767,719	768,940	776,268	815,713	853,201	866,731	873,172	945,520	933,136	980,038	969,261	1,026,561	1,064,906	956,905
Hydro	133,692	144,426	127,224	147,622	120,869	133,815	131,004	136,031	147,931	135,115	135,381	131,706	134,990	143,890	146,348	126,001	137,250	123,188	115,998	118,947
Nuclear	195,797	209,451	218,076	248,656	259,567	287,879	297,606	321,738	327,296	317,687	319,756	321,104	314,934	230,423	285,866	293,038	304,291	279,009	251,744	274,651
Geothermal	3,752	4,057	4,065	4,125	4,117	5,078	5,735	6,048	6,125	6,251	6,314	6,212	6,224	6,216	6,217	6,384	6,508	6,580	7,018	7,764
Solar	1	1	12	13	16	19	23	28	34	38	44	50	58	69	79	92	111	135	170	292
Wind	0	0	1	1	6	9	15	21	33	93	257	546	912	1,477	2,188	3,077	4,431	6,061	6,898	8,704
Others	14,934	15,785	15,813	15,824	16,346	17,497	18,087	19,426	19,569	20,271	20,960	23,336	24,362	27,985	31,857	31,606	31,300	31,924	32,652	29,536
Total	1,029,956	1,069,391	1,082,788	1,098,187	1,155,695	1,186,679	1,220,190	1,252,232	1,277,256	1,295,167	1,335,914	1,349,685	1,354,652	1,355,580	1,405,692	1,440,238	1,453,151	1,473,457	1,479,387	1,396,799
Loss and Own Use of Electricity (GWh)																				
Transmission and Distribution Losses	58,890	62,234	63,154	62,812	64,685	68,242	65,406	66,844	70,399	72,470	74,089	81,356	77,628	76,310	83,879	89,673	82,950	85,329	86,314	83,222
Own Use	51,602	51,744	54,494	54,914	58,388	59,741	62,547	63,508	64,942	63,618	69,054	72,572	67,650	72,346	74,774	74,282	74,737	77,634	78,083	77,258
Total	110,492	113,978	117,648	117,726	123,073	127,983	127,953	130,352	135,341	136,087	143,143	153,928	145,278	148,656	158,653	163,955	157,687	162,963	164,397	160,480
Fuel Input for Power Generation (ktoe)																				
Coal	53,769	56,191	59,048	60,053	62,456	65,524	71,209	76,032	80,484	83,665	89,157	93,837	97,996	103,295	107,433	111,221	110,036	110,963	112,154	104,865
Oil	52,916	51,510	52,117	43,777	52,624	45,635	44,429	39,300	34,823	34,453	32,523	28,175	26,832	32,600	28,493	30,680	29,154	31,240	34,141	20,977
Gas	37,080	38,667	39,340	38,837	40,836	41,630	43,417	45,190	45,992	49,568	51,377	54,261	55,757	59,261	56,026	57,101	56,791	63,283	63,716	61,048
Total	143,765	146,368	150,506	142,667	155,917	152,789	159,054	160,522	161,300	167,686	173,058	176,273	180,585	195,155	191,953	199,001	195,981	205,486	210,012	186,889
CO_2 Emissions (kt C)																				
Coal	130,660	133,755	132,931	134,207	136,137	140,272	146,446	153,721	156,188	160,225	171,114	170,597	173,904	180,083	184,274	186,392	186,159	188,301	189,071	171,444
Oil	225,982	230,296	234,120	227,644	240,917	242,167	244,997	241,630	236,081	240,355	240,228	233,113	230,199	237,902	233,712	236,139	228,398	222,679	216,040	195,683
Gas	38,907	40,907	42,251	42,895	45,084	46,676	48,855	50,571	51,839	54,815	57,138	59,206	60,264	63,462	63,011	65,469	67,888	74,325	75,183	72,779
Total	395,548	404,959	409,302	404,746	422,138	429,115	440,298	445,922	444,107	455,395	468,479	462,916	464,367	481,446	480,996	488,000	482,445	485,305	480,295	439,905

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Table 8.7 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Macroeconomic Indicators																				
Population (thousand)	144,050	144,700	145,256	145,775	146,436	147,184	147,804	148,389	148,936	149,411	149,881	150,443	151,045	151,641	151,976	152,302	152,639	153,072	153,471	153,825
Urban Population, %	66.3	66.6	66.9	67.2	67.5	67.8	67.9	68.1	68.2	68.4	68.5	68.7	68.9	69.1	69.3	69.5	69.7	69.9	70.2	70.4
GDP (constant 2000 $ million)	4,487,623	4,624,376	4,661,279	4,683,367	4,735,295	4,832,122	4,965,192	5,051,369	4,973,244	4,988,988	5,135,936	5,155,030	5,186,531	5,269,706	5,421,359	5,531,919	5,649,046	5,788,978	5,747,398	5,431,741
GDP (current $ million)	3,417,060	3,856,555	4,165,850	4,711,394	5,159,786	5,698,266	5,115,076	4,764,441	4,313,445	4,816,642	5,135,971	4,528,785	4,381,038	4,784,303	5,323,407	5,359,211	5,222,469	5,373,077	6,037,093	6,084,505
GDP (constant 2005 PPP $ million)	3,699,438	3,804,933	3,834,808	3,861,333	3,910,883	3,995,324	4,108,501	4,184,412	4,133,613	4,159,573	4,284,306	4,305,857	4,342,413	4,417,736	4,548,743	4,644,749	4,745,103	4,866,135	4,844,623	4,603,452
GDP/capita (constant 2000 $)	31,153	31,958	32,090	32,127	32,337	32,830	33,593	34,041	33,392	33,391	34,267	34,266	34,338	34,751	35,672	36,322	37,009	37,819	37,449	35,311
GDP/capita (current $)	23,721	26,652	28,679	32,320	35,236	38,715	34,607	32,108	28,962	32,238	34,267	30,103	29,005	31,550	35,028	35,188	34,215	35,102	39,337	39,555
GDP - Manufacturing (% of GDP)	22.3	22.8	22.1	21.3	20.9	21.3	21.5	21.7	21.0	20.8	21.2	20.1	19.7	20.4	21.0	21.5	21.8	22.1	22.2	19.0
Car Ownership (car/1,000 persons)	472	486	497	508	518	530	544	553	559	565	573	575	591	593	597	603	606	606	606	597
Basic Energy Indicators																				
TPES/capita (toe/person)	3.72	3.79	3.85	3.89	4.01	4.10	4.22	4.27	4.19	4.24	4.28	4.23	4.18	4.20	4.27	4.31	4.30	4.29	4.25	3.97
TFEC/capita (toe/person)	2.57	2.64	2.65	2.66	2.73	2.80	2.86	2.89	2.86	2.90	2.95	2.90	2.88	2.88	2.89	2.90	2.88	2.84	2.77	2.60
TPES/GDP (toe/constant 2000 $ million)	119	118	120	121	124	125	125	126	126	127	125	123	122	121	120	119	116	114	113	112
TFEC/GDP (toe/constant 2000 $ million)	83	83	83	83	84	85	85	85	86	87	86	85	84	83	81	80	78	75	74	74
Import Dependency (%)	54.1	52.4	52.4	50.9	52.8	50.4	50.8	48.7	45.4	47.1	44.6	41.6	40.7	44.7	42.7	42.0	41.2	39.1	39.7	33.4
Oil Import Dependency (%)	88.7	88.6	89.1	89.0	90.1	89.8	90.0	89.5	88.2	90.6	87.7	86.8	87.5	88.8	89.5	90.9	91.1	89.6	89.7	88.1
Electricity/capita (kWh/ person)	6,264	6,464	6,515	6,559	6,896	7,027	7,232	7,393	7,503	7,595	7,815	7,838	7,905	7,889	8,165	8,199	8,275	8,336	8,377	7,858
CO_2 Intensity (t C/constant 2000 $ million)	88	88	88	86	89	89	89	88	89	91	91	90	90	91	89	88	85	84	84	81
CO_2/capita (t C)	2.75	2.80	2.82	2.78	2.88	2.92	2.98	3.01	2.98	3.05	3.13	3.08	3.07	3.17	3.16	3.20	3.16	3.17	3.13	2.86
CO_2/TPES (t C/toe)	0.74	0.74	0.73	0.71	0.72	0.71	0.71	0.70	0.71	0.72	0.73	0.73	0.74	0.76	0.74	0.74	0.74	0.74	0.74	0.72

GDP = gross domestic product, CO_2 = carbon dioxide, GWh = gigawatt-hour, kt C = thousand tons of carbon equivalent, ktoe = thousand tons of oil equivalent, kWh = kilowatt-hour, PPP = purchasing power parity, t C = ton of carbon equivalent, TFEC = total final energy consumption, toe = ton of oil equivalent, TPES = total primary energy supply.

Note: Figures may not add up to total because of rounding.

Sources: APERC (APEC Energy Database), APERC estimates, JAMA (2012), and World Bank.

8.1 Australia

Country Profile (2009)		Energy Reserves (year-end 2008)	
Total Surface Area (square kilometer)	7,682,300	Coal (million ton) - Recoverable	76,400.0
Population (thousand)	21,952	Gas (trillion cubic feet) - Proven	28.9
GDP (constant 2000 $ billion)	550.6	Oil (billion barrel) - Proven	2,335.0
Electrification Rate (%)	100.0		

GDP = gross domestic product.

Sources: ADB (2012), UNDP (2009), World Bank, and WEC (2010).

2009 Energy Supply and Demand Flow (ktoe)

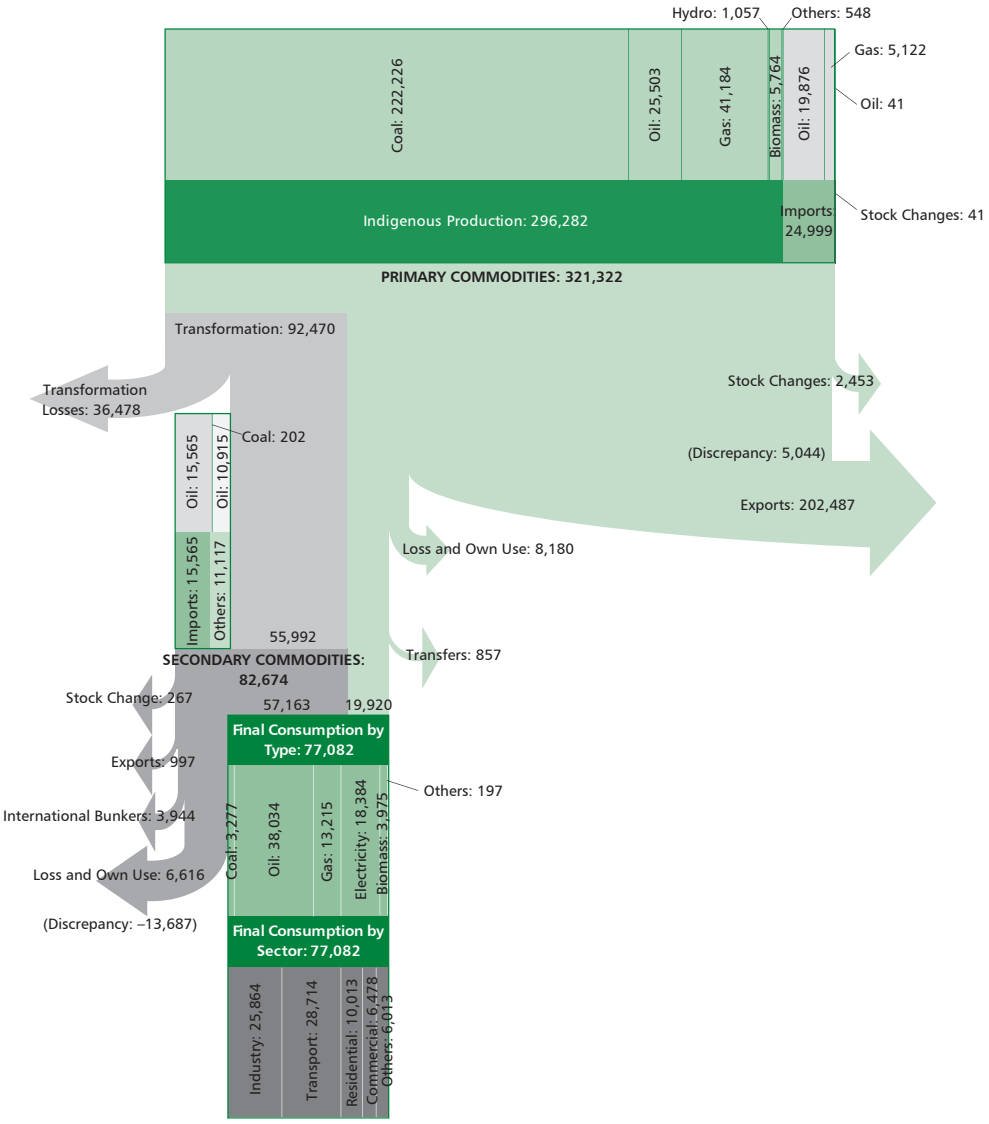


Table 8.1.1 Key Data and Economic Profile

	1990	1995	2000	2005	2009
Socioeconomic Data					
Population (thousand)	17,065	18,072	19,153	20,395	21,952
GDP (constant 2000 $ billion)	298.7	336.6	416.9	489.7	550.6
GDP (constant 2005 PPP $ billion)	407.0	458.8	568.1	667.3	750.4
GDP/capita (constant 2000 $)	17,501	18,627	21,766	24,009	25,083
GDP/capita (constant 2005 PPP $)	23,850	25,385	29,663	32,719	34,184

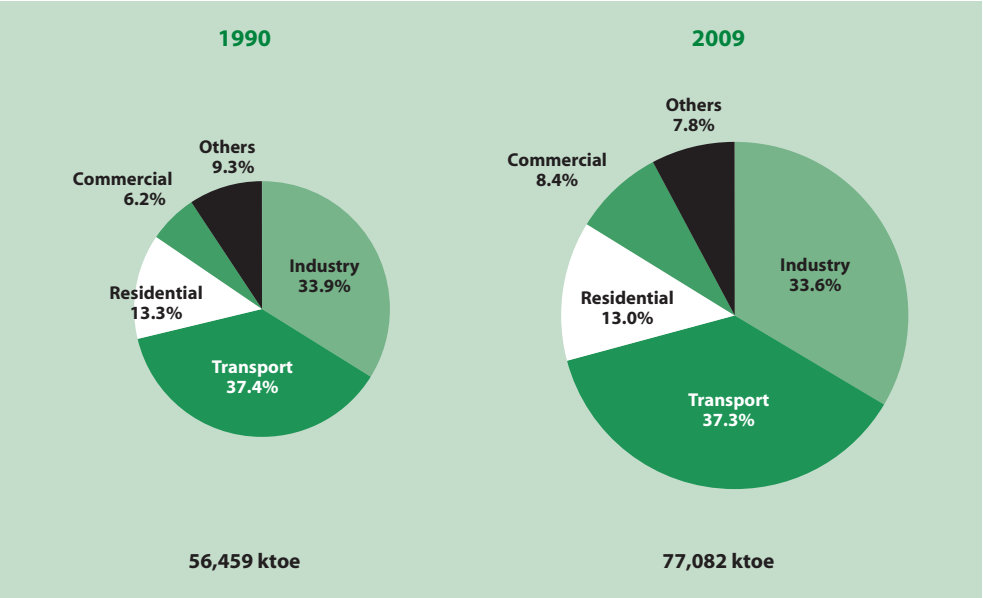
GDP = gross domestic product, PPP = purchasing power parity.
Source: World Bank.

Table 8.1.2 Energy Supply and Demand

	1990	1995	2000	2005	2009
Primary Energy Supply (ktoe)					
Indigenous Production	158,144	187,221	233,412	267,916	296,282
Net Imports	–71,297	–94,341	–125,445	–152,031	–169,341
Total PES	86,847	92,880	107,967	115,885	126,941
Coal	34,980	37,549	48,156	50,750	50,930
Oil	31,201	32,554	34,152	35,559	40,356
Gas	15,344	17,029	19,095	22,966	28,286
Biomass	3,961	4,270	5,035	5,120	5,764
Others	1,361	1,478	1,528	1,489	1,606
TPES/capita (toe)	5.09	5.14	5.64	5.68	5.78
TPES/GDP (toe/constant 2005 PPP $ million)	213	202	190	174	169
Final Energy Consumption (ktoe)					
Industry	19,121	20,866	23,777	25,632	25,864
Transportation	21,111	23,080	25,658	27,739	28,714
Other Sectors	16,227	18,135	20,131	21,740	22,503
Total FEC	56,459	62,081	69,566	75,111	77,082
Coal	4,204	4,287	4,115	3,476	3,277
Oil	28,999	31,397	34,714	36,797	38,034
Gas	8,810	10,180	11,459	13,444	13,215
Electricity	11,112	12,460	14,857	17,334	18,384
Biomass	3,252	3,678	4,340	3,998	3,975
Others	81	80	82	63	197

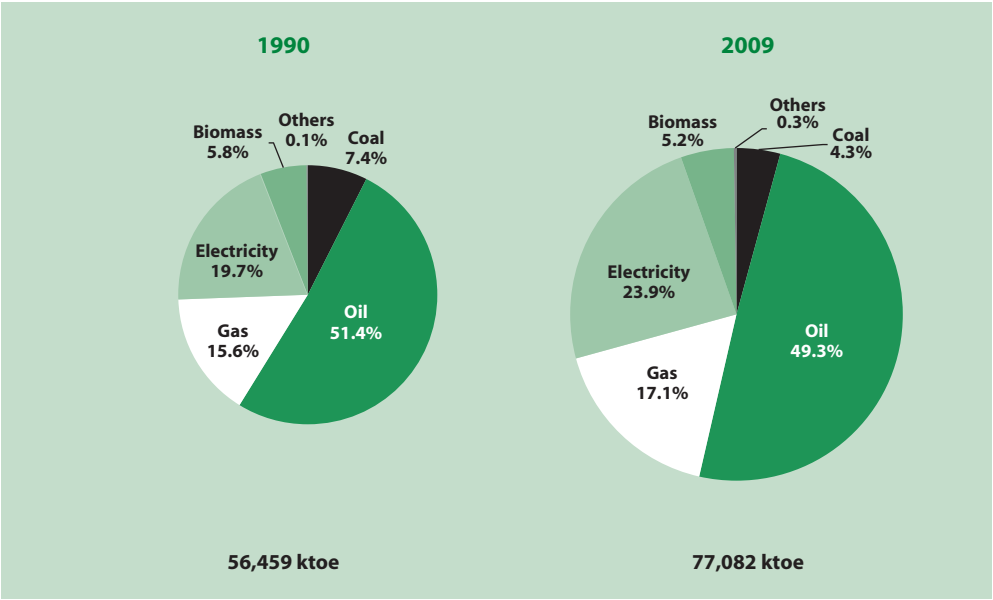
FEC = final energy consumption, GDP = gross domestic product, ktoe = thousand tons of oil equivalent, PES = primary energy supply, PPP = purchasing power parity, toe = ton of oil equivalent, TPES = total primary energy supply.
Source: APERC (APEC Energy Database).

Figure 8.1.1 Final Energy Consumption by Sector, 1990 and 2009



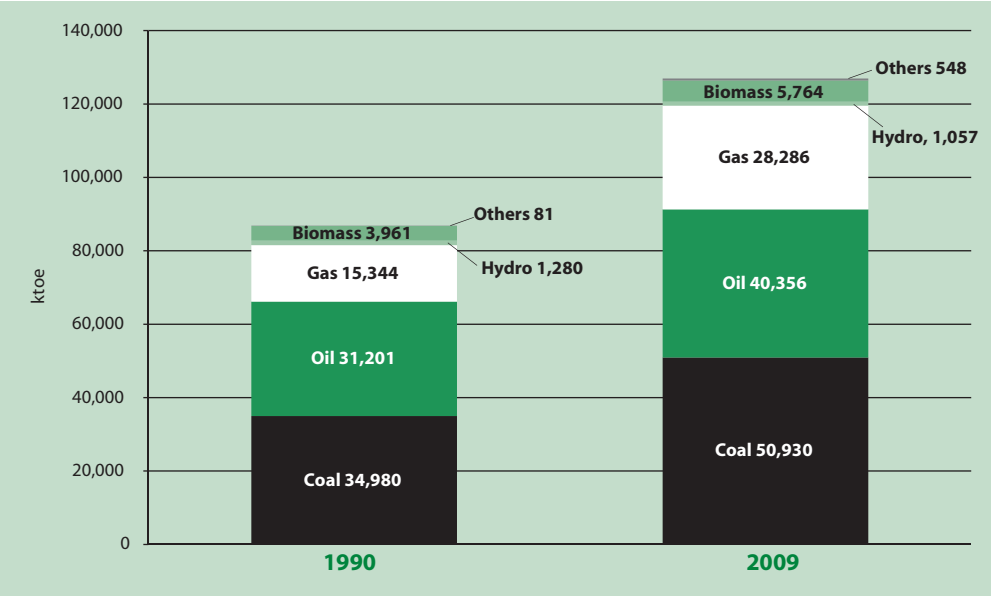
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 8.1.2 Final Energy Consumption by Type of Energy, 1990 and 2009



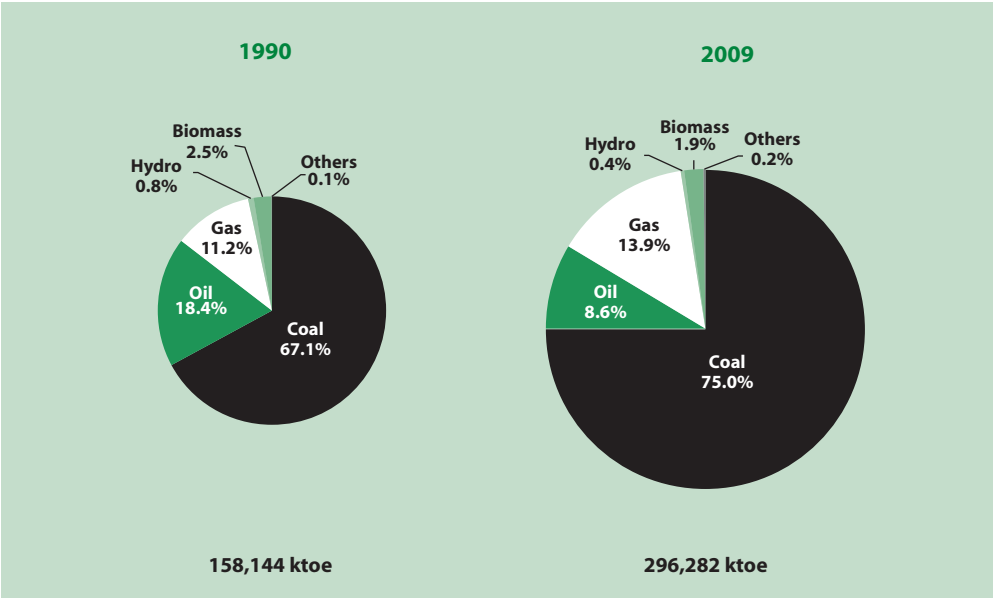
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 8.1.3 Total Primary Energy Supply, 1990 and 2009



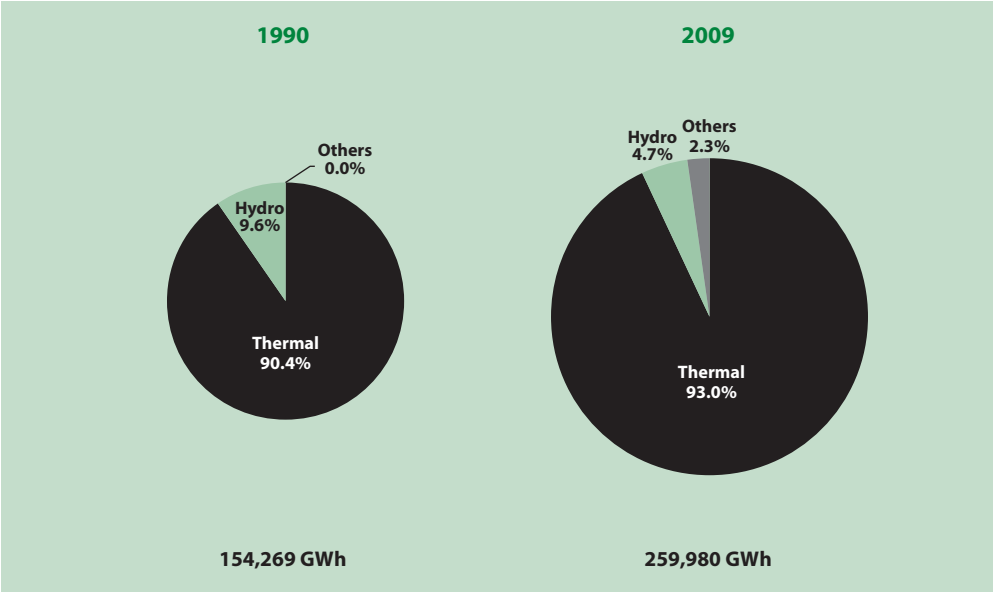
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 8.1.4 Indigenous Energy Production, 1990 and 2009



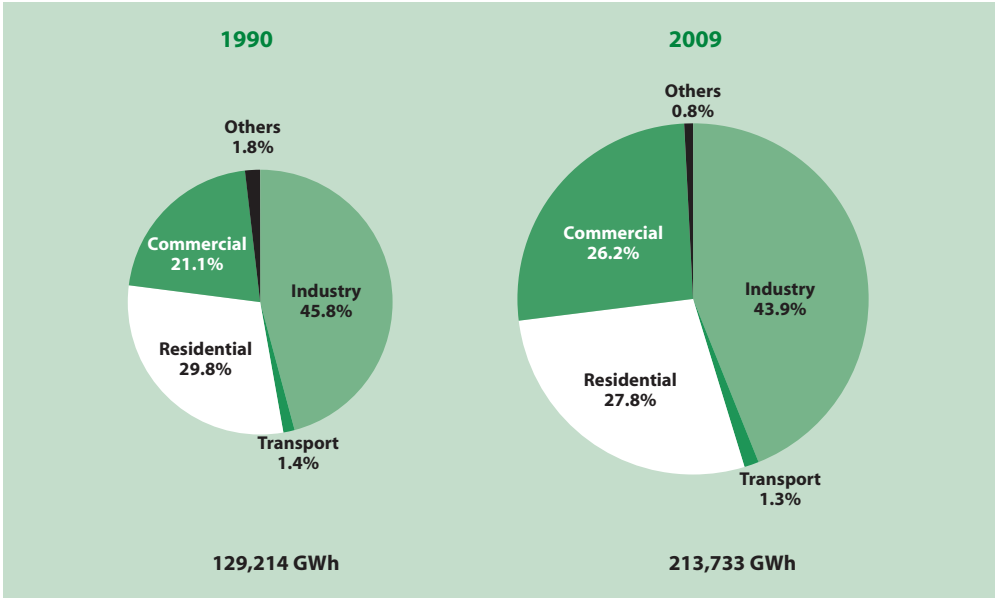
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 8.1.5 Electricity Generation by Plant Type, 1990 and 2009



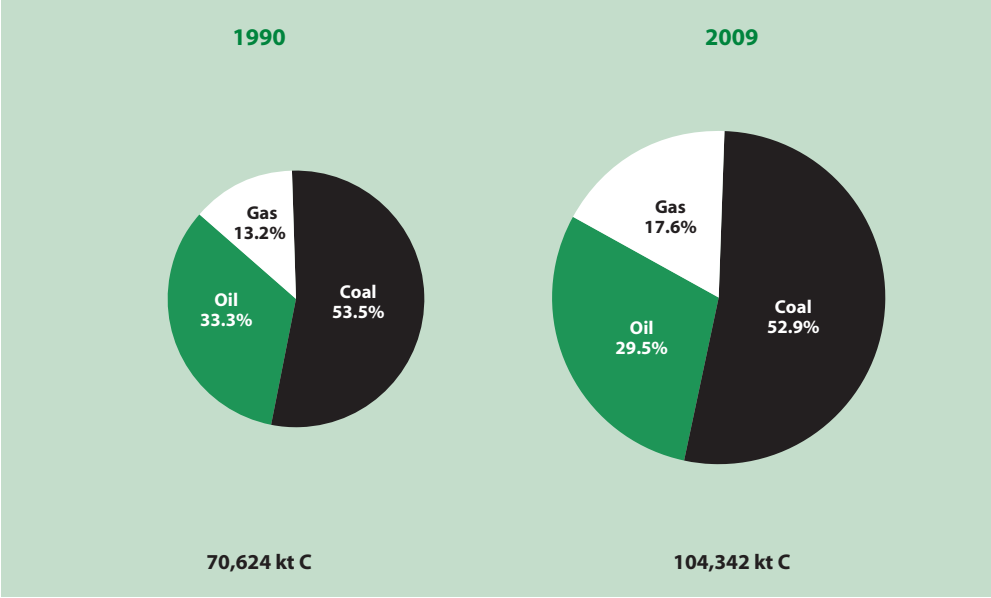
GWh = gigawatt-hour.
Source: APERC (APEC Energy Database).

