Contents

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Front Cover Photo: PowerHouse area of Chameliya Hydroelectric Project
Back Cover Photo: Dam of Chameliya Hydroelectric Project.

NEPAL ELECTRICITY AUTHORITY
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Message from Chairperson

It makes me really happy while expressing my thoughts as Nepal Electricity Authority (NEA)'s Chairperson on the occasion of its 29th anniversary. I want to convey my best wishes to all the employees of NEA and its consumers alike on this jubilant day.

As a predominant player in the country's power sector, NEA has a crucial role to play to provide adequate and reliable electricity services to its consumers at an affordable price. Although with the introduction of Nepal Electricity Act, 1992, the country opened its power sector for private sector investment, and accordingly, a number of independent generation companies have added capacity of the Integrated Nepal Power System since then, NEA, being the sole state owned power utility, has a special position in country's power sector. In fact, sustenance of IPPs depends on NEA's health. Apart from energizing industries and other economic operations, NEA also serves as a medium in order for the Government to meet its obligations of equitable supply of electricity to as many consumers as possible by way of mainly rural electrification.

Today, everyone of us involving in power sector is not in a comfortable position. Persistent load-shedding is really a bugbear. Although the problem might not have been solely due to our doings, it is now our responsibility to get rid of it. Whatever comes on our way, we must gird our loins to face it. The Ministry of Energy is preparing to establish a national Transmission Grid entity in order to prepare a non-discriminate highway for all power producers. Establishment of a power trading company may also be required soon in order to smoothen the process of power trading including the trading through long-term power purchase agreements.

It has become almost certain that in a monsoon-hydro dominated power system as ours, trading and/or exchange of power with neighbouring country is inevitable. We are constantly working towards to conclude a power trade and transmission connection agreement with India. It is always good to start a work with considerable amount of discussion, but such discussion and debate should also have their limits. I feel that we already wasted valuable time in debating as to what is proper and what is not. They are segregated clearly when we start real work.

We are again working on the new Electricity Bill and Nepal Electricity Regulatory Commission Bill, which remained in the previous parliament for a considerable length of time. We expect that great reforms will find their ways once these bills are enacted. We are prepared to make necessary decisions in order to remove all obstructions in the way to enhancing reliable and affordable electricity supply. In return, we want that no one questions NEA's project implementation capacity. Almost all of NEA's generation and transmission line projects that are under construction have undergone severe time overrun or cost overrun or both. Loss reduction is yet another area in which, I think, NEA should work hard. I see no reason why NEA's employees cannot overturn such situation.

In the end, I would like to assure that a reform process by no means should adversely affect any one of NEA employees. I wish to congratulate all the NEA staff for their sincere efforts while performing their duties so far, and once again, wish that they would be successful in quest of their personal as well as organizational bright future.

(Radha Kumari Gyawali)
Minister for Energy
Government of Nepal and
Chairperson, Nepal Electricity Authority

Board of Directors

Chairperson
Radha Kumari Gyawali
Minister for Energy

Member
Mr. Rajendra Kishore Kshatri
Secretary, Ministry of Energy

Member
Secretary, Ministry of Finance

Member
Mr. Santosh Narayan Shrestha

Member
Mr. Laxman Prasad Agrawal

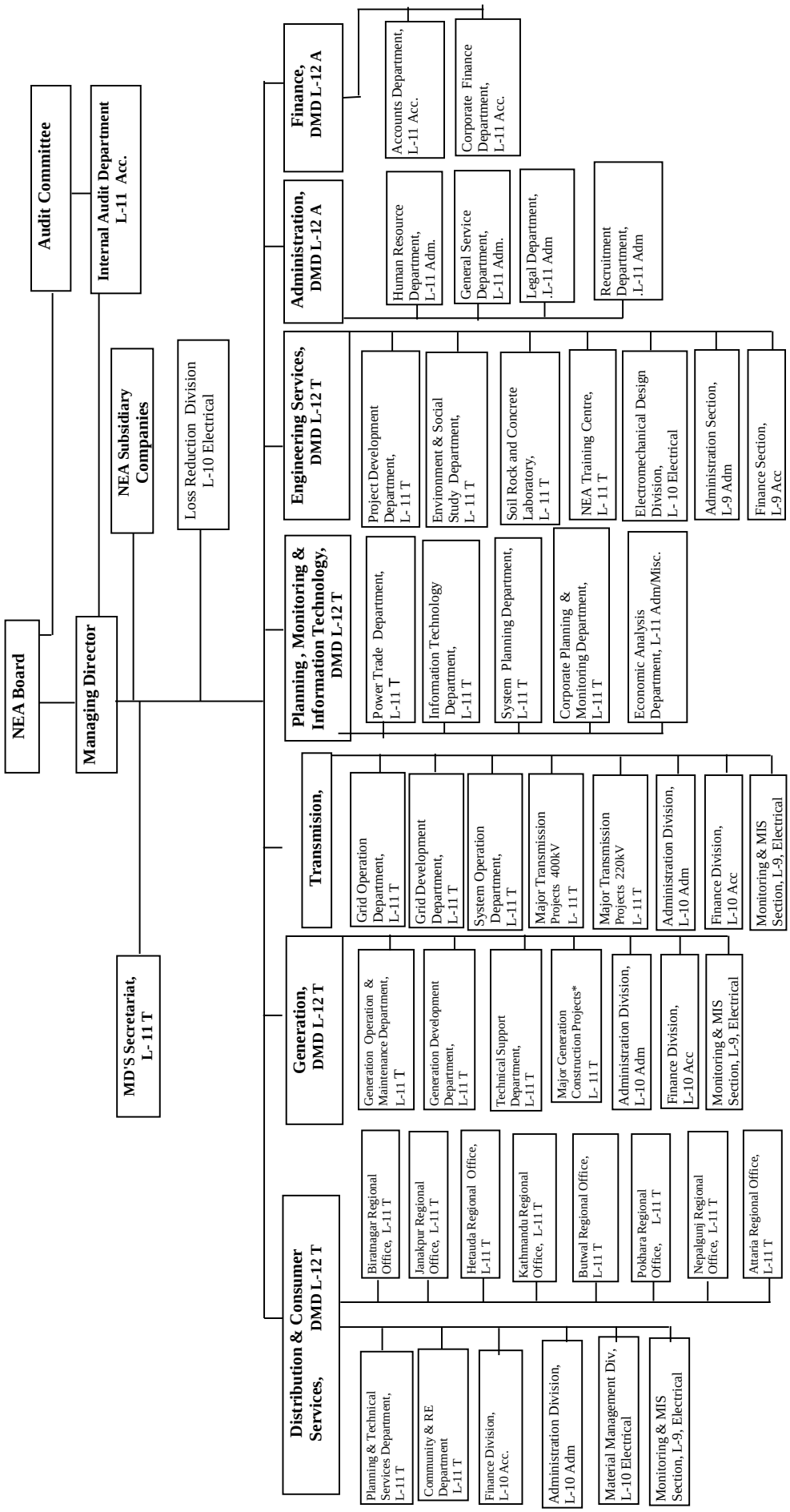
Member
Mr. Manoj Kumar Mishra

Member
Mr. Suraj Lamichhane

Member Secretary
Mr. Ram Chandra Pandey
Officiating Managing Director, NEA

NEPAL ELECTRICITY AUTHORITY

Organization Structure



Note : * Major Generation Construction Projects will be defined by the Board.
T = Technical Services; A = Administration Services: Adm = Administration Group:
Acc=Account Group

Deputy Managing Directors

Mr. Birendra Kumar Pathak
Deputy Managing Director
MD's Secretariat

Mr. Ram Chandra Pandey
Deputy Managing Director
Distribution & Consumer Services Directorate

Mr. Subash Dahal
Deputy Managing Director
Planning, Monitoring & Information Technology Directorate

Mr. Sher Singh Bhat
Deputy Managing Director
Generation Directorate

Mr. Sunil Kumar Dhungel
Deputy Managing Director
(On Deputation to Tanahu Hydropower Ltd.)

Mrs. Gosai K.C.
Acting Deputy Managing Director
Administration Directorate

Mr. Lekha Nath Koirala
Acting Deputy Managing Director
Finance Directorate

Mr. Kanhaiya Kumar Manandhar
Officiating Deputy Managing Director
Transmission Directorate

Mr. Lila Nath Bhattarai
Officiating Deputy Managing Director
Engineering Services Directorate

Managing Director's Report

On the occasion of 29th anniversary of the founding of Nepal Electricity Authority (NEA), it is my pleasure to report on the activities of NEA over the past fiscal year 2013/14. Our efforts during the past fiscal year continued in aiming to function NEA on a sound commercial basis so as to make it capable of undertaking future challenges of development, and to provide our valued customers electricity of acceptable quality and affordable price. NEA is no more the sole player in the country's power sector. With the emergence of the private sector enterprise, particularly in electricity generation, it is imperative that NEA improve its operational efficiency not only for its sustenance but also equally if not more for the development of Nepal's power sector.

On this occasion, I would like to take this opportunity to affirm our commitment to perform better and deliver better results in the days to come. With this note, I now present my report on the activities of NEA during past fiscal year 2013/14.

Operational Performance

The annual peak power demand of the Integrated Nepal Power System (INPS) in fiscal year 2013/14 is estimated to be 1,201 MW, with 410 MW power estimated to have been shed. Out of the 791 MW of power actually supplied, 436.4 MW was contributed by NEA hydro, 22 MW by NEA thermal, 216.4 MW by IPP hydro and the rest 116.2 MW was import. Compared to the preceding fiscal year's figure of 1,094.6 MW, the annual peak power demand of the INPS registered a growth rate of 9.7 %.

Energy demand of INPS in fiscal year 2013/14 is estimated at 5,909.96 GWh, out of which only 4,631.51 GWh (78.4%) could be supplied. The rest 1,278.45 GWh (21.6%) was resorted to load shedding. Of the total supplied energy volume, 3,559.28 GWh (76.8%) was contributed by domestic generation and 1,072.23 GWh (23.2%) by import from India. Domestic supply included 1,258.94 GWh (35.4%) from IPPs and the rest 2,300.34 GWh (64.6%) was from NEA owned power stations with a share of 2,290.78 GWh from hydro and 9.56 GWh from thermal.

In fiscal year 2013/14, we succeeded in restricting the load shedding hours to a maximum 12 hours per day. This was possible due to sound operation of the power system, to ensure filling up of the Kulekhani reservoir at the onset of the dry season, and also comparatively a wet monsoon. Record generation from Kali Gandaki 'A' and Middle Marsyangdi hydropower plants since their commissioning and highest generation from Marsyangdi hydropower plant in the last 15 years also played a role. Extended load shedding hours for the feeders that reported high percentage of theft was also a contributing factor. NEA resorted to all possible means to minimize load shedding; including purchase of all excess energy from the IPPs, operation of costly diesel plants and all possible import under power exchange agreement and power trade with India. Till the supply capability of NEA power system is substantially improved, I regret to say that load shedding is NEA's compulsion.

Total energy sales including sales to India was 3,447.58 GWh in fiscal year 2013/14. This is a growth by 9.1 % in the sales figure of fiscal year 2012/13. Sales to India however declined to 3.32 GWh from 3.6 GWh in fiscal year 2012/13.

Decrease in NEA's system loss in fiscal year 2013/14 is also encouraging. NEA's system loss decreased by 0.32 percentage point from the audited loss figure of 25.11% in fiscal year 2012/13 to 24.79 % (provisional) in fiscal year 2013/14. This, we believe, is the result of our continued efforts and measures taken on curbing electricity theft. We are committed in continuing to intensify our efforts to bring down the system loss to an acceptable level. For this, support from the political parties, civil society and the general public will also be solicited.

The total number of consumers including community and bulk buyer (India) consumer categories at the end of fiscal year 2013/14 reached 2.71 million. Out of the total number of consumers of 2.71 million, the domestic consumer category alone accounted for 2.56 million (94.37%).

Financial Performance

In fiscal year 2013/14, net revenue from sales of electricity amounted to NRs. 27,624.28 million, an increment of 8.95% over the preceding fiscal year's sales revenue. Other income such as surcharge, interest

income, lease rent, service charge, dividend etc. contributed NRs. 1,596.84 million to the total revenue. NEA's total revenue of NRs. 29,221.12 million in fiscal year 2013/14 recorded a growth rate of 7.34% over the preceding fiscal year's total revenue.

NEA's operating expenses for generation, transmission, distribution and administration were NRs 1,679.2 million, NRs. 450 million, NRs. 4,855.57 million and NRs. 1,314.23 million respectively in fiscal year 2013/14. Power purchase from the IPPs and India is a major cost item in NEA's operating expenses and reached NRs. 16,388.31, a 20.75 % increment over the previous fiscal year's figure. This cost item alone accounted for 56.75% of NEA's total operating cost. Addition of number of IPP projects in the NEA power system, increased quantity of power purchased from India to minimize load shedding, provision for annual escalation in the power purchase rates and depreciation of NRs vis-a-vis the US$ that effect the US$ denominated PPAs are some of the factors causing increase in power purchase cost in fiscal year 2013/14.

Annual depreciation charge on fixed assets was NRs. 3,256.48 million in fiscal year 2013/14, an increase by nearly 1% over the preceding fiscal year's figure. Interest on borrowing in fiscal year 2013/14 increased by 1.61% to reach NRs 4,104.75 million.

As, NEA's total revenue could not keep pace with the total cost, NEA, in fiscal year 2013/14, suffered a net loss of NRs 5,704.24 million.

NEA capitalized several distribution system reinforcement and rural electrification projects that amounted to NRs. 3,984.31 million. With this; NEA's property, plant and equipment as of end of fiscal year 2013/14 stood at NRs. 84,651.3 million.

Capital work in progress as of end of fiscal year 2013/14 stood at NRs. 50,812.58 million. Four major hydropower projects namely Chameliyagadh (30 MW), Kulekhani-III (14 MW), Upper Trishuli 3A (60 MW) and Rahughat (32 MW) and a number of transmission lines of different voltage levels are presently under construction. Most of the projects are being funded through government equity and foreign loans channeled through Government of Nepal. In fiscal year 2013/14, NEA invested NRs. 14,953.72 million in capital works and investment projects out of which NRs. 6,356.43 million comprised of government equity and NRs. 8,597.3 million comprised of government loan. Long term borrowings stood at NRs. 83,132.19 million and share capital stood at NRs. 44,221.33 million as of end of fiscal year 2013/14.

Development Activities

NEA's electricity supply position is far from satisfactory to meet the increasing demand, thus compelling NEA to resort to heavy load shedding. To overcome this imbalance of supply over demand, as well to keep pace with the growth in annual demand, NEA is undertaking the construction of number of hydropower projects. Quite a few projects are also being developed through NEA's subsidiary and associate companies. The private sector also has a role to contribute. Extension of the transmission grid and the distribution network are also NEA's responsibilities.

Construction of Kulekhani-III Hydroelectric Project (14 MW), a cascade scheme of existing Kulekhani-II Hydroelectric Project (32 MW), is at an advanced stage for completion with 80% of progress achieved so far. Civil works relating to the headwork except the control room have been completed. Excavation of the tunnel except the inclined portion of the penstock has been completed. Tunnel lining works is about 70% complete with the grouting works to be started soon. Powerhouse superstructure is about 71% complete to an elevation of 503 meter. Tailrace structures have been completed. As for the hydro mechanical works, draft tube has been installed and fabrication of penstock, penstock bifurcation and hydraulic gates are underway. Manufacturing of major equipment such as Generator, Turbine, Spiral Casing, Exciter, Governor, Transformer and Crane has been completed and already dispatched from China for installation.

Construction of Chameliya Hydroelectric Project (30 MW) is also at an advanced stage for completion with 94% progress achieved so far for the civil works. Construction of connecting tunnel and desanding basin is complete. Similarly, construction of dam, intake, adit tunnel, headrace tunnel, power house and tailrace is almost complete. Progress in the construction of surge tank and penstock is also satisfactory. However, completion in construction of headrace tunnel has been hampered due to squeezing of tunnel in 843 meter section between Adit 2 at downstream and Adit 3 at upstream. Squeezing to an extent of 40% of tunnel diameter has been observed. Rectifying this squeezing problem has been started and 57% work has been completed so far. Regarding the 131 km 132 kV transmission line, all the towers have been erected and stringing of conductors for 86.63 km length has been completed.

The construction of Upper Trishuli -3A Project started from 1st June 2011. Most of the land needed for the Project has been acquired including leasing of land for the temporary facilities. Construction of steel bridge and a pedes ¬trian bridge over Trishuli River, temporary

camp at headwork and excavation of 127.5 meter adit number 1, 134.5 meter adit number 2, 234.6 meter adit number 3 and 109.32 meter adit number 4 have been completed. At headwork, first phase of river diversion with installation of 2 gated weirs, construction of intake and 106 meter of approach channel have been completed. Second stage river diversion work commenced on February 8, 2014 and excavation of foundation, foundation concreting work, curtain grouting at diversion axis and concreting at stilling basin have also been completed. Excavation for desander basin and 11,180 cubic meter of concreting up to the invert level of desander flushing in eight panels each of three layers have also been completed. Similarly, 2,806.4 meter of 4,076 meter (68.85%) headrace tunnel has been excavated. The drilling operation for two blasting holes of surge shaft head started on 24 June 2014 and two holes out of five has been completed. For the construction of underground powerhouse, Powerhouse Cavern (Upper Portion) excavation has been completed. Cable tunnel 169.82 meter, access tunnel 180.66 meter and first stage of excavation of drainage tunnel (239.18 meter) have also been completed. Defect treatment work of the sheared zone and grouting injection on rock anchored beam have been completed along with treatment for fault alteration zone near rock face crane beam. Crane beam concreting work is progressing. The concrete lining for colluviums deposit at tailrace tunnel has also been completed on 14 June 2014.

Rahughat Hydroelectric Project (32 MW) was initiated with the joint funding of Government of Nepal and Nepal Electricity Authority utilizing the soft loan made available through a Line of Credit with the Export Import Bank of India. So far, track opening for 10 km of 12.5 km access road has been made. The Civil Contractor has built the Contractor's camp, Army camp and the Crusher plant. Preparatory works for excavation of adit 3, excavation of powerhouse adit and construction of access road are being carried out. The process for selecting the contractors for the Electro-mechanical and Hydro-mechanical works has already been initiated. Application for prequalifying (PQ) the contractors for Electro-mechanical work was invited on 4th March 2012. Presently, the Bidding documents are being finalized. Similarly, application for prequalifying the contractors for Hydro-mechanical work was invited on 9th July, 2012. Eight applied and four of them were qualified.

To prepare promising hydropower projects for their implementation, study ranging from desk study to feasibility study level has been carried out on number of hydropower projects. Noteworthy among them is the Dudhkoshi Storage Hydroelectric Project. The process for selecting an international consultant for implementing the Dudhkoshi Storage Hydroelectric Project has already been initiated. The consultant will: upgrade the existing feasibility study, carry out detail design and prepare tender documents. Similarly, for implementing the Upper Arun Hydroelectric Project, assistance from the World Bank has been sought and the Expression of Interest for hiring an international consultant as per the World Bank Procurement Guidelines will be issued soon. Other projects that are under active consideration for implementation are Tamakoshi V (87 MW) and Upper Modi 'A' (42 MW) together with its cascade Upper Modi (18.2 MW).

Contracts for most of the packages of 285 km 400 kV Double Circuit Hetauda - Dhalkebar - Inaruwa transmission line projects have been awarded and tower foundation works at 50 locations have been completed so far. Commissioning of this transmission line will enable in transmitting bulk power for export to India through the 400 kV Double Circuit Dhalkebar - Muzaffarpur cross border transmission line.

The Khimti- Dhalkebar 220 kV double circuit transmission line project, with only one circuit initially to be strung, is almost complete barring interruption of work at few stretches of the line at Sindhuli due to right of way compensation dispute. Stringing for the second circuit is also in progress. Construction of the Hetauda - Bharatpur - Bardghat 220 kV transmission line is under way.

The Hetauda 132 kV Sub-station and Transmission Line Project and the Matatirtha Sub-station Expansion Project were completed in fiscal year 2013/14. Substantial progress have been achieved in the construction of: Dumre-Damauli-Marsyangdi 132 kV transmission line, Singati- Lamosangu 132 kV transmission line, Kabeli 132 kV transmission corridor, Chapali 132 kV substation, second circuit stringing of Butwal - Kohalpur - Mahendranagar 132 kV transmission line and second circuit stringing of Hetauda - Kulekhani-II - Siuchatar 132 kV transmission line. Similarly: Modi - Lekhnath, Solu Corridor (Katari - Okhaldhunga - Solu) and Samundratar - Trishuli 3B 132 kV transmission line projects were initiated in fiscal year 2013/14.

Number of other transmission line projects are also planned for implementation. Most are under project preparatory stage under-going various studies.

Similarly, a number of electrification projects, distribution substation construction and upgrading projects and 33 kV transmission line and substation projects are underway throughout the country to increase the accessibility of electricity to the rural population.

NEA's Subsidiary and Associate Companies and the Private Sector

Quite a few development activities are being carried out through NEA's subsidiary and associate companies.

The Upper Tamakoshi Hydro Power Company Limited (UTKHPL), in which NEA has a share ownership of 41 %, is undertaking the construction of 456 MW Upper Tamakoshi Hydroelectric Project, a project of national pride. The construction works in the project at different front such as Dam, Intake, Headrace Tunnel, Surge shaft, Powerhouse and Tailrace tunnel are ongoing at full swing. The contractor for hydro mechanical works has installed the second stage embedded part such as guide frames, sill beams, alignment bolts; wall plates of dam stop logs and dam radial gates number 3 and 4. The contractor for mechanical and electrical works has started the installation works in the powerhouse. Spiral distributor installation works for Unit 1 to Unit 4 are ongoing, whereas pit liner installation work for Unit 5 is almost completed. The contractor for transmission line and sub-station works has completed the detailed survey of the transmission line route from Gongar to Khimti Substation. Land acquisition process has been initiated for first 35 km of approved section of the transmission line route alignment and tower foundation works will commence immediately after this year's monsoon season.

Chilime Hydropower Company Limited (CHPCL), NEA's majority (51 %) owned subsidiary company, is undertaking the development of Upper Sanjen (14.6 MW), Sanjen (42.5 MW), Rasuwagadhi (111MW) and Middle Bhotekoshi (102 MW) hydropower projects, through CHPCL's subsidiary companies. All the four projects are being developed with 50% debt and 50% equity financing mix. On its own, NEA has a share ownership of 10 % in Sanjen Hydro Power Company Limited, a share ownership of 10 % in Middle Bhotekoshi Hydro Power Company Limited and a share ownership of 18 % in Rasuwagadhi Hydro Power Company Limited. For all the four projects, consultants and the main civil contractors have been selected. The main civil contractors have already started their work.

NEA has also created Tanahu Hydropower Limited, a special purpose vehicle (SPV) with full NEA ownership for the development of a 140 MW Tanahu Hydropower Project. This storage type hydropower project is being built with co-financing from Asian Development Bank (ADB), Japan International Cooperation Agency (JICA) and European Investment Bank (EIB). The construction of the project is planned to begin in 2015 with the target set for completion by 2021.

NEA's other subsidiary/associate companies are Trisuli Jalvidut Company Limited (TJCL) with a share ownership of 30% and Power Transmission Company of Nepal (PTCN) with a share ownership of 50%. The Trisuli Jalvidut Company Limited (TJCL) is developing the 42 MW Upper Trishuli "3B" Hydroelectric Project and the Power Transmission Company of Nepal (PTCN) is implementing the Nepal portion of 400 kV Dhalkebar – Muzaffarpur double circuit cross border transmission line. Contract for constructing the Nepal portion of 400 kV Dhalkebar - Muzaffarpur double circuit cross border transmission line has already been awarded by PTCN and the contractor has spotted locations for all the towers so far.

NEA has always considered IPPs as trusted partners in meeting Nepal's growing electricity demand. PPAs for 148 projects have been concluded so far as of end of fiscal year 2013/14 that would generate nearly 2,000 MW installed capacity on their completion. In fiscal year 2013/14, a total of 6 new projects developed by the IPPs with their combined capacity of 23,558 kW were commissioned. Projects that were commissioned are: Lower Chaku Khola (1,765 kW), Ankhu Khola - 1 (8,400 kW), Bhairab Kunda (3000 kW), Radhi Khola (4,400 kW), Mailung Khola (5,000 kW) and Chhote Khola (993 kW). With these projects, the total number of IPP-owned projects that are in operation has reached 39 with a combined installed capacity of 255.65 MW. During the fiscal year under review, 9 new PPAs for a total capacity of 175.47 MW were signed

The Way Forward

NEA's current huge shortfall of supply over demand cannot be removed outright and is bound to remain for the next 2-3 years. For the intervening period, following measures, among others, will be pursued to restrict number of load shedding hours to 12-14 per day per consumer during the dry season:

- Additional import of nearly 70 MW would be pursued with India on a priority basis on completion of conductor upgrading work of 132 kV Kusaha - Kataiya transmission line.
- Possibility of importing 30 MW power through the 132 kV Gandak - Ramnagar transmission line, 10 MW power from the 33 kV Birgunj - Raxual line and 10 MW power from the 33 kV Bhairahwa - Sunauli line will be explored with urgency.
- Considering hydropower alone is not sufficient to minimize load shedding, other probable sources of renewable energy including solar power will be connected to the national grid. With the objective of minimizing load shedding in Kathmandu Valley, 25 MW solar power plant will be installed in the coming fiscal year. Other solar power projects will also be encouraged.

- NEA's power system will be operated and managed in such a way, even by utilizing existing thermal and import under exchange as well as trade, so that the Kulekhani Reservoir is full at the onset of dry season.
- Stringent measures shall be taken for the reduction of technical as well as theft part of the losses. For this support from political parties, civil society and the general public will be solicited. Electricity loss including the theft part will be restricted to 23 % by fiscal year 2015/16.

  NEA will improve the quality of its services through the use of new technologies to meet the challenges of new environment of utility business. In particular following measures will be pursued:
- The dBase computerized billing system, a 15 year old system based on outdated computer technology is still in use in some of the distribution centers. To bring in uniformity in the billing system, the dBase computerized billing system will be gradually phased out and replaced by the more advanced Oracle based M-power computerized billing system. The M-power computerized billing system will be gradually implemented in additional distribution centers.
- Handheld Meter Reading Device (HHD), which has helped in reducing human errors at the time of meter reading, will also be implemented in additional distribution centers. This device will also be introduced for reading Time of Day (TOD) meters.
- Any Branch Payment System will also be extended to Maharajgunj, Thimi and Bhaktapur distribution centers in Kathmandu valley.
- Payment of electricity bills through the use of Mobile phone will be implemented on a pilot project basis.
- Internet based payment and billing information system accessible by the customers on line will be introduced.
- A system for paying electricity bills either through a bank or in NEA's revenue collection center will be implemented. Payment KIOSK will be installed in major branches to facilitate bill payment outside office hours.
- Contracting out revenue collection to a third party will be gradually implemented. With such an arrangement NEA's customers will have wide latitude in choosing from different modes of bill payment as made available by the third party.
- Automatic Meter Reading (AMR) System for NEA's 200 large customers will be implemented in fiscal year 2014/15 on a pilot project basis. This system automatically collects consumption data and status information of electronic energy meter (TOD) and transfers them to a real-time central database for the purpose of billing, troubleshooting and analyzing. This technology mainly saves utility providers the expense of periodic trips to each physical location to read a meter.
- Centralized customer care center will be established to ensure single point of contact for all consumer related activities, timely service, less processing time for new connection, prompt grievance handling services and centralized control and monitoring over the entire customer care process.

Tariff based on the cost plus principle will be applied to the customers availing NEA's power through dedicated feeder. This has in principle been agreed by the Electricity Tariff Fixation Commission.

Safety for the NEA personnel while operating and maintaining the electrical supply lines as well as safety to the consumers will be accorded a high priority.

Transformer Test Bench will be installed in Central Workshop Hetauda and NEA Training Center, Kharipati. This will ensure quality control of 33 kV and 11 kV transformers of capacity up to 10 MVA owned by NEA as well as grid connected transformers owned by the private sector. This facility will be gradually extended to other parts of the country.

Integrated Financial Management Information System (IFMIS) based on Enterprise Resource Planning (ERP) will be implemented. With such a system in place, NEA will be transformed into an IT enabled organization with prompt and reliable information for facilitating effective and efficient decision-making.

The projects under construction by IPPs and projects for which PPAs have been signed are run-of-river type only. These projects will generate substantial energy during wet season but provide less quantity of energy during dry season. This results in surplus during wet season and deficit during dry season. A comprehensive plan is required to utilize this surplus energy and to manage the deficit in dry season. In this regard, completion of 400 kV Dhalkebar - Muzaffarpur Cross Border transmission line is of utmost importance, following which export of surplus energy to India in large scale would be possible. NEA will also implement additional cross border transmission lines gradually and presently the feasibility study for the 400 kV Bardghat - Gorakhpur Cross Border transmission line is ongoing.

Development of storage projects will provide a long term solution to resolve the problem of imbalance between supply and demand during wet and dry seasons. Andhikhola, Tamor and Uttar Ganga Hydroelectric Projects have been identified as prospective and viable storage projects for implementation in near future. NEA will implement these projects on a priority basis.

Acknowledgements

To conclude, I take this opportunity to thank all those contributing to NEA's activities over the past fiscal year. It is only through positive teamwork, I must stress, that a big organization like NEA can function and achieve results to the satisfaction of its stakeholders including customers.

I wish to take this opportunity to thank the Government of Nepal for their continued assistance in our operations and their contributions to our development activities. I express my deep gratitude to the Chairperson and members of NEA Board of Directors who have steered the course successfully in all adverse conditions. Thanks are also due to the donor community that has made it possible for NEA to undertake the works for its development.

Despite very adverse working conditions, our staff have shown consistent strive for betterment and dedication throughout the year. I am thankful to the entire staff of NEA and their representative Unions for their support and cooperation to the management.
Most importantly, I wish to thank our valued customers for bearing with us during periods of difficulty and assure them that we are in constant pursuit for providing electrical supply that is reliable and adequate for their needs.

Thank You.

Ram Chandra Pandey
Officiating Managing Director

Generation Directorate

Generation Directorate, headed by Deputy Managing Director, is responsible for construction of new power projects together with operation and maintenance of NEA owned power stations. This Directorate is supported by three departments, namely, Generation Development Department, Technical Support Department, Generation Operation and Maintenance Department along with separate Major Generation Construction Projects each headed by Director. At present this Directorate is taking care of construction of the following four hydropower projects.

- Kulekhani III Hydroelectric Project (14 MW)
- Chameliya Hydroelectric Project (30 MW)
- Rahughat Hydroelectric Project (32 MW)
- Upper Trishuli 3 'A' Hydroelectric Project (60 MW)

Chameliya Hydroelectric Project, Rahughat Hydroelectric Project and Upper Trisuli 3 'A' Hydroelectric Project are headed by respective Project Directors and report to the Deputy Managing Director. Whereas, Kulekhani III Hydroelectric Project is headed by a Project Manager and reports to the Director, Generation Development Department. The Technical Support Department provides technical support needed for the ongoing projects and existing power plants. The four hydropower projects under construction and the Generation Operation and Maintenance Department are described as following.

KULEKHANI III HYDROELECTRIC PROJECT

Project Background

The 14 MW Kulekhani III Hydroelectric Project is a 3rd cascade scheme of the Kulekhani Reservoir project and is located immediately downstream of the Kulekhani II Powerstation in Makawanpur district. The Civil works contract was awarded to Sinohydro Corporation, China and the Electromechanical Contract was awarded to M/S Zhejiang Jinlun Electromechanic Co., China. By the end of FY 2013/2014 approximately 80% of the construction works has already been completed. The power generated from the Project will be evacuated to INPS through a 500m long 132 kV single circuit transmission line.

Government of Nepal and Nepal Electricity Authority (NEA) are funding the construction of this project. The initial total estimated cost of the project was 2.43 billion and scheduled to be completed by December 7, 2011. The construction works was halted by the Civil Contractor citing various problems. Re-negotiations were held with the Contractor and a "Memorandum of Agreement" (MoA) was signed on February 18, 2012 and subsequently the construction of the project was resumed from March 23, 2012. The main construction components of the Project are Civil Works (Lot C-1) and Electromechanical and Hydromechanical Works (Lot-2). Originally, the project was scheduled to be completed within a period of 44 months including mobilization, testing and commissioning. As per the MoA, the project duration has been extended by 30 months and the revised completion date is September 13, 2014. Accordingly, the initial cost estimate for the project has been revised and is in the process of approval.

Since, the original contract agreement with the consultant (Joint Venture of Water Resources Consult (P.) Ltd, SILT Consultants (P.) Ltd. and Hydro Engineering & Development Co. (P.) Ltd.) for the Construction Management and Construction Supervision Work was terminated in February 2012, a new Engineer was appointed temporarily in lieu for the time being until the appointment of the new Consultant. The current Consultant for the Project is Water and Power Consultancy Services, (WAPCOS) Ltd., Haryana, India, in association with Total Management System (TMS), Nepal.

Project Status

The majority of the Civil Works have already been completed. All of the Civil Works in the Headworks excepting the control room have been completed. The excavation of the overall tunnels except the inclined portion of the penstock has been completed (about 68 m of the penstock remaining out of 5916.365 m of overall underground excavation including forebay, inclined shaft, penstock, headrace tunnel and adits). The tunnel

Concrete lining works in Forebay of Kulekhani III HEP

lining works is around 70% completed and the grouting works for the tunnel is to be started immediately. The Powerhouse superstructure has been completed up to an elevation of 503 m and is around 71% completed. The tailrace structures have been completed. As for the Hydromechanical works, the draft tube has been installed and the fabrication of the penstock, penstock bifurcation, and hydraulic gates are underway. The inspection of the major parts such as Generator, Turbine, Spiral casing, Exciter, Governor, Transformer, Crane has been completed and have already been dispatched from China for installation. All the switchyard equipments are in the final stages of manufacturing while the manufacturing of the Transmission towers, panels, cables etc are underway.

CHAMELIYA HYDROELECTRIC PROJECT

Project Background

Chameliya Hydroelectric Project under joint funding of GoN, NEA and Korean loan was started in 2007 and is scheduled to be completed in March 14, 2015. The site is located at Sikhar VDC, Ward No. 4, Balanch of Darchula District. The plant capacity is 30 MW with average annual energy generation of 184.21 GWh. Even with numerous problems, the project has achieved 94% progress so far.

Project Status

By the end of FY 2013/14, 99.8% of the dam construction works has been completed. Similarly, 99.1 % of intake, 100% of connecting tunnel, 100% of desanding basin, 94.1% of adit tunnel and 99.1% of the headrace tunnel

Photo: Tunnel sqeezing treatment work in Chameliya HEP

(excluding squeezing portion) has been completed. The progress of power house, surge tank, penstock and tail race construction stands at 99.9%, 70.6%, 63% and 99.8% respectively. The overall progress of civil works is 94%.

The progress in the construction of headrace tunnel has been delayed due to squeezing problem encountered in tunnel section between Adit 2 d/s and Adit 3 u/s. Maximum squeezing of 40% of tunnel diameter has been observed. Total squeezed length of 843.00m has been the major challenges of the Project. The treatment for this problem has been started and 57% work has been completed so far.

Another major problem faced by the project is the excessive weak geological condition in the vertical shaft penstock forming the cavity with debris flow. The Panel of Experts has recommend R.C.C. with geomembrane vertical shaft after visiting the site in December 2013.

The embedded parts for powerhouse have been installed. Installation of two draft tubes with all accessories has been completed. Similarly installation of turbines have also been completed. Most of hydro-mechanical and electro-mechanical equipment have been delivered to site. In the 132 kV transmission line works, 100% of tower foundation works and 100% of tower erection works have been completed. In addition, 86.63 km out of 131 km stringing works of the 132 kV transmission line have been completed. Moreover, 100 % tree cutting has been completed. Similarly, 83.15 percent of total electromechanical/hydro mechanical/transmission line works have been completed. A total expense of project till now is Rs. 12 billion.

RAHUGHAT HYDROELECTRIC PROJECT

Project Background

Rahughat Hydroelectric Project (32 MW) which is under construction, is located near Beni of Myagdi district. The Project envisages generating 187.66 GWh energy from the Rahughat river. The Project was initiated with the joint funding of Government of Nepal and Nepal Electricity Authority utilizing the soft loan made available through the Line of Credit from the Export Import Bank of India. The estimated cost of the Project is US$ 67 million (excluding IDC & taxes) out of which US$ 31 million is available from the Export-Import Bank (EXIM Bank) of India for civil works and its construction supervision. The remaining US$ 36 million required for electro-mechanical, hydro-mechanical, transmission line & consultancy is available from the EXIM Bank. It's main civil works comprises of headworks, desander, 6.1 km long headrace tunnel, inclined shaft, power house and tailrace. The 132 kV transmission line up to New Modi sub-station will be 28 km long.

Project Status

Construction of camp facilities for the project includes 14 numbers of buildings out of which 11 buildings have been almost completed. Due to local issues and

contractor's problem, the finishing works are yet to be carried out. The Contractor will be handing over some building in near future.

About 30 hectare of land required for project(camp, road, power-house, etc.) have been acquired. About 1,442 numbers of trees are required to be cut for clearance of construction site for the project works.

WAPCOS Ltd is the Consultant for construction supervision of the civil works. For the construction of Main Civil Works, a Contract agreement was signed on 4th November 2010 with the Contractor IVRCL Limited, India. The Consultant issued the "Notice to Proceed" (NTP) to the Contractor on 30th November, 2012. However, the contractor did not accept the NTP and asked for a claim of nearly NRs. 31 crore. After a long period of negotiation, NEA board asked the Consultant to review/recommend the MOU & addendum to MOU made between NEA & IVRCL LIMITED.

NEA Board accepted the recommendation of the Consultant, WAPCOS Limited, including paying the Contractor NRs 3.93 crores as "Settlement against Claim and Delay Compensation" on 22nd December, 2013. The payment for the Contractor was made through the EXIM Bank in January 2014.

The Contractor was instructed to resume the works

Photo: Rahughat HEP Camp under construction

by bringing the necessary equipments and materials. However, the Contractor almost stopped the construction work of Access Road at all fronts since 13th June, 2014 citing the Company's very poor financial condition.

A team comprising of the representatives of the Ministry of External Affairs (GOI) and EXIM Bank of India visited the site in early July 2014 to assess the problem at site. The line of credit meeting held at Ministry of Finance gave strict instruction to the Contractor to start work at the earliest.

So far, 10 km out of 12.5 km long access road track opening has been made. The Contractor (civil) has built the Contractor's camp, Army camp, Crusher plant and Adit 3 excavations preparation is being carried out. Lack of clearance by the Forest Department of Nepal causes further delay in the access road construction. NEA has already carried out supplementary IEE of 2.5 km of the access road.

At present preparatory work for the excavation of Adit 2 and Adit 3 along with access road construction are being carried out.

The application for prequalification (PQ) for Electro-mechanical works of the project was invited on 4th March 2012. Only one applicant namely Bharat Heavy Electricals Limited, India (BHEL, India) submitted the application for PQ and it has been qualified. Bidding documents are being finalized at present. Similarly, the application for prequalification for Hydro-mechanical work was invited on 9th July, 2012. Eight applicants applied and four have been qualified.

