

HARMONIZING ELECTRICITY LAWS IN SOUTH ASIA

Recommendations to Implement the
South Asian Association for Regional
Cooperation Framework Agreement
on Energy Trade (Electricity)



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Foreword

South Asia, home to nearly one-sixth of the global population, is one of the poorest regions in the world. Access to electricity in the region is low and the South Asian Association for Regional Cooperation (SAARC) member countries face acute electricity shortages, adversely impacting their socioeconomic development. Yet the region is endowed with hydropower potential, coal reserves, natural gas reserves, large renewable energy resources, and petroleum reserves. These can be harnessed to become key drivers of the region's growth—and energy trade has the potential to capitalize on this asset.

The Asian Development Bank (ADB) recognizes energy as one of its priority sectors. ADB's energy policy aims to help developing member countries to provide reliable, adequate, and affordable energy for inclusive growth in a socially, economically, and environmentally sustainable way. The policy has three pillars: promoting energy efficiency and renewable energy; maximizing access to energy for all; and promoting energy sector reform, capacity building, and governance. ADB recognizes that regional cooperation can play a vital role in ensuring energy security in a sustainable manner. Regional power trade can help meet energy demand while maximizing scarce natural resources. The focus will be on removing barriers to greater cooperation and trade in the energy sector; and seeking ways to address regulatory, currency, and trading risks, as well as political uncertainty.

The SAARC Framework Agreement for Energy Cooperation (Electricity) (the framework agreement), signed in November 2014 by all SAARC member states, is a key step and positive development for the realization of regional energy trade. Its emphasis on electricity lays down the broad contours for energy cooperation in South Asia. The framework agreement recognizes the need for the SAARC to work together in the field of energy to enable its people to benefit from the region's energy resources and to uplift millions of people from poverty.

To support the implementation of the framework agreement, ADB and the South Asian Association for Regional Cooperation in Law (SAARCLAW) are working together under a technical assistance project entitled *Strengthening Legal Institutions and Enhancing Regional Cooperation in Law, Justice, and Development in South Asia*. The project aims to facilitate the improvement, harmonization, and use of legal resources in the development process through institutional and capacity development; to share experiences in areas of mutual concern; and to produce and disseminate knowledge products. One of the initial areas identified under the project for legal and regulatory harmonization is the energy sector.

This report culminates the work of ADB and SAARCLAW on regional energy trade. The country reports (for Bangladesh, Bhutan, India, Nepal, and Sri Lanka) provide a detailed analysis and study of each country's energy sector, enabling a better understanding of the state of the legal and regulatory framework for energy trade. This report also identifies other areas of reform and intervention for the improvement of the energy sector. Building on these reports as well as inputs from energy experts from the region, this report identifies the legal, regulatory, technical, and commercial requirements for energy trade; and what each country needs to do to make the framework agreement a reality. The recommendations, summarized in tables, provide an easy reference for policy makers and energy stakeholders in the region.

It is hoped that this report's recommendations, derived from the work of national consultants and regional and international experts, will contribute to the fulfillment of the framework agreement. This report can serve as a guide for governments and the legal community in SAARC in identifying areas of reform for study and implementation. SAARC countries have proven time and again that they can work together, but greater cooperation and work are needed to address the many legal and regulatory barriers to regional energy trade. Governments, the private sector, and particularly the legal community of SAARC can contribute to efforts to make regional energy trade a reality.

Abbreviations

ADB	Asian Development Bank
BEA	Bhutan Electricity Authority
BERC	Bangladesh Energy Regulatory Commission
BPC	Bhutan Power Corporation
CEB	Ceylon Electricity Board
CERC	Central Electricity Regulatory Commission, India
DAE	Department of Atomic Energy, India
GWh	gigawatt-hour
HDI	human development index
IPP	independent power producer
kV	kilovolt
LECO	Lanka Electricity Company
MEA	Maldives Energy Authority
MW	megawatt
MWh	megawatt-hour
NEA	Nepal Electricity Authority
NEPRA	National Electric Power Regularity Authority, Pakistan
NTDC	National Transmission and Dispatch Company, Pakistan
PGCB	Power Grid Company of Bangladesh
PSMP	Power System Master Plan, Bangladesh
PUCSL	Public Utilities Commission of Sri Lanka
REB	Rural Electrification Board, Bangladesh
SAARC	South Asian Association for Regional Cooperation
SAARCLAW	South Asian Association for Regional Cooperation in Law
SARPE	South Asia Regional Power Exchange
SEB	State Electricity Board
SERC	State Electricity Regulatory Commission, India
SMS	SAARC member state
SRETS	SAARC Regional Energy Trade Study

STELCO	State Electric Company, Maldives
T&D	transmission and distribution
WAPDA	Water and Power Development Board
WAPECA	Water and Power Engineering Consultancy Authority of Afghanistan

Executive Summary

The South Asian Association for Regional Cooperation (SAARC) member states have been reeling under severe electricity shortages, despite the region having the potential to generate sufficient electricity from indigenous resources to meet the demand. Electricity shortages hold back the social and economic development of the region. Even in the present scenario, these shortages can be partially mitigated through cross-border power trade, as surplus energy is available in the power systems in parts of the region despite shortages in the other parts. Realizing this, the member states signed the SAARC Framework Agreement for Energy Cooperation (Electricity) (the framework agreement), with emphasis on electricity cooperation, in November 2014.

ADB provided this technical assistance to the South Asian Association for Regional Cooperation in Law (SAARCLAW), a body the SAARC recognizes, to facilitate the implementation of this agreement, by reviewing the laws and regulations of the member states and suggesting measures to harmonize them to facilitate cross-border electricity trade in the region. Country reports were prepared for six of the eight member states, except for Afghanistan and Maldives. This regional report was synthesized from these country reports, and information available in the public domain for Afghanistan and Maldives.

This report presents the main development indicators; the electricity demand and/or supply scenario, and access to electricity in the region; impact of shortages on businesses, the institutional framework of the sector, and the role of these institutions in each of these countries; and captures the essence of the framework agreement.

This report discusses the prevailing electricity laws, regulations, and policies of member states. Based on the review, it identifies provisions that need to be harmonized with those of the other countries in the region for promoting cross-border electricity trade. This report highlights the legal, regulatory, technical, and commercial aspects that need to be harmonized to lay a solid foundation for promoting electricity trade in South Asia and create a South Asia electricity market, as has been done in other parts of the world. Taking cognizance of the prerequisites for promoting regional electricity trade, and international best practices, this report presents a matrix of the action items and the specific actions to be taken by each member state to harmonize their electricity laws, regulations, and policies.

However, mere harmonization of the electricity laws and regulations alone will not be sufficient to help implement the framework agreement and promote regional electricity trade in South Asia. Hence, this report also recommends additional steps member states need to take to harness the benefits of cooperation and cross-border electricity trade.



1 South Asian Association for Regional Cooperation and ADB's Support for the South Asian Association for Regional Cooperation in Law

1.1 South Asian Association for Regional Cooperation

The seven South Asian nations (Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, and Sri Lanka) established the South Asian Association for Regional Cooperation (SAARC) on 8 December 1985 in Dhaka. Afghanistan became the eighth member in April 2007. Australia, the People's Republic of China, the European Union, Iran, Japan, the Republic of Korea, Mauritius, Myanmar, and the United States were accorded the status of observer states. The main objectives of SAARC are, among other things, to promote welfare and improve the quality of life; and accelerate economic growth, social progress, and cultural development in the region. Despite its existence for over 3 decades, challenges remain in attaining these objectives, as reflected by the human development index (HDI) ranking of SAARC countries in Table 1.

Table 1: Human Development Index Ranking of South Asian Association for Regional Cooperation Member States (2016)

Country	Global HDI Ranking	Country	Global HDI Ranking
Afghanistan	169	Maldives	105
Bangladesh	139	Nepal	144
Bhutan	132	Pakistan	147
India	131	Sri Lanka	73

HDI = human development index.

Source: United Nations Development Programme. 2016. *Human Development Report 2016: Human Development for Everyone*. New York: UNDP.

The individual country HDI parameters show that the literacy rate, life expectancy, percentage of population below the poverty line, and school enrollment rates may still be vastly improved. Robust economic growth is the key to faster social development, which, in turn, requires adequate energy supply at affordable prices. Therefore, enhancing availability of energy supply across the region assumes great significance.

1.2 South Asian Association for Regional Cooperation's Initiatives on Energy Cooperation

Realizing the need for regional cooperation in the energy sector, SAARC established a technical committee on energy in January 2000. This was followed by the creation of a Working Group on Energy in January 2004, and the SAARC Energy Centre in October 2005. The SAARC Energy Centre was tasked to carry out technical, economic, and financial analysis of potential energy cooperation initiatives; and expedite establishment of energy linkages within and with neighboring regions. ADB's support to SAARC in the energy sector included "Preparing the Energy Sector Dialogue and SAARC Energy Centre Capacity Development;" the "South Asia Economic Integration Partnership" program; creation of the "SAARC Renewable Energy Task Force;" carrying out the "SAARC Regional Energy Trade Study (SRETS)," the "SAARC Regional Power Exchange Study," "Energy Trade in South Asia Opportunities and Challenges;" and several other initiatives.

1.3 ADB's Support to the South Asian Association for Regional Cooperation in Law

The SAARC member states signed the SAARC Framework Agreement for Energy Cooperation (Electricity) (the framework agreement) in Kathmandu, Nepal on 27 November 2014. This broad-based agreement for cooperation in the energy sector primarily lays emphasis on electricity cooperation, as reflected by the word "electricity" in parentheses at the end of its title. Its implementation will require member states to implement the various articles within it.

Recognizing the myriad of legal and regulatory issues countries will face in the implementation of the framework agreement, the Office of the General Counsel of ADB and the South Asian Association for Regional Cooperation in Law (SAARCLAW) agreed to collaborate on studying these issues with the aim of identifying areas where legal and policy reforms are needed. The goal is to examine the energy (especially electricity) laws and regulations of the member states to help identify and overcome the impediments that can or have the potential to hamper regional energy cooperation and to support the implementation of the said agreement. The SAARCLAW, as a regional body of the legal fraternity of SAARC countries and recognized by SAARC as an apex body, can play an important role in the implementation of the framework agreement, particularly in using its legal and regulatory expertise to promote electricity trade in the region.

1.4 Methodology for Carrying out the Study

The main objective of this report is to facilitate the implementation of the framework agreement by analyzing the prevailing legal, regulatory, and policy regimes of the member

states; and to make recommendations on legal, regulatory, and policy changes required to promote regional electricity trade. To fulfill this objective, this report confines its analysis to the electricity laws, regulations, and policies; and makes recommendations about electricity sector development and cooperation among the SAARC member states.

The SAARCLAW hired national consultants to review the energy laws and policies of Bangladesh, Bhutan, India, Nepal, Pakistan, and Sri Lanka. The consultants prepared the country reports containing their analyses for their respective countries. To make this report concise, the country reports are contained in the CD that accompanies this report.¹ An international expert in energy laws and policies was hired to synthesize these country reports in a regional report. The expert reviewed the country reports and the previous work done on the subject by the SAARC, ADB, and other organizations. The expert collected and reviewed information available in the public domain for Afghanistan and Maldives, to the extent possible, as country reports were not prepared for these countries.

This report briefly covers the electricity scenarios and the importance of cooperation at the regional level. It identifies issues arising out of the prevailing laws and regulations that have the potential to hamper regional electricity trade in South Asia. It proposes changes to the existing electricity laws and regulations of member states for forging electricity cooperation in the region. It identifies legal, technical, financial, operational, and commercial mechanisms to put in place to promote multilateral electricity trade, create a cross-border electricity infrastructure, and create an electricity market in South Asia. It also makes recommendations to help South Asia meet its electricity demand by (i) enhancing the availability of electricity supply for regional trade, and (ii) attracting investments for the creation of cross-border electricity infrastructure.

1.5 Sequencing of Chapters

The report has been divided into seven chapters. Chapter 1 gives a brief overview of the SAARC region and ADB's support to the SAARCLAW. Chapter 2 describes the electricity scenario in the region and the sector structure by country. Chapter 3 captures the essence of the SAARC Framework Agreement for Energy Cooperation (Electricity). Chapter 4 lists the electricity laws, regulations, and policies of the member states and covers the findings of this review from the perspective of promoting electricity trade in the region. Chapter 5 highlights the requirements for promoting cross-border electricity trade. Chapter 6 summarizes the actions required by each country to meet the specific requirements for the implementation of the above agreement and creation of an electricity market in South Asia. Chapter 7 summarizes the study's conclusion and makes recommendations for the SAARC member states' consideration.

¹ Copies of this report and the country studies are also available through the SAARCLAW website www.saarclaw.org

2 Energy Scenario and Institutional Framework

2.1 Energy Scenario in the South Asian Association for Regional Cooperation Region

The SAARC region has been endowed by nature with relatively large hydropower potential, renewable energy resources, and coal. However, hydrocarbons, such as petroleum and natural gas reserves, are insignificant in relation to the demand for these. All SAARC member states (SMSs) are dependent on petroleum imports, some even up to 100% of the demand. India and Pakistan, which use natural gas, are dependent on gas imports. Only Bangladesh somehow manages to meet its gas demand from indigenous sources. Energy shortages are holding back these countries' socioeconomic development. Petroleum and natural gas are among the largest items in their import baskets in foreign currency outflows. Given the limited possibilities for regional trade in petroleum, natural gas, and other hydrocarbon fuels, energy cooperation in South Asia has to primarily focus on cooperation in the electricity sector. Thus, the framework agreement emphasizes electricity cooperation.

To appreciate the status of electricity sector development in South Asia, the indigenous energy resources of the region are presented in Table 2.

Table 2: Conventional Energy Reserves of South Asian Association for Regional Cooperation Member States

Country	Coal (million tons)	Oil (million barrels)	Natural Gas (trillion cubic feet)	Hydropower Potential (megawatts)	Biomass (million tons)
Afghanistan	440	1,600*	15	25,000	18–27
Bhutan	2	0	0	30,000	26.6
Bangladesh	884	12	8	330	0.08
India	90,085	5,700	39	150,000	139
Maldives	0	0	0	0	0.06
Nepal	NA	0	0	42,000	27.04
Pakistan	17,550	324	33	45,000	NA
Sri Lanka	NA	150	0	2,000	12
Total	108,961	5,906	95	294,330	223

NA = not applicable.

Source: SAARC Secretariat. 2010. *SAARC Regional Energy Trade Study*. Kathmandu: SAARC Secretariat. www.sasec.asia/uploads/publications/srets_a.pdf

The figures above indicate that the region has plenty of energy resources that, if exploited, can fully meet in the foreseeable future the region's electricity demand.

2.2 Demand and Supply Scenario of Electricity in South Asia

To appreciate the status of electricity sector development in South Asia, the region's demand and supply situation for electricity, is presented in Table 3.

Table 3: Installed Capacity, Generation, Demand, and Electricity Shortages (2013–2014)

Country	Installed Capacity (MW)	Peak Demand (MW)	Generation (GWh)	Demand (GWh)
Afghanistan	620	700	880	3,890
Bangladesh	9,821	9,268	42,195	36,233
Bhutan	1,510	282	6,750	1,640
India	23,7742	129,815	957,734	802,567
Maldives	141	NA	290	270
Nepal	787	1,200	3,558	3,448
Pakistan	22,860	23,953	92,860	76,860
Sri Lanka	3,362	2,164	11,962	10,632
Total	276,843	167,382	1,116,229	935,540

GWh = gigawatt-hour, MW = megawatt, NA = not available.