Figure 8.1.6 Electricity Consumption by Sector, 1990 and 2009



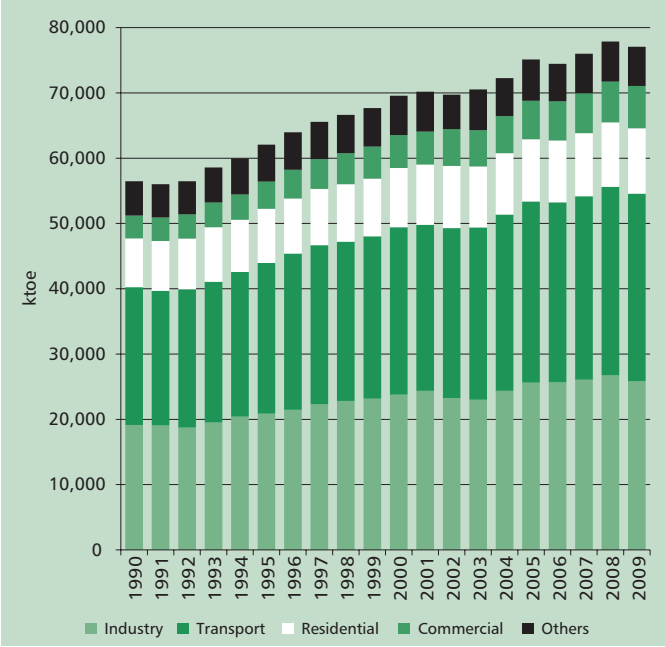
GWh = gigawatt-hour.
Source: APERC (APEC Energy Database).

Figure 8.1.7 Carbon Dioxide Emissions from Fuel Combustion, 1990 and 2009



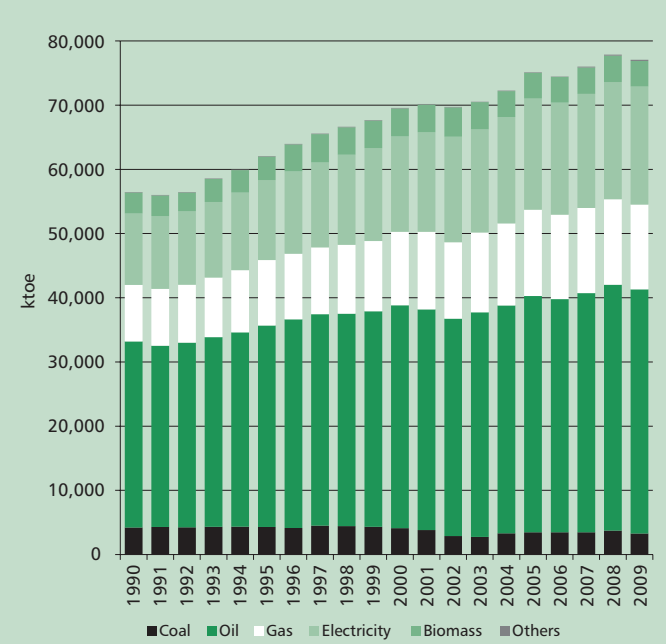
kt C = thousand tons of carbon equivalent.
Source: APERC (APEC Energy Database).

Figure 8.1.8 Final Energy Consumption by Sector, 1990–2009



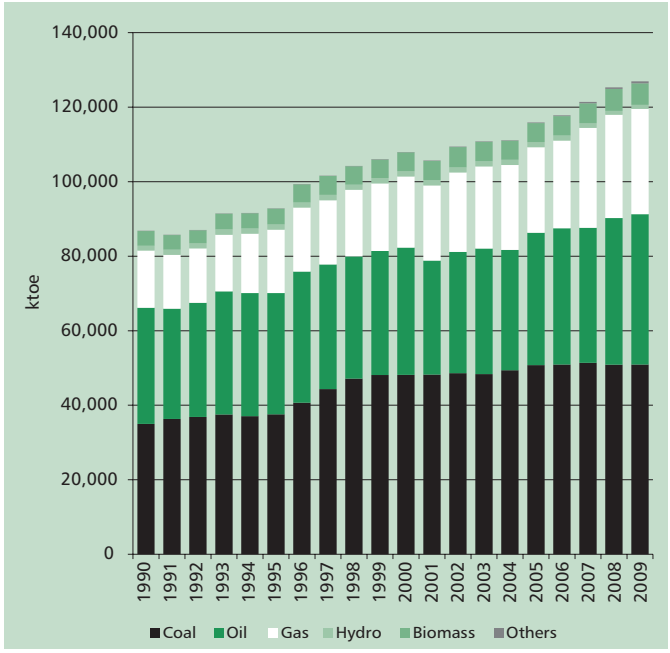
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 8.1.9 Final Energy Consumption by Type, 1990–2009



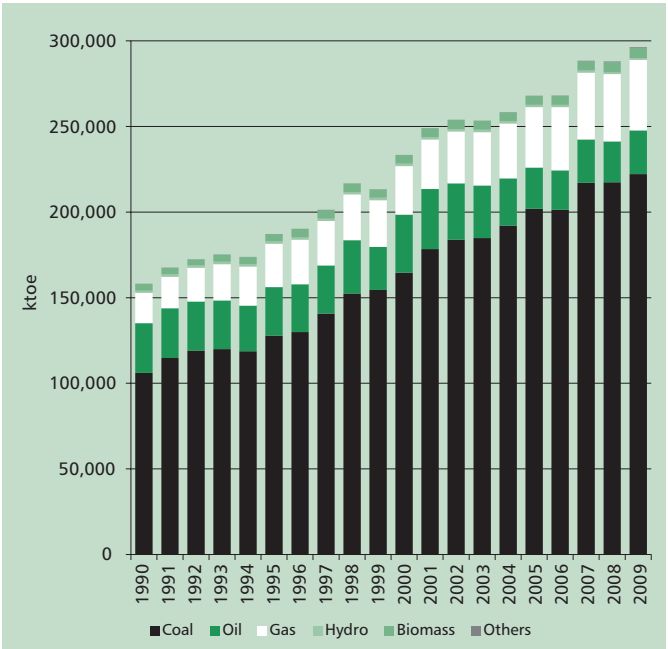
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 8.1.10 Total Primary Energy Supply, 1990–2009



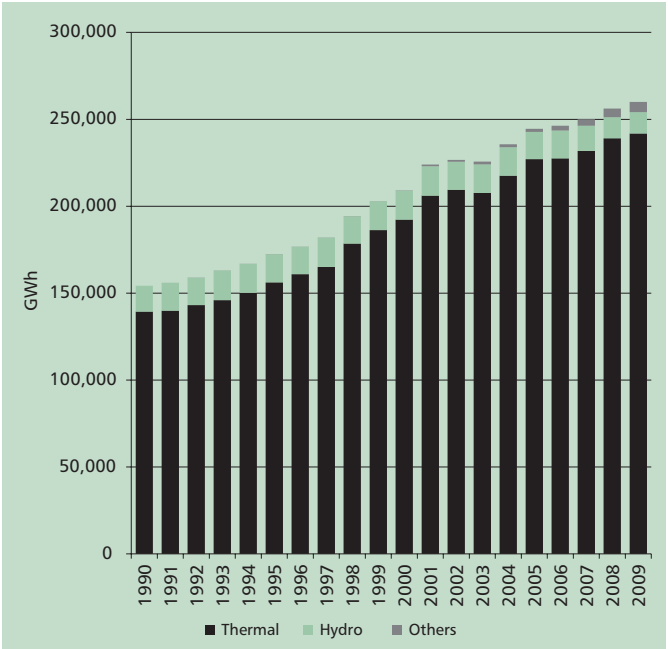
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 8.1.11 Indigenous Energy Production, 1990–2009



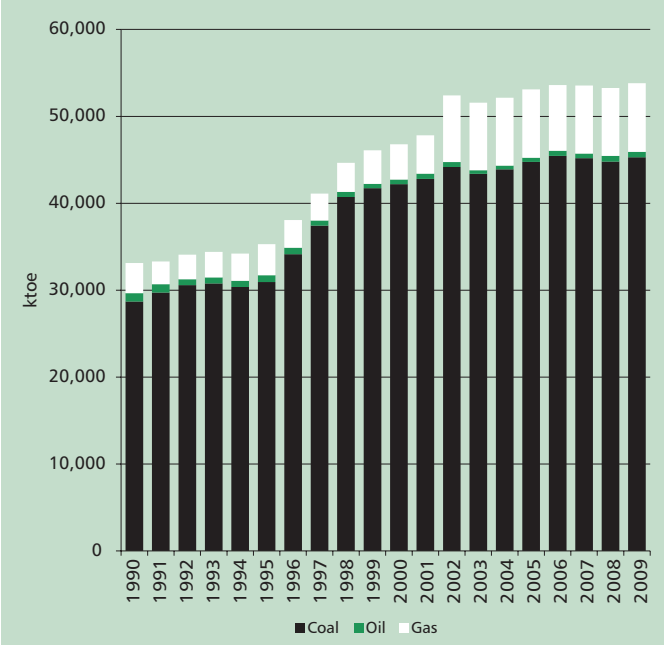
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 8.1.12 Electricity Generation by Source, 1990–2009



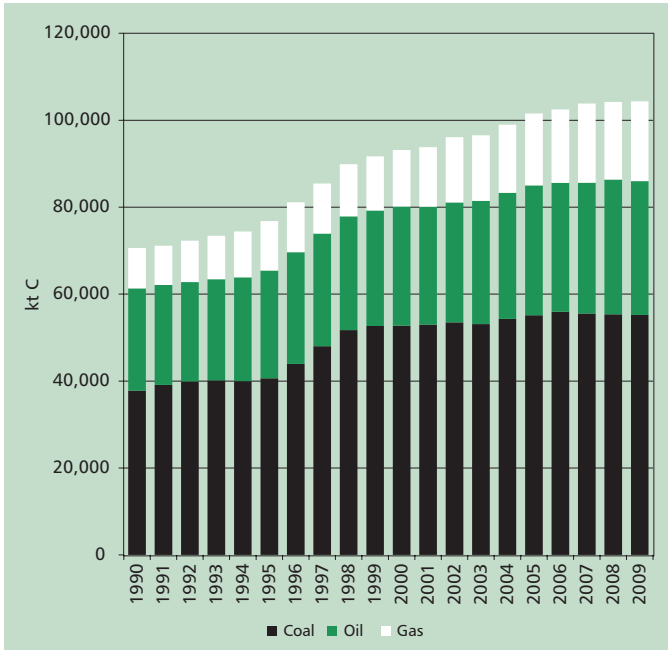
GWh = gigawatt-hour.
Source: APERC (APEC Energy Database).

Figure 8.1.13 Fuel Input for Electricity Generation, 1990–2009



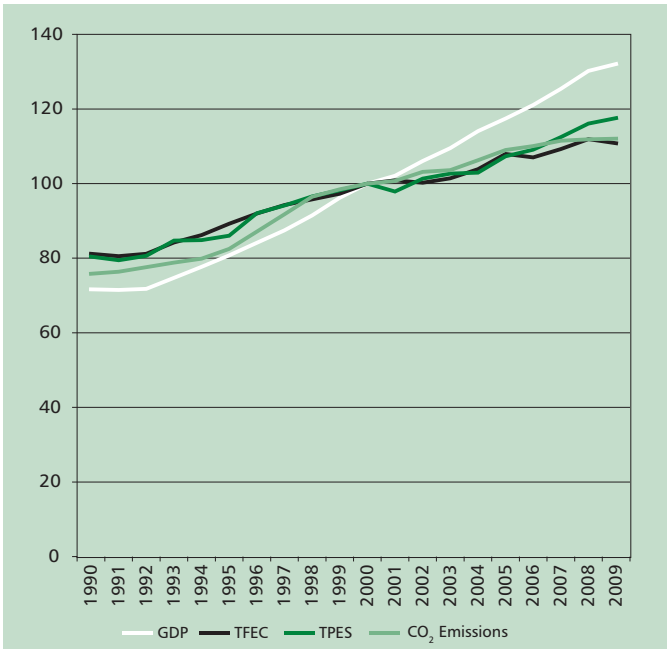
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 8.1.14 Carbon Dioxide Emissions from Fuel Combustion, 1990–2009



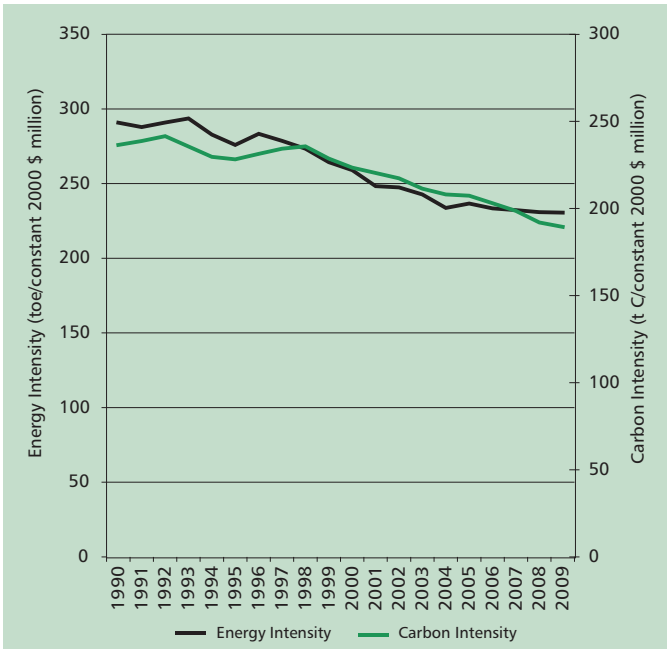
kt C = thousand tons of carbon equivalent.
Source: APERC estimates.

Figure 8.1.15 Growth of GDP, TFEC, TPES, and CO_2 (indexed to year 2000), 1990–2009



CO_2 = carbon dioxide, GDP = gross domestic product, TFEC = total final energy consumption, TPES = total primary energy supply.
Note: Indices are measured relative to the base year 2000 (2000 = 100).
Source: APERC estimates.

Figure 8.1.16 Energy and Carbon Intensities, 1990–2009



t C = ton of carbon equivalent , toe = ton of oil equivalent.
Source: APERC estimates.

Table 8.1.3 Australia Energy Balance Table, 2006

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	201,305	0	23,079	0	0	0	0	0	0	0	36,933	1,378	0	0	9	147	5,174	58	0	0	268,084
2.	Imports	0	31	20,002	11,959	2,877	0	5,260	1,365	349	2,107	1,204	0	0	0	0	0	2	0	0	0	33,198
3.	Exports	−149,984	0	−12,550	−1,776	−620	0	−360	−471	0	−325	−14,611	0	0	0	0	0	0	0	0	0	−178,921
4.	International Bunkers	0	0	0	−3,771	0	0	−198	−811	0	−2,761	0	0	0	0	0	0	0	0	0	0	−3,771
5.	Stock Changes	91	−527	−124	−228	0	51	−117	−24	−39	−99	0	0	0	0	0	0	0	0	0	0	−788
6.	Total Primary Energy Supply	51,412	−496	30,407	6,184	2,257	51	4,585	59	310	−1,078	23,526	1,378	0	0	9	147	5,176	58	0	0	117,802
7.	Transfers	0	0	−1,156	7,096	0	0	0	0	670	6,426	0	0	0	0	0	0	0	0	0	0	5,940
8.	Total Transformation Sector	−48,854	2,121	−33,303	31,156	13,091	94	9,156	951	698	7,164	−7,958	−1,378	0	0	−9	−147	−1,174	0	21,271	0	−38,276
8.1	Power Generation	−45,031	−425	0	−593	0	0	−497	−97	0	0	−7,551	−1,378	0	0	−9	−147	−1,126	0	21,271	0	−34,991
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	−328	0	0	0	0	0	0	0	0	0	−328
8.3	Refineries	0	0	−33,351	31,772	13,091	94	9,654	1,069	698	7,164	0	0	0	0	0	0	0	0	0	0	−1,579
8.4	Coal Transformation	−3,822	2,546	0	−22	0	0	−1	−21	0	0	−79	0	0	0	0	0	0	0	0	0	−1,378
8.5.	Other Transformation	0	0	48	0	0	0	0	0	0	0	0	0	0	0	0	0	−48	0	0	0	0
9.	Loss and Own Use	0	−621	−22	−2,390	0	−7	−972	−68	−47	−1,296	−6,280	0	0	0	0	0	0	0	−3,830	0	−13,142
10.	Discrepancy	−18	−75	4,111	−5,766	−408	−122	335	54	1,016	−6,641	3,869	0	0	0	0	0	0	0	0	0	2,122
11.	Total Final Energy Consumption	2,541	929	37	36,280	14,941	16	13,104	996	2,648	4,575	13,157	0	0	0	0	0	4,002	58	17,442	0	74,446
12.	Industry Sector	2,439	896	37	3,588	0	0	2,390	841	244	112	8,298	0	0	0	0	0	2,571	0	7,830	0	25,659
13.	Transport Sector	79	0	0	26,904	14,835	0	8,391	152	1,769	1,756	379	0	0	0	0	0	0	0	225	0	27,586
14.	Other Sectors	23	33	0	2,783	105	11	2,323	3	341	0	3,858	0	0	0	0	0	1,431	58	9,387	0	17,572
14.1	Residential and Commercial	23	33	0	831	0	11	513	3	304	0	3,856	0	0	0	0	0	1,431	58	9,227	0	15,458
14.1.1	Commerce and Public Services	21	31	0	568	0	11	483	3	71	0	948	0	0	0	0	0	8	4	4,404	0	5,985
14.1.2	Residential	1	2	0	263	0	0	30	0	234	0	2,908	0	0	0	0	0	1,422	54	4,823	0	9,473
14.2	Non-Specified Others	0	0	0	1,952	105	0	1,810	0	36	0	2	0	0	0	0	0	0	0	160	0	2,113
15.	Non-Energy Use	0	0	0	3,006	0	5	0	0	294	2,707	623	0	0	0	0	0	0	0	0	0	3,629
16.	Electricity Output (GWh)	194,341	0	2,385	0	0	0	0	0	0	0	30,799	16,029	0	0	106	1,713	947	0	0	0	246,320
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.
Note: Figures may not add up to total because of rounding.
Source: APERC (APEC Energy Database).

Table 8.1.4 Australia Energy Balance Table, 2007

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	217,133	0	25,301	0	0	0	0	0	0	0	38,973	1,248	0	0	11	225	5,342	144	0	0	288,376
2.	Imports	0	27	20,740	10,986	2,268	0	4,668	1,311	434	2,305	4,598	0	0	0	0	0	0	0	0	0	36,351
3.	Exports	−158,314	0	−15,103	−1,455	−662	0	−245	−199	0	−349	−16,760	0	0	0	0	0	0	0	0	0	−191,632
4.	International Bunkers	0	0	0	−3,916	0	0	−72	−763	0	−3,080	0	0	0	0	0	0	0	0	0	0	−3,916
5.	Stock Changes	−6,937	−506	−287	−19	−29	3	66	66	14	−139	0	0	0	0	0	0	0	0	0	0	−7,749
6.	Total Primary Energy Supply	51,883	−479	30,650	5,596	1,578	3	4,417	414	448	−1,263	26,811	1,248	0	0	11	225	5,342	144	0	0	121,431
7.	Transfers	0	0	−989	8,525	0	0	0	0	614	7,911	0	0	0	0	0	0	0	0	0	0	7,536
8.	Total Transformation Sector	−48,521	2,123	−34,854	31,986	14,044	73	9,115	794	828	7,132	−8,175	−1,248	0	0	−11	−225	−1,240	0	21,591	0	−38,575
8.1	Power Generation	−44,782	−412	0	−521	0	0	−367	−154	0	0	−7,829	−1,248	0	0	−11	−225	−1,141	0	21,591	0	−34,578
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	−264	0	0	0	0	0	0	0	0	0	−264
8.3	Refineries	0	0	−34,953	32,528	14,044	73	9,482	969	828	7,132	0	0	0	0	0	0	0	0	0	0	−2,425
8.4	Coal Transformation	−3,739	2,535	0	−21	0	0	0	−21	0	0	−82	0	0	0	0	0	0	0	0	0	−1,308
8.5.	Other Transformation	0	0	99	0	0	0	0	0	0	0	0	0	0	0	0	0	−99	0	0	0	0
9.	Loss and Own Use	0	−629	−92	−2,252	0	−6	−790	−76	−48	−1,332	−7,910	0	0	0	0	0	0	0	−3,822	0	−14,705
10.	Discrepancy	−844	−77	5,323	−6,628	−518	−54	1,062	−157	565	−7,527	2,542	0	0	0	0	0	0	0	0	0	315
11.	Total Final Energy Consumption	2,518	938	38	37,227	15,104	15	13,804	975	2,407	4,921	13,267	0	0	0	0	0	4,102	143	17,769	0	76,003
12.	Industry Sector	2,412	911	38	3,673	0	1	2,555	804	226	87	8,428	0	0	0	0	0	2,630	0	7,977	0	26,069
13.	Transport Sector	85	0	0	27,382	14,996	0	8,937	168	1,441	1,840	396	0	0	0	0	0	0	0	228	0	28,091
14.	Other Sectors	21	27	0	2,831	108	11	2,313	3	396	0	3,817	0	0	0	0	0	1,471	143	9,564	0	17,876
14.1	Residential and Commercial	21	27	0	908	0	11	535	3	359	0	3,816	0	0	0	0	0	1,471	143	9,405	0	15,792
14.1.1	Commerce and Public Services	20	25	0	591	0	11	506	3	71	0	907	0	0	0	0	0	8	4	4,567	0	6,123
14.1.2	Residential	1	2	0	318	0	0	30	0	288	0	2,908	0	0	0	0	0	1,463	140	4,837	0	9,669
14.2	Non-Specified Others	0	0	0	1,923	108	0	1,778	0	38	0	2	0	0	0	0	0	0	0	160	0	2,084
15.	Non-Energy Use	0	0	0	3,342	0	3	0	0	344	2,994	625	0	0	0	0	0	0	0	0	0	3,967
16.	Electricity Output (GWh)	197,635	0	2,109	0	0	0	0	0	0	0	32,044	14,517	0	0	127	2,611	971	0	0	0	250,014
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.
Note: Figures may not add up to total because of rounding.
Source: APERC (APEC Energy Database).

Table 8.1.5 Australia Energy Balance Table, 2008

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	217,400	0	23,859	0	0	0	0	0	0	0	39,391	1,037	0	0	14	266	5,874	157	0	0	287,998
2.	Imports	0	4	21,339	14,386	2,750	0	6,412	1,567	562	3,096	4,346	0	0	0	0	0	0	0	0	0	40,075
3.	Exports	−163,964	0	−14,992	−1,516	−560	0	−396	−247	0	−313	−15,995	0	0	0	0	0	0	0	0	0	−196,468
4.	International Bunkers	0	0	0	−4,006	0	0	−66	−887	0	−3,053	0	0	0	0	0	0	0	0	0	0	−4,006
5.	Stock Changes	−2,107	−456	179	127	28	−3	−79	7	−18	193	0	0	0	0	0	0	0	0	0	0	−2,257
6.	Total Primary Energy Supply	51,329	−452	30,384	8,991	2,217	−3	5,871	440	543	−77	27,742	1,037	0	0	14	266	5,874	157	0	0	125,342
7.	Transfers	0	0	−789	9,319	0	0	0	0	401	8,918	0	0	0	0	0	0	0	0	0	0	8,530
8.	Total Transformation Sector	−48,178	2,190	−32,608	32,399	13,651	86	9,919	819	910	7,014	−8,161	−1,037	0	0	−14	−266	−1,758	0	22,123	0	−35,310
8.1	Power Generation	−44,440	−351	0	−669	0	0	−508	−161	0	0	−7,809	−1,037	0	0	−14	−266	−1,609	0	22,123	0	−34,071
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	−270	0	0	0	0	0	0	0	0	0	−270
8.3	Refineries	0	0	−32,759	33,089	13,651	86	10,426	1,001	910	7,014	0	0	0	0	0	0	0	0	0	0	330
8.4	Coal Transformation	−3,738	2,541	0	−21	0	0	0	−21	0	0	−82	0	0	0	0	0	0	0	0	0	−1,300
8.5.	Other Transformation	0	0	150	0	0	0	0	0	0	0	0	0	0	0	0	0	−150	0	0	0	1
9.	Loss and Own Use	0	−691	−92	−2,176	0	−9	−804	−69	−51	−1,243	−7,338	0	0	0	0	0	0	0	−3,879	0	−14,175
10.	Discrepancy	−398	−71	3,144	−10,283	−831	−58	−338	−156	512	−9,411	1,083	0	0	0	0	0	0	0	0	0	−6,525
11.	Total Final Energy Consumption	2,753	977	39	38,250	15,037	15	14,648	1,034	2,315	5,201	13,326	0	0	0	0	0	4,116	157	18,244	0	77,862
12.	Industry Sector	2,664	954	39	3,897	0	0	2,686	872	243	96	8,354	0	0	0	0	0	2,680	0	8,159	0	26,747
13.	Transport Sector	71	0	0	28,138	14,927	0	9,629	159	1,360	2,063	403	0	0	0	0	0	0	0	242	0	28,854
14.	Other Sectors	18	24	0	2,882	110	10	2,333	3	426	0	3,877	0	0	0	0	0	1,436	157	9,844	0	18,238
14.1	Residential and Commercial	18	24	0	937	0	9	536	3	389	0	3,875	0	0	0	0	0	1,436	157	9,683	0	16,129
14.1.1	Commerce and Public Services	17	23	0	592	0	9	508	3	72	0	923	0	0	0	0	0	8	5	4,678	0	6,244
14.1.2	Residential	1	1	0	345	0	0	28	0	317	0	2,952	0	0	0	0	0	1,428	152	5,005	0	9,885
14.2	Non-Specified Others	0	0	0	1,945	110	1	1,797	0	38	0	3	0	0	0	0	0	0	0	161	0	2,109
15.	Non-Energy Use	0	0	0	3,333	0	5	0	0	286	3,041	691	0	0	0	0	0	0	0	0	0	4,023
16.	Electricity Output (GWh)	200,835	0	2,781	0	0	0	0	0	0	0	35,522	12,057	0	0	160	3,093	1,771	0	0	0	256,219
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.
Note: Figures may not add up to total because of rounding.
Source: APERC (APEC Energy Database).