UPPER TRISHULI 3A HYDROELECTRIC PROJECT

Project Background

Upper Trishuli 3A is a 60 MW Run of River hydropower Project located in Rasuwa and Nuwakot districts. The construction of this project was initiated in FY 2010/11. The project is being financed by a soft loan from China Exim Bank. An agreement was signed between the Government of Nepal and China Exim Bank for a concessional loan of 120 million US Dollars. The estimated cost of the project is 125.775 Million US$ and the loan from China Exim Bank is expected to cover the cost of the major project works including Civil, Electro-Mechanical, Hydro Mechanical and Transmission Line works. It is envisaged that this medium sized project under construction through concessional loan will help to improve the power supply in the Kathmandu valley.

The Project structures comprise of a 15 m high, 95 m wide diversion weir, Intake, desander, 4.1 km long headrace tunnel, a surge shaft, a vertical shaft, pressure tunnel, underground powerhouse, a tailrace, 48 km long 220 kV Transmission line and ancillary structures like camp facilities. The 2.3 km new access road to reach the surge shaft and other Project sites, upgrading of 11.5 km existing road and a steel bridge of 55 m span over Trishuli River are also other components of the project. The estimated annual energy generation of the Project is 460 GWh. The construction of this project is being undertaken under Engineering Procurement and Construction (EPC) model.

Project Status

Contract for the major construction work (Civil, electro-mechanical, hydro-mechanical works) was signed on 28 May 2010 with China Gezhouba Group

Company. Ltd. (CGGC) at a cost of 89.1779 Million US$. After signing of the Loan Agreement and subsequent Subsidiary Loan Agreement (SLA) between Government of Nepal and NEA the Contract has become effective since 1st June 2011. The construction work has started from 1st June 2011.

Contract for construction supervision of the project has been signed with Northwest Hydro Consulting Engineers on September 2010. The supervision work has also started since 1 June 2011.

Land acquisition for the major Project work has been basically completed including leasing of land for the temporary facilities.

CGGC has completed construction of steel bridge and a pedestrian bridge over Trishuli River, temporary camp at headworks, excavation of

127.5m long adit no.1, 134.5m long adit no.2, 234.6 m long adit no.3 and 109.32m long adit no.4. At headworks, CGGC has completed first phase of river diversion with installation of 2 Gated weirs, construction of Intake works and 106 m of approach channel. Second stage River diversion work was commenced at February 8, 2014 and excavation of foundation, foundation concrete works, curtain grouting at diversion axis and concrete at stilling basin has also been completed. Excavation for desander basin and 11180 m^3 of concrete up to the invert level of desander flushing in eight panels each of three layers has also been completed. Similarly, 2806.4m out of 4076m (68.85%) headrace tunnel excavation works has already been completed. The drilling operation for two blasting holes of surge shaft head has been started on 24 June 2014 and two holes out of five has been completed.

In underground powerhouse, Powerhouse Cavern (Upper Portion) excavation has been completed. Cable tunnel 169.82m, access tunnel 180.66m, first stage of excavation of drainage tunnel (239.18 m) has also been completed. Defect treatment work of the sheared zone and grouting injection on rock anchored beam has been completed along with treatment for fault alteration zone near rock face crane beam and crane beam concrete work is going on. The concrete lining for colluviums deposit at tailrace tunnel has also been completed on 14 June 2014.

CGGC has been undertaking upgradation of the 11.5 km long access road, access road to Surge shaft, Employer's Permanent camp.

The Transmission line comprises of 46 km long 220 kV line from powerhouse switchyard to Matatirtha substation in Kathmandu. In addition to 46 km overhead line about 1 km of 220 kV underground cable route leads to the Matatirtha Substation and two 132 kV line bay extension work will be installed for interconnection with existing Matatirtha substation. The overhead transmission line comprises of about 4 km 132 kV double circuit single Bison conductors from powerhouse to UT3B Hub substation, about 36 km 220 kV double circuit double Bison conductors from UT3B Hub substation to Bandbhanjyang and about 220 kV four circuit having upper two circuits double Bison conductor and lower two circuits double Moose conductors from Bandbhanjyang to Matatirtha.

The 22.6 million US$ excluding VAT Contract for the Transmission line was awarded to China International Water & Energy Corporation (CWE) in 27 March 2011.The Contract for the transmission line has become effective from 26 February 2012 after the loan agreement between GoN and China Exim Bank was signed on 17 August 2011.

Route alignment survey has been finalized by CWE and Detail survey and geological and geotechnical investigation of the transmission line has been completed. 400 km ACSR 'BISON' Conductor and Anchor Bolt for tower foundations has already arrived at the site. Land acquisition for tower foundation has also been completed and approval for tree cutting has been obtained from the cabinet. Till now two tower foundation concrete work has been completed and other are on progress.

Apart from the works mentioned above, NEA has conducted skill enhancement training to 60 persons from the project site. Four school building, two water supply system, road improvement to Trishuli hospital, supply of hospital equipments, various roads are also on progress under public support program. The Supplementary Initial Environmental Examination (IEE) for Transmission line work has been approved from the concerned ministry.

GENERATION OPERATION AND MAINTENANCE DEPARTMENT

Generation Operation and Maintenance Department (GO&MD), headed by Director, is responsible for operation and maintenance of seventeen (17) hydropower stations and two (2) thermal power plants with an objective to maximize production by optimally utilizing generation resources while undertaking

rehabilitation, periodic overhauling and maintenance of generating facilities. It has always strived to uphold economy, operational efficiency and an acceptable level of reliability in its drive for improvement.

The aggregate installed capacity continues to remain at 523.29 MW with share of 469.29 MW from hydro and 54 MW from thermal plants. The total generation recorded this year is 2,283.34 GWh with contribution of 2,273.59 GWh from hydro and 9.75 GWh from thermal. The Department has strived to increase production of energy year on year basis especially from hydro resources. This yielded record generations from Kali Gandaki A and Middle Marsyangdi since commissioning and highest generation from Marsyangdi in the last 15 years. An increment of 0.86% is observed in actual generation of ROR schemes compared to last year as major plants exceeded their previous performances whereas an increment of 6.18% is observed in storage plants. The maximum water level of Kulekhani reservoir this year was recorded at 1,530.36 masl on 20 December, 2013 and minimum water level was recorded at 1,507.32 masl on 24 May 2014. Identical reservoir levels are expected next year as well considering current reservoir drawdown rate and volume of rainfall in the catchment area. The production of thermal plants has been reduced to half as compared to previous year mainly due to high operating cost compared to their hydro counterparts.
The generation target of 2,170.38 GWh was set this year for ROR schemes whereby a shortfall of 37.46 GWh is observed despite major plants exceeding the targets. The shortfall is reportedly due to problems in Gandak, Trishuli and Modi although improvements were observed in Modi compared to previous year. The aggregate plant factor of generating plants this year is 49.81% with 64.54% that of ROR power plants. Only 1.3% of available energy is consumed by generating facilities thereby retaining self sufficiency ratio of 98.7 %. The Department continues to work on corrective/preventive maintenance, periodic overhauling and major maintenances of facilities along with rehabilitation projects which are financed from its own sources and/or Government of Nepal and/or multilateral development agencies.

Apart from preventive and corrective maintenance works, periodic overhaulings were carried out in Unit No. 1 of Kali Gandaki A, Unit No. 2 of Middle Marsyangdi, Unit No. 1 of Trishuli and Unit No. 1 of Puwa Khola. Major maintenance works include commissioning of Digital Governor and AVR of Unit No. 1 of KL-I, commissioning of new three phase Power Transformer in KL-II, deployment of online sediment monitoring system in Middle Marsyangdi, emergency repair of generator of Unit No. 6 of Trishuli, installation of Digital Governors in Modi Khola and installation of VCBs with C&R panels in Panauti. The damaged interfacing transformer of Chatara is being repaired at NEA Transformer Workshop in Hetauda. Comprehensive investigation and subsequent rehabilitation have also been planned for Gandak and Chatara to rectify the damages and alleviate the degraded performance of equipments.

This year is marked to be a remarkable year for Kaligandaki A Hydropower Plant Rehabilitation Project (KGAHPPRP) for achieving three significant milestones. Financing Agreement of Kali Gandaki A Hydropower Plant Rehabilitation Project was signed between Nepal and International Development Association (IDA) on 11 September, 2013 followed by Project Agreement between International Development Association (IDA) and Nepal Electricity. International

RCC Works of Retaining Structure on Downstream of Undersluice Gate of Modi Khola

Development Association (IDA) has agreed a credit in an amount equivalent to eighteen million two hundred thousand Special Drawing Rights (SDR 18,200,000). Subsequently, Government of Nepal has signed a Subsidiary Loan Agreement (SLA) with Nepal Electricity Authority on 8 December, 2013.

Rehabilitation of KL-I, Panauti, Devighat, Seti and Gandak under Power Plant Rehabilitation Project, financed by GoN, was implemented in an effort to improve the performance of ailing plants. Modernization of excitation system of Marsyangdi and installation of Trash Rack Cleaning Machine in Gandak are jointly financed by Asian Development Bank (ADB) and GoN under Energy Access and Efficiency Improvement Project (EAEIP) whereas rehabilitation of Tinau and Sundarijal small hydropower plants is only financed by Asian Development Bank (ADB) under Electricity Transmission Expansion and Supply Improvement Project (ETESIP). All Projects are currently in progress and at different stages of implementation. Rehabilitation of Modi Khola, financed from own sources, is primarily implemented to enhance sediment handling capabilities and rectify damages to facilities. It involves civil modifications and

improvements of desander facilities, rectification of diversion weir and right wing retaining wall, demolition of upstream boulders in addition to electromechanical repairs which include improvement in trash rack panels and maintenance of under sluice gates.

Ageing plants coupled with ageing workforce, unavailability of spare parts, rapid technological progress and burgeoning O&M costs pose mounting challenges in the days ahead. The Department continues to work in the generation improvement initiatives which include enforcing preventive maintenance schedule, timely overhauling, training of staffs, reducing self consumption and rapid response to breakdowns thereby reducing equipment down times.
The following section gives a terse overview of plants and activities carried out during this fiscal year.

1. Kaligandaki 'A' Hydropower Station

Kaligandaki 'A' Hydropower Station is the largest power plant of Nepal with installed capacity of 144 MW and annual design generation of 842 GWh. It is located at Krishna Gandaki, Syangja. It has achieved the highest generation of 864.103 GWh this year since

commissioning in 2002. The significant maintenance work this year includes overhauling of Unit No. 1 from 9 March 2014 to 19 April, 2014, under which repair and replacement of HVOF coated runner, guide vanes set and new facing plate were carried out in addition to repair of wear rings and application of Metaceram. Maintenance of diversion gate 1 and 3, under sluice gates, desander flushing gates and concreting on the base of desander were also carried out in dam gate structure. As part of electro-mechanical works of Kali Gandaki A Hydropower Plant Rehabilitation Project (KGAHPPRP), Contract Agreements for direct Contract packages for Supply of Generator and Turbine Spare Parts and Supply of MIV Spare Parts have been concluded between Nepal Electricity Authority and Toshiba India Pvt. Ltd. The other three competitive packages consisting of Turbine Spare Parts & Repair of Turbine, Supply of Spare Parts for Power House Auxiliary System and Installation of Trash Rack Cleaning Machine are under evaluation. In Technical Assistance and Capacity-Building component, short-listing of Consultants is completed and evaluation of proposals is underway. The Consultant is expected to commence the services from November, 2014.

2. Middle Marsyangdi Hydropower Station

Middle Marsyangdi Hydropower Station with installed capacity of 70 MW and annual design generation of 398 GWh is located at Bhoteodar, Siundibar, Lamjung. It has recorded the highest generation of 434.17 GWh this year since commissioning in 2008. Major works carried out this year include installation of an online sediment

monitoring system at headworks intake and powerhouse penstock to acquire real time sediment status of turbine system, emergency repair of turbine parts of Unit No.1, strengthening of desander flushing channel outlet's foundation and repair of all three Desander Bieri. As in previous years, erosion resistant epoxy based compound was applied in all three spillways and flap gate wall upto 20 m on either side. Unit pre-startup conditions were modified to avoid unnecessary blocking of unit startups due to spurious signals. Also, low level alarm was added and tripping level of surge tank was lowered in Controcad system to reduce frequency of plant trips especially during low reservoir levels.

3. Marsyangdi Hydropower Station

Marsyangdi Hydropower Station with installed capacity of 69 MW and annual design generation of 462.5 GWh is located at Aanbookhaireni, Tanahun in the central region. It was commissioned in 1989 AD. It has consistently performed well thereby generating 461.69 GWh this year exceeding all previous years generations for the last 15 years. Its outstanding operational performance is rightly supported by periodic overhauling of Units, which was carried out in Unit No. 2 this year from 9 March, 2014 to 12 April, 2014. Contract Agreement was signed between Nepal Electricity Authority and Alstom Power GmbH on 29 January, 2014 for repair and maintenance works of GIS and its execution is planned for mid September, 2014. Excitation System Modernization under Energy Access and Efficiency Improvement

Project (EAEIP), Loan Number: 2587-NEP (SF) which is jointly financed by ADB and GoN will be carried out by Voith Hydro GmbH & Co. KG, Germany next year.

4. Kulekhani-I Hydropower Station

Kulekhani-I Hydropower Station is the only seasonal storage type Plant in Nepal with installed capacity of 60 MW and annual design generation of 211 GWh (165 GWh

primary and 46 GWh secondary). It was commissioned in 1982 AD and is located at Dhorsing, Makwanpur. The availability of this Plant is critical to INPS. The plant was principally designed for operation during dry season when potential capacities in other run of river schemes are significantly reduced. Major works this year consist of installation of 3 numbers of 11 kV SF_6 circuit breakers, replacement of station MOCBs of primary distribution by VCBs with C&R panel and installation of combination panel of Digital Governor and AVR in Unit no. 1 identical to that of Unit No. 2. Existing 66 kV XLPE cable laid between indoor Power Transformers and outdoor switchyard is considered for replacement after it failed twice previously. Civil repair works include maintenance of shot crete and debris mitigation at dam, construction of gabion wall and penstock painting.

5.Kulekhani-II Hydropower Station

Kulekhani-II Hydropower Station having installed capacity of 32 MW and annual design generation of 104.6 GWh is a cascade of Kulekhani-I with diversion

of Mandu River to specially built intake. There is also a special facility to pump water from a nearby Rapti River to KL-II. This Plant is located at Nibuwatar, Makwanpur and was commissioned in 1986 AD. The catastrophic fire and explosion in switchyard last year inflicted severe damages to facilities resulting prolonged disruptions and painstaking recovery. In an endeavor to recover, new 3 Phase, 132/6.6 kV, 26/37.8 MVA Power Transformer was commissioned on 14 January, 2014. Outdoor 132 kV SF_6 Gas Circuit Breakers consisting of 1 (one) number triple pole and another 2 (two) numbers single pole which have already been supplied are planned to commission in August, 2014. Earthing resistance improvement work was also carried out in switchyard.

6. Trishuli Hydropower Station

Trishuli Hydropower Station is constructed on the banks of Trishuli River at Trishuli Bazar, Nuwakot. Initial installed capacity was 21 MW having 7 units of 3 MW each. It was commissioned in 1967 AD in assistance with the Government of India at a cost of INR 140 million. It was later rehabilitated in 1995 AD and upgraded to 24 MW with 6 units each 3.5 MW and one unit 3 MW. It is a peaking run-of-river plant with peaking capacity of 21 MW and annual design generation of 163 GWh. Major activities this year include restoration of Unit No. 6 on 24 September, 2013 after emergency repair of generator and overhauling of Unit No. 1 in which replacement of runner and repair of wicket gates were carried out. Efforts

are underway to restore Unit No. 7 which is down due to problems in Auto Start/Stop Panel since 15 August,

2013. Balancing reservoir extension and sedimentation minimization works look plausible alternatives to utilize the Plant's full potential in future.

7. Gandak Hydropower Station

Gandak Hydropower Plant is a canal drop plant located in Western Canal at Surajpura, Nawalparasi. This Canal with maximum discharge of 12,000 cusec advances further for irrigation in Uttar Pradesh, India. The Plant has three horizontal mounted tubular bulb type low head high discharge Kaplan turbo-generators of 5 MW each with aggregate capacity of 15 MW and annual design

generation of 106.38 GWh. It was commissioned in 1979 AD in assistance with the Government of India. Operational performance of the Plant is deteriorating after rupture of coupling bolts of Unit No. 2 & 3 in July, 1999. Presently, Unit No. 1 is not in operation since 1 October, 2008 due to damages in its stator windings. Excessive leakage of turbine oil from runner bushing and oil sealing rings inhibited operation of Unit No. 2 since 27 April, 2014. Unit No. 3 is also not in operation since 12 February, 2013 due to wear and tear of turbine parts and problems in governor and excitation systems. Given the present status of Plant, Generation Directorate is considering a thorough investigation and rehabilitation in assistance with the GoN.

8.Devighat Hydropower Station

Devighat Hydropower Plant with installed capacity of 14.1 MW and annual design generation of 144 GWh is a tailrace development of Trishuli Hydropower Plant. It is located at Devighat, Nuwakot and was commissioned in 1984 AD. Improved operational performance is observed after successful completion of rehabilitation in 2011. Significant works this year include replacement of AC-DC and DC-DC converters and programming of Distributed

Processing Unit (DPU) and I/O cards of governor control panel of Unit No. 1 and replacement of outdoor 66 kV Y-Phase Bus PT. Inspection of Ni-Cd battery bank was carried out after problems were observed and subsequent testing resulted in finding of 9 dysfunctional cells. Other activities include construction of gabion retention wall for flood protection and protection of 66 kV steel tower located on the banks of Trishuli River.

9. Modikhola Hydropower Station

Modikhola Hydropower Station with installed capacity of 14.8 MW and annual design generation of 92.5 GWh is located at Dimuwa, Parbat. It was commissioned in 2000 AD. Operation of this Plant has been adversely affected especially during rainy season reportedly due to sub-optimal design and inadequate sediment handling facilities. Ongoing rehabilitation works is expected to improve its performance. Major works this year include installation of digital Governors, repair of inlet valves and replacement of spindle seals in desander, intake and sand purging gates located at headworks. Problematic heat exchangers of thrust bearing in both units were also replaced.

Among rehabilitation activities, 70% of one of the two boulders located at upstream has been demolished to uniformly distribute high flood towards diversion weir and under sluice. Diversion weir rectification works which include replacement of plum concreting of

downstream apron with RCC apron and construction of cutoff wall at the end and application of epoxy paintings are in progress. The existing tilted right wing wall has been replaced with new RCC cantilever retaining wall.

Erection of protection wall has also been completed for bye-pass steel pipe system on the right bank of regulating pondage. In hydro-mechanical works, stop lugs of under sluice gates has been repaired and detail design drawings are being reviewed for improvement of intake trashrack panels.

10. Sunkoshi Hydropower Station

Sunkoshi Hydropower station, located at 81 km east from Kathmandu on the upper reach of Sunkoshi River in Sindhupalchowk, is a run-of-river daily pondage power plant having installed capacity of 10.05 MW and annual design generation of 70 GWh. The powerhouse was first operated in January 1972. It was constructed in assistance with Water Conservancy and Electric Power Ministry of the People's Republic of China and Government of Nepal. The Project cost was approximately NRs. 109.4 million including 66 kV single circuit transmission line up to Kathmandu. Overhauling

of Unit No. 3 scheduled for this year could not take place and is postponed for next fiscal year. Construction of gabion wall near the Workshop, barbed wire fencing near Balka, drain cleaning along the power canal, replacement of shaft-seal of Unit No. 2 & 3, repair of control cables and control system accessories of Intake Gate No. 3 and replacement of damaged trashrack panels at intake in headworks were carried out this year.

11. Illam (Puwakhola) Hydropower Station

Puwa Khola Hydropower Station is a run of river type with installed capacity of 6.2 MW and annual design generation of 48 GWh. It is located at Golakharka, Ilam. It was commissioned in 1999 AD and was jointly developed by Government of Nepal and NEA at a cost of USD 15.7 million. It has two identical units of 3.1 MW each and has generated 29.60 GWh of energy this year. Major repair and maintenance works this year include overhauling

of Unit No. 1 whereby Pelton runner, needle, nozzle and oil cup seals were replaced. Construction of gabion wall at intake site, drainage repair of access road and maintenance of headtank crack were also accomplished this year. The penstock which has problem of movement reportedly due to weak geology was rectified to some extent by constructing saddle support and erecting manhole. This problem, however, requires a thorough geological investigation in the future.

12. Chatara Hydropower Station

Chatara Hydropower Station, a canal drop type power station, is located at Chatara, Sunsari with installed capacity of 3.2 MW and annual design generation of 6

GWh. It was commissioned in 1996 AD in assistance with Government of India at a cost of NRs. 162.6 million.

The plant which was originally designed to be a captive plant powering drazzer pumps to flush sediments from the Canal was later handed over to NEA by Sunsari Morang Irrigation Project (SMIP) on 29 March, 1999. A 3,500 kVA, 11/33 kV grid interfacing transformer was damaged on 13 May, 2013 and repair works are underway at NEA Transformer Workshop in Hetauda. This disrupted normal operation of both units and Unit No.1 was managed to operate in isolated mode. Unit No. 2 requires repair and maintenance in turbine runner assembly, auxiliaries and electrical controls to bring it into operation. The Department has initiated for rehabilitation of this plant from original equipment manufacturers.

13. Panauti Hydropower Station

Panauti Hydropower Station is constructed on Roshi Khola located at Khopasi, Panauti, 35 km east of Kathmandu with installed capacity of 2.4 MW and annual design generation of 6.97 GWh. It was commissioned in 1965 AD with assistance from the then Soviet Union at a cost of NRs 27 million. The Project was designed for operation of only two units at a time with third unit as a standby. Power canal of 3,721 m long with discharge of 3.2 cu. m/s from headwork to reservoir has seven (7) outlet gates for irrigation in the vicinity of Khopasi.

GoN is assisting in rehabilitation of this Plant under which rewinding of stator coils, replacement of switchgear and protection system and repair of mechanical parts in Unit No. 1 & 3 are underway. This Plant further requires refurbishment of excitation and governing system along with outdoor power transformers and switchyard elements.

14. Seti Hydropower Station

Seti Hydropower Station is a run of river plant with installed capacity of 1.5 MW and design generation of

9.8 GWh. It consists of 3 units of 0.5 MW each. It is located at Nadipur, Pokhara and was put into operation in 1985 AD with assistance from the People's Republic of China. Power canal of this Plant serves both objectives of irrigation and energy. Intake of the canal is regulated primarily for irrigation by Department of Irrigation and hence, normal operation of the Plant sometimes gets affected regardless of availability of Units. Some of the works carried out this year include repair of runner and guide vane of Unit No. 1, temporary relocation of desander gate and maintenance of power canal and protection of Furse Khola.

15. Fewa Hydropower Station

Fewa Hydropower Station is a small 1.0 MW Plant erected at the end of Fewa Canal which was mainly constructed to irrigate land in the vicinity of Birauta. The main Canal starts from the barrage which is located at one end of Fewa Lake at a popular tourist destination called Damsite. This canal after traversing some distance is branched at Ram Mandir to form main and branch

canal. The main canal heads to the East for irrigation and branch canal heads to the South for both power and irrigation. This Power Plant is located at the end of branch Canal at Pardi, Birauta, Pokhara. It consists of 4 units each 0.25 MW and annual design generation of 6.5 GWh. It was commissioned in 1969 AD with assistance from the Government of India. Currently, three units are in operation and Unit No. 4 is not in operation due to problem in generator turbine coupling

16. Sundarijal Hydropower Station

Sundarijal Hydropower Station is located at Sundarijal,

15 km northeast of Kathmandu and serves twin purpose

of water supply and energy. The tailwater discharge is utilized for water supply system to Kathmandu Valley whereas it has name plate combined turbine capacities of 1,300 BHP. This Plant was erected under Colombo Plan scheme whereby the main equipments were supplied by The English Electric Company Ltd., England. It was commissioned in 1934 AD. Considering its operational life, rehabilitation of this Plant together with Tinau Hydropower Plant under Electricity Transmission Expansion and Supply Improvement Project (ETESIP) jointly funded by ADB and GON is currently underway. Project specifications and cost estimates are being prepared by the Consultant

17. Pharping Hydropower Station

Pharping Hydropower Station is the first power station in Nepal, which upholds the legacy of hydropower development in Nepal for more than a century. It was inaugurated by the late king Prithivi Bir Bikram Shah Dev on Monday, 22 May, 1911 (B.S. 1968, 9 Jestha, Monday) at 6:30 PM more than 100 years back by switching on lights in Tundikhel, Kathmandu. It was erected with a grant from British Government at a

cost of NRs. 0.713 million. It is located in Pharping of Kathmandu district, nearly 12 km south from the city. It utilizes spring water from Satmule and Shesh Narayan area. There are two units each 250 kW with an aggregate installed capacity of 500 kW. Previously, only one unit was operated for an hour a day, but currently due to increasing shortage of drinking water. A master plan has been prepared to develop the site as Live Energy Museum with constructions and establishments including scientific research center and model power station of wind, solar and hydro and as a centenary celebration memorial. Inauguration day of this Plant, 9 Jestha, is celebrated as a National Energy Day to mark the beginning of Hydropower Development in Nepal.

18. Multi-Fuel Power Plant

Multifuel Power Plant with installed capacity of 39 MW, is located at Bansbari, Morang in the eastern industrial corridor of Nepal. Out of total installed capacity of 39 MW, 26 MW capacity was put into service in fiscal year 1990/91 and additional 13 MW capacity was put into service in fiscal year 1997/98. It consists of 6 (Six) Wartsila Diesel engines which use furnace oil (FO) as a source of energy. There are two units each 7.5 MVA from Leroy Somer France and four units each 8.144 MVA from Alsthom, France. Rehabilitation of all the six engine sets was successfully completed in December 2012 from the World Bank financed under Power Development Project (PDP). Currently, a total of 36 MW with 6 MW each from all units is available from the Plant. The Plant operates as a backup in INPS and is normally operated for peaking during dry season. Major works this year include installation of plate heat exchanger

(PHE) and modification of cooling pipe line. The plant has generated 4.98 MWh energy this year.

19. Hetauda Diesel Power Plant

Hetauda Diesel Power Plant with installed capacity of 14.41 MW is located at Hetauda, Makawanpur and acts as a standby to hydropower plants. The first phase with three engine sets of English Electric Co. Ltd. was commissioned in 1963 and the second phase with four engine sets of GEC Diesel Ltd. was commissioned in 1980 in assistance with British Government. It adds to generation mix providing operational flexibility. It operates in an emergency, however, soaring fuel prices severely restricts its operation. Presently, it is

able to operate at capacity of 10 MW. Major works this year include repair of 16 CSV Engine cooling towers and turbocharger casing of Unit No. 6 besides routine maintenance works. The plant has generated 4.77 MWh energy this year.

Nepal Electricity Authority

Generation Directorate

Actual Generation for Fiscal Year 2070/71 (FY 2013/14 A.D.)

Unit: MWh

S.No.	Power Stations/Month	Shrawan	Bhadra	Ashwin	Kartik	Mangsir	Poush	Magh	Falgun	Chaitra	Baishakh	Jestha	Ashad	Total
1	Kaligandaki 'A'	98,236.00	95,962.00	91,030.00	86,067.00	76,451.00	54,688.00	43,803.00	39,834.00	42,398.00	53,606.00	84,210.00	97,818.00	864,103.00
2	Mid-Marsyangdi	47,432.32	43,090.80	43,482.69	42,131.62	37,743.81	28,704.88	22,579.19	20,779.62	22,120.37	30,091.88	47,267.25	48,747.28	434,171.71
3	Marsyandi	47,931.30	47,357.80	47,394.30	44,153.30	42,266.00	32,649.90	25,847.80	23,338.40	24,027.60	30,313.80	46,217.80	50,190.10	461,688.10
4	Kulekhani I	9,615.00	3,767.00	521.00	2,938.00	4,051.00	4,539.00	9,733.00	16,711.00	15,278.00	20,471.00	5,986.00	474.00	94,084.00
5	Kulekhani II	4,258.04	1,754.32	229.81	1,369.02	2,014.89	2,187.53	5,074.60	8,576.35	7,643.06	10,162.69	3,063.33	235.89	46,569.53
6	Trishuli	10,315.50	9,158.60	9,723.00	9,709.40	10,094.20	9,736.10	7,996.90	7,159.00	7,402.00	9,364.00	10,278.00	10,910.10	111,846.80
7	Gandak	1,420.70	2,415.30	2,638.40	-	-	1,051.60	64.90	608.90	507.90	64.90	29.70	-	8,802.30
8	Modi	3,071.80	3,522.20	4,795.80	2,274.30	3,230.60	3,521.90	2,607.70	2,779.30	3,182.80	3,963.50	5,160.70	3,527.20	41,637.80
9	Devighat	8,003.46	7,685.89	8,335.05	8,534.80	9,107.44	8,956.04	7,406.10	6,593.80	6,468.00	7,725.01	8,334.85	8,276.56	95,427.00
10	Sunkoshi	7,049.40	6,752.30	6,663.40	6,473.10	6,308.90	4,626.50	3,513.00	3,116.90	3,346.50	3,884.60	6,175.60	6,757.20	64,667.40
11	Puwa	4,083.24	3,842.97	3,546.31	4,015.62	2,737.98	2,009.65	1,101.53	1,034.47	1,069.57	728.42	1,529.81	3,905.38	29,604.95
12	Chatara	727.00	492.50	486.25	108.50	-	132.00	166.00	90.00	133.50	16.75	-	2.75	2,355.25
13	Panauti	254.80	312.12	283.29	316.75	306.40	245.46	113.47	122.30	71.08	70.21	27.55	83.09	2,206.52
14	Seti	868.77	843.12	996.39	961.38	983.43	969.48	888.93	833.31	909.81	985.50	929.61	722.79	10,892.52
15	Fewa	219.99	218.91	254.94	121.17	222.90	249.58	232.50	215.60	100.90	64.73	-	148.92	2,050.14
16	Sundarijal	451.00	454.33	440.33	259.00	238.00	273.66	236.66	204.00	172.33	102.00	245.00	405.00	3,481.29
17	Pharping	0.870	0.850	0.665	0.430	0.415	0.285	0.300	0.360	0.520	0.675	0.325	0.245	5.94
	Total (Hydro)	243,939.18	227,631.01	220,821.63	209,433.39	195,756.96	154,541.57	131,365.59	131,997.31	134,831.93	171,615.67	219,455.52	232,204.50	2,273,594.26
18	Multifuel	-	76.12	914.50	127.32	42.22	392.02	902.63	1,291.11	1,156.51	-	79.00	-	4,981.43
19	Hetauda Diesel	2.20	1.93	0.51	88.63	52.30	16.07	917.86	2,612.70	1,005.10	57.00	6.04	8.58	4,768.93
	Total (Thermal)	2.20	78.05	915.01	215.95	94.52	408.09	1,820.49	3,903.82	2,161.61	57.00	85.04	8.58	9,750.36
	Grand Total	243,941.39	227,709.06	221,736.64	209,649.33	195,851.48	154,949.67	133,186.08	135,901.12	136,993.54	171,672.67	219,540.56	232,213.08	2,283,344.62

Note:
Provisional figures subjected to final audit

Nepal Electricity Authority

Generation Directorate

Generation Related Statistics and Performance Indicators for Fiscal Year 2070/71 (2013/14 A.D.)

S.No.	Power Stations	Total Installed Capacity (MW)	Total No. of Units Installed	Actual Generation (MWh)			Maximum Generation in a year till date/year (MWh)	Design Generation (MWh)	Generation Target (MWh)	Backfeed (MWh)	Transmission to Grid (MWh)	Net Transmission to Grid (MWh)	Local Distribution (MWh)#	Self Sufficiency Ratio (%)	Plant Factor (%)	Current No. of Employees
				FY 2068/69	FY 2069/70	FY 2070/71*										
1	Kaligandaki 'A'	144.00	3	860,754.00	847,258.00	864,103.00	864,103.00 (2070/71)	842,000.00	848,540.19	1,057.00	861,678.97	860,621.97	662.00	99.67%	68.50	163
2	Middle Marsyangdi	70.00	2	425,344.20	428,082.21	434,171.71	434,171.71 (2070/71)	398,000.00	425,887.26	4,797.95	429,452.20	424,654.25	607.34	97.97%	70.80	78
3	Marsyandi	69.00	3	445,899.40	450,136.00	461,688.10	483,928.20 (2052/53)	462,500.00	453,937.50	429,213.00	870,420.20	441,207.20	-	97.70%	76.38	98
4	Kulekhani-I	60.00	2	143,284.00	92,829.00	94,084.00	249,680.00 (2056/57)	211,000.00	136,720.85	103,013.91	187,064.21	84,050.30	8,373.52	99.16%	17.90	112
5	Kulekhani-II	32.00	2	71,448.38	39,642.83	46,569.53	122,757.00 (2056/57)	104,600.00	75,700.69	48.85	45,934.01	45,885.16	-	98.53%	16.61	50
6	Trishuli	24.00	6+1	134,772.80	124,776.20	111,846.80	154,423.75 (2053/54)	163,000.00	135,647.44	148,860.35	247,088.30	98,227.95	13,175.56	99.83%	53.20	82
7	Gandak	15.00	3	13,077.70	19,207.70	8,802.30	52,272.70 (2043/44)	106,380.00	30,487.12	121,320.74	96,084.44	(25,236.30)	33,625.98	99.68%	6.70	41
8	Modi Khola	14.80	2	34,608.40	30,718.60	41,637.80	67,348.90 (2063/64)	92,500.00	53,963.14	56,772.41	80,486.37	23,713.96	16,542.45	98.60%	32.12	40
9	Devighat	15.00	3	105,089.20	100,563.60	95,427.00	106,277.70 (2056/57)	114,000.00	101,834.05	97,806.19	171,584.50	73,778.31	19,394.34	98.83%	72.62	63
10	Sunkoshi	10.05	3	66,383.10	63,577.00	64,667.40	66,383.10 (2068/69)	70,000.00	63,662.75	40.49	62,266.02	62,225.53	1,447.20	98.46%	73.45	61
11	Ilam (Puwa Khola)	6.20	2	28,329.99	30,435.66	29,604.95	34,640.93 (2064/65)	48,000.00	32,653.86	7.53	29,508.89	29,501.36	-	99.65%	54.51	40
12	Chatara	3.20	2	3,032.75	1,643.75	2,355.25	5,219.75 (2063/64)	6,000.00	3,876.78	1,376.68	1,187.84	(188.84)	2,402.90	96.22%	8.40	29
13	Panauti	2.40	3	1,280.16	1,510.81	2,206.52	4,654.80 (2058/59)	6,970.00	2,618.31	1,653.70	398.04	(1,255.67)	3,098.96	90.59%	10.50	28
14	Seti	1.50	3	10,411.29	10,512.54	10,892.52	11,616.19 (2067/68)	9,310.00	10,544.37	-	10,857.50	10,857.50	-	99.68%	82.90	
15	Fewa	1.00	4	1,872.21	2,081.96	2,050.14	3,919.47 (2034/35)	2,200.00	2,366.22	2.40	2,034.58	2,032.18	-	99.12%	23.40	43
16	Sundarijal	0.64	2	4,345.62	4,198.29	3,481.29	4,355.50 (2063/64)	4,770.00	4,362.03	-	3,467.05	3,467.05	-	99.59%	62.09	30
17	Pharping	0.50	2	35.08	15.06	5.94	48.65(2064/65)	-	-	-	-	-	-	-	0.14	5
	Total (Hydro)	**469.29**	**48**	**2,349,968.28**	**2,247,189.21**	**2,273,594.26**	**-**	**2,641,230.00**	**2,382,802.55**	**965,971.20**	**3,099,513.11**	**2,133,541.91**	**99,330.25**	98.74%	**55.31**	**963**
18	Multifuel	39.90	6	623.53	9,954.28	4,981.43	86,215.07 (2055/56)	-	-	1,248.20	4,686.90	3,438.70	-	75.24%	1.43	47
19	Hetauda Diesel	14.10	4+3	940.53	8,868.62	4,768.93	24,203.64 (2055/56)	-	-	-	4,763.93	4,763.93	-	99.90%	3.86	42
	Total (Thermal)	**54.00**	**13**	**1,564.06**	**18,822.89**	**9,750.36**	**-**	-	-	**1248.20**	**9450.83**	**8202.63**	**-**	85.93%	**2.06**	**89**
	Grand Total	**523.29**	**61**	**2,351,532.34**	**2,266,012.10**	**2,283,344.62**	**-**	**2,641,230.00**	**2,382,802.55**	**967,219.40**	**3,108,963.94**	**2,141,744.54**	**99,330.25**	**98.70%**	**49.81**	**1,052**

Note:

**Provisional figures subjected to final audit*

 # Transmission at 11 KV and Local Distribution is considered same

Transmission Directorate

Transmission Directorate is responsible for development, implementation and operation of high voltage transmission system. This directorate is headed by a Deputy Managing Director and has Grid Operation Department (GOD), System Operation Department(SOD), Grid Development Department, Major Transmission Projects 220 kV and Major Transmission Projects 400 kV, each headed by a Director.

This directorate monitors, operates and constructs transmission lines and substation facilities to evacuate power generated by both NEA and IPP owned power plants and undertake reinforcement of the existing transmission system. Nepal's first-ever 400kV Nepal-India cross-border transmission link is being implemented with the leading involvement of this directorate and study work is being initiated for second cross border Bardghat-Gorakhpur 400kV transmission link. The Hetauda-Dhalkebar-Inaruwa 400kV transmission line, which is under construction, will help to build a strong and robust transmission grid in near future. The Khimti-Dhalkebar 220kV transmission line, a pioneer line of NEA at 220kV class, is nearing completion.

This Transmission Directorate is also forging ahead for an updated Transmission System Master Plan upon which NEA intends to develop river basin wise transmission system as a long term strategy for power development of Nepal.

I. System Operation Department (SOD)

As in the past years, Load Dispatch Centre (LDC) has been working round the clock to keep the operation of the Integrated Nepal Power System (INPS) on the right track through the use of computer based Supervisory Control and Data Acquisition (SCADA) system.

The availability of real time data and better communication system have improved the overall availability of power stations and transmission lines and has helped to reduce the number of complete system collapse and minimize the time required for restoration of the power system in case of black-outs, thereby reducing loss of revenue. The number of complete system collapse has been reduced significantly to 22 as compared to 40 in the previous year, and the subsequent complete outage time has been reduced to 264 minutes as compared to 543 minutes in the previous year. The magnitude of load shedding has also been maintained to maximum 84 hours per week.
For the continued smooth functioning of the system, it is necessary that the data acquisition from the power stations and substations be updated according to the latest changes/modifications in the respective stations. The trained manpower in the LDC has been able to keep the data up-to-date in the SCADA software in the LDC. Besides the regular maintenance works, new station Kamane has been integrated into the SCADA software. Around Rs.130 million revenue is being received annually by leasing (to Nepal Telecom and other private companies) the fibers from the fiber optic cable.

II. Grid Operation Department

The Grid Operation Department is entirely responsible for the transmission of reliable and quality power from distant generators to various load centers as well as providing connection facilities to IPPs and Bulk Consumers in different voltage levels by accomplishing Connection Agreement as per NEA Grid Code. Another main function of the Department is to look after the operation of 66kV & above Substations and Transmission Lines along with routine and breakdown maintenance works including up-gradation, extension, replacement works, reactive compensation and rehabilitation works etc. Under the Department there are three division offices respectively in Kathmandu, Hetauda, Butwal and three branch offices respectively in Duhabi, Pokhara & Attaria.