Sources: Compiled by the author from annual reports of the respective ministries, departments, and utilities. For data during 2011–2012, see P. Wijayatunga et al., Cross-Border Power Trading in South Asia: A Techno Economic Rationale. ADB South Asia Working Paper Series No. 38. Manila: Asian Development Bank. <http://www.adb.org/sites/default/files/publication/173198/south-asia-wp-038.pdf>

The data in Table 3 indicates that during the financial year 2013–2014, the total generation of all countries put together added up to 1,116,229 gigawatt-hours (GWh), against the total demand of 935,540 GWh during the same period. Were the power grids of the SAARC countries been interconnected and if proper load management and dispatch systems in place, electricity shortages would not have occurred at the regional level.

2.3 Access to Electricity in South Asia

The region currently has surplus availability of electricity supply, but a large percentage of the population still does not have access to electricity and, where available, power outages of 8–16 hours per day happen in some countries in the region. The percentage of population with access to electricity in South Asia is shown in Table 4.

Table 4: Electricity Access in South Asia, 2013

Country	Electrification Rate (National, %)	Electrification Rate (Urban, %)	Electrification Rate (Rural, %)
Afghanistan	33	70% (only Kabul)	NA
Bangladesh	62	90	48
Bhutan	60	NA	60
India	81	96	74
Maldives	100	100	100
Nepal	76	97	72
Pakistan	73	91	62
Sri Lanka	94	99	93

NA = not available.

Sources: International Energy Agency, 2015. *World Energy Outlook 2015*. Paris: Organisation for Economic Co-operation and Development and International Energy Agency; and SAARC Regional Electricity Trade Study (for the countries where figures are not available in the *World Energy Outlook 2015*).

People with access to electricity varies from 33% in Afghanistan to 100% in Maldives. This is despite Maldives being totally dependent on marine diesel oil to generate electricity. Given that South Asia has a total population of nearly 1.5 billion, people without access to electricity adds up to millions. This is far from ideal from the perspectives of human and economic development. This could be one of the reasons South Asia is one of the poorest regions in the world.

2.4 Impact of Electricity Shortage on Business

While nonavailability of electricity supply to a sizable percentage of the population directly impacts the region's human and social development, electricity shortages have a huge adverse impact on the economic development as well, as reflected by the losses suffered by businesses due to shortages of electricity, as shown in Table 5.

Table 5: Business Opportunities Lost Due to Electricity Shortages

Country	Value Lost Due to Electricity Outages (As percentage of sales)
Afghanistan (2007)	6.49
Bangladesh (2007)	10.56
Bhutan (2009)	4.33
India (2009)	6.62
Maldives (2009)	NA
Nepal (2009)	26.95
Pakistan (2007)	9.16
Sri Lanka (2011)	3

NA = not available.

Source: World Bank, 2013. *World Development Indicators 2013*. Washington, DC: World Bank.

Electricity shortages directly impact the manufacturing and other sectors of the economy. The loss of sales due to these shortages varies from 3% in Sri Lanka to 26% in Nepal. These high levels of losses adversely impact the gross domestic product growth of the region, which is essential for uplifting large sections of the population from abject poverty. Enhancing access to electricity for economic and social development of the region will require enhancing availability of electricity supply and integration of power systems of the member countries to bridge the yawning demand–supply gap in some of the countries.

2.5 Institutional Framework of the Power Sector in South Asia

The institutional framework of the electricity sector in each SAARC member state is given below.

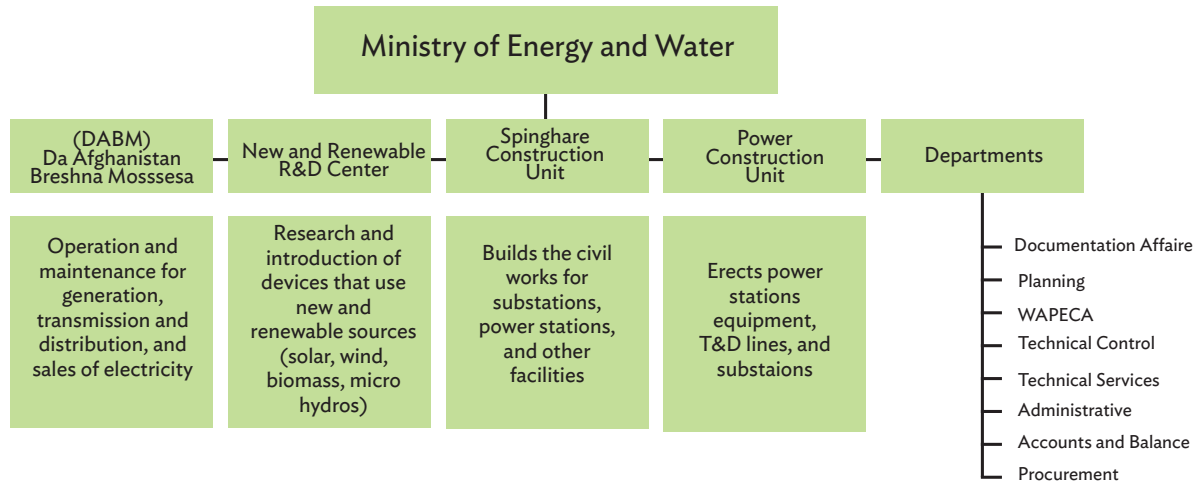
2.5.1 Institutional Framework of Power Sector in Afghanistan

The Government of Afghanistan created the state-owned power sector in 1968 by taking over the electricity corporation, which was a joint sector enterprise. In 1986, the government enacted Afghanistan's Usage of Electricity Act making the Ministry of Water and Power responsible for the power sector's operations. The government also created five autonomous enterprises for managing the power sector, under the Enterprise Act of 1980 as given below:

- (i) Da Afghanistan Breshna Moassesa, which is in charge of generation, transmission, and distribution of electricity in Afghanistan.
- (ii) Spinghare Construction Unit, which is in charge of civil works for power stations and substations and all civil works relating to power sector.
- (iii) Power Construction Unit in charge of erecting all electrical works such as transmission and distribution lines and substations.
- (iv) Water and Power Engineering Consultancy Authority (WAPECA), which is responsible for the design, including field surveys for new generation, transmission, and distribution projects.
- (v) New and Renewable Energy Research and Development Centre, which is responsible for activities relating to the development of renewable energy.

A representation of the power sector in Afghanistan is shown in Figure 1.

Figure 1: Institutional Framework of the Afghanistan Power Sector



R&D = research and development, T&D = transmission and distribution, WAPECA = Water and Power Engineering Consultancy Authority.

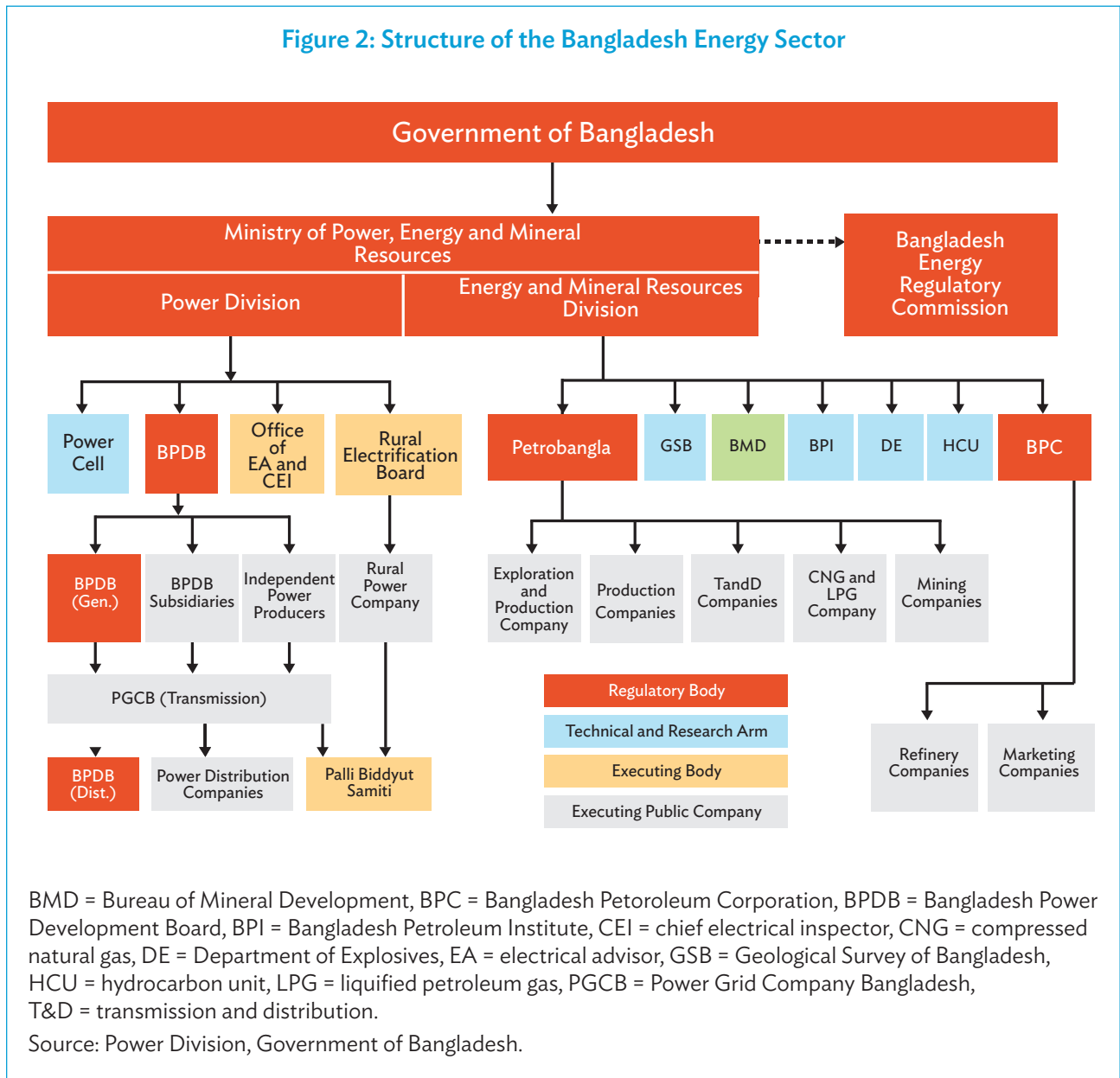
Source: South Asia Regional Initiative for Energy Integration. Afghanistan. https://sari-energy.org/oldsite/PageFiles/Countries/Afghanistan_Energy_detail.html

2.5.2 Institutional Framework of Power Sector in Bangladesh

The Ministry of Power, Energy and Mineral Resources governs the energy sector operations in Bangladesh. The Energy and Mineral Resources Division under the ministry is empowered to formulate all policies related to natural gas, liquid petroleum, coal, and other mineral resources. This division is also responsible for formulating policies and executing administrative control over the regulatory agencies that act as the Energy and Mineral Resources Division's strategic planning, administrative, and research wings. The Power Division is responsible for formulating policies relating to electricity; and supervising, controlling, and monitoring the development activities in the sector. The Power Cell assists the Power Division in implementing its mandate related to generation, transmission, and distribution. It operates primarily through the Power Cell, and the Office of the Electrical Advisor and the Chief Electrical Inspector. The Power Cell is responsible for strategic planning and the Office of Electrical Advisor and Chief Electrical Inspector are responsible for ensuring control over the safety issues.

The Bangladesh Power Development Board under the Power Division is responsible for planning, construction, and operation of power generation and transmission throughout Bangladesh; and is responsible for the distribution of electricity in urban areas, except for the metropolitan city of Dhaka and its adjacent areas. The Power Grid Company Bangladesh (PGCB), the Rural Power Company Ltd., and the Rural Electrification Board (REB) are all executing bodies driven by the regulatory framework set out and monitored by the agencies described above. The REB, constituted in 1977, is responsible for the

electrification of rural areas in Bangladesh. Currently, the REB operates in 76 rural electric cooperatives called Palli Bidyut Samity (a kind of a society in each area). The representation of the sector is shown in Figure 2.



Bangladesh Energy Regulatory Commission

The Bangladesh Energy Regulatory Commission (BERC) regulates the power sector in Bangladesh. It is tasked to ensure that energy companies have necessary and adequate incentives to provide quality service at affordable prices; and that the sector functions in a safe, reliable, and transparent manner. BERC is characterized by its independence, neutrality, and quasi-judicial authority and power. Its functions include promoting

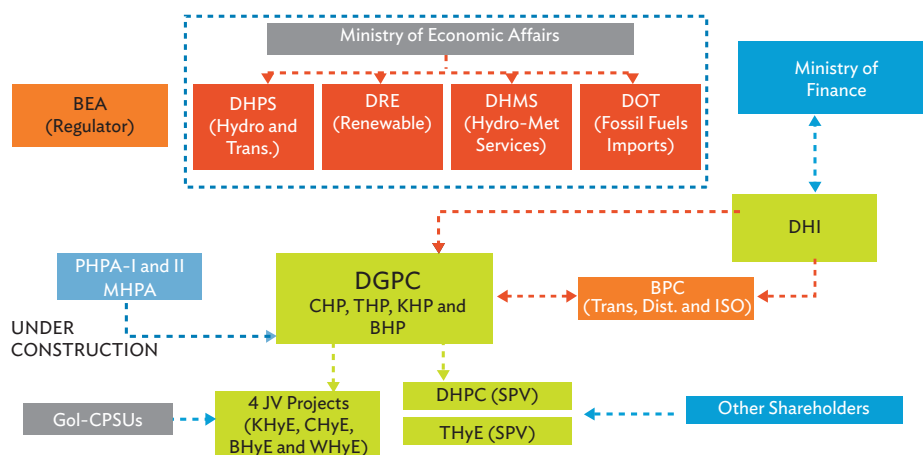
investment in the energy and power sector by formulating policies that create and ensure a level playing field; a reasonable return on investment; rationalizing cost structures; and assisting parties involved in the generation and transmission of power, and in mediation and dispute resolution. BERC has a fund specially created to enable it to dispense its functions, the Bangladesh Energy Regulatory Commission Fund.

The BERC comprises a chairman and four members, appointed by the President upon the proposal of the Ministry of Power, Energy and Mineral Resources as full-time officers of the commission. The chairman and members hold office for 3 years and are eligible for reappointment for another term.

2.5.3 Institutional Framework of the Power Sector in Bhutan

The former Department of Power under the erstwhile Ministry of Trade and Industry was responsible for all activities related to the power sector until June 2002. The Electricity Act July 2001 enabled major restructuring of the power sector in Bhutan. The Department of Power was split into two organizations: the Department of Energy for policy making and planning of all aspects of energy and power sector, and the Bhutan Power Corporation (BPC) for the transmission and distribution of electricity. The three hydropower corporations (Basochhu, Chhukha, and Kurichhu), which were operating as independent corporations, were merged into a single entity, the Druk Green Power Corporation, on 1 January 2008. The Department of Hydropower and Power Systems, under the Ministry of Economic Affairs, formed in 2011, is responsible for developing the long-term policies and plans for the energy and power sector. The Department of Renewable Energy, established in December 2011 under the Ministry of Economic Affairs, serves as the central coordination agency for all matters related to renewable energy development. The Department of Hydro-Met Services, formed in 2011, is responsible for developing effective a hydrometeorological and flood warning services network and database to provide appropriate and timely services and products.