Table 8.1.6 Australia Energy Balance Table, 2009

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	222,226	0	25,503	0	0	0	0	0	0	0	41,184	1,057	0	0	24	327	5,764	197	0	0	296,282
2.	Imports	0	0	19,876	15,565	3,182	0	7,081	1,624	555	3,123	5,122	0	0	0	0	0	0	0	0	0	40,563
3.	Exports	−169,045	0	−15,421	−997	−231	0	−307	−182	0	−276	−18,020	0	0	0	0	0	0	0	0	0	−203,483
4.	International Bunkers	0	0	0	−3,944	0	0	−62	−763	0	−3,119	0	0	0	0	0	0	0	0	0	0	−3,944
5.	Stock Changes	−2,453	202	41	−267	−44	3	−200	−3	16	−39	0	0	0	0	0	0	0	0	0	0	−2,477
6.	Total Primary Energy Supply	50,728	202	29,999	10,357	2,907	3	6,511	676	571	−311	28,286	1,057	0	0	24	327	5,764	197	0	0	126,941
7.	Transfers	0	0	−857	10,915	0	0	0	0	538	10,377	0	0	0	0	0	0	0	0	0	0	10,058
8.	Total Transformation Sector	−47,791	1,068	−33,244	32,481	13,752	59	10,014	756	878	7,021	−8,237	−1,057	0	0	−24	−327	−1,789	0	22,443	0	−36,478
8.1	Power Generation	−44,958	−338	0	−624	0	0	−491	−132	0	0	−7,905	−1,057	0	0	−24	−327	−1,571	0	22,443	0	−34,361
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	−265	0	0	0	0	0	0	0	0	0	−265
8.3	Refineries	0	0	−33,463	33,122	13,752	59	10,506	906	878	7,021	0	0	0	0	0	0	0	0	0	0	−341
8.4	Coal Transformation	−2,833	1,405	0	−17	0	0	0	−17	0	0	−67	0	0	0	0	0	0	0	0	0	−1,512
8.5.	Other Transformation	0	0	219	0	0	0	0	0	0	0	0	0	0	0	0	0	−218	0	0	0	1
9.	Loss and Own Use	0	−496	−110	−2,061	0	−11	−871	−61	−52	−1,065	−8,070	0	0	0	0	0	0	0	−4,059	0	−14,796
10.	Discrepancy	−442	9	4,250	−13,696	−1,913	−38	−937	−319	439	−10,927	1,236	0	0	0	0	0	0	0	0	0	−8,644
11.	Total Final Energy Consumption	2,495	782	38	37,996	14,746	13	14,717	1,051	2,373	5,095	13,215	0	0	0	0	0	3,975	197	18,384	0	77,082
12.	Industry Sector	2,401	763	38	3,828	0	0	2,577	900	268	83	8,151	0	0	0	0	0	2,607	0	8,076	0	25,864
13.	Transport Sector	79	0	0	27,972	14,613	0	9,758	148	1,368	2,085	417	0	0	0	0	0	0	0	246	0	28,714
14.	Other Sectors	15	19	0	2,965	133	8	2,382	3	439	0	4,029	0	0	0	0	0	1,368	197	10,062	0	18,655
14.1	Residential and Commercial	15	19	0	951	0	7	544	3	396	0	4,027	0	0	0	0	0	1,368	197	9,914	0	16,491
14.1.1	Commerce and Public Services	15	18	0	607	0	7	518	3	79	0	1,015	0	0	0	0	0	7	7	4,810	0	6,478
14.1.2	Residential	0	1	0	344	0	0	26	0	318	0	3,012	0	0	0	0	0	1,361	190	5,104	0	10,013
14.2	Non-Specified Others	0	0	0	2,014	133	1	1,838	0	42	0	3	0	0	0	0	0	0	0	148	0	2,165
15.	Non-Energy Use	0	0	0	3,231	0	5	0	0	299	2,927	617	0	0	0	0	0	0	0	0	0	3,848
16.	Electricity Output (GWh)	203,334	0	2,639	0	0	0	0	0	0	0	35,854	12,295	0	0	277	3,806	1,775	0	0	0	259,980
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.
Note: Figures may not add up to total because of rounding.
Source: APERC (APEC Energy Database).

Table 8.1.7 Australia Summary Table, 1990–2009

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Indigenous Production (ktoe)																				
Coal	106,103	114,763	119,139	119,983	118,687	127,823	129,956	140,676	152,427	154,539	164,578	178,433	183,863	184,858	192,073	201,952	201,305	217,133	217,400	222,226
Oil	29,026	29,050	28,687	28,407	26,739	28,365	27,876	28,221	31,140	25,058	33,910	35,016	32,969	30,667	27,643	24,129	23,079	25,301	23,859	25,503
Gas	17,693	18,416	19,693	21,137	22,817	25,285	26,052	25,845	26,835	27,318	28,360	29,002	30,219	31,186	32,038	35,226	36,933	38,973	39,391	41,184
Hydro	1,280	1,385	1,356	1,458	1,432	1,397	1,353	1,449	1,353	1,424	1,438	1,456	1,381	1,418	1,404	1,343	1,378	1,248	1,037	1,057
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Geothermal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Solar	0	0	1	1	1	2	2	2	3	3	4	4	5	6	7	8	9	11	14	24
Wind	0	0	0	0	0	1	1	1	1	2	5	18	31	60	61	76	147	225	266	327
Biomass	3,961	3,934	3,508	4,173	4,068	4,270	4,866	5,068	4,955	4,968	5,035	5,086	5,414	5,177	5,133	5,120	5,174	5,342	5,874	5,764
Others	81	81	80	80	80	80	80	80	80	81	82	86	88	66	63	63	58	144	157	197
Total	158,144	167,629	172,465	175,239	173,825	187,221	190,185	201,343	216,794	213,394	233,412	249,101	253,970	253,440	258,421	267,916	268,084	288,376	287,998	296,282
Primary Energy Supply (ktoe)																				
Coal	34,980	36,313	36,864	37,543	37,083	37,549	40,679	44,340	47,142	48,104	48,156	48,221	48,611	48,344	49,398	50,750	50,916	51,404	50,878	50,930
Oil	31,201	29,622	30,621	33,035	33,034	32,554	35,191	33,457	32,822	33,286	34,152	30,606	32,550	33,735	32,289	35,559	36,591	36,247	39,375	40,356
Gas	15,344	14,439	14,633	15,191	15,922	17,029	17,203	17,219	17,890	18,174	19,095	20,196	21,332	22,034	22,783	22,966	23,526	26,811	27,742	28,286
Hydro	1,280	1,385	1,356	1,458	1,432	1,397	1,353	1,449	1,353	1,424	1,438	1,456	1,381	1,418	1,404	1,343	1,378	1,248	1,037	1,057
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Geothermal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Solar	0	0	1	1	1	2	2	2	3	3	4	4	5	6	7	8	9	11	14	24
Wind	0	0	0	0	0	1	1	1	1	2	5	18	31	60	61	76	147	225	266	327
Biomass	3,961	3,934	3,508	4,173	4,068	4,270	4,866	5,068	4,955	4,968	5,035	5,086	5,414	5,177	5,133	5,120	5,176	5,342	5,874	5,764
Others	81	81	80	80	80	80	80	80	80	81	82	86	88	66	63	63	58	144	157	197
Total	86,847	85,773	87,063	91,481	91,620	92,880	99,375	101,615	104,245	106,043	107,967	105,673	109,411	110,841	111,138	115,885	117,802	121,431	125,342	126,941
Final Energy Consumption by Sector (ktoe)																				
Industry	19,121	19,043	18,742	19,498	20,411	20,866	21,463	22,302	22,813	23,159	23,777	24,367	23,276	23,010	24,367	25,632	25,659	26,069	26,747	25,864
Transport	21,111	20,651	21,184	21,574	22,155	23,080	23,918	24,384	24,406	24,889	25,658	25,442	26,015	26,396	27,000	27,739	27,586	28,091	28,854	28,714
Residential	7,490	7,617	7,765	8,345	7,994	8,310	8,435	8,620	8,788	8,826	9,061	9,227	9,538	9,336	9,393	9,524	9,473	9,669	9,885	10,013
Commercial	3,481	3,613	3,698	3,799	3,883	4,146	4,403	4,546	4,760	4,900	5,041	5,029	5,627	5,544	5,683	5,910	5,985	6,123	6,244	6,478
Others	5,256	5,100	5,089	5,371	5,524	5,679	5,758	5,725	5,862	5,893	6,029	6,113	5,282	6,252	5,816	6,307	5,742	6,051	6,132	6,013
Total	56,459	56,025	56,479	58,586	59,967	62,081	63,977	65,577	66,629	67,667	69,566	70,178	69,738	70,539	72,259	75,111	74,446	76,003	77,862	77,082

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Table 8.1.7 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Final Energy Consumption by Type (ktoe)																				
Coal	4,204	4,294	4,238	4,319	4,340	4,287	4,129	4,510	4,418	4,316	4,115	3,829	2,885	2,759	3,315	3,476	3,469	3,456	3,730	3,277
Oil	28,999	28,230	28,762	29,544	30,269	31,397	32,505	32,942	33,105	33,584	34,714	34,364	33,848	34,964	35,483	36,797	36,318	37,265	38,289	38,034
Gas	8,810	8,866	9,032	9,275	9,696	10,180	10,239	10,407	10,722	10,944	11,459	12,085	11,924	12,448	12,794	13,444	13,157	13,267	13,326	13,215
Electricity	11,112	11,328	11,435	11,771	12,090	12,460	12,811	13,233	14,034	14,492	14,857	15,515	16,437	16,070	16,556	17,334	17,442	17,769	18,244	18,384
Heat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Biomass	3,252	3,225	2,932	3,597	3,492	3,678	4,213	4,404	4,269	4,250	4,340	4,299	4,557	4,231	4,049	3,998	4,002	4,102	4,116	3,975
Others	81	81	80	80	80	80	80	80	80	81	82	86	88	66	62	63	58	143	157	197
Total	56,459	56,025	56,479	58,586	59,967	62,081	63,977	65,577	66,629	67,667	69,566	70,178	69,738	70,539	72,259	75,111	74,446	76,003	77,862	77,082
Power Generation (GWh)																				
Thermal	139,389	139,946	143,107	146,016	150,127	156,174	160,913	165,092	178,571	186,229	192,274	206,103	209,504	207,574	217,609	227,108	227,525	231,788	239,138	241,827
Hydro	14,880	16,103	15,768	16,953	16,649	16,239	15,731	16,852	15,733	16,563	16,720	16,933	16,054	16,490	16,331	15,612	16,029	14,517	12,057	12,295
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Geothermal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Solar	0	0	11	13	16	19	23	28	34	38	44	50	58	69	79	91	106	127	160	277
Wind	0	0	0	0	4	7	7	7	8	28	58	210	364	703	705	885	1,713	2,611	3,093	3,806
Others	0	0	0	0	0	0	0	0	0	0	0	700	633	866	892	879	947	971	1,771	1,775
Total	154,269	156,049	158,886	162,982	166,796	172,439	176,674	181,979	194,346	202,858	209,096	223,996	226,613	225,702	235,616	244,575	246,320	250,014	256,219	259,980
Loss and Own Use of Electricity (GWh)																				
Transmission and Distribution Losses	9,501	9,521	9,957	9,916	10,116	10,613	10,816	10,896	12,311	14,037	14,980	18,151	15,062	12,959	17,825	18,777	18,619	16,111	16,841	17,009
Own Use	10,093	9,697	10,239	10,230	10,231	10,757	10,958	11,027	12,354	13,923	14,822	17,863	14,551	17,409	16,785	14,940	15,229	17,228	17,069	19,100
Total	19,594	19,218	20,196	20,146	20,347	21,370	21,774	21,923	24,665	27,960	29,802	36,014	29,613	30,368	34,610	33,717	33,848	33,339	33,910	36,109
Fuel Input for Power Generation (ktoe)																				
Coal	28,705	29,727	30,578	30,782	30,377	30,935	34,141	37,426	40,720	41,741	42,200	42,801	44,175	43,388	43,899	44,765	45,456	45,194	44,791	45,295
Oil	946	968	677	687	696	793	749	591	594	503	525	602	570	409	428	479	593	521	669	624
Gas	3,471	2,612	2,837	2,931	3,145	3,562	3,182	3,099	3,334	3,858	4,061	4,413	7,662	7,782	7,814	7,864	7,551	7,829	7,809	7,905
Total	33,122	33,306	34,092	34,400	34,218	35,289	38,072	41,116	44,648	46,101	46,785	47,817	52,407	51,580	52,142	53,108	53,601	53,544	53,269	53,824
CO_2 Emissions (kt C)																				
Coal	37,814	39,110	39,903	40,165	39,969	40,624	43,944	48,015	51,735	52,654	52,758	52,992	53,522	53,099	54,304	55,140	55,936	55,538	55,364	55,222
Oil	23,506	23,010	22,865	23,276	23,893	24,797	25,712	25,918	26,160	26,581	27,395	27,128	27,577	28,343	28,994	29,863	29,646	30,081	31,010	30,781
Gas	9,303	9,012	9,515	9,965	10,529	11,398	11,476	11,520	11,989	12,468	12,989	13,680	14,984	15,077	15,679	16,545	16,918	18,215	17,839	18,338
Total	70,624	71,132	72,283	73,407	74,391	76,819	81,132	85,452	89,883	91,703	93,142	93,800	96,083	96,519	98,977	101,548	102,500	103,834	104,213	104,342

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Table 8.1.7 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Macroeconomic Indicators																				
Population (thousand)	17,065	17,284	17,495	17,667	17,855	18,072	18,311	18,517	18,711	18,926	19,153	19,413	19,651	19,895	20,127	20,395	20,698	21,073	21,499	21,952
Urban Population, %	85.4	85.5	85.7	85.8	86.0	86.1	86.3	86.5	86.8	87.0	87.2	87.4	87.6	87.8	88.0	88.2	88.4	88.6	88.7	88.9
GDP (constant 2000 $ million)	298,651	297,937	299,290	311,519	323,874	336,634	350,711	364,642	381,363	401,041	416,888	425,524	442,135	456,603	475,579	489,652	504,740	522,730	542,761	550,622
GDP (current $ million)	314,519	329,965	328,992	315,554	326,530	371,091	403,661	437,674	401,217	390,209	416,923	380,428	397,239	468,469	615,276	696,034	749,316	856,816	1,039,415	924,843
GDP (constant 2005 PPP $ million)	407,003	406,029	407,872	424,538	441,376	458,766	477,949	496,935	519,722	546,539	568,135	579,904	602,543	622,259	648,119	667,298	687,860	712,377	739,675	750,389
GDP/capita (constant 2000 $)	17,501	17,238	17,107	17,633	18,139	18,627	19,153	19,692	20,382	21,190	21,766	21,920	22,499	22,950	23,628	24,009	24,386	24,806	25,246	25,083
GDP/capita (current $)	18,431	19,091	18,805	17,861	18,288	20,534	22,045	23,636	21,443	20,618	21,768	19,597	20,214	23,547	30,569	34,128	36,203	40,660	48,348	42,131
GDP - Manufacturing (% of GDP)	14.5	14.2	13.7	13.5	13.5	13.0	13.0	12.7	12.5	12.1	11.8	11.8	11.6	11.7	11.3	10.9	10.5	10.4	10.4	9.6
Car Ownership (car/1,000 persons)	573	568	569	574	583	589	606	613	632	638	642	625	634	643	653	662	671	675	683	683
Basic Energy Indicators																				
TPES/capita (toe/person)	5.09	4.96	4.98	5.18	5.13	5.14	5.43	5.49	5.57	5.60	5.64	5.44	5.57	5.57	5.52	5.68	5.69	5.76	5.83	5.78
TFEC/capita (toe/person)	3.31	3.24	3.23	3.32	3.36	3.44	3.49	3.54	3.56	3.58	3.63	3.62	3.55	3.55	3.59	3.68	3.60	3.61	3.62	3.51
TPES/GDP (toe/constant 2000 $ million)	291	288	291	294	283	276	283	279	273	264	259	248	247	243	234	237	233	232	231	231
TFEC/GDP (toe/constant 2000 $ million)	189	188	189	188	185	184	182	180	175	169	167	165	158	154	152	153	147	145	143	140
Import Dependency (%)	–82.1	–95.4	–98.1	–91.6	–89.7	–101.6	–91.4	–98.1	–108.0	–101.2	–116.2	–135.7	–132.1	–128.7	–132.5	–131.2	–127.6	–137.5	–129.8	–133.4
Oil Import Dependency (%)	7.0	1.9	6.3	14.0	19.1	12.9	20.8	15.6	5.1	24.7	0.7	–14.4	–1.3	9.1	14.4	32.1	36.9	30.2	39.4	36.8
Electricity/capita (kWh/ person)	7,573	7,622	7,602	7,749	7,875	8,018	8,137	8,311	8,723	8,905	9,021	9,295	9,728	9,394	9,566	9,885	9,800	9,807	9,870	9,740
CO_2 Intensity (t C/constant 2000 $ million)	236	239	242	236	230	228	231	234	236	229	223	220	217	211	208	207	203	199	192	189
CO_2/capita (t C)	4.14	4.12	4.13	4.16	4.17	4.25	4.43	4.61	4.80	4.85	4.86	4.83	4.89	4.85	4.92	4.98	4.95	4.93	4.85	4.75
CO_2/TPES (t C/toe)	0.81	0.83	0.83	0.80	0.81	0.83	0.82	0.84	0.86	0.86	0.86	0.89	0.88	0.87	0.89	0.88	0.87	0.86	0.83	0.82

GDP = gross domestic product, CO_2 = carbon dioxide, GWh = gigawatt-hour, kt C = thousand tons of carbon equivalent, ktoe = thousand tons of oil equivalent, kWh = kilowatt-hour, PPP = purchasing power parity, t C = ton of carbon equivalent, TFEC = total final energy consumption, toe = ton of oil equivalent, TPES = total primary energy supply.

Note: Figures may not add up to total because of rounding.

Sources: APERC (APEC Energy Database), APERC estimates, JAMA (2012), and World Bank.

8.2 Japan

Country Profile (2009)		Energy Reserves (year-end 2008)	
Total Surface Area (square kilometer)	364,500	Coal (million ton) - Recoverable	350.0
Population (thousand)	127,558	Gas (trillion cubic feet) - Proven	1.8
GDP (constant 2000 $ billion)	4,817.3	Oil (billion barrel) - Proven	68.0
Electrification Rate (%)	100.0		

GDP = gross domestic product.
Sources: ADB (2012), UNDP (2009), World Bank, and WEC (2010).

2009 Energy Supply and Demand Flow (ktoe)

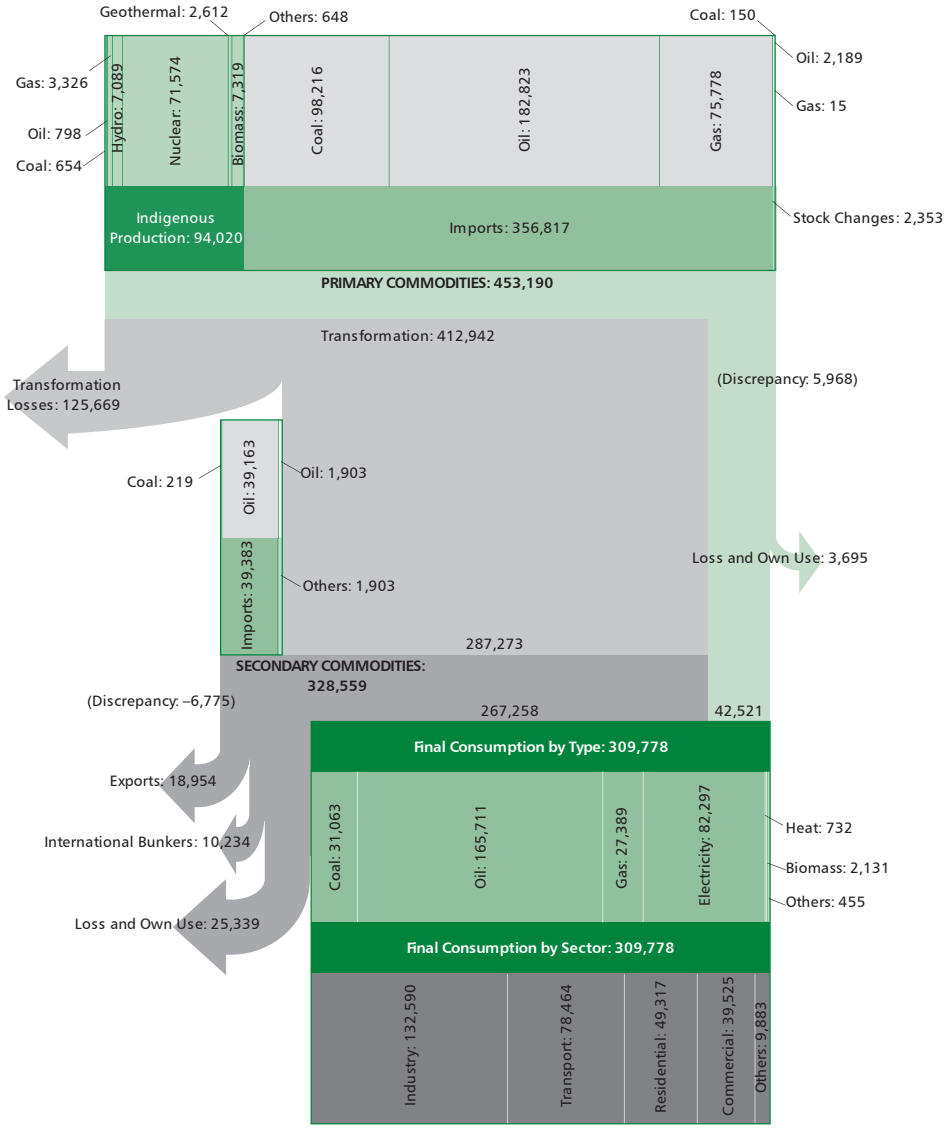


Table 8.2.1 Key Data and Economic Profile

	1990	1995	2000	2005	2009
Socioeconomic Data					
Population (thousand)	123,537	125,439	126,870	127,773	127,558
GDP (constant 2000 $ billion)	4,150.3	4,450.3	4,667.4	4,979.5	4,817.3
GDP (constant 2005 PPP $ billion)	3,227.9	3,461.2	3,630.1	3,872.8	3,746.7
GDP/capita (constant 2000 $)	33,595	35,478	36,789	38,972	37,766
GDP/capita (constant 2005 PPP $)	26,129	27,593	28,613	30,310	29,372

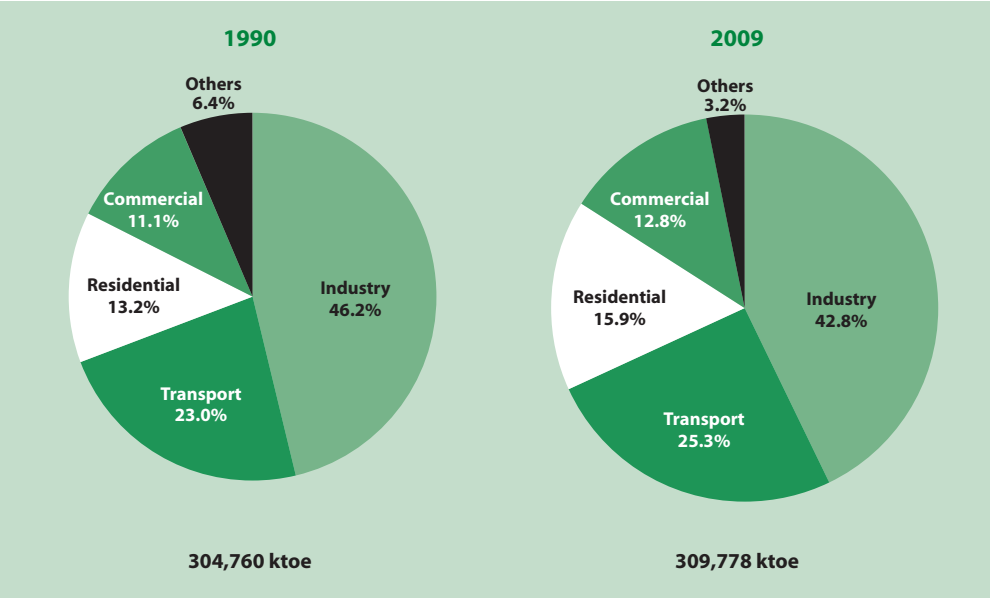
GDP = gross domestic product, PPP = purchasing power parity.
Source: World Bank.

Table 8.2.2 Energy Supply and Demand

	1990	1995	2000	2005	2009
Primary Energy Supply (ktoe)					
Indigenous Production	75,441	98,634	106,958	99,704	94,020
Net Imports	359,656	395,915	408,666	423,747	371,268
Total PES	435,096	494,549	515,624	523,451	465,288
Coal	75,444	82,870	91,814	112,739	98,659
Oil	249,022	267,404	256,457	244,310	198,267
Gas	43,525	51,988	64,918	70,914	79,120
Biomass	5,591	6,068	7,122	7,946	7,319
Others	61,515	86,218	95,314	87,541	81,923
TPES/capita (toe)	3.52	3.94	4.06	4.10	3.65
TPES/GDP (toe/constant 2005 PPP $ million)	135	143	142	135	124
Final Energy Consumption (ktoe)					
Industry	140,882	150,365	160,674	155,667	132,590
Transportation	70,087	81,282	87,140	86,475	78,464
Other Sectors	93,791	107,703	112,070	112,862	98,725
Total FEC	304,760	339,350	359,884	355,004	309,778
Coal	39,591	38,009	39,747	36,148	31,063
Oil	183,241	205,615	211,551	203,598	165,711
Gas	13,574	17,844	21,610	24,803	27,389
Electricity	64,052	73,825	82,913	86,767	82,297
Biomass	2,909	2,507	2,529	2,317	2,131
Others	1,393	1,550	1,534	1,371	1,187

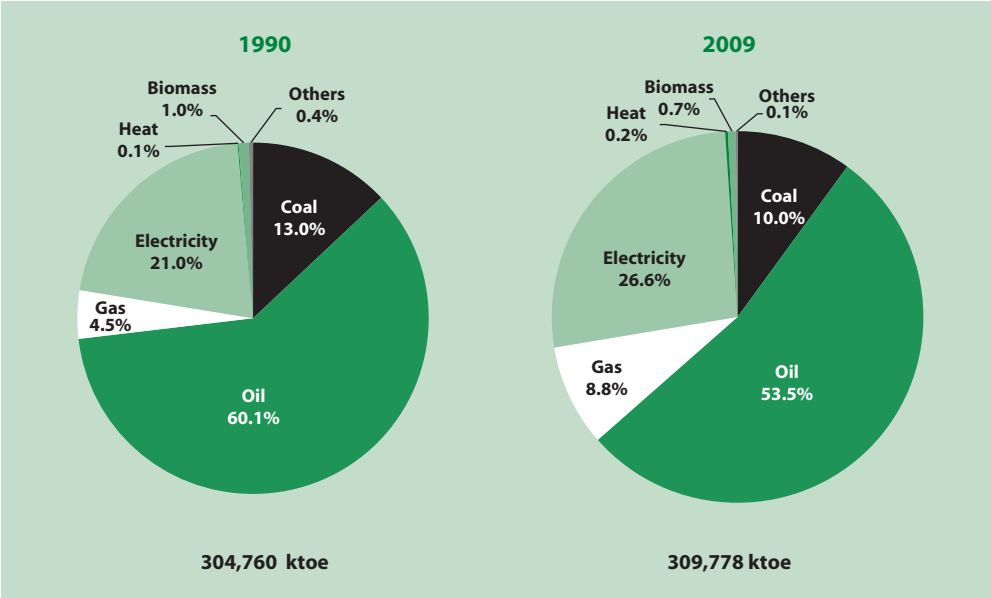
FEC = final energy consumption, GDP = gross domestic product, ktoe = thousand tons of oil equivalent, PES = primary energy supply, PPP = purchasing power parity, toe = ton of oil equivalent, TPES = total primary energy supply.
Source: APERC (APEC Energy Database).