Major Works performed in the F/Y 2070/71 are as follows:

Transformer Upgrading, Compensation and Substation Reinforcement Works (Completed)
This department has executed numbers of Transformer reinforcement, upgrading works in various Substations. With the increase of power demand and Voltage problem, up-gradation, Reactive Power Compensation and rehabilitation of power system equipments in the Substations is being carried out. The existing Transformers after being replaced are reused in other Substations after necessary Overhauling and Maintenance works. Reallocations of such Power Transformers among Substations are a cost effective solution for load management. Grid has completed some of the connection facilities to evacuate Power from Independent Power Producers (IPPs).

Various works executed by this department have supported to reduce forced load shedding caused by

inadequate transformation capacity. The department has carried out and completed following major up-gradation and reinforcement works in FY 2070/71 are as follows:

- Installation of new 132/33kV, 30MVA Transformer Bay at Chandranigahpur S/S.
- Installation of new 66/11kV, 22.5MVA Transformer Bay at Chabel S/S.
- Installation of new 66/11kV, 18MVA Transformer Bay at Patan S/S.
- Installation of new 33/11kV, 16.6MVA Transformer replacing the existing 7.5MVA at Kohalpur S/S.
- Installation of new 33/11kV, 16.6MVA Transformer replacing the existing 7.5MVA at Attaria S/S.
- Shifting and Installation of 33/11kV, 7.5MVA Transformer replacing the existing 3MVA at Mahendranagar S/S.
- Shifting and Installation of 33/11kV, 7.5MVA Transformer at Butwal S/S.

Following major up-gradation & Reinforcement works for Substation are initiated and are under progress

- Installation of new 132/33kV, 63MVA Transformer Bay at Duhabi S/S.
- Installation of new 132/11kV, 30MVA Transformer at Pokhara S/S.
- Installation of new 33/11kV, 16.6MVA Transformer to replace existing 3MVA at Damauli S/S.
- Installation of new 33/11kV, 16.6MVA Transformer to replace existing 5MVA at Dhalkebar S/S.
- Installation of new 33/11kV, 16.6MVA Transformer to replace existing 3MVA at Chanauta S/S.
- Installation of new 132/33kV, 30MVA Transformer at Singati S/S of Singati - Lamosanghu Corridor project as the prject upgraded the existing 132/33kV, 15MVA Transformer at Lamosanghu S/S with new 30MVA.

The Department has successfully accomplished the Grid Connection Agreement with 21 IPPS (Independent Power Producers) for 406.26MW Capacity to mitigate the future load demand.

III. Grid Development Department (132kV Transmission Line Projects)

Brief summary of projects under different stages of development are presented below:

A. Recently Completed Projects

1. Hetauda 132kV Substation and Transmission Line Project

The main objective of this project is to provide dedicated power supply to Shivam Cement Industries located at Hatiya, Hetauda and Rural Electrification of Phaparbari area Makawanpur District. The main component of this Project is 132/33 kV, 30 MVA substation at Kamane and 10 km D/C 33 kV transmission line in lattice tower from Kamane to Hatiya. Total Project cost is NRs. 320

Hetauda-Kamane 132/33kV Substation

Million. This project was commenced on FY 065/066, Construction of the substation was completed and put in to operation on Paush 3, 2070 (December 18, 2013).

2. Matatirtha Substation Expansion Project

Objective of this project is to cater the increasing electricity demand of the western part of Kathmandu

Matatirtha Substation Expansion work

valley and capacity increment of Bharatpur substation. Scope of this project also includes electricity supply to United Cement, Naubise and Laxmi Cement, Lalitpur. Cost of this project is NRs. 240 Million and is jointly funded by loan assistance of ADB, GoN and NEA. The project started in FY 2065/066 and completed, put in to operation on Baisakh 2071 (May 2014).

B. Projects under Execution

1. Thankot – Chapagaon - Bhaktapur 132kV Transmission Line

This project was started in FY2055/056 with the objective of improving and enhancing supply reliability, transmission capacity of the substations within Kathmandu Valley with estimated project cost of US$ 23 Million. Project was scheduled to be completed by FY 2072/073 (2015/016).

Upgrading of Bhaktapur and Balaju substations and construction of new Matatirtha substation under the project has been completed and handed over to Kathmandu Grid Division. Due to protest from local inhabitants in the Lalitpur district, construction of transmission line and substation at Harisiddhi has been stopped. Due to timely unavailability of right of way (RoW) at Lalitpur district, prolongation of construction time, transmission line contract was terminated.

For stringing of conductors on erected towers in Kathmandu and Bhaktapur districts, a new contract had been awarded and conductor stringing work in Kathmandu district has been completed. The line stringing work in Bhaktapur district is undergoing.

2. Dumre – Damauli – Marsyangdi 132kV Transmission Line

The objective of this project is to evacuate and enhance reliability of the power generated by Marshyangdi Power

Dumre Damauli 2nd Circuit Stringing Work is in Progress

Plants. Cost of this project is estimated to US$ 18.62 Million which is jointly funded by loan assistance of ADB, GoN and NEA. This project is started on F.Y 2065/66 and scheduled to be completed by FY 2072/73 (2015/16).

Major component of this project includes construction of 40 km of 2nd circuit transmission line on same existing tower from Middle Marsyangdi-Dumre-Lower Marsyangdi and double circuit 22km transmission line from Dumre tapping to Damauli, construction of 132/33KV, 24/30 MVA New Marsyangdi (Markichowk) substation at dam site of Lower Marsyangdi power plant. As of Ashad 2071, for Transmission Line Construction Package, all transmission line materials received at site, about 12km of second circuit conductor stringing work completed. Construction contract has been signed for substation package.

3. Butwal–Kohalpur-Mahendranagar 132kV Transmission Line 2nd Circuit

The rationale behind this project is to provide adequate power to Western Nepal so as to meet the electricity demand requirement of ADB and Danida funded rural electrification projects in the region in addition to regular electricity demand, to provide power to upcoming cement factories in the region, to evacuate power from Chameliya hydropower plant (30 MW) and to supply part of the Butwal area from Tanakpur to alleviate the present load shedding problem. The line is also required to evacuate 36 MW free power to be received from Upper Karnali hydropower plant.

The scope of Butwal-Kohalpur section consists of second circuit stringing on existing double circuit towers and construction of necessary line bays in associated substations. A 20 MVAR capacitor bank is proposed to be installed at Kohalpur substation as required in NEA's Transmission Plan, 2008. New 132/11 kV substation at Kusum, Banke is proposed to cater the local load of Kusum area and to connect 132/33 kV Hapure substation through 132 kV Kusum – Hapure transmission. The main activities of the project includes 132 kV second circuit stringing on existing double circuit towers between Butwal and Kohalpur (208 km), Replacement of existing ground wire between Butwal and Kohalpur with optical ground wire(211 km), New transformer 132/33 kV, 24/30 MVA at Shivapur substation, New 132/33kV, 30MVA substation at Kusum and 132kV Bay Expansion at substations.

Butwal-Kohalpur 2nd Circuit Stringing Work is in Progress

The project was started in FY 2008/09 with US$ 13.8 million loan assistance from ADB and NRs. 276.4 million from GoN and NEA and is scheduled to be completed in FY 2014/015. As of end of FY 2013/14, the second circuit stringing of ACSR conductor has been completed for the length of 200 km out of 208km and the replacement of ground wire with OPGW has been completed for whole length of 211 km. Bay extension works at existing Butwal, Shivpur, Lamahi & Kohalpur 132 kV substations and construction of new 132 kV Kusum substation have been completed. All substations are ready for Testing & Commissioning.

The scope of works under Kohalpur – Mahendranager second circuit Transmission consists of second circuit stringing on existing double circuit towers (190km), replacement of existing ground wire with OPGW from Kohalpur to Mahendranagar (Lalpur) and construction of necessary line bays in associated substations. Two new 132/33/11 kV substations at Bhurigaun of Bardiya and Pahalmanpurya of Kailali district has been proposed to meet the increased electricity demand of Bardiya and Kailali districts.

The project was started in FY 2011/12 with US$ 20.78 million loan assistance from Asian Development Bank and is scheduled to be completed in FY 2014/015. As of end of FY 2013/14, Contract has been signed for transmission Line Package on 23th February, 2014 and the bid evaluation for Substation package is in progress.

4. Chapali 132kV Substation

Two part of this project are Chapali 132kV Substation and Chapali Substation Expansion.
The objective of the Chapali 132kV substation project is to cater and improve power supply reliability of the increased residential and commercial demand of Northern part of Kathmandu. The project started in FY 2008/09 (2065/066) is scheduled to be completed in 2071/072 (2014/015). Total cost of the project is US$ 16 Million jointly financed by loan assistance of ADB, GoN and NEA.

The main output of the Chapali 132kV substation is to construct new 132/11kV, 30MVA substation at Chapali and built 7.7km long 66kV underground cable interconnection between existing substations at Chabahil and Lainchhour.

As of Ashadh 2071, about 75% of the substation construction work is completed and remaining construction work is in progress.
Second part 132kV Chapali Substation Expansion Project was started in FY 2068/069 with NRs 807 million jointly from ADB and NEA. Project is scheduled to be completed in FY2072/073 (2015/016). The main output of the project includes interlink of 132kV and 66kV voltage level and appropriate bay expansion work at substations.

As of Ashadh 2071, construction contract is signed and construction work is about to start.

5. Kabeli 132kV Transmission Corridor

The objective of this project is to connect Hydro Electric Projects (HEPs) in the Kabeli Corridor to Integrate Nepal Power System (INPS) to facilitate power evacuate of 150 MW and to improve the distribution network of Jhapa, Ilam, Panchthar and Terhathum districts.

Scope of project includes construction of 90 km 132 kV double circuit transmission line from Damak substation to Kabeli substation, replacement 76 km of shield wire with optical fiber ground wire (OPGW) from Duhabi substation to Anarmani substation, construction of 132/33kV substations at Damak, Ilam, Phidim and

132/33kV, 30MVA Damak Substation

Kabeli and community based rural electrification within 2.5 km of either side of the transmission line.

Project Cost is estimated at US$ 37.77 Million and funded by WB, GoN and NEA. Project was started in FY 2062/063 (2006/07) and is estimated to be completed by FY 2071/72 (2015/16).

Project status as of Ashadh 2071, 99% construction work completed of Damak substation, 85% construction work completed of Ilam substation. Both substations are planning to charge soon. Phidim S/S and Kabeli S/S construction work are in progress. 80% transmission line construction material received at project site. Section-I (Damak-Ilam) TL construction work is in progress, out of 95 for first section, 80 tower foundations and 18 tower erection works has been completed. Construction works for second and third section shall be started soon. Public notice has been published for land acquisition for tower foundation work in Section-II and Section-III.

6. Singati-Lamosangu 132kV Transmission Corridor

The objective of this project is to evacuate power from different hydroelectric projects to be developed by different IPP's in the Tamakoshi - Singati basin. Project will construct Singati - Lamosangu 40 km 132 kV Double Circuit Transmission Line and 132/33 kV, 30 MVA substation at Singati. Total cost of the project is about US$ 13 million and is funded by GoN. The project was started in FY 2065/066 and is scheduled to be completed in 2072/073 (2015/016).

As of Asadh 2071, substation civil construction work is completed so far whereas substation equipment erection work is in progress. Land acquisition work at Dolakha for tower footing is completed and Transmission Line construction work is about to start.

7. Hetauda-Kulekhani-II-Siuchatar 2nd Circuit 132kV Transmission Line

The objective of this project is for power evacuation from Kulekhani III Hydroelectric Project which is under

New 132kV Bay Expansion for 2nd Circuit connection at Siuchatar Substation

construction, reinforcement of INPS and to increase the reliability of INPS. The project is scheduled to be completed in 2071/072 (2014/015). Cost of this project is estimated to US$ 2.5 Million and funded by GoN. Scope of the project includes construction of 46km 2nd circuit 132kV Transmission Line on same existing Tower and Bay extension works at substations (Hetauda, Matatirtha and Siuchatar).

As of Ashadh 2071, about 32km 2nd circuit 132kV Transmission Line has been constructed so far from Fakhel to Chaukitol, Hetauda. Work has been stopped by local people of Matatirtha and Hetauda demanding RoW compensation. Construction of four number of 132 kV Bays at Matatirtha, Hetauda and Siuchatar is completed. Testing of the equipments has also been completed.

8. Kusaha-Kataiya 132kV Transmission Line

The objective of this project is to reduce load shedding by increasing import power from India. For this project is upgrading existing conductor from Kusaha to Kataiya by the equivalent size high current carrying conductors called Aluminum Conductor Composite Reinforced (ACCR). Project started in 2069/070 (2012/13) and expected to be completed in 2070/071 (2013/014). Project cost is estimated to US$ 4.0 Million and funded by government of GoN.

As of Ashadh 2071, 12km of Conductor Replacement work at Nepal side has been completed; remaining 3km of Indian portion is in process. Permission from Indian Government has been granted to transport the construction material to Indian side to complete the remaining 3km. After completion of the work, line will enable to import around 150 MW Power from India instead of 80MW.

9. Modi-Lekhnath 132kV Transmission Line

The objective of this project is to increase power evacuation capacity of the IPP's upcoming in the Modi and Madi river basin. Scope of the project includes construction of 132kV Double Circuit Transmission Line 42km from New Modi to Hemja Substation to Lekhnath Substation and New Hemja 132/33/11kV substation. Cost of this project is estimated to US$ 20.39 Million and jointly funded by Exim Bank of India and GoN. The project is scheduled to be completed by FY 2073/074 (2016/017).

As of Ashadh 2071, Detail Survey work is completed; Scoping ToR Document is submitted for approval to Ministry of Energy as part of Environmental Impact Study. Project approval received from Exim Bank of India and Preliminary Officer has been appointed for New Hemja substation Land Acquisition.

10. Solu Corridor (Katari-Okhaldhunga-Solu) 132kV Transmission Line

The objective of this project is to increase power evacuation capacity of the IPP's upcoming in the Solu Corridor and expansion of INPS. It includes construction of 90km of Double Circuit Transmission Line with CARDINAL conductor from Tingla (Solu) substation to Mirchaiya and 132/33kV New Substation at Tingla. Cost of this project is estimated to US$ 29 Million and jointly funded by Exim Bank of India and GoN. The project is scheduled to be completed by FY 2073/074 (2016/017).

As of Ashadh 2071, Exim Bank of India has approved the project, Project Management Consultant has been nominated, Feasibility Study, Survey work and Initial Environmental Examination work completed, Land Acquisition process concluded for Tingla substation.

11. Samundratar-Trishuli 3B 132kV Transmission Line

Objective of this project is to evacuate the generated electrical power from IPP's up coming in the Trishuli, Tadi basin. Cost of this project is estimated to US$ 10.5 Million and jointly funded by ADB/EIB and GoN. The project is scheduled to be completed by FY 2073/074 (2016/017). It includes construction of 26 km double circuit transmission line from Samundratar to Trishuli 3B Hub and new 132/33kV, 2x30MVA Substation at Samundratar, Nuwakot.

As of Ashadh 2071, detail survey work for Transmission Line and Substation has been completed whereas the draft report of IEE is submitted to MOE for approval.

Amount of land price for development of Substation at Samundratar has been delivered to District Administration Office for distributing compensation amount to land owners. Construction of the Project shall be initiated from FY 2071/72.

C. Survey/IEE Study Completed Projects

- Kohalpur-Surkhet 132kV Transmission Line, 50 km
- Ramechap (Garjyang) – Khimti 132kV Transmission Line, 30 km
- Hapure-Tulsipur 132kV Transmission Line, 18 km
- Dordi Corridor (Kirtipur-Udipur/ Marsyangdi) Transmission Line, 16 km

D. Feasibility Study Completed Projects

- Gulmi-Arghakhanchi-Chanauta 132kV Transmission Line, 110 km
- Karnali Corridor (Lamki-Upper Karnali) 132kV Transmission Line, 60km
- Bajhang-Deepayal-Attariya 132kV Transmission Line, 130 km
- Surkhet-Dailekh-Jumla 132kV Transmission Line, 107 km
- Kaligandaki-Gulmi (Jhimruk) 132kV Transmission Line, 43 km
- Dhalkebar-Loharpatti 132kV Transmission Line, 20 km
- Baneshwor-Bhaktapur 132kV DC Under Ground Cable Transmission Line, 12 km
- Rupeni 132kV Substation
- Shyaule 132/33kV Substation

E. Projects under Feasibility Study

- Budhganga-Umedi-Pahalwanpur 132kV Transmission Line, 75km
- Butwal (Gorusinge)-Lumbini 132kV Transmission Line
- Kusaha-Biratnagar 132kV Transmission Line

F. Projects for Power Supply to Cement Industries

Government of Nepal has taken policy of developing transmission line and road networks up to the site to promote cement industries. A minute of understanding was signed between Ministry of Industry (MoI) and NEA. According to the understanding NEA will execute the transmission line project as per the instruction of MoI which in turn will provide required funds. Projects aimed for power supply to cement industries at different stages of implementation are as follows:

1. Kusum - Hapure 132kV Transmission Line

The main objective of this project is to develop transmission system up to the site of Dang Cement Industries to be established at Hapure of Dang. Further extension of this line will benefit Sonapur and Rolpa Cements. The project started in FY 2008/09 with an estimated cost of NRs. 500 million and is financed by GoN.

Hapure 132/33kV, 30MVA Substation

The main activities of this project covers: construction of 22 km Kusum-Hapure 132 kV transmission line and 132/33kV, 30 MVA Substation at Panchakule of Dang. Project achievement till date includes: construction of 42 nos. of towers foundation and Substation except the installation of OLTE, Field testing & commissioning of S/S, land acquisition for towers, agreement with forest department for Row clearance and delivery of OPGW, ACSR bear conductor including insulator and hardware fittings at site. The arrival of towers is in progress. The construction of transmission line is likely to be completed in FY 2070/071.

2. Mirchaiya-Katari 132kV Transmission Line

The objective of this project is to provide power supply to Maruti Cement Industry to be established at Katari. Cost of this project is estimated to NRs. 374 Million and funded by GoN. The project is scheduled to be completed by 2072/073 (2015/016).

Project components includes construction of 132/33 kV, 30 MVA substations at Mirchaiya. For this purpose one circuit of existing Dhalkebar – Lahan 132kV line will be looped-in and looped-out at Mirchaiya in Siraha district to extend the 132kV transmission line to Katari. As of Ashadh 2071, civil construction work is completed, substation equipments are in process to receive at site.

3. Lamahi-Ghorahi 132kV Transmission Line

The objective of this project is to provide power supply to Ghorahi Cement Industry and Ghorahi Municipality. Cost of this project is estimated to US$ 6.5 Million and GoN through Ministry of Finance allocated budget for this work. The project is scheduled to be completed by FY 2072/073 (2015/016). Project components includes construction of 15 km 132 kV transmission line from existing Lamahi Substation to Laxmipur VDC Goglee and construction of 132/33 kV, 30 MVA substations at Laxmipur VDC Goglee.

As of Ashadh 2071, Land acquisition for the substation construction concluded, tender has been called for the civil construction work. Substation equipment design/ manufacturing work completed and is about to receive at site. Forest Field Data Collection work completed for Transmission Line Right of Way, proposal sent to Forest Department for approval.

4. Matatirtha-Naubise 33kV Transmission Line

The objective of this project is to provide power supply to United Cement. GoN through Ministry of Finance allocated budget for this work. Cost of this project is estimated to US$ 2.5 Million. The project is scheduled to be completed by FY 2072/073(2015/016). Project component includes construction of 25km of 33kV Double circuit sub transmission line from Matatirtha to Naubise, 33/11kV, 8MVA Substation at Naubise.
As of Ashadh 2071, substation construction work is in progress, tender is called for 33kV sub transmission line construction.

5. Matatirtha- Malta 33kV Transmission Line

The objective of this project is to provide power supply to Laxmi Cement.Cost of this project is estimated to US$ 2.2 Million and GoN through Ministry of Finance allocated budget for this work. The project is scheduled to be completed by FY 2072/072 (2015/016). Project component includes construction of 30km of 33kV Double circuit sub transmission line from Matatirtha to Malta, 33/11kV, 2X16.5MVA Substation at Malta.
As of Asadh 2071, substation construction work is in progress, tender is called for 33kV sub transmission line construction.

6. Tulsipur-Kapurkot 33kV Transmission Line

The objective of this project is to provide power supply to Rolpa Cement P. Ltd. Cost of this project is estimated to US$ 1.7 Million and GoN through Ministry of Finance allocated budget for this work. The project is scheduled to be completed by FY 2072/073(2015/016).
As of Ashadh 2071, construction of 16 km of 33kV transmission line from tapping point at Tulsipur substation (Salyan) up to the proposed substation construction site at Kapurkot is in progress. Estimate preparation for 33/11kV substation at Koilachaur is in the process.

IV. Major Transmission Projects 220 kV

A. Projects under Execution

1.Khimti – Dhalkebar 220 kV Transmission Line

The project was started in 2059/60 with the objective of enhancing transmission capacity, improving supply reliability, reducing losses and voltage drop through construction of 220kV double circuit line and is scheduled to be completed in 2071/72 (2014/015). The project cost is estimated at US$ 28 Million and is jointly funded by World Bank, GoN and NEA.
The scope of the project includes construction of 75 km long Khimti-Dhalkebar 220kV transmission line on double circuit tower with single circuit of twin Bison ACSR conductor (initially charged at 132kV) and 132kV line bays extension work at Khimti and Dhalkebar substations in the first phase and stringing of second circuit in the second phase.

Khimti-Dhalkebar 220kV Transmission Line

As of Ashadh 2071, 100% Substation equipment supply was completed. Bay extension work at Dhalkebar and Khimti was completed. Stringing of the second circuit is in progress. Out of 188 no. of Tower Pad Foundations, 181 foundations were completed. 178 no. of Tower Erection was completed. 65km out of 73km conductor stringing was completed. Construction work is interrupted due to right of way compensation dispute at Sindhuli.

2. Hetauda - Bharatpur 220kV Transmission Line

The objective of the project is to enhance the transmission capacity and reliability of the Integrated Nepal Power System (INPS), to evacuate the power to be generated by other hydro power plants from western region of Nepal. Cost of this project is estimated to US$ 24.25 Million and funded jointly by loan assistance of WB, GoN and NEA. The project is started in 2009 and scheduled to be completed by 2071/072 (2014/015).

Construction of about 75 km long double circuit Hetauda-Bharatpur transmission line initially to be string single circuit 220kV transmission line and associated 132kV substations are being taken. The substations component includes expansion of existing Hetauda and Bardghat substations and construction of New Hetauda and New Bharatpur substations.

As of Ashadh 2071, almost all transmission line construction materials received at site, Out of 226 towers 86 towers foundation is completed, 33 towers erection completed. Right of way clearance work and land acquisition for tower footing are in progress. Civil

works for New Hetauda and Bharatpur substations are near to completion, substation equipments for both substations receive at site and installation works are in progress.

3. Bharatpur - Bardghat 220kV Transmission Line

The objective of the project is to enhance the transmission capacity and reliability of the Integrated Nepal Power System (INPS) and to evacuate the power to be generated by other hydro power plants from western region of Nepal. Cost of this project is estimated to US$ 17 Million and funded jointly by loan assistance of WB, GoN and NEA. The project is started in 2009 and scheduled to be completed by the beginning of 2072/073 (2015/016).
The project comprises of construction of approx. 74 km long double circuit 220 kV line connecting New-Bharatpur substation (under construction) and existing Bardaghat substation using ACSR "Bison" duplex conductors. 220 kV lines shall be initially energized at 132 kV.
As of Ashadh 2071, 98 % of the transmission line construction materials have been received at site, forest clearance along the alignment is underway.

B. Funding Secured Projects

1. Tamakoshi -Kathmandu 220/400kV Transmission Line

Objective of this project is to increase power evacuation capacity of theTransmission Line to evacuate IPP's upcoming projects in the Khimti, Tamakoshi & Sunkoshi basin and also increase reliability of cross border transmission. Project will construct about 100km of Double Circuit 400 kV Transmission Line but initially charged at 220kV with 220/132/11kV Substations at Barhabise and Mulpani (Kathmandu). Cost of this project is estimated to be US$100 Million and jointly funded by ADB, Norway and GoN. The project is scheduled to be completed by 2074/075 (2017/018).

As of Ashadh 2071, re-survey work at 400 kV voltage level has been completed for New Khimti to Barhabise section and from Barhabise to Mulpani (Kathmandu) is about to start. ToR for IEE study has been sent to the Ministry for approval. Evaluation for appointment of Project Management Consultant has been completed, concurrence from ADB has already been received and waiting for approval from NEA Board for Contract negotiation. Land Selection work at Kathmandu and Barhabise for Substation Construction is undergoing and land acquisition is expected to be completed in coming fiscal year.

2. Marsyangdi Corridor 220kV Transmission Line Project

Marsyangdi Corridor 220 KV Transmission Line Project has been envisaged to evacuate approximately 1000 MW of power generated by different hydropower stations coming on Marsyangdi Corridor. Project will construct 115 km long Double Circuit Transmission Line from Manag (Dharapani) to Khudi HUB (32km), Khudi to Markichok (53km),Markichok to Bharatpur (30km) and 220/132/33kV substations at Dharapani , Khudi, Udipur, Markichok and bay extension at Bharatpur Substation. Cost of this Project is estimated to be US$ 100 Million which is to be funded by ADB and GoN. The Project is started in 2065/066 (2008/09) and expected to be completed on 2075/076 (2018/019).

As of Ashadh 2071, field reconnaissance survey completed with AP location confirmation for Khudi-Markichowk section, Survey License for 220 kV voltage level from Manang-Khudi-Udipur-Markichowk-Bharatput is expected soon. EIA TOR shall be finalized soon once the DoED will issue License from Manang to Bharatput. Land acquisition for Substation Construction at Khudi and Markichowk has been completed. Udipur substation shall be constructed at land owned by NEA at Phaliyasangu, Dalal and bay extension at Bharatpur shall be done at existing land of new Bharatpur substation at Aptari.

3. Marsyangdi-Kathmandu 220kV Transmission Line Project

Objective of this project is to increase power evacuation capacity of the Marsyangdi Corridor and INPS system reinforcement. Cost of this project is estimated to US$ 37.93 Million and jointly funded by ADB and GoN. Project will construct 220kV DC, 85 (km TL from New Marsyangdi (Markichok) to Matatirtha and 220/132kV substation at Matatirtha, bay extension work at New Marsyangdi (Markichok) substation. The project is started in 2066/067 (2009/010) and expected to be completed on 2073/074 (2016/017).

As of Ashadh 2071, detail re-survey of the transmission route is undergoing as previous survey was completed four years ago and some parts of the route has to be realigned because of settlements and physical developments. EIA study is in final stage, land acquisition for 220kV substation expansion at Markichwok has been completed and for Matatirtha substation acquisition process is undergoing.

4. Kaligandaki Corridor 220kV Transmission Line Project.

Objective of this project is to increase power evacuation capacity of the IPP's up coming in the Kaligandaki Corridor. Cost of this project is estimated to US$ 182 Million and jointly funded by ADB and GoN. The project is started in 2066/067 (2009/10) and expected to be completed on 2073/074 (2016/017) Project include construction of 38.2km DC 220kV line from Dana to KusmaHUB , 71.7km DC 220kV from Kusma HUB to New Butwal S/S, 45km DC 400kV from New Butwal

to Bardghat and 220/132/33kV substations at Dana, Kusma, New Butwal and Bardghat.

As of Ashadh 2071, details survey work for Kusma-New Butwal section is completed, re-survey work in 220kV voltage level for Dana-Kusma section is completed, New Butwal-Bardghat section is yet to be done, IEE study report for Dana-Kusma section submitted to Ministry of Energy for approval. Land acquisition for Dana substation is completed, for Kusma substation, process is in progress. Survey License for total Kaligandaki Corridor renew process started.

5. Koshi 220kV Transmission Corridor

Objective of this project is to increase power evacuation capacity of generating stations coming in the Koshi Corridor and expansion of INPS. This project comprises of two components. Main output of the project component 1 is construction of about 110 km of 220kV Double Circuit Transmission Line from Khandbari to Baneshwor to Basantapur to Inaruwa and 220/132/33kV new substations at Khandbari, Baneshwor, Basantapur.

Construction of about 33km of 220kV double circuit Transmission Line from Change (Taplejung) to Basantapur (Terhathum) and 220/132/33kV Substation at Change will be taken as component 2. The total cost of this project is estimated to 110 MUSD (90 MUSD from Exim Bank of India and rest by GoN) and jointly funded by Exim Bank of India and GoN. The project is started in 2065/066 (2008/09) and scheduled to be completed by FY 2075/076 (2018/019) for Inaruwa-Basantapur-Baneshwor-Khandbari section & Basantapur -Change section by FY 2076/077 (2019/020).

As of Ashadh 2071, Exim Bank of India has approved the project; subsidiary loan agreement yet to be signed with GoN, appointment of project management consultant is concluded, Detail Survey from Inaruwa to Basantapur to Khadbari and from Basantapur to Change Completed, IEE Report of Inaruwa-Basantapur-Khadbari transmission line approved by Ministry of Energy, substation land acquisition for Khandbari, Baneshwor and Basantapur concluded, for Change it is in the process.

6. Chilime-Trishuli 3B 220kV Transmission Line Project

Objective of this project is to increase power evacuation capacity of the IPP's up coming in the Chilime, Trishuli basin. Project includes construction of 220kV, 30 km double circuit Chilime to Trishuli 3B substation and 220/132kV substation at Chilime. Cost of this project is estimated to US$ 35.0 Million and jointly funded by EIB, KFW and GoN. Project started at FY 067/68 and expected to be completed by FY 2073/074 (2016/017). As of Ashadh 2071, Detail Survey work for 220kV Voltage Level has been completed, MoU has been signed for IEE Study and ToR/Scoping report for the work submitted to Ministry has been approved, Contract has been signed with M/S Lahmeyer International for feasibility study; which is in final stage. Land acquisition process for substation at Chilime is also in final stage.

7. Trishuli 3B HUB 220kV Substation Project

Objective of this project is to increase power evacuation capacity of the IPP's up coming in the Chilime, Trishuli basin. Project includes construction of 220/132/33kV Hub substation at Manakamana VDC of Nuwakot District. Cost of this project is estimated to be US$ 22.9 Million and jointly funded by EIB, KFW and GoN. Project is expected to be completed by FY 2073/074 (2016/017).

As of Ashadh 2071, Detail Survey work and Environmental study have been completed, Consultant for Detail Feasibility, M/S Lahmeyer International submitted the draft Report of feasibility study; final report is under process. Land acquisition process has been completed.

C. Survey/ IEE Study Completed Projects

Lekhnath-Damauli 220kV Transmission Line, 45 km

V. Major Transmission Line Projects, 400kV

A. Projects under Execution

1. Nepal-India Electricity Transmission and Trade Project (NIETTP) Hetauda- Dhalkebar – Duhabi 400kV Transmission Line

The objective of this World Bank funded project is to establish cross-border transmission capacity of about 1000 MW to facilitate electricity trade between India and Nepal and increase the supply of electricity in Nepal by the sustainable import of at least 150 MW of electricity. The project includes construction of approximately 285 km of 400kV double-circuit Hetauda - Dhalkebar-Inaruwa transmission line, together with concomitant substations. Synchronized operation of the Nepal and Indian grids is another major objective of this project.

As of Ashadh 2071, detailed route survey has already been completed for whole line while check survey of about 194 km has been completed so far. Preparation of plan profile, soil resistivity test are in progress. Tower foundation work is completed at 50 locations and is ongoing at other places. The contract agreement for supply of conductor, earth-wire and OPGW and construction of substations at Hetauda, Dhalkebar and Inaruwa has been signed. Likewise, the evaluation of transformers/reactors" is in final stage. EDF France

has been appointed as consultant for transmission system master plan study, which is under progress. The consultancy service is functioning satisfactorily. Hot spot study has also been completed.

B. Feasibility Study Completed Projects

- Hetauda-Butwal 400kV Transmission Line, 168 km
- Butwal-Lamki 400kV Transmission Line, 300 km
- Lamki-Mahendranagar 400kV Transmission Line, 102 km
- Duhabi-Anarmani 400kV Transmission Line, 100 km

C. Survey/ IEE Study Completed Projects

- Butwal- Sunauli 400 kV Tr. Line
- Duhabi-Jogbani 400 kV Tr. Line

D. Projects under Feasibility Study

- Bardghat-Gorakhpur 400kV 2nd Cross Border Transmission Line
- Mulpani-Naubise-Hetauda400kV Transmission Line
- NewKhimti- Okhaldhunga -Dhalkebar 400kV Transmission Line

VI. Power Development Project – Part C

Power development project (PDP) was originally approved by the World Bank board on May 22, 2003 for SDR 55.2 million. It had three components, and Power Development Project implemented by Nepal Electricity Authority (NEA) is one of them. Additional finance was provided on May 26, 2009 to further enhance NEA components, taking the total project amount to SDR 60.1 million. These funds were provided to address the prevailing power crisis in Nepal through rehabilitation of generation capacity, strengthening of the transmission system, and expansion of distribution access.

Original NEA component includes Chandranigahapur System Reinforcement Project, Distribution and Rural Electrification Project, Khimti-Dhalkebar 220 kV transmission line project and Institutional strengthening project. At the time of restructuring, Hetauda Bharatpur 220kV Transmission Line Project, Distribution system rehabilitation project and Institutional strengthening project (II phase) were started. Similarly under additional financing following activities were included: Hetauda diesel rehabilitation project, Kaligandaki-A HEP rehabilitation project, Duhabi Multifuel power plant rehabilitation project, Bharatpur Bardaghat 220kV transmission line project, Pathlaiya 132kV substation project, Kathmandu valley distribution system strengthening project, implementation of the integrated financial management information system (IFMIS) and conductor procurement for Hetauda-Dhalkebar-Duhabi (HDD) line. The conductor procurement for HDD line was included under the PDP in January 2011 to achieve financial closure of the Nepal-India Electricity Transmission and Trade Project (NIETTP). However, it could not be materialized under PDP funding. Instead, it is now proposed as additional funding under NIETTP.

Chandranigahapur system reinforcement project and Distribution and Rural Electrification Projects are now complete. However, Khimti-Dhalkebar 220kv transmission line project is only 95% complete. Some of the local problems in the area have delayed progress to be made in Khimti-Dhalkebar 220 kV transmission line. Similarly, the Distribution System Rehabilitation Project, Hetauda diesel rehabilitation project, Duhabi multifuel power plant rehabilitation project and Pathlaiya 132kV substation projects are complete. However, the Hetauda-Bharatpur 220kV transmission line project has been significantly affected due to rerouting and delays in forest clearance. The forest clearance has now been received and the contractor is trying to expedite the work. A substantial proportion of the activity has been extended beyond the loan closing date, i.e. December 31, 2013. Similarly, having taken more time in securing Forest Clearance approval from the Ministry of Forest, implementation of Bharatpur-Bardaghat 220kV transmission line project has been extended beyond the loan closing period.

Further, the following three activities are cancelled from PDP: (1) Conductor for Hetauda-Dhalkebar-Duhabi line, (2) Rehabilitation of Kaligandaki-A plant and (3) Implementation of the Integrated Financial Management Information System (IFMIS) and procurement of System Integrator (SI). Funds for conductors, system integrator for IFMIS and remaining part of Hetauda Bharatpur 220kV Line Project and Bharatpur Bardghat 220kV transmission line projects have been allocated as an additional financing under NIETTP.

The 144 MW Kaligandaki-A is the largest hydropower plant in Nepal, providing nearly 22% of the electricity supply. Although it is in urgent need for rehabilitation, identification of technical solution has taken much longer than originally anticipated. The World Bank has already proposed funds for rehabilitation of Kaligandaki – A Hydropower Plant as a stand alone project. While the overall PDP project is closing on December 31, 2013, the disbursement ratio currently remains at 90%.

Distribution and Consumer Services Directorate

NEA board made decision to change the various business groups of NEA in to Directorates, as per which the Distribution and Consumer Services (DCS) Business Group was also changed to DCS Directorate (DCSD). DCSD is responsible for overall management of electricity distribution services and networks of NEA. The major activities of this directorate include planning, expansion, operation, maintenance and rehabilitation of the electricity distribution networks including substations up to 33 kV voltage level and consumer services activities such as new consumer connections, meter reading, billing, and revenue collection. The directorate has lately introduced some of the smart meter reading and billing techniques as a pilot projects in the Kathmandu valley with plans to introduce even better techniques and expand them in the entire areas. The operation and maintenance of off grid small hydro power plants in its area, also falls under the jurisdiction of this directorate. There are Planning and Technical Services Department (PTSD) and Community Rural Electrification Department (CRED) at the central level and eight regional offices to manage the overall distribution and consumer services activities in more effective and efficient manner under this directorate. During review period of FY 2013/14, it was initially headed by the General Manager as a chief of business group and subsequently by Deputy Managing Director as a chief of DCSD. Under the directorate, PTSD & CRED at the centre and eight regional offices are headed by the Directors/chiefs.

DCSD is the largest directorate of NEA in terms of number of employees and business activities. Approximately 67% of the total staff of NEA are employed in DCSD. This is also on the forefront to earn revenue for sustaining operation, maintenance and development activities of NEA. DCSD is providing services to consumers through its 90 Distribution Centers spread over the whole country.

Performance Highlights

In FY 2013/14, total number of consumers under DCS reached 2,712,633 an increase of 4.36 % over the last fiscal year's figure. In comparison to the previous years, less increase in consumer number in last fiscal year was due to unavailability of energy meters. However, it is expected to increase substantially once the energy meters are available in the first quarter of the FY 2014/15.

Consumer Category	No of consumer (% of total consumers)	Sales %	Revenue %
Domestic	94.37	44.08	44.03
Non-Commercial	0.58	3.33	5.07
Commercial	0.54	8.13	11.59
Industrial	1.47	35.80	34.00
Others	3.01	8.19	5.29

Similarly, in FY 2013/14, a total of 3413.76 GWh of energy was sold earning a gross revenue of Rs. 27392.84 Million, an increase of 8.10% and 8.03% over the previous year's energy sales and revenue respectively. Industrial and Commercial consumer categories combined together represent only 2.01% of the total number of consumers but shared 43.93% of total sales. Similarly, the domestic consumer category represents 94.37% of total consumers and contributed 44.08% to the total sales.

Programs and Activities

The programs and activities of DCSD were hard hit in FY 2013/14 due to unavailability of goods, specially the distribution transformers and meters and metering equipments due to ongoing rift on procurement practices. However, it was resolved with relentless effort and the goods are now expected for store delivery by the first quarter of FY 2014/15, after which the consumer services activities shall be smoothly run. DCSD took special drives to expedite the activities for loss reduction, metering & billing and decreasing amount receivables from black listed consumers. An additional collection of about Rs. 50 million and Rs. 43 million was made from additional billing and collection from black listed consumers respectively during the period of review. The goods on stock were closely monitored which resulted in substantial decrease in the stock material/amount. As part of reinforcement and expansion of the distribution systems, many programs, projects and the activities are undertaken in FY 2013/14 to expand and improve the service delivery. These programs and activities are executed by the Departments at center and Regional Offices.