The Bhutan Electricity Authority (BEA), established in 2001, functions as the regulator for the power sector in Bhutan. Druk Holding and Investments, established in November 2007, manages the existing and future investments of the the Government of Bhutan. It is the largest and only government-owned holding company in Bhutan. It has 11 wholly-owned companies, three controlled companies, and six linked companies operating in the manufacturing, energy, natural resources, financial, communication, aviation, trading, and real estate sectors. Druk Green Power Corporation and the BPC are fully owned by Druk Holdings and Investments. The organization structure of the electricity sector in Bhutan is in Figure 3.

Figure 3: Institutional Arrangement of the Bhutan Energy Sector

BEA = Bhutan Electricity Authority, BHP = Basochhu Hydropower Plant, BHyE = Bunakha Hydro Electric, BPC = Bhutan Power Corporation, CHP = Chhukha Hydropower Plant, CHyE = Chamkharchhu-I Hydro Electric, CPSU = Central Public Sector Undertaking, DGPC = Druk Green Power Corporation, DHI = Druk Holdings and Investments, DHMS = Department of Hydro-Met Services, DHPC = Dagachhu Hydro Power Corporation Limited, DHPS = Department of Hydropower and Power Systems, DRE = Department of Renewable Energy, DOT = Department of Trade, JV = joint venture, KHP = Kurichhu Hydropower Plant, KHyE = Kholongchhu Hydro Electric, MHPA = Mangdechhu Hydroelectric Project Authority, THP = Tala Hydropower Plant, THyE = Tangsibji Hydro Energy Limited.

Source: Prepared by the author of this report based on the country report.

2.5.4 Institutional Framework of the Electricity Sector in India

Electricity is a concurrent subject at Entry 38 in List III of the Seventh Schedule of the Constitution of India. It means that both the central and state governments can legislate and pass laws on matters relating to electricity. Electricity generation and transmission at the national level primarily falls under the domain of the Ministry of Power. The Ministry of New and Renewable Energy and the Department of Atomic Energy (DAE) are the other organizations involved in promoting electricity generation at the national level. States manage electricity generation, transmission, and distribution at the state level. A brief description of the role of each one of these organizations is provided below.

Ministry of Power

The Ministry of Power started functioning independently from 2 July 1992. It is primarily responsible for the development of electrical energy in India. The ministry is responsible for the administration of the Electricity Act, 2003; the Energy Conservation Act, 2001; and to undertake such amendments to these acts, as may be necessary from time to time in conformity with the government's policy objective.² Its main role is to formulate electricity laws and regulations at the national level, get them approved by the Parliament; and formulate electricity policies and programs at the national level.

² Ministry of Power. About Ministry. <http://powermin.nic.in/About-Ministry>

Ministry of New and Renewable Energy

The Ministry of New and Renewable Energy is the nodal ministry of the Government of India for all matters relating to new and renewable energy development. The broad aim of the ministry is firstly, to develop and deploy new and renewable energy to supplement the country's energy requirements. Specifically, it aims at making new and renewable energy a significant source to further the national aim of energy security and independence. Secondly, to develop, demonstrate, and commercialize cost-effective technologies for harnessing new and renewable energy sources in close concert with corporate, scientific, and technical institutions. And thirdly, to replace the use of fossil fuels wherever possible, and increase access to electricity in remote areas, through renewable energy systems.

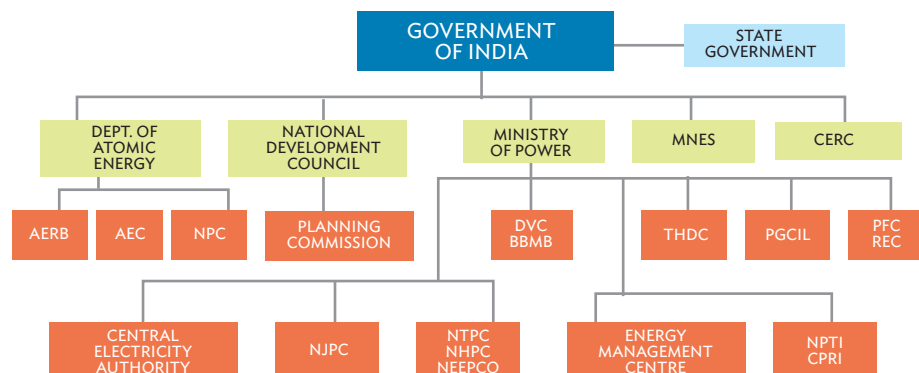
Department of Atomic Energy

The DAE was formed on 3 August 1954 under the direct charge of the Prime Minister through a presidential order. According to the resolution constituting the Atomic Energy Commission, the secretary to the Government of India in the DAE is ex officio chairman of the Atomic Energy Commission. The DAE engages in the development of nuclear power technology, applications of radiation technologies for use in other fields, and research.

Central Electricity Regulatory Commission

The Central Electricity Regulatory Commission (CERC) regulates the sector operations at the national level. As entrusted by the Electricity Act, 2003, the commission, among other things, has the responsibility to discharge the regulatory functions for central power utilities, interstate sale, transmission, and power transactions. A representation of the India power sector at the national level is shown in Figure 4.

Figure 4: Institutional Framework of India's Central Power Organization



AEC = Atomic Energy Commission, AERB = Atomic Energy Regulatory Board, BBMB = Bhakra Beas Management Board, CPRI = Central Power Research Institute, DVC = Damodar Valley Corporation, NEEPCO = North Eastern Electric Corporation, NHPC = National Hydroelectric Power Corporation of India, NJPC = Nathpa Jhakri Power Corporation, NPC = Nuclear Power Corporation, NPTI = National Power Training Institute, NTPC = National Thermal Power Corporation, PFC = Power Finance Corporation, PGCIL = Power Grid Corporation of India, REC = Rural Electrification Corporation, THDC = Tehri Hydro Development Corporation.

Source: Prepared by the author of this report.

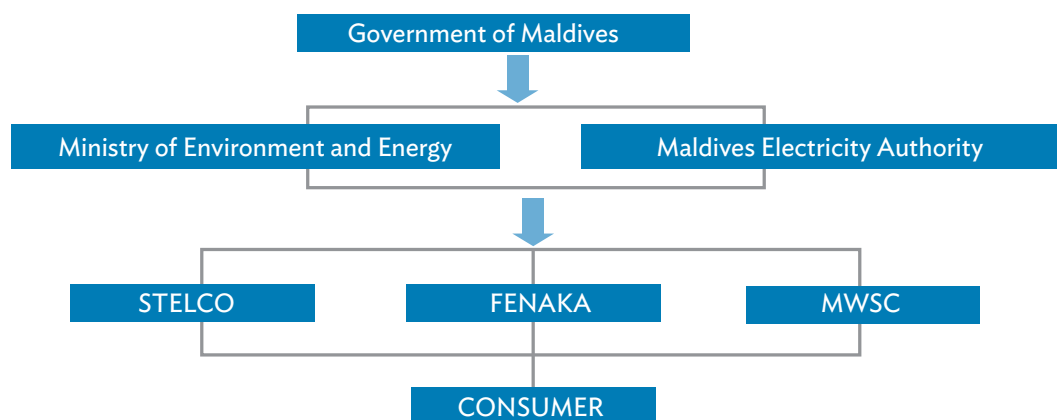
Electricity Sector at the State Level

State governments have powers to formulate and implement policies for the state in conformity with the national laws and plan projects at the state level. Prior to reforms, the electricity sector at state level was operated as a single, vertically integrated utility in each state, but some small states operated the sector as part of their power department. Reforms in the state power sector led to the unbundling of the former State Electricity Boards (SEBs) owned by state governments on operational lines, i.e., generation, transmission, and distribution. To avoid having multiple organizations within each state and as a result of the implementation of reforms, a general modality was adopted. This included creating a minimum number of generating companies, one state-owned transmission company, and some distribution companies. The Electricity Regulatory Commissions Act 1998 paved the way for the formation of the State Electricity Regulatory Commission (SERC) at the state level. As a result, the state governments' regulatory powers were transferred to the SERCs. Consequently, the tariff regulatory function of the Central Electricity Authority was transferred to the CERC. Functions of the SERCs are akin to those of the CERC, except that their jurisdiction is restricted to the respective state.

2.5.5 Institutional Framework of the Power Sector in Maldives

Over the past 6 decades since the introduction of electricity in 1949, government departments under different names, Department of Electricity and Maldives Electricity Board, managed the electricity sector in the country until 1997, when the State Electric Company (STELCO) was formed. STELCO is wholly owned by the government. Its core business includes power generation, distribution, and retail. It operates 28 power systems in 33 islands, providing electricity to 60% of the population. Each power system is independent with its own generation and distribution infrastructure. The STELCO's largest operation is in Malé, the capital of Maldives.

Figure 5: Institutional Framework of the Maldives Power Sector



Fenaka = Fenaka Corporation Limited, MWSC = Male Water and Sewerage Company, STELCO = State Electric Company.

Source: Maldives Energy Authority. *Legal and Regulatory Framework of the Energy Sector of Maldives*. <http://www.irena.org/EventDocs/Maldives/2LegalRegFrameworkMaldivesEnSectorEnAuth.pdf>

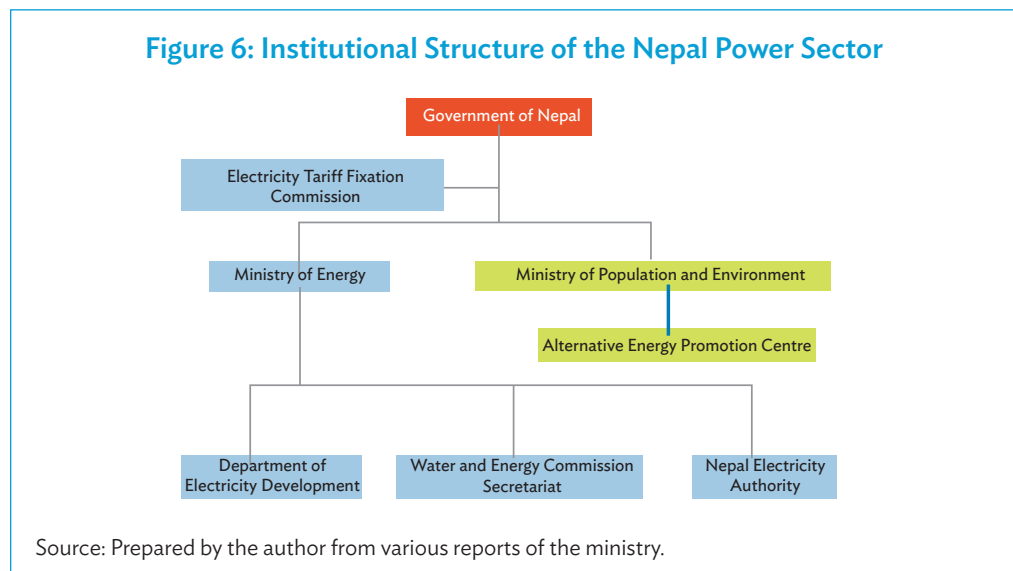
Regulation

The Maldives Energy Authority (MEA) is responsible for regulating generation, distribution, and utilization, including tariff setting of electricity in the country. The MEA established electricity standards by adopting the standards of Singapore. However, the MEA does not have sufficient resources to enforce the standards and regulations in the outer islands and, therefore, in many islands, the electricity installations do not meet safety standards.

2.5.6 Institutional Framework of the Power Sector in Nepal

The development of the power sector in Nepal started after the formation of the Department of Electricity Development in 1960. The Nepal Electricity Corporation was formed in 1962. Its function was limited to the operation and maintenance of power plants, and consumer services. Nepal's electricity market was under state monopoly until 1984 and was managed through the Electricity Department, Nepal Electricity Corporation, and by different special purpose development committees when constructing hydroelectric projects. As part of the restructuring process, the Nepal Electricity Authority (NEA) was established in 1985 under the Nepal Electricity Authority Act 1984. The NEA started functioning as a vertically integrated utility to manage generation, transmission, and distribution, including electrification of rural areas.³

Electricity sector operations in Nepal are governed by the Ministry of Energy through the Department of Electricity Development, the Water and Energy Commission, and the NEA. For the development of renewable energy sources, Nepal established the Alternative Energy Promotion Centre, which is part of the Ministry of Population and Environment. The Alternative Energy Promotion Centre functions independently under an 11-member board with representatives from the government, industry, and nongovernmental organizations. The representation of the Nepal power sector is shown in Figure 6.



³ www.nea.org.np

Regulation

The Electricity Tariff Fixation Commission was set up with a limited mandate to recommend retail tariffs to the government. The bill for the establishment of an independent electricity regulator is still awaiting the Parliament's approval.

2.5.7 Institutional Framework of the Power Sector in Pakistan

Electricity generation, transmission, and distribution in Pakistan are under the domain of the Ministry of Water and Power, except for generation from the atomic power plants, which is under the Atomic Energy Commission of Pakistan. The electricity infrastructure in Pakistan is made up of a complex and segmented system, which consists of a network of different bodies responsible for carrying out various functions. Their roles, responsibilities, and functions are provided below.

Pakistan Water and Power Development Authority

The Water and Power Development Authority (WAPDA) was established in 1959 under the Pakistan WAPDA Act, 1958, as an autonomous and statutory body under the Government of Pakistan, for coordinating and giving unified direction to the development of schemes in the water and power sectors. The WAPDA Act applies to the whole Pakistan, except in the district of Karachi. Its powers include preparation of detailed plans for the development and use of Pakistan's water and power resources. It is also responsible for the generation, transmission, and distribution of power in Pakistan. The WAPDA Act, pursuant to Section 12, grants the WAPDA licensee status under the Electricity Act, 1910. Pakistan, in its Cabinet Energy Committee meeting of July 1992, accepted a Strategic Plan for the Privatization of Power Sector. The plan had four main goals: (i) restructuring and corporatization of the WAPDA into distinct business units and subsidiary corporations; (ii) establishment of a power regulatory authority to assist and oversee the development of the independent power producers (IPPS), and to regulate prices and operations in a defined way; (iii) establishment of electricity pricing arrangements; and (iv) privatization of the WAPDA's power operations. As a result, the WAPDA's power wing was restructured into 12 autonomous entities under the Companies Ordinance, 1984, comprising three generation companies, one transmission company, and eight distribution companies. After restructuring, the WAPDA is now responsible for the production and development of electricity from hydropower sources.

National Transmission and Dispatch Company

The National Transmission and Dispatch Company (NTDC) was incorporated on 6 November 1998. It commenced commercial operation on 24 December 1998 by taking over all the properties, rights, assets, obligations, and liabilities of the 220 kilovolt (kV) and 500 kV grid stations and transmission lines or network owned by the WAPDA. The National Electric Power Regulatory Authority (NEPRA) granted the NTDC a transmission license on 31 December 2002 to engage exclusively in the transmission business for a term of 30 years, pursuant to Section 17 of the Regulation of Generation, Transmission, and Distribution of Electric Power Act, 1997.

Alternative Energy Development Board

The Alternative Energy Board was formed under the Alternative Energy Board Act, 2010 to assist and facilitate development and generation of alternative and renewable energy.