Figure 8.2.1 Final Energy Consumption by Sector, 1990 and 2009



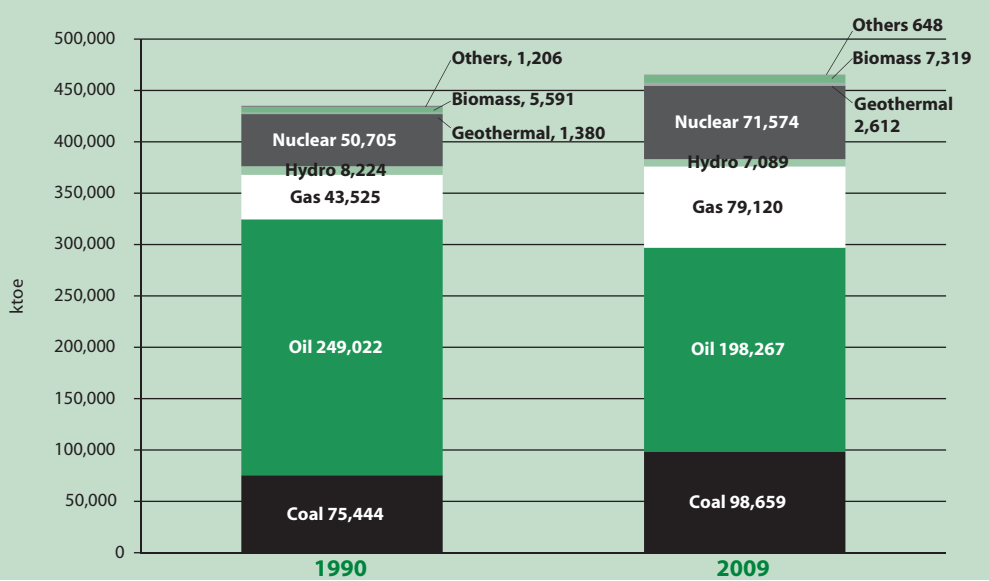
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 8.2.2 Final Energy Consumption by Type of Energy, 1990 and 2009



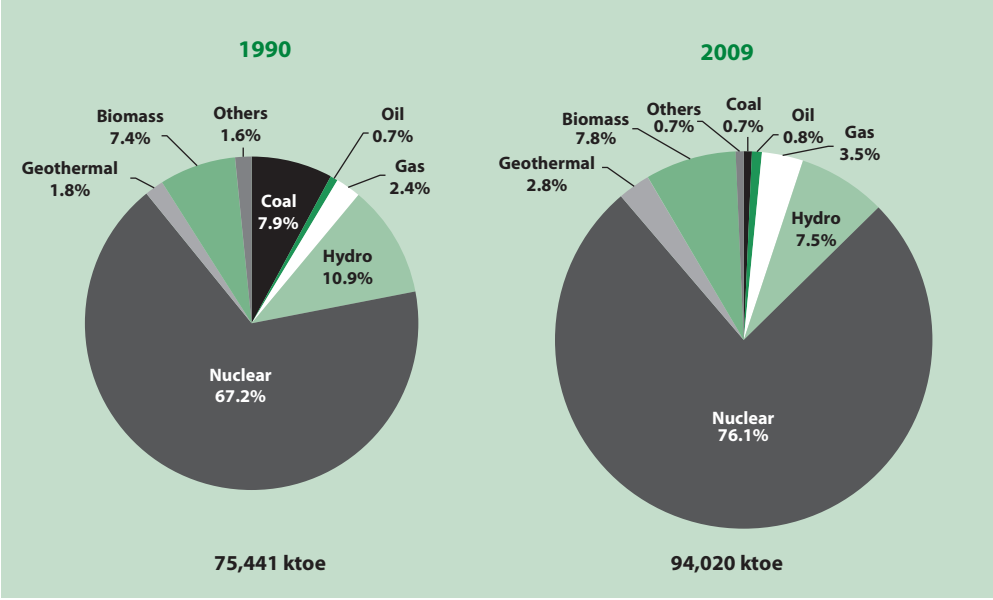
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 8.2.3 Total Primary Energy Supply, 1990 and 2009



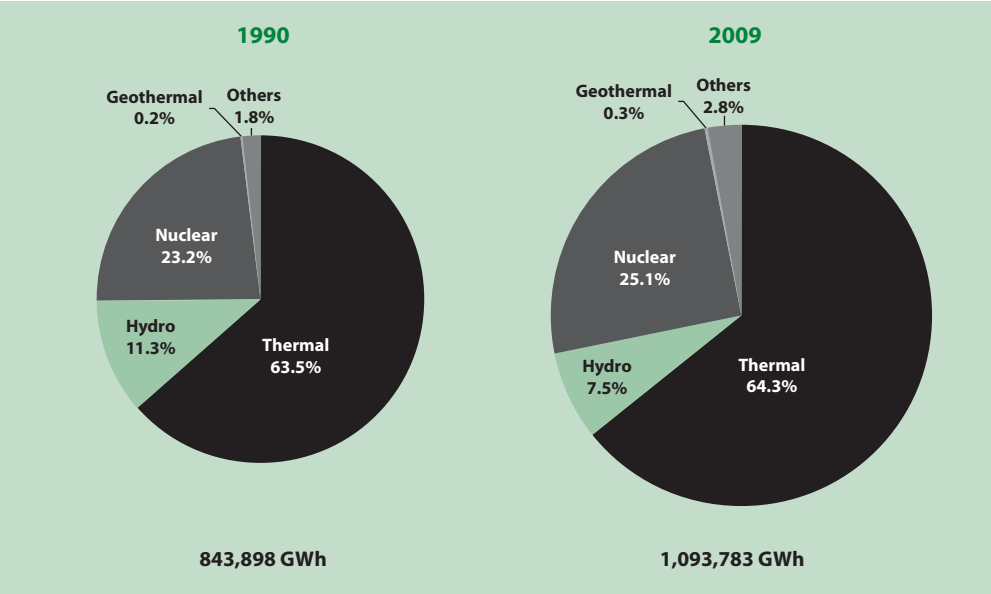
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 8.2.4 Indigenous Energy Production, 1990 and 2009



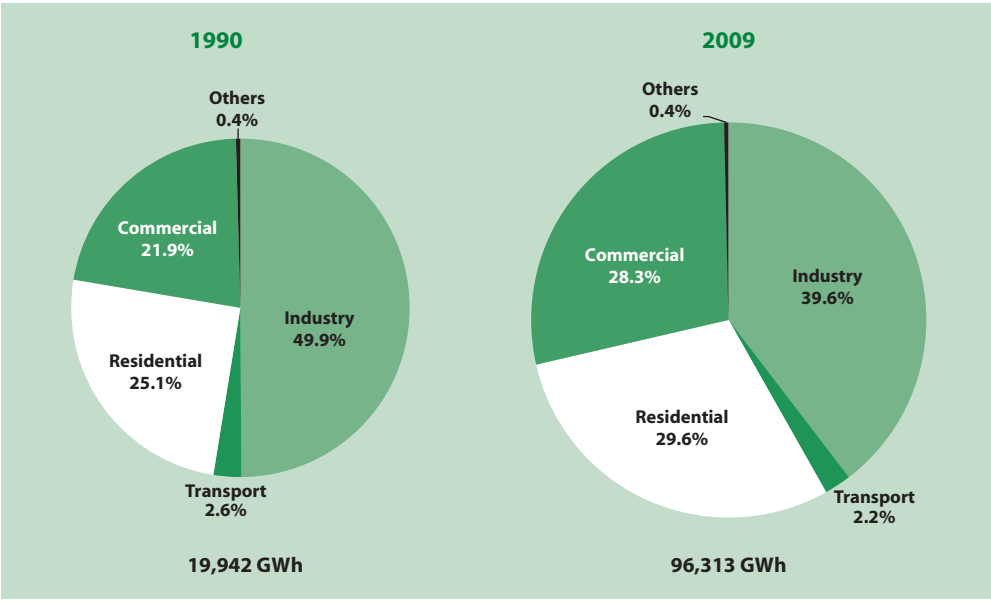
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 8.2.5 Electricity Generation by Plant Type, 1990 and 2009



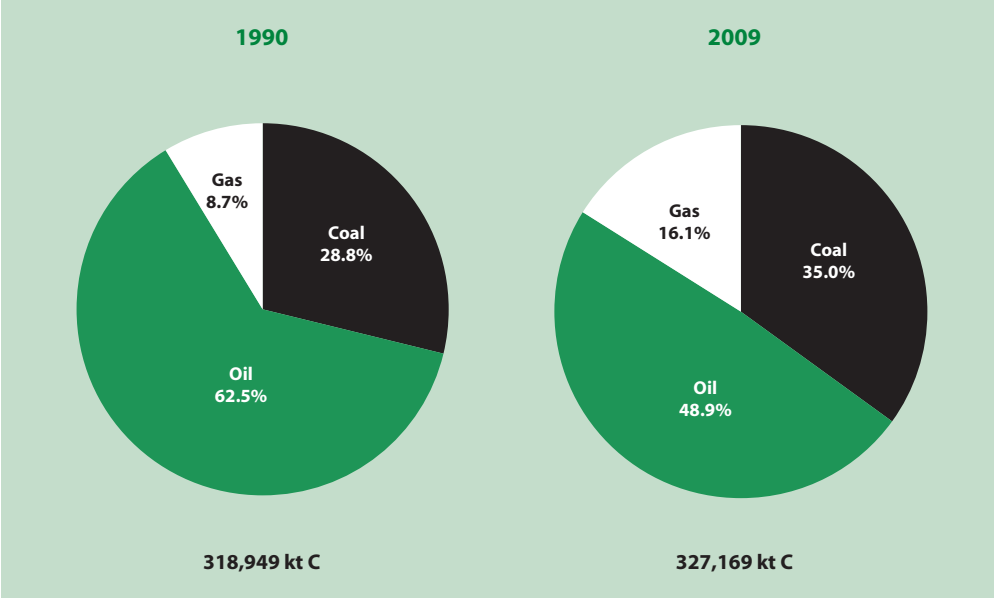
GWh = gigawatt-hour.
Source: APERC (APEC Energy Database).

Figure 8.2.6 Electricity Consumption by Sector, 1990 and 2009



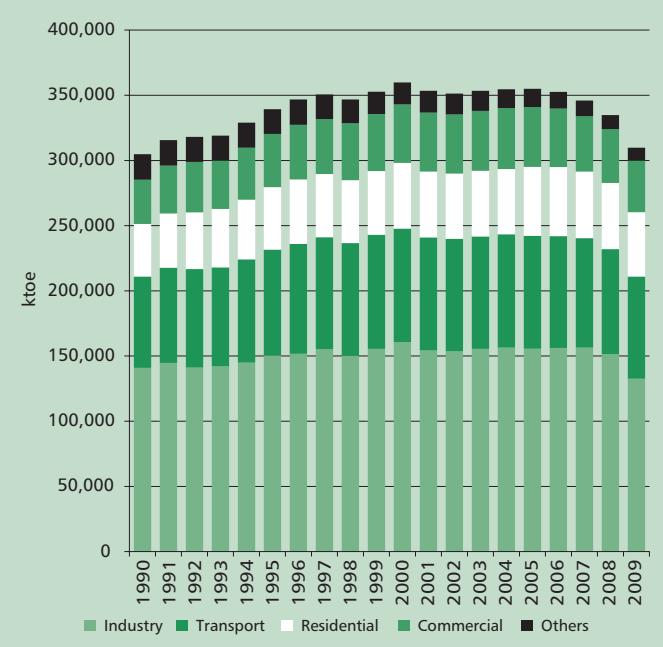
GWh = gigawatt-hour.
Source: APERC (APEC Energy Database).

Figure 8.2.7 Carbon Dioxide Emissions from Fuel Combustion, 1990 and 2009



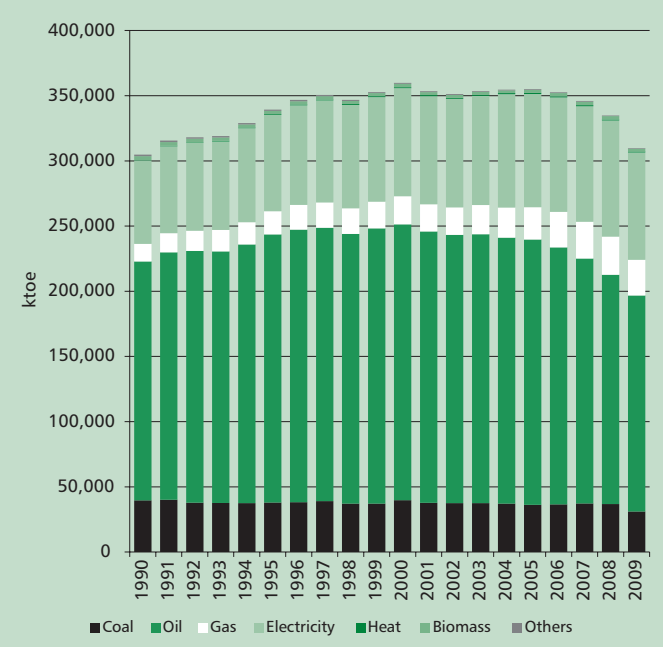
kt C = thousand tons of carbon equivalent.
Source: APERC estimates.

Figure 8.2.8 Final Energy Consumption by Sector, 1990–2009



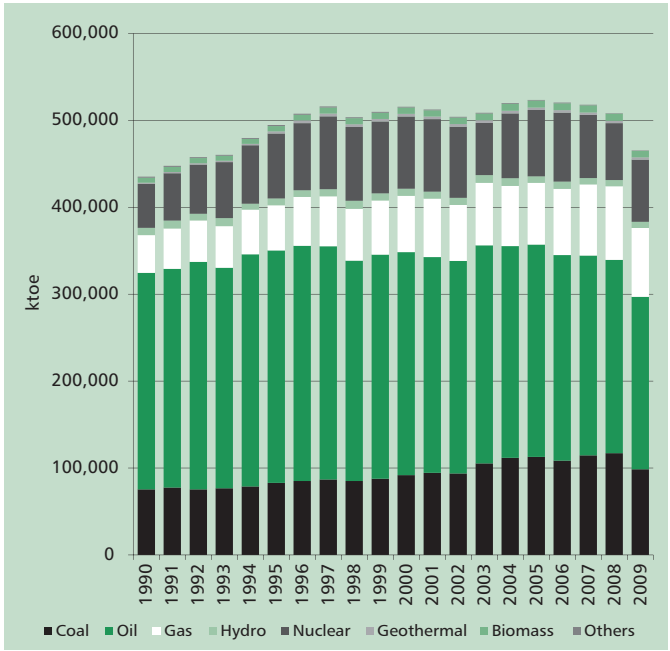
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 8.2.9 Final Energy Consumption by Type, 1990–2009



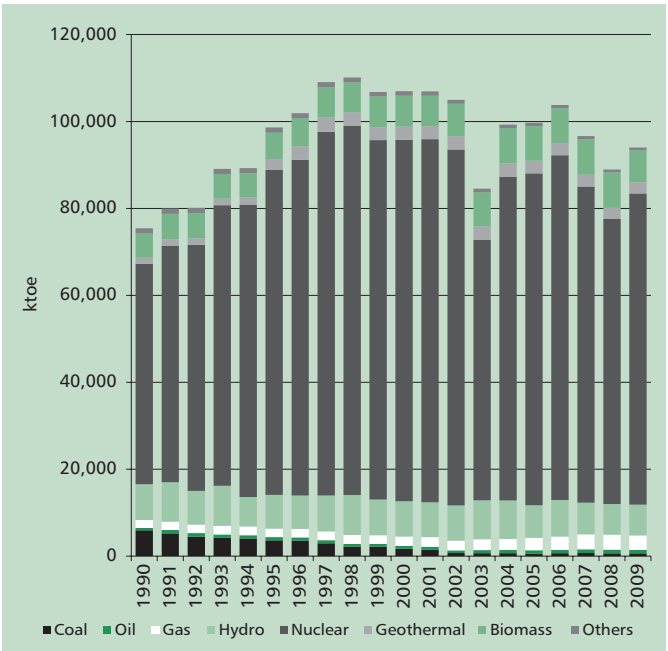
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 8.2.10 Total Primary Energy Supply, 1990–2009



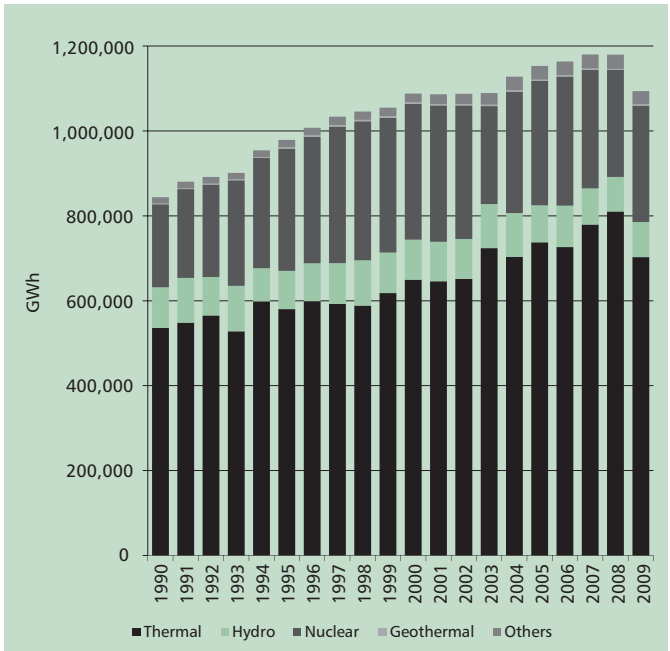
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 8.2.11 Indigenous Energy Production, 1990–2009



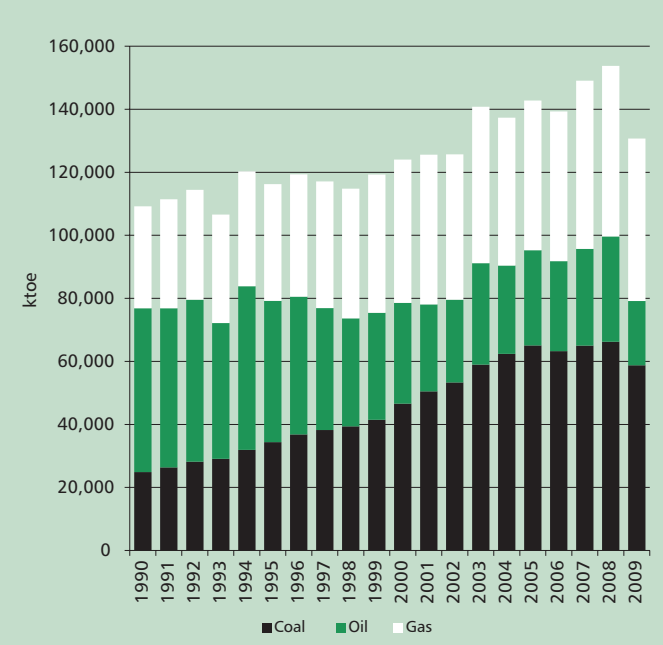
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 8.2.12 Electricity Generation by Source, 1990–2009



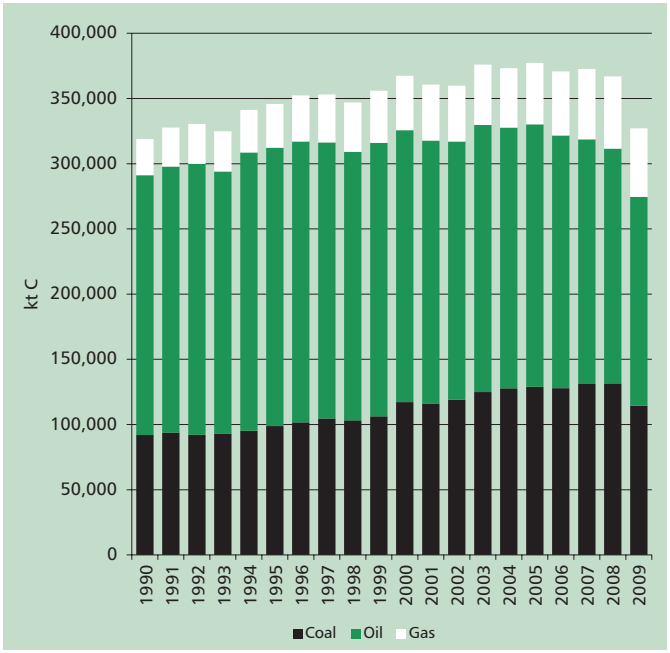
GWh = gigawatt-hour.
Source: APERC (APEC Energy Database).

Figure 8.2.13 Fuel Input for Electricity Generation, 1990–2009



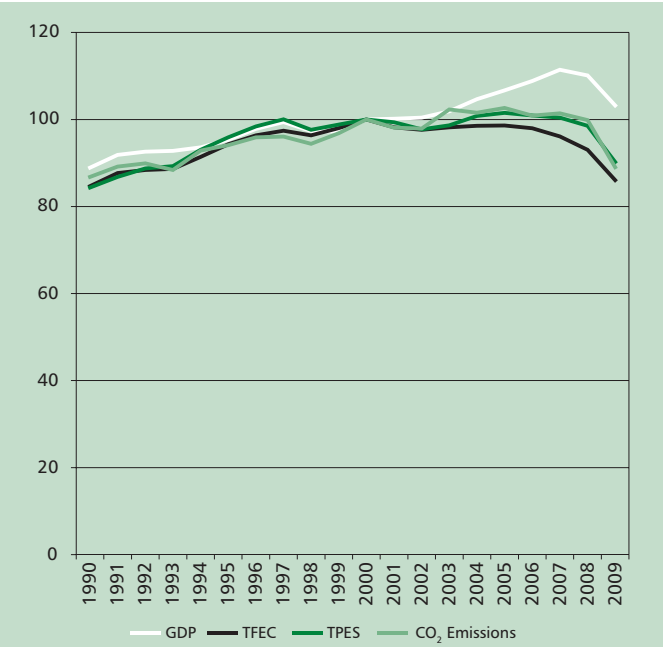
ktoe = thousand tons of oil equivalent.
Sources: APERC (APEC Energy Database).

Figure 8.2.14 Carbon Dioxide Emissions from Fuel Combustion, 1990–2009



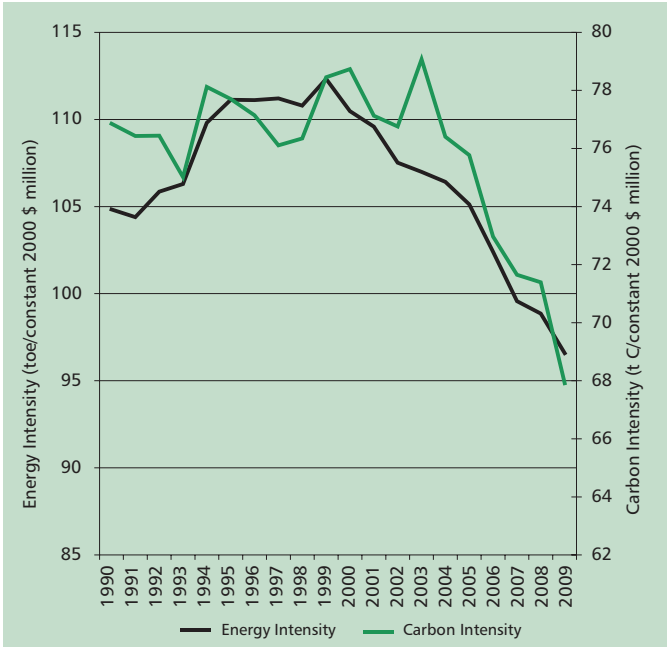
kt C = thousand tons of carbon equivalent.
Source: APERC estimates.

Figure 8.2.15 Growth of GDP, TFEC, TPES, and CO_2 (indexed to year 2000), 1990–2009



CO_2 = carbon dioxide, GDP = gross domestic product, TFEC = total final energy consumption, TPES = total primary energy supply.
Note: Indices are measured relative to the base year 2000 (2000 = 100).
Source: APERC estimates.

Figure 8.2.16 Energy and Carbon Intensities, 1990–2009



t C = ton of carbon equivalent, toe = ton of oil equivalent.
Source: APERC estimates.

Table 8.2.3 Japan Energy Balance Table, 2006

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	685	0	779	0	0	0	0	0	0	0	3,061	8,398	79,298	2,824	0	0	7,994	754	0	0	103,793
2.	Imports	108,348	1,187	210,313	50,268	1,809	973	276	3,777	16,358	27,075	73,004	0	0	0	0	0	0	0	0	0	443,120
3.	Exports	0	–1,321	0	–9,166	–230	–295	–3,517	–3,196	–80	–1,849	0	0	0	0	0	0	0	0	0	0	–10,487
4.	International Bunkers	0	0	0	–13,180	0	0	–34	–6,246	0	–6,901	0	0	0	0	0	0	0	0	0	0	–13,180
5.	Stock Changes	–405	0	–1,007	–1,482	–49	–831	–32	–420	–327	178	–25	0	0	0	0	0	0	0	0	0	–2,920
6.	Total Primary Energy Supply	108,628	–135	210,085	26,440	1,529	–153	–3,306	–6,085	15,951	18,503	76,040	8,398	79,298	2,824	0	0	7,994	754	0	0	520,326
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	–95,964	28,562	–209,265	182,823	45,450	22,078	34,055	36,263	3,792	41,184	–46,816	–8,398	–79,298	–2,824	0	0	–8,515	–207	99,974	867	–139,062
8.1	Power Generation	–56,200	–7,056	–6,557	–22,031	0	–139	–131	–18,509	–598	–2,654	–48,112	–8,398	–79,298	–2,824	0	0	–8,515	–207	99,974	867	–138,358
8.2	Gas Processing	0	–13	0	–1,144	0	0	0	0	–1,144	0	1,296	0	0	0	0	0	0	0	0	0	140
8.3	Refineries	0	0	–208,280	212,222	45,450	22,217	34,186	54,772	5,534	50,063	0	0	0	0	0	0	0	0	0	0	3,942
8.4	Coal Transformation	–39,764	35,631	0	–546	0	0	0	0	0	–546	0	0	0	0	0	0	0	0	0	0	–4,680
8.5.	Other Transformation	0	0	5,571	–5,679	0	0	0	0	0	–5,679	0	0	0	0	0	0	0	0	0	0	–107
9.	Loss and Own Use	–171	–3,009	0	–12,736	0	–140	–40	–1,975	–699	–9,883	–2,459	0	0	0	0	0	0	0	–11,344	0	–29,720
10.	Discrepancy	2,419	–3,768	–819	511	793	1	559	152	861	–1,855	577	0	0	0	0	0	3,044	0	–812	–89	1,063
11.	Total Final Energy Consumption	14,911	21,651	0	197,037	47,773	21,785	31,268	28,356	19,905	47,949	27,342	0	0	0	0	0	2,523	547	87,818	778	352,607
12.	Industry Sector	14,911	20,667	0	68,107	108	4,735	3,697	12,032	9,191	38,345	12,174	0	0	0	0	0	2,499	0	37,818	0	156,177
13.	Transport Sector	0	0	0	83,905	47,665	0	25,846	4,617	1,253	4,524	0	0	0	0	0	0	0	0	1,851	0	85,756
14.	Other Sectors	0	983	0	39,945	0	17,050	1,726	11,708	9,462	0	15,168	0	0	0	0	0	24	547	48,149	778	105,594
14.1	Residential and Commercial	0	983	0	32,604	0	14,811	201	8,130	9,462	0	15,168	0	0	0	0	0	24	547	47,830	695	97,851
14.1.1	Commerce and Public Services	0	964	0	13,295	0	2,092	201	8,130	2,872	0	6,370	0	0	0	0	0	0	20	23,463	664	44,777
14.1.2	Residential	0	19	0	19,309	0	12,719	0	0	6,590	0	8,798	0	0	0	0	0	24	527	24,367	31	53,074
14.2	Non-Specified Others	0	0	0	7,341	0	2,239	1,525	3,578	0	0	0	0	0	0	0	0	0	0	319	83	7,743
15.	Non-Energy Use	0	0	0	5,080	0	0	0	0	0	5,080	0	0	0	0	0	0	0	0	0	0	5,080
16.	Electricity Output (GWh)	327,199	0	143,008	0	0	0	0	0	0	0	256,118	97,650	304,291	3,140	5	2,096	23,252	6,869	0	0	1,163,626
17.	Heat Output (TJ)	784	0	1,098	0	0	0	0	0	0	0	20,848	0	0	0	0	0	0	13,573	0	0	36,303

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.
Note: Figures may not add up to total because of rounding.
Source: APERC (APEC Energy Database).