Loss Reduction Activities

In FY 2013/14, special drives were initiated to reduce the technical and non-technical losses. Feeder-wise loss evaluation was continued and extra load shedding hours were set for high loss prone feeders. This practice was found substantially effective to bring down the losses of such feeders. At the same time, distribution centers were assigned loss targets to achieve within the prescribed time frame. This was also linked with the performance of concerned distribution center chief and a significant loss reduction was observed in many areas. Special drives were initiated for monitoring and supervision of overall DCS activities with priority for loss reduction. Regular review meetings were organized at the central as well as regional level. The special efforts of the employees and the support of the various governmental and nongovernmental institutions in controlling non technical losses brought in good results. The overall result towards loss reduction was found to be encouraging during review period. The Business Group carried out regular monitoring of the feeders and areas having more than 30% energy loss. The activities of the Loss Controlling Committee formed under the chairmanship of Chief District Officer were effective enough to reduce non-technical losses. The support from local administration was commendable in some districts as Kapilbastu and Chitawan. Loss Controlling Committee at the center level issued directives to the concerned offices to improve the loss situation. During the FY 2013/14, a total of 32952 numbers of consumer lines were disconnected from which Rs 413,570,000 was recovered. Similarly action was taken against 2147 consumers for electricity pilferage and Rs 15,461,000 was recovered from it. Regular monitoring, data downloading and analysis of the large industrial and commercial consumers were augmented.

Significant loss reduction was observed in many high non technical loss prone areas by the use of Ariel Bundled Conductor (ABC) cable. Upgrading of overloaded conductors and transformers was also carried out to reduce the non technical losses. As per NEA decision, the electromechanical meters of the consumers of capacity 25-50 kVA range continued to be replaced with electronic (TOD) meters. Despite the adverse working conditions at local levels, especially in terai and some hilly areas, continued efforts and measures taken to control losses brought fruitful results by bringing down the distribution system losses to 17.92 % in this period.

Demand Side Management

With grant assistance from Asian Development Bank, DCSD completed program to distribute 750,000 energy saving CFL lamps in selected areas. Installation of capacitor banks in Nepalgunj, Jaleshwor, Rajbiraj and Tanki-Sinuwari substations resulted substantial voltage improvement in the areas. The construction of 33/11 kV Substations near load centers continued during review period and majority of them are expected to complete in FY 2014/15. This will substantially reduce the losses in the feeder lines and improve reliability of electricity supply.

Future Plans and Programs

As high system loss is a major challenge for NEA, DCSD is trying to make every effort to bring down the distribution system loss which contributes in substantial proportion. It is also planning to improve the quality of the services through the use of new technologies and capacity building to meet the challenges of new environment in utility business. Consumer complaints shall be addressed without delay and the procedure for new connection related works shall be made simple and user friendly. DCSD is committed to establish centralized customer care center to ensure single point of contact for all consumer related activities, timely service, less processing time for new connection and centralized control and monitoring over the entire customer care process. NEA is planning to implement Automatic Meter Reading (AMR) system. Plans are to make available the payment and billing information in internet so that consumer can access information on line. A system will be implemented for consumers to pay the electricity bill either through bank or in NEA's revenue collection center. Payment KIOSK shall be installed in major branches to facilitate bill payment outside office hours.

Safety is one of the aspects where DCSD is entrusting major priority. In this regard, not only the NEA employees, public awareness is also important. For this the directorate is giving priority for people's awareness

People's awareness campaign towards electrical safety organized in Chitwan district by Jagatpur-Madi 33 kV line project

for electrical safety, right from the implementation of the project.

Various programs and activities under DCSD are executed by the Departments at center and Regional Offices.

Some glimpses of the major activities undertaken are presented below in subsequent headings.

Planning and Technical Services Department

The Planning and Technical Services Department (PTSD) is responsible for planning and preparation of distribution system expansion programs and supporting DCSD in the technical and commercial matters. The department is trying to introduce distribution planning first time in NEA with the help of the World Bank. Major works under this department include-

- Identification of potential rural electrification and substation rehabilitation projects and implement them
- Programming/re-programming, data download and analysis of TOD energy meters & metering equipments
- Monitoring and evaluation of region wise monthly distribution system losses. Assist to identify and implement programs for loss reduction in distribution systems
- Initiate modern facilities for the electricity consumers in the field of meter reading, billing and revenue collection
- Plans to execute distribution planning incorporating demand side management and loss reduction as an integral part of it

Ninety collection centers have computerized billing system till date and plans are to extend it to all with modern facilities in the coming years. The Computerized Billing Division under PTSD has plans to cover entire distribution centers within Kathmandu valley with 'Any Branch Payment System'. With addition of four collection centers in FY 2013/14, all distribution centers in the valley, except Maharajgunj, Thimi and Bhaktapur, have facility of 'Any Branch Payment System' till date. The department is also implementing AMR for high valued consumers and study are under way to introduce SMS billing as well.

Energy Monitoring and Auditing of Distribution Substations

Under the program, static energy meters were installed at distribution substations to measure the amount of energy delivered by the substations enhancing the energy accountability. The Planning and Technical Services Department co-operated with Grid Operation Department to install ToD meters in various grid substations. The static meters installed at different substations were downloaded to check and verify the data. The program for installation of Bulk Supply Meters and the Metering Unit was also continued in FY 2013/14. The energy monitoring and audit was also augmented verifying the data with concerned transmission grid and generation units.

Project Highlights

1. Energy Access and Efficiency Improvement Project

This project is being implemented under ADB loan/grant. The various subprojects under this are as follows.

Project for Energy Efficiency through Loss Reduction

This project has been started with the objective of reducing technical losses in the distribution networks of Kathmandu valley and Birgunj Simara corridor. This project is jointly financed by Asian Development Bank (ADB), GoN and NEA. The project has identified 27 distribution feeders with unacceptable high loss in Kathmandu valley and Birgunj where rehabilitation is required. The scope of this project includes upgradation of 462 Nos of Distribution Transformers (100, 200 and 300 kVA), replacement of 214 Km of overhead 11 kV undersized ACSR conductor with 120 sq.mm. XLPE Covered Conductor, use of 35 Km of 300 sq.mm. 11 kV Underground Power Cable and 401 Km of 95 sq.mm. LV ABC Cable. Major Line material for this project are received, check survey is completed and installation work is initiated. The project is scheduled to complete in FY 2014/15.

Distribution System Augmentation Project

This project is jointly financed by Asian Development Bank (ADB), GoN and NEA. The scope of the project includes:

i) Construction of new 33/11 kV, 6/8 MVA substation at Baniyani, Mirchaiya, Dhanushadham, Paraul,

Construction Works of 33 kV S/S at Mirchaiya of Siraha district

Barhathawa, Banskot, Kushma, Mainapokhar and 11 kV switching station in Mirmi, Swoyambhu & Mulpani; and (ii) Construction of 95 km of 33 kV and 156 km of 11 kV

12 kV Indoor switchgears installed at Barhathawa substation in Sarlahi district

lines in the vicinity of substation area.
The construction of substations and interconnection feeders is expected to complete in FY 2014/15.

Project for Solar Powered Street Lighting and Grid-tied PV Solar System

This project is run under ADB Grant and aims to install solar powered street lighting systems in some parts of five municipalities of the Kathmandu valley. This project's scope also includes installing 100 kWp and 60 kWp Grid-tied PV solar power systems in NEA Training Centre, Kharipati and Bir Hospital, Kathmandu respectively. Solar street light project will facilitate the promotion of solar powered street lighting in important places of Kathmandu valley. For the successful implementation of this project, an advisory committee comprising of representatives from Ministry of Federal Affairs and Local Development and members from other stake holders has been set up. The project includes purchase of solar powered street- lighting system, replacement /installation and setting up a system to ensure a smooth maintenance. Around 1000 sets of solar street lamps will be installed which will reduce peak demand by 0.2 MW and save about 700 MWh per year. Two contracts have been signed for supply and installation of solar street lights and one for PV Grid tied solar systems and the project is expected to complete by FY 2014/15.

Energy Efficiency in lighting (CFL) Project

NEA had launched the pilot CFL distribution program in 21 locations of the country successfully in the past and was found to be effective to save energy and create awareness among consumers towards use of it. It encouraged NEA to design and implement additional CFL distribution program in other parts of the country.

Under this project, around 7,50,000 high quality CFLs with a capacity of 14W were distributed. The execution of the program has been completed in march 2014. The objective of this program is to reduce annual energy consumption by 23 GWh. About 450,000 residential customers benefited from this program. The project is financed by ADB & GoN.

Pilot Project for Public Private Partnership in Distribution System

This project is jointly financed by ADB and GoN. The project aims at enhancing the quality of service delivery and overall efficiency through Public Private Partnership program in the sector of electricity distribution. The scope of the project includes procurement of the consulting services for the implementation of Public Private Partnership in three distribution centers of NEA. The consultants have submitted draft bidding document and franchisee agreement which will be used in implementing PPP in distribution. The consultant has shortlisted the distribution centers for implementation.

Expanded Electricity Distribution Project

This is one of the components of Electricity Transmission Expansion and Supply Improvement Project financed by ADB under Loan No. 2808-NEP (SF).The scope of project which is divided into three lots comprises of up-gradation of substations at Gaur, Nijgarh, Chandragadhi, Jare, Belbari, Parasi, Gorkha, Krishnanagar, Taulihawa, Amuwa, Gaddhachauki & Mirmi and development of 11 & 0.4 kV network in the affected area along the proposed Tamakoshi- Kathmandu 400 kV Transmission Line. The total cost of this project is USD 9.5 Million. The contract agreement for all the three lots has been signed and the project is scheduled to be completed by 2015/016.

2. Computerized Billing and Networking Division

The objective of this Division is to implement a common billing system in all the revenue collection centers of NEA for improved billing and revenue collection processes in a modern, efficient and cost effective manner. M-Power Billing system has provided NEA with a wider and more sophisticated array of functions and features that would enhance the billing efficiency and provide greater visibility into the entire process chain.

M-power Billing System is in operation in 90 collection centers which covers more than 50% of the total consumers and covers 70% of the total NEA revenue. Handheld Meter Reading Device (HHD) has also been implemented which is in operation in 55 different collection centers. This has helped reduce human errors during meter reading. Further, this division plans to implement Mpower billing system and Handheld Meter Reading Device in additional 15 collection centers within this Fiscal Year. This division also has plans to implement Handheld Meter Reading Device for TOD (Time of Day) Consumers.

Any Branch Payment System (ABPS) has been implemented in 8 different revenue collection centers inside Kathmandu valley (Ratnapark DC, Naxal Sub Branch, Baneshwor DC, Chabahil Sub Branch, Kuleshwor DC, Balaju Sub Branch, Lagankhel DC and Pulchowk DC) which has helped the customers to pay their bill in any of the above locations with ease. This system will also help NEA to collect revenue and get analytical reports on time.

The replacement of One Month Delay Billing System (PSICOBS) to Mpower (Spot) Billing System has been successfully implemented in 6 locations (Balaju Sub Branch, Kirtipur DC, Nayamill Sub Branch, Nepalgunj DC, Biratnagar DC and Bhairawa DC) in the review period. This has also increased the revenue of NEA for that Fiscal Year. This division plans to complete the replacement of the PSICOBS/RAAS system to Mpower system in the remaining Distribution Centers (Birgunj DC, Janakpur DC, Bhaktapur DC, Kalaiya DC and Rajbiraj DC) within this Fiscal Year.

Automatic Meter Reading is a technology of automatically collecting consumption, diagnostic, and status of electronic energy meter (TOD) and transferring that data to a central database real-time for billing, troubleshooting, and analyzing. This technology mainly saves utility providers the expense of periodic trips to each physical location to read a meter. Computerized Billing and Network Division intends to implement this system in 200 High Value (TOD) consumers as a pilot project within Fiscal Year 2014/15.

Computerized Billing and Network Division will implement the Centralized Billing System of the collection centers inside the Kathmandu valley within this Fiscal Year. For this purpose a Billing Data Center shall be established. A MIS based system with dashboard and snapshot shall be established so that it will be easier for the top management to access enterprise-wide billing, collection and consumer related information with dashboards and snapshots to get an overall operational view of NEA's performance that will facilitate swifter decision making.

This division is also planning to implement third party collections (banks and third party collection) so that it will be easier for the customer to pay from any means provided by the third parties.

Customized training programs were conducted to NEA staff who have been operating with the billing system. The division plans to conduct more training programs to enhance the skill and knowledge of these staff for smooth operation of the Mpower system.

3. Matatirtha Naubise 33 kV Transmission Line Project

This project aims at supplying power to United Cement Industry Pvt. Ltd. in Naubise, Dhading and existing NEA consumers in its vicinity. The project will help to improve the quality of supply and reduce the technical losses of the area also. The scope of the project includes the construction of 33/11 kV, 2*6/8 MVA substation along with double circuit 13 km 33 kV line. The project was started in FY 2009/10 with funds from infrastructure development program of Ministry of Industry, GoN and is scheduled to complete in FY 2014/15.

4. Matatirtha Malta 33 kV Transmission Line Project

This project aims at supplying power to Laxmi Cement Industry Pvt. Ltd. in Malta, Lalitpur and existing NEA consumers in its vicinity. The project will help to improve the quality of supply and reduce the technical loses of the area also. The scope of the project includes the construction of 33/11 kV, 10/13.3/16.6 MVA substation along with double circuit 35 km 33 kV line. The project was started in FY 2009/10 with funds from infrastructure development program of Ministry of Industry, GoN and is scheduled to complete in FY 2014/15.

5. Matatirtha Markhu 33 kV Transmission Line Project

This project aims to meet the growing demand of electricity in Kulekhai area of Makawanpur district and its vicinity. The project will help to improve the quality of supply and reduce the technical loses of the area. The scope of the project includes the construction of 33/11 kV, 6/8 MVA substation along with single circuit 13 km 33 kV line. The project was started in FY 2009/10 with funds from GoN and is scheduled to complete in FY 2014/15.

6. Dhulabari 33 kV Substation Project

The project funded by GoN aims to meet the growing demand of electricity in Dhulabari area of Jhapa district and its vicinity. The project will help to improve the quality of supply and reduce the technical losses of the

Completed Dhulabari 33/11 kV, 6/8 MVA Substation

area. The scope of the project includes the construction of 33/11 kV, 6/8 MVA Substation with interconnection facilities. The construction of Substation has been completed and 4.5 km long 33 kV Sub Transmission Line work is in progress and is scheduled to complete within 6 months.

7. Ramghat (Surkhet) 33 kV Substation Project

The project funded by GoN aims to meet the growing demand of electricity in Ramghat area of Surkhet district along Surkhet-Jajarkot route. The scope of the project includes the construction of 33/11 kV, 6/8 MVA Substation with interconnection facilities. The construction of substation and Loop In Loop Out has been completed and testing & Commissioning work is in progress.

8. Buipa-Okhaldhunga 33 kV Transmission Line Project

The scope of this project includes the construction of 32.5 km of 33kV transmission line, 80 km of 11kV and 80 km of LV distribution line and two 33/11kV, 1.5MVA substations one each at Khotang (Buipa) and Okhaldhunga districts. Pre-commissioning and testing of Buipa Substation has been completed. Construction work at Okhaldhunga S/S is in progress; materials and equipment have been delivered to the site, control building constructed and civil construction is in its final stage. Construction of 32.5 km of 33kV line, 62.9km of 11kV line and 22 km of LV distribution line and 17 nos. of Transformers has been completed and construction of remaining LV line is in progress. Buipa to Bakshila, a major component of project has been almost completed. Bakshila, one of the remote VDC and centre for North-East region of Khotang has been electrified.

Since, 33kV line from Jaljale to Buipa is charged at 11kV, parallel 11kV line is being constructed to free the existing 33kV line to feed the Buipa substation. 55.4 km of 11kV line has been constructed so far. Also Buipa-Lamidanda-Bhadaure(Okhaldhunga district) parallel 11kV line construction has been completed. Maintenance of 33kV line from Jaljale to Buipa is almost complete. The project is expected to complete in FY 2014/15.

9. Rasuwaghat-Khotang S/S and RE Project

Major works to be performed under this Project include the construction of 14 km of 33kV transmission line, one 33/11kV 1.5 MVA capacity substation at Rasuwaghat of Khotang district, 90km of 11kV and 90 km of LV distribution line in Khotang and Udaypur district. Out of these, 6 km of 33kV transmission line, 28.5km of 11kV line and 33km of LV distribution line construction have been completed and 11nos. of distribution transformer have been installed. 33kV Bay extension at Jaljale substation has been completed. Construction of remaining 4km 33kV line is in progress. Store cum Quarter building has been constructed in Bagedhunga, Khotang. 750kVA transformer and accessories have been received. 5km long parallel 11kV line construction has been completed to free Rasuwaghat-Bagedhugna 33kV line. Polling works, line construction for rural electrifications are in progress.

10. Bharatpur-Madi 33 KV Sub-transmission Line & RE Project

This project is financed by the Govt. of Nepal (GoN) and is being implemented for the electrification of Madi area and its vicinity in Chitwan district. The scope of the project includes construction of a 3 MVA, 33/11 kV substation, 20 km of 33 kV overhead line, 8 km of 33 kV underground Cable, 30 km of 11 kV line and 50 km of 0.4 kV line and installation of 24 distribution transformers. The project will provide electricity to about 11,000 households of the area. The construction of substation and U/G cable and Construction of 20 Km of 33 KV overhead line has been almost complete. The project is scheduled to be completed in FY 2014/15.

Besides, the 33/11 kV, 6/8 MVA each substations at Parsa district and Chautara of Sindhupalchok district are under different stages of construction. The aim of these projects is to improve the quality of electricity supply in the area and also to reduce the system losses.

Community and Rural Electrification Department

In order to expand the access of electricity services to the rural areas on the demand driven approach, the Government of Nepal (GoN) has brought forward Community Rural Electrification Program (CREP) since 2003 which is being executed. NEA had established a separate Department" COMMUNITY RURAL ELECTRIFICATION DEPARTMENT (CRED)" to efficiently conduct the Community Rural Electrification Program of GoN in 2003. Later on in 2010, CRED was dissolved in the process of restructuring of NEA and the activities of CREP were carried out through eight Regional Offices. However, the CREP activities were slowed down due to lack of coordination at center and regional level. On this background, CRED has been formed again in July 2013.

Under CREP, the GoN is contributing 90 % of the rural electrification Cost through NEA and the Rural Electric Community (REC) is required to contribute remaining 10 % of the cost. NEA sells bulk power to the RECs and RECs are responsible for operation and management of electricity distribution within the area. NEA provides services up to 11 kV Line and the REC itself is responsible

for 400/230 Volt Line. NEA, Community and Rural Electrification By-Law 2065 governs the activities of NEA, REC and CREP.

Consumer friendly rural electrification program is becoming more effective to promote energy access, consumer capacity building and livelihood development. Community Rural Electrification Program(CREP) has been playing an integral role in rural development, empowering Rural Electric Community (REC) and to alleviate Poverty. In the journey of 11 years, CREP has achieved a major success of accessing electricity to more than 360,000 households of 51 districts through 465 nos. of Different Community entities.

Despite of having many problems like insufficient human resources and adolescent office itself, the performance of newly re-born CRED evaluated as satisfactory in FY 2013/14. During review period, CRED initiated activities to resolve setback old community rural electrification contracts successfully and by the result hanged out contracts were regularized and most of them were completed in this year. CRED's major activities of the year include:

- New NEA, Community and Rural Electrification By-Law has been drafted by making the existing CRE By-Law 2065 compatible to the motive of re-formed CRED and addressing the problems experienced in community rural electrification program & operational activities. However, it is yet to be submitted for approval.
- All together 17 community rural electrification proposals including extension of existing 11/0.4-0.23 kV distribution network and transformer upgrading of estimated cost of NRs. 314 Million has been approved. These proposals comprise construction of 11 kV Line (3 wire) : 151.43 kM, 400/230 V. Line (4 wire): 104.35 km, 400/230 V. Line (3wire): 49.70 km, 400/230 V. Line (2wire): 104.55 km and installation of total 60 numbers of 11/0.4 kV, distribution transformers (25 kVA- 17 nos, 50 kVA - 16 nos. and 100 kVA - 27 nos.) which will electrify to total 6500 nos. of households.
- Four numbers of Contracts were signed for the electrification work in the distribution area (Khaskushma of Banke Dist, Gadariya of Kailali Dist, Fulkhang of Dhading Dist, and Memepokhari of Lamjung Dist) of four new Rural Electric Community (REC). Their approved proposal amounted NRs. 200 Million. These electrification work will be completed by the end of next fiscal year 2014/15.
- Bids have been invited for the electrification work in the distribution area of six other RECs having approved proposal of amount NRs. 80 Million.
- In order to strengthen the operating capacity of RECs, training for Linemen and Accountant was conducted. 25 Linemen personnel and 25 Account personnel were trained this year.
- Distribution system operation agreement of 82 nos. of RECs were renewed this year.
- In order to bring uniformity in cost estimation of rural electrification work, the major line materials cost (Pole, Conductor, Insulator, Transformer and Stay set etc) has been fixed.
- Proposal of amount USD 26 Million has been prepared and sent to Ministry of Finance through Ministry of Energy seeking grant assistance from GIZ for expansion of community rural electrification, replacement of wooden poles by Steel poles, improvement & strengthening of the distribution network and capacity building of RECs.
- CRED has planned different activities in FY 29014/15 for meaningful and result oriented implementation of CREP that will strengthen the CRED and support the sustainability of the RECs too.

Foremost activities planned for year 2014/15 are :

- Finalize the New NEA, Community and Rural Electrification By-Law.
- Prepare and maintain up to date database of RECs. At this stage CRED does not have complete & updated database of RECs like, number of RECs. number of consumers served by the RECs, data of 11 kV Line, 400/230 volt Line and Transformers, Energy consumed by RECs etc,. In the absence of these data, the effectiveness of CREP is difficult to evaluate. Renewal of Distribution system operation agreement did a little help but the number of renewal remained only about 40 % of actual RECs.
- Replacement of Wooden pole by Steel pole and re-strengthening the Distribution Network. Many RECs having wooden pole in their distribution network are on the verge of collapse due to their inability of maintaining replacement cost of rotten wooden pole. Around 5000 wooden poles of different RECs are targeted to replace under CREP in FY 2014/15.
- Move to IT. In coordination with IT Department of NEA, a separate section for CRED will be formed in NEA Web site where all the CRE related data, documents, information, By-law, Directives, Steering Committee's Decision including Contract progresses will be uploaded which will be informative to all the stakeholders and play a positive role to accelerate CREP activity.
- Bring 216 RECs established by Kailai - Kanchanpur

Rural Electrification Project (KKREP) under the umbrella of NEA, Community Rural Electrification By-law after clearance of their Index loan.

- Training to RECs. Technical, Financial, Administrative and Managerial trainings will be provided to the staffs and member of RECs from Training Centre of NEA. Total 200 trainees of different RECs will be benefitted in different discipline.

Regional Offices

There are eight regional offices (ROs) under DCSD located at Biratnagar, Janakpur, Hetauda, Kathmandu, Pokhara, Butwal, Nepalgunj and Attariya. The functions of operation, maintenance, and expansion of the distribution system up to 33 kV voltage level and consumer services such as new consumer connections, meter reading, billing, and revenue collection are carried out by Regional Offices. In addition, operation and maintenance of off grid small hydro power plants also falls under regional office's jurisdiction. Each regional office is headed by a director/chief and reports to the Deputy Managing Director. There is provision of technical division headed by a Manager in each RO which looks after the technical matters, rural electrification activities and management of small hydro power plants. The regional chief is also supported by account and administrative sections in the related matters.

Loss Reduction Program

The distribution networks comprise of technical and non-technical losses, in which proportion of non-technical losses is quite high. During the year under review, various measures taken in the preceding years were continued to reduce the non-technical losses. Massive awareness campaigns as workshops and review meetings were

Review meeting being held at Butwal Regional Office

implemented in various distribution centers. Besides review meetings were organized in each regional office by a DCS central team to evaluate the overall performance of the office.

Strict measures for electricity theft control as confiscation of electric equipments and taking legal action against culprits were also conducted in various distribution centers with the help of local administration and security agencies.

Electrical goods confiscated for illegal use of electricity at Belbari DC

Regional offices in co-ordination with DCSD and PTSD, implemented extensive programs to avoid electricity theft, manipulation meter and metering units which mainly consisted of:

- Installation of tamper proof meter enclosures and refurbishment of metering facilities
- Implementation of meter and meter enclosure seal management system to avoid tampering.
- Replacement of electro-mechanical meters by programmable poly phase electronic meters and replacement of unmatched current transformers to eliminate possible errors in multi plying factor.

Meter resealing being done at Ramechhap DC

- Investigations on illicit tapings and meter tempering
- Meter testing: Bulk/ Ordinary supplies
- Rehabilitation of meter cubicles
- Replacement of bare conductor with ABC cables in loss prone areas

NEA management made various decisions as 'Immediate Action Plans' to improve its functioning. Among many, this plan included regular inspection of Time-of-Day (TOD) meters, data download and analysis to curb any connection fault or manipulation. All regional offices and

distribution centers actively participated in this drive which was found to be much effective.

Customer Care

Distribution centers work as interfaces between NEA and its consumers. So, special efforts were taken to improve the quality of service at the consumer interface points. The employees took special efforts to serve our valued consumers in more effective way. With the Queue Management System at some of the cash collection centers, difficulties encountered by the consumers in queuing for making payments were minimized. Round the clock no-light services have been implemented in most of the urban no-light centers. These functions and activities were carried out by all regional offices.

Concluding session of 'Interaction program on TOD meters' organized for Regional Chiefs at NEA training center

The region wise performance under the review period is summarized in Annex-1 and 2 below. Some of the glimpses of the regional offices are presented here under.

Biratnagar Regional Office

Operational highlights

There are 14 Distribution Centers under Biratnagar Regional Office (BRO) spread over Mechi and Koshi zones. The distribution loss of BRO is 16.95%. Sales contribution to NEA system of this RO is 13.85%. The performance highlights of this regional office during review period are as under.

Energy sales(MWH) –473121
Revenue (million) – Rs.3793.60
Numbers of consumers –475679

Project highlights

The major projects being implemented under this regional office are as under.

Rake-Rabi-Chisapani 33 kV Transmission Line Project

The project includes the construction of 25 km of 33 kV line, 40 km of 11 kV line, 40 km of LV distribution line, construction of 33/11 kV substation and 33 kV bay. Out of which, 23 km of 33 kV line and 10 km of 11 kV line has been constructed. Land for Switching Station at Chamaite of Ranke has been already acquired while land acquisition for Substation at Chisapani is still in process.

Tumlingtar-Dingla-Bhojpur 11 kV Transmission Line Project

The project includes the construction of 30 km of 11 kV and 25 km of LV distribution line in Sankhuwasabha and Bhojpur districts. The 11 kV and LV distribution line as per project scope has been completed. Installation of distribution transformers is not complete due to unavailability. The project work is constrained due to limited allocation of budget.

Dhankuta-Hile-Leguwa-Bhojpur 33 kV Transmission Line Project

The project includes the construction of 50 km of 33 kV transmission line, 52 km of 11 kV line, 50 km of LV distribution line and one 33/11 kV substation in Bhojpur district. Construction of 33 kV transmission line and 33 kV Bay/Switching Substation have been completed and are in operation. 23 km of 11 kV line and 15 km of LV line construction has been completed so far. Construction of 33/11 kV, Substation at Bhojpur is in progress. The project is scheduled to be completed by FY 2014/15.

Muga-Ghodetar-Bhojpur 11 kV Transmission Line Project

The project started in FY 2010/11. Scope of works includes 10 km of 11 kV line and 10 km of LV distribution line in different VDCs of Bhojpur district. Procurement of Hardware, Insulators, ACSR Conductor has been made and remaining portion of works is in progress.

Ranibas-Balardaha-Bhojpur 33 kV Transmission Line

The project started in FY 2010/11. 33 64 km of kV line survey has been completed in last fiscal year. Construction of 33/11 Substation at Ghoretar of Ranibas and 33 kV bay extension at Balardaha is to be done.

Piluwa 33/11 kV Substation Upgrading

The scope of works includes upgrading of 1.5 MVA, 33/11 kV transformer by 6/8 MVA, 33/11 kV power transformer and replacement of 33 kV Switchgear and Panels. Contract for supply, delivery, installation and commissioning of 6/8 MVA transformer was made and works is in progress and scheduled to be completed by FY 2012/13. Tender for replacement of Switchgear

and Panels has been made and completion of works is scheduled to be finished by FY 2012/13.

Ilam-Phidim-Taplejung 33 kV Transmission Line Project

The scope of the project includes the construction of 90 km of 33 kV transmission line in Fidim and Taplejung district. Construction of 33/11 kV 1.5 MVA Substation at Phidim and 33 kV Bay at Ilam Substation has been completed. 83 km 33 kV line construction is complete. Remaining 7 km of 33 kV line, construction of 3 MVA substation at Taplejung and 33 kV Bay at Phidim Substation is yet to be completed.

Bokhim Lekharka (Bhojpur) Electrification Project

The project includes construction of 70 km of 11 kV line and 100 km of LV line in Bokhim, Khawa, Sideshwor, Gupteswor, Nagi, Lekharka, Gogane, Timma, Kot, Chinamakhu and Annapurna VDC of Bhojpur district. Erection of poles for 11 kV line is in progress. There was no participation in tenders, though the bids were invited twice in the last fiscal year. So, project work could not be expedited.

Dhankuta-Hile-Ranibas-Bhojpur 33 kV Transmission Line Project

The project includes construction of 27 km of 33 kV line, 50 km of 11 kV line and 50 km of LV line in different V.D.C. of Bhojpur district. Erection of 33 kV transmission line has been completed. Construction of switching station at Pakhribas and substation at Ghoretar of Ranibas is yet to be commenced.

Other Projects

The following projects in the region are also in the various stages of execution.

- Panchthar Distribution Substation Project
- Aathrai Sakrantibazar 33 kV Substation Project
- Bhedetar (Rajarani) 33/11 kV Transmission line and Substation Project
- Chinpur Sitalpati 33 kV transmission line and Substation Project

Janakpur Regional office

Operational highlights

There are 11 Distribution Centers under Janakpur Regional Office (JRO) spread over Sagarmatha and Janakpur zones. The distribution loss of JRO is 36.90%. Sales contribution to NEA system from this RO is 8.53%. The performance highlights of this regional office during review period are as under.

Energy sales(MWH) –291360
Revenue (million) – Rs.2000.01
Numbers of consumers –390418

Project highlights
The major projects being implemented under this regional office are as under.

Sangutar-Okhaldhunga 33 KV Transmission line project.

Major components of the project include the construction of 40 km 33 kV line, 40 km 11 kV line, one 33 kV bay at Sanghutar and 40 km LV distribution line. Pole erection for 20 km of 33 kV line has been completed. Procurement of 315 nos. of poles and 120 km of conductor with hardware has been made during the period of review for construction of 33 KV line and construction work is in progress.

Okhaldhunga-Salleri 33 KV Transmission line project
The major component of this project are construction of 40 km 33 KV line, 40 km 11 kV line, one 33 KV bay construction at Okhaldhunga substation and 1.5 MVA Substation & 40 km of LT line at Salleri of Solukhumbu district. Procurement of 315 nos. of poles and 120 km of conductor with hardware has been made for construction of 33 KV line and work is in progress.
Khurkot-Nepalthok 33 kV Transmission Line Project

Major components of the project include the construction of 25 km of 33 KV line, 25 km of 11 kV line, 40 kM of LV distribution line at Sindhuli District & 33/11 kV, 1.5 MVA Substation at Nepalthok. The procurement of poles & conductor for 12 KM of 33 KV Transmission line has been completed and construction of line is in progress.

Hetauda Regional Office

Operational highlights

There are 8 Distribution Centers under Hetauda Regional Office (HRO) spread over Narayani zone. The distribution loss of HRO is 16.55%. Sales contribution to NEA system from this RO is 19.93%. The performance highlights of this regional office during review period are as under.

Energy sales(MWH) –680414
Revenue (million) – Rs.5326.58
Numbers of consumers –312361

Project highlights

The major projects being implemented under this regional office are as under.

Chhatiwan 33/11 kV Project

The project scope includes construction of 33 kV line from Hatia to Chhatiwan and construction of 6/8 MVA, 33/11 kV substation at Chhatiwan of Makawanpur

district. Land acquisition at Bhimsendamar of Chhatiwan is completed in FY 2013/14. Project is scheduled to complete in FY 2015/16.

Kathmandu Regional Office

Operational highlights

There are 17 Distribution Centers under Kathmandu Regional Office (KRO) spread over Bagmati zone. The distribution loss of KRO is 13.20%. Sales contribution to NEA system from this RO is 27.91%. The performance highlights of this regional office during review period are as under.

Energy sales(MWH) –952922
Revenue (million) – Rs.8898.36
Numbers of consumers –562731

Project highlights

The major projects being implemented under this regional office are as under.

Bijulikot Nagdaha Distribution line Project

The project includes construction of distribution system in Bijulikot and Nagdaha VDC of Ramechhap district. Construction work is in progress and is scheduled to be completed by the end of FY 2014/15.

Kathajor VDC 1,4,5 Distribution line Project

The project includes construction of distribution system in Kathajor VDC of Ramechhap district. Construction work is in progress and is scheduled to be completed by the end of FY 2014/15.

Saipu VDC 1,2 Distribution line Project

The project includes construction of distribution system in Saipu VDC of Ramechhap district. Construction work is in progress and is scheduled to be completed by the end of FY 2014/15.

Kumari, Duipipal, Sunkhani, Talakhu, Ghayangphedi Distribution line Project

The project includes construction of distribution system in Kumari, Duipipal, Sunkhani, Talakhu, Ghayangphedi VDCs of Nuwakot district. Construction work is in progress and is scheduled to be completed by the end of FY 2014/15.

Sano kimtang ma. Vi. Distribution line Project

The project includes construction of distribution system in sano kimtang of Nuwakot district. Construction work is in progress and is scheduled to be completed by the end of FY 2014/15.

Madankudari Makaibari Singati 33 kV transmission line and Substation Project

The project includes construction of 33 kv line from Madankudari to Makaibari and construction of substation. Land acquisition is completed.

Line Re-alignment Due to Road Expansion in Kathmandu

Extensive line re-alignment work is being implemented in Kathmandu valley in the areas where road expansion is taking place. Concerned distribution centers are executing this work in co-operation with road department and other concerned agencies. 220 km of 11kV and LV distribution line is to be re-aligned. The work is to be co-ordinated with other agencies also and is scheduled to be completed in FY 2014/15.

Old line being dismantled and new constructed due to road expansion at Lazimpat

Kathmandu Valley Distribution System Strengthening Project

Kathmandu Valley Distribution System Strengthening Project is financed by the World Bank, International Development Association (IDA) for the Nepal Power Development Projects.

The main objective of this project is to strengthen and rehabilitate/upgrade the existing distribution system of eight (8) distribution centers of Kathmandu Valley. The major works include (i) supply and installation of 100 km of Covered conductor, 139 km of HV and around 600 km of LV ABC Cables (ii) supply and installation of 735 numbers of Distribution Transformers of various ratings (iii) laying 34 km of underground XLPE power cable (iv) supply and installation of Steel tubular and PSC poles and (v) Dismantling of existing poles, transformers,

conductors and hardware.
The project covers following area:
Lot 1: Bhaktapur and Thimi Distribution Center
Lot 3: Baneshwor and Maharajganj and Jorpati Distribution Center
Lot 4: Ratnapark, Kuleswor and Kirtipur Distribution Center
The procurement of all items is completed. The rehabilitation work is underway. Stringing of covered conductor, LV ABC cables and laying of underground XLPE cable is in progress. The project is expected to be completed by FY 2014/15.

Pokhara Regional Office

Operational highlights

There are 10 Distribution Centers under Pokhara Regional Office (PRO) spread over Dhaulagiri and Gandaki zones. The distribution loss of PRO is 13.97%. Sales contribution to NEA system from this RO is 5.65%. The performance highlights of this regional office during review period are as under.

Energy sales(MWH) –193032
Revenue (million) – Rs.1545.89
Numbers of consumers –232037

Project highlights

The major projects being implemented under this regional office are as under.

Udipur Substation Upgrading Project:

The project has been started from FY 067/068 to upgrade the existing Udipur substation to 8 MVA capacity. Upgrading work has been completed and upgraded substation is in operation during period of review.

Udipur-Besisahar-Manang 33 kV Transmission Line Project

The project includes the construction of 90 km of 33 kV transmission line, 53 km of 11 kV, 53 km of LV distribution line and one 33/11 kV, 1.5 MVA substation in Manang and 33 kV bay extension in the existing Udipur substation. Out of 90 km long 33 kV transmission line, pole erection for 70 km up to Danaque of Manang district and stringing of conductor for 15 km up to Bulbule has been completed. Land acquisition for Manang Substation has been completed. Procurement of line materials (Insulator & Hardwares) for 15 km of 33 kV transmission line has been completed.

Galkot Substation Project

This project is being implemented to provide electric supply to Galkot area in Baglung district. 33 KV Bay extension at Baglung substation has been completed. Land Acquisition for Sub-station construction at Galkot has been completed. Civil work for land protection is now in progress.

Other Projects

The following projects in the region are also in the various stages of execution.

- Jomsom Lomatham Upallo Mustang 33 kV Transmission Line Project
- Beni Darbang Myagdi 33 kV Transmission Line Project
- Sindhubeshi-Lamjung-Lekhnath Kaligandaki 33 kV Transmission Line Project
- Righa Kharwang (Baglung) 33 kV Transmission Line Project

Butwal Regional Office

Operational highlights

There are 9 Distribution Centers under Butwal Regional Office (BuRO) spread over Lumbini zone. The distribution loss of BuRO is 16.61. Sales contribution to NEA system from this RO is 13.26%. The performance highlights of this regional office during review period are as under.
Energy sales(MWH) –486833
Revenue (million) – Rs.3315.51
Numbers of consumers –349196

Project highlights

The major projects being implemented under this regional office are as under.

Thada 33 kV Substation Project

The project scope includes construction of 22 km 33 kV line and 33/11 kV, 6/8 MVA substation at Thada, Arghakhachi. Purchasing of land has been completed for the construction of Thada Substation. Polling works in about 10 km line length for 33 kV line is complete. The project is scheduled to complete in FY 2016/17.

Bojhapokhari Nawalparasi 33 kV Transmission Line Project

The project scope includes construction of 15 km 33 kV line, 10 km 11 kV line, 10 km of distribution line and construction 33/11 kV, 6/8 MVA substation at Bojhapokhari of Nawalparasi district. Polling works in about 10 km line length for 33 kV line is complete. The project is scheduled to complete in FY 2016/17.

Other Projects

The following projects in the region are also in the various stages of execution.

- Chandrauta-Maharajgunj (Kapilbastua) 33 kV

Transmission line and Substation Project
- Majua (Gulmi) 33 kV Substation Project
- Amarai-Dohali-Wagla-Aglung(Gulmi) Electrification Project
- Purkotdaha-MayalpokhariBajhakateri Electrification Project

Nepalgunj Regional office

Operational highlights

There are 12 Distribution Centers under Nepalgunj Regional Office (NRO) spread over Rapti, Bheri and Karnali zones. The distribution loss of NRO is 17.13%. Sales contribution to NEA system from this RO is 6.53%. The performance highlights of this regional office during review period are as under.

Energy sales(MWH) –222975
Revenue (million) – Rs.1692.53
Numbers of consumers –239924

Project highlights

The major projects being implemented under this regional office are as under.

Surkhet Bijaura 33 kV Substation Project

The project scope includes construction of 30 km 33 kV line, 20 km 11 kV line and construction 33/11 kV substation at Bijaura Surkhet. Land acquisition work has been completed and procurement of goods and installation of line is in progress. Civil construction as compound wall is in progress.