Karachi Electric Supply Corporation

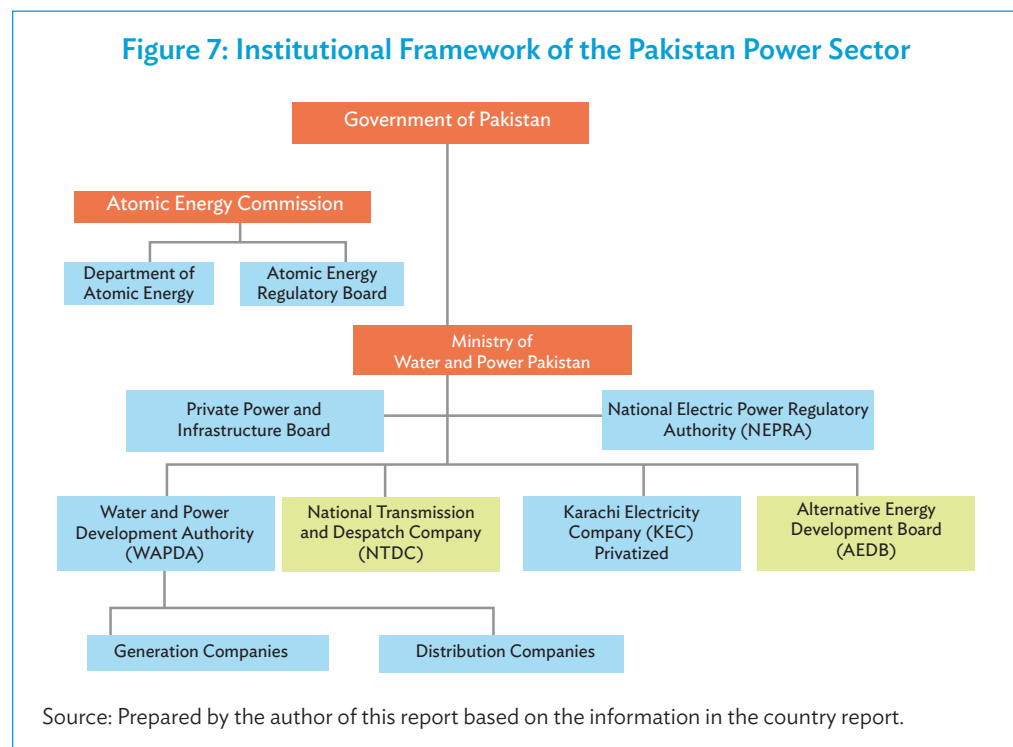
The district of Karachi was not covered by the WAPDA Act. Electricity is generated, transmitted, and distributed in Karachi, historically and at present, by the Karachi Electricity Supply Corporation, incorporated in 1913, nationalized by Pakistan in 1952, and privatized again in 2005.

Private Power and Infrastructure Board

The Private Power and Infrastructure Board was created in 1994 as part of the Strategic Plan for Power to promote private sector participation in the sector. Its role includes implementing policies; drafting, negotiating, and finalizing security packages; and coordinating with the provincial governments and departments of the government to promote and facilitate private sector investment in the sector.

National Electric Power Regulatory Authority

The NEPRA was established under the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997 (NEPRA Act) in 1997 to regulate the power sector. It is responsible for the regulation of generation, transmission, and distribution of electric power in Pakistan. The representation of the Pakistan power sector is shown in Figure 7.



2.5.8 Institutional Framework of the Power Sector in Sri Lanka

Ministry of Power and Renewable Energy

The Ministry of Power and Renewable Energy is responsible for the management of the power sector in Sri Lanka. It comprises several divisions to discharge its functions in the planning and supervision of subsector state institutions. It is mandated to formulate and implement policies, programs, and projects pertaining to power and energy; provide all public services that come under the ministry's purview; reform all systems and procedures to ensure efficient conduct of business; monitor, investigate, plan, and develop electricity facilities, including hydropower, thermal power, mini-hydropower, coal, and wind power; extend rural electrification; develop a sound, adequate, and uniform electricity policy for the control, regulation, and use of energy resources; promote energy efficiency; and develop indigenous renewable energy resources.

Ceylon Electricity Board

Established in 1969, the Ceylon Electricity Board (CEB) is empowered to generate, transmit, and distribute electricity in the country. The Electricity Act of 2009 caused CEB's businesses of (i) generation, (ii) transmission and bulk supply operations, and (iii) distribution and supply to be separately licensed.

Lanka Electricity Company Pvt. Ltd

The Lanka Electricity Company (LECO) was established in 1983 to distribute electricity in areas previously served by local authorities (municipal councils). LECO receives electricity from CEB at 11 kV and distributes in LECO franchise areas. It serves about 10% of customers in the country.

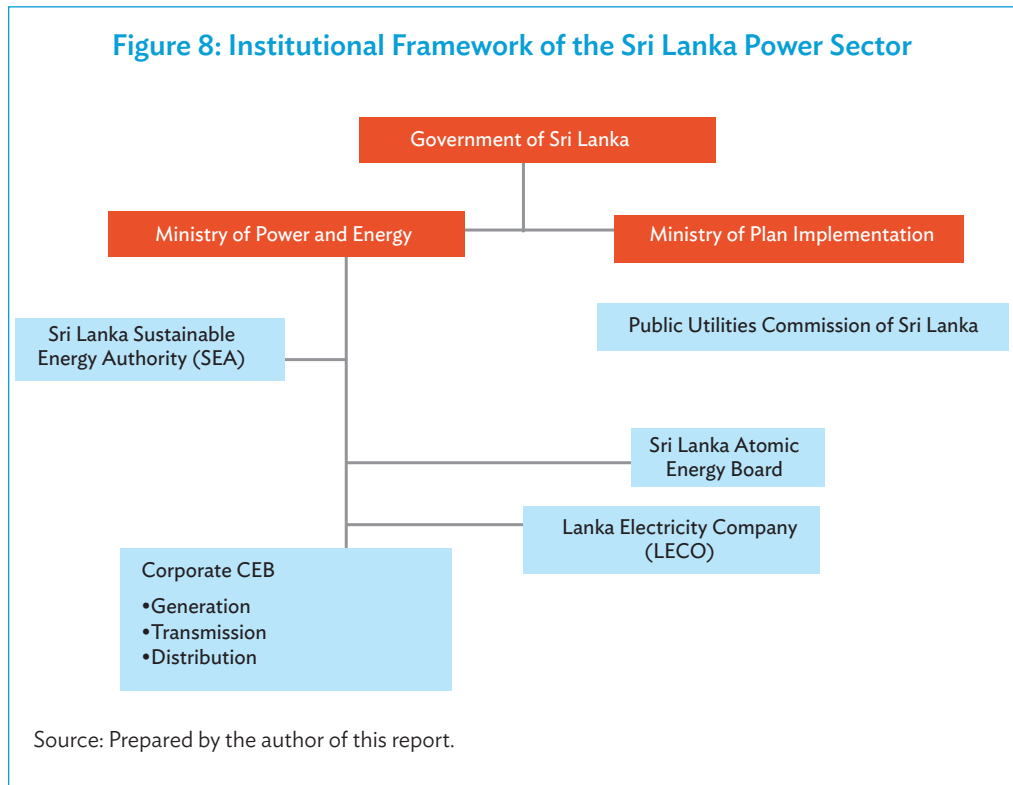
Sri Lanka Sustainable Energy Authority

The Sri Lanka Sustainable Energy Authority was established on 1 October 2007 under the Sri Lanka Sustainable Energy Authority Act No. 35 of 2007 to consolidate the gains realized through sustainable energy development, in both renewable energy and energy efficiency spheres. To strengthen the institutional framework for achieving the targets of the National Energy Policy and Strategy, the government enacted new legislation to convert the Energy Conservation Fund, a unit under the MOPE, into a statutory body called the Sri Lanka Sustainable Energy Authority. It is mandated to develop and implement the country's policy for renewable energy development, demand-side energy-efficiency improvement, and energy conservation.

Public Utilities Commission of Sri Lanka

Structured as a multisector regulator, the Public Utilities Commission of Sri Lanka (PUCSL) is mandated to act as the economic, technical, and safety regulator for the electricity industry, and petroleum and water sector in Sri Lanka under the purview of the PUCSL Act of 2002. The PUCSL was established in July 2003. In 2009, through

the passage of Electricity Act, the PUCSL was empowered to regulate the generation, transmission, distribution, supply, and use of electricity. It is answerable to the Parliament. A representation of the Sri Lanka power sector is shown in Figure 8.



3 South Asian Association for Regional Cooperation Framework Agreement for Energy Cooperation (Electricity)

3.1 Emphasis on Electricity Cooperation in the Framework Agreement

To capture the essence of the framework agreement, it is essential to understand why this agreement emphasizes cooperation in the electricity sector. As stated earlier and briefly summarized below, all member states are deficient in hydrocarbon fuels. In such a scenario, it is not possible to trade these fuels from indigenous resources. Electricity is the only indigenous form of energy presently traded across the borders in South Asia. This trade has the potential to expand.

3.1.1 Hydrocarbons

Petroleum

Bangladesh, India, Pakistan, and to a limited extent, Afghanistan have proven petroleum reserves and are extracting from these to partially meet their demand, as these reserves are far less than their projected demand in the future. All other countries in the region are totally dependent on petroleum imports.

Natural Gas

In South Asia, only Bangladesh, India, and Pakistan use natural gas in their energy basket. Having been a natural gas exporter, the gas infrastructure in Afghanistan was totally destroyed during the war. India and Pakistan, unable to meet their gas demand from indigenous sources, import natural gas. As such, there is little opportunity for sharing and/or trading indigenous gas, unless new reserves far in excess of domestic demand are found and developed.

Coal

Bangladesh has recently started generating electricity from indigenous coal. But the difficulties in its extraction due to the high population density limit the option of open cast mining. Exploitation of underground reserves faces problems due to the very high water table in the country. Pakistan, despite having large reserves of lignite, is still planning for the generation of electricity from coal. India is the only country in the region with substantial

installed electricity generation capacity based on coal. Despite having the fifth largest coal reserves in the world,⁴ India imports coal for power generation and other applications.

3.1.2 Hydropower

South Asia has a hydropower potential of 294,000 megawatts (MW),⁵ out of which only a small fraction has been exploited. This potential is nearly equal to the total installed electricity generation capacity of India and is many times the combined installed capacity of all the other countries in the region put together, from all sources. If exploited fully, it will create immense opportunities for regional energy trade in South Asia and provide energy security to the region.

3.1.3 Renewable Energy Sources

South Asia has very large renewable energy sources comprising hydropower, wind, solar, biomass, and geothermal. Electricity generated from these resources can be harnessed for domestic use and for regional power trade.

3.2 South Asian Association for Regional Cooperation Framework Agreement for Energy Cooperation (Electricity)

The text of the framework agreement is reproduced in Appendix 1. In essence, the agreement recognizes the

- (i) importance of electricity in the economic growth and improvement in the quality of life;
- (ii) benefits of cross-border electricity trade and how resources can be optimally utilized;
- (iii) importance of electricity trade and development of conventional and/or renewable energy sources; and
- (iv) demand management through energy efficiency, conservation, labeling, and standardization of appliances.

The framework agreement further recognizes that public and private power producers, power utilities, trading companies, transmission utilities, distribution companies, and other organizations having permission under the laws of relevant member states may facilitate energy trade. The framework also lists the objectives of enabling cross-border trade of electricity on a voluntary basis among member states based on bilateral, trilateral, and

⁴ <http://www.mining-technology.com/features/feature-the-worlds-biggest-coal-reserves-by-country/> (15 November 2016).

⁵ Data from the SAARC Regional Energy Trade Study (SRETS).

multilateral agreements. In view of opening the sector to public and private parties, the framework provides, as addition, for the following:

- (i) Joint development and protection of grid systems incidental to cross-border interconnection ensuring reliability and security of grids of participating member states;
- (ii) Grid operators to jointly develop coordinated procedures for secure and reliable operations of interconnected grids, including scheduling, dispatch, energy accounting, and settlement procedures;
- (iii) Members to enable nondiscriminatory access to transmission grids as per laws, rules, regulations, and applicable intergovernmental bilateral trade agreements;
- (iv) Members to enable authorized entities to engage in cross-border electricity trade subject to local or domestic laws;
- (v) Enabling knowledge sharing and joint research and exchanges between experts and professionals related to, among other things, power generation, transmission, distribution, energy efficiency, reduction of transmission and distribution losses, and development and grid integration of renewable energy resources;
- (vi) Development of structural, functional, and institutional mechanisms to resolve regulatory issues related to electricity exchange and trade;
- (vii) Development of a dispute-resolution mechanism;
- (viii) The ability or the right of member states to withdraw from the agreement subject to ongoing projects at the time of withdrawal; and
- (ix) Scope of review of the agreement after 5 years of signing.



4 Review of Electricity Laws, Regulations, and Policies

This chapter details the electricity laws, regulations, and policies of each member state that have been reviewed, along with their coverage. The findings of the review from the perspective of cross-border power trade are given at the end of this chapter.

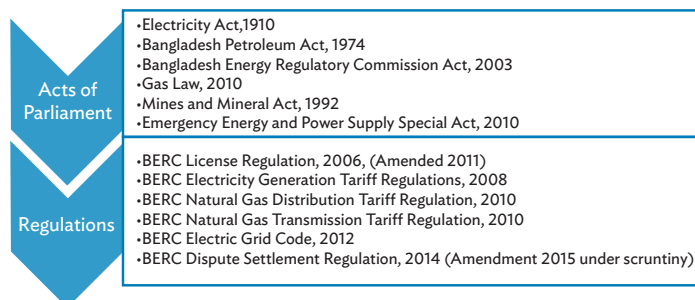
4.1 Legal, Regulatory, and Policy Framework of Afghanistan

There is no overarching law to govern the power sector in Afghanistan. The only documents relating to this and that have been reviewed are the Electricity Policy 2003–2010 and the Afghanistan National Development Strategy (Energy Sector Strategy) with focus on enhancing electricity supply in the country. There is no mention of power or electricity trade, despite the fact that Afghanistan imports electricity from its neighboring countries to meet a significant part of its electricity demand.

4.2 Legal, Regulatory, and Policy Framework of Bangladesh

Energy laws of Bangladesh govern energy generation, distribution, and supply for both primary and secondary energy. These laws, statutes, rules, and regulations apply to both types of energy. There are six statutory laws and six regulations. This chapter focuses on those laws, regulations, and policies that have a direct bearing on the implementation of the framework agreement.

Figure 9: Existing Energy Sector Laws and Regulations of Bangladesh



BERC = Bangladesh Energy Regulatory Commission.

Source: Prepared by the Author of the Report based on information from the country report.

Electricity Act, 1910

The Electricity Act, 1910—the governing law for the power sector—was enacted in a united India. It created the basic framework for the electric supply industry. It envisaged growth of the electricity industry through private licensees and created the legal framework for the laying down of wires and other works relating to the supply of electricity.

Bangladesh Energy Regulatory Commission under the BERC Act, 2003

The Bangladesh Energy Regulatory Commission (BERC) Act, 2003 was enacted to regulate the electricity and natural gas sectors. It took over all the tasks enumerated in the Electricity Act, 1910 and gave these responsibilities to the BERC.

Emergency Energy and Power Supply Special Act, 2010

Emergency Energy and Power Supply Special Act, 2010 was enacted to bypass the public procurement law for importing power and energy and for the planning and execution of power or energy-related projects. Instead of following the Public Procurement Act, 2006, this act created a new route for evaluating any proposal put forward by any government-owned organization for increasing production, transmission, distribution, and marketing of any type of energy and power supply. This 2010 act also limited the jurisdiction of the courts, so that any decision taken under the act cannot be challenged in the court of law.

Bangladesh Energy Regulatory Commission Dispute Settlement Regulation, 2014

The regulation applies to the settlement of disputes between the licensees or between licensees and the consumer. Recently, the High Court division of the Bangladesh Supreme Court decided that all such disputes shall be referred to the commission.