Table 8.2.4 Japan Energy Balance Table, 2007

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	722	0	833	0	0	0	0	0	0	0	3,448	7,313	72,710	2,720	0	0	8,171	724	0	0	96,641
2.	Imports	113,815	1,392	206,464	45,290	767	283	278	3,663	15,494	24,805	78,437	0	0	0	0	0	0	0	0	0	445,398
3.	Exports	0	–1,073	0	–13,603	–335	–607	–6,714	–3,069	–129	–2,748	0	0	0	0	0	0	0	0	0	0	–14,675
4.	International Bunkers	0	0	0	–12,281	0	0	–104	–5,840	0	–6,337	0	0	0	0	0	0	0	0	0	0	–12,281
5.	Stock Changes	–291	0	2,370	709	–35	465	–100	175	275	–72	–19	0	0	0	0	0	0	0	0	0	2,769
6.	Total Primary Energy Supply	114,246	319	209,668	20,116	396	141	–6,639	–5,070	15,640	15,648	81,865	7,313	72,710	2,720	0	0	8,171	724	0	0	517,851
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	–97,563	28,632	–209,104	180,029	45,860	19,123	36,709	30,404	3,877	44,055	–52,886	–7,313	–72,710	–2,720	0	0	–8,633	–205	101,388	863	–140,221
8.1	Power Generation	–57,844	–7,178	–7,787	–22,952	0	–52	–130	–19,504	–634	–2,631	–53,983	–7,313	–72,710	–2,720	0	0	–8,633	–205	101,388	863	–139,074
8.2	Gas Processing	0	0	0	–967	0	0	0	0	–967	0	1,097	0	0	0	0	0	0	0	0	0	130
8.3	Refineries	0	0	–207,031	210,318	45,860	19,176	36,839	49,909	5,479	53,055	0	0	0	0	0	0	0	0	0	0	3,286
8.4	Coal Transformation	–39,719	35,810	0	–560	0	0	0	0	0	–560	0	0	0	0	0	0	0	0	0	0	–4,469
8.5.	Other Transformation	0	0	5,715	–5,809	0	0	0	0	0	–5,809	0	0	0	0	0	0	0	0	0	0	–94
9.	Loss and Own Use	–222	–3,073	0	–12,670	0	–99	–39	–1,923	–695	–9,914	–3,213	0	0	0	0	0	0	0	–11,958	0	–31,135
10.	Discrepancy	–791	–4,261	–564	387	723	–54	510	–175	840	–1,456	2,461	0	0	0	0	0	3,095	0	–825	–79	–578
11.	Total Final Energy Consumption	15,669	21,617	0	187,862	46,980	19,111	30,541	23,236	19,661	48,333	28,227	0	0	0	0	0	2,633	519	88,606	784	345,917
12.	Industry Sector	15,669	20,755	0	64,919	148	3,907	3,611	9,796	9,026	38,432	13,740	0	0	0	0	0	2,609	0	38,710	0	156,402
13.	Transport Sector	0	0	0	82,166	46,833	0	25,253	4,010	1,215	4,855	0	0	0	0	0	0	0	0	1,829	0	83,995
14.	Other Sectors	0	862	0	35,732	0	15,204	1,678	9,430	9,420	0	14,487	0	0	0	0	0	24	519	48,066	784	100,474
14.1	Residential and Commercial	0	862	0	29,246	0	13,237	187	6,401	9,420	0	14,487	0	0	0	0	0	24	519	47,734	701	93,575
14.1.1	Commerce and Public Services	0	845	0	11,311	0	1,881	187	6,401	2,842	0	6,086	0	0	0	0	0	0	20	23,453	670	42,386
14.1.2	Residential	0	17	0	17,934	0	11,357	0	0	6,578	0	8,402	0	0	0	0	0	24	499	24,281	31	51,188
14.2	Non-Specified Others	0	0	0	6,486	0	1,966	1,490	3,029	0	0	0	0	0	0	0	0	0	0	332	82	6,900
15.	Non-Energy Use	0	0	0	5,046	0	0	0	0	0	5,046	0	0	0	0	0	0	0	0	0	0	5,046
16.	Electricity Output (GWh)	336,115	0	156,334	0	0	0	0	0	0	0	287,319	85,033	279,009	3,025	8	2,521	23,884	6,853	0	0	1,180,100
17.	Heat Output (TJ)	783	0	679	0	0	0	0	0	0	0	21,263	0	0	0	0	0	0	13,406	0	0	36,130

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Source: APERC (APEC Energy Database).

Table 8.2.5 Japan Energy Balance Table, 2008

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	627	0	855	0	0	0	0	0	0	0	3,482	7,017	65,605	2,532	0	0	8,163	683	0	0	88,964
2.	Imports	117,014	1,106	210,089	44,300	450	222	198	5,244	15,967	22,219	81,307	0	0	0	0	0	0	0	0	0	453,816
3.	Exports	0	–650	0	–19,135	–594	–444	–10,673	–3,436	–166	–3,822	0	0	0	0	0	0	0	0	0	0	–19,785
4.	International Bunkers	0	0	0	–11,658	0	0	–13	–5,486	0	–6,159	0	0	0	0	0	0	0	0	0	0	–11,658
5.	Stock Changes	–1,103	0	–1,863	–185	71	706	–329	43	–405	–272	–10	0	0	0	0	0	0	0	0	0	–3,161
6.	Total Primary Energy Supply	116,538	456	209,081	13,322	–73	485	–10,817	–3,635	15,396	11,966	84,779	7,017	65,605	2,532	0	0	8,163	683	0	0	508,175
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	–98,905	28,804	–208,548	175,425	44,645	17,107	39,583	26,590	3,666	43,835	–53,656	–7,017	–65,605	–2,532	0	0	–8,569	–189	101,359	831	–138,601
8.1	Power Generation	–59,316	–6,920	–9,439	–24,020	0	–42	–127	–20,637	–721	–2,492	–54,718	–7,017	–65,605	–2,532	0	0	–8,569	–189	101,359	831	–136,134
8.2	Gas Processing	0	0	0	–946	0	0	0	0	–946	0	1,062	0	0	0	0	0	0	0	0	0	116
8.3	Refineries	0	0	–204,303	206,379	44,645	17,148	39,710	47,227	5,333	52,316	0	0	0	0	0	0	0	0	0	0	2,076
8.4	Coal Transformation	–39,589	35,724	0	–706	0	0	0	0	0	–706	0	0	0	0	0	0	0	0	0	0	–4,570
8.5.	Other Transformation	0	0	5,194	–5,282	0	0	0	0	0	–5,282	0	0	0	0	0	0	0	0	0	0	–88
9.	Loss and Own Use	–299	–3,112	0	–11,997	–1	–62	–35	–1,796	–673	–9,430	–3,502	0	0	0	0	0	0	0	–11,734	0	–30,643
10.	Discrepancy	–1,555	–5,122	–533	–949	435	–105	378	–118	–93	–1,446	1,762	0	0	0	0	0	3,032	0	–620	–77	–4,061
11.	Total Final Energy Consumption	15,779	21,027	0	175,801	45,006	17,424	29,108	21,042	18,296	44,925	29,384	0	0	0	0	0	2,626	494	89,006	754	334,870
12.	Industry Sector	15,779	20,339	0	59,713	96	3,263	3,370	9,038	8,295	35,651	14,644	0	0	0	0	0	2,604	0	38,428	0	151,507
13.	Transport Sector	0	0	0	78,689	44,910	0	24,141	3,681	1,160	4,798	0	0	0	0	0	0	0	0	1,846	0	80,535
14.	Other Sectors	0	688	0	32,923	0	14,161	1,597	8,323	8,841	0	14,739	0	0	0	0	0	22	494	48,732	754	98,352
14.1	Residential and Commercial	0	688	0	27,012	0	12,373	175	5,623	8,841	0	14,739	0	0	0	0	0	22	494	48,403	679	92,038
14.1.1	Commerce and Public Services	0	671	0	10,135	0	1,614	175	5,623	2,723	0	6,173	0	0	0	0	0	0	20	23,618	648	41,265
14.1.2	Residential	0	17	0	16,877	0	10,759	0	0	6,118	0	8,567	0	0	0	0	0	22	474	24,784	31	50,772
14.2	Non-Specified Others	0	0	0	5,910	0	1,787	1,423	2,700	0	0	0	0	0	0	0	0	0	0	329	74	6,314
15.	Non-Energy Use	0	0	0	4,476	0	0	0	0	0	4,476	0	0	0	0	0	0	0	0	0	0	4,476
16.	Electricity Output (GWh)	345,327	0	169,787	0	0	0	0	0	0	0	295,037	81,595	251,744	2,814	10	2,748	23,970	6,699	0	0	1,179,733
17.	Heat Output (TJ)	693	0	587	0	0	0	0	0	0	0	20,767	0	0	0	0	0	0	12,733	0	0	34,780

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.
Note: Figures may not add up to total because of rounding.
Source: APERC (APEC Energy Database).

Table 8.2.6 Japan Energy Balance Table, 2009

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	654	0	798	0	0	0	0	0	0	0	3,326	7,089	71,574	2,612	0	0	7,319	648	0	0	94,020
2.	Imports	98,216	219	182,823	39,163	697	309	189	2,430	13,649	21,890	75,778	0	0	0	0	0	0	0	0	0	396,200
3.	Exports	0	−580	0	−18,374	−797	−290	−10,277	−3,667	−202	−3,142	0	0	0	0	0	0	0	0	0	0	−18,954
4.	International Bunkers	0	0	0	−10,234	0	0	−4	−4,957	0	−5,273	0	0	0	0	0	0	0	0	0	0	−10,234
5.	Stock Changes	150	0	2,189	1,903	32	198	205	434	557	477	15	0	0	0	0	0	0	0	0	0	4,256
6.	Total Primary Energy Supply	99,019	−360	185,809	12,458	−68	217	−9,887	−5,760	14,004	13,952	79,120	7,089	71,574	2,612	0	0	7,319	648	0	0	465,288
7.	Transfers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	−86,623	24,377	−185,709	168,115	44,824	16,871	36,980	25,856	3,824	39,761	−51,237	−7,089	−71,574	−2,612	0	0	−7,905	−193	93,972	809	−125,669
8.1	Power Generation	−52,906	−5,881	−3,352	−17,011	0	−26	−165	−13,488	−613	−2,720	−52,208	−7,089	−71,574	−2,612	0	0	−7,905	−193	93,972	809	−125,950
8.2	Gas Processing	0	0	0	−875	0	0	0	0	−875	0	971	0	0	0	0	0	0	0	0	0	96
8.3	Refineries	0	0	−187,486	191,842	44,824	16,896	37,145	39,343	5,312	48,322	0	0	0	0	0	0	0	0	0	0	4,357
8.4	Coal Transformation	−33,717	30,257	0	−636	0	0	0	0	0	−636	0	0	0	0	0	0	0	0	0	0	−4,095
8.5.	Other Transformation	0	0	5,129	−5,205	0	0	0	0	0	−5,205	0	0	0	0	0	0	0	0	0	0	−76
9.	Loss and Own Use	−299	−2,711	0	−11,703	0	−65	−35	−1,604	−739	−9,260	−3,396	0	0	0	0	0	0	0	−10,925	0	−29,034
10.	Discrepancy	448	−2,789	−100	−3,159	458	−305	300	−1,130	−215	−2,266	2,902	0	0	0	0	0	2,717	0	−750	−77	−807
11.	Total Final Energy Consumption	12,546	18,517	0	165,711	45,214	16,718	27,358	17,361	16,873	42,187	27,389	0	0	0	0	0	2,131	455	82,297	732	309,778
12.	Industry Sector	12,546	17,972	0	54,338	97	3,138	3,177	6,978	7,350	33,598	13,018	0	0	0	0	0	2,109	0	32,607	0	132,590
13.	Transport Sector	0	0	0	76,662	45,117	0	22,729	3,243	1,129	4,445	0	0	0	0	0	0	0	0	1,802	0	78,464
14.	Other Sectors	0	545	0	30,567	0	13,580	1,453	7,140	8,395	0	14,371	0	0	0	0	0	22	455	47,889	732	94,581
14.1	Residential and Commercial	0	545	0	25,197	0	11,861	116	4,825	8,395	0	14,371	0	0	0	0	0	22	455	47,595	658	88,842
14.1.1	Commerce and Public Services	0	531	0	9,099	0	1,572	116	4,825	2,586	0	5,983	0	0	0	0	0	0	17	23,268	627	39,525
14.1.2	Residential	0	14	0	16,097	0	10,288	0	0	5,809	0	8,388	0	0	0	0	0	22	438	24,326	31	49,317
14.2	Non-Specified Others	0	0	0	5,371	0	1,719	1,336	2,315	0	0	0	0	0	0	0	0	0	0	294	74	5,739
15.	Non-Energy Use	0	0	0	4,144	0	0	0	0	0	4,144	0	0	0	0	0	0	0	0	0	0	4,144
16.	Electricity Output (GWh)	310,753	0	108,390	0	0	0	0	0	0	0	283,658	82,432	274,651	2,901	15	3,427	20,885	6,670	0	0	1,093,783
17.	Heat Output (TJ)	273	0	436	0	0	0	0	0	0	0	20,344	0	0	0	0	0	0	12,824	0	0	33,877

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Source: APERC (APEC Energy Database).

Table 8.2.7 Japan Summary Table, 1990–2009

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Indigenous Production (ktoe)																				
Coal	5,933	5,241	4,438	4,188	4,049	3,629	3,564	2,939	2,132	2,165	1,720	1,494	699	683	684	567	685	722	627	654
Oil	555	770	881	800	764	757	735	741	695	643	644	660	628	711	725	794	779	833	855	798
Gas	1,847	1,926	1,944	1,979	2,032	1,961	1,976	2,021	2,040	2,008	2,159	2,219	2,249	2,498	2,533	2,855	3,061	3,448	3,482	3,326
Hydro	8,224	9,067	7,771	9,217	6,741	7,744	7,662	8,249	9,192	8,225	8,104	8,013	8,086	8,950	8,871	7,488	8,398	7,313	7,017	7,089
Nuclear	50,705	54,386	56,559	64,551	67,299	74,763	77,268	83,693	84,949	82,671	83,163	83,532	81,896	59,958	74,497	76,366	79,298	72,710	65,605	71,574
Geothermal	1,380	1,521	1,559	1,494	1,621	2,511	3,077	3,260	3,092	2,974	3,024	2,988	3,032	3,072	3,048	2,896	2,824	2,720	2,532	2,612
Solar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wind	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Biomass	5,591	5,832	5,790	5,689	5,629	6,068	6,432	6,933	6,895	7,074	7,122	7,027	7,473	7,815	8,075	7,946	7,994	8,171	8,163	7,319
Others	1,206	1,237	1,197	1,163	1,156	1,200	1,207	1,210	1,113	1,021	1,023	978	918	871	827	792	754	724	683	648
Total	75,441	79,980	80,140	89,081	89,291	98,634	101,921	109,047	110,108	106,781	106,958	106,912	104,981	84,559	99,259	99,704	103,793	96,641	88,964	94,020
Primary Energy Supply (ktoe)																				
Coal	75,444	77,552	75,446	76,698	78,864	82,870	85,020	86,854	85,005	87,771	91,814	94,409	93,797	105,295	111,742	112,739	108,493	114,565	116,994	98,659
Oil	249,022	251,562	261,710	253,635	266,993	267,404	270,564	268,260	253,513	257,662	256,457	248,183	244,475	250,956	243,516	244,310	236,524	229,783	222,403	198,267
Gas	43,525	46,486	47,614	47,876	51,367	51,988	56,271	57,430	59,702	62,305	64,918	67,283	64,384	71,781	69,288	70,914	76,040	81,865	84,779	79,120
Hydro	8,224	9,067	7,771	9,217	6,741	7,744	7,662	8,249	9,192	8,225	8,104	8,013	8,086	8,950	8,871	7,488	8,398	7,313	7,017	7,089
Nuclear	50,705	54,386	56,559	64,551	67,299	74,763	77,268	83,693	84,949	82,671	83,163	83,532	81,896	59,958	74,497	76,366	79,298	72,710	65,605	71,574
Geothermal	1,380	1,521	1,559	1,494	1,621	2,511	3,077	3,260	3,092	2,974	3,024	2,988	3,032	3,072	3,048	2,896	2,824	2,720	2,532	2,612
Solar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wind	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Biomass	5,591	5,832	5,790	5,689	5,629	6,068	6,432	6,933	6,895	7,074	7,122	7,027	7,473	7,815	8,075	7,946	7,994	8,171	8,163	7,319
Others	1,206	1,237	1,197	1,163	1,156	1,200	1,207	1,210	1,113	1,021	1,023	978	918	871	827	792	754	724	683	648
Total	435,096	447,643	457,647	460,324	479,669	494,549	507,502	515,890	503,461	509,704	515,624	512,414	504,061	508,698	519,863	523,451	520,326	517,851	508,175	465,288
Final Energy Consumption by Sector (ktoe)																				
Industry	140,882	144,698	141,144	142,150	144,904	150,365	151,662	155,215	150,120	155,514	160,674	154,327	153,545	155,548	156,428	155,667	156,177	156,402	151,507	132,590
Transport	70,087	73,022	75,525	75,842	79,298	81,282	84,308	85,922	86,474	87,570	87,140	86,638	86,341	86,185	86,949	86,475	85,756	83,995	80,535	78,464
Residential	40,322	41,701	43,565	44,872	45,689	47,851	49,546	48,549	48,273	48,776	50,357	50,626	50,098	50,444	50,053	52,964	53,074	51,188	50,772	49,317
Commercial	33,949	36,610	38,594	37,034	39,938	40,861	41,857	42,058	43,722	43,822	44,883	45,072	45,269	45,874	46,679	45,937	44,777	42,386	41,265	39,525
Others	19,520	19,560	19,275	19,093	19,166	18,991	19,372	18,869	18,246	17,082	16,830	16,783	16,068	15,379	14,521	13,961	12,823	11,945	10,791	9,883
Total	304,760	315,592	318,103	318,991	328,995	339,350	346,744	350,614	346,834	352,764	359,884	353,446	351,320	353,430	354,630	355,004	352,607	345,917	334,870	309,778

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Table 8.2.7 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Final Energy Consumption by Type (ktoe)																				
Coal	39,591	40,068	37,830	37,620	37,504	38,009	38,142	39,073	37,176	37,094	39,747	37,709	37,534	37,497	37,124	36,148	36,562	37,286	36,806	31,063
Oil	183,241	189,801	193,063	192,911	198,416	205,615	209,194	209,693	206,788	211,144	211,551	208,184	205,683	206,220	203,991	203,598	197,037	187,862	175,801	165,711
Gas	13,574	14,753	15,522	16,496	17,034	17,844	18,944	19,355	19,750	20,483	21,610	20,908	21,195	22,436	23,170	24,803	27,342	28,227	29,384	27,389
Electricity	64,052	66,618	67,492	67,919	72,145	73,825	76,374	78,297	79,221	80,196	82,913	82,879	83,172	83,712	86,919	86,767	87,818	88,606	89,006	82,297
Heat	261	317	347	372	438	540	612	661	688	717	741	748	758	760	788	797	778	784	754	732
Biomass	2,909	2,898	2,759	2,614	2,423	2,507	2,509	2,579	2,339	2,338	2,529	2,265	2,288	2,167	2,038	2,317	2,523	2,633	2,626	2,131
Others	1,132	1,137	1,089	1,058	1,036	1,010	968	956	872	791	793	753	691	637	600	574	547	519	494	455
Total	304,760	315,592	318,103	318,991	328,995	339,350	346,744	350,614	346,834	352,764	359,884	353,446	351,320	353,430	354,630	355,004	352,607	345,917	334,870	309,778
Power Generation (GWh)																				
Thermal	536,009	548,198	565,541	528,122	598,459	580,520	599,239	592,817	588,605	618,027	649,809	645,926	651,366	724,171	703,654	737,644	726,324	779,768	810,152	702,802
Hydro	95,629	105,431	90,365	107,178	78,386	90,044	89,093	95,923	106,881	95,635	94,228	93,094	94,020	103,780	103,091	87,064	97,650	85,033	81,595	82,432
Nuclear	195,797	209,451	218,076	248,656	259,567	287,879	297,606	321,738	327,296	317,687	319,756	321,104	314,934	230,423	285,866	293,038	304,291	279,009	251,744	274,651
Geothermal	1,621	1,770	1,806	1,743	1,890	2,917	3,574	3,790	3,596	3,458	3,392	3,374	3,410	3,466	3,428	3,225	3,140	3,025	2,814	2,901
Solar	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	5	8	10	15
Wind	0	0	0	0	1	1	0	0	3	26	79	197	393	628	1,122	1,578	2,096	2,521	2,748	3,427
Others	14,840	15,669	15,693	15,704	16,226	17,368	17,948	19,275	19,432	20,127	20,817	22,513	23,547	26,910	30,733	30,507	30,121	30,737	30,669	27,555
Total	843,898	880,520	891,482	901,404	954,529	978,729	1,007,461	1,033,543	1,045,813	1,054,959	1,088,082	1,086,208	1,087,670	1,089,378	1,127,895	1,153,059	1,163,626	1,180,100	1,179,733	1,093,783
Loss and Own Use of Electricity (GWh)																				
Transmission and Distribution Losses	47,000	50,322	50,805	50,448	52,037	55,020	51,977	53,213	55,288	55,664	56,064	60,177	59,553	60,458	63,060	67,918	61,321	66,189	66,343	63,078
Own Use	40,705	41,162	43,294	43,768	47,332	48,177	50,678	51,364	51,556	48,522	53,054	53,334	51,856	53,615	56,750	57,887	58,027	58,939	59,481	56,782
Total	87,705	91,484	94,099	94,216	99,369	103,197	102,655	104,577	106,844	104,185	109,118	113,511	111,409	114,073	119,810	125,805	119,348	125,128	125,824	119,860
Fuel Input for Power Generation (ktoe)																				
Coal	24,894	26,347	28,187	29,096	31,916	34,382	36,848	38,225	39,405	41,487	46,573	50,519	53,316	58,967	62,372	65,049	63,232	64,999	66,215	58,778
Oil	51,964	50,535	51,382	43,072	51,922	44,829	43,676	38,708	34,228	33,950	31,998	27,573	26,262	32,185	28,058	30,199	28,556	30,719	33,441	20,351
Gas	32,368	34,544	34,877	34,401	36,467	37,037	38,823	40,184	41,180	43,876	45,475	47,499	46,124	49,658	46,903	47,512	47,490	53,349	54,098	51,600
Total	109,226	111,426	114,445	106,569	120,305	116,247	119,348	117,118	114,813	119,313	124,046	125,590	125,703	140,811	137,333	142,761	139,277	149,067	153,754	130,729
CO_2 Emissions (kt C)																				
Coal	91,913	93,773	92,060	93,070	95,257	98,751	101,614	104,631	103,241	106,323	117,168	116,124	118,955	124,882	127,795	128,872	127,839	131,017	131,514	114,504
Oil	199,240	204,098	207,805	200,937	213,327	213,500	215,381	211,694	205,858	209,648	208,511	201,646	198,097	204,836	199,880	201,383	193,823	187,622	180,025	160,124
Gas	27,796	29,881	30,605	30,870	32,652	33,544	35,366	36,736	37,826	40,011	41,805	42,889	42,812	46,232	45,567	47,039	49,079	54,017	55,437	52,542
Total	318,949	327,752	330,470	324,877	341,237	345,795	352,361	353,062	346,925	355,982	367,484	360,660	359,863	375,951	373,242	377,293	370,741	372,656	366,975	327,169

continued on next page

Table 8.2.7 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Macroeconomic Indicators																				
Population (thousand)	123,537	123,921	124,229	124,536	124,961	125,439	125,761	126,091	126,410	126,650	126,870	127,149	127,445	127,718	127,761	127,773	127,756	127,771	127,704	127,558
Urban Population, %	63.1	63.4	63.7	64.0	64.3	64.6	64.7	64.8	65.0	65.1	65.2	65.4	65.5	65.7	65.8	66.0	66.2	66.3	66.5	66.6
GDP (constant 2000 $ million)	4,150,256	4,288,224	4,323,346	4,330,742	4,368,141	4,450,335	4,567,703	4,639,122	4,544,072	4,537,665	4,667,448	4,676,055	4,688,318	4,754,589	4,885,068	4,979,549	5,081,106	5,201,164	5,140,555	4,817,339
GDP (current $ million)	3,058,038	3,484,770	3,796,114	4,350,012	4,778,992	5,264,380	4,642,544	4,261,842	3,857,028	4,368,735	4,667,448	4,095,484	3,918,335	4,229,097	4,605,921	4,552,200	4,362,590	4,377,944	4,879,861	5,032,983
GDP (constant 2005 PPP $ million)	3,227,860	3,335,165	3,362,481	3,368,233	3,397,321	3,461,247	3,552,530	3,608,076	3,534,151	3,529,168	3,630,107	3,636,800	3,646,338	3,697,880	3,799,360	3,872,843	3,951,829	4,045,204	3,998,066	3,746,684
GDP/capita (constant 2000 $)	33,595	34,605	34,801	34,775	34,956	35,478	36,321	36,792	35,947	35,828	36,789	36,776	36,787	37,227	38,236	38,972	39,772	40,707	40,254	37,766
GDP/capita (current $)	24,754	28,121	30,557	34,930	38,244	41,968	36,916	33,800	30,512	34,495	36,789	32,210	30,745	33,113	36,051	35,627	34,148	34,264	38,212	39,456
GDP – Manufacturing (% of GDP)	22.9	23.4	22.8	22.0	21 .5	22.0	22.2	22.5	21.7	21.7	22.2	20.9	20.5	21.3	22.0	22.7	23.0	23.3	23.5	20.1
Car Ownership (car/1,000 persons)	457	473	486	497	509	521	534	543	548	553	559	563	581	581	584	592	594	593	591	579
Basic Energy Indicators																				
TPES/capita (toe/person)	3.52	3.61	3.68	3.70	3.84	3.94	4.04	4.09	3.98	4.02	4.06	4.03	3.96	3.98	4.07	4.10	4.07	4.05	3.98	3.65
TFEC/capita (toe/person)	2.47	2.55	2.56	2.56	2.63	2.71	2.76	2.78	2.74	2.79	2.84	2.78	2.76	2.77	2.78	2.78	2.76	2.71	2.62	2.43
TPES/GDP (toe/constant 2000 $ million)	105	104	106	106	110	111	111	111	111	112	110	110	108	107	106	105	102	100	99	97
TFEC/GDP (toe/constant 2000 $ million)	73	74	74	74	75	76	76	76	76	78	77	76	75	74	73	71	69	67	65	64
Import Dependency (%)	82.7	82.1	82.5	80.6	81.4	80.1	79.9	78.9	78.1	79.1	79.3	79.1	79.2	83.4	80.9	81.0	80.1	81.3	82.5	79.8
Oil Import Dependency (%)	99.8	99.7	99.7	99.7	99.7	99.7	99.7	99.7	99.7	99.8	99.7	99.7	99.7	99.7	99.7	99.7	99.7	99.6	99.6	99.6
Electricity/capita (kWh/person)	6,030	6,252	6,318	6,343	6,714	6,845	7,063	7,222	7,288	7,364	7,600	7,581	7,590	7,623	7,912	7,898	7,994	8,065	8,106	7,503
CO_2 Intensity (t C/constant 2000 $ million)	77	76	76	75	78	78	77	76	76	78	79	77	77	79	76	76	73	72	71	68
CO_2/capita (t C)	2.58	2.64	2.66	2.61	2.73	2.76	2.80	2.80	2.74	2.81	2.90	2.84	2.82	2.94	2.92	2.95	2.90	2.92	2.87	2.56
CO_2/TPES (t C/toe)	0.73	0.73	0.72	0.71	0.71	0.70	0.69	0.68	0.69	0.70	0.71	0.70	0.71	0.74	0.72	0.72	0.71	0.72	0.72	0.70

GDP = gross domestic product, CO_2 = carbon dioxide, GWh = gigawatt–hour, kt C = thousand tons of carbon equivalent, ktoe = thousand tons of oil equivalent, kWh = kilowatt–hour, PPP = purchasing power parity, t C = ton of carbon equivalent, TFEC = total final energy consumption, toe = ton of oil equivalent, TPES = total primary energy supply.

Note: Figures may not add up to total because of rounding.

Sources: APERC (APEC Energy Database), APERC estimates, JAMA (2012), and World Bank.

8.3 New Zealand

Country Profile (2009)		Energy Reserves (year-end 2008)	
Total Surface Area (square kilometer)	263,310	Coal (million ton) - Recoverable	571.0
Population (thousand)	4,316	Gas (trillion cubic feet) - Proven	1.6
GDP (constant 2000 $ billion)	63.8	Oil (billion barrel) - Proven	162.0
Electrification Rate (%)	100.0		

GDP = gross domestic product.