Dang Bhalubang 33 kV Transmission Line Project:

The project scope includes construction of 25 km 33 kV line, 10 km 11 kV line and construction 33/11 kV substation at Bhalubang. Process has been initiated for land acquisition

Rajapur 33 kV Substation Project

The project scope includes construction of 15 km 33 kV line, 10 km 11 kV line, 10 km of distribution line and construction 33/11 kV substation at Rajapur, Project work for the construction of Rajapur Substation is in progress.

Sitalpati -Musikot 33 kV Transmission Line Project

The project includes the construction of 50 km of 33 kV transmission line, 50 km of 11 kV line, 40 km of LV distribution line and two 33/11 kV substations of 1.5 MVA capacity one each at Sitalpati and Musikot. Out of 50 km long 33 kV transmission line, stringing of 34 km line & pole erection has been completed. Construction of 33/11 kV, 1.5 MVA substation at Sitalpati and 33 kV bay extension at Tulsipur are in progress and expected to be completed in FY 2014/15. Land acquisition for Musikot Substation has been completed.

Chhinchu-Rakam-Jajarkot 33 kV Transmission Line Project

The scope of the project consists of the construction of 70 km of 33 kV transmission line, 100 km of 11 kV, 100 km of LV distribution line and two 33/11 kV substations at Surkhet and Jajarkot districts. Out of 70 km long 33 kV transmission line, pole erection and stringing of conductor for 45 km and 11 km of 11 kV line has been completed. Project work is in progress and expected to be completed by FY 2014/15.

Ghorahi-Holeri 33 kV Transmission Line Project

Scope of this project consists of the construction of 45 km of 33 kV transmission line, 50 km of 11 kV, 50 km of LV distribution line and two 33/11 kV substations at Holleri & Ghorahi. Construction of 45 km 33 kV transmission line up to Holleri has been completed. 33/11 kV, 750 kVA sub-station at Holleri is now in operation from FY 2013/14.

Dailekh Substation Project

The project includes the construction of 25 km of 33 kV, 15 km of 11 kV, 10 km of LV distribution line & one 33/11 kV, 1.5 MVA substation at Dailekh and 33 kV Bay extension at Surkhet. Construction of 33/11 kV, 1.5MVA sub-station at Dailekh and 33 kV bay extension at Surkhet substation is almost complete. Project is expected to complete in FY 2014/15.

Kapurkot-Koilachaur 33 kV Transmission Line Project

The project includes the construction of 15 km of 33 kV, 25 km of 11 kV, 25 km of LV distribution line in Salyan & Rolpa districts & 6/8 MVA 33/11 kV substation at Koilachaur & a switching substation at Kapurkot. Construction of 33 kV transmission line from Kapurkot to Kalachaur has been completed. Land acquisition for substation construction has been completed. Tender for construction of 6/8 MVA 33/11kV substation has been invited and is in the process of evaluation.

Attariya Regional office

Operational highlights

There are 8 Distribution Centers under Attariya Regional Office (ARO) spread over Mahakali and Seti zones. The distribution loss of ARO is 17.72%. Sales contribution to NEA system from this RO is 3.31%. The performance highlights of this regional office during review period are as under.

Energy sales(MWH) –113108
Revenue (million) – Rs.820.35
Numbers of consumers –150287

Project highlights

The major projects being implemented under this regional office are as under.

Khorpe (Baitadi) Chainpur(Bhajang) 33 kV Transmission Line Project

The scope of this Project includes the construction of 90 km of 33 kV, 40 km of 11 kV, 40 km of LV distribution line in Baitadi and Bajura district , 33/11 kV substations at Chainpur and 33 kV bay extension at Baitadi Substation. Tendering has been done for poles for construction of additional 10 km 33kV line. Land Acquisition process for Sub-station construction has been initiated.

Martadi (Bajura)-Gamgadi (Mugu) 33 kV Transmission Line Project

The project includes the construction of 90 km of 33 kV, 40 km of 11 kV, 40 km of LV distribution line in Bajura and Mugu district, 33/11 kV substations at Martadi and 33 kV Bay extension at Saphebagar. The project is facing hurdles due to long route, difficult terrain and insufficient budget allocation.

Saphebagar(Achham)-Martadi (Bajura)33 kV Transmission Line Project

The project includes the construction of 48 km of 33 kV, 40 km of 11 kV, 40 km of distribution line in Achham and Bajura district , 33/11 kV substations at Martadi and 33 kV Bay extension at Saphebagar. construction 0f 12 kV transmission in progress. Procurement of conductors and insulator hardware for 33 kV transmission line has been completed. Process of land acquisition has been initiated.

Dadeldhura-Baitadi 33 kV Transmission Line Project

The scope of the project includes the construction of 14 km of 33 kV transmission line, 15 km of 11 kV & LV distribution line, one 33/11 kV 3 MVA substation at Baitadi and 33 kV bay extension in the existing Dadeldhura substation. Construction of 33/11 kV, 3 MVA substation is complete and is in operation. However construction of 11 kV feeder to fully utilize the substation capacity is still left.

Other Projects

The following projects in the region are also in the various stages of execution.

- Balanch-Khalanga 33 kV Transmission line Project
- Pahalmanpur-Joshipur 33 kV Transmission line and Substation Project
- Mauwa-Nagardaha (Doti) 33 kV Transmission line and Substation Project
- Sanphebagar-Chamara-Chautara 33 kV Transmission line and Substation Project
- Budhar-Jogbudha Bagarkot 33 kV Transmission line and Substation Project
- Chandani Substation Project
- Chaumala Substation Expansion Project
- Dhangadi-Attaria Distribution System Reinforcement Project
- Mahendranagar Distribution System Reinforcement Project
- Dipayal-Sanphe-Manma-Jumla 33 kV Transmission line and Substation Project
- Tikapur-Lamki Distribution System Reinforcement Project

Annex -1: Features of eight regional offices

S.No.	Category	Biratnagar	Janakpur	Hetauda	Kathmandu	Pokhara	Butwal	Nepalgunj	Attaria	Total
No. of Consumers (Nos) for F/Y 2013/14										
1	Domestic	436440	367215	288530	543142	224559	334729	222988	142365	2559968
2	Non-Commercial	2350	1638	1347	3029	1,629	2339	2206	1453	15991
3	Commercial	2120	1157	1549	4973	1,334	1547	1245	822	14747
4	Industrial	5787	7143	6111	8410	3,100	5069	3008	1483	40111
5	Water Supply	650	75	139	324	167	203	83	32	1673
6	Irrigation	27205	12256	13539	802	175	3836	9676	3522	71011
7	Street Light	108	430	398	776	58	274	124	39	2207
8	Temporary Supply	35	10	62	475	14	54	47	28	725
9	Transport	0	0	1	40	2	0	0	0	43
10	Temple	740	317	491	522	511	854	376	230	4041
11	Community Sales	92	93	69	93	454	212	118	267	1398
12	Internal Consumption	152	84	125	145	34	77	53	46	716
13	Bulk Supply	0	0	0	0	0	2	0		2
	Total	**475,679**	**390,418**	**312361**	**562731**	**232037**	**349,196**	**239924**	**150287**	**2712633**
Sales Unit (MWh) for F/Y 2013/14										
1	Domestic	193784	124569	166875	543021	115801	184588	115989	60424	1505051
2	Non-Commercial	13191	10291	12309	65712	8682	7746	7,433	3409	128774
3	Commercial	23471	10475	22101	161373	19055	18770	14,031	8463	277740
4	Industrial	213228	92587	437900	131263	17812	247772	63,940	17881	1222384
5	Water Supply	6730	5646	6148	13401	2271	7597	2,773	936	45503
6	Irrigation	9369	11011	10616	542	126	3601	7,424	1076	43765
7	Street Light	5616	18457	20445	23422	2424	5189	2,879	1760	80192
8	Temporary Supply	61	24	112	664	43	90	47	273	1315
9	Transport	0	0	623	5522	21	0	0	0	6166
10	Temple	615	4610	435	1510	381	907	336	117	8911
11	Community Sales	6644	8782	1914	5521	26262	7050	7,863	18592	82629
12	Internal Consumption	411	4908	936	971	154	291	196	176	8043
13	Bulk Supply	0	0	0	0	0	3230	63	0	3293
	Total	473,121	291,360	680414	952922	193032	486,833	222975	113108	3413765

Anex- 1 Continued...

Revenue (Million NRs) for F/Y 2013/14

S.No.	Category	Biratnagar	Janakpur	Hetauda	Kathmandu	Pokhara	Butwal	Nepalgunj	Attaria	Total
1	Domestic	1464.22	954.08	1341.18	4721.33	902.16	1397.68	837.98	442.36	12061
2	Non-Commercial	138.24	50.48	136.47	792.58	101.21	49.17	82.20	40.91	1391
3	Commercial	294.41	120.87	268.25	1860.52	230.87	140.16	170.79	88.67	3175
4	Industrial	1741.83	730.74	3296.96	1143.31	164.71	1581.53	511.40	144.92	9315
5	Water Supply	41.11	11.21	38.77	89.10	15.06	24.49	17.30	6.63	244
6	Irrigation	35.59	18.28	41.13	2.09	0.51	12.53	15.72	3.97	130
7	Street Light	42.78	91.46	163.69	201.52	22.22	0.47	22.22	15.96	560
8	Temporary Supply	0.94	0.41	1.80	13.41	0.80	0.53	0.85	3.38	22
9	Transport	0.00	0.00	5.42	33.48	0.29	0.00	0.00	0.00	39
10	Temple	3.11	1.26	2.34	8.65	1.83	36.57	1.71	0.60	56
11	Community Sales	26.93	17.88	21.05	20.29	104.80	4.95	30.35	70.84	297
12	Internal Consumption	4.44	3.34	9.51	12.08	1.43	0.00	2.01	2.11	35
13	Bulk Supply	0.00	0.00	0.00	0.00	0	67.44	0.00	0	67
14	Black Listed	0.00	0.00	0.00	0.00	0	0	0	0	0
	Total	3793.60	2000.01	5326.58	8898.36	1545.89	3315.51	1692.53	820.35	27392.84

Loss percentage

1	Received Energy, MWH	569,698	461,734	815317	1097796	224384	583816	269061	137471	4159277
2	Sales Energy, MWH	473,121	291,360	680414	952922	193032	486,833	222975	113108	3413765
3	Loss Unit, MWH	96,577	170,374	134903	144874	31352	96983	46086	24364	745513
4	Loss percentage	16.95	36.90	16.55	13.20	13.97	16.61	17.13	17.72	17.92

Annex -2: Perfomance Status of Eight Reginal Offices

Description	Biratnagar	Janakpur	Hetauda	Kathmandu	Pokhara	Butwal	Nepalgunj	Attaria	Total
Zonal Coverage	Mechi & Koshi	Janakpur & Sagarmatha	Narayani	Bagmati, Janakpur	Gandaki & Dhaulagiri	Lumbini	Bheri, Karnali & Rapti	Mahakali & Seti	
No. of municipalities fully electrified	10	8	7	12	2	11	2	2	54
No. of municipalities partially electrified	17	10	5	1	11	9	8	15	76
No. of VDCs fully electrified	30	389	241	173	217	119	53	37	1259
No. of VDCs partially electrified	297	218	123	268	111	238	224	157	1636
No. of VDCs having no access to electricity	136	99	20	54	74	33	172	142	730
No. of community electrified VDCs	25	31	23	59	133	53	9		333
No. of distribution center	14	11	8	17	10	9	13	8	90
Units sold during the year under review (GWh)	473.12	291.36	680.41	952.92	193.032	486.83	222.975	113.108	3413.755
Revenue (NRs in million)									
Billing amount	3,793.60	2,000.01	5,326.58	8,898.36	1,545.89	3,715.00	1,541.00	820.35	27640.79
Collection amount	3,550.17	1,887.29	5,111.10	8,680.00	1,497.46	3,705.00	1,445.00	734.95	26610.97
Total no. of consumers at the end of the year	475,679	390,418	312,361	562,731	232,037	349,196	239,924	150,287	2712633
No of Additional billed (Chhut) consumers	41	10	10	5	9	3	33	22	133
Amount recovered from Additional billing (Chhut) in million Rs.	38.84	0.71	2.21	1.74	1.95	5.47	1.31	1.23	53.46
No. of Black listed Consumers	4297	3,991	6,389	9351	1486	4517	2,544	1,085	33660
Revenue to be collected from black listed Consumers in mlllion Rs.	75.52	78.93	150.07	200.7	12.14	83.2	33.31	14.32	648.19

Annex -2: Continued...

Description	Biratnagar	Janakpur	Hetauda	Kathmandu	Pokhara	Butwal	Nepalgunj	Attaria	Total
Revenue collected from black listed Consumers; nos.	16	65	499	600	98	352	90	33	1753
Revenue collected from black listed Consumers in mlllion Rs.	0.23	2.8	17.54	12.5	1.28	4.57	3.25	0.323	42.493
Total line disconnected; nos.	4394	1,560	9,725	7519	1178	2856	2,715	3,005	32952
Revenue to be collected from line disconnection in million Rs.	64.45	52.21	292.54	122.23	13.71	49.5	41.94	27.61	664.19
Revenue collected from line disconnection in million Rs.	42.33	37.13	118.84	97.16	16.23	51.73	22.53	27.62	413.57
Action against theft; nos.	7	710	593	217	185	262	154	19	2147
Collection from Action against theft in million Rs.	0.052	3.38	3.32	3.98	1.08	2.82	0.66	0.169	15.461
Loss Reduction activities									
-Meter change	176	999	1,341	1694	1448	1427	964	572	8621
-Resealing	1753	6,108	6,227	5991	3613	3259	2,438	6,104	35493
-Conductor Upgrading (HT/LT); km	29	23.77	20	49.84	3.25	0	13	13.8	152.66
-Transformer addition/upgradation, nos.		7	22	312	115	0	56	20	532
-Meter Inspection (TOD/Three Phase/Single Phase); nos.	678	3,310	4,273	1971	1376	0	1,177	2,649	15434
-Public interaction conducted; nos.	9	13	4	19	0	0	10	3	58
-Public hearing, awareness, notice published; nos.	11	4	1	12	0	0	6	28	62

Planning, Monitoring and Information Technology Directorate

Planning, Monitoring and Information Technology Directorate is entrusted with the key responsibilities of generation and transmission system planning, corporate planning and monitoring, appropriate implementation of information technology in NEA's activities, economic and financial analysis of NEA and trading of power. It is headed by a Deputy Managing Director and consists of 5 Departments. System Planning Department carries out load forecasting, generation expansion planning and transmission system planning of the power system of Nepal while Corporate Planning and Monitoring Department develops corporate plans and programs in addition to monitoring and evaluation of NEA-implemented projects. Similarly, Information Technology Department introduces new, innovative IT services and carries out overall maintenance, enhancement and expansion of its fiber and wireless network infrastructure and server systems. Power Trade Department executes the trading of power with Independent Power Producers and also carries out the business activities of power exchange and trading of power with India. Likewise, Economic Analysis Department carries out the activities pertinent to the economic and financial analysis of NEA.

System Planning Department

Currently, Grid Impact Study (GIS) for new generation projects is the main focus of System Planning Department (SPD). The GIS analyzes the effect of new connection to NEA Grid to ensure satisfactory operation of the NEA Grid in conformity with the NEA Grid Code; requirement for additional transmission lines, reinforcement in the network, and requirement for the installation of capacitors and reactors are recommended.

SPD also identifies constraints in the grid that could pose operational risk and that reduces efficiency due to outages in the Integrated Nepal Power System (INPS). SPD also develops transmission configurations for evacuating power from planned generation projects. For this, different technical studies such as load flow, short circuit, steady and transient stability are carried out.

SPD also assists other Departments of NEA by providing necessary data and give suggestions regarding implementation of planned projects. The Department is also actively involved in the study of Technical Assistance for Preparing Transmission System Master Plan of NEA that is being studied by EDF as the consultant. The Department is also involved in the Joint Study for the Cross Border Exchange and Trade of Power between India and Nepal that is being studied by Power Grid as the consultant.

In FY 2013/14, System Planning Department carried out number of technical studies at the request of NEA's different departments. Notable among them are:

- Load flow analysis of Shyaule substation.
- Energy simulation of Power Purchase Agreement and Grid Impact Study completed projects.

In FY 2013/14, System Planning Department completed Grid Impact Study for the following hydropower projects to be developed by the private sector:

List of Grid Impact Study (GIS) conducted projects in FY 2013/14

S.N.	Name of Projects	Capacity (MW)	Connection Substation
1	Upper Rahughat HPP	48.5	Dana substation.
2	Upper Syange Khola Small HPP	2.4	Khudi (Tadi Kuna) substation.
3	Lower Khorunga Khola HEP	5.5	Basantapur substation.
4	Upper Myagdi HPP	20	Dana substation.
5	Rahughat Mangale HPP	35.5	Upper Rahughat HPP's switchyard.

6	Likhu Khola A HEP	24.2	New Khimti substation.
7	Middle Sunkoshi HEP	3.4	Barabise substation.
8	Yambling Khola HEP	7.27	Barabise substation.
9	Upper Chirkhuwa Khola HPP	4.4	Khandabari Substation.
10	Rudi Khola B HEP	6.6	Lekhnath Substation.
11	Lower Hewa Khola HPP	21.6	Phidim substation
12	Upper Mailung A HPP	6.42	Trishuli 3B hub substation.
13	Langtang Khola HPP	10	Chilime hub substation.
14	Likhu 2 HEP	33.4	Likhu Khola A HEP's switchyard
15	Suri Khola HEP	6.4	Singati substation
16	Likhu 1 HEP	51.4	Likhu Khola A HEP's switchyard.
17	Kalanga Gad HPP	15.33	Upper Kalanga Gad HPP's switchyard
18	Upper Kalanga Gad HPP	38.46	Balanch substation
19	Upper Sani Gad HPP	10.7	Upper Kalanga Gad HPP's switchyard
20	Upper Nyasem Khola HEP	41.4	Barabise substation.
21	Lower Khare Khola Small HPP	11	Singati substation.
22	Kaligandaki Koban HEP	163	Dana substation.
23	Sanjen Khola HPP	78	Chilime hub substation.
24	Makari Gad HEP	10	Balanch substation.
25	Kabeli 'A' HEP	37.6	Pinase substation

Grid Impact Study for the bulk load of 15 MVA of Shivam Cement in the Kamane substation was also carried out.

Corporate Planning and Monitoring Department

Corporate Planning and Monitoring Department is responsible for developing corporate and periodical development plans and programs, for carrying out periodical monitoring and evaluation of projects implemented by NEA, and for assisting the National Planning Commission, Ministry of Energy and Ministry of Finance in the preparation of annual budget and programs for energy projects being undertaken by NEA. Besides, the Department also provides necessary support to NEA management for carrying out various studies related to institutional reforms and development. In addition, the Department also provides input for studies undertaken by various organizations on topics related to NEA.

The Department also assists in obtaining new licenses and any extension there of as required for development of generation, transmission and distribution systems. During the year under review, NEA obtained survey license for one transmission line and transmission license for two transmission lines. Similarly, NEA also obtained survey license for Upper Modi Hydropower Project and Tamor Storage Hydropower Project, and generation license for Upper Trisuli 3 'B' Hydropower Project.

The Department also plays coordinating role in the development of hydropower projects under different financing mode.

During the year under review, the Department collected, evaluated and reviewed monthly, trimester and annual

progress of 145 development projects implemented by various business groups and corporate offices of NEA. Of these 145 projects, 8 projects were feasibility study of storage, medium and large hydropower projects; 6 projects were hydropower projects under construction; 36 projects were transmission line projects; 81 projects were distribution system expansion and rural electrification projects and the rest included rehabilitation and maintenance of hydropower stations and institutional strengthening projects.

The Department furnished various data and reports to Ministry of Energy (MoEn), National Planning Commission (NPC) and other concerned authorities of Government of Nepal on energy sector.

Information Technology Department

Information Technology Department is responsible for IT-related activities within the organization and is headed by a Director.

The Department has completed a very productive year with the introduction of new ICT (Information and Communication Technology) solutions and expansion of network infrastructure. Apart from the implementation of newer IT services, the Department provided continuous ICT maintenance / support and training were imparted at local and regional level.

To make the procurement system of NEA transparent, the Department posted more than 500 tenders through its portal. NEA procurement system portal now has a total of 590 registered active bidders.

The Department has also made significant progress in the area of Intranet expansion with fiber optics cable. The offices under Distribution and Consumers Services (DCS) such as Naxal, Kuleshwor, Koteshwor, Bhaktapur, Thimi were linked to the central office network this year and have initiated any-branch-payment system service within Kathmandu valley.

A DCS activity portal site was made operational this year with the aim to capture overall DCS activities including revenue collection, line connection/disconnection details, leakage, accidents & electrocution etc. The site is accessible through the NEA intranet site (www.nea.org/revenue) and the website http://nea.org.np/revenue/ .

Considering training as an integral aspect of carrier development and to enhance the efficiency of the staff, the Department conducted several training courses at corporate office level and also at the regional office level. A total of 10 training sessions were conducted with a total participant count of 100. A group of Engineers and Assistant Computer Officers were also sent to India to participate in a training course of Distributed Database Management course. Outcome of this training program is targeted towards making the electricity bill payment open, accessible and available online for all.

Other major activities taken up by the Department include rolling out of e-attendance system to more than sixty two locations and the testing of the document management system for implementation in the next fiscal year. The Department has also completed a computer hardware procurement process for new roll out of e-attendance system and for replacement of old machines running CAIS. Furthermore, continuous support was provided to offices with accounting, inventory, payroll and other IT systems.

Power Trade Department

Power Trade Department is responsible for trading of electric power in both domestic and cross border market. It is the single window interface of NEA with Independent Power Producers (IPPs) for processing their application for Power Purchase Agreement (PPA). Functions of Power Trade Department may be broadly classified into three categories:

- PPA Processing and Signing:
  It covers PPA processing activities up to and including its signing.
- PPA Implementation and Monitoring:
  It includes PPA administration after its execution till commercial operation.
- Operational Administration and Monitoring of PPAs:
  It includes PPA administration after commercial operation.

The Department has 3 Divisions to carry out these functions. Various reform measures have been introduced in the Fiscal Year under review so as to make the processing of the PPA applications systematic and transparent. The applications are put on a processing sequence based on pre-established criteria and published in its notice board. Finally, a PPA Processing Basket is formed and the applications which have fallen into it with the completion of necessary criteria are processed ahead towards the signing of PPAs. When the earlier entries get completed, the Basket is periodically updated.

A total of 6 new projects developed by the Independent Power Producers (IPPs) with their combined capacity of 23,558 kW were commissioned in FY 2013/14. Projects that were commissioned are: Lower Chaku

Khola (1,765 kW), Ankhu Khola–1 (8,400 kW), Bhairab Kunda (3000 kW), Radhi Khola (4,400 kW), Mailung Khola (5,000 kW) and Chhote Khola (993 kW). With these 6 projects, the total number of IPP-owned projects that are in operation has reached 39 with their combined installed capacity of 255.65 MW. Similarly, 62 projects (including Andikhola upgraded by 4300 kW) of IPPs with their combined capacity of 1205.61 MW are under construction. Likewise, 48 projects of IPPs with their combined capacity of 535.45 MW are in other stages of development.

During FY 2013/2014, 9 new PPAs with their combined capacity of 175.47 MW were concluded. With this, the total number of PPAs conducted so far till FY 2013/2014 stands at 148 with their combined capacity of 1996.7 MW.

Apart from 50 MW import under the Power Exchange Agreement with India, a short term PPA for the import of 30 MW power from December 1, 2013 to May 15, 2014 was concluded with Power Trading Corporation of India (PTC) Ltd. In addition to this, NEA also purchased electricity from Bihar State Power Holding Company Nepal (BSPHCL) in the Fiscal Year under review. Besides, a long term Power Sale Agreement (PSA) was signed with PTC for the import of 150 MW power from Mujaffarpur off-take point in India.

Currently, Power Trade Department is also considering the proposals from the developers of export-oriented hydropower projects to purchase their energy during the 5 months of dry and winter season. NEA has recently approved the interconnection and in-principle power purchase from plants and mini-grid of size less than 100 kW having synchronous generators.

Economic Analysis Department

Economic Analysis Department is one of the five Departments under Planning, Monitoring and Information Technology Directorate of Nepal Electricity Authority. The Department is mainly responsible for conducting the activities related to financial and economic analysis of NEA. More specifically, the Department is assigned with the following responsibilities:

- Formulate criteria for economic and financial analysis of NEA's projects;
- Financial/ economic, commercial and market analyses of NEA;
- Cost benefit analyses of NEA projects;
- Prepare Log Frame of generation and transmission line projects of NEA;
- Cost analysis of electricity services distributed by NEA;
- Prepare documents for review of electricity tariff to be submitted to Electricity Tariff Fixation Commission (ETFC);
- Carry out comparative benefit study of hydropower generation and transmission lines of NEA;
- Carry out study and evaluation on economic and financial sustainability of projects completed by NEA;
- Assist the Departments of NEA in prioritizing the selected projects.

The Department is the focal point of NEA to coordinate with Electricity Tariff Fixation Commission (ETFC). At present, the Department is also assisting Power Trade Department to conclude PPA with IPPs including purchasing of dry season energy form export oriented hydropower projects.

NEA has submitted a proposal to Electricity Tariff Fixation Commission (ETFC) for the upward adjustment by 20 percent of the existing tariff structure in FY 2012/13.

Engineering Services Directorate

Engineering Services Directorate is entrusted with the responsibility to carry out engineering studies beginning from the identification to detailed engineering design, environmental studies, geological and geotechnical studies. It is headed by a Deputy Managing Director. The Directorate has rendered its services to NEA and private sector particularly for the study of hydropower and transmission line projects. The Project Development Department, Soil Rock and Concrete Laboratory, Environmental and Social Studies and Dudhkoshi Storage Hydroelectric Project provide these services to various departments within NEA and to the private parties. Likewise, Training Center is one of the important departments of Nepal Electricity Authority, under Engineering Services Directorate. It has been enhancing the skills and knowledge to the staffs of NEA as well as Nepalese citizens since 2046 B.S.

Dudhkoshi Storage Hydroelectric Project

The Dudhkoshi River located in the Eastern Development Region of Nepal is one of the main tributary of the Sunkoshi River. The Dudhkoshi Hydroelectric Project is a storage type of project located between boundaries of Khotang and Okhaldhunga districts on the Dudhkoshi River in Eastern Development Region of Nepal. The project was initially identified during the preparation of Master Plan Study on the Koshi River Basin in 1985. The feasibility study was carried out by NEA in 1998 for 300 MW installed capacity and was identified as a viable and attractive project and was recommended for the project development. The catchment area upstream of the dam site is 4,100 km^2. The latitude and longitude of the dam site are 27.30^0N and 86.70^0E respectively and the altitude is el. 429 masl. The Nationwide Master Plan Study on Storage type Hydroelectric Power development in Nepal conducted by JICA has identified and selected 10 most promising storage projects for development in which the Dudhkoshi Hydroelectric Project tops the ranking.

The Dudhkoshi project site is located approximately 5 km northwest of Lamidanda airport located in Khotang district, which is about 160 km east of Kathmandu. The dam site can be accessed by a 20 km long fair weather road that branches from Ghurmi - Diktel road. The dam site can also be assessed by other fair weather road from Okaldhunga. Nearest road head for proposed powerhouse site is located at Dhitung village which is about 8 km from powerhouse site. Ghurmi, a market center located at the middle hill road is the nearest road junction for the project area. The middle hill road continues towards east connecting Halesi, Diktel etc. Okhaldhunga is also connected to Ghurmi. Regular public transport services to Diktel, the headquarters of Khotang district and Okhaldhunga, the district headquarter of Okhaldhunga district are in operation from Kathmandu and Katari via Ghurmi.

The recommended scheme in the Feasibility Study consists of a 160 m high rock fill dam at Dudhkoshi and powerhouse at Baikhu Khola, a tributary of Sunkoshi. The predominant rock types in the dam site are phyllite and quartzite. The reservoir area is 10 km^2 at the full supply level (FSL) of 580 masl with gross storage volume of 687.4 million m^3 at FSL, a spillway of discharge capacity of 5,500 m^3/s in the right abutment, a headrace tunnel of 13,260 m length, and an underground powerhouse with an installed capacity of 300 MW and average annual energy generation of 1806 GWh, a tailrace tunnel of 370 m length with a surge chamber. The station houses five Francis turbines each of 60 MW rated capacity with a rated net head of 249.3 m and a design discharge of 27.2m^3/s.

Survey license of Dudhkoshi was issued to NEA by DoED, in April 2013. The condition of the license requires the tailrace water of the project to be released in the upstream of the proposed Sunkoshi-Kamala Diversion head work. This constraint has preempted the development with a long headrace tunnel (Scheme B) recommended in the Feasibility Study 1998. The remaining option is the toe development (Scheme A) with a possibility of dam height optimization to maximize the site potential in given conditions. There is still a possibility of releasing the required discharge to meet irrigation requirement by the proposed Sunkoshi-Kamala Diversion during lean flow months and utilizing the remaining discharge in order to materialize the layout proposed in the FS, thus sticking to Scheme B with some operational constraints. Besides, possibility of a staged development with the combination of toe powerhouse and then long headrace tunnel leading to the powerhouse at Baikhu Khola needs to be given due consideration.

The review report of the project prepared by NEA in FY 2012/13 has compared the two options of development,

Toe Option with Long Tunnel Option releasing the required water for Sunkoshi - Kamala diversion. For the comparison purpose, the Toe Option as well as Tunnel Option was analyzed and compared assuming full supply level of 580 masl as conceived in the feasibility study. In Tunnel Option, the energy benefit is estimated by releasing the required discharge from the dam site to ensure 90 per cent dependable flow of a year (Q_{90}) for Sunkoshi - Kamala Diversion. The analysis showed that with the dam height of 160m, the Toe Option will generate 210 MW with annual energy of 1,108 GWh whereas the Tunnel Option will generate 365 MW with 1,928 GWh of annual energy based on 12 hours peaking. The comparison distinctly showed that the Tunnel Option is better than the Toe Option even though considerable amount of water is released downstream in the prime dry season. The study further revealed that there is possibility of increasing the dam height in the present demand and supply scenario to increase energy generation. With the increase in dam height up to 220 meter, the project could generate above 800 MW based on 12 hours peaking.

There is a need of addressing the conditions stated in the license thereby requiring the release of tail water at the u/s of the Sunkoshi Kamala diversion. It is required to review the feasibility study of the project and upgrade it by taking into consideration of all viable alternatives including (i) release of tail water at the upstream of the Sunkoshi Kamala diversion, (ii) releasing water from the dam site to ensure require water discharge for irrigation at Sunkoshi Kamala Diversion, and (iii) stage wise development. Besides, the site capacity is required to be optimized since the feasibility study of the project was conducted under the umbrella of Medium Hydropower Study project (MHSP) where maximum capacity was limited to 300 MW.

Dudhkoshi Dam site

The main objective of the further study would be to prepare the project for implementation from the current status of the existing Feasibility study. Owing to this, it is planned to employee a reputed international Consultant to carry out necessary field investigation and update the existing Feasibility study of Dudhkoshi Storage Hydroelectric Project, carryout detail design and prepare tender documents and tender drawings; prepare Environmental Impact Assessment, Social Impact Assessment, Environmental Management Plan and Construction Plan to meet the NEA, GoN and leading multilateral agencies requirements for construction of the project. In this backdrop, a process for selection of an international Consultant has already been initiated and a total of 23 firms has submitted Expression of Interest for the study. It is envisaged that selection of the Consultant and award of the Contract would be completed by March 2015. It is planned to complete the field investigation, detailed engineering design, EIA/SIA and prepare the bidding documents in 30 months staring from April 2015 and necessary documents would be ready to start construction by September 2017.

Project Development Department

Project Development Department (PDD) looks after the study of hydropower projects at different levels. It is headed by a director. There are six divisions under the department each headed by a manager. The department mainly focuses on the preparation of hydropower projects for development by NEA. This includes identification of projects, their screening and ranking, carrying out their feasibility studies and finally preparing tender documents and detailed drawings through a detailed design study. The department has also been providing construction supervision services for the projects under construction as per the agreements with the concerned project. In addition, PDD has also been providing consulting services for the detailed survey of a number of transmission line projects being carried out by Grid Development Directorate. Brief descriptions of the projects being carried out from this department is outlined in following sections.

Upper Arun Hydroelectric Project

The Arun River is bestowed with high firm flow and steep river gradient making very favorable for the hydropower development. The Upper Arun Hydroelectric Project, which lies on the upper reach of the Arun River, is one of the most attractive projects in the Eastern Development Region of Nepal. Based on the feasibility study carried out on 1991, the installed capacity of Peaking Run-of –River type Upper Arun HEP is 335 MW. The design discharge of the project is 78.8 m3/sec and generates the firm energy of 2050 GWh per annum. The project has design head of 492 m. The total cost of the project is US$ 479 Million.

Review Study of this project was carried out by NEA in 2011. The project cost was revised based on the year 2011 unit rate, prevailing road facilities which is already built up to Num near the dam site of Arun 3 HEP and transmission line. The total project cost at 2011 was estimated to be 445.54 M US$. The review study also showed the increment in the annul generation to 2734.2 GWh. The project is proposed to be developed by NEA under the ownership of Nepal Government.

Head works site of Upper Arun Hydroelectric Project

In the development of UAHEP, World Bank (WB) has been introduced as a possible financing partner. The WB has provided the Aide Memoir for the project. The EOI documents for the selection of consultant of the project have been revised considering the WB requirements. Some of the other works include hydrological updating of the project. The project development department (PDD) has also completed the transmission line survey of the project. The 220kV double circuit line stretches from the powerhouse site to the Tumlingtar substation. So far environmental study is concerned; PDD has prepared the ToR for the consultation services of the ESIA and CIA study of the project. The comprehensive consultation meeting for finalization of ToR was also conducted in this fiscal year. EOI and RFP document to procure consulting services for engineering as well as environmental and social studies related to the project have been prepared. It has been planned that two separate international consultants shall be hired for the environmental study and detailed engineering design of the project. The ESIA and CIA study is expected to be started in 2071/72 fiscal year at the earliest possible.

The Project site is presently not accessible by motorable road. The nearest accessible point is Num Bazaar. Num Bazaar can be assessed by about 40 km fair-weather road from Khandbari. The powerhouse of the Project is about 25 km from Num. Department of Road, North-South Koshi Road Project (NSKRP) is currently constructing new fair weather road from Num Bazaar to Kimathanka through Gola. The UAHEP will construct a bridge over the Arun River and a 24 km long new access road from powerhouse site near Gola to proposed dam site including 1.7 km of road tunnel. The PDD has been finalizing the EOI and RFP documents required for the consultation services for the project road.

As UAHEP is proposed to be developed by NEA under the ownership of Nepal Government; it will not be possible for the local people to invest on it. Hence, a separate project called Ikhuwa Khola Hydropower Project (IKHEP) has been identified and is proposed to be developed as an integral part of Upper Arun HEP for the social mitigation purpose. IKHEP is located approximately 8 km downstream from the powerhouse site of Upper Arun HEP. The feasibility study of the project is being carried out by the Department of Electricity Development. NEA is planning to develop Upper Arun and Ikhuwa Khola HEP at the earliest possible time.

Upper Modi A & Upper Modi Hydroelectric Project

Upper Modi 'A' Hydro Electric Project was identified during 1997 and the Feasibility study of this project was completed in the year 2000. Environmental Impact Assessment (EIA) of the project was approved in 2004. Presently this project is conceptualized to be developed as cascade scheme between Upper Modi 'A' and Upper Modi HEP with total installed capacity of 62.2 MW (Upper Modi 'A'- 42 MW and Upper Modi - 18.2 MW)
This project is located approximately 250 km west of Kathmandu in Kaski District of Gandaki Zone in the Western Development Region of Nepal. Both the headwork and powerhouse site of the project is located in Ghandruk VDC. The nearest highway to the project site is at Nayapul, about 38 Km west of Pokhara on Pokhara Banglung highway. Approximately 8 km of motorable road and a steel truss bridge over Modi Khola has already been constructed by the local administration. Hence, approximately 8.0 Km of access road need to be constructed from powerhouse of the Upper Modi A to the headwork site. Approximately 1.0 km of project road will be required for the construction of Upper Modi project. Similarly, 8 Km long 132 KV single circuit transmission line will be required to evacuate generated energy from both projects to the INPS system at New Modi Khola substation.

This cascade project is conceptualized to be developed in Public Private Partnership (PPP) model. A Joint Development Agreement (JDA) was signed between Nepal Electricity Authority (NEA) and Korean Water Resources Corporation (K-Water) with the share holding provision of 60% to NEA, 30% to K- Water and 10% to the local residents. Presently, the technical team of

NEA and K- Water has completed the joint feasibility study report of cascade project. Detailed engineering design of access road up to the headwork site of Upper Modi 'A' from the existing road has been completed. Similarly, detailed topographical survey of transmission line has been completed. Supplementary Environmental Assessment study of the Biological environment of the project area has been completed as per the requirements of Ministry of Forest and Soil conservation. Detailed Engineering Design of this project is planned for the coming fiscal year.

Upper Modi 'A' Headwork site

Tamakoshi V Hydroelectric Project

The Tamakoshi-V Hydropower Project is a cascade development of the Upper Tamakoshi HEP with tandem operation. It is located approximately 170 km north east of Kathmandu, the capital of Nepal and approximately 40 km away from the district head-quarter of Dolkha District- Charikot Bazaar. The newly constructed road connecting Singate Bazaar and Lamabagar for the construction of Upper Tamakoshi HEP passes both powerhouse and headwork sites of this project. Upper Tamakoshi Project recently built this road.

Tamakoshi V Powerhouse Site

The feasibility study of the Project was carried out by NEA in fiscal year 2010/11. All the structures of this project are located on the right bank of Tamakoshi River. The project being a cascade development to Upper Tamakoshi HEP, it does not need separate headwork. Tamakoshi-V feeds on the discharge from the tailrace of the Upper Tamakoshi Project through an underground inter connection arrangement and conveyed water to headrace tunnel of the Project. An underground powerhouse is proposed at Suri Dovan. The design discharge of the project is 66 m^3/sec with an installed capacity of 87 MW.

The general arrangement of the project comprises of underground inter connection arrangement of headrace tunnel with the tailrace tunnel of Upper Tamakoshi HEP. The interconnection system consists of connecting tunnel, a head pond required to maintain suction head before the pressurized head race tunnel entrance, spillway and spillway tunnel. Discharge from the tailrace of Upper Tamakoshi HEP is diverted through interconnection system and conveyed to 8.20 Km long concrete lined headrace tunnel, 122.38 m high drop shaft, 41.44 m long pressure tunnel and to the underground powerhouse containing four number of vertical axis Francis turbine for the generation of 87 MW electricity equivalent to 460.5 GWh of energy (without Rolwaling). Tailrace tunnel of 141.61 m and 54.55 m long tailrace canal will release the water into the Tamakoshi River itself after the generation of power. The outlet of the tailrace is approximately 0.2 km downstream from the confluence of Tamakoshi River and Khari Khola at Suri Dovan. With the availability of the infrastructure developed for the Upper Tamakoshi HEP particularly the access road and transmission line and also being the cascade project of Upper Tamakoshi HEP, Tamakoshi V HEP can be developed along with Upper Tamakoshi HEP. Hence, the project can be commissioned in five to six years from FY 2070/71 and shall be the milestone project to overcome the load shedding in future.