National Energy Policy 1996 (Revised 2004)

The National Energy Policy, first issued in 1996, provides guidelines for the overall energy sector. Though the policy deals with country-specific energy sector issues, it does mention the development of a regional energy market for the rational exchange of commercial energy to ensure energy security, and to provide and secure energy resources for all. The policy further provides and recognizes the possibility of regional cooperation in energy trade. It emphasizes examining of the possibility of a cross-border electricity trade among neighboring countries and establishing linkages of local utilities with those in other countries for the exchange of experience in power sector development, training of human resources, and the possibility of cooperation of utilities across the region to promote experience-sharing and capacity development.

Policy Guidelines for Enhancing of Private Participation in the Power Sector, 2008

Though aimed at promoting private investment in different segments of electricity business in the country, this policy allows open access in power transmission systems,

under the heading Wheeling of Power. The policy also envisages the seamless transmission of electricity produced by the private sector. It provides for the Power Grid Company of Bangladesh (PGCB) and all other distribution licensees to extend nondiscriminatory open access to their distribution infrastructure or system on payment of a fee the BERC determines. It states that commercial power plants shall establish their own dedicated transmission system to reach to the transmission grid of the PGCB and other distribution licensees. The policy states that independent system operator shall (i) ensure efficient power flow in coordination with the national load dispatch center, and (ii) deal with mismatch and imbalance in power trading under BERC regulations. In addition, the policy provides that unless an operator reaches a total wheeled power of 500 MW, the PGCB shall act as an independent system operator. Above 500 MW, a newly created agency will take over the functions of the independent system operator from the PGCB.

Power System Master Plan, 2010

The Power System Master Plan (PSMP) 2010 recognizes the cross-border power trade as a realistic option. The plan intends to add 3,000 MW of electricity to the national grid by importing electricity from countries in the region. The PSMP further recognizes the huge potential of importing hydropower from Bhutan, Myanmar, and Nepal.

4.3 Legal, Regulatory, and Policy Framework of Bhutan

4.3.1 Electricity Act of Bhutan, 2001

The Electricity Act enabled the restructuring of the power supply industry and the participation of the private sector by providing mechanisms for licensing and regulating the operations of power companies. The establishment of the BEA as an autonomous body ensures a transparent regulatory regime. The authority lays down the standards, codes, and specifications of the electricity supply industry. The act came into force in July 2005. The BEA is the custodian of the act. The main objectives of the act are to (i) promote a safe and reliable supply of electricity throughout the country, and (ii) enhance revenue generation through export of electricity. The act lays down the following:

- (i) Powers and functions of the minister to grant licensee permissions for compulsory acquisition of ownership or rights to land and water necessary for implementation and operation of licensed activities,
- (ii) Duty to obtain license,
- (iii) Procedure for the application of a license,
- (iv) Factors to be considered in an application,
- (v) Obligations of the transmission licensee for open access on its systems,
- (vi) Creation of the system operator and the operator's obligations,
- (vii) Defining the bulk supplier and the supplier's responsibilities,

- (viii) Principles governing private sector participation in the electricity sector, and
- (ix) Bidding procedures and selection of bidders.

The Bhutan Electricity Act states that when granting or rejecting applications, the BEA shall consider the needs for electricity, or revenues from the export of electricity, of the country, regions, or community. Based on the act, the holder of a transmission license shall provide access to all existing and potential users of the transmission grid on payment of fees and other charges for grid services as may be approved by the authority. The authority may designate a person to be a system operator, and license the person, among other things, to monitor the import and export of electricity. The authority shall designate a bulk supplier who will be responsible for the wholesale supply, including import and export, of electricity. The terms and operating conditions of the bulk supplier shall be specified in its sale license or prescribed by regulations.

4.4 Legal, Regulatory, and Policy Framework of India

The legal and regulatory framework for the power sector in India comprises various legislation. Electricity laws or policies, their objectives, and the impacts are provided below.

Law or Policy	Objective	Impact
The Electricity Act, 1910	Infrastructure framework for electricity supply.	Attracted private capital.
The Electricity Act, 1948	Mandated creation of state electricity boards.	Ownership in the hands of state electricity boards.
Independent Power Producer Policy, 1991	Private investment in power generation.	Independent power producers were able to enter power generation.
The Electricity (Amendment) Act, 1998	Power transmission made a separate activity.	Central transmission utility and state transmission utilities set up.
Mega Power Policy, 1995	Setting up of mega power plants.	Mega power plants awarded.
The Regulatory Commission Act, 1998	Provision for setting up of the Central Electricity Regulatory Commission and State Electricity Regulatory Commission.	Independent regulatory mechanism put in place.
National Electricity Policy	Competition and protection of the interests of consumers.	More players and investors and efficient consumer service.
Electricity Act, 2003	Provide reliable and quality power to consumers at reasonable rates.	Investment in capacity addition.
National Tariff Policy Tariff structuring		Attractive tariff for players.

Electricity Act, 2003

The Electricity Act, 2003 sought to create a liberal framework for developing the power industry, promote competition, protect interests of consumers and supply of electricity to all, rationalize electricity tariff, and ensure transparent policies and promotion of efficiency, among others. The act came out with the National Electricity Policy; the creation of SERCs with emphasis on rural electrification, open access in transmission and distribution; and other provisions. It mandated the regulatory commissions to regulate the tariff and issue of licenses. This act focused on laws relating to generation, transmission, distribution, trading, and uses of electricity. The act was amended on 28 May 2007 and was enacted with greater emphasis on assessment, fines, and the legal framework to check commercial losses due to theft and unauthorized use of electricity. The act marked a paradigm shift in the sector by mandating licensee-free generation, nondiscriminatory open access to transmission systems, and gradual implementation of open access in the distribution systems to pave the way for the creation of a power market in India. The act mandated the restructuring of the vertically integrated segments into unbundled and independent activities. It created a consolidated policy framework for generation, transmission, distribution, trading, and consumption of electricity with market-based mechanisms. Its five main features are as follows:

- (i) It encouraged more competition in the sector by unbundling SEBs into generation, transmission, and distribution utilities.
- (ii) Thermal generation and captive generation were delicensed.
- (iii) Nondiscriminatory open access in transmission was granted to all generators.
- (iv) Mandatory metering, stringent punishment of electricity theft, and multiyear tariffs were introduced to curb financial losses of SEBs. Furthermore, state governments were required to provide an advance subsidy to certain target groups through their budgets if the tariffs were to be set lower than the regulated tariff.
- (v) The act included a purchase obligation of renewable-based electricity. The amendment to this act in 2007 loosened some reformative features, including the elimination of the cross-subsidy that levies surcharges on industrial consumers to subsidize other groups, particularly agricultural consumers.

The act further entrusted the government with the role of a facilitator through the use of policy instruments. The central government was required, as mandated by the Electricity Act, 2003, to formulate policies, namely, the National Electricity Policy, National Tariff Policy, National Policy on stand-alone systems for rural areas and nonconventional energy systems, and National Policy on electrification and local distribution in rural areas. The act is also the statutory basis for the constitution of the Central Electricity Authority, CERC, and the SERCs, as well as for the establishment of an appellate tribunal.

National Electricity Policy, 2005

As per the mandate of the Electricity Act, 2003, the central government formulated the National Electricity Policy in 2005 with the following aims and objectives:

- (i) Access to electricity available for all households in the next 5 years.
- (ii) Availability of power demand to be fully met by 2012. Energy and peaking shortages to be overcome and spinning reserve to be available.

- (iii) Supply of reliable and quality power of specified standards is available in an efficient manner and at reasonable rates.
- (iv) Per capita availability of electricity to be increased to over 1,000 units by 2012.
- (v) Minimum lifeline consumption of 1 unit/household/day as a merit good by 2012.
- (vi) Financial turnaround and commercial viability of the electricity sector.
- (vii) Protection of consumers' interests.

Electricity Rules, 2005

The Electricity Rules, 2005 came into force on 8 June 2005. These rules deal with the requirements of captive generation plants, compliance by transmission utilities, establishment of a Consumer Redressal Forum and Ombudsman, Inter-State Trading License, jurisdiction of the courts, etc. The amendment to these rules were incorporated by a notification dated 26 October 2006 that amended Section 42 (5) stating that the distribution licensee shall establish a Forum for Redressal of Grievances of Consumers under subsection (5) of section 42, which shall consist of officers of the licensee. The appropriate commission shall nominate one independent member familiar with consumer affairs. It provides the manner of appointment and the qualification and experience of persons to be appointed as members of the forum and the procedure of dealing with grievances of consumers.

National Tariff Policy

The policy lays down guidelines for attracting adequate investments for the sector and to ensure reasonable charges for consumers. These guidelines emphasize competitive procurement of power. The central government formulated this policy in consultation with regulatory commissions. Regulatory bodies are guided by this policy in framing the tariff regulation.

Electricity (Amendment) Bill, 2014

Based on exhaustive consultations, certain amendments to the Electricity Act, 2003 were proposed broadly covering the following areas:⁶ (i) enhancing grid safety and security, (ii) separation of carriage and content in the distribution sector, (iii) promotion of renewable energy, (iv) tariff rationalization, and (v) miscellaneous areas. Such areas include improving the accountability and transparency in the working of Appropriate Commissions without affecting their functional autonomy; bringing clarity to appointments, functions and powers of the chief electrical inspector and electrical inspectors, and levying of fees for electrical inspections; exemption to the developer of special economic zones, railways, and metro rail for obtaining distribution license; and collection and realization of any dues along with the electricity dues.

⁶ Press Information Bureau, Ministry of Power, Government of India, *Electricity Amendment Bill, 2014 Introduced in Lok Sabha; Changes Aimed at Promoting Competition, Efficiency in Operations and Improvement in Quality of Supply of Electricity*. 19 December 2014. <http://pib.nic.in/newsite/PrintRelease.aspx?relid=113779>.

Energy Conservation Act, 2001

The Energy Conservation Act, 2001 was enacted with the goal of reducing energy intensity in India's economy. The Bureau of Energy Efficiency was established as the statutory body on 1 March 2002 at the central level to facilitate the implementation of the act. The act provides regulatory mandate for standards and labeling of equipment and appliances, energy, conservation, building codes for commercial buildings, and energy consumption norms for energy-intensive industries. It directs states to designate agencies for the implementation of the act and promotion of energy efficiency.

4.5 Legal, Regulatory, and Policy Framework of Maldives

The Maldives Energy Authority (MEA) is an independent regulatory organization affiliated with the Ministry of Environment and Energy. It operates under the guidance of a governing board with mandate to regulate the energy sector through the implementation of the relevant regulations. MEA is the delegated authority under the Public Utilities Law 4/96 and by presidential decree.

Its mandates are follows:

- (i) Providing advice to relevant government organizations regarding energy, and assisting in decision making in this sector.
- (ii) Setting the standards and operating the regulations for the administration and monitoring of this sector according to government policy on energy.
- (iii) Developing the regulatory code and standards on the production and use of energy in the Maldivian context, and developing and administering the regulations for the provision of energy in Maldives.
- (iv) Setting the standards for the sources of energy that are imported into or sold in Maldives.
- (v) Issuing permits to parties that wish to provide electricity services, setting up the system of fees for the services provided by such parties, issuing permits to parties that wish to produce electricity for their own use, and monitoring such parties to ensure adherence to relevant regulations.
- (vi) Issuing permits to electric technicians and setting the standards for consultants.
- (vii) Investigating issues between parties arising from noncompliance to the terms of agreements between providers and users of electricity.
- (viii) Monitoring the statistics on the production and usage of energy in the Maldives, ascertaining the energy requirements of the country, gathering data, researching, and disseminating information on this issue.

4.6 Legal, Regulatory, and Policy Framework of Nepal

Overview of Energy Laws of Nepal

The following laws, regulations, and policies govern power sector operations in Nepal:

- (i) Electricity Act, 1992 and Electricity Regulation, 1993
- (ii) Water Resources Act, 1992 and Water Resources Regulation, 1993
- (iii) Hydropower Development Policy, 2001
- (iv) Foreign Investment Policy, 2014
- (v) Guideline for Electricity Project License, 2015

The Electricity Act requires licenses for survey, generation, transmission, and sale of electricity with installed capacity of more than 1 MW. The maximum term prescribed for the survey license is 5 years; and for the transmission, distribution, and generation license is 50 years. However, the Hydropower Development Policy 2001 provides 30 years as the maximum period for a generation license for domestic supplies, and 35 years for export-oriented projects. Despite the legal provision, the limitation under Hydropower Development Policy 2001 is being implemented. The act also has provisions related to import and export of electricity—with prior approval of the government, the licensee may distribute electricity by importing the same into Nepal. Similarly, by entering into an agreement with the government, the licensee may export generated power to a foreign country.

A bill is being proposed for a new Electricity Act with main features, including: (i) formation of an Electricity Regulatory Commission and Electricity Tribunal; (ii) revision of the licensing procedure; (iii) preparation of guidelines for hydropower development strategy, including identification of projects, priorities, export possibility, and others issues; (iv) formulation of an integrated water resource management policy; and (v) licensing through a competitive bidding process and by formulating screening criteria for developers. The bill envisages that the Government of Nepal will carry out survey activities to identify potential hydropower projects.

4.7 Legal, Regulatory, and Policy Framework of Pakistan

Electricity Act, 1910

The Electricity Act, 1910 continues to govern electrical energy in Pakistan. Several amendments were made to it since 1910 to address gaps in the regulatory framework and developments in the supply and use of electricity. The act lays down the legal and regulatory framework for the supply and use of electrical energy in Pakistan. It prescribes a compulsory licensing system for the supply of energy, and sets forth provisions governing

the supply, transmission, and use of energy by nonlicensees. The act also contains general protective and penalty clauses, which set forth safety standards and requirements in the generation, transmission, and supply of electricity. It gives consumers the right to register complaints against the utility before an electric inspector, as defined in the act and its rules, for matters relating to excessive billing and/or suspension of electricity.

Electricity Rules, 1937

These rules primarily carry out the objectives and purposes of the Electricity Act, 1910. These prescribe the appointment, qualification, and powers of inspectors; the form of application and supporting documents for granting a license under the act; conditions attached to the license and incumbent upon the licensee; the requirement of preparing and submitting accounts; and measures to be adopted for the public's safety in relation to the generation, transmission, and distribution of electricity; and when energy is used in mines and oil fields.

Punjab Electricity Act, 1939

The Punjab Electricity Act, 1939 was passed by the Government of Punjab to amend the application of section 7 of the Electricity Act, 1910 in the province of Punjab. It also grants the provincial government powers of a licensee, as defined in the Electricity Act, 1910 on the provincial government supplying electrical energy in the province. Section 7 of Electricity Act, 1910 permits a provincial government to purchase an undertaking (not being a local authority) that was granted a license under the said act to supply electrical energy in the particular province after the expiration of the license term specified in it. Section 7 of the act specifies that if a province elects to purchase a licensed undertaking, the licensee must sell its undertaking to the province.

Punjab Electricity (Emergency) Powers Act, 1941

The Punjab Electricity (Emergency) Powers Act, 1941 applies only to the province of Punjab. The primary objective of enacting the said legislation was to provide a legal framework, allowing the Government of Punjab to assume control and possession of a public electricity service, if the following events occur: (i) any systematic failures in the continuous supply of electricity to the public; (ii) in the event there was doubt as to whether the government or any other person is the owner of the public electricity service; or (iii) during any period of transfer of public electricity service to the government and it became expedient for the government to assume possession and control of such service. However, an order issued pursuant to the act may only remain in force for a maximum of 2 years. The act also lays down (i) the process for the transfer of public electricity service to the government, (ii) the government's powers when in control and in possession of a public electricity service, and (iii) the treatment and compensation of employees engaged in the service of the public electricity service.