Sources ADB (2012), UNDP (2009), World Bank, and WEC (2010).

2009 Energy Supply and Demand Flow (ktoe)

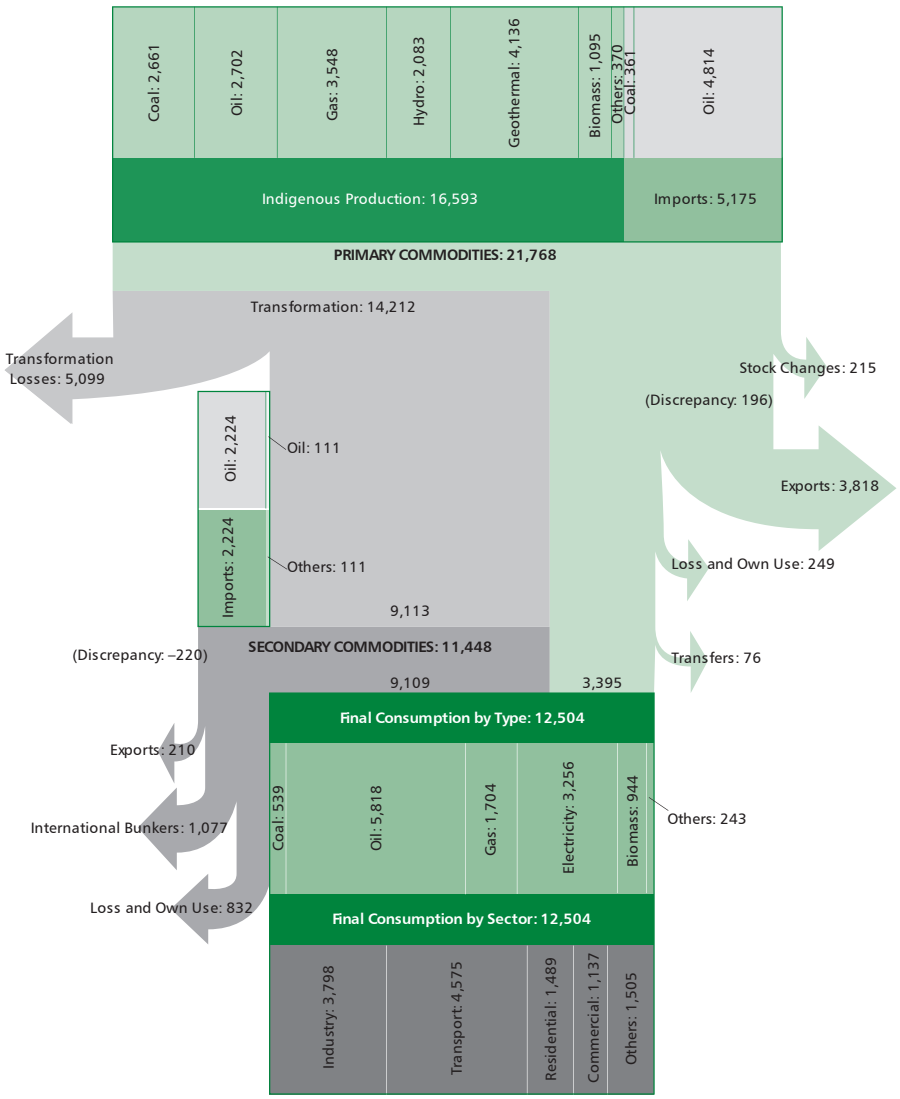


Table 8.3.1 Key Data and Economic Profile

	1990	1995	2000	2005	2009
Socioeconomic Data					
Population (thousand)	3,448	3,673	3,858	4,134	4,316
GDP (constant 2000 $ billion)	38.7	45.2	51.6	62.7	63.8
GDP (constant 2005 PPP $ billion)	64.6	75.3	86.1	104.6	106.4
GDP/capita (constant 2000 $)	11,229	12,292	13,375	15,172	14,778
GDP/capita (constant 2005 PPP $)	18,728	20,502	22,309	25,305	24,649

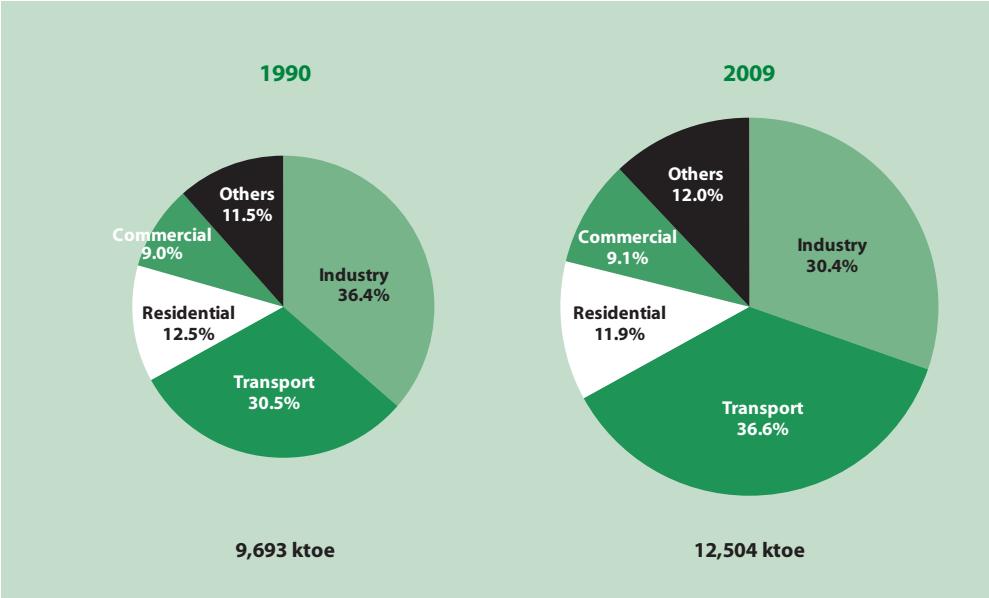
GDP = gross domestic product, PPP = purchasing power parity.
Source: World Bank.

Table 8.3.2 Energy Supply and Demand

	1990	1995	2000	2005	2009
Primary Energy Supply (ktoe)					
Indigenous Production	12,662	13,481	14,895	13,543	16,593
Net Imports	1,351	2,212	2,720	4,004	2,110
Total PES	14,014	15,693	17,615	17,547	18,704
Coal	1,190	1,107	1,058	2,207	1,468
Oil	4,277	5,442	5,680	6,045	6,093
Gas	3,872	3,827	5,057	3,229	3,460
Biomass	729	961	1,039	1,114	1,095
Others	3,947	4,356	4,782	4,953	6,588
TPES/capita (toe)	4.06	4.27	4.57	4.24	4.33
TPES/GDP (toe/constant 2005 PPP $ million)	217	208	205	168	176
Final Energy Consumption (ktoe)					
Industry	3,528	3,881	3,975	3,807	3,798
Transportation	2,961	3,647	4,066	4,543	4,575
Other Sectors	3,203	3,885	4,765	3,926	4,131
Total FEC	9,693	11,413	12,806	12,275	12,504
Coal	674	606	490	519	539
Oil	4,026	4,833	5,306	5,963	5,818
Gas	1,803	2,332	2,984	1,304	1,704
Electricity	2,425	2,646	2,945	3,270	3,256
Biomass	595	817	887	989	944
Others	169	179	194	230	243

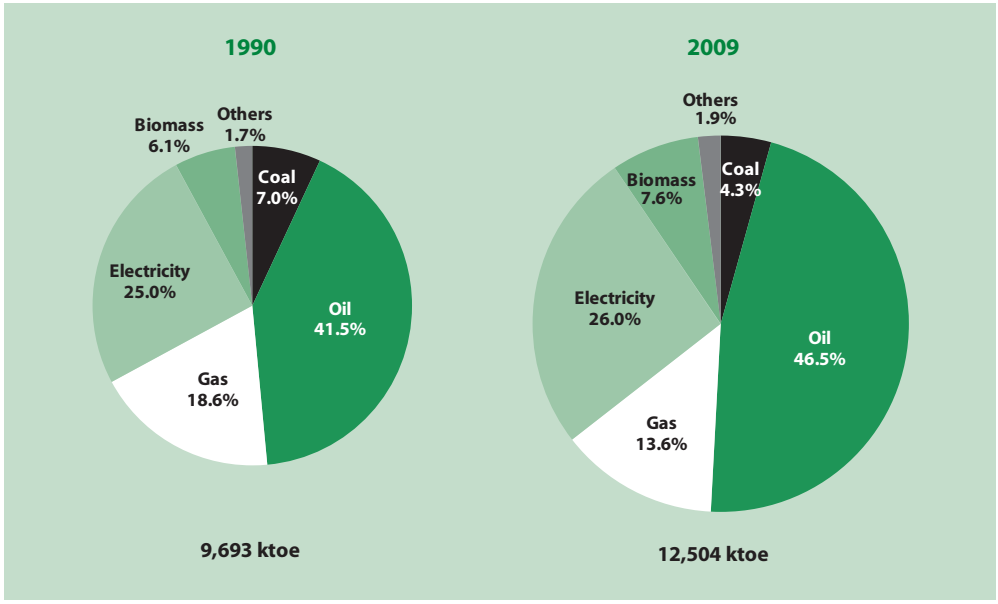
FEC = final energy consumption, GDP = gross domestic product, ktoe = thousand tons of oil equivalent, PES = primary energy supply, PPP = purchasing power parity, toe = ton of oil equivalent, TPES = total primary energy supply.
Source: APERC (APEC Energy Database).

Figure 8.3.1 Final Energy Consumption by Sector, 1990 and 2009



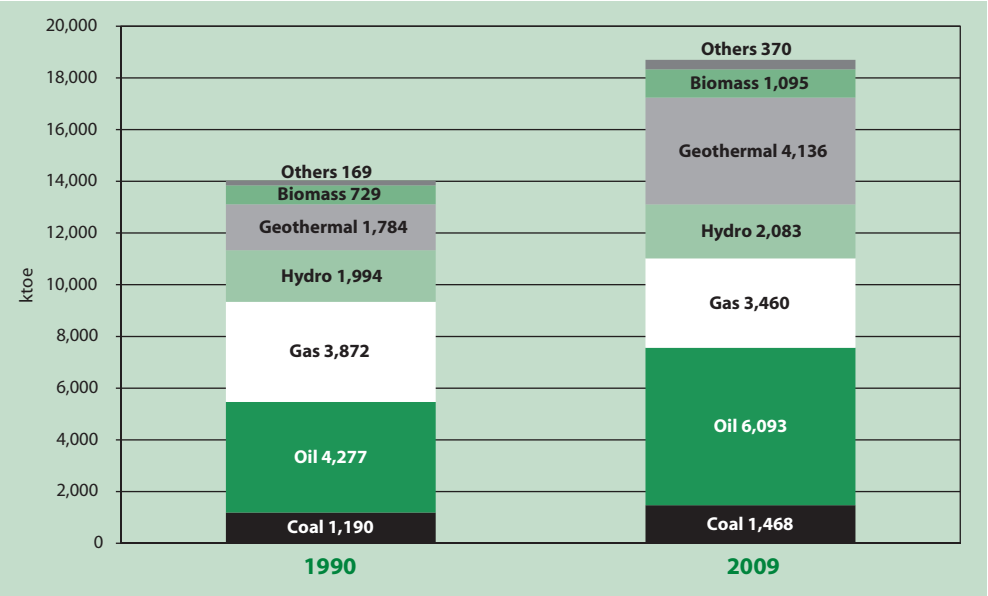
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 8.3.2 Final Energy Consumption by Type of Energy, 1990 and 2009



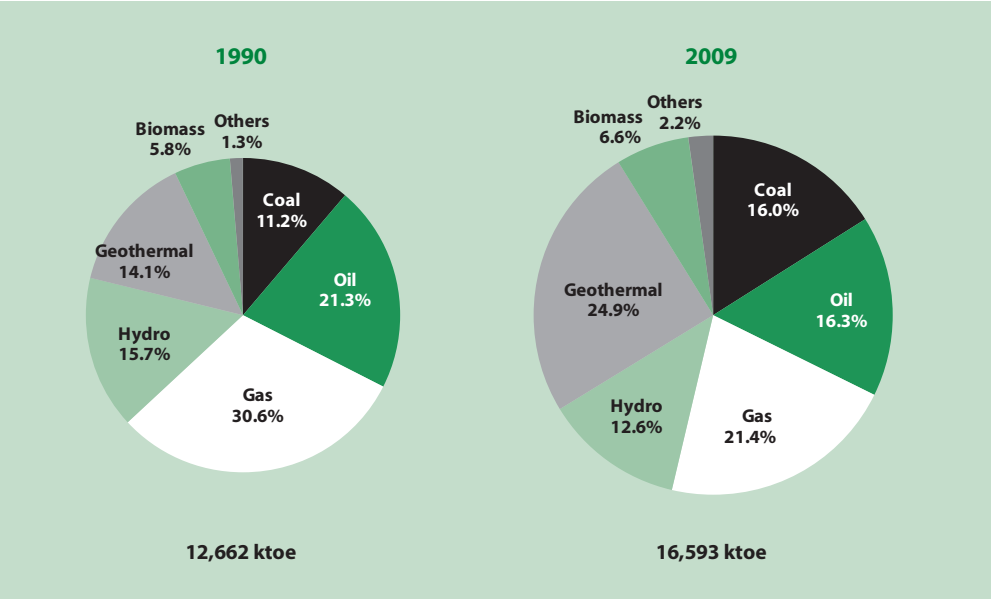
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 8.3.3 Total Primary Energy Supply, 1990 and 2009



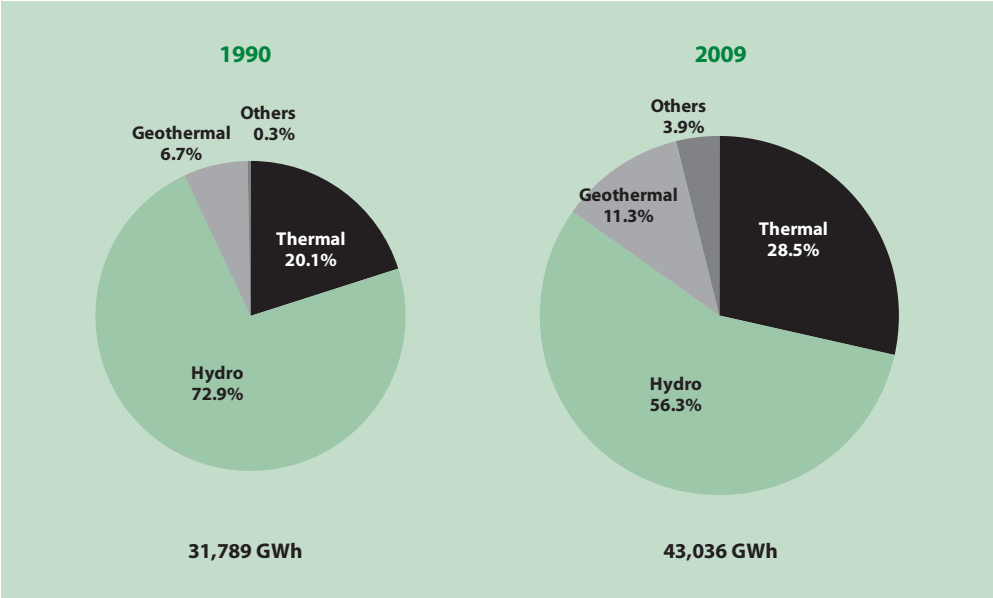
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 8.3.4 Indigenous Energy Production, 1990 and 2009



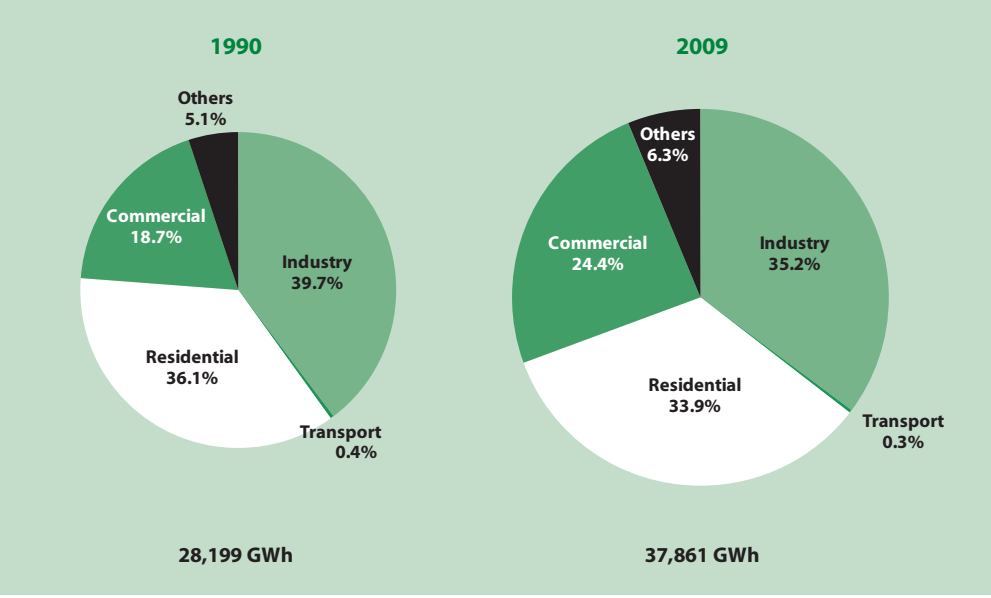
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 8.3.5 Electricity Generation by Plant Type, 1990 and 2009



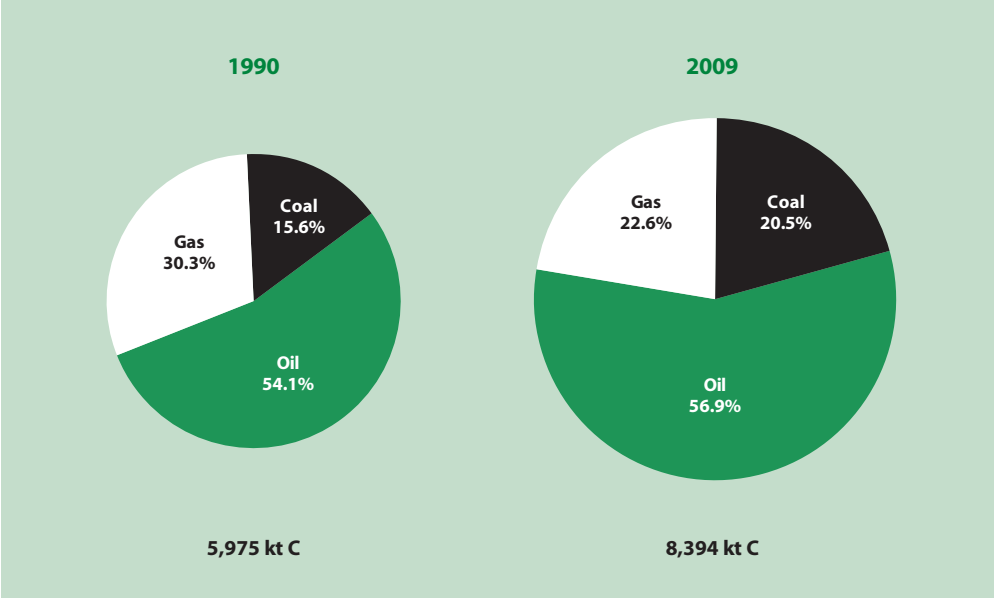
GWh = gigawatt-hour.
Source: APERC (APEC Energy Database).

Figure 8.3.6 Electricity Consumption by Sector, 1990 and 2009



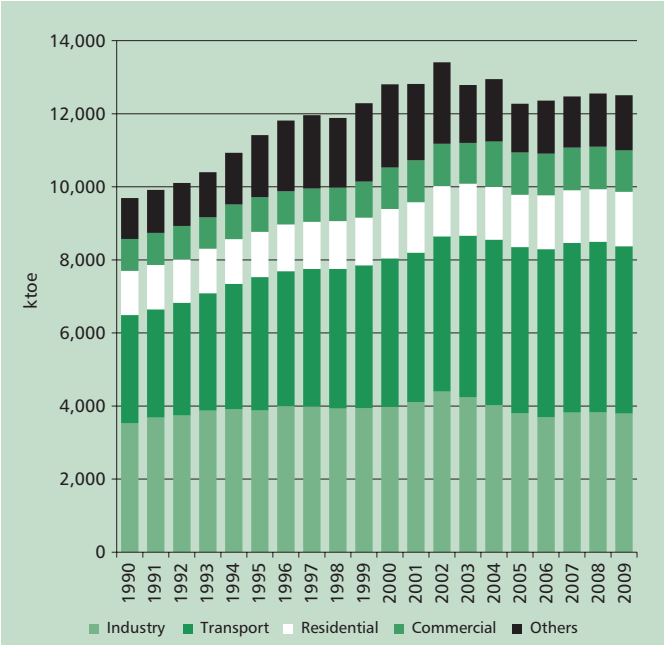
GWh = gigawatt-hour.
Source: APERC (APEC Energy Database).

Figure 8.3.7 Carbon Dioxide Emissions from Fuel Combustion, 1990 and 2009



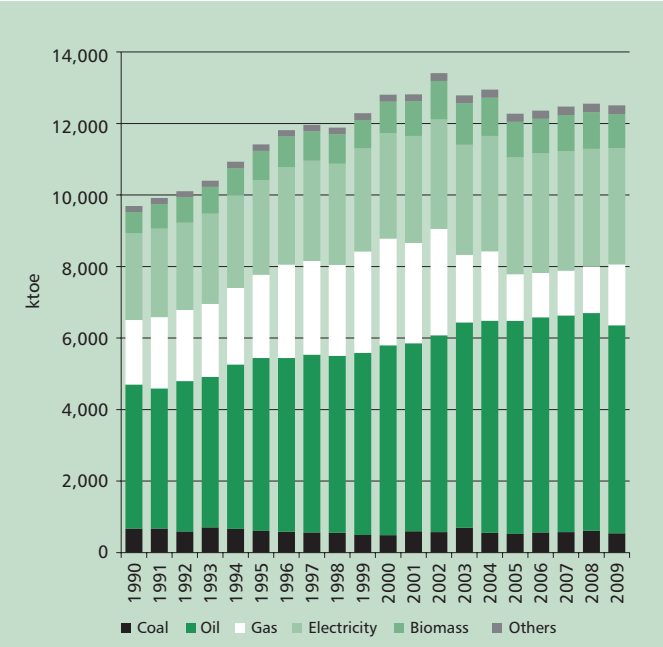
kt C = thousand tons of carbon equivalent.
Source: APERC estimates.

Figure 8.3.8 Final Energy Consumption by Sector, 1990–2009



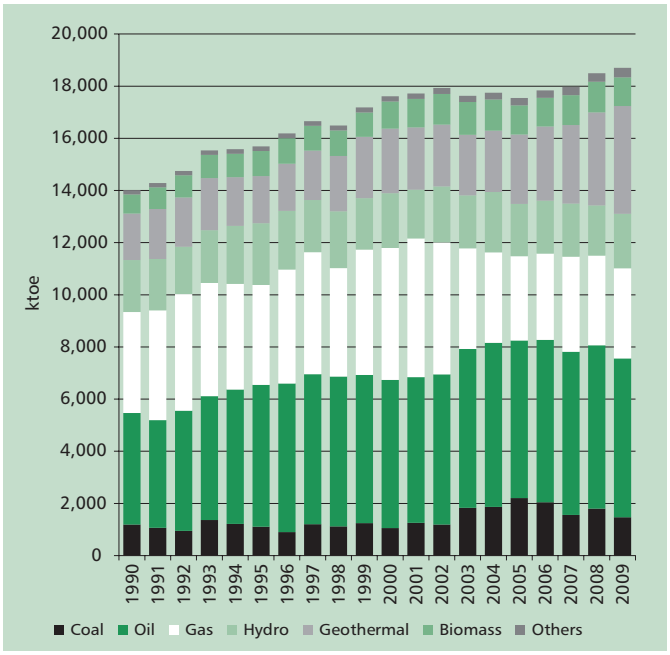
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 8.3.9 Final Energy Consumption by Type, 1990–2009



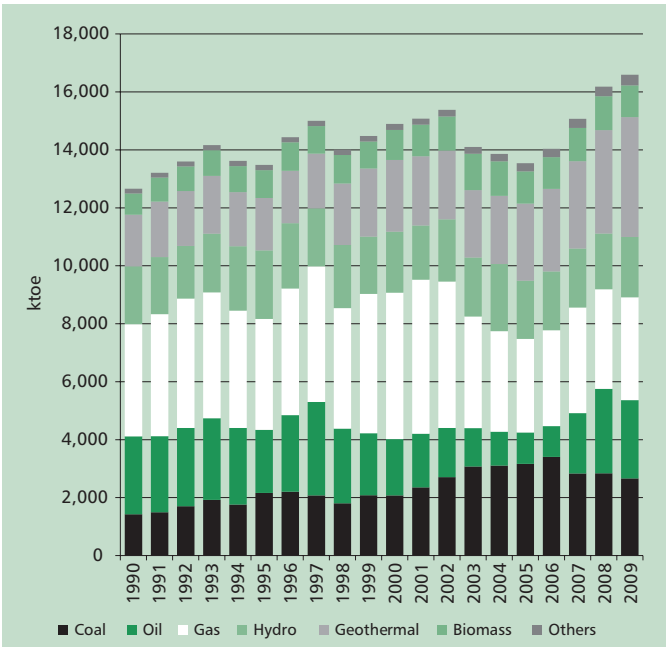
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 8.3.10 Total Primary Energy Supply, 1990–2009



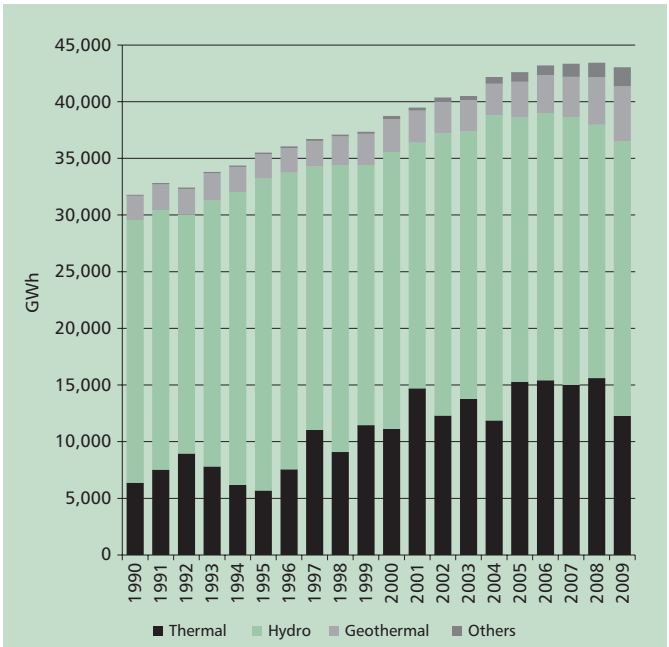
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 8.3.11 Indigenous Energy Production, 1990–2009



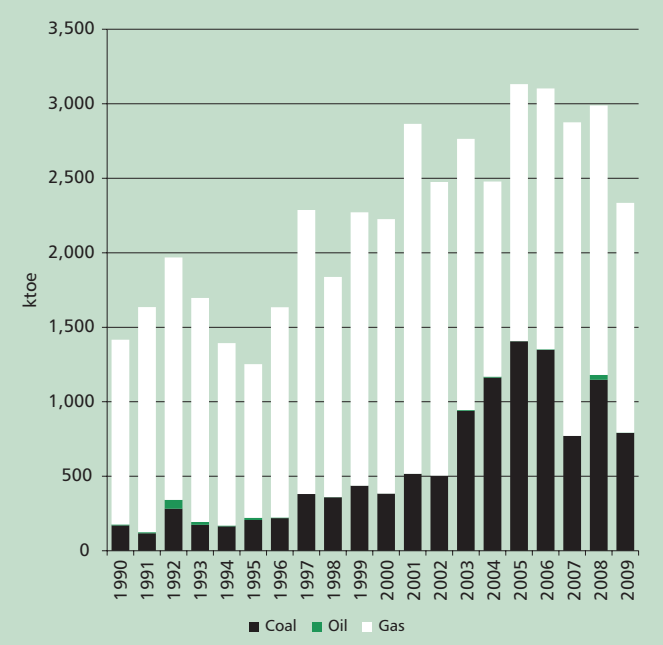
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 8.3.12 Electricity Generation by Source, 1990–2009



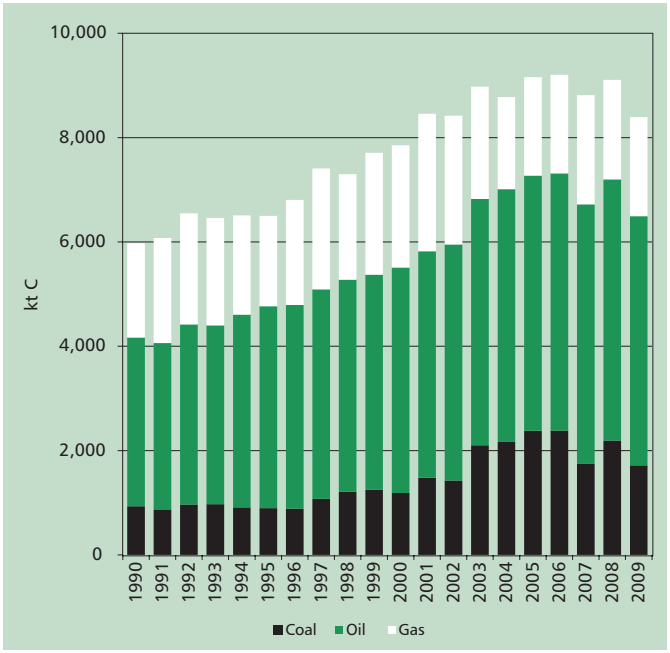
GWh = gigawatt-hour.
Source: APERC (APEC Energy Database).