For the speedy implementation of Tamakoshi V, NEA has initiated the preparatory works for the Detailed Engineering Design in this fiscal year so that the detailed engineering design can be carried out in the next fiscal year. All the necessary activities like additional geological and geotechnical investigation/s, Environmental Impact Assessment (EIA) finalization, finalization of Expression of Interest (EoI) and Request for proposal (RFP) documents for selection of international consultants are being prepared for the detailed engineering design of the project. With regards to the interconnection system, an agreement has been signed between Project Development Department (PDD) and Upper Tamakoshi HEP for the detailed engineering design and construction supervision of interconnection system. This work will be carried out through the consultant of Upper Tamakoshi HEP. Similarly, the construction of interconnection system will also be executed through the present civil contractor of Upper Tamakoshi HEP.

Andhikhola Storage Hydroelectric Project

Andhi Khola Storage Hydroelectric Project is a medium sized storage scheme situated on Andhi khola, a tributary of Kali Gandaki River in the Gandaki Basin. The dam site is located at about 1.6 km upstream of confluence of Kali Gandaki and Andhi Khola whereas, powerhouse site is located on the left bank of Kali Gandaki River, about 12 km downstream of the Kali Gandaki-A HEP powerhouse.

The Feasibility Study of this project was carried out by NEA in 1998. As per the study, the project will generate an annual average energy of 693 GWh with installed capacity of 180 MW. NEA started to upgrade the feasibility study from the year 2010/11 and NEA has applied for survey license of this project in the same year. In the view of further study, altogether four options have been considered.

Andhikhola Dam Site

An alternative study is carried out considering two dam and two powerhouse sites including the old dam and powerhouse site from previous studies (1998). In the fiscal year 2013/14, the Project Development Department carried out the project alternative study with all those options and prepared the Interim Feasibility Study Report. The study indicated that the old dam site option is more economically attractive than the new dam site option. And the economic parameters for both the power house options do not vary significantly with old dam site option. Hence the both the alternatives are recommended for the further study. As per the study, the project will generate an annual energy of 664 GWh with installed capacity of 303 MW with dam height of 193 m and Full Supply Level of 710 m with old powerhouse option whereas in case of new powerhouse option for the same dam height, the annual energy is 600 GWH with installed capacity of 275 MW.

Uttar Ganga Storage Hydroelectric Project

The Government of Nepal (GON) has given priority for the development of storage type hydropower projects and accordingly NEA has initiated the "Selection and Feasibility Study of Storage Projects" across the country under funding of GoN. Uttar Ganga Storage Project is one of such potential projects, for which NEA has proposed to initiate the feasibility study in the fiscal year 2011/12. The proposed project lies in Baglung District of Dhaulagiri Zone in Western Development Region (WDR) of Nepal. The dam site is located at Gaba village of Nisi VDC whereas the powerhouse site is situated on the left bank of Nisi Khola nearby Kaigau Village of Nisi VDC. The earthen track road has been constructed up to Uttar Ganga (Dhorpatan) in this fiscal year. About 11 KM long access road from Uttar Ganga, the nearest road head will be required to reach the dam site. The proposed power house site is accessible by Rukum – Banglung part of Madhyapahadi Highway (Pushpalal Lokmarg). A bridge across the Nisi Khola is needed to be constructed to reach the powerhouse site.

View of Reservoir Area & Uttar Ganga River of Uttar Ganga Storage Project

The application for the survey license was submitted to DoED in the fiscal year 2011/12. As the dam and reservoir area of the project are located within Dhorpatan Hunting Reserve, pre-approval is required from Ministry of Forest and Land Conservation for conducting the feasibility study. Though the application for the same has been submitted, the approval from the Ministry has not been received yet. However, the third meeting of Project Facilitation Committee under the office of Prime Minister and Cabinet chaired by the Chief Secretary on April 29, 2013 decided to prepare the Detail Project Report (DPR) and Environmental Impact Study of the project. Accordingly, NEA has again made a request to DoED for the survey license of generation submitting the required additional license fee and prepared the project status report in the F/Y 2012/13.

The major components of the project are 145 m high rock fill dam, sloping type intake, 9,800 m long headrace tunnel, circular restricted orifice surge shaft, 3,900 m long inclined pressure shaft and horizontal tunnel and an underground powerhouse on the right bank of Nisi Khola. The installed capacity of the project has been computed as 300 MW on basis of 18 hours in dry season (November-May) and 6 hours in wet

season (June-October) operation. The annual energy generation from the project after outage and losses will be 1,269.4 GWh of which the firm energy (all dry season energy from November to May and peak wet season energy from June to October) is 1,252.0 GWh and the secondary energy (off peak wet season energy from June to October) is 17.4 GWh. The energy generated from the project will be evacuated to the INPS at the proposed Kusma sub-station through 85 km long 220 kV transmission line. The distinct features of the project are as follows:

- Availability of very high effective head of up to 1,310 m making the project very cost effective;
- High Run Off Capacity Factor (RCF) of 62% facilitating the much flexibility in reservoir operation;
- Less sediment yield of 2,750 t/km^2/year thereby increasing the life of the reservoir;
- Inundation of only 250 ha of cultivated land and resettlement of 260 households thus having comparatively less socio-environmental impacts.

The total cost of project has been updated as US$ 775 million at the price level of June, 2013 excluding interest during construction (IDC) and other financial costs. The economic indicators EIRR of 12.91 and B/C of 1.30, as well as financial indicators FIRR of 15.2 and B/C of 1.16 shows that project is viable for development.

During this fiscal year 2013/14, the following works are carried out:

Topographical survey of proposed power house site.

- Field hydrological works including new gauge installation at Kanga Village (near to dam site), discharge measurement at both dam site & power house site and gauge reading continue at both dam site & power house site.
- Geological study included geological mapping of the power house site.
- Presentation at NEA Office Kathmandu to information sharing with local people from Project site (Bobang & Nisi VDC of Baglung District).

Tamor Storage Hydroelectric Project

Tamor Storage Hydropower Project lies in Terhathum and Panchthar districts of Eastern Development Region. The Project was identified during the Koshi River Basin Master Plan Study, 1985. Further studies on the project started only in 2009, after about 25 years of its identification. The Project is in its initial stage of study. The Project site can be accessed via. Biratnagar – Dhankuta- Myanglung black topped road.

An earthen track of about 25 Km connects Myanglung to Lambhughat which is located at about 1.5 Km upstream of the proposed dam site. Being a reservoir project with seasonal storage capacity and suitably located to cater the energy hungry industries of Eastern Development Region, this is one of the promising storage projects being studied by Project Development Department.

Proposed Dam Axis of Tamor Storage Hydroelectric Project

DoED has granted license to NEA for full supply level 450m on Shrawan 2070. Due to high level sedimentation in the flow, the reservoir will fill within few years (3-4). So this FSL is not feasible and the alternative study was being started. Due to the presence of Kabeli 'A'- Hydropower Project with installed capacity of 37.6 MW, total energy 202.5 GWh and Dry energy 31.0 GWh, planned by IPP at upstream of Dam site of the Tamor Storage project directly interfere Tamor Storage Hydroelectric Project. Thus, the study has been carried out considering two alternatives. First alternative "with considering the Kabeli 'A' HEP" in which the maximum reservoir level of Tamor Storage Hydroelectric Project will be restricted to EL 450 m and second alternative "without Kabeli 'A' HEP" in which the maximum reservoir level has been optimized with the optimization of the design discharge and corresponding installed capacity.

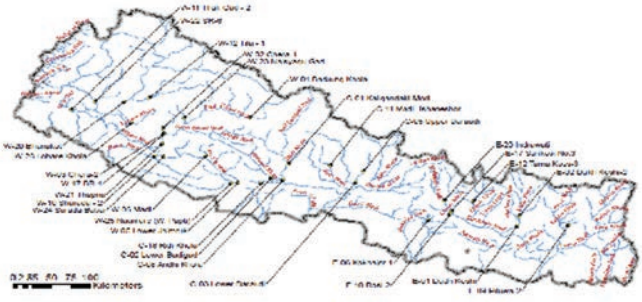
The following main conclusions were drawn from this alternative study:

- Based on economical analysis with long run marginal cost, the alternative-II with full supply level 550 masl, Installed capacity 762 MW, net present value-622.4 Million US$, B/C ratio-1.61 and EIRR-16.17% is economically and technically viable in comparison to Alternative-I.
- The comparison of two alternatives clearly shows that alternative-1 is not feasible due to high flow of sediment. Considering sediment flushing in three years, a concrete dam was proposed for this level of 450 masl which was found to be economically non attractive in comparison to Alternative II.
- The alternative-II is more attractive at dam height 550 m and installed capacity 762 MW. In this option, the cost of Kabeli-A 37.60 MW project is included in the total project cost.
- The Project is capable of generating 3,151.5 GWh of annual energy and dry energy 1,075 GWh.

- Abundant discharge (average: 309.79 m^3/s) and enough storage capacity total: 2725 MCM, Effective storage volume: 1900 MCM)
- Approximately 30 kilometers of access road from Mulghat along the river should be constructed and improvement of existing ragged road of around 25 km from Terhathum to the project site is required.
- Less environmental impact, (few relocation houses and less cultivated land)
- Favorable Project location Eastern Region
- Approximately 75 km of 400 KV transmission line will be required for the power evacuation at Inaruwa substation.

Nationwide Master Plan study on Storage Hydroelectric Power Development in Nepal

The Nationwide Master Plan Study on Storage Hydroelectric Power Development in Nepal had been conducted on the basis of the scope of work agreed between Japan International Cooperation Agency (JICA) and the Ministry of Energy, Government of Nepal (MoE) with Nepal Electricity Authority (NEA) as the counterpart agency. The study aims to prepare a master plan for storage type Hydroelectric Power Development for domestic demand in Nepal for the coming 20 years by selecting promising candidate projects in the range from 100 MW to 300 MW from a list of 67 potential projects listed by NEA.



Location of Candidate Storage Projects

The study started off in Japan from the end of December 2011. The first work period in Nepal began from January16, 2012 up to February 26, 2012. The first stake holder's meeting was held in February 2012 in Kathmandu. The second work period for the JICA team in Kathmandu was from the May 8, 2012 up to June 30, 2012. The end of the second work period concluded with the reconnaissance site survey work of four storage projects. Third, Fourth and Fifth work period of JICA study was concluded between November 18th 2012 to December 2nd, 2012, February 3rd, 2013 to February17th, 2013 and May 27th 2013 to June 8th, 2013 respectively.

The Second and Third stake holders meeting between different agencies was held on November 28th, 2012 and February 13th, 2013 respectively

The Study Team submitted the following report on the study to JICA/NEA

Inception Report	December	2011
Progress Report	February	2012
Interim Report	November	2012
Draft Final Report	February	2013
Final Report	March	2014

The Joint Coordination Committee (JCC) and Strategic Evaluation Assessment (SEA) meeting between different stake holders was held on June 3, 2013 and June 5, 2013 respectably at Ministry of Energy, Government of Nepal. The JICA Study Team in coordination with the Nepal Electricity Authority has submitted the Final Report in this fiscal year BS 2069/070. Based on the JCC & SEA meetings outcome, JICA submitted the Final Report on March 20, 2014 (FY 2070/071) & list of ten promising storage projects selected for Master Plan Study by JICA/ NEA Study Team are as follows.

Project Name	Region	Installed Capacity (MW)	Annual Energy (GWh)	Project Cost* (MUS$)	The Earliest possible Commis-sioning Year (FY)	Re-marks
Dudh Koshi	Eastern	300	1909.6	1141.0	2023/24	1
Nalsyau Gad	Mid Western	410	1406.1	966.9	2023/24	2
Andhi Khola	Western	180	648.7	665.8	2025/26	3
Chera-1	Western	148.7	563.2	576.9	2027/28	4
Madi	Western	199.8	621.1	637.3	2027/28	5
Naumure	Eastern	245	1157.5	954.5	2027/28	6
Sun Koshi No.3	Eastern	536	1883.6	1690.5	2028/29	7
Lower Badigad	Western	380.3	1366.0	1209.8	2028/29	8
Kokhajor-1	Eastern	111.5	278.9	476.5		9
Lower Jhimruk	Mid Western	142.5	454.7	520.9		10

*: FY 2012/13 price

The JICA Study Team recommended the three power development plans related to the Base case, High Case and Low Case from the year 2012/13 to 2031/32 consisting of storage projects, run of the river projects and pondage run off the river projects. In those power development plans, the total installed capacities of storage type HPPs are 1993 MW for the base case, 3154 MW for the high case and 1664 MW for the low case demand forecast scenario. The power development plan of the storage projects for these three cases are as follows:

Project Name	Installed Capacity (MW)	Commissioning Year(FY)			Remarks
		Base Case	High Case	Low Case	
Kulekhani No. 3	14	2015/16	2015/16	2015/16	
Tanahu	140	2020/21	2020/21	2020/21	
Budhi Gandaki	600	2022/23	2022/23	2022/23	
Dudh Koshi	300	2026/27	2026/27	2027/28	
Nalsyau Gad	410	2028/29	2027/28	2029/30	
Andhi Khola	180	2029/30	2029/30	2031/32	
Chera-1	149	2031/32	2029/30		
Madi	200	2031/32	2030/31		
Naumure	245		2030/31		
Sun Koshi No.3	536		2031/32		
Lower Badigad	380		2031/32		
Total Capacity		1993MW	3154 MW	1644 MW	

*: FY 2012/13 price

Survey of Transmission Lines

Survey Division has been accomplishing different activities of Engineering Services. During this fiscal year 2070/2071 the following surveying activities of the transmission line have been undertaken.

S.N.	Transmission Line Project Name	District	Length of Transmission Line in KM	Project Status
1.	Kaligandaki Corridor, Dana – Kushma 220 KV	Parbat and Myagdi	38.73	Completed
2.	Chilime – Trishuli 220 KV	Rasuwa and Nuwakot	26.49	Completed
3.	Marsyangdi – Kathmandu 220 KV	Tanahu, Gorkha, Chitawan, Dhading and Kathmandu	About 82	Running
4.	Upper Arun – Tumlingtar 220 KV	Sankhuwasabha	44.80	Completed
5.	Upper Modi 'A' – New Modi 132 KV	Kaski and Parbat	11.10	Completed
6.	Samundratar – Trishuli 3B 132 KV	Nuwakot	25.67	Completed
7.	Jhuljhule – Middle Marsyangdi 132 KV	Lamjung	19.30	Completed
8.	Feasibility study of Rupani 132 KV Sub-station	Saptari		Completed
9.	Koshi Corridor, Basantapur – Taplejung 220 KV	Taplijung, Sankhuwasabha and Tehrathum	43.30	Completed

Other Activities

In addition to regular work consisting of carrying out studies at different levels for different projects, PDD has been carrying out various activities which have been instrumental in developing the institutional strength of Nepal Electricity Authority in the field of consulting services. The following are the few of the activities of PDD carried out during the fiscal year 2070/71.

- Continuation of the construction supervision of Chameliya Hydroelectric Project in association with the joint venture of three local consulting firms (SHAH, SILT and ICON JV).
- Construction of Corporate Office Building Project
  NEA planned to establish a corporate office, commercial complex and business complex at 26 ropanis land at Durbarmarg, Kathmandu. A master plan was developed in 1989. Due to enormous change in building technology, evolution in latest office design concept and changed scenario in commercial building requirements, NEA modified the existing master plan through the Consultant 'Designer Pavilion (P) Ltd. For further improvement of the Project, NEA has selected the joint venture consortium of "BDA Nepal (P.) Ltd., Innovative CREATEERS Architects & Engineers Pvt. Ltd. and MRB Associates". The detail design of Corporate Office Building was completed in FY 2070/71 by the Consultant. Project Development Department invited a bid for the pre-qualification of the contractor for the construction of NEA corporate office building at existing NEA premises. The project consists approximately rectangular building of 40 m x 29 m (Gross floor area just above 1100 m2 at the basement level). The building is of 16 floor plus 2 attic floor above ground, double basement for parking. Total floor area of the proposed building is approximately 16,000 sqm. From the invited contractors, the pre-qualified contractors have

been short listed and evaluation report has been prepared. The project is proposed to construct with the financial investment by NEA itself. The construction of the building is planned to be started in the coming FY 2071/2072.

Environmental and Social Studies Department

Environment and Social Studies Department (ESSD) is one of the integral departments of Engineering Service Directorate of NEA. This department executes activities related to all aspects of environmental and social aspects of hydropower and transmission line projects being planned, designed, constructed or operated by NEA.

This department is a commercial wing of NEA and with its technical expertise involved in conducting Environmental Impact Assessment (EIA), Initial Environmental Examination (IEE), Social Impact Assessment (SIA), Vulnerable Community Development Plan (VCDP), Resettlement Action Plan (RAP) studies along with environmental monitoring, and implementation of mitigation measures and community support programs of hydroelectric, transmission line and distribution line projects.

During the fiscal year 2013/14, ESSD was actively engaged in overall assessment, monitoring and protection of the environment. The department successfully conducted several environmental studies out to which IEE of Rahughat-Modi 132 kV and Koshi Corridor 220 kV TL projects have been approved by Ministry of Energy. Similarly, Supplementary IEE of Upper Trishuli 3'A'-Matatirtha 220 kV TL project; project and Updated EIA (Biological Part) of Upper Modi A Hydroelectric Project have been approved by Ministry of Forest and Soil Conservation whereas Suplementary IEE of Kabeli Corridor 132 kV TL was approved by Ministry of Energy. ESSD is engaged in different projects which are at different phases of study. The Terms of Reference (ToR) of IEE study of two different projects -Chilime-Trishuli 220 KV and Kaligandaki Corridor 220 kV TL projects have also been approved by the Ministry of Energy. Similarly, the Updated VCDP of Khimti–Dhalkebar 220 kV TL Project and hot spot study of birds, elephant, monkey and large mammals prepared for Hetauda-Dhalkebar-Duhabi 400 kV TL Project were cleared by the World Bank. The department has prepared and submitted the following study reports to the respective ministries for approval.

1. EIA Completed Projects
   - Kohalpur-Surkhet 132 kV TL Project
   - Upper Trishuli 3'B' Hydroelectric Project
2. IEE Completed Projects
   - Kushaha-Kataiya 132 kV TL Project
   - Rahughat Hydroelectric Project (Supplementary)
   - Samundratar-Trishuli 3'B' Hub 132 kV TL Project Trishuli 3'B' Hub Substation Project
3. ToR and Scoping of the projects
   - Dordi Corridor 132 kV TL Project
   - Ramechhap-Garjyang 132 kV TL Project
   - New Modi-Lekhnath 132 kV TL Project
   - New Khimti-Barhabishe-Kathmandu 400 kV TL Project

ESSD has been undertaking environmental monitoring and mitigation of three under-construction hydroelectric projects (30 MW Chameliya, 60 MW Upper Trishuli 3A and 14 MW Kulekhani III) by establishing an Environment and Social Monitoring Unit (ESMU) at each site. In addition to these, the department has been monitoring seven under-construction transmission line projects (Hetauda-Dhalkebar-Duhabi 400 kV; Bharatpur-Bardghat 220 kV; Hetauda-Bharatpur 220 kV; Middle Marshyangdi-Dumre-Damauli 132 kV; Kabeli Corridor 132 kV; Balach-Attaria 132 kV and Jagatpur-Madi 33 kV) by establishing ESMUs at project sites. In the near future, an ESMU will be established for Kaligandaki A Hydroelectric Plant Rehabilitation project and Upper Trishuli 3'A' –Matatirtha 220 kV TL Project.

Under mitigation and enhancement programs, different activities were conducted in this FY 2013/14. Vegetable training was provided to 25 households and 80,000 vegetable seedlings were provided to 200 Project affected

Nursery established at Malakheti-8 of Kailali District Vegetable Nursery established at Balach, Darchula District

Families (PAFs) of Chameliya HEP and Balach-Attariya 132 kV TL Project. In addition to this, a nursery was established at Malakheti-8 of Kailali District with the objective of producing 2,00,000 seedlings/saplings for the compensatory plantation program of same projects.

In case of Hetauda-Bharatpur 220 kV TL project, the department conducted training to 40 Community Forest Users' Group (CFUGs) members and provided 80,000 seedlings of Non-Timber Forest Project (NTFPs) plants. Different trainings like forest management and wildlife conservation; agriculture productivity intensification and vegetable farming; and Social awareness programs were conducted at Kulekhani III HEP project area which benefitted a total of 94 local people. A training on electricity safety was provided to 63 local people of Jagatpur-Madi 33 kV TL project area. Similarly, School Support Programs were conducted in the project areas of Upper Trishuli 3A HEP, Kulekhani III HEP and Kabeli Corridor 132 kV TL.

Distrubution of Computers to Tribhuvan High School Chitwan District of Manakamana-8, Nuwakot District

Participants of Electricity Safety Training, Madi,

Soil, Rock and Concrete Laboratory

Soil, Rock and Concrete Laboratory (SRCL) established and developing as Geotechnical Department is under the Engineering Service Directorate of Nepal Electricity Authority. It provides services in material testing, geological and geotechnical investigations for the different phases of a hydropower project development. It provides services like geological mapping, various types of geophysical surveys, core drilling and construction material investigation at different levels to the different departments of NEA and the private sector. In the field of soil and rock engineering, it also provides services of carrying out in-situ tests and laboratory tests viz. determination of index properties, tri-axial tests, consolidation tests, point load tests, direct shear tests, uniaxial compressive strength tests etc. on a regular basis for clients inside and outside NEA.

Following are the major works executed by SRCL in fiscal year 2013/14

1) Geological and geotechnical investigation works of Tanahu Hydropower Project:-

This project is being developed by Tanahu Hydropower Limited ; a subsidiary company of Nepal Electricity Authority (formally Upper Seti Hydroelectric Project) in Tanahu district. Geological and geotechnical investigation works (Phase 2) including 1320 m core drilling, and Laboratory tests at the Dam site and Powerhouse site of the project are near to completion.

2) Geological and geotechnical investigation works at Headworks site of Rahughat Hydroelectric Project:-

This project is in construction phase and being developed by NEA. As a part of additional geological investigation at the Headworks site of the project, a total of 130m core drilling in five holes has been completed in this fiscal year.

3) Additional geological and geotechnical Investigation works at Tamakoshi –V Hydroelectric Project:

Additional geological and geotechnical investigation works including 280 m core drilling at Surge Tank site, Detail engineering geological mapping and 2-D Electrical Resistivity Tomography along the headrace tunnel alignment, construction material survey and Laboratory tests of the project are near to completion.

Core drilling at Dam site of Tanahu Hydropower Project.

4) Electrical Resistivity Tomography (ERT) Survey at Headwork slope of Kaligandaki A Hydropower Station:

Electrical Resistivity Tomography was carried out in five profiles with total length of 2290m along the unstable left bank slope of Headworks site.

Field work for the 2-D Electrical Resistivity Tomography

Laboratory works:

SRCL provides laboratory services of carrying out in-situ tests and laboratory tests including construction material survey and quarry site investigations. Following major works has been carried out in this fiscal year.

- Laboratory testing works (Uniaxial Compressive Strength, Point Load, absorption, Specific gravity and density test on Core samples) of Rahughat Hydroelectric Project.
- Construction Material Investigation and reserve quantity estimation of Tamakoshi V Hydroelectric Project, NEA, Dolkha.
- Laboratory test works of Detail Survey & Design of Electrified Railway Line for Tamasaria - Butwal Sector of MMR and Butwal - Bhairahawa Lumbini Link (DOHWA-KUNHWA-KRNA-ICT-FBC JV).

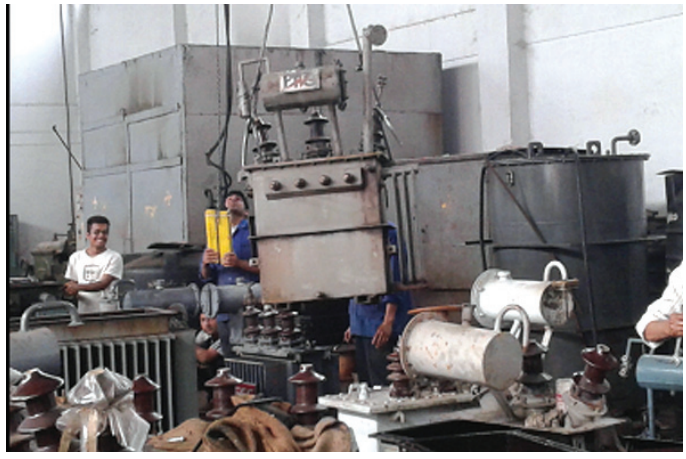
- Laboratory test on core samples of LRBP Project Charuwa Khola, Dhankuta (I.C.G.S. Pvt. Ltd.)
- Laboratory test works on Core samples of Tamakoshi Gum Khola Bridge, Dolkha (N.G.C. Lab. Pvt. Ltd.)
- Laboratory test works of Bagmati River Basin Improvement Project(Department of Irrigation & DHI)
- Laboratory test works on soil and core samples of Thankot Area Road Improvement Project in Nepal (JICA)
- Laboratory test works on construction materials of Ghandruk - Modi Hydroelectric Project, Kaski (Niltara W & E Pvt. Ltd.)
- Laboratory test works on construction materials of Solu Hydroelectric Project, Solukhumbu conducted by Upper Solu Hydro Electric Company Pvt. Ltd.
- Laboratory test works (density, uniaxial compressive strength, tensile strength, point load & petrography analysis etc.) on core samples of Rasuwagadhi Hydroelectric Project, Rasuwa (Soil Test Pvt. Ltd.)
- In-situ concrete over coring works of under construction building of Sajha Prakashan at Pulchowk, Lalitpur and report submission of laboratory test results (concrete grade reconfirmation) to Nepal Government, Commission for the Investigation of Abuse of Authority (CIAA), Tangal, Kathmandu.
- Laboratory test works on core samples of Madi Khola Hydropower Project, Rolpa (MEH Geo - Engineering Services Pvt. Ltd.)
- Laboratory test works on core samples of Dotigad Hydropower Project (MEH Geo-Engineering Services Pvt. Ltd.)
- Laboratory test works (Alkali reactivity (AAR) bar method and Prism method) on construction materials of Tanahu Hydropower Project, Tanahu, (in progress).

Electromechanical Design Division

This division handles all of the electromechanical issues arising within Engineering Services. These issues range from the design of electromechanical equipments of projects that are under various stages of study. Apart from design of the electromechanical equipments, this division also runs and maintains Central Workshops in Hetauda and manufacturers of concrete poles from its two Concrete Pole manufacturing Plants, one in Kotre and the other in Amlekhgunj.

Central workshop

During the last fiscal year 070/071, Central Workshop had completed maintenance of 395 Distribution Transformers capacity ranging from 15 KVA to 250 KVA. Also it had completed repairing, servicing, Shifting, Installation of 7 more Power Transformer capacity ranging from 630 KVA to 20 MVA. Central Workshop had also tested 1,119 Distribution Transformer brought from various outer sectors.



Central Workshop

In order to carry out routine test of transformer up to 10MVA, Central Workshop is planning to established test bench. For this, the contract agreement between Nepal Electricity Authority and M/S Prolific Systems and Technologies Pvt. Ltd., India is executed on June 9, 2014 for the works known as design, manufacture, supply, delivery, installation, testing and commissioning of transformer Test Bench (EPC) to test transformers up to 10 MVA.

Kotre Pole Plant

Kotre Pole Plant was jointly established by Government of Nepal & Finland Government in 2042 B.S to implement for Pokhara Electrification Project. It is located in Dulegauda-2 VDC, Kotre of Tanahu District. After termination of this project, the plant was handover to

PSC pole production at Kotre Pole Plant

Nepal Electricity Authority (NEA).Then this plant was run by NEA, Distribution & Consumer Service Directorate up to F.Y.2061/2062. In that period this plant was in near to close condition and only produced very few pole required for Pokhara Distribution center & its periphery. In F.Y 2061/062, again it was handover Engineering Service Directorate. Since, then the plant was maintained and started to produce PSC pole commercially. Now it is running with separate budget center to implement pole production & Distribution activities.

Production of PSC Pole in Past Two Fiscal Years.

SN	Types of pole	FY 2012/13	FY 2013/2014
1	10.4m	332	260
2	8 m	2,188	2,352
	Total	2,520	2,612

Amlekhgunj Concrete Pole Plant

Concrete pole Plant was established in 2050 B.S at Bara District, Amlekhgunj V.D.C, Ward No. 3. It was jointly established under the Government of Nepal in assistance of Asian Development Bank to implement for seventh electrification project. After termination of the project this plant was handed over to Nepal Electricity Authority (NEA), Engineering Service Directorate. The total capacity of manufacturing pole is 14000 in numbers

Daily production capacity of the plant and the production scenario are as follows. However, from F/Y 2070/71 the production capacity will increase as shown below:

Pole Type	F.Y 2012/13	F.Y 2013/014	Remarks
8 m long	30	48	Work in Progress
9 m long	20	30	Completed
11 m long	8	8	Already exists

Amlekhgunj Concrete Pole Plant

Production of PSC Pole

SN	Types of pole	FY 2013/2014
1	8.0 m	5,682
2	9 m	3,840
3	11 m	1,296
	Total	10,818

NEA Training Center

Background

NEA Training Center (NEA TC) is one of the important departments of Nepal Electricity Authority that is being developed as a center of excellence. It has been contributing different skills to the staffs as well as Nepalese citizens since 2046 B.S from Ratnapark and in Kharipati, Bhaktapur since 2057 B.S. In the last 25 years, NEA Training Center has trained all total of 13,539 employee from the different core group of Nepal Electricity Authority and some of other organizations. During initial five years of its inception NEA TC has conducted trainings only for non officer level. The total no. of 9,782 employee of non-officer level has been trained till F.Y. 2070/71. NEA Training Center has started training courses for officer level since F.Y. 2051/52 and 3,757 officers have been trained till F.Y. 2070/71.

NEA TC occupies around 203 Ropanis of land in Bhaktapur district. It provides different technical as well as non technical trainings with its sovereign identity. Training Center has 27 (Technical 14 and Nontechnical 13) staffs under the control of Director. Those staffs cover all electrical, mechanical, computer, electronics, civil engineering as well as administration and management department functions. They prepare training/seminar programs annually and provide services effectively. The main function is preparing trainings/resource management/collecting appropriate trainees and other general management actions.

With the view to expanse its training programs for clients outside of NEA, upon their request, TC is also conducting various programs to non NEA staff.

Objectives

- Provide Knowledge, Skill and Attitude enhancing tips.
- Supply need based training to NEA employees of enhancing their work efficiency and enabling them for serving the customers effectively.
- Train to the employees to enable them to plan, implement, maintain and operate NEA's system

today and in the future.

- Promote knowledge and skill of the employee to interface them to the changing environment and technology.
- Conduct problem oriented interactions, research and development and seminars relating to service business.
- Design training packages and implement.

Vision

NEATC is to be strengthened day by day to be a sovereign academic institution capable to cope with the training requirements of power sector of the country. Finally NEA Training center aims to be developed as a engineering and management center of excellence. It also aims its academic standard to be comparable with the best SAARC regional institutions.

Activities in F/Y 2070/71

The term training refers to the acquisition of knowledge, skills and competencies as a result of the teaching of vocational or practical skills and knowledge that relate to specific useful competencies. As Human Resource is one of the most important ingredients of any Organization, its development is indispensable for the survival and advancement of the Organization. So, investment in training is treated as corporate assets of organization.

NEA, Training Center (NEA, TC) has been providing need-based short terms trainings covering 2 days to 15 days for NEA employees with an objective to upgrade their professional knowledge, skills and attitudes of manpower at operational and managerial levels involved in the power sector. The training types involve induction, in services or refreshers and requested as required. The training programs are designed as per training needs assessment (TNA) of an organization and at the personnel level after discussion has been held with the management and as feedbacks provided by trainees respectively.

These trainings were conducted on contract with corporate and DMD office levels of NEA. Altogether 11 nos. of trainings were conducted during the fiscal year 2070/71 as given below.

S.N.	Name of the Training	Officer	Non-officer	Total
1	Primavera P6	16	0	16
2	No. of Participants in Induction training for the newly recruited employees in NEA.	71	0	71
3	TOD Meter Data Download and Analysis (Kathmandu (Engineers and Regional Directors) Biratnagar, Hetauda, Pokhara and Nepalgunj)	71	45	116
4	Arc GIS	26	0	26
5	MS Office package	8	1	9
6	33/11 kV S/S Maintenance	0	16	16
Total number of Participants		192	62	254

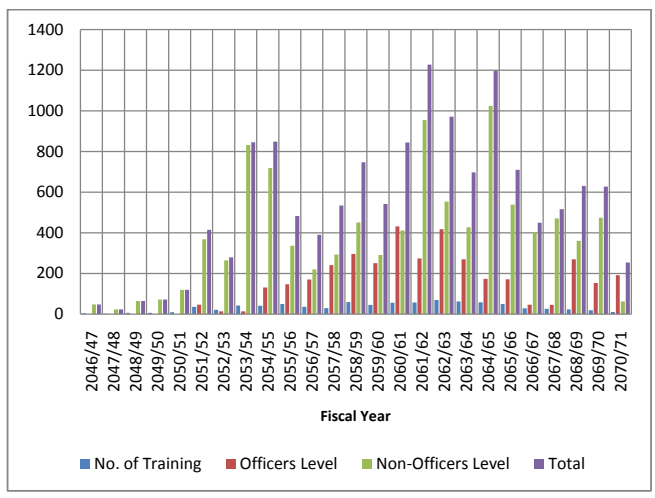
In addition to regular training programs, NEA TC has managed to facilitate the Stress Management Training Program to all level personnel in this FY 2070/71. The total numbers of participants in this program were 54.

In this fiscal year 2070/71, study visit was done by NEA officials team in Asian Institute of Technology (AIT) Bangkok and similarly AIT officials team visited NEA Training Center to access training needs assessment (TNA) of NEA in order to conduct joint training courses in between both organizations.

Extra Activities

NEA TC is providing rental facilities of Seminar Halls, Class rooms, Hostel and Ground space to different parties on their request. Parties like different engineering colleges for their survey camping, political parties for their mass meetings and various organizations for the conduction of seminars, meeting etc are using this facility. The total income generated from this rental activity amounts to Rs. 27,06,473. 00.

Short Term Training Courses Conducted in last 25 years



NEA's Subsidiary and Associate Companies

CHILIME HYDROPOWER COMPANY LIMITED

Chilime Hydropower Company Limited (CHPCL), a subsidiary of Nepal Electricity Authority (NEA)was established in 1996 with the main objective of harnessing the hydropower potential of the country for the benefit of the people at large by optimally utilizing the untapped resources and creating synergy with the private sector. The company's 51% share belongs to NEA, 25% to employees of NEA and CHPCL, 10% to local public of Rasuwa District and the remaining 14% share to the general Public.The scheme has an installed capacity of 22.10 MW, generating 20 MW based on the power purchase agreement with Nepal Electricity Authority (NEA). The project is designed to generate 137 GWh energy per annum. The generated energy from this Project is being fed into the National Grid of Nepal Electricity Authority (NEA) through a 38 km long 66 KV transmission line at Trishuli, Nuwakot District.

Chilime Hydropower Plant (CHPP)

In Fiscal Year 2013/2014 Chilime Hydro power Plant was able to transmit an excess of 13.72 % of energy

in addition to the deemed energy (133.129 GWh). Generation figures depict that the plant was able to deliver chargeable deemed energy of 129.880 GWh and excess of 21.510 GWh Energy out of which 11.233 GWh was paid while 10.277 GWh was for free.

The Plant loading factor was 79.32 % and the total availability was 96.27% . The delivered energy to NEA was 151.390 GWh and the energy for internal consumption and station load amounted to 0.868GWh. The total energy for different outages was calculated to be 3.355 GWh which comprised 0.949 GWh of maintenance outage, 0.308 GWh of forced/plant outage and 2.098 GWh of NEA outage. Based on these figures, the available capacity of the plant for the fiscal year 2070/71was estimated to be 154.745 GWh.

Under the scope of Corporate Social Responsibility (CSR) activities in the fiscal year 2013-14, Chilime has spent almost 5.47 million in community and local development works like health, education, infrastructure, drinking water, irrigation etc.

Chilime has launched four hydropower projects with total capacity of 270.3 MW for construction in parallel through its three subsidiaries, namely Rasuwagadhi Hydropower Company Limited (RGHCL), Madhya Bhotekoshi Jalavidyut Company Limited (MBJCL) and Sanjen Jalavidyut Company Limited (SJCL). Likewise Chilime has already applied for the survey license to Department of Energy Development (DoED), Govt. of Nepal for the development of other new hydropower projects to meet the company's target of 500MW by2020.

Snjen Jalavidhyut Company Limited (SJCL)

Sanjen Jalavidhyut Company Limited (SJCL), a company promoted by Chilime Hydropower Company Limited (CHPCL) was established on 1st February, 2010 AD with the objective of harnessing hydropower potential of the county with maximum participation of local people in the projects' ownership and mobilization of local resources for the successful implementation of various hydroelectric projects. As the first initiative the SJCL has planned to develop two hydroelectric projects, namely, Sanjen (Upper) Hydroelectric Project (SUHEP-14.8 MW) and Sanjen Hydroelectric Project (SHEP-42.5 MW) in cascade, with its own equity and loan from financial institutions of Nepal. Both the projects' financing mechanism will be 50:50 Debt: Equity ratio. 51% of the equity part will be invested by the promoters of the company, which is composed of CHPCL (38%), Nepal Electricity Authority (10%) and District Development Committee (DDC) and all 18 Village Development Committees (VDCs) of Rasuwa (3%). For financing the remaining 49% of the investment, SJCL will raise through share participation of the public, which is composed of Depositors of Employees' Provident Fund (EPF-19.5%), Employees of EPF (1%), Employees of Promoters (3.5%), General Public (15%) and Project Affected Local People (10%). Brief progresses are as follows:

- Chilime – Tiloche main access road and access road to Surge Tank (18 km).
- Construction of camps, offices and resettlement buildings in completion stage.
- Consultancy Services: Detail Design and Construction Supervision Works are in progress.
- Lot 2 Civil Works: Contractor for SUHEP is ECI-BGCCPL J/V and that for SHEP is SEW-TUNDI J/V. In SUHEP, Headrace Tunnel excavation, Aeration Tunnel, Adit excavation, Headworks excavation, Diversion channel excavation etc. are in progress. Total HRT excavation is 106 m. In SHEP, Powerhouse slope protection works, preparation of penstock adit portals and preparation of headrace tunnel adits portals are in progress.
- Lot 3 Electromechanical Works: Design works are in progress for both projects.
- Lot 4 Hydromechanical Works: Design, Procurement, Fabrication of Pipes and Gates, Hoisting etc. are in progress for both projects.
- Lot 5 Transmission Line Works: Detail Design of 132 kV transmission line works of both projects is in progress. Contract award has been scheduled for the first quarter of year 2015.
- A total of 324.31 GWh of electricity will be added into NEA Grid at Chilime Hub upon completion of these two projects. The total estimated cost of the two projects is NRs. 7.24 billion.

Rasuwagadhi Hydropower Company Limited

Background

Rasuwagadhi Hydropower Company Limited (RGHPCL), a subsidiary company of Chilime Hydropower Company Limited (CHPCL) is established in Shrawan 17, 2068 as a public limited company for the development of Rasuwagadhi Hydroelectric Project (RGHEP) having capacity of 111 MW. The project is located in Rasuwa district, Bagmati Zone of Central Development Region. The project is accessible by the Kathmandu-Syabrubesi- Rasuwagadhi road at a distance of 145 km north from Kathmandu.