Punjab Electricity (Emergency Powers) (Control of Supply) Act, 1949

The Punjab Electricity (Emergency Powers) (Control of Supply) Act, 1949 applies only to the province of Punjab. The act empowers the government to prohibit and/or restrict the supply and consumption of electrical energy by a licensee within the province if certain acts

and/or omissions, occurred, which, among other things, include exceeding the maximum supply of electrical energy at any time, or exceeding the maximum consumption of energy, and/or connecting or had connected load beyond as notified in writing to the supplier. The act provides the manner in which the government may exercise its powers granted under the said act; and prescribes penalties for the violation of any provision of the act on any person and/or corporation; or the contravention of an order the provincial government issued under the said act.

West Pakistan Electricity Duty Rules, 1964

The West Pakistan Electricity Duty Rules 1964 was promulgated through the West Pakistan Finance Act, 1964 and applies to the whole Pakistan. It establishes the legal and regulatory framework for (i) the procedure of reading meters by electric inspectors appointed under the Electricity Act, 1910; (ii) the calculation and manner of collection of duty payable by consumers for the usage of electricity; and (iii) the manner in which a licensee should maintain books of accounts in relation to the supply of electricity to consumers. The rules also specify the powers granted to electric inspectors for the purpose of inspection, and the manner in which such powers are exercised; the settlement of disputes relating to the amount of electricity duty payable; and penalties for contravening any provisions of the rules.

Electricity Control Ordinance, 1965

The Electricity Control Ordinance, 1965 was promulgated by the National Assembly in exercise of the powers conferred by Article 29 of the Constitution of the Islamic Republic of Pakistan. The ordinance applies to all of Pakistan and empowers the federal government to control the production, distribution, use, and consumption of electrical energy throughout Pakistan during an emergency. The ordinance defines an emergency as an event or time when it becomes necessary to maintain supplies and services essential for the life of the community. Under the ordinance, the federal government may declare an emergency by issuing an order in writing to regulate or prohibit the production, distribution, use, or consumption of electricity in all of Pakistan.

Electricity Control (West Pakistan) Order, 1966

The Electricity Control (West Pakistan) Order, 1966 was issued by the federal government as a result of shortage in the supply of electrical energy in Pakistan. It was put in force in the provinces of Baluchistan, Punjab, and Sindh. The order placed restrictions on the consumption of electrical energy in the said provinces, which, among other things, prohibited certain commercial establishments and restaurants from displaying trade signs, lights for decoration, advertisements, or other electrical displays between certain hours in the evening and night.

Sindh Electricity Control Act, 1952

The Sindh Electricity Control Act, 1952 is no longer in force, and was superseded by the Karachi Electricity Control Act, 1952. It applies to the Karachi Division and empowers the provincial government of Sindh to control the production, distribution, use, and consumption of electrical energy throughout Karachi during a time of emergency. The act

defines an emergency as an event or time when it becomes necessary to maintain supplies and services essential for the life of the community in Karachi. Under the act, the provincial government may declare an emergency by issuing an order in writing to regulate or prohibit the production, distribution, use, or consumption of electricity; regulate the rates that may be charged by agencies supplying electrical energy; levy a surcharge for the supply of electrical energy; and collect information or statistics in relation to the same.

Power Generation Policy, 2015

The Council of Common Interests, in consultation with provincial representatives during a meeting of the Interprovincial Coordination Committee held on 31 March 2015, approved the Power Generation Policy, 2015. The objectives of this policy, are (i) providing sufficient power generation capacity at the least cost, (ii) encouraging and ensuring the exploitation of indigenous resources, (iii) ensuring safeguards and security for all stakeholders, and (iii) safeguarding the environment. The scope of this policy extends to (i) private sector power projects; (ii) public sector power projects, where required by the project sponsor; (iii) public–private partnership power projects; and (iv) power projects developed by the public sector and subsequently divested.

The benefits and incentives offered by this policy are available to (i) hydropower projects, (ii) thermal power projects, and (iii) power projects implemented by public–private partnerships. However, this policy sets out the eligibility requirements applicable to each class of projects. This policy does not extend to the renewable energy projects implemented under the Renewable Energy Policy. The Power Generation Policy provides several benefits and incentives that include guarantee by the Government of Pakistan of the payment obligations of power purchaser, in cases where it is a federal entity. This policy also provides that the government shall guarantee payment obligations of some provincial governments under government implementation agreements. Protection against changes in the tax and duty regimes are also provided in this policy.

Transmission Policy

This policy provides fiscal and nonfiscal incentives to prospective investors in transmission line projects offered to the private sector. Such projects are in the form of reasonably-sized financeable packages comprising one or more transmission line sections along with an associated grid or converter station implemented on a build–own–operate–transfer basis. The term of these projects is 25 years, after which they will be transferred to the NTDC.

4.8 Legal, Regulatory, and Policy Framework of Sri Lanka

Two different ministries separately govern the power and petroleum sectors. The biomass sector operates independently and informally, with little interaction with the energy sector governing structure. In addition to the involvement of the government, private organizations and the general public are also stakeholders of the energy sector.

National Energy Policy and Strategies, 2006⁷

The National Energy Policy and Strategies, 2006 identified the development of renewable energy sources and demand-side energy efficiency improvements as major strategic pillars. Sri Lanka's revised National Energy Policy and Strategies consists of (i) energy policy elements; (ii) implementing strategies; and (iii) specific targets, milestones, and institutional responsibilities. The major guiding policy elements are the following:⁸ (i) providing basic energy needs, (ii) ensuring energy security, (iii) promoting energy efficiency and conservation, (iv) promoting indigenous resources, (v) adopting an appropriate pricing policy, (vi) enhancing energy sector management capacity, (vii) consumer protection and ensuring a legal playing field, (viii) enhancing the quality of energy services, and (viii) protecting energy facilities from adverse environmental impacts.

Atomic Energy Authority Act, 1969

The Atomic Energy Authority, established by the Sri Lanka Atomic Energy Authority Act of 1969, has been repealed and two institutions, namely, the Sri Lanka Atomic Energy Board and the Sri Lanka Atomic Energy Regulatory Council, were established by the Sri Lanka Atomic Energy Act of 2014.

Sri Lanka Atomic Energy Act, 2014

The new act aims to establish the Sri Lanka Atomic Energy Board; for the promotion and encouragement of the use of nuclear science and technology for national development purposes; for establishment of the Sri Lanka Atomic Energy Regulatory Council; for the regulation of practices involving ionizing radiation, and the safety and security of sources; and for the prohibition of nuclear weapons and ensuring safeguards against these.

Sri Lanka Sustainable Energy Authority Act, 2007

The act provides for the establishment of the Sri Lanka Sustainable Energy Authority; to develop renewable energy resources; to declare energy development areas; to implement energy efficiency measures and conservation programs; to promote energy security, reliability, and cost-effectiveness in energy delivery and information management; to repeal the Energy Conservation Fund Act, No. 2 of 1985; and to provide for matters connected therewith or incidental thereto. The act aims to develop and promote indigenous renewable energy sources as an alternative to fossil fuel-generated power, to enhance energy security, and to promote energy efficiency.

Electricity Act, 2009

The act provides for regulation of the generation, transmission, distribution, supply, and use of electricity in Sri Lanka; to repeal the Electricity Reform Act, No. 28 of 2002 and the Electricity Act (Chapter 205); and for matters connected therewith or incidental thereto. The administration of the provisions of this act is vested in the Public Utilities Commission

⁷ Mahinda Chintana. Vision for New Sri Lanka, *A Ten-Year Horizon Development Framework, 2006–2016*. <https://www.thegef.org/gef/sites/thegef.org/files/documents/MahindaChintanaTenYearDevelopmentPlan.pdf>

⁸ Footnote 7.

of Sri Lanka (PUCSL) established under the Public Utilities Commission of Sri Lanka Act, 2002. It defines the functions of the commission, which include the following: (i) to act as the economic, technical, and safety regulator for the electricity industry in Sri Lanka; (ii) to advise the government on all matters concerning the generation, transmission, distribution, supply, and use of electricity in Sri Lanka; (iii) to exercise licensing, regulatory, and inspection functions; (iv) to regulate tariffs and other charges levied by licensees and other electricity undertakings; and (v) to promote the efficient use and conservation of electricity. It prohibits the generation, transmission, distribution, and supply of electricity without a license; and provides requirements and procedures for obtaining a license. It specifies general conditions of licenses, powers and duties of licensees, and the power of the commission to modify or enforce licenses. The act further provides for consumer protection measures, new generation plants and extension of existing plants, license fees, offences and penalties, etc.

Sri Lanka Electricity (Amendment) Act, 2013

The amendments to the Sri Lanka Electricity Act, No. 20 of 2009 came into force on 8 April 2013. This amendments include the following:

- (i) legal and administrative proceedings regarding duty or function, which are delegated under subsection (1);
- (ii) insertion of a new section 2A in the principal enactment on delegation of powers, duties, and functions of the commission;
- (iii) section 8 specifies minor amendments;
- (iv) amendment of section 9: the new 9A and 10 establish new requirements to perform sections 27 and 39 that specify licensing; and
- (v) the replacement of “Provision of section 43 deals with new generation plant or the extension of any existing plant, etc.”

4.9 Findings of the Review by Country

Afghanistan

The electricity laws and policies of Afghanistan are still the ones prevailing prior to the war. As such, there is urgent need to revise these to meet present requirements for sector development. While formulating its new energy laws and regulations, Afghanistan needs to take cognizance of the requirements for promoting cross-border electricity and/or energy trade and also to act as an important transit country for energy flows from Central Asia into South Asia. In addition to meeting its own energy requirements, Afghanistan will be the biggest beneficiary of energy flows through its territory, as a transit country.

Bangladesh

Reviewing the electricity laws, regulations, and policies of Bangladesh, the National Energy Policy issued in 1996 and revised in 2004 provides guidelines for the overall energy sector. Though it deals with country-specific energy sector issues, it discusses the development of

a regional energy market for the rational exchange of commercial energy to ensure energy security, and to provide and secure energy resources for all. The policy further provides and recognizes the possibility of regional cooperation in energy trade. It emphasizes the examination of the possibility of cross-border electricity trade among neighboring countries and establishing linkages of local utilities with those in other countries for an exchange of experience in power sector development, training of human resources, and the possibility of utilities cooperating across the region to promote experience-sharing and capacity development.

The Policy Guidelines for the Enhancement of Private Participation in the Power Sector, 2008 allows open access on power transmission systems, under the heading Wheeling of Power. It provides the PGCB and other distribution licensees the power to extend nondiscriminatory open access to their distribution system on payment of a fee as determined by the BEREC. It also has provisions for the creation of an independent system operator to (i) ensure and deal with efficient power flow in coordination with national load dispatch center, and (ii) deal with mismatch and imbalance in power trading under BEREC regulations. The PSMP 2010 recognizes cross-border power trade as a realistic option. The plan envisages the addition of 3,000 MW to the national grid by importing electricity from countries in the region. The PSMP further recognizes the huge potential of importing hydropower from Bhutan, Myanmar, and Nepal.

Bhutan

Bhutan intends to develop its hydropower resources as a revenue earner for the economy and made necessary provisions in the Bhutan Electricity Act, 2002, under which the BEA was created. The laws and regulations have clear provisions to promote cross-border electricity trade. The act states that when granting or rejecting an application for license, the authority shall take into consideration the needs for electricity or revenues from the export of electricity. As per the act, the holder of a transmission license shall provide access to all existing and potential users of the transmission grid on payment of fees and other charges for grid services as may be approved by the BEA. It also states that the authority may designate a person to be a system operator, and license the person, among other things, to monitor the import and export of electricity. It states that the authority shall designate a bulk supplier who will be responsible for the wholesale supply, including import and export, of electricity. The terms and operating conditions of the bulk supplier shall be specified in its sale license or prescribed by regulations.

India

The Electricity Act, 2003 is the overarching legislation governing India's electricity sector. The act, and regulations and policies made under it, have all the necessary provisions for the creation of a healthy electricity market. Although India is exchanging and/or trading electricity with three countries in the region, the act is silent about cross-border electricity trade. A redeeming feature of the act is that India's electricity market has been smoothly functioning under its provisions. If the SAARC member states (SMSs) so choose, the requisite provisions can be adopted with suitable modification, wherever necessary, for the creation of the regional electricity market. India may need to extend the provisions of the act to cover its cross-border electricity trade as well. However, small modifications may be

required to fully harmonize the provisions of the act with those of other countries in the region for the implementation of the framework agreement.

Maldives

Maldives has a tiny isolated power system with little possibility of getting connected to any other system at present. Its laws and regulations are naturally silent about cross-border electricity trade. Technological developments in the future may make an electricity connection with the mainland technically and economically viable.

Nepal

Nepal recognizes the importance of developing its hydropower resources to meet the domestic electricity demand and to export the surplus energy to the neighboring countries. Electricity Act, 1992; Electricity Regulation, 1993; and Hydropower Development Policy, 2001 have the requisite provisions essential for promoting cross-border electricity trade. However, the provisions in the Electricity Regulation, 1993 for the levying of tax on the electricity exports will not be in the interest of promoting cross-border electricity trade.

Pakistan

Like India, the laws and regulations of Pakistan have been formulated primarily for the governance of the sector operations within the country and do not make any mention about electricity imports, although it is importing electricity from Iran. However, these laws contain certain essential features that would be required to encourage cross-border electricity trade, including the open access to transmission systems on payment of requisite fee to be determined by the NEPRA.



Sri Lanka

Sri Lanka's electricity laws and regulations are silent about cross-border electricity trade. Moreover, some of the provisions virtually eliminate the possibility of participation by the private sector in the business of electricity generation and transmission in Sri Lanka. These provisions also require the licensee to sell electricity generated exclusively and only to a transmission licensee. As a result, a generator can only sell electricity to the transmission company. This would restrict the sale of electricity by the IPPs to third parties or distribution companies directly. Such provisions are major hindrances not only for attracting major investments in the electricity sector in Sri Lanka, but also pose a challenge for the cross-border electricity trade among SMSs.

4.10 Summary of Findings of the Review

Afghanistan is in the process of formulating its electricity laws and regulations. Thus, there is an opportunity to align the country's laws and policies with the requirements for the implementation of the framework agreement. Since Bangladesh started electricity imports in the recent past from India, it has made certain provisions in its energy policy and plans to meet a part of its electricity demand through imports from neighboring countries. Bhutan and Nepal have made elaborate provisions in their electricity laws and regulations to promote regional power trade. The electricity laws and regulations of India and Pakistan are quite exhaustive to govern sector operations within these countries. However, the scope of the laws has to be widened to cover cross-border trade as well. Sri Lanka needs to remove the bottlenecks in the electricity laws and regulations in line with the needs of creating an electricity market and to participate in cross-border electricity trade. Maldives may soon take necessary action on items of the framework agreement relevant to its participation in the said agreement.

The region's redeeming feature is that the present electricity sector structure and its institutional framework are in line with the requirements for putting cross-border electricity trade on sound legal and regulatory footing. Moreover, widening the scope of the existing laws and regulations to cover the regional power trade with suitable modifications, or enhancing the powers of existing institutions will be relatively easy.

Since all these countries are signatories to the framework agreement, they have to reach a consensus on harmonizing their electricity laws, regulations, and policies to support its implementation.