Figure 8.3.13 Fuel Input for Electricity Generation, 1990–2009



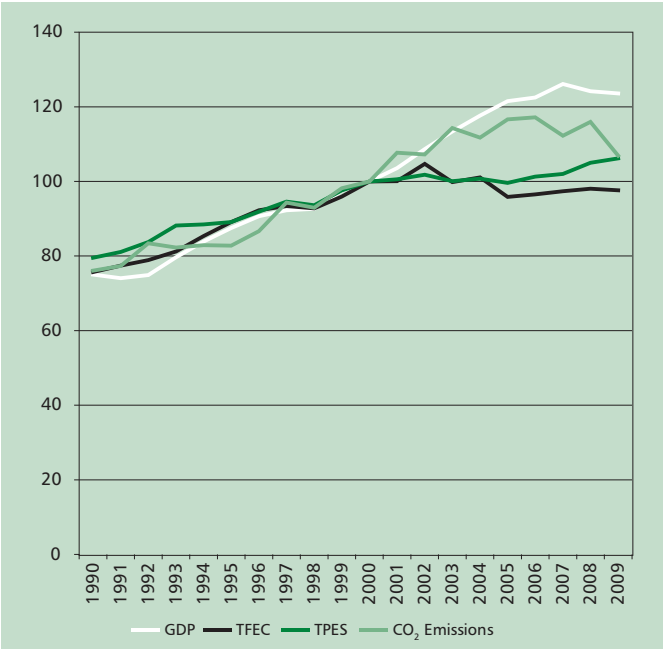
ktoe = thousand tons of oil equivalent.
Source: APERC (APEC Energy Database).

Figure 8.3.14 Carbon Dioxide Emissions from Fuel Combustion, 1990–2009



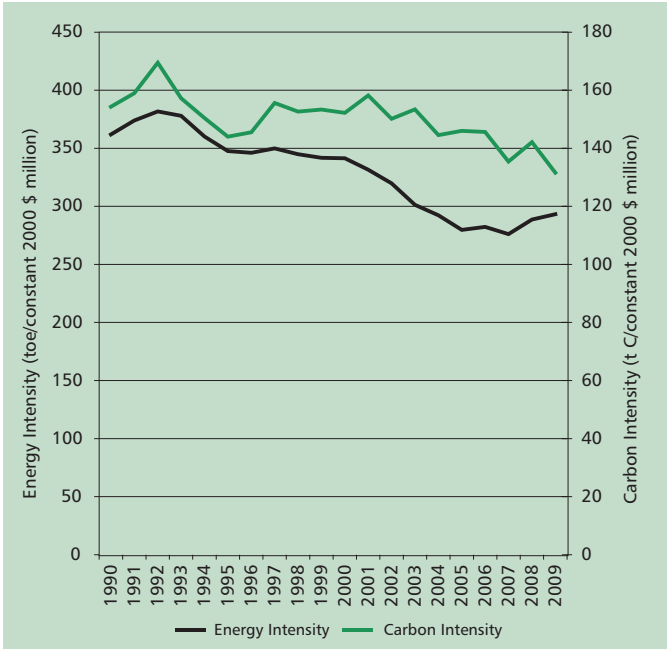
kt C = thousand tons of carbon equivalent.
Source: APERC estimates.

Figure 8.3.15 Growth of GDP, TFEC, TPES, and CO_2 (indexed to year 2000), 1990–2009



CO_2 = carbon dioxide, GDP = gross domestic product, TFEC = total final energy consumption, TPES = total primary energy supply.
Note: Indices are measured relative to the base year 2000 (2000 = 100).
Source: APERC estimates.

Figure 8.3.16 Energy and Carbon Intensities, 1990–2009



t C = ton of carbon equivalent, toe = ton of oil equivalent.
Source: APERC estimates.

Table 8.3.3 New Zealand Energy Balance Table, 2006

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	3,404	0	1,061	0	0	0	0	0	0	0	3,311	2,027	0	2,849	0	53	1,099	230	0	0	14,034
2.	Imports	643	0	4,780	2,093	942	0	766	0	44	341	0	0	0	0	0	0	0	0	0	0	7,515
3.	Exports	−1,934	0	−680	−95	0	0	0	−89	−7	0	0	0	0	0	0	0	0	0	0	0	−2,710
4.	International Bunkers	0	0	0	−1,038	0	0	−44	−262	0	−732	0	0	0	0	0	0	0	0	0	0	−1,038
5.	Stock Changes	−69	0	102	4	29	0	−28	−11	−1	16	0	0	0	0	0	0	0	0	0	0	38
6.	Total Primary Energy Supply	2,044	0	5,263	964	970	0	694	−361	36	−376	3,311	2,027	0	2,849	0	53	1,099	230	0	0	17,840
7.	Transfers	0	0	−147	150	−18	1	0	0	154	13	0	0	0	0	0	0	0	0	0	0	3
8.	Total Transformation Sector	−1,558	94	−5,259	5,291	1,579	2	1,847	388	0	1,476	−1,750	−2,027	0	−2,849	0	−53	−138	0	3,750	44	−4,457
8.1	Power Generation	−1,171	−177	0	−5	0	0	−5	0	0	0	−1,750	−2,027	0	−2,849	0	−53	−138	0	3,750	44	−4,376
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	−5,259	5,296	1,579	2	1,852	388	0	1,476	0	0	0	0	0	0	0	0	0	0	37
8.4	Coal Transformation	−387	270	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	−117
8.5.	Other Transformation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	Loss and Own Use	−1	−54	0	−360	0	0	0	0	0	−360	−276	0	0	0	0	0	0	0	−425	0	−1,116
10.	Discrepancy	38	0	143	−27	17	0	−6	5	2	−46	−46	0	0	0	0	0	0	0	25	−44	89
11.	Total Final Energy Consumption	523	40	0	6,017	2,548	3	2,535	32	193	707	1,239	0	0	0	0	0	961	230	3,350	0	12,359
12.	Industry Sector	373	40	0	436	12	3	347	7	67	0	631	0	0	0	0	0	808	141	1,266	0	3,695
13.	Transport Sector	2	0	0	4,586	2,480	0	1,660	23	33	390	1	0	0	0	0	0	0	0	9	0	4,597
14.	Other Sectors	148	0	0	678	56	0	528	1	92	0	293	0	0	0	0	0	152	89	2,076	0	3,435
14.1	Residential and Commercial	103	0	0	187	3	0	91	1	92	0	253	0	0	0	0	0	152	76	1,845	0	2,615
14.1.1	Commerce and Public Services	87	0	0	115	3	0	77	1	33	0	113	0	0	0	0	0	6	62	755	0	1,137
14.1.2	Residential	16	0	0	72	0	0	13	0	59	0	141	0	0	0	0	0	147	13	1,089	0	1,478
14.2	Non-Specified Others	45	0	0	491	53	0	438	0	0	0	40	0	0	0	0	0	0	13	231	0	820
15.	Non-Energy Use	0	0	0	317	0	0	0	0	0	317	315	0	0	0	0	0	0	0	0	0	631
16.	Electricity Output (GWh)	5,538	0	23	0	0	0	0	0	0	0	9,851	23,571	0	3,368	0	622	232	0	0	0	43,205
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.
Note: Figures may not add up to total because of rounding.
Source: APERC (APEC Energy Database).

Table 8.3.4 New Zealand Energy Balance Table, 2007

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	2,832	0	2,086	0	0	0	0	0	0	0	3,645	2,033	0	3,013	0	80	1,149	235	0	0	15,072
2.	Imports	388	0	4,698	2,486	1,100	0	898	0	96	391	0	0	0	0	0	0	0	0	0	0	7,572
3.	Exports	–1,445	0	–1,664	–123	–15	0	0	–108	0	0	0	0	0	0	0	0	0	0	0	0	–3,232
4.	International Bunkers	0	0	0	–1,080	0	0	–40	–272	0	–768	0	0	0	0	0	0	0	0	0	0	–1,080
5.	Stock Changes	–215	0	–101	–43	–32	–2	–11	–5	1	6	–1	0	0	0	0	0	0	0	0	0	–360
6.	Total Primary Energy Supply	1,559	0	5,018	1,241	1,054	–2	848	–385	97	–371	3,644	2,033	0	3,013	0	80	1,149	235	0	0	17,972
7.	Transfers	0	0	–107	114	0	1	1	0	114	–2	0	0	0	0	0	0	0	0	0	0	7
8.	Total Transformation Sector	–992	96	–4,876	5,066	1,516	3	1,749	407	0	1,391	–2,105	–2,033	0	–3,013	0	–80	–142	0	3,763	32	–4,284
8.1	Power Generation	–600	–171	0	0	0	0	0	0	0	0	–2,105	–2,033	0	–3,013	0	–80	–141	0	3,763	32	–4,347
8.2	Gas Processing	0	0	0	–13	0	0	–13	0	0	0	0	0	0	0	0	0	0	0	0	0	–13
8.3	Refineries	0	0	–4,877	5,079	1,516	3	1,762	407	0	1,391	0	0	0	0	0	0	0	0	0	0	202
8.4	Coal Transformation	–392	266	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–126
8.5.	Other Transformation	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	–1	0	0	0	0
9.	Loss and Own Use	–1	–57	0	–348	0	0	0	0	0	–348	–233	0	0	0	0	0	0	0	–434	0	–1,073
10.	Discrepancy	–31	0	–35	–15	25	2	18	19	–11	–68	–55	0	0	0	0	0	0	0	16	–32	–152
11.	Total Final Energy Consumption	536	39	0	6,057	2,594	4	2,616	42	199	602	1,252	0	0	0	0	0	1,007	235	3,344	0	12,470
12.	Industry Sector	400	39	0	461	11	3	368	12	67	0	660	0	0	0	0	0	855	145	1,263	0	3,824
13.	Transport Sector	2	0	0	4,628	2,524	1	1,723	28	35	317	1	0	0	0	0	0	0	0	9	0	4,639
14.	Other Sectors	135	0	0	683	60	0	525	1	97	0	268	0	0	0	0	0	152	90	2,072	0	3,399
14.1	Residential and Commercial	102	0	0	198	9	0	92	1	97	0	229	0	0	0	0	0	152	77	1,851	0	2,609
14.1.1	Commerce and Public Services	89	0	0	122	9	0	77	1	35	0	108	0	0	0	0	0	6	62	780	0	1,168
14.1.2	Residential	12	0	0	76	0	0	14	0	62	0	121	0	0	0	0	0	146	14	1,071	0	1,440
14.2	Non-Specified Others	33	0	0	485	51	0	433	0	0	0	39	0	0	0	0	0	0	13	221	0	791
15.	Non-Energy Use	0	0	0	285	0	0	0	0	0	285	323	0	0	0	0	0	0	0	0	0	608
16.	Electricity Output (GWh)	3,162	0	1	0	0	0	0	0	0	0	11,842	23,638	0	3,555	0	929	216	0	0	0	43,343
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.
Note: Figures may not add up to total because of rounding.
Source: APERC (APEC Energy Database).

Table 8.3.5 New Zealand Energy Balance Table, 2008

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	2,837	0	2,915	0	0	0	0	0	0	0	3,439	1,922	0	3,571	0	91	1,169	237	0	0	16,181
2.	Imports	319	0	4,970	2,284	928	0	840	8	115	393	0	0	0	0	0	0	1	0	0	0	7,575
3.	Exports	−1,781	0	−2,631	−210	−30	0	0	−180	0	0	0	0	0	0	0	0	0	0	0	0	−4,623
4.	International Bunkers	0	0	0	−1,123	0	0	−46	−303	0	−774	0	0	0	0	0	0	0	0	0	0	−1,123
5.	Stock Changes	427	0	55	5	−1	0	−15	21	−3	3	0	0	0	0	0	0	0	0	0	0	487
6.	Total Primary Energy Supply	1,801	0	5,310	956	897	0	779	−454	112	−378	3,439	1,922	0	3,571	0	91	1,170	237	0	0	18,498
7.	Transfers	0	0	−79	80	−22	9	−1	−1	84	11	0	0	0	0	0	0	0	0	0	0	0
8.	Total Transformation Sector	−1,353	91	−5,306	5,351	1,604	1	1,779	518	0	1,449	−1,809	−1,922	0	−3,571	0	−91	−144	0	3,771	34	−4,948
8.1	Power Generation	−985	−163	0	−32	0	0	−32	0	0	0	−1,809	−1,922	0	−3,571	0	−91	−141	0	3,771	34	−4,908
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	−5,309	5,382	1,604	1	1,810	518	0	1,449	0	0	0	0	0	0	0	0	0	0	74
8.4	Coal Transformation	−368	254	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	−114
8.5.	Other Transformation	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	−3	0	0	0	0
9.	Loss and Own Use	0	−54	0	−362	0	0	0	0	0	−362	−252	0	0	0	0	0	0	0	−444	0	−1,112
10.	Discrepancy	128	0	76	59	71	−8	44	3	0	−51	−77	0	0	0	0	0	0	0	−37	−34	115
11.	Total Final Energy Consumption	577	37	0	6,084	2,550	2	2,601	66	196	669	1,301	0	0	0	0	0	1,026	237	3,290	0	12,553
12.	Industry Sector	425	37	0	475	9	1	374	32	59	0	671	0	0	0	0	0	875	146	1,198	0	3,827
13.	Transport Sector	1	0	0	4,657	2,492	1	1,746	34	39	345	1	0	0	0	0	0	0	0	9	0	4,667
14.	Other Sectors	150	0	0	629	50	0	480	1	98	0	246	0	0	0	0	0	151	92	2,083	0	3,352
14.1	Residential and Commercial	111	0	0	178	4	0	74	1	98	0	211	0	0	0	0	0	151	74	1,880	0	2,604
14.1.1	Commerce and Public Services	103	0	0	113	4	0	68	1	40	0	94	0	0	0	0	0	6	60	789	0	1,166
14.1.2	Residential	8	0	0	64	0	0	6	0	58	0	117	0	0	0	0	0	145	14	1,090	0	1,438
14.2	Non-Specified Others	40	0	0	452	46	0	406	0	0	0	35	0	0	0	0	0	0	17	204	0	748
15.	Non-Energy Use	0	0	0	323	0	0	0	0	0	323	383	0	0	0	0	0	0	0	0	0	707
16.	Electricity Output (GWh)	4,832	0	132	0	0	0	0	0	0	0	10,652	22,346	0	4,204	0	1,057	212	0	0	0	43,435
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.
Note: Figures may not add up to total because of rounding.
Source: APERC (APEC Energy Database).

Table 8.3.6 New Zealand Energy Balance Table, 2009

Unit: ktoe

		1.	2.	3.	4.	4.1	4.2	4.3	4.4	4.5	4.6	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Coal	Coal Products	Crude Oil and NGLs	Petroleum Products	Gasoline	Kerosene	Gas/ Diesel Oil	Fuel Oil	LPG	Other Petroleum Products	Gas	Hydro	Nuclear	Geothermal	Solar	Wind	Biomass	Others	Electricity	Heat	Total
1.	Indigenous Production	2,661	0	2,702	0	0	0	0	0	0	0	3,548	2,083	0	4,136	0	126	1,095	243	0	0	16,593
2.	Imports	361	0	4,814	2,224	1,082	0	722	0	107	312	0	0	0	0	0	0	0	0	0	0	7,399
3.	Exports	–1,481	0	–2,338	–210	–5	0	0	–205	0	0	0	0	0	0	0	0	0	0	0	0	–4,028
4.	International Bunkers	0	0	0	–1,077	0	0	–38	–303	0	–737	0	0	0	0	0	0	0	0	0	0	–1,077
5.	Stock Changes	–73	0	–54	32	–5	2	32	–10	2	11	–88	0	0	0	0	0	0	0	0	0	–183
6.	Total Primary Energy Supply	1,468	0	5,124	969	1,072	2	716	–518	109	–413	3,460	2,083	0	4,136	0	126	1,095	243	0	0	18,704
7.	Transfers	0	0	–76	79	–1	0	0	0	81	–1	0	0	0	0	0	0	0	0	0	0	3
8.	Total Transformation Sector	–1,007	85	–5,167	5,253	1,511	1	1,752	568	0	1,422	–1,542	–2,083	0	–4,136	0	–126	–150	0	3,739	36	–5,099
8.1	Power Generation	–634	–157	0	–2	0	0	–2	0	0	0	–1,542	–2,083	0	–4,136	0	–126	–148	0	3,739	36	–5,054
8.2	Gas Processing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.3	Refineries	0	0	–5,169	5,255	1,511	1	1,754	568	0	1,422	0	0	0	0	0	0	0	0	0	0	86
8.4	Coal Transformation	–373	242	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–131
8.5.	Other Transformation	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	–2	0	0	0	0
9.	Loss and Own Use	–3	–50	0	–354	0	0	0	0	0	–354	–245	0	0	0	0	0	0	0	–428	0	–1,080
10.	Discrepancy	47	0	119	–130	–79	–1	4	–7	0	–47	31	0	0	0	0	0	0	0	–54	–36	–24
11.	Total Final Energy Consumption	504	35	0	5,818	2,502	2	2,473	43	190	608	1,704	0	0	0	0	0	944	243	3,256	0	12,504
12.	Industry Sector	418	35	0	392	5	2	310	11	63	0	860	0	0	0	0	0	795	151	1,146	0	3,798
13.	Transport Sector	0	0	0	4,565	2,453	0	1,733	32	34	314	1	0	0	0	0	0	0	0	9	0	4,575
14.	Other Sectors	85	0	0	567	44	0	429	0	93	0	316	0	0	0	0	0	149	92	2,101	0	3,310
14.1	Residential and Commercial	68	0	0	160	4	0	62	0	93	0	277	0	0	0	0	0	149	75	1,897	0	2,626
14.1.1	Commerce and Public Services	49	0	0	97	4	0	55	0	38	0	131	0	0	0	0	0	6	60	794	0	1,137
14.1.2	Residential	19	0	0	63	0	0	7	0	56	0	146	0	0	0	0	0	143	15	1,103	0	1,489
14.2	Non-Specified Others	17	0	0	407	39	0	367	0	0	0	39	0	0	0	0	0	0	17	204	0	685
15.	Non-Energy Use	0	0	0	294	0	0	0	0	0	294	526	0	0	0	0	0	0	0	0	0	821
16.	Electricity Output (GWh)	3,295	0	9	0	0	0	0	0	0	0	8,972	24,220	0	4,863	0	1,471	206	0	0	0	43,036
17.	Heat Output (TJ)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

GWh = gigawatt-hour, ktoe = thousand tons of oil equivalent, LPG = liquefied petroleum gas, NGL = natural gas liquid, TJ = terajoule.

Note: Figures may not add up to total because of rounding.

Source: APERC (APEC Energy Database).

Table 8.3.7 New Zealand Summary Table, 1990–2009

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Indigenous Production (ktoe)																				
Coal	1,423	1,493	1,700	1,919	1,762	2,160	2,206	2,075	1,803	2,080	2,074	2,355	2,707	3,074	3,108	3,164	3,404	2,832	2,837	2,661
Oil	2,692	2,628	2,705	2,822	2,641	2,176	2,642	3,226	2,580	2,142	1,944	1,849	1,693	1,322	1,169	1,084	1,061	2,086	2,915	2,702
Gas	3,872	4,209	4,467	4,344	4,052	3,827	4,372	4,680	4,159	4,810	5,056	5,320	5,058	3,858	3,467	3,228	3,311	3,645	3,439	3,548
Hydro	1,994	1,969	1,814	2,020	2,222	2,368	2,252	2,000	2,177	1,971	2,101	1,864	2,143	2,031	2,316	2,006	2,027	2,033	1,922	2,083
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Geothermal	1,784	1,918	1,893	1,999	1,866	1,809	1,808	1,893	2,125	2,355	2,477	2,394	2,375	2,325	2,355	2,664	2,849	3,013	3,571	4,136
Solar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wind	0	0	0	0	0	0	1	1	2	3	10	12	13	13	31	53	53	80	91	126
Biomass	729	827	850	887	897	961	981	949	978	931	1,039	1,089	1,174	1,259	1,190	1,114	1,099	1,149	1,169	1,095
Others	169	168	167	173	179	179	179	180	186	190	194	195	216	220	227	230	230	235	237	243
Total	12,662	13,212	13,597	14,163	13,619	13,481	14,440	15,004	14,009	14,482	14,895	15,079	15,380	14,100	13,862	13,543	14,034	15,072	16,181	16,593
Primary Energy Supply (ktoe)																				
Coal	1,190	1,065	946	1,363	1,215	1,107	902	1,203	1,118	1,246	1,058	1,259	1,194	1,835	1,870	2,207	2,044	1,559	1,801	1,468
Oil	4,277	4,131	4,613	4,749	5,153	5,442	5,696	5,752	5,746	5,680	5,680	5,585	5,758	6,089	6,292	6,045	6,227	6,259	6,266	6,093
Gas	3,872	4,209	4,467	4,345	4,052	3,827	4,371	4,681	4,158	4,810	5,057	5,320	5,058	3,858	3,466	3,229	3,311	3,644	3,439	3,460
Hydro	1,994	1,969	1,814	2,020	2,222	2,368	2,252	2,000	2,177	1,971	2,101	1,864	2,143	2,031	2,316	2,006	2,027	2,033	1,922	2,083
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Geothermal	1,784	1,918	1,893	1,999	1,866	1,809	1,808	1,893	2,125	2,355	2,477	2,394	2,375	2,325	2,355	2,664	2,849	3,013	3,571	4,136
Solar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wind	0	0	0	0	0	0	1	1	2	3	10	12	13	13	31	53	53	80	91	126
Biomass	729	827	850	887	897	961	981	949	978	931	1,039	1,089	1,174	1,259	1,190	1,114	1,099	1,149	1,170	1,095
Others	169	168	167	173	179	179	179	180	186	190	194	195	216	220	227	230	230	235	237	243
Total	14,014	14,287	14,751	15,536	15,585	15,693	16,188	16,659	16,490	17,185	17,615	17,719	17,932	17,628	17,746	17,547	17,840	17,972	18,498	18,704
Final Energy Consumption by Sector (ktoe)																				
Industry	3,528	3,688	3,743	3,878	3,916	3,881	4,000	3,989	3,933	3,942	3,975	4,108	4,399	4,241	4,027	3,807	3,695	3,824	3,827	3,798
Transport	2,961	2,960	3,086	3,210	3,427	3,647	3,688	3,762	3,818	3,911	4,066	4,088	4,246	4,423	4,528	4,543	4,597	4,639	4,667	4,575
Residential	1,209	1,212	1,183	1,220	1,226	1,241	1,283	1,291	1,311	1,304	1,353	1,381	1,376	1,420	1,445	1,432	1,478	1,440	1,438	1,489
Commercial	876	879	915	856	947	949	905	911	914	988	1,133	1,151	1,158	1,115	1,238	1,158	1,137	1,168	1,166	1,137
Others	1,119	1,177	1,177	1,236	1,417	1,695	1,938	2,009	1,907	2,143	2,279	2,086	2,228	1,585	1,709	1,336	1,451	1,398	1,454	1,505
Total	9,693	9,916	10,103	10,400	10,932	11,413	11,814	11,962	11,883	12,287	12,806	12,813	13,406	12,785	12,947	12,275	12,359	12,470	12,553	12,504

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Table 8.3.7 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Final Energy Consumption by Type (ktoe)																				
Coal	674	673	593	705	663	606	583	567	554	495	490	598	576	697	554	519	562	575	614	539
Oil	4,026	3,921	4,203	4,212	4,598	4,833	4,860	4,968	4,948	5,088	5,306	5,258	5,502	5,743	5,932	5,963	6,017	6,057	6,084	5,818
Gas	1,803	1,992	1,988	2,036	2,142	2,332	2,613	2,622	2,545	2,836	2,984	2,801	2,975	1,886	1,942	1,304	1,239	1,252	1,301	1,704
Electricity	2,425	2,474	2,441	2,528	2,595	2,646	2,728	2,805	2,827	2,887	2,945	2,995	3,061	3,081	3,223	3,270	3,350	3,344	3,290	3,256
Heat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Biomass	595	688	709	746	755	817	851	821	823	790	887	966	1,077	1,158	1,070	989	961	1,007	1,026	944
Others	169	168	167	173	179	179	179	180	186	190	194	195	216	220	227	230	230	235	237	243
Total	9,693	9,916	10,103	10,400	10,932	11,413	11,814	11,962	11,883	12,287	12,806	12,813	13,406	12,785	12,947	12,275	12,359	12,470	12,553	12,504
Power Generation (GWh)																				
Thermal	6,381	7,527	8,949	7,807	6,188	5,688	7,567	11,031	9,092	11,457	11,118	14,702	12,302	13,775	11,873	15,286	15,412	15,005	15,616	12,276
Hydro	23,183	22,892	21,091	23,491	25,834	27,532	26,180	23,256	25,317	22,917	24,433	21,679	24,916	23,620	26,926	23,325	23,571	23,638	22,346	24,220
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Geothermal	2,131	2,287	2,259	2,382	2,227	2,161	2,161	2,258	2,529	2,793	2,922	2,838	2,814	2,750	2,789	3,159	3,368	3,555	4,204	4,863
Solar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wind	0	0	1	1	1	1	8	14	22	39	120	139	155	146	361	614	622	929	1,057	1,471
Others	94	116	120	120	120	129	139	151	137	144	143	123	182	209	232	220	232	216	212	206
Total	31,789	32,822	32,420	33,801	34,370	35,511	36,055	36,710	37,097	37,350	38,736	39,481	40,369	40,500	42,181	42,604	43,205	43,343	43,435	43,036
Loss and Own Use of Electricity (GWh)																				
Transmission and Distribution Losses	2,389	2,391	2,392	2,448	2,532	2,609	2,613	2,735	2,800	2,769	3,045	3,028	3,013	2,893	2,994	2,978	3,010	3,029	3,130	3,135
Own Use	804	885	961	916	825	807	911	1,117	1,032	1,173	1,178	1,375	1,243	1,322	1,239	1,455	1,481	1,467	1,533	1,376
Total	3,193	3,276	3,353	3,364	3,357	3,416	3,524	3,852	3,832	3,942	4,223	4,403	4,256	4,215	4,233	4,433	4,491	4,496	4,663	4,511
Fuel Input for Power Generation (ktoe)																				
Coal	170	117	283	174	164	207	219	381	359	437	384	517	505	939	1,162	1,406	1,348	771	1,148	791
Oil	6	7	59	18	6	14	4	0	1	0	0	0	0	5	7	1	5	0	32	2
Gas	1,240	1,511	1,627	1,504	1,224	1,032	1,411	1,907	1,478	1,835	1,842	2,349	1,971	1,821	1,309	1,725	1,750	2,105	1,809	1,542
Total	1,417	1,636	1,969	1,697	1,394	1,253	1,634	2,288	1,838	2,271	2,226	2,865	2,475	2,765	2,478	3,132	3,103	2,876	2,989	2,335
CO_2 Emissions (kt C)																				
Coal	932	873	968	971	912	898	887	1,075	1,212	1,248	1,188	1,482	1,427	2,101	2,175	2,380	2,385	1,746	2,193	1,717
Oil	3,235	3,188	3,450	3,431	3,697	3,869	3,905	4,018	4,063	4,126	4,322	4,339	4,526	4,722	4,838	4,894	4,929	4,976	5,006	4,778
Gas	1,808	2,014	2,131	2,060	1,902	1,734	2,014	2,315	2,024	2,336	2,343	2,636	2,468	2,153	1,765	1,885	1,890	2,093	1,908	1,899
Total	5,975	6,075	6,550	6,462	6,511	6,501	6,806	7,408	7,299	7,710	7,853	8,456	8,421	8,976	8,777	9,158	9,204	8,815	9,107	8,394