The company has planned to manage its capital requirement for the construction of Rasuwagadhi Hydroelectric project from debt and equity under the debt equity ratio of 50:50 excluding IDC cost. The company is managing the debt requirement of the project from the Employees Provident Fund (EPF) under the term loan agreement made on Marg 22, 2068 and equity investment from 51% promoter share and 49% public share. The details of the share holdings are as follows:

The Project:

The design discharge of the project is 80m3/sec in Q40 exceedance of time. The project is a run-of-river type having the capacity of 111 MW and the annual energy generation will be 613.875 GWh with the available gross head of 167.9 m. The headwork site is located about 400 m downstream from the confluence of Kerung khola and Lende khola which are the Boundary Rivers of Nepal and China. The desanding basin and powerhouse are underground type. The length of headrace tunnel is 4203m.

The construction works of the project has been divided into three Lots, namely; Lot 1: Civil and Hydro-mechanical works, Lot 2: Electro-mechanical works and Lot 3: Transmission line works.

Project has achieved many milestones including signing Power Purchase Agreement (PPA) with NEA, signing loan agreement with Employees Provident Fund etc. In implementation front, the consultant M/S SMEC International Pty Ltd., Australia has been appointed for Consulting Services of the project on 3rd December, 2012 and for Lot-1: Civil and Hydromechanical Works under Engineering, Procurement and Construction (EPC) contract modality, the Contractor M/S China International Water and Electric Corporation (CWE), China has been awarded the contract on 5th January, 2014. Similarly, procurement for Lot 2: Electromechanical works in Plant & Design Build (P&DB) contract model is ongoing.
The completion date of the project has been scheduled on August, 2017.

Lot 1: Civil and Hydro-Mechanical Works
The contractor M/S China International Water and Electric Corporation (CWE), China is being mobilized to site from 6th February, 2014 and the current status of their construction works are as follows:

Lot 2: Electro-Mechanical Works:
For Lot 2: Electro-mechanical Works, the Contract agrement has been made with VOITH Hydro Pvt. Ltd, India on 31st July 2014. The Contractor has started the Preliminary works of the contract.

Lot 3: Transmission Line Works:
The project has completed detail survey of 10 Km double circuit 132 kV transmission line and detail design is in progress. Term of Reference (TOR) for IEE has been approved by Ministry of Energy and the preparation of final IEE report is in progress.
Similarly, the contractor ANK Construction Co. Pvt. Ltd. is constructing the Camp Facilities for the Employer

at Ghatte Khola Gaun of Timure VDC. The project has carried out rural electrification in the project affected villages: Dahalphedi, Thuman, Mendo, Lingling and Timure of Thuman and Timure VDCs. Other corporate social responsibilities (CSR) activities including the construction of village road of the Thuman VDC has been started.

Madhya Bhotekoshi Hydroelectric Project (MBKHEP-102MW)

Madhya Bhotekoshi Jalavidyut Company Ltd. (MBJCL) is a public limited company established in 2010 AD to

harness country's hydropower potential at a reasonable rate with the maximum utilization of resources (both financial and technical) available in the country. MBJCL intends to execute construction of Middle Bhotekoshi Hydroelectric Project of capacity 102 MW located in Sindhupalchowk District of Bagmati Zone of the Central Development Region. The project works are splitted into three main contract packages:

Lot 1 Civil and hydro-mechanical works on EPC contract model.

Lot 2 Electromechanical works on PDB contract model.

Lot 3 Transmission line and substation on PDB contract model.

Key Achievements:

The project has achieved all major pre-construction milestones that are required for the execution of the project. Following are highlights of the key achievements till date:

S.no	Description	Completed on
1	Power Purchase agreement with NEA	14-Nov-11
2	Study License in the Name of MBKHEP	8-Apr-11
3	Financial Closure with Employee Provident Fund	8-Dec-11
4	Public Hearing	15-Aug-12
5	Contract agreement With Consultant	4-Nov-12
6	Completion of Test tunnel at Sakhuwa(250m)	25-Jan-13
7	Registration on DOI	17-Mar-13
8	EIA approval from MoEST	12-Nov-13
9	Generation License received	03-Dec-13
10	Contract Agreement with LOT 1 Contractor	01-Jan-14
11	Commencement of Works (LOT 1 Contract)	11-Feb-14
12	Contract Agreement with LOT 2 Contractor	10-Jun-14

Progress Status:

The Project is in the initial take off stage where by LOT 1 –Civil and Hydro mechanical Contractor has already been mobilized and the LOT 2-Electromechanical Contractor is about to obtain the Commencement order. The points stated below will give the quick view on overall current status of the Project

Land Acquisition/Lease: Approx.255 Ropani out of 360 Ropani of Land procurement completed; Evaluation and negotiation of existing household completed and distribution of compensation for the same in progress;the project has already put the request on District Forest office for Government Land Leasing and it has to be decided from the Cabinet.

LOT 1 Civil and Hydro mechanical Contract: Geological boreholes completed; Manpower and Equipment Mobilization in Progress; Preliminary Design report submitted and is in the process of review; Construction of relevant Infrastructures (Access Road, Contractor's Camp facilities Workshop, Batching Plant, Laboratory..Etc) in progress.

LOT 2 Electromechanical Works: Contract agreement made with Andritz India Private Limited; Has planned to provide Commencement is order on or before September 2014.

Infrastructures: Construction of Camp facilities for Employer and Consultant in Progress; Excavation of Diversion tunnel (Length 330m) completed by Himal Hydro and has been handed over to LOT 1 Contractor; Test Tunnel at Adit 1 already completed.

Construction planning and scheduling

The planned Commercial operation date is in 9th June 2017.

UPPER TAMAKOSI HYDROPOWER LIMITED

Upper Tamakoshi Hydropower Limited (UTKHPL) was established on 09 March 2007 (2063 Falgun 25 B.S.) as a subsidiary company of NEA with the primary objective of developing 456 MW Upper Tamakoshi Hydroelectric Project (UTKHEP) utilizing domestic financial resources. The majority shares (51%) of UTKHPL belong to four public entities, namely, Nepal Electricity Authority (NEA), Nepal Telecom (NT), Citizen Investment Trust (CIT) and Rastriya Beema Sansthan (RBS) with 41%, 6%, 2% and 2% stakes respectively. The rest of the equity capital will be raised from general public (15%), residents of Dolakha district (10%), contributors in Employees' Provident Fund, EPF (17.28%), NEA and UTKHPL staffs (3.84%) and staffs of debtor institutions (2.88%).

A seven-member Board of Directors representing 4 from NEA, one each from EPF and NT and one from public shareholder (to be nominated) has been constituted at present. The board is being chaired by the Managing Director of NEA, whereas one member each from CIT and RBS represents as invitee in the board. The company plans to issue the shares to the residents of Dolakha district and contributors of EPF in the Fiscal Year of 2014/2015.

Project Features

UTKHEP, one of the national pride projects of Nepal, is located in Lamabagar VDC of Dolakha District in Central Development Region of Nepal. UTKHEP is a run-of-the river development with a live storage volume sufficient for four hours daily peaking operation. The project will generate 2,281 GWh of energy annually with the available gross head of 822 m and design discharge of 66 m3/s. The Project comprises 22 m high and 60 m long diversion dam integrated with 35 m wide intake on the right bank of Tamakoshi river, 225 m long twin settling basin, about 8 km long headrace tunnel, two vertical penstock shafts, underground powerhouse cavern (142m x 13m x 29 m), transformer cavern (167m x 13m x 17.5 m) and about 3 km long tailrace tunnel. The electro-mechanical equipment consists of six sets of vertical Pelton Turbines (Rated Power of 79.5 MW each) coupled with six sets of synchronous generators (Rated Power of 90 MVA each). The generation voltage of 11 kV will be stepped up to 220 kV by 18 (plus one spare) numbers of single phase transformers of rated capacity 90 MVA each. The energy generated from the project will be evacuated to the national grid at Khimti Sub-station through 47 km long double circuit 220 kV transmission line.

Financial Arrangement

The approved cost estimate of the project prior to bidding of different construction lots and consultancy services in different stages was 456 MUSD excluding Interest During Construction (IDC). The project cost has been forecasted as 463 MUSD due to increments in administrative expenditures and market prices, increments in costs of consultancy services with increase in scope of works and additional time, additional taxes and duties to be paid, and modification in design of lower parts of headrace tunnel including some additional works. The project is being financed through 30% equity and 70% debt proportions. As per the separate loan agreements, EPF will invest NRs. 10 Billion as loan and NRs 2 Billion as debenture in the project, whereas NT will invest NRs. 6 Billion as loan. Similarly, CIT and RBS each will invest NRs. 2 Billion as loans. Furthermore, Government of Nepal (GoN) has decided to provide loan upto NRs. 11.08 Billion as the gap funding during implementation of the project.

Power Purchase Agreement (PPA)

PPA has been signed with NEA on 29 December 2010. As per the PPA, average purchase rates have been fixed as NRs. 3.50 per unit for the base year (2010/11) and NRs 4.06 per unit at Commercial Operation Date (COD). After 9 years of COD with annual escalation of 3%, the average purchase rate will remain as NRs. 5.30 per unit throughout the tenure of PPA.

Project Status

The project is being implemented with four separate contract packages: (i) Lot 1 - Civil Works, (ii) Lot 2 - Hydro-mechanical Works, (iii) Lot 3 - Mechanical and Electrical Works and (iv) Lot 4 - Transmission Line & Substation Works. The respective Contractors for those lots are (i) Sinohydro Corporation Ltd., China, (ii) Texmaco

Rail and Engineering Ltd., India, (iii) Andtriz Hydro GmbH, Austria and (iv) KEC International Ltd., India. J/V Norconsult AS, Norway – Lahmeyer International GmbH Germany is assigned as the Engineer/Consultant for construction supervision of the project.

The project has achieved physical progress of 66.5% by the end of the fiscal year 2070/71 (2013/14). The

breakdown of progress in major civil works is as follows:

SN	Project Components	Progress
1	Headworks Concrete	71.1%
2	Headrace Tunnel Excavation	66.0%
3	Adit/Other Tunnels	98.2%
4	Powerhouse/Transformer Caverns	100.0%
5	Tailrace Tunnel Excavation	94.6%
6	P/H and Transformer Caverns Concrete	48.8%

The Lot 2 Contractor has installed the second stage embedded part such as guide frames, sill beams, alignment bolts, wall plates of dam stoplogs and dam radial gates No. 3 and 4. The Contractor is also continuing its work for design and fabrication according to its schedule. The Lot 3 Contractor has started its installation works in the powerhouse. Spiral distributor installation works for Unit 1 to Unit 4 are ongoing, whereas pit liner installation work for Unit 5 is almost completed. The Lot 4 Contractor has completed the detailed survey of the transmission line route from Gongar to Khimti Substation. Land acquisition process has been initiated for first 35 km of approved section of the transmission line route alignment and tower foundation works will commence immediately after the ongoing monsoon season. As the problem of land acquisition has not been resolved yet for new Khimti Sub-station, detail survey works around existing Khimti Sub-station have been carried out to seek as an alternate option.

The commissioning of all six units and thereby overall completion of the project is targeted to be achieved by the end of July 2016, which is about 4 months delay from the base line schedule. This delay is mainly due to design modification of headrace tunnel and time taken in crack treatments of powerhouse crown etc. However, this delay may further increase due to ongoing difficulties in the construction of vertical penstock shaft and stoppages of works in headrace tunnel downstream. The detail design of Rolwaling Diversion as the second stage development of the project will be carried out in the current fiscal year for which the RFP documents have been issued to the short-listed consulting firms.

TANAHU HYPROPOWER LIMITED (THL)

Tanahu Hydropower Limited (THL) is a subsidiary company of Nepal Electricity Authority (NEA) established in 2012 to develop 140 MW Tanahu Hydropower Project ("the Project") (formerly, Upper Seti Hydropower Project). The Project site is situated 150 km west of Kathmandu on Seti River near Damauli of Tanahu District in Gandaki Zone.

The Project is a storage type hydropower project with an estimated average annual energy generation of 587.7 GWh (Years 1-10) and 489.9 GWh (Year 11 onwards). The project is designed for peaking up to six hours in dry season. The main components of the Project are a 140 m high concrete gravity dam with a crest length of 175m on the Seti River and a reservoir with a total surface area of 7.26 km^2 at FSL (EL 415m). The waterway consists of a 7.4 m diameter, 1,203 m long headrace tunnel. A

Proposed Dam site of Tanahu Hydropower Project

117 m long 7.4m diameter tailrace tunnel will discharge the tail water back into the Seti River. An underground powerhouse measuring 27m wide x 46m high x 97m long will be built approximately 6 km (along the river course) downstream of the dam. Access roads (totaling 7.3 km) and several temporary and secondary access roads will provide access to the Project area. Temporary facilities include contractor's camps, equipment and maintenance yard, office areas, project staff's camp area.

Under construction Bridge over Seti River

The project will also include rural electrification (RE) and transmission lines (TL) component. A new 220 kV double circuits TL will evacuate the generated power to the Bharatpur Substation. The length of the transmission

line corridor is 39 km. Additionally, the Project will electrify villages through its Rural Electrification (RE) Program in 18 VDC areas.

The project is being co-funded by Asian Development Bank (ADB), Japan International Cooperation Agency (JICA), European Investment Bank (EIB). Loan agreement for an amount of US$ 150 million was signed with ADB on 21th February, 2013. Similarly, loan agreement for an amount of US$ 183 million was signed with JICA on 13th March, 2013 and that with European Investment Bank (EIB) for an amount of US$ 70 million was signed on 7th May, 2013. Further process is going on for increment of investment amount by EIB. GoN and NEA fund will be used for the preparation of preconstruction infractures. ADB loan will be used for the construction of head

Test audit excavation for additional geological study at dam site.

works, rural electrification, transmission line, and that for JICA for the construction of tunnel, power house, and supply and installation of hydro-mechanical and electromechanical equipment. The project is planned to commence the construction work in 2015 and complete in 2021. Estimated IRR of the project is twelve percent. Land acquisition for access road and camp area has been completed and preliminary actions for land acquisition in reservoir area have been initiated. Development of preliminary infrastructures is in progress. RCC Bridge over Seti River is under construction and will be completed in FY 2071/072. Additional test audit excavation, exploratory drilling for geological study of dam and power house is under progress. The construction of access road and construction power supply will be initiated in the FY 2071/072. Supervision consultant will be deployed in the FY 2071/072 and contractor selection for project construction works will be completed in the FY 2071/072.

TRISHULI JAL VIDHYUT COMPANY LIMITED (TJVCL)

Trishuli Jal Vidhyut Company Limited (TJVCL) is a joint venture company of Nepal Electricity Authority (NEA) and Nepal Doorsanchar Company Limited (NDCL) having equal equity share participation apart from other equity share holders. The main objective of this company is to develop the Upper Trisuli 3B Hydroelectric Project (42 MW) located in Nuwakot and Rasuwa District. This project is cascade project of Trisuli 3A Hydroelectric Project (60 MW) and therefore, operates with respect to Upper Trisuli 3A HEP. The equity share structure of the company is as follows:

Nepal Electricity Authority: 30 %
Nepal Telecom: 30 %
VDCs and DDCs of Nuwakot and Rasuwa: 5 %
Financial institutions formed by the natives of Rasuwa and Nuwakot District: 5 %
Natives of project effected districts (Nuwakot and Rasuwa): 10 %
General Public: 15 %
Employees of NEA and Nepal Telecom in proportion to employees ratio: 5 %

Project Status

The feasibility study of the project was completed by Nepal Electricity Authority in fiscal year 2007/08. TJVCL has carried out the review of the project and updated the project parameters based on the site condition. The company TJVCL by its own engineer has completed the detail engineering design of the project in the fiscal year 2012/13. During the detail design, the project has been updated to 42 MW with the gross head of 99.31 m, design discharge of 51 m^3/s, total energy of 337.88 GWh, the update cost of project is 7745.08 Million NPR. The company has targeted to commission this project by the end of year 2018 AD. Following works are carried out by the company

- Acquisition of about 76 Ropanies of the private land has been completed.
- The construction of camp facilities shall starts from Bhadra 1, 2071.
- The generation license of the project has been acquired by NEA. The company TJVCL has given the application for the transferring the license and updating the installed capacity from 37 MW to 42 MW.
- Power Purchase Agreement (PPA) with NEA is in process.
- First round consultation meeting has been conducted with the potential financing institutions such as a) Nepal Doorsanchar Company Limited, b) Provident Fund, c) CIT, d) HIDC.
- Invitation letter has been issued to all VDCs and

DDCs of Nuwakot and Rasuwa district for their promoters' shareholder participation.

- Project has carried out the short listing of the international consultant and selection of the consultant shall be carried out within two months.
- Tendering of the Test Adit has been carried out and expected to start the construction of test adit within 2 months.
- The EIA study of Upper Trishuli 3B Hydroelectric Project (37 MW) has been completed by the local consultant and submitted to the Ministry of Environment for the approval. The updating study of EIA for the installed capacity 42 MW shall be carried out in the fiscal year 2070/71.

Proposed Powerhouse site

POWER TRANSMISSION COMPANY NEPAL LIMITED (PTCN)

In Mid 2006 IL&FS, NEA and Power Trading Company of India (PTC India) took initiative to facilitate the development of transmission interconnection between India and Nepal for the mutual interest and benefit of both the countries. For this purpose Power Transmission Company Nepal Limited (PTCN) and Cross Border Power Transmission Company India (CPTC) were established.
The responsibilities of these companies include development, construction, operation and maintenance of the Dhalkebar-Mujaffarpur 400 kV Transmission Interconnection (D-M Line). The PTCN will construct, operate and maintain an approximately 41.5 km of transmission line from Dhalkebar to Bitthamod near Indo-Nepal border in the Nepalese territory and around 87 km of line in India will be constructed, operated and maintained by CPTC. This Transmission interconnection will be initially charged at 220kV and would be operated in Synchronous mode between Indian and Nepalese Electrical grids.

The Nepalese portion of the project cost includes NRs 1503.57 million (USD 20.0 million) out of which USD 13.2 million is to be funded by government of India through soft loan as a line of credit to GoN through Exim Bank of India and remaining part would be funded through shareholder's equity. The debt equity ratio is 70:30. Subsequently, financial closure between NEA and PTCN has been achieved.

Two separates Agreements namely Implementation and Transmission Service Agreement (ITSA) that governs the legal provision for the construction, operation, maintenance of the line and payment mechanism by NEA and Power Sale Agreement (PSA) with PTC India for the purchase of 150 MW of power in long term basis has been signed on December 12th and 13th, 2011.
Joint Venture cum Share Purchase Agreement (JV cum SPA) was signed on 5th April 2014 among NEA, POWERGRID Corporation of India Ltd (PGCIL), Hydroelectricity Investment and Development Company Ltd. and IEDCL India. Thus the shareholder of PTCN has been fullfilled. The shareholder pattern is as follows: NEA - 50%, PGCIL India - 26%, HIDCL - 14% and IEDCL - 10%

The agreement between Power Transmission Company Nepal Limited (PTCN) and M/s Tata Projects Limited (TPL) for Construction of Dhalkebar-Bhithamod 400kV Transmission Line (Nepal Portion) was held on 19th Dec' 2013. The cost of Award is 7.03 Million US dollar without taxes and VAT and the construction period is 16 months.

The contract between PTCN and TPL to execute the works under the scope has been approved from Exim Bank of India. PGCIL India retained as Project Management Consultant (PMC) for execution of the 400kV D/C Twin Moose of Nepal portion of transmission line. The contract between PTCN and PGCIL India was held on 13th August 2012 and the financing contract for PMC has come into effect from dollar Line of Credit through Exim Bank of India on 20th June 2014.

As of Asadh 2071, Route alignment of complete route length has been completed. Detailed survey work and Check survey work have been completed and approved. All tower locations have been identified in the field. Tower spotting data, sag template curve, foundation drawings, structural drawings and bill of materials of tower type DA, DB, DC and DD has been approved. Soil investigation is in progress. Out of 115 towers 81 nos. lie in Mahottari district and rest are in Dhanusha district. Public notice for land acquisition in Mahottari district has been published. Civil foundation works are started on 8th July 2014 from Mahottari district and are going on.
Master list of materials/equipments has been approved from Ministry of Finance. LC opening has been completed.

Central Activities

1. Internal Audit Department

The Internal Audit Department, guided by the Audit Committee and led by the Director is responsible for the planning, implementation and monitoring & evaluation of financial, technical and management audits based on enterprise risks. The department performs the aforesaid audits on quarterly basis and reports to the Audit Committee and Managing Director of NEA. Among these audits, financial audit is performed basically to help the final audit which is mandatory by law, and other audits are performed to evaluate the directorate-wise performance and to support managerial decision making. Though the internal audit report is remarkable and valuable to the organization, the implementation part is yet to be regarded by high level management for persistent commitment. As internal audit could play a vital role in enhancing NEA's performance in the sectors of internal control system, maintaining financial discipline, managerial efficiency and technical efficiency, it should be well-equipped with qualified, trained and motivated employees. The division-wise summaries of the audits performed during FY 2013/14 are given in the following paragraphs in brief:

Audit Committee:

As per international practices and to provide independency to the internal audit system as well as corporate governance, NEA has incorporated the concept of Audit Committee consisting of three members, headed by a member of the NEA Board and two peripheral sectoral experts. The committee, formed in FY 2011/12, is responsible for reviewing the accounts, financial statements and reports of final audit as well as internal audit. Among other works, it has prepared the Audit Operating Procedures and submitted to the Board of Directors of NEA for approval.

Financial Audit:

The financial audit covers the audit of internal control system, compliance with existing rules and regulations, financial discipline and fairness of financial statements. During FY 2013/14, Financial Audits were carried out in 94 out of 156 budget centers of NEA till the end of second quarter of FY 2013/14. The audit of transactions of the third quarter has already started. The status clearing out audit observations is generally not satisfactory. The details of financial audit shall be included in the Annual Audit Report for FY 2013/14.

Technical Audit:

The technical audit covers the audit of technical norms and standards, guidelines, energy balance, preventive as well as breakdown maintenance, condition monitoring, energy optimization and electricity loss. Due to insufficiency of technical staff, the division could carry out technical audits of a few critical and risk based offices during FY 2013/14. The major non-compliances were generally related to equipment & plant maintenance, especially in the forms of delay in maintenance works and poor records of maintenance history. A loss analysis exercise for FY 2012/13 was carried out by the division, and based on it's learnings a detailed loss analysis report for FY 2013/14 is expected to be prepared. The details of technical audits including the loss analysis report shall be included in the Annual Audit Report for FY 2013/14.

Management Audit:

The management audit covers the review and implementations of managerial plans, policies, procedures, programs and targets, procurement management, organization structure, job analysis, accountability and monitoring & evaluation. Due to deficiency of management audit staff, the division could carry out management audit of a few regional and other offices during FY 2013/14. The details of management audit shall be included in the Annual Audit Report for FY 2013/14.

Risk Management Unit:

The Risk Management Unit, which is a relatively new concept for managing risks within the organization has been recently established. This unit has been formulated to collect risk information based on risk indicators and analyze and link them with other activities of the entity. It is also responsible for the establishment of directorate-level enterprise risk management team and it supports the preparation of the enterprise risk framework for risk management.

Capacity Building:

A customized training program was conducted for senior and junior officers in New Delhi by the Institute of Cost Accountants of India during June, 2014 to enhance their auditing skills and transfer professional knowledge related to performance auditing, procurement management, risk management, computer based IT auditing and other issues of internal audit.

2. NEA Board Matters

The then Minister of Energy Mr. Uma Kanta Jha was Chairman of the NEA Board till Bhadra 26, 2070. Thereafter the then Energy Secretary Mr. Biswo Prakash Pandit assumed the chairmanship of NEA Board from Aswin 26, 2070 to Falgun 6, 2070. Energy Minister Radha Kumari Gyawali is presently presiding the NEA Board since Baisakh 14, 2071. Energy secretary Mr. Rajendra Kishor Chhetri joined the NEA Board as an ex-officio member from Ashad 6, 2071 and the then Finance Secretary Mr. Yub Raj Bhusal was NEA Board ex-officio member from Ashad 6, 2071 to Shrawan 9, 2071.

During Fiscal Year 2013/14, altogether 21 Board meetings were held. Many important decisions were taken during this period. Approval of Deputy Managing Director's Job Description, establishment of Projection Management Directorate, Pension Fund Regulation, amendment to Managing Director's/General Manager's condition of service Regulation were some of the Board Decisions.

3. Loss Reduction Division

Loss and Leakage Control Activities:

This division headed by Manager, is entrusted with the key responsibility to conduct and monitor electricity loss and leakage all over NEA. The major objectives of this division are to conduct activities related to reduction of electricity theft, tampering, leakage and loss control which aims to minimize the overall electrical loss of Nepal Electricity Authority.

Loss Reduction Division is also responsible for conducting field raid Operation as and when required. Beside these activities this division is also responsible for involvement in the technical calculation and billing amount that is to be charged for energy loss due to meter tampering, pilferage, outage, wrong MF calculation and wrong connections. So, it has to perform its activities successfully to live in close relation with DCS.

The division monitors the present situation of electricity loss and leakage in various Distribution Centres and also informs about the methods adopted by other neighboring countries for loss minimization and actions that can accordingly be taken in Nepal.

Target of Loss Reduction Division (FY 2070/2071): To support NEA overall loss reduction target of 1.5% this year, loss reduction division had set target of 15,00,000 unit recovery through effective and cross verification of NEA consumers through field visit throughout NEA distribution Centers. Division has targeted city areas, tamper infected areas and rural community Consumers. Beside the approved annual work plan loss reduction division also conducts activities and sets target as directed by MDNEA as and when required.

Target Vs Achievement of Loss Reduction Division: To achieve the defined target of recovery of 15,00,000 units, loss reduction division has visited DCS under six different regional offices namely Hetauda, Biratnagar, Attariya, Nepalgunj, Butwal and PokharaROs, covering five development region of the country. This year Loss Reduction Division has conducted data download of 315 TOD meters and sudden check andcross verify 17, 3-Φ whole current meters.

By the end of this fiscal year loss reduction division has recovered 14,92,219.00 units and forwarded the letters to the concerned Distribution Centers and Regional Offices for billing purpose of missing units. Details of units to be billed are listed below:

Photo 1: Data being downloaded from TOD meter during cross inspection visit to the consumers under Bhairahava DCS.

Photo 2: *Data being downloaded from TOD meter during field visit to the consumers under Tikapur DCS.*

S. N.	Regional Office	Number of meter inspected	Bill Units	Remarks
1	Biratnagar RO (Anarmani, Bhadrapur, Rangeli, BelbariDCS)	110	228633	
2	Hetauda RO (Birgunj, Simara DCS)	55	633915	
3	Nepalgunj RO (GhorahiDCS)	24	479125	Swargadwari Bidhut Samuday ikSanstha (02-29-110)
4	Butwal RO (Bhairahawa DCS)	62	21303.87	Unit calculation is yet to be done for CT outage.
5	Pokahara RO (GagangaudaDCS)	26	9384.05	
6	Attariya RO (Tikapur, Dhangadi, MahendranagarDCS)	55	119858	Unit calculation is yet to be done for CT outage.
Total		332	1492219	

Even though this division has achieved its 99.48% target and perform loss reduction activities broadly and effectively it could have recover more units if human resources are fulfilled according to its approved "Darbandi".

Administration Directorate

Administration Directorate of NEA is responsible for the management of human resource, logistic support, legal advice and arbitration, property management and promotion of public relation functions. Timely amendment of personnel administration regulation and financial administration regulation also falls under the jurisdiction of this Directorate. This Directorate is led by a Deputy Managing Director and supported by Four Departments, namely, Human Resource Department, General Services Department, Legal Department and Recruitment Department each led by a Director.

Human Resource Department

Human Resource Department is responsible for executing manpower planning, recruitment, training and capacity development, disciplinary actions, implementation of staff welfare activities and other human resources related functions.

By the end of FY 2013/14, the total number of staff stood at 8,699 while the approved positions remained at 11,142. During the year under review, 382 employees were retired out of which 35 employees took voluntary retirement and services of 16 employees were terminated on charge of long absence. Similarly, 39 employees resigned and 36 employees passed away. During the year under review, 667employees of different levels were promoted to higher levels based on their performance evaluation and 195 employees of different levels were promoted to higher level based on internal competition. During fiscal year 2013/14, the Department filed 79 vacant posts of non-officer levels

Meanwhile, 34 employees were censured, 41 employees were suspended, promotion of 2staffs were withheld and yearly increment in the salary of one staff was also withheld. Similarly, 15 employees got removal from service out of which 14 employees were charged of having long absenteeism without sanction of leave and one was charged for irregularity. As a part of staff welfare activities, additional financial support was provided to10 employees for treatment of different hard diseases and "Kaaj Kriya Anudan" was provided to 368 employees. Similarly, under the staff welfare loan facility, a total sum of NRs. 13,67,80,000.00 was disbursed as loan to employees for purchase, construction and maintenance of house/ land, for carrying out social event/ rituals and so forth. Similarly, a sum of NRs. 1,78,32,886.00 was disbursed to various employees under accidental insurance and medical facility scheme and NRs. 21,91,40,384.16 was disbursed under life insurance scheme.

The statistics of employed personnel till the end of fiscal year 2013/14 is given in the table below:

Level		Approved Position			Existing Situation			
	Service	Regular	Project	Total	Permanent	Periodic	DailyWages / Contract	Total
Managing Director		1	0	1	0	1	0	1
DDM (Level-12)		7	0	7	2	0	0	2
Officer (Level 6-11)	Technical	1202	159	1361	872	1	1	874
	Non-Tech	503	25	528	512	1	0	513
	Total	1705	184	1889	1384	2	1	1387
Assistant (Level1-5)	Technical	5888	0	5888	4307	495	38	4840
	Non-Tech	3358	0	3358	2299	160	11	2470
	Total	9246	0	9246	6606	655	49	7310
Grand Total		10958	184	11142	7992	657	50	8699

General Service Department

General Service Department (GSD) is unit responsible for vehicle management, logistics management, maintenance of vehicles and corporate office buildings, property management and security management of NEA's corporate offices. It also closely works with other departments regarding the property issued of NEA. The Department is also responsible for dealing with media, organizing press conferences and releasing ceremonial activities.

The Department also publishes Vidyut, a half yearly magazine which covers the wide spectrum of technical, managerial, administrative and other activities of NEA. It also appoints the advertising agency for the publication of various notices of NEA. The Department also registers the complaints from stakeholders regarding service delivery and forwards them to the concerned units for necessary action. During the year under review, 495 such complaints were registered and forwarded to concerned units for the necessary actions. Out of 495 such complaints, 468 complaints were settled/addressed and remaining complaints are under settlement procedure.

During the year under review, the Department updated the records of land owned by NEA and their utilization. The total land available with NEA is 30,807-13-3-1 Ropanis as per record of Assets Management Section. In addition, the Department was also entrusted with the responsibility of organizing sports activities for staffs. The Department established NEA Sports Club to encourage participation of staffs in the various sports competition. NEA was successful in securing First and third position in the inter-corporation Quiz tournament organized by Public Enterprises Employees Association of Nepal (PEEAN) in 2014.

Legal Department

The Legal Department is responsible for dealing with legal matters of NEA. It provides written legal advice to the management as well as to the different departments of NEA. The Department is also involved during negotiations for power purchase and contract agreements. Another area of its participation is to defend cases of NEA through NEA's legal advisors in different courts of the country and abroad for dispute resolution. Generally, cases to be resolved are related to the misuse of electricity, electricity theft and unauthorized use of electricity, land acquisition, employees service termination, staff promotion and contracts/tenders disputes. The Department also provides assistance to the various committees formed for formulating rules and regulations of the organization.

During the fiscal year under review, the Department provided158 numbers of legal advices to the NEA Management & other departments. Out of 132 cases registered in different courts during fiscal year 2013/14, NEA won 27 cases, lost 6 and the other cases remained sub-judice. Some disputes related to contracts of construction projects are presently being resolved through arbitration and some others are under consideration.

Organization Restructuring

As per the NEA's 681th Board Decision held on2071/4/3,Recruitment Department has been created under Administration Directorate. This new Department is basically responsible for recruitment and promotion activities of NEA.

Photo: The winners of inter-corporation Quiz tournament organized by (PEEAN) in 2014

Finance Directorate

The Finance wing, led by a Deputy Managing Director, is responsible to carry out overall financial and accounting functions of NEA. Key responsibility areas include revenue administration, accounting system operation, budgetary control, and treasury management. The finance wing is also responsible for financial planning, monitoring, and control at corporate level of decision-making process. Two functional departments, namely Corporate Finance Department and Accounts Department, are structured to support the finance wing. The Corporate Finance Department is entrusted to carry out various functions relating to revenue, budget, and treasury management. Likewise, Accounts Department is responsible for consolidating overall accounts within NEA and prepares entity and group financial statements. It also deals with the statutory audit, taxation issues, follow up and settlement of internal and external audit qualifications. Both Departments are headed by an individual Director responsible for its functional areas of operation and report directly to the DMD,Finance. A separate project office, Institutional Strengthening Project, has been set up to implement Integrated Financial Management Information System (IFMIS) under Accounts Department.

Energy generation from NEA's hydropower plants remained stable during the year 2013/14. NEA recorded 2,290.78 GWh of hydro electricity generation including small power plants against the target generation of 2,261.72 GWh. It is a nominal growth of 0.78 % against the previous year record. The generation from Thermal Plants recorded as 9.56 GWh against the target generation of 42.50 GWh. NEA increased power import from India by 35.70 % as compared to previous year to minimize load shedding especially in dry season. Total energy import from India is recorded 1,072.23 GWh as compared to import of 790.14 GWh previous year. Similarly, power purchase from IPPs within Nepal also increased to 1,258.94 GWh which is higher than 82.96 GWh from the previous year purchase. The total energy purchase constitutes 46.00 % from import and 54.00 % from local IPPs. Total energy available in the NEA's system increased by 8.77 % over the previous year's figure of 4,258.08 GWh to reach 4,631.51 GWh. Out Of the total available electricity NEA could sell only 3,447.58 GWh of energy to its consumers and system losses accounted for the rest. During the year, total energy sales increased by 9.05 %. The system losses reduced to 24.79 % from 25.11% in the FY 2012/13.

NEA's consumer base increased to 2.71 million including community and bulk buyer. The domestic consumer category, which holds 2.56 million consumers, continued to be the largest consumer category with 94.37 % share of entire consumers. Domestic and Industrial consumer category contributed 42.91% and 34.64 % to the gross electricity sales revenue respectively. Rest of the consumer category generated remaining 22.45 % of gross sales revenue.

During the FY 2013/14, net sales revenue increased by 8.95 % amounting to NRs. 27,624.28 million. NEA allowed NRs. 588 million as rebate in order to encourage consumer to pay their bills earlier than credit period. Income from other service such as surcharge, dividend, lease rent, sale of goods and service charge amounted to NRs. 1,596.84 million. NEA's total income including income from other services increased to NRs. 29,221.12 million as compared to NRs. 27,222.99 million in the previous year. The growth in the overall revenue income is about 7.34 % as compared to previous year.

NEA's overall operating expenses increased from NRs. 25,128.15 million in FY 2012/13 to NRs. 28,873.79 million for the year 2013/14. The increase in the expense is about 14.91 % as compared to the previous year. The power purchase expenses continued to be the largest cost component of the total operating expenses. NEA paid NRs. 16,388.31 million to the IPPs and for import from India during the FY 2013/14. The power purchase cost represented 56.75 % of the total operating cost and 59.32 % of the total electricity sales revenue. The power purchase cost increased by 20.75 % for the FY 2013/14 due to increase in volume of purchase and to some extent of normal increase in price. Other operating expenses included generation, transmission distribution, and administration, which reached NRs. 1,679.20 million, 450 million, 4,855.57 million and 1,314.23 million respectively.

Interest costs on long-term borrowings increased by 1.61 % over the previous year's figure to reach NRs. 4,104.75 million. Likewise, depreciation charge on fixed assets increased by nearly 1% that accounted NRs. 3256.48 million in the FY 2013/14. NEA realized foreign exchange translation gain of NRs. 56.58 million in FY 2013/14 due to appreciation of Nepalese Ruepees vis-a-vis the Japanese Yen loan for Kulekhani Disaster Prevention Project. NEA has provisioned NRs. 2,053.40 million towards long term employee liabilities in respect

of gratuity, pension, medical facilities and accumulated leave facilities under employees' benefit plan scheme.

NEA continued to face deteriorating financial performance for the FY 2013/14. Despite the growth in total revenue, it incurred a net loss of NRs. 5,704.24 million for the year under review. The major cause for attributing this loss is felt to be the higher cost of services as compared to the electricity sales tariff.

The total receivables at the end of FY 2013/14 remained NRs 7,813.24 million, which is equivalent to 104 day's sales revenue. Of the total receivables, street light dues of different Municipalities from FY 2009/10 to FY 2013/14 and VDCs from FY 2011/12 to FY 2013/14 amounted to NRs. 2,152 million.

At the end of the FY 2013/14, net carrying amount of property, plant and equipment reached to NRs. 84,651.30 million. During the year, NEA completed various distribution system reinforcement and rural area electrification projects resulting in capitalization of NRs. 3,984.31 million in non- current assets under the category of property, plant, and equipment. Property, plant and equipment constitutes 57.63% of total non-current assets of NEA.

During the year, NEA invested significant amount of resources in various projects relating to generation, transmission, and distribution. Capital work in progress, the second largest element of non-current assets, figured to NRs. 50,812.58 million with addition of NRs. 14,953.72 million during the review FY 2013/14. The sources of investment included government equity and loan, foreign loan and grants, and NEA's internal cash generation. The ongoing major hydroelectricity projects, namely Chameliyagadh (30 MW), Kulekhani III (14 MW), Upper Trishuli 3A (60 MW) and Rahughat (32 MW) and various transmission systems of different voltage level contributed to increase capital work in progress.

NEA invested NRs. 4,600 millions in subsidiaries, associates, joint ventures and others during the FY 2013/14. NEA holds equity share capital of NRs. 489.60 million in Chilime Hydro Power Company Limited (CHPCL), a subsidiary company of NEA. CHPCL has initiated to develop about 270MW projects namely Upper Sanjen HEP (14.6 MW), Sanjen HEP (42.5MW), Middle Bhotekoshi (100MW) and Rasuwagadhi (112 MW). NEA is committed to take 10% equity of each company, Sanjen Hydro Power Company Limited and Middle Bhotekoshi Hydro Power company Limited and 18 % equity of Rasuwagadhi Hydro Power Company Limited . During the year, NEA invested NRs. 530 million in different companies promoted by Chilime Hydro Power Company Limited. Investment on those company included NRs. 150 million in Sanjan Hydro Power Company Limited , NRs. 210 million in Middle Bhotekoshi Hydro Power Company and NRs. 170 million in Rasuwagadhi Hydro Power Company Limited. In the FY 2013/14 , NEA received 10% cash dividend and 30 % bonus share from CHPCL. During the FY 2013/14, NEA, with its loan provider Nepal Telecom, Citizen Investment Trust and Rastriya Beema Sansthan, invested NRs. 4,000 million towards the loan capital for Upper Tamakoshi Hydro Power Company Limited under subsidiary financing agreement. At the end of the FY 2013/14, total investment in Upper Tamakoshi Hydro Power Company Limited reached NRs. 4,341.90 million as equity and NRs. 4,000 million as long term loan. NEA holds 41 % interest in equity share capital in Upper Tamakoshi Hydro Power Co. Ltd.

Other investment of NEA includes equity investment in KhumbuBijuli Co (NRs. 20.65 million), SalleriChaylsa Hydro Electric Co. (NRs. 11.63 milion), Nepal Engineering Consultancy Service Center Ltd (2.28 Million), Nepal Hydro lab (NRs.1 million), Power Transmission Company Limited (NRs. 32.5 million) and Butwal Power Company (NRS.8.8 million). NEA is not receiving any dividend except CHPCL and Butwal Power Company Limited (BPCL). During the year, NEA invested NRs. 45 milllion in Trishuli Hydro Power Co. Ltd and NRs. 16.01 million in Tanahu Hydro Company Ltd. NEA increased its investment in Butwal Power Company by NRs. 92.46 million in a form of Right Share. In addition to the above investment, NRs. 30.22 million was invested in the equity of Cross Border Power Transmission Company Limited. NEA deposited NRs. 150 million in Citizen Investment Trust (CIT) towards gratuity and pension liabilities. Total asset fund in CIT against the future liabilities amounted to NRs. 1,033.89 million at the end of the FY 2013/14. Similarly, NEA deposited NRs. 10 million in NEA Retirement Fund scheme as an equity capital in order to make the Fund approved by the Inland Revenue Department.

Government of Nepal (GoN) provided NRs. 4,097.30 million as long-term loan from local source to invest in different projects relating to generation and transmission. Likewise, NEA received NRs. 4,500 million as long-term loan from the donor agencies in the FY 2013/14. At the end of the financial year, total long-term borrowings from GoN, the main source of project financing, reached to NRs. 83,132.19 million from NRs. 75,034.89 million in FY 2012/13. During the FY 2013/14, NEA received NRs. 6,356.43 million from GoN as equity investment in various generation, transmission and distribution projects. With the objective of minimising the load shedding in the driest season of FY 2013/14, NEA

received NRs. 950.87 million as reimbursement of loss incurred by NEA in respect of power imported from India under load shedding mitigation programm.

During the year, NEA paid NRs. 600 million as interest on long term borrowings, NRs. 880 million as royalties, NRs. 500 million as repayment of long term borrowing to GoN treasury.

NEA is required to achieve a number of covenants in respect of borrowing from the donor agencies. Major covenants related to financial performance are Rate of Return (RoR) (6%) , Debt Service Coverage Ratio (DSCR) (1.2 times), Average Collection Period (ACP) (< 3month). In FY 2013/14, NEA achieved RoR (0.30%), DSCR (0.90) and ACP (3.42 month) which all are default .

In FY 2011/12, Electricity Tariff Fixation Commission (ETFC) approved to increase tariff by 20 percent in average. While revising the tariff, ETFC instructed NEA to comply with certain conditions regarding loss reduction, inventory management, receivables management and administrative reform. The tariff revision brought in positive impact on NEA's operational and financial performance but not to the desired level. Therefore, NEA has again submitted the tariff petition for upward adjustment of up to 20 % on existing tariff structure. The proposed tariff petition is under consideration at ETFC.

Mr. Jagadish Bhattarai and Mr. Mahesh Guragain, Chartered Accountants, appointed by the Office of the Auditor General for consecutive third term, jointly completed the financial audit for the year 2012/13. Office of the Auditor General has appointed Mr. Parakram Sharma and Mr. Sudrashan Raj Pandey to perform financial audit for the FY 2013/14 .

Large Tax Payer's Office completed income tax assessment up to FY 2009/010 in the FY 2013/14. However, NEA has filed petition for administrative review against tax assessment order for the FY 2009/10 to Inland Revenue Department. Similarly, NEA had appealed to the Revenue Tribunal against the assessment order given by Large Tax Payer's office for the year 2005/06 and 2006/07. During the year, Revenue Tribunal has settled the NEA's appeal

During the year, long pending audit qualifications of NRs. 6.27 million has been settled. NEA expects to settle remaining balance of NRs. 1.91 million by next year which is being brought since FY 1993/94.

NEA has perceived the need for improvement in its current financial management system to meet the requirement of national and international accounting standards in preparation and presentation of financial statements. For strengthening financial accounting and financial management decision support system, NEA plans to put in place a modern IT based Integrated Financial Management Information System (IFMIS). Accordingly, Institutional Strengthening Project is under implementation with the assistance from World Bank to strengthen financial management and accounting system. MS Deloitte Touch Tohmatsu India Pvt. Ltd. (DTT) has been appointed as consultant for this project and has been working since December 2010.The major scope of the consultancy service includes Accounting Framework Reform, Design and Support for Implementation of new IFMIS & capacity building. During the year, 14 companies offered their expression of interest to work as System Integrator (SI) for IFMIS implementation. Based on technical evaluation, NEA has selected 6 companies to submit detail financial and technical proposal and issued Request for Proposal (RFP) in July 2014.

Nepal Electricity Authority

Highlights of FY 2013/14

Description	FY 2014*	FY 2013	Increase(Decrease)	
			Amount	%
Revenue				
Net Sale of Electricity (M.NRs.)	27,624.28	25,354.62	2,269.66	8.95
Income form other Services (M.NRs.)	1,596.84	1,868.37	(271.53)	(14.53)
Total Renenue (M. NRs.)	**29,221.12**	**27,222.99**	1,998.13	7.34
Operating Expenses:			-	
Genertion Expenses (M. NRs.)	1,679.20	1,604.31	74.89	4.67
Power Purchase (M. NRs.)	16,388.31	13,572.46	2,815.85	20.75
Royalty (M. NRs.)	930.00	890.49	39.51	4.44
Transmission Expenses (M. NRs.)	450.00	416.74	33.26	7.98
Distribution Expenses (M. NRs.)	4,855.57	4,087.97	767.60	18.78
Administration Expenses (M. NRs.)	1,314.23	1,327.50	(13.27)	(1.00)
Depreciation Expenses (M. NRs.)	3,256.48	3,228.68	27.80	0.86
Total Operating Expenses (M. NRs.)	**28,873.79**	**25,128.15**	3,745.64	14.91
Operating Surplus (M. NRs.)	**347.33**	**2,094.84**	(1,747.51)	(83.42)
Interest on Long-Term Loans (M. NRs.)	4,104.75	4,039.65	65.10	1.61
Foreign exhcnage tranlation losses (Gain)	(56.58)	(652.14)	595.56	(91.32)
Provision for Employee benefits	2,053.40	2,112.74	(59.34)	(2.81)
Prior years Income(Income) Expenses	(50.00)	(34.21)	(15.79)	46.16
Net Income (Loss) (M. NRs.)	**(5,704.24)**	**(3,371.20)**	(2,333.04)	69.21
Long-Term Loans (M. NRs.)	83,132.19	75,034.89	8,097.30	10.79
Net Property, Plant & Equipment (M. NRs.)	84,651.30	83,873.47	777.83	0.93
Number of Consumers	**2,721,873**	**2,599,156**	122,717	4.72
Total Sales of Electricity (GWh)	**3,447.58**	**3,161.39**	286.19	9.05
Internal Sold/Utilised (GWh)	3,444.26	3,157.79	286.47	9.07
Annual Average Consumer's Consumption (kWh)*	1,266.62	1,216.31	50.31	4.14
Average Price of Electricity (NRs./kWh)	8.18	8.18	(0.00)	(0.02)
Peak Load Interconnected System (GWh)	1,200.98	1,094.62	106.36	9.72
Toal Available Electric Energy (GWh)	**4,631.51**	**4,258.08**	373.43	8.77
NEA Hydro Generation (GWh)	2,290.78	2,273.11	17.67	0.78
Termal Generation (GWh)	9.56	18.85	(9.29)	(49.28)
Purchased Energy (GWh)- India	1,072.23	790.14	282.09	35.70
- Nepal (Internal)	1,258.94	1,175.98	82.96	7.05
Average Power Purchase Rate (NRs./kWh)***	7.03	6.90	0.13	1.84
Exported Energy (GWh)	3.32	3.60	(0.28)	(7.78)
Self Consumption (GWh)	35.66	27.35	8.31	30.38
Net System Losses (Percentage)	24.79	25.11	(0.32)	(1.28)

Note: *Provisional figures
**on internal sales
***on total purchase

Nepal Electricity Authority
Statement of Financial Position as at July 16, 2014

(NRs. in million)

Particulars	2014*	2013	2012	2011	2010	2009	2008	2007	2006	2005
Assets										
Non Current Assets										
Property, Plant & Equipment	84,651.30	83,873.47	85,460.71	84,725.47	83,105.63	81,238.50	52,030.28	51,781.76	51,743.38	52,166.56
Capital Work in Progress	50,812.58	39,843.17	29,905.45	22,832.03	17,040.47	13,550.46	35,699.71	29,145.19	21,991.50	16,060.40
Investments	11,407.56	6,807.56	5,049.17	4,855.07	3,122.06	2,139.92	1,620.19	882.05	819.90	777.00
Deferred Expenditure to be Written Off	-	-	-	-	323.68	361.22	423.33	130.94	32.40	126.70
Total Non-Current Assets	**146,871.44**	**130,524.20**	**120,415.33**	**112,412.57**	**103,591.84**	**97,290.10**	**89,773.51**	**81,939.94**	**74,587.18**	**69,130.66**
Current Assets :-										
Inventories	3,216.75	3,043.02	3,033.83	2,502.93	2,431.99	2,159.12	1,800.13	1,498.45	1,354.80	1,372.70
Trade and other Receivables	7,813.24	7,930.03	6,693.17	6,871.19	6,097.74	4,854.02	5,721.08	5,151.41	4,415.40	3,947.00
Cash and Cash Equivalents	3,038.27	4,714.98	2,697.48	2,016.58	1,244.65	1,724.76	1,337.15	1,447.58	1,258.60	1,322.60
Prepaid, Advances, Loans and Deposits	4,125.72	3,300.57	4,222.65	2,976.82	4,585.60	2,495.13	2,319.72	2,225.53	2,293.90	2,098.60
Total Current Assets	18,193.98	18,988.60	16,647.13	14,367.52	14,359.98	11,233.03	11,178.08	10,322.97	9,322.70	8,740.90
Total Assets	**165,065.42**	**149,512.80**	**137,062.46**	**126,780.09**	**117,951.82**	**108,523.13**	**100,951.59**	**92,262.91**	**83,909.88**	**77,871.56**
Equity and Liabilities										
Capital and Reserves										
Share Capital	44,221.33	37,364.90	31,422.44	25,694.81	38,651.77	33,659.46	28,609.97	26,382.18	23,113.10	20,161.80
Reserves and Accumulated Profits:										
Reserve	1,721.41	1,721.41	1,706.03	1,677.55	1,631.30	1,497.85	1,407.83	998.92	550.49	513.87
Accumulated Profits (Loss)	(19,042.41)	(13,238.16)	(9,866.97)	0.00	(21,022.36)	(14,098.83)	(8,985.61)	(6,650.04)	(6,095.81)	(4,808.01)
Total Equity	**26,900.33**	**25,848.15**	**23,261.50**	**27,372.36**	**19,260.71**	**21,058.48**	**21,032.19**	**20,731.06**	**17,567.78**	**15,867.66**
Non-Current Liabilities										
Borrowings	83,132.19	75,034.89	68,909.20	62,631.85	58,231.66	53,788.45	51,368.84	47,616.15	46,487.91	44,537.51
Deferred Tax	693.20	693.20	693.20	693.20	693.20	693.20	791.01	848.40	-	-
Total Non-Current Liabilities	**83,825.39**	**75,728.09**	**69,602.40**	**63,325.05**	**58,924.86**	**54,481.65**	**52,159.85**	**48,464.55**	**46,487.91**	**44,537.51**
Current Liabilities										
Borrowings	700.00	1,200.00	3,500.00	790.00	1,280.00	250.00	1,140.00	-	700.00	600.00
Sundry Creditors and Other Payables	37,868.96	33,019.22	29,137.09	27,825.95	32,909.45	29,402.22	24,534.17	22,374.17	18,444.39	16,168.69
Provisions	15,770.74	13,717.34	11,561.47	7,466.73	5,576.80	3,330.78	2,085.38	693.13	709.80	697.70
Total Current Liabilities	**54,339.70**	**47,936.56**	**44,198.56**	**36,082.68**	**39,766.25**	**32,983.00**	**27,759.55**	**23,067.30**	**19,854.19**	**17,466.39**
Total Liabilities	**138,165.09**	**123,664.65**	**113,800.96**	**99,407.73**	**98,691.11**	**87,464.65**	**79,919.40**	**71,531.85**	**66,342.10**	**62,003.90**
Total Equity and Liabilities	**165,065.42**	**149,512.80**	**137,062.46**	**126,780.09**	**117,951.82**	**108,523.13**	**100,951.59**	**92,262.91**	**83,909.88**	**77,871.56**

Note:- *Provisional figures

Nepal Electricity Authority

Income Statement for the year ended July 16, 2014

(NRs. in million)

Particulars	2014*	2013	2012	2011	2010	2009	2008	2007	2006	2005
Sales	27,624.28	**25,354.62**	**20,088.64**	**17,946.82**	**17,164.60**	**14,405.93**	**15,041.39**	**14,449.73**	**13,331.90**	**12,605.20**
Cost of Sales :										
Generation	1,679.20	1,604.31	1,147.69	929.56	1,541.27	1,119.71	979.76	855.64	811.12	642.06
Power Purchase	16,388.31	13,572.46	11,948.41	10,493.74	9,746.57	7,691.28	7,437.04	6,967.58	6,391.95	5,760.31
Royalty	930.00	890.49	941.60	854.76	849.77	796.12	839.18	970.47	897.50	844.11
Transmission	450.00	416.74	421.38	345.96	337.73	328.16	274.85	240.88	232.13	215.93
Gross profit	**8,176.77**	**8,870.62**	**5,629.56**	**5,322.80**	**4,689.26**	**4,470.66**	**5,510.56**	**5,415.16**	**4,999.20**	**5,142.79**
Other Income	1,596.84	1,868.37	1,695.42	1,382.94	1,188.27	1,601.67	934.66	1,016.61	639.90	617.50
Distribution Expenses	4,855.57	4,087.97	3,685.15	3,004.18	3,091.21	2,575.09	2,110.01	1,834.39	1,703.70	1,484.20
Administrative Expenses	1,314.23	1,327.50	973.38	866.74	789.52	651.69	683.98	479.60	419.50	622.40
Interest Expenses	4,104.75	4,039.65	3,885.49	3,594.01	3,668.65	2,492.55	2,274.37	2,385.41	3,050.90	3,079.80
Depreciation	3,256.48	3,228.68	3,175.80	3,031.33	2,902.92	2,361.20	1,895.17	1,856.47	1,816.90	1,733.50
Loss (Gain) on Foreign Exchange	-56.58	-652.14	896.57	85.01	28.67	813.96	484.10	-493.39	42.70	-230.00
Provision for losses on property, plant & equipment		-	-	-	-	-	60.00	60.00	65.00	40.00
Provision under Employees' Benefits Plan	2,053.40	2,112.74	4,106.68	1,890.01	2,246.02	1,246.00	1,354.00	-	-	-
Street light dues written off		-	549.79	-	-	863.00	-	-	-	-
Deferred Expenditure Written Off		-	-	323.68	112.36	96.68	108.51	42.56	105.40	123.30
Net Profit/(Loss) before Tax	**-5754.24**	**-3405.41**	**-9947.88**	**-6089.22**	**-6961.82**	**-5027.84**	**-2524.92**	**266.73**	**-1565.00**	**-1092.91**
Deferred Tax Expense (Income) recognised				0.00	0.00	97.80	57.39	73.47	0.00	0.00
Net Profit (Loss) after Tax	**-5754.24**	**-3405.41**	**-9947.88**	**-6089.22**	**-6961.82**	**-4930.04**	**-2467.53**	**193.26**	**-1565.00**	**-1092.91**
Net Profit (Loss) as per Last Account			**0.00**	**-21022.36**	**-14098.83**	**-8985.61**	**-6650.04**	**-6095.81**	**-4808.01**	**-3475.20**
Prior years (Income) Expenses	-50.00	-34.21	-80.91	76.61	-38.29	163.18	-151.96	727.49	-297.20	219.90
Total Profit Available for Appropriation	**-5704.24**	**-3371.20**	**-9866.97**	**-27188.19**	**-21022.36**	**-14078.83**	**-8965.61**	**-6630.04**	**-6075.81**	**-4788.01**
Appropriation for Insurance Fund				0.00	0.00	20.00	20.00	20.00	20.00	20.00
Accumulated Loss Adjusted			**0.00**	27188.19	0.00	0.00	0.00	0.00	0.00	0.00
Profit (Loss) transferred to Statement of Financial Position	**-19042.41**	**-13238.17**	**-9866.97**	**0.00**	**-21022.36**	**-14098.83**	**-8985.61**	**-6650.04**	**-6095.81**	**-4808.01**

Note:- *Provisional figures

Significant Accounting Policies

For the year ended July 16, 2014 (Ashad 32, 2071)

Constitution and Ownership

Nepal Electricity Authority ('NEA') was incorporated on Bhadra 1, 2042 (16 August 1985) under the Nepal Electricity Authority Act, 1984, through the merger of the Department of Electricity of Ministry of Water Resources, Nepal Electricity Corporation and related Development Boards. The merger was necessitated to remedy the inherent weaknesses associated with these fragmented electricity organizations with overlapping and duplication of works, and became necessary to achieve efficiency and reliable service.

The principal objectives of NEA include generation, transmission and distribution of adequate, reliable and affordable electric power by planning, constructing, operating such facilities in Nepal's power system both interconnected and isolated.

1. Significant Accounting Policies

1.1 Basis of preparation of Financial Statements

The financial statements have been prepared in accordance with Nepal Accounting Standards (NAS) and Generally Accepted Accounting Principles and practices following historical cost conventions. These standards and practices are substantially in line with the principles set out in IFRS.

a. The preparation of financial statements requires NEA's management to make estimates and assumptions that affect the reported balance of assets and liabilities, revenues and expenses and disclosures relating to the contingent liabilities. The management believes that the estimates used in preparation of the financial statements are prudent and reasonable and management is aware that future results could differ from these estimates. Any revision to accounting estimates is recognised prospectively in the current and future periods. Examples of such estimates include provision for employee benefits, net realisable value of inventory, diminution in value of long-term investments and non-recoverability of receivable balances etc.

b. The figures for the previous year are rearranged and reclassified wherever necessary for the purpose of comparison.

c. Appropriate disclosures are made for the effect of any change in accounting policy, accounting estimate and adjustment of error.

d. The financial statements are prepared, generally, on accrual basis. However, some income and expenses are accounted on a cash basis, for practical reasons. Management believes that the impact of recognising those revenues on accrual basis will not be materially different from the current practice.

e. Management has applied estimation while presenting financial statements. Such specific estimates are disclosed in individual sections wherever they have been applied.

1.2 Foreign Currency Transactions

The transactions in foreign currency are recognised at the prevailing rate on transaction date.

The balances of monetary assets and liabilities in foreign currencies are translated at closing rate. The resulting gain or loss due to the translation is taken to profit and loss.

1.2.1 Functional and Presentation Currency

Items included in the financial statements of the Company are measured and presented using the currency of the primary economic environment in which the Company operates (the functional currency), which is the Nepalese Rupees (indicated as Rs. in short).

1.3. Property, Plant and Equipment

Property plant and equipment are stated at cost of acquisition and/or cost of construction less accumulated depreciation. The cost of property, plant and equipment include cost of acquisition or construction/erection together with other incidental costs and charges attributable to bringing the asset to its working condition for its intended use and also include borrowing costs directly attributable to the acquisition, construction/erection of qualifying asset.

The incidental costs include proportionate overheads relating to the following offices at the rates given below:

(a)	Planning	50%
(b)	Distribution and Consumer	10%
(c)	Engineering	50%
(d)	Finance and Administration	10%

Depreciation

Depreciation is provided on Property, Plant and Equipment, except land, on straight-line basis, which reflects the estimated useful lives of those assets. The rates of depreciation applied on property, plant and equipment are as follows:

Assets Category		Depreciation Rate (per annum)
(a)	Land	-
(b)	Buildings	2%
(c)	Hydro Electric Structures	2%-3%
(d)	Hydro Electric Plant & Machinery	3%
(e)	Internal Combustion on plant & machinery	2%
(f)	Transmission lines (66 KV, 132 KV and above)	3%
(g)	Transmission lines (33 KV)	3%
(h)	Transmission Substations	3%
(i)	Distribution system (including < 11 KV Transmission lines)	3%-4%
(j)	Solar Power	3%
(k)	Meter & metering equipment	10%
(l)	Consumer Services	7%
(m)	Public lighting	3%
(n)	Vehicles, tools and instruments, furniture and fixtures.	20%
(o)	Office Equipment	15%
(p)	Miscellaneous properties	50%
(q)	Additions during the year	50% of applicable rates

1.4 Capital Work in Progress (CWIP)

All expenditures in developing property, plants and equipments not yet completed or not ready to use are categorised as CWIP.The value of Capital works-in-progress includes stock of equipment lying in store or in transit for the purpose of use in the construction or development. It also includes the balances with contractors and suppliers for the value yet to be received. These are capitalised upon commissioning or identified as being ready to use.

1.5 Investments in Shares

All investments in shares are carried at cost. Write-downs are made for impairment, if any, in the value of such investments. Bonus shares issued by investee companies have not been accounted in books. However, total number of bonus shares received has been disclosed with initial investment.

1.6 Inventories

a. Inventories include goods in hand being held for use, sale or as spares.

b. Inventories are valued at lower of cost or net realisable value, using the weighted average method.

c. Net realizable value is the sale price as estimated by the management in the ordinary course of business, less estimated costs, if any, necessary to make the sale. Further, adjustments are made for those inventories identified by management as obsolete or otherwise.

1.7 Trade Receivables

Trade receivable are stated at carrying values except for those identified by the management as being doubtful on recovery. Such estimations for doubtful recovery are reviewed by the management regularly.

1.8 Cash and Cash equivalents

Cash and cash equivalents are carried at cost. They include cash-in-hand, cash-in-transit (bank transfers and cheques in collection which are collected in the subsequent period), and deposits with banks in the various forms of deposit accounts which may or may not bear interest, but which are not of the nature of investments.

1.9 Borrowings

Borrowings that are due after 12 months from the date of the financial position are classified as non-current liabilities and those less than 12 months are classified as current liabilities. Borrowing costs that are directly attributable to the construction of a qualifying asset are included in the cost of that asset. Other borrowing costs are treated as an expense in the period it occurs.

1.10 Foreign Currency Loans

Liabilities on foreign currency loans as at the year ended are converted into Nepali Rupees by applying prevailing year-end exchange rates. The gain /loss arising there from such transaction is recognised as profit or loss.

1.11 Trade and other payables

Liabilities for creditors and other payables are carried at cost which is the fair value of the consideration to be paid in the future for the goods / services received, whether or not billed to the Company.

1.12 Provisions

Provisions are recognised when the Company has a present legal or constructive obligation as a result of past events, it is probable that an outflow of resources embodying economic benefits will be required to settle the obligation and the reliable estimate of the amount can be made.

Recognition of Provisions involves substantial degree of estimation in measurement. Provisions are reviewed at each statement of financial position date and are adjusted to reflect the current best estimate.

1.13 Employee Benefits

a. Employee benefits, other than retirement benefits, are accounted for in the period during which the services have been rendered on accrual basis.

b. For Retirement Benefits Plans

- Defined Contribution Plans (such as Provident Fund and Insurance Schemes) expenses are charged to income statement on the basis of the liability recognised for the period.
- Defined Benefit Plans (such as Gratuity, Pension, Leave Encashment and Medical Benefits) expenses are charged to the income statement on the basis of actuarial valuation.

c. Liability of actuarial valuation done during the year 2007/08 (2064/65) is being charged over the period of five beginning in that particular year.

1.14 Grant–in-Aid, Contribution from Customer / Local Authority

Grants-in-Aid received from the GoN or other Authorities towards capital expenditure as well as consumers' contribution to capital work are treated initially as Capital Reserve and subsequently adjusted as income in the same proportion as depreciation is charged on such assets.

1.15 Contingent Liabilities

Contingent liabilities are disclosed in respect of possible present obligations that have arose from past events but their existence can only be confirmed on occurrence or non occurrence of one or more uncertain future events not wholly within the control of NEA and possibility of outflow of resources is not determinable.

1.16. Revenue from Sale of Electricity

a. Revenue from sale of electricity is recognised at the time of raising bills to the customers as per the billing cycle. Revenue from the billing cycle date up to 32Ashad (16 July) has been recognised on estimated basis. Revenue from sale of electricity is shown net of rebate.

b. Rebate on payment before the due date and surcharge for delayed payments are accounted for on cash basis.

1.17 Income from Other Services

a. Interest on investments and rental income are recognised on accrual basis.

b. Dividend on investment in shares is recognized when right to receive has been established.

c. Revenue from other services, including services provided by Engineering Services, are recognised on cash basis.

1.18 Insurance Fund

Insurance fund is created by setting aside a sum of Rs 20 million every year, in case of profit for the year, to cover any loss of property, plant and equipment, for any eventuality.

1.19 Taxes

a. Current tax

Current Tax is determined as the amount of tax payable in respect of taxable income for the year.

b. Deferred tax

Deferred tax is recognised on temporary difference, being the difference between tax base of assets and liability and carrying amount thereto. Where there is carry forward losses, deferred tax asset are recognized only if there is virtual certainty of realization of such assets. Other deferred tax assets are recognised only to the extent there is reasonable certainty of realisation in future.

Tariff Rates

Billing Effective since August 17, 2012

1	**DOMESTIC CONSUMERS**			
	1.1) Low Voltage (400/230 V)			
	A	Minimum Monthly Charge:		
		METER CAPACITY	**Minimum Charge (NRs.)**	**Exempt (kWH)**
		Up to 5 Ampere	80.00	20
		15 Ampere	365.00	50
		30 Ampere	795.00	100
		60 Ampere	1765.00	200
		Three phase supply		
		Up to 10 KVA	4400.00	400
		Above 10 KVA to 25 KVA	6900.00	600
	B	**Energy Charge: (Single Phase)**		
		Energy Consumption Block	**Rate NRs. (Per Unit)**	**Billing Method**
	1	Up to 20 Units	4.00	Minimum Charge
	2	21- 50 Units	7.30	Up to 20 units Rs. 4.00/unit, for 21-30 units Rs.7.30/unit. But, for energy consumption above 30 units, consumption from 1 unit itself shall be charged at Rs. 7.30/unit.
	3	51-150 Units	8.60	Rs. 7.30/unit for 0-50 Units and Rs. 8.60/unit for 51-150 Units .
	4	151-250 Units	9.50	Rs. 8.60/unit for 0-150 Units and Rs. 9.50/unit for 151-250 Units .
	5	Above 250 Units	11.00	Rs. 9.50/unit for 0-250 Units and Rs. 11.00/unit above 250 Units.
	C	**Energy Charge: (Three Phase)**		
	1	Up to 10 KVA	12.00	Minimum charge Rs.4400.00 for Consumption up to 400 Units and Rs.12.00/unit above 400 Units.
	2	Above 10 KVA up to 25 KVA	12.50	Minimum charge Rs.6900.00 for Consumption up to 600 Units and Rs.12.50/unit above 600 Units.
	1.2) Medium Voltage (33/11 K.V.)			
	A	Minimum Monthly Charge:		
		METER CAPACITY	**Minimum Charge (NRs.)**	**Minimum Unit kWH**
		Above 25 KVA	31250.00	2500
	B	**Energy Charge**		
		Energy Consumption Block	**Rate NRs. (Per Unit)**	**Billing Method**
		Above 25 KVA	12.90	Minimum Charge Rs. 31,250.00 for consumption up to 2500 Units and Rs. 12.90/unit above 2500 Units.

2	**OTHER CONSUMERS**			
	2.1 Low Voltage (400/230 Volt)		Rate (NRs.)	
	S.N.	**Consumer Category**	**Demand Charge Rs./KVA/month**	**Energy Charge Rs./Unit**
	1	Industrial		
		a) Rural and domestic	55.00	6.50
		b) Small Industry	100.00	8.00
	2	Commercial	295.00	9.35
	3	Non-Commercial	195.00	10.00
	4	Irrigation		3.60
	5	Water Supply		
		a) Community Water Supply	140.00	4.30
		b) Other Water Supply	210.00	6.00
	6	Temple		5.10
	7	Street Light		
		a) Metered		6.10
		b) Non Metered	2250.00	
	8	Temporary Supply		16.50
	2.2 High Voltage			
	a) 66 kV or above			
	1	Industrial	220.00	6.25
	b) Medium Voltage (33 kV)			
	1	Industrial	230.00	7.00
	2	Commercial	285.00	9.00
	3	Non-Commercial	220.00	9.50
	4	Irrigation	50.00	4.00
	5	Water Supply		
		a) Community Water Supply	200.00	5.00
		b) Other Water Supply	200.00	5.50
	6	Transportation		
		a) Trolleybus	230.00	5.30
		b) Other Transportation	230.00	7.20
	c) Medium Voltage (11 kV)			
	1	Industrial	230.00	7.20
	2	Commercial	285.00	9.25
	3	Non-Commercial	220.00	9.60
	4	Irrigation	50.00	4.10
	5	Water Supply		
		a) Community Water Supply	200.00	5.20
		b) Other Water Supply	200.00	5.70
	6	Transportation		
		a) Trolleybus	230.00	5.30
		b) Other Transportation	230.00	7.30
	7	Temple	200.00	8.25
	8	Temporary Supply	300.00	10.00

3	TIME OF DAY (TOD) TARIFF RATE					
	S.N.	Consumer Category	Monthly Demand Charge (Rs.	Energy Charge (Rs./Unit)		
				Peak Time	Off-Peak	Normal
				17:00-23:00	23:00-5:00	5:00-17:00
	a) 66 kV or above					
	1	Industrial	220.00	7.75	3.30	6.25
	b) Medium Voltage (33 kV)					
	1	Industrial	230.00	8.50	4.20	7.00
	2	Commercial	285.00	10.25	5.40	9.00
	3	Non-Commercial	220.00	11.00	5.60	10.00
	4	Irrigation	50.00	5.25	2.50	3.90
	5	Water Supply				
		a) Community Water Supply	200.00	6.10	2.90	4.90
		b) Other Water Supply	200.00	8.50	4.20	7.00
	6	Transportation				
		a) Trolleybus	230.00	6.35	3.10	5.20
		b) Other Transportation	230.00	8.50	3.10	7.00
	7	Street Light	70.00	7.00	2.80	3.50
	c) Medium Voltage (11 kV)					
	1	Industrial	230.00	8.75	4.30	7.10
	2	Commercial	285.00	10.50	5.50	9.25
	3	Non-Commercial	220.00	11.25	5.70	10.20
	4	Irrigation	50.00	5.30	2.80	3.95
	5	Water Supply				
		a) Community Water Supply	200.00	6.20	3.50	5.10
		b) Other Water Supply	200.00	8.75	4.30	7.10
	6	Transportation				
		a) Trolleybus	230.00	6.50	3.50	5.30
		b) Other Transportation	230.00	8.75	3.50	7.10
	7	Street Light	70.00	7.35	3.00	3.65
	8	Temple	200.00	9.40	4.10	7.60
	9	Temporary Supply	300.00	12.00	5.25	9.80

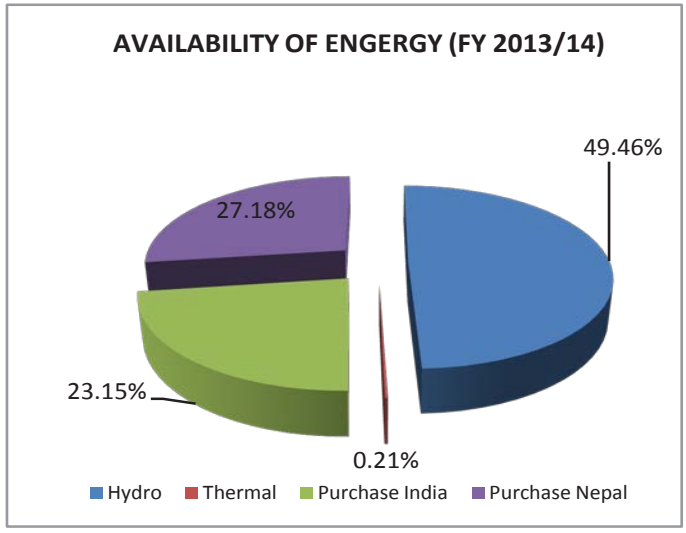
4	COMMUNITY WHOLESALE CONSUMER		
		Voltage Level	Energy Charge (Rs./Unit)
		a) Medium Voltage (33 kV/11 kV)	
		Up to (N X 30) Units	3.50
		Above (N x 30) Units	5.00
		b) Low Voltage (400/230 Volt)	
		Up to (N X 30) Units	3.50
		Above (N x 30) Units	5.25

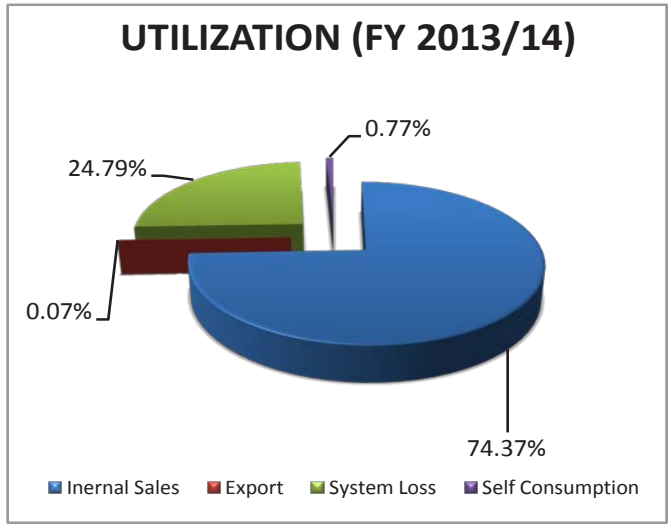
N= Total Number of Consumers of a community group.

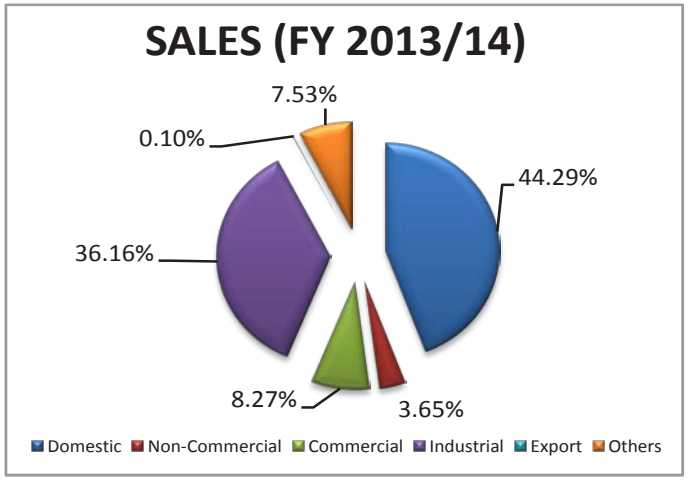
Notes:

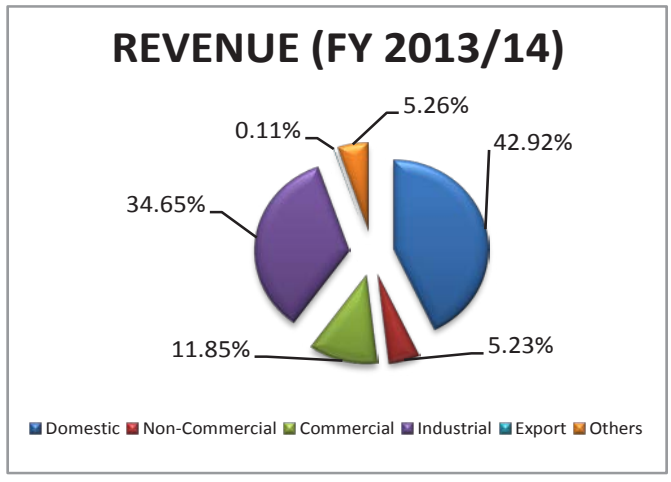
1) Low voltage refers to 230/400 V, Medium voltage refers to 11 kV / 33 kV and High voltage refers to 66 kV and above.
2) If Demand Meter of any consumer reads kilowatts (kW), then kVA=kW/0.8. Consumers having kW demand meter shall mandatorily install Capacitors within the given time. Otherwise their kVA demand shall be calculated as kVA=kW/0.7.
3) 10% Discount in the total bill amount will be given to the GoN approved Industrial Districts, if the bill is paid within 21 days of billing date.
4) 20% Discount in the total bill amount will be given to the Nepal Government Hospitals and Health Centres (except residential complex), if the bill is paid within 21 days of billing date.
5) Consumers supplied at High Voltage (66 kV and above) and Medium Voltage (33 kV and 11 kV) should compulsorily install TOD Meters.
6) If new additional consumers applying for 11 kV supply are to be supplied at 33 kV, they will be charged as per 11 kV tariff structure.

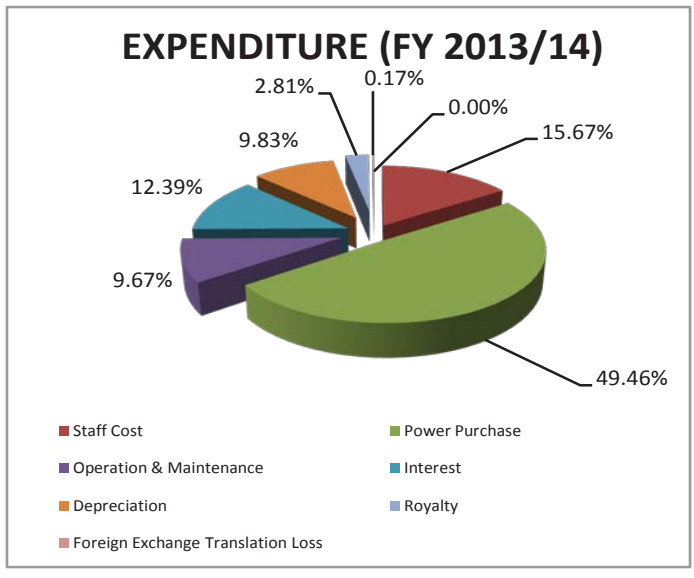
Statistics & Schematics

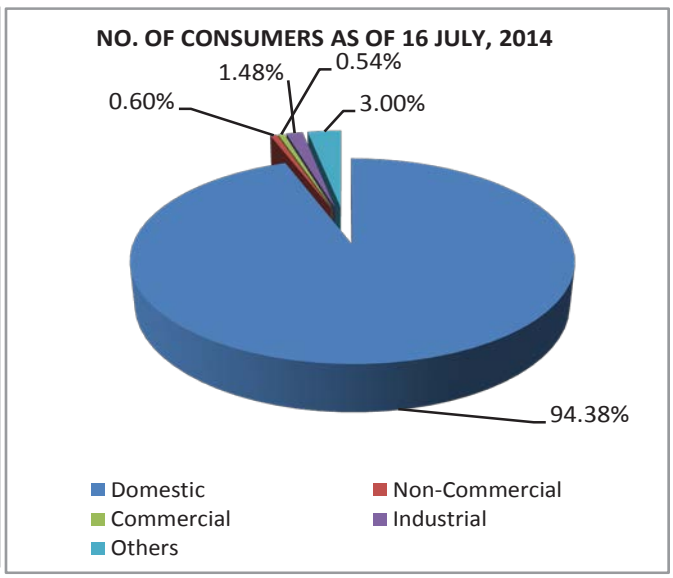