5 Requirements for Cross-Border Electricity Trade

5.1 Requirements for Regional Power Trade

SAARC member states (SMSs) need to put in place laws and regulations to govern their electricity sector. These include the technical and operational norms and safety standards, commercial arrangements, and others. for governing electricity sector operations within each country. While the prevailing laws and regulations help in the smooth management of the countries' sector operations, there is need to harmonize the laws and regulations among the neighboring countries to facilitate cross-border electricity trade and transit. Harmonization is needed because each country has its own technical specifications, operational norms, and safety standards and some do not match those set by other countries. The operational and safety standards of the interconnected power grids have to match fully or technical solutions have to be put in place to overcome mismatches; thereby requiring additional investments that may lead to higher tariffs.

Previous studies noted the importance and potential of regional power trading to spur the region's socioeconomic development, especially since the region faces challenges such as poor access to energy, energy shortages, and energy security concerns.⁹ One recent study points out that South Asia has significant potential in developing a regional power market—which can harness economies to invest in and operate a power system that will provide access to electricity to a large percentage of the population.¹⁰ A 2008 World Bank study notes that regional energy trade provides a win-win situation to all the participants and is a logical and rational public policy choice, and some of the reasons include the following:¹¹

- (i) Addressing the mismatch between energy demand growth and energy endowments of the different countries;
- (ii) Energy security concerns;
- (iii) Substantial benefits to smaller exporting countries, such as Bhutan and Nepal;
- (iv) Environmental and climate change imperatives such, as less reliance on coal;
- (v) Reduction of supply costs; and
- (vi) Cash flow implications wherein large domestic capital investments are not immediately needed.

⁹ ADB. 2016. Executive Summary. *Improving Regulatory Environment for a Regional Power Market in South Asia*. Manila

¹⁰ Footnote 9, p.21.

¹¹ World Bank, 2008. *Potential and Prospects for Regional Energy Trade in the South Asia Region*. pp. xvii–xviii.

The SAARC Regional Energy Trade Study, done in 2010, noted that regional power trade can include benefits such as technical, operational, environmental, financial, economic, and social.¹² Some of the main benefits include the following:¹³

- (i) System operational benefits:
 - Optimal use of natural resources to meet growing energy demand,
 - Concentration of various types of energy resources in different countries,
 - Economies of scale,
 - Improved energy security and reliability,
 - Optimized transmission network,
 - Increased economic efficiency in system operation,
 - Reduced adverse environmental impact, and
 - Reduced spinning reserves in the case of electricity generation.
- (ii) Economic and financial benefits:
 - Enhanced industrial productivity,
 - Increased revenues from trade and industrial activities,
 - Faster gross domestic product growth rate, and
 - Increased foreign exchange earnings for exporting countries.

Undoubtedly, regional power trade has many advantages and benefits for the SAARC member countries. In a region with millions of poor people without access to electricity, meeting energy demands through trade should be a priority. However, the SAARC countries must overcome various challenges and hurdles for regional trading to take place and go beyond the bilateral or trilateral arrangements now in place.

The important requirements that the SMSs have to consider and incorporate in any regional mechanism to promote and facilitate cross-border electricity trade and transit are summarized below.

5.2 Legal

Though not in the order of their importance, the major aspects that merit attention to facilitate electricity trade among the SMSs are the following:

Table 6: Legal Requirements for Cross-Border Electricity Trade

Requirement	Objective
Recognize cross-border electricity trade in laws and regulations	Give legal sanction to matters relating to cross-border electricity trade
Open access to transmission and distribution networks	Ensure free flow of energy on the existing and proposed systems for payment of due fee

continued on next page

¹² SAARC Secretariat. 2010. *Regional Energy Trade Study*. Kathmandu: SAARC Secretariat. p.xxi.

¹³ See footnote 12.

Table 6 continued

Requirement	Objective
Grant of right-of-way for laying new transmission lines	Enable creation of additional transmission capacity for cross-border electricity trade and transit
Freedom of transit	Allow countries not sharing common borders to trade electricity through a third country or between the different regions of a country
Cross-border energy flows to receive same treatment as provided by the host country to its own energy flows	Help create South Asia electricity market, as energy flows will be treated fairly irrespective of origin, destination, and ownership
Nondisruption of energy supplies	Will ensure security of supply, one of the highest concerns of the consumer
Allow creation of regional and/or subregional power generation facilities	Provide additional energy supply for the regional power market

Source: Prepared by the author of this report.

5.3 Regulatory

Regulatory mechanisms need to be put in place at the regional level to handle cross-border electricity trade issues, including the following:

Table 7: Regulatory Requirements for Cross-Border Electricity Trade

Requirement	Objective
Licensing for cross-border electricity trade	Ensure that only credible traders with sound financial standing participate
Establishment of independent system operators	Transparent handling of the energy flows to give confidence to the system participant
Fair trade practices	Minimize the landed costs of cross-border electricity supply
Regulations to be environmentally sensitive	Address environmental concerns
Fair returns on investments	Ensure sufficient investments flow for the creation of cross-border electricity infrastructure and have a solvent regional electricity market
Encourage new technologies	Reduce costs and transmission losses
System pricing to be cost-reflective	Reduce or eliminate cross-subsidization and create healthy competition
Separation of ownership of cross-border transmission infrastructure from energy flows	Provide a level playing field for all participants
Benefits provided by generator to the system (voltage and frequency support, grid reliability and stability, reduction in transmission and distribution losses, and reduced requirements for spinning reserve)	System pricing to account for these benefits and to compensate benefit providers. Generators not to be charged excessively for system impacts
Electricity systems to be reflective of market-based instruments (emission trading, output-based standards that fully reflect energy conversion efficiencies, and internalization of environmental costs of energy conversion)	Ensure that customer tariffs reflect the overall system costs and benefits.

Source: Prepared by the author of this report.

5.4 Technical

To ensure that electricity trade among the SMSs becomes a reality in a cost-effective manner, among other things, the following technical issues merit consideration:

Table 8: Technical Requirements for Cross-Border Electricity Trade

Technical Requirement	Objective
Harmonization of grid codes, operational parameters, connectivity standards for grid participants, maintenance schedules and procedures, and maintenance of voltage and frequency standards	Ensure seamless energy flow across the region; avoid system failures, burnouts, and other adverse system impacts
Energy flows through the transmission systems to be based on detailed load flow studies, optimal power flow modeling, short-circuit modeling, dynamic stability modeling, and transient modeling	Ensure system safety and avoid disruption of supply due to technical reasons
Protection systems	Protection systems to be put in place for load segregation, in the event of any major faults occurring in one of the interconnected systems
Communication and monitoring systems	Timely availability of information and to address any eventualities
Deployment of appropriate technology to reduce investment requirements	Lower tariffs for end-use consumers
Adopt common metering standards for energy flows	Help avoid raising of disputes

Source: Prepared by the author of this report.

5.5 Commercial

In addition to the pricing, the SMSs have to reach a consensus on the following commercial issues:

Table 9: Commercial Requirements for Cross-Border Electricity Trade

Commercial Requirement	Objective
Reach an understanding on currency for settlement of accounts	Bring clarity to settling of accounts
Payment security and settlement mechanisms	Ensure that the payments against power purchases are settled in time
Security of investments made in building cross-border transmission interconnections	Support to lenders and to help attract large investments required for the creation of the cross-border electricity infrastructure
Frequency and the intervals at which meter readings are recorded and bills raised	Timely raising of bills and their settlement
Mechanism to settle deviations from the scheduled supply	Ensure system stability/reliability and act as a deterrent for over-drawls
Standardization of commercial documents to reduce the project cycle and transaction costs	Savings in time and reduced transaction costs
Dispute resolution mechanism	Provide investor confidence, and timely settlement of disputes that may arise



6 Harmonizing Electricity Laws and Regulations of South Asian Association for Regional Cooperation Member States

Laws and Regulations to be Harmonized

A detailed review of the electricity laws, regulations, and policies of the eight SAARC member states (SMSs) was conducted to identify the specific provisions that deal with cross-border electricity trade. The list of documents reviewed is in Appendix 2. The summary of findings of this review is provided in Chapter 4, section 4.10. The review suggests that SMSs have to make certain changes to their electricity laws, regulations, and policies for the implementation of the SAARC Framework Agreement for Energy Cooperation (Electricity), to which all these countries are signatories. Its implementation will promote regional power trade and help create the South Asia electricity market. The actions each country is required to take are in Table 10 below. Maldives is not included in the table since it is not possible to connect Maldives' power system to any of the other systems in the foreseeable future, due to its geographical location, extremely meager demand for electricity, and technological limitations. When technology makes it possible to connect Maldives' power system to any of the systems in South Asia, Maldives may then incorporate these provisions in its electricity laws and regulations.



Table 10: Suggested Changes to Policies, Laws, and Regulations

No.	Action	Afghanistan	Bangladesh	Bhutan	India	Nepal	Pakistan	Sri Lanka
1	Legal/Policy							
1.1	Laws, regulations, and/or policies to recognize cross-border power trade and set parameters for the issue of licenses	Make necessary provisions in the proposed electricity laws and regulations.	Recognized in National Energy Policy, 1996. Identify participants and issue licensing norms.	Recognized in the BEA Act, 2001. Identify bulk suppliers, and issue licensing norms.	Recognize cross-border trade in EA 2003, identify participants, and issue licensing norms.	Recognized in Electricity Act 2049 (1992), and issue licensing norms.	Recognize cross-border trade in NEPRA Act. Identify participants and issue licensing norms.	Recognize cross-border trade in EA 2009. Identify participants and issue licensing norms.
1.2	Provide freedom of transit for electricity flows	To be provided.	To be provided.	To be provided.	To be provided.	To be provided.	To be provided.	Not applicable.
1.3	Permit open access in transmission and distribution systems	To be provided.	Provided for in transmission. Allow in distribution.	Provided for in transmission. Allow in distribution.	Already provided for.	Provided for in transmission. Allow in distribution.	Provided for in transmission. Allow in distribution.	To be provided.
1.4	Transit countries to grant right-of-way to lay new transmission lines	Allow	Allow	Allow	Allow	Allow	Allow	Allow
1.5	Exemption from obtaining license from commerce/ relevant ministry	Exempt	Exempt	Exempt	Exempt	Exempt	Exempt	Exempt
2	Regulatory							
2.1	Formulate regulations for cross-border power trade and issue of licenses	Formulate	Formulate	Formulate	Formulate	Formulate	Formulate	Formulate

continued on next page

Table 10 *continued*

No.	Action	Afghanistan	Bangladesh	Bhutan	India	Nepal	Pakistan	Sri Lanka
2.2	Permit cross-border power traders to access regional power exchange or power exchanges in India	Permit	Permit	Permit	Permitted	Permit	Permit	Permit
2.3	Exempt power trade through power exchanges from regulation	Make necessary provision.	BERC to make necessary provision.	BEA to make necessary provision.	Already provided for.	ETFC to make necessary provision.	NEPRA to make necessary provision.	PUCSL to make necessary provision.
2.4	Permit investments for the creation of cross-border electricity infrastructure from within the region	Allow	Allow	Allow	Allow	Allow	Allow	Allow
2.5	Exempt power purchases through power exchanges, from regulation	To be provided.	BERC to take action.	BEA to take action.	Already provided for.	ETFC to take action.	NEPRA to take action.	PUCSL to take action.
2.6	Deemed trading license for generation/distribution licensees to engage in cross-border electricity trade	To be provided in proposed regulations.	BERC to take action.	BEA to take action.	Already provided for.	NEA to take action.	NEPRA to take action.	PUCSL to take action.
2.7	Mechanism for transmission charges for third party access to transmission	The Government of Afghanistan to take action.	BERC to take action.	BEA to take action.	Already provided for.	NEA to take action.	NEPRA to take action.	PUCSL to take action.

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Table 10 continued

No.	Action	Afghanistan	Bangladesh	Bhutan	India	Nepal	Pakistan	Sri Lanka
2.8	Issue trading license to suitable parties	The Government of Afghanistan to take action	BERC to take action	BEA to take action	Already provided for.	NEA to take action	NEPRA to take action	PUCSL to take action
3	Technical							
3.1	Develop grid code for coordinated system operation with neighboring countries	The Government of Afghanistan to take action.	BERC to take action.	BEA to take action.	CERC to take action.	The Government of Nepal and/or NEA to take action.	NEPRA to take action.	PUCSL to take action.
3.2	Independent system operator to manage the system	Provided for in the proposed laws.	Approved, yet to be put in place.	Already in place.	Already in place.	Approved, yet to be put in place.	Approved, yet to be put in place.	To be approved.
3.3	Cross-border transmission planning in consultation with neighboring countries	DABS to take action.	PGCB to take action.	BPC to take action.	CEA to take action.	NEA to take action.	NTDC to take action.	CEB to take action.
4	Commercial							
4.1	Evolve commercially acceptable payment security mechanism	Evolve	Evolve	Evolve	Evolve	Evolve	Evolve	Evolve
4.2	Settlement of deviations from scheduled trade as per unscheduled interchange mechanism in India	Permit	Permit	Permit	Already provided for.	Permit	Permit	Permit
4.3	Exempt cross-border power trade from duties and taxes	Exempt	Exempt	Exempt	Exempt	Exempt	Exempt	Exempt

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Table 10 continued

No.	Action	Afghanistan	Bangladesh	Bhutan	India	Nepal	Pakistan	Sri Lanka
4.4	Establish dispute resolution mechanism for cross-border trade	Contribute to the formulation of the mechanism.	Contribute to the formulation of the mechanism.	Contribute to the formulation of the mechanism.	Contribute to the formulation of the mechanism.	Contribute to the formulation of the mechanism.	Contribute to the formulation of the mechanism.	Contribute to the formulation of the mechanism.
4.5	Evolve a commercial mechanism to settle imbalances through a regional mechanism	Evolve	Evolve	Evolve	Evolve	Evolve	Evolve	Evolve

BEA = Bhutan Electricity Authority, BPC = Bhutan Power Corporation, BEREC = Bangladesh Energy Regulatory Commission, CEB = Ceylon Electricity Board, DABS = Da Afghanistan Breshna Sherkat (vertically integrated power utility in Afghanistan), EA 2003 = Electricity Act 2003 (India), ETFC = Electricity Tariff Fixation Commission of Nepal, GON = Government of Nepal, NEA = Nepal Electricity Authority, NEPRA = National Electric Power Regulatory Authority of Pakistan, NTDC = National Transmission and Dispatch Company, PGCB = Power Grid Company of Bangladesh, PUCSL = Public Utilities Commission of Sri Lanka.

Source: Compiled by the author.



7 Conclusions and Recommendations

7.1 Conclusions

Power trading is already taking place between Afghanistan with the Central Asian Republics and Iran; India with Bangladesh, Bhutan, and Nepal; and Pakistan with Iran. Most of these cross-border trade arrangements predate the introduction of the existing electricity laws and regulations of the member states. Though the prevailing laws and regulations were formulated and came into force when these trades were already taking place, few of the countries in the region—Bangladesh, Bhutan, and Nepal—made requisite provisions in their laws to recognize and regulate the cross-border electricity trade within. As a result, the prevailing electricity laws, regulations, and policies of other SAARC member states (SMSs) are designed to govern sector operations within the country only.

SMSs face significant electricity shortages, and a large percentage of the population does not have access to electricity. On the other hand, there are intervals of time when generation exceeds demand, due to variations in the daily and seasonal load curves. These, coupled with the time difference between the countries, provide an excellent opportunity for trading the surplus energy, which would be beneficial to both energy trading parties. Realizing the need for cooperation in the electricity sector, the framework agreement was signed in 2014. Its implementation will promote cross-border electricity trade, facilitate the creation of the South Asia electricity market; and significantly reduce shortages, enhance access to electricity, and make energy available for the region's economic and social development.