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Table 8.3.7 *continued*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Macroeconomic Indicators																				
Population (thousand)	3,448	3,495	3,532	3,572	3,620	3,673	3,732	3,781	3,815	3,835	3,858	3,881	3,949	4,027	4,088	4,134	4,185	4,228	4,269	4,316
Urban Population, %	84.7	84.8	84.9	85.1	85.2	85.3	85.4	85.5	85.5	85.6	85.7	85.8	85.9	86.0	86.1	86.2	86.3	86.4	86.6	86.7
GDP (constant 2000 $ million)	38,716	38,215	38,643	41,106	43,280	45,153	46,778	47,605	47,808	50,282	51,600	53,451	56,077	58,514	60,713	62,718	63,201	65,084	64,081	63,780
GDP (current $ million)	44,504	41,820	40,744	45,828	54,263	62,795	68,871	64,925	55,200	57,698	51,600	52,873	65,464	86,738	102,210	110,978	110,563	138,317	117,817	126,679
GDP (constant 2005 PPP $ million)	64,575	63,739	64,454	68,562	72,187	75,311	78,022	79,401	79,740	83,866	86,064	89,152	93,532	97,596	101,264	104,608	105,414	108,555	106,882	106,379
GDP/capita (constant 2000 $)	11,229	10,934	10,942	11,507	11,955	12,292	12,534	12,589	12,532	13,111	13,375	13,774	14,202	14,530	14,853	15,172	15,103	15,393	15,011	14,778
GDP/capita (current $)	12,907	11,965	11,537	12,829	14,989	17,095	18,454	17,170	14,469	15,045	13,375	13,625	16,579	21,538	25,006	26,846	26,421	32,712	27,599	29,352
GDP – Manufacturing (% of GDP)	16.8	16.6	17 .0	17 .0	17 .2	16.8	16.5	16 .1	15.5	15.5	15.5	15.0	15.6	15.3	15.4	15.0	14.2	14.2	13.8	13.3
Car Ownership (car/1,000 persons)	520	529	539	548	528	546	558	567	582	602	690	704	715	731	749	657	660	667	664	712
Basic Energy Indicators																				
TPES/capita (toe/person)	4.06	4.09	4.18	4.35	4.31	4.27	4.34	4.41	4.32	4.48	4.57	4.57	4.54	4.38	4.34	4.24	4.26	4.25	4.33	4.33
TFEC/capita (toe/person)	2.81	2.84	2.86	2.91	3.02	3.11	3.17	3.16	3.11	3.20	3.32	3.30	3.40	3.17	3.17	2.97	2.95	2.95	2.94	2.90
TPES/GDP (toe/constant 2000 $ million)	362	374	382	378	360	348	346	350	345	342	341	331	320	301	292	280	282	276	289	293
TFEC/GDP (toe/constant 2000 $ million)	250	259	261	253	253	253	253	251	249	244	248	240	239	218	213	196	196	192	196	196
Import Dependency (%)	9.6	7.5	7.8	8.8	12.6	14.1	10.8	9.9	15.0	15.7	15.4	14.9	14.2	20.0	21.9	22.8	21.3	16.1	12.5	11.3
Oil Import Dependency (%)	37.1	36.4	41.4	40.6	48.7	60.0	53.6	43.9	55.1	62.3	65.8	66.9	70.6	78.3	81.4	82.1	83.0	66.7	53.5	55.7
Electricity/capita (kWh/ person)	8,180	8,232	8,039	8,230	8,336	8,378	8,500	8,626	8,619	8,756	8,879	8,976	9,015	8,897	9,169	9,199	9,310	9,198	8,964	8,774
CO_2 Intensity (t C/constant 2000 $ million)	154	159	169	157	150	144	145	156	153	153	152	158	150	153	145	146	146	135	142	132
CO_2/capita (t C)	1.73	1.74	1.85	1.81	1.80	1.77	1.82	1.96	1.91	2.01	2.04	2.18	2.13	2.23	2.15	2.22	2.20	2.08	2.13	1.95
CO_2/TPES (t C/toe)	0.43	0.43	0.44	0.42	0.42	0.41	0.42	0.44	0.44	0.45	0.45	0.48	0.47	0.51	0.49	0.52	0.52	0.49	0.49	0.45

– = no data or not applicable, CO_2 = carbon dioxide, GDP = gross domestic product, GWh = gigawatt–hour, kt C = thousand tons of carbon equivalent, ktoe = thousand tons of oil equivalent, kWh = kilowatt–hour, PPP = purchasing power parity, t C = ton of carbon equivalent, TFEC = total final energy consumption, toe = ton of oil equivalent, TPES = total primary energy supply.

Note: Figures may not add up to total because of rounding.

Sources: APERC (APEC Energy Database), APERC estimates, JAMA (2012), and World Bank.

Appendix 1

Definition of Columns and Rows of the Energy Balance Table

Unit

For the purpose of presenting energy balances, a thermal value has been adopted: 10^7 kilocalories (41.863 gigajoules) is equivalent to 1 ton of oil equivalent (toe). This quantity of energy is, within a few percent, equal to the net heat content of 1 ton of crude oil.

Conversion (from original units to toe)

The balances are expressed in terms of net heat value. The difference between the net heat value and gross heat value for each fuel is the latent heat in condensation of the water vapor produced during combustion of the fuel. For coal and oil, net heat value is 5% less than gross heat value; for most forms of natural and manufactured gas, the difference is 9%–10%; while for electricity, there is no difference. The use of net heat value is consistent with the practice of the Statistical Offices of the European Communities and the United Nations.

Layout

The energy balances are presented in tabular format: columns for the various sources of energy and rows for the different origins and uses.

Columns

Across the top of the table from left to right, there are 22 columns with the following headings.

Column 1. Coal comprises solid fossil fuels consisting of carbonized vegetal matter.

1. **Anthracite.** This is a high-rank, hard coal with a gross calorific value (moist, ash-free basis) greater than or equal to 24 megajoules per kilogram (MJ/kg) and a vitrinite mean random reflectance greater than or equal to 2.0%.
2. **Coking coal.** This is a bituminous coal that can be used in the production of coke capable of supporting a blast furnace charge.
3. **Bituminous coal.** This is a medium-rank hard coal with either a gross calorific value (moist, ash-free basis) not less than 24 MJ/kg and with a vitrinite mean random reflectance of less than 2.0%, or a gross calorific value (moist, ash-free basis) of less than 24 MJ/kg provided that the vitrinite mean random reflectance is equal to or greater than 0.6%.

4. **Subbituminous coal.** This is a brown coal with a gross calorific value (moist, ash-free basis) equal to or greater than 20 MJ/kg and less than 24 MJ/kg.
5. **Lignite.** This is a brown coal with a gross calorific value (moist, ash-free basis) of not greater than 20 MJ/kg.
6. **Peat.** This is a solid formed from the partial decomposition of dead vegetation under conditions of high humidity and limited air access (initial stage of coalification).

Column 2. Coal products are products derived directly or indirectly from the various classes of coal by carbonization or pyrolysis processes, by the aggregation of finely divided coal, or by chemical reactions with oxidizing agents including water.

1. **Patent fuel.** This is a composition fuel made by molding hard coal fines into briquette shapes with the addition of a binding agent.
2. **Coal coke.** This is the solid, cellular, infusible material remaining after the carbonization of certain coals. Various cokes are defined according to the type of coal carbonized and their conditions of carbonization or use. Coke oven coke is the solid product obtained from carbonization of coking coal at high temperatures. It is low in moisture and volatile matter and has the mechanical strength to support a blast furnace charge. It is used mainly in the iron and steel industry, acting as a heat source and chemical agent. Gas coke is a by-product from the carbonization of bituminous coal for the manufacture of gas works gas. Gas coke is used for heating purposes. Coke breeze comprises particles of coke of sizes less than 10 millimeters. It is the residue from screening coke, which may be made from bituminous or brown coals. Semi-coke is produced by low-temperature carbonization.
3. **Brown coal briquettes and peat briquettes.** Brown coal briquettes are composition fuels made of brown coal produced by briquetting under high pressure with or without the addition of a binding agent. Peat briquettes are fuels comprising small blocks of dried, highly compressed peat made without a binding agent and used mainly as household fuel.
4. **Coal tar.** This is the liquid by-product of the carbonization of coal in coke ovens.
5. **Coke oven gas.** This is a gas produced from coke ovens during the manufacture of coke oven coke.
6. **Blast furnace gas.** This is the by-product gas of blast furnace operation, consisting mainly of nitrogen, carbon dioxide, and carbon monoxide. It is used to heat blast air and as a fuel in the iron and steel industry. It may also be used by other nearby industrial plants.
7. **Basic oxygen steel furnace gas.** This is the by-product gas of the production of steel in a basic oxygen steel furnace. The gas is recovered as it leaves the furnace. The concentration of carbon monoxide in this gas is higher than that in blast furnace gas.

Column 3. Crude oil and natural gas liquids comprise crude oil, refinery feedstocks, natural gas liquids, additives and oxygenates, and other hydrocarbons.

1. **Crude oil.** This is a mineral oil of fossil origin extracted by conventional means from underground reservoirs. It comprises liquid or near-liquid hydrocarbons and associated impurities, such as sulfur and metals. It exists in the liquid phase under normal surface temperature and pressure, and usually flows to the surface under the

pressure of a reservoir. This is termed "conventional" extraction. Crude oil includes condensate from condensate fields, and field or lease condensate extracted with the crude oil.

2. **Natural gas liquids.** These are a mixture of ethane, propane, normal butane, isobutane, isopentane, and a few higher alkanes collectively referred to as pentanes plus. These liquids are removed from associated and nonassociated natural gases in field facilities or gas separation plants before the sale of the gas.

3. **Refinery feedstocks.** These are oils or gases from crude oil refining or the processing of hydrocarbons in the petrochemical industry, which are destined for further processing in a refinery, excluding blending. Typical feedstocks include naphthas, middle distillates, pyrolysis gasoline, and heavy oils from vacuum distillation and petrochemical plants.

4. **Additives and oxygenates.** These are compounds added to or blended with oil products to modify their properties (e.g., octane rating, cetane number, and cold properties). Examples include (i) oxygenates such as alcohols (e.g., methanol and ethanol) and ethers (e.g., methyl tertiary butyl ether, ethyl tertiary butyl ether, and tertiary amyl methyl ether); (ii) esters (e.g., rapeseed or dimethylester); and (iii) chemical compounds (e.g., tetramethyllead, tetraethyllead, and detergents). Some additives and oxygenates may be derived from biomass, while others may be of hydrocarbon origin.

5. **Other hydrocarbons.** These are nonconventional oil and hydrogen. Nonconventional oils refer to those obtained by nonconventional production techniques, that is, oils that are extracted from reservoirs containing extra-heavy oils or oil sands that need heating or treatment (e.g., emulsification) in situ before they can be brought to the surface for refining or processing. They also include oils extracted from oil sands; extra-heavy oils; and coal and oil shale that are at, or can be brought to, the surface without treatment and require processing after mining (i.e., ex situ processing). Nonconventional oils may also be produced from natural gas. Hydrogen, although not a hydrocarbon, is included unless it is a component of another gas.

Columns 4 and 4.1–4.6. Petroleum products (column 4) comprises gasoline; kerosene, including jet fuel; gas/diesel oil; residual fuel oil; and other petroleum products, such as white spirits, lubricants, bitumen, paraffin waxes, and petroleum coke (columns 4.1–4.6).

4.1 Gasoline. Gasolines are complex mixtures of volatile hydrocarbons distilling between approximately 25°Celsius (C) and 220°C and consisting of compounds in the C4 to C12 range. Motor gasoline is a mixture of some aromatics (e.g., benzene and toluene) and aliphatic hydrocarbons in the C5 to C12 range. The distillations range is 25°C–220°C. Motor gasoline may also contain biogasoline products. Aviation gasoline is gasoline prepared especially for aviation piston engines with additives that assure performance under flight conditions. Aviation gasoline is predominantly alkylates (obtained by combining C4 and C5 isoparaffins with C3, C4, and C5 olefins) with the possible addition of more aromatic components including toluene. The distillation range is 25°C–170°C. Gasoline-type jet fuel includes all light hydrocarbon oils for use in aviation turbine power units, distilling between 100°C and 250°C. They are obtained by blending kerosene and gasoline or naphtha in such a way that the aromatic content does not exceed 25% in volume and the vapor pressure is 13.7–20.6 kilopascals.

4.2 Kerosene. This comprises jet fuel kerosene and other kerosene. This is a mixture of hydrocarbons in the range C9 to C16, distilling over the temperature interval 145°C to 300°C, but not usually above 250°C, and with a flashpoint above 38°C. Kerosene-type jet fuel is a blend of kerosene suited to flight conditions with particular specifications, such as freezing point. The specifications are set down by a small number of national standards committees, most notably, the American Society for Testing and Materials (United States), MOD (United Kingdom), and GOST (the Russian Federation). Other kerosene, used for heating, cooking, lighting, solvents, and internal combustion engines, is known as burning oil, vaporizing oil, power kerosene, and illuminating oil.

4.3 Gas/diesel oil (distillate fuel oil). Gas/diesel oils are middle distillates, predominantly of carbon number range C11–C25, with a distillation range of 160ºC–420°C. This product comprises road diesel and heating or other gas oil.

4.4 Fuel oil. This comprises residual fuel oil and heavy fuel oil, which is usually a blended product based on the residues from various refinery, distillation, and cracking processes. Residual fuel oils have a distillation range of 350°C–650°C and a kinematic viscosity of 6–55 centistokes at 100°C. Their flash point is always above 60°C, and their specific gravity is above 0.95.

4.5 Liquefied petroleum gases. These refer to liquefied propane (C_3H_8) and butane (C_4H_{10}) or mixtures of both. Commercial grades are usually mixtures of these gases with small amounts of propylene, butylene, isobutene, and isobutylene stored under pressure in containers.

4.6 Other petroleum products. These comprise white spirits and special boiling point spirits, lubricants, bitumen, paraffin waxes, petroleum coke, and other products. This category also includes aromatics (e.g., benzene, toluene, and xylene) and olefins (e.g., propylene) produced within refineries.

Column 5. Gas includes natural gas, liquefied natural gas, and gasworks gas, excluding natural gas liquids.

1. **Natural gas.** This is a mixture of gaseous hydrocarbons, primarily methane, but generally also including ethane, propane, higher hydrocarbons in much smaller amounts, and some noncombustible gases (e.g., nitrogen and carbon dioxide). Natural gas comprises gases occurring in underground deposits, whether liquefied or gaseous, consisting mainly of methane. It includes associated gas, which is natural gas produced in association with crude oil; nonassociated gas, which is natural gas originating from fields producing hydrocarbons only in gaseous form; and colliery gas, which is methane produced at coal mines, piped to the surface, and consumed at collieries or transmitted by pipeline to consumers.
2. **Liquefied natural gas.** This is produced by liquefaction of natural gas by reducing its temperature to simplify storage and transport when production sites are remote from centers of consumption and pipeline transport is not economically feasible.
3. **Gasworks gas.** This is gas obtained from the carbonization or gasification of carbonaceous material of fossil or biomass origins in gasworks plants. The gases comprise gases obtained from carbonization or gasification of coals, cokes, biomass or waste, and substitute natural gas (a methane-rich gas) made from synthesis gas. Synthesis gas is a mixture of mainly hydrogen and carbon monoxide obtained by cracking hydrocarbons with high-temperature steam. The hydrocarbons may be taken from fossil fuels, biofuels, or wastes.

Column 6. Hydro shows electricity produced from devices driven by fresh, flowing, or falling water.

Column 7. Nuclear energy is the heat obtained from the steam (or other working fluid) produced by the nuclear reactor with an average thermal efficiency of 33%.

Column 8. Geothermal shows the heat extracted from the earth that is used to generate electricity with an average thermal efficiency of 10%.

Column 9. Solar energy shows energy captured from solar radiation. This energy is subdivided into three major technologies used to capture the solar radiation and to produce a useful energy output. Solar energy comprises solar photovoltaics, nonconcentrating solar thermal, and concentrating solar thermal. With solar photovoltaics, electricity is produced by the direct conversion of solar radiation through photovoltaic processes in semiconductor devices (i.e., solar cells), including concentrating photovoltaic systems. Nonconcentrating solar thermal systems convert solar radiation to low-temperature heat, while concentrating solar thermal systems convert solar radiation to high-temperature heat.

Column 10. Wind energy shows electricity produced from devices driven by wind.

Column 11. Biomass includes wood, wood waste, black liquor, industrial and municipal waste, charcoal, agricultural waste, and other biomass that are used as fuels.

Column 12. Power generation from other fuel sources (excluding columns 1–11) is included here.

Column 13. Electricity shows final consumption and trade in electricity (which is counted at the same heat value as electricity in final consumption, that is, 1 gigawatt-hour equals 0.000086 million toe).

Column 14. Heat includes heat production from public combined heat and power plants, and from autoproducers that is sold to a third party (e.g., to a network).

Column 15. The total of columns 1–14 excluding columns 4.1, 4.2, 4.3, 4.4, 4.5, and 4.6.

Rows

The categories on the left-hand side of the table have the following definitions.

Row 1. Indigenous production shows the capture, extraction, or manufacture of fuels or energy in forms that are ready for general use.

Rows 2 and 3. Imports comprise all fuel (excluding nuclear fuel) and energy entering the national territory. Exports comprise all fuel (excluding nuclear fuel) and energy leaving the national territory, with the exception of exports that exclude quantities of fuels delivered for use by merchant (including passenger) ships and civil aircraft, of all nationalities, during international transport of goods and passengers.

Row 4. International bunkers comprise international marine bunkers and international aviation bunkers. International marine bunkers cover those quantities delivered to merchant (including passenger) ships, of any nationality, for consumption during international voyages transporting goods or passengers. International aviation bunkers comprise quantities of fuels

delivered to civil aircraft, of any nationality, for consumption during international flights transporting goods or passengers.

Row 5. Stock changes are defined as the increase (i.e., stock build) or decrease (i.e., stock draw) in the quantity of stock over the reporting period.

Row 6. Total primary energy supply is made up of indigenous production (row 1) + imports (row 2) – exports (row 3) – international bunkers (row 4) and ± stock changes (row 5).

Row 7. Transfers are essentially statistical devices to overcome practical classification and presentation issues resulting from changes in use or identity of a product. Transfers comprise products transferred and interproduct transfers.

Row 8. Transformation is the movement of part or all of the energy content of a product entering the process to one or more different products leaving the process. The transformation sector consists of power generation, gas processing, refineries, coal transformation, and other transformation.

Row 8.1 Power generation. This comprises main activity producers and autoproducers. Columns 1–11 show primary and secondary fuel input to public utilities' plants as negative entries. Gross electricity produced (including power stations' own consumption) appears as a positive quantity in column 13 ("Electricity"). Transformation losses appear in column 15 ("Total") as a negative number. Columns 1–11 also show primary and secondary fuel input to electricity generation of autoproducers as negative entries. An autoproducer is an establishment that, in addition to its main activities, generates electricity wholly or partially for its own use, such as industries, railways, and refineries. Total gross electricity produced appears as a positive quantity in column 13 ("Electricity"). Transformation losses appear in column 15 ("Total") as a negative number.

Row 8.2 Gas processing. Where there is a production of gas at gas processing plants, the treatment is similar to that for electricity generation, with the quantity produced appearing as a positive figure in column 5 ("Gas"), input as negative entries in column 1 (coal), 2 (coal products), 4 (petroleum products), and 5 (natural gas input), and conversion losses appearing in the "Total" column.

Row 8.3 Refineries. Petroleum refineries shows the transformation of crude oil, natural gas liquids, condensates, and other refinery feedstocks into petroleum products.

Row 8.4 Coal transformation. This row shows the transformation of coal from primary into secondary fuels and from secondary into tertiary fuels (e.g., hard coal to coke, coke to blast furnace gas, or brown coal to brown coal briquettes).

Row 8.5 Other transformation. This row contains the energy feedstocks and outputs of petrochemical industry, biofuel processing, charcoal processing, and other transformation processes that are not classified elsewhere.

Row 9. Loss includes losses during the transmission, distribution, and transport of fuels, heat, and electricity. Losses also include venting and flaring of manufactured gases, losses of geothermal heat after production, and pilferage of fuels or electricity. Own use contains the primary and secondary energy consumed by transformation industries for heating, traction, and lighting purposes. These are shown as negative figures. Included here are, for example, the coal mines' own use of energy, energy use in refineries, electricity plants' own consumption

(which includes gross electricity consumed for pumped storage), and energy used for oil and gas extraction (which also includes consumption for the pipeline system).

Row 10. Discrepancy is a category, which includes the sum of the unexplained statistical differences for individual fuels.

Row 11. Total final consumption is all fuel and energy that is delivered to users for both their energy and nonenergy uses not involving transformation processes. Final consumption comprises the sum of consumption by the different end-use sectors. In final consumption, petrochemical feedstocks, as well as natural gas for producing fertilizer, are shown under the industry sector.

Row 12. Consumption of the industry sector (energy used for transport by industry is not included but reported under transport).

Row 13. The transport sector includes consumption of fuels and electricity used to transport goods or persons between points of departure and destinations within the national territory irrespective of the economic sector within which the activity occurs.

Row 14. Other sectors cover agriculture, residential, commercial and public services, and nonspecified consumption.

Row 14.1 Residential and commercial. This row comprises the consumption of the residential and commercial sectors, and that of public services.

Row 14.1.1 Commercial and public services. This row shows the consumption of the commerce and public services.

Row 14.1.2 Residential. This row shows the consumption of the residential sector. Fuels and electricity used by household for transport are excluded.

Row 14.2 Non-specified others. This row shows consumption for military use and for activities not classified elsewhere.

Row 15. Non-energy use covers use of coal; gas; and petroleum products, such as white spirits, paraffin waxes, lubricants, bitumen, and other products. Petroleum coke is shown under nonenergy use only when there is evidence of such use; otherwise, it is shown under energy use in industry or other sectors. Feedstocks for the petrochemical industry are accounted for in industry (row 12). This covers all oil, including naphtha, except the other petroleum products listed above, and gas used as petrochemical feedstock. Gas used as raw material for chemical products, such as methanol and ammonia/urea, is also included.

Row 16. Electricity output is located here by fuel type, as well as each primary electricity source. The figures are measured in gross generation amounts.

Row 17. Heat output is also located here by fuel source. The figures are reported in gross calorific values.

Appendix 2

Conversion Factors

Table A2.1 Conversion Factors for Units of Volume

To	US gallon	UK gallon	Barrel	Cubic foot	Liter	Cubic meter
From	**Multiply by**					
US gallon	1.0	0.8327	0.02381	0.1337	3.785	0.0038
UK gallon	1.201	1.0	0.02589	0.1605	4.546	0.0045
Barrel	42.0	34.97	1.0	5.615	159.0	0.159
Cubic foot	7.48	6.229	0.1781	1.0	28.3	0.0283
Liter	0.2642	0.22	0.0063	0.0353	1.0	0.001
Cubic meter	264.2	220.0	6.289	35.3147	1000	1.0

Source: IEA (2004).

Table A2.2 Conversion Factors for Units of Energy

To	Terajoule	Gigacalorie	Million tons of oil equivalent	Million Btu	Gigawatt-hour
From	**Multiply by**				
Terajoule	1.0	238.8	2.388×10^{-5}	947.8	0.2778
Gigacalorie	4.1868×10^{-3}	1.0	10^{-7}	3.968	1.163×10^{-3}
Million tons of oil equivalent	4.1868×10^{4}	107	1.0	3.968×10^{7}	11,630
Million Btu	1.0551×10^{-3}	0.252	2.52×10^{-8}	1.0	2.931×10^{-4}
Gigawatt-hour	3.6	860	8.6×10^{-5}	3,412	1.0

Btu = British thermal unit.

Source: IEA (2004).

Appendix 3
Intergovernmental Panel on Climate Change Carbon Emission Factors for Fossil Fuels

Fuel	Carbon Emission Factors (ton of carbon equivalent/terajoule)
Oil and Oil Products	
Crude oil	20.0
Orimulsion	22.0
Natural gas liquids	17.2
Gasoline	18.9
Jet kerosene	19.5
Other kerosene	19.6
Shale oil	20.0
Gas/diesel oil	20.2
Fuel oil	21.1
Liquefied petroleum gas	17.2
Ethane	16.8
Naphtha	20.0
Bitumen	22.0
Lubricants	20.0
Petroleum coke	27.5
Refinery feedstocks	20.0
Refinery gas	18.2
Other oil products	20.0
Coal and Coal Products	
Anthracite	26.8
Coking coal	25.8
Other bituminous coal	25.8
Sub-bituminous coal	26.2
Lignite	27.6
Oil shale	29.1
Peat	28.9
Coal briquettes and patent fuels	25.8
Coke oven coke or gas coke	29.5
Coke oven gas	13.0
Blast furnace gas	66.0
Gaseous Fossil Products	
Natural gas (dry)	15.3

Source: IEA (2011a).

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Energy Statistics in Asia and the Pacific (1990–2009)

Energy Statistics in Asia and the Pacific (1990–2009) is a compilation of energy supply and demand data of the member economies of the Asian Development Bank in Asia and the Pacific. The data include the latest 4 years of energy balances of 47 of the 48 ADB members in the region, and historical summary tables that present data on electric power generation, as well as macroeconomic and basic energy indicators.

About Asia-Pacific Economic Cooperation

Asia-Pacific Economic Cooperation was established in 1989 to further enhance economic growth and prosperity for the region and to strengthen the Asia-Pacific community. APEC has 21 members, referred to as member economies.

APEC operates as a cooperative, multilateral economic and trade forum. It is the only international intergovernmental grouping in the world committed to reducing barriers to trade and investment without requiring its members to enter into legally binding obligations. APEC achieves its goals by promoting dialogue and arriving at decisions on a consensus basis, giving equal weight to the views of all members.

About the Asia Pacific Energy Research Centre

The Asia Pacific Energy Research Centre (APERC) was established in July 1996 in Tokyo as an affiliate of the Institute of Energy Economics, Japan, pursuant to the Action Agenda adopted by the APEC Economic Leaders at the Osaka Summit in November 1995. The Government of Japan generously agreed to host and finance the center.

The primary objective of APERC is to foster understanding among APEC economies of global, regional, and domestic energy demand and supply trends, energy infrastructure development, energy regulatory reform, and related policy issues in view of regional prosperity. APERC advocates rational energy policy formulation and enhances capacity building in energy research in the region, following APEC's Non-binding Energy Policy Principles for furthering energy security, economic growth, and environmental quality.

About the Asian Development Bank

ADB's vision is an Asia and Pacific region free of poverty. Its mission is to help its developing member countries reduce poverty and improve the quality of life of their people. Despite the region's many successes, it remains home to the majority of the world's poor. ADB is committed to reducing poverty through inclusive economic growth, environmentally sustainable growth, and regional integration.

Based in Manila, ADB is owned by 67 members, including 48 from the region. Its main instruments for helping its developing member countries are policy dialogue, loans, equity investments, guarantees, grants, and technical assistance.

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