To harness these benefits, the SMSs have to undertake the following:

- (i) Harmonize their electricity laws, regulations, and policies with those of the other countries in the region.
- (ii) Take steps to add new generation capacity to make additional electricity supply available for trade.
- (iii) Create cross-border electricity infrastructure for energy flows.
- (iv) Take other steps to support the implementation of the agreement.

7.2 Recommendations

Based on the preceding conclusions and discussions in the previous chapters, the following recommendations are made:

7.2.1 Electricity Laws, Regulations, and Policies to be Harmonized

From a detailed review of the electricity laws, regulations, and policies, it was found that the SMSs have to make changes and add provisions to facilitate the implementation of the SAARC Framework Agreement for Energy Cooperation (Electricity). The changes and additions required for harmonizing the laws and regulations by each of these countries are provided in Table 10. The SMSs need to take the necessary action in this direction to harness the benefits of regional energy (electricity) cooperation.

Of particular importance is the recognition of cross-border electricity trade in the countries' laws and regulations. Enacting key amendments in the energy laws will not only make energy trade possible, but will also show the countries' commitment to the framework agreement. Allowing for freedom of transit of electricity flows, permitting open access in transmission and distribution systems, and permitting investments for the needed infrastructure are other important legal and regulatory issues to be discussed.

Technical and commercial aspects also need to be considered. Common grid codes and cross-border transmission planning are key technical challenges. For commercial aspects, a commercially acceptable payment security mechanism is needed, as well as a regional dispute resolution mechanism for cross-border trade agreements.

7.2.2 Generation Capacity Addition

All SMSs have medium- and long-term plans to develop their energy resources to meet their domestic electricity demand. With increasing demand for electricity and the member states' goal of "Electricity for All," the existing and the planned generation capacity may not be sufficient for cross-border power trade in the long run. Some initiatives of Bhutan and Nepal for harnessing energy from hydropower resources in bilateral mode with India are committed under these bilateral agreements. Hence, the energy generated from these plants will not become available for regional power trade on a regular basis.

SMSs need to collaborate to establish new generation facilities through the establishment of regional power projects,¹⁴ which has been discussed and suggested on earlier occasions as well. The core of this concept is that three or more member states can jointly develop these power plants in one of the participating countries and share the energy generated and benefits from these based on their level of participation in the joint venture. It is the energy from these regional power projects that will become available for long-term trade. The option of power exports from the regional power plants will help spread the risks and make

¹⁴ See footnote 12.

it easier to finance these projects. These could be hydropower, thermal, and/or renewable power plants.

7.2.3 South Asian Association for Regional Cooperation Investment Facilitation Program

It has been observed that establishing new generation facilities and creating cross-border electricity infrastructure gets inordinately delayed in South Asia. One of the main reasons for this is the paucity of funds to timely finance these projects. Given the risk aversion of international energy majors to make investments in the emerging markets, private sector investment from within the region could help implement these projects through an Investment Facilitation Program. There are major energy companies within the region who, if given a level playing field, could address this issue. SMSs should, therefore, permit and facilitate cross-border investment in the electricity sector from any of the SMSs on a nondiscriminatory basis, with the same rights and privileges as their national investors, with added provisions of non-nationalization or takeover of assets created from such investments, repatriation of profits and investments, complete freedom to operate the systems as per the framework agreement, and without any extraneous considerations.

7.2.4 South Asia Regional Power Exchange

Member states recognize the need for the establishment of a regional power exchange and an electricity market in South Asia. The SAARC Secretariat, with the assistance of ADB, has already undertaken a study to establish the South Asia Regional Power Exchange (SARPE). Member states need to expedite setting it up, to facilitate electricity trade in the region. Until the time SARPE becomes operational, SMSs could designate one or more power exchanges already operational in some member countries as the regional power exchange to facilitate cross-border electricity trade, as a precursor to the establishment of SARPE, and then decide whether to continue with this arrangement or make SARPE the only power exchange to deal with cross-border electricity trade in the region.

7.2.5 Knowledge-Sharing Mechanism

Member states should evolve a mechanism that enables and encourages, on a regular basis, sharing of knowledge and joint research including exchange of experts and professionals related to, among other things, power generation, transmission, distribution, energy efficiency, reduction of transmission and distribution losses, and grid integration of renewable energy resources.

7.2.6 South Asian Association for Regional Cooperation Template Documents

One of the factors that delays power projects in the region is the multiple documents the SMS uses at various stages of project planning to the stage of implementation. To overcome this hurdle, it is desirable to adopt, with suitable modifications, a set of documents from among the best and tested ones already in use in one or more of the member states, and

adopt them to be used as SAARC template documents for regional power projects. These could be tender documents, project award agreements, power purchase agreements, fuel supply agreements, transmission service agreements, and tolling agreements. Since these template documents would be preapproved by member states, their use will make projects happen faster, saving time and money.

7.2.7 South Asian Association for Regional Cooperation Electricity Database

It is extremely difficult to carry out any research or plan an activity in the electricity sector on a regional basis. The first challenge is the lack of authentic, up-to-date, and credible information. Some information are available in bits and pieces in various places, but mostly do not meet the requirements. Moreover, there is no uniformity in the data compiled. Project developers, financiers, researchers, and others interested in the sector operations face this challenge regularly. Therefore, it is recommended that a SAARC regional electricity database be prepared and regularly updated to overcome this challenge.



APPENDIX 1

South Asian Association for Regional Cooperation Framework Agreement for Energy Cooperation (Electricity)

The South Asian Association for Regional Cooperation (SAARC) Member States, comprising Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, and Sri Lanka;

Recognizing the importance of electricity in promoting economic growth and improving the quality of life;

Realizing the common benefits of cross-border electricity exchanges and trade among the SAARC Member States leading to optimal utilization of regional electricity generating resources, enhanced grid security, and electricity trade arising from diversity in peak demand and seasonal variations;

Convinced of the need of increasing economic cooperation and creating new opportunities in the electricity sector;

Recalling the decision of the Sixteenth SAARC Summit held in Thimphu (2010), to enhance cooperation in the energy sector to facilitate energy trade, development of efficient conventional and renewable energy sources including hydropower;

Emphasizing the need to promote regional power trade, energy efficiency, energy conservation and development of labeling and standardization of appliances, and sharing of knowledge;

Recalling further the decision of the Seventeenth SAARC Summit held in Addu City-Maldives (2011), which directed the conclusion of an Inter-Governmental Framework Agreement for Energy Cooperation;

Now, therefore, in the spirit of solidarity and mutual cooperation, and subject to the laws, regulations, and international obligations of the Member States, wherever applicable, have agreed as follows:

Article 1 Definitions Buying and Selling Entities

Buying and Selling Entities means any authorized public or private power producer, power utility, trading company, transmission utility, distribution company, or any other institution established and registered under the laws of any one of the Member States having permission of buying and selling of electricity within and outside the country in which it is registered.

Article 2 Objective

Member States may enable cross-border trade of electricity on voluntary basis subject to the laws, rules and regulations of the respective Member States and based on bilateral/trilateral/mutual agreements between the concerned states.

Article 3 Scope

Member States may enable Buying and Selling Entities to negotiate the terms, conditions, payment security mechanism and tenure of electricity trade under the Government regulatory mechanisms of the concerned states.

Article 4 Duties and Taxes

Member States may work towards exempting from export/import/duty/levies/fees, etc. for cross-border trade and exchange of electricity between Buying and Selling Entities.

Article 5 Data Updating and Sharing

Member States may share and update technical data and information on the electricity sector in an agreed template.

Article 6 Promoting Competition

Member States shall encourage the process of opening up of electricity sector guided by respective national priorities with the aim of promoting competition.

Article 7 Planning of Cross-Border Interconnections

Member States may enable the transmission planning agencies of the Governments to plan the cross-border grid interconnections through bilateral/trilateral/mutual agreements between the concerned states based on the needs of the trade in the foreseeable future through studies and sharing technical information required for the same.

Article 8 Build, Operate, and Maintain

Member States may enable the respective transmission agencies to build, own, operate, and maintain the associated transmission system of cross-border interconnection falling within respective national boundaries and/or interconnected at mutually agreed locations.

Article 9

Transmission Service Agreements

Member States may facilitate authorized Buying and Selling Entities to enter into transmission service agreements with the transmission service providers for the purpose of cross-border electricity trade.

Article 10

Electricity Grid Protection System

Member States shall enable joint development of coordinated network protection systems incidental to the cross-border interconnection to ensure reliability and security of the grids of the Member States.

Article 11

System Operation and Settlement Mechanism

Member States shall enable the national grid operators to jointly develop coordinated procedures for the secure and reliable operation of the inter-connected grids and to prepare scheduling, dispatch, energy accounting, and settlement procedures for cross-border trade.

Article 12

Transmission Access

Member States shall, for the purpose of electricity trade, enable nondiscriminatory access to the respective transmission grids as per the applicable laws, rules, regulations, and applicable inter-governmental bilateral trade agreements.

Article 13

Facilitating Buying and Selling Entities

Member States shall enable Buying and Selling Entities to engage in cross-border electricity trading subject to the laws and regulations of the concerned Member States.

Article 14

Knowledge Sharing and Joint Research in Electricity Sector

Member States may enable and encourage knowledge sharing and joint research including exchange of experts and professionals related to, *inter alia*, power generation, transmission, distribution, energy efficiency, reduction of transmission and distribution losses, and development and grid integration of renewable energy resources.

Article 15

Regulatory Mechanisms

Member States shall develop the structure, functions, and institutional mechanisms to resolve regulatory issues related to electricity exchange and trade.

Article 16
Dispute Settlement

Any dispute arising out of interpretation and/or implementation of this Agreement shall be resolved amicably among the Member States. If unresolved, the Member States may choose to refer the dispute to the SAARC Arbitration Council.

Article 17
Withdrawal

Any Member State may withdraw from this Agreement at any time after its entry into force. Such withdrawal shall be effective 6 months from the day on which written notice thereof is received from the SAARC Secretariat, the depository of this Agreement.

The rights and obligations of a Member State which has withdrawn from this Agreement shall cease to apply as of that effective date with exception that ongoing proceedings at the time of termination shall nonetheless be completed in accordance with the provisions of this Agreement.

Article 18
Entry into Force

This Agreement shall enter into force on completion of formalities by all Member States and upon issuance of a notification thereof by the Secretary General of SAARC.

Article 19
Amendment

Any amendment to this Agreement may be submitted by a Member State to the SAARC Secretariat and recommended by consensus to the Meeting of SAARC Energy Ministers. Such amendment(s) will be effective upon deposit of the instruments of acceptance with the Secretary General of SAARC.

Article 20
Review

The Member States shall meet in order to review this Agreement on request or at the end of 5 years from the date of its entry into force, unless they notify one another in writing that no such review is necessary.

IN WITNESS WHEREOF, the undersigned being duly authorized thereto by their respective Member States have signed this SAARC Framework Agreement for Energy Cooperation (Electricity).

DONE in Kathmandu, Nepal, on this the Twenty-Seventh Day of November of the Year Two Thousand Fourteen, in Ten Originals in the English Language.

Zarar Ahmad Osmani

Acting Minister of Foreign Affairs
Islamic Republic of Afghanistan

Rinzin Dorje

Minister of Foreign Affairs
Kingdom of Bhutan

Dunya Maumoon

Minister of Foreign Affairs
Republic of Maldives

Sartaj Aziz

Adviser to the Prime Minister on National
Security and Foreign Affairs
Islamic Republic of Pakistan

Abul Hassan Mahmood Ali, MP

Minister for Foreign Affairs
People's Republic of Bangladesh

Sushma Swaraj

Minister of External Affairs
Republic of India

Mahendra Bahadur Pandey

Minister for Foreign Affairs
Nepal

Gamini Lakshman Peiris

Minister of External Affairs
Democratic Socialist Republic of
Sri Lanka





APPENDIX 2

List of Laws and Regulations Reviewed

A detailed analysis of the prevailing laws, regulations, and policies of the South Asian Association for Regional Cooperation (SAARC) member states was done to prepare this report. The main laws and regulations with implications on the regional electricity trade are presented below::

Afghanistan

- (i) Strategic Policy Framework for the Water Sector prepared by the Transitional Islamic State of Afghanistan, Ministry of Irrigation, Water Resources, and Environment, published in May 2004
- (ii) Law for Using Electric Energy, 1986
- (iii) Electricity Sector Policy of 2003

Bangladesh

- (i) Electricity Act, 1910 (with various amendments made to it, after the formation of Bangladesh)
- (ii) National Energy Policy, 1996 (Revised 2004)
- (iii) Power System Master Plan, 2010
- (iv) Power Pricing Framework (approved by the government in January 2004)
- (v) Policy Guidelines for the Enhancement of Private Participation in the Power Sector, 2008
- (vi) Bangladesh Power Development Board Order, 1972
- (vii) Bangladesh Energy Regulatory Commission Act, 2003
- (viii) Private Sector Infrastructure Guidelines
- (ix) Policy Guidelines for Power Purchase from Captive Power Plants
- (x) Private Sector Power Generation Policy of Bangladesh
- (xi) Guidelines for Remote Power Supply Systems
- (xii) Rural Electrification Board Ordinance, 1977
- (xiii) Renewable Energy Policy of Bangladesh, November 2008
- (xiv) Policy Guidelines for Small Power Plants in Private Sector, April 1998 (revised November 2008)
- (xv) Vision Statement of the Government of Bangladesh to Provide Access to Affordable and Reliable Electricity to All by the Year 2020

Bhutan

- (i) Bhutan Electricity Act, 2001

India

- (i) Electricity Act, 2003
- (ii) Amendment to the Central Electricity Regulatory Commission (Procedure, Terms, and Conditions for Grant of Trading License and Related Matters) Regulations, 2009

Maldives

- (i) The Maldives National Energy Policy and Strategy, 2010
- (ii) Electricity Regulations of Maldives, 2012
- (iii) Law4/96 (provision of utility services)
- (iv) Guidelines for Power Systems Approval

Nepal

- (i) Electricity Act, 2049 (1992)
- (ii) Electricity Regulation, 2050 (1993)

Pakistan

- (i) Sindh Electricity Control Act, 1952 (Sindh Act No. XXXI of 1952)
- (ii) Electricity Act (Punjab Amendment) Ordinance, 1971 Punjab Ordinance No. XXIX of 1971
- (iii) Electricity Rules, 1978 (Sindh Amendment)
- (iv) Karachi Electricity Supply Company Electricity Control Order, 1978

Sri Lanka

- (i) Sri Lanka Electricity Act, No. 20 of 2009
- (ii) National Energy Policy and Strategies
- (iii) Sri Lanka Sustainable Energy Authority Act, 2007
- (iv) Sri Lanka Electricity (Amendment) Act, 2013

HARMONIZING ELECTRICITY LAWS IN SOUTH ASIA

Recommendations to Implement the South Asian Association for Regional Cooperation Framework Agreement on Energy Trade (Electricity)

Electricity shortages in South Asia are adversely impacting the region's socioeconomic development. Energy trade is seen as a solution to this challenge. The South Asian Association for Regional Cooperation (SAARC) Framework Agreement for Energy Cooperation (Electricity) is a key step in realizing regional trade in energy. To support implementation of the framework agreement, ADB and SAARC in Law are working to improve legal and regulatory harmonization in the energy sector.

This report identifies the legal, regulatory, technical, and commercial requirements for energy trade, and what each country in South Asia needs to do to make the framework agreement a reality. The recommendations, summarized in tables, provide an easy reference for policy makers and energy stakeholders in the region.

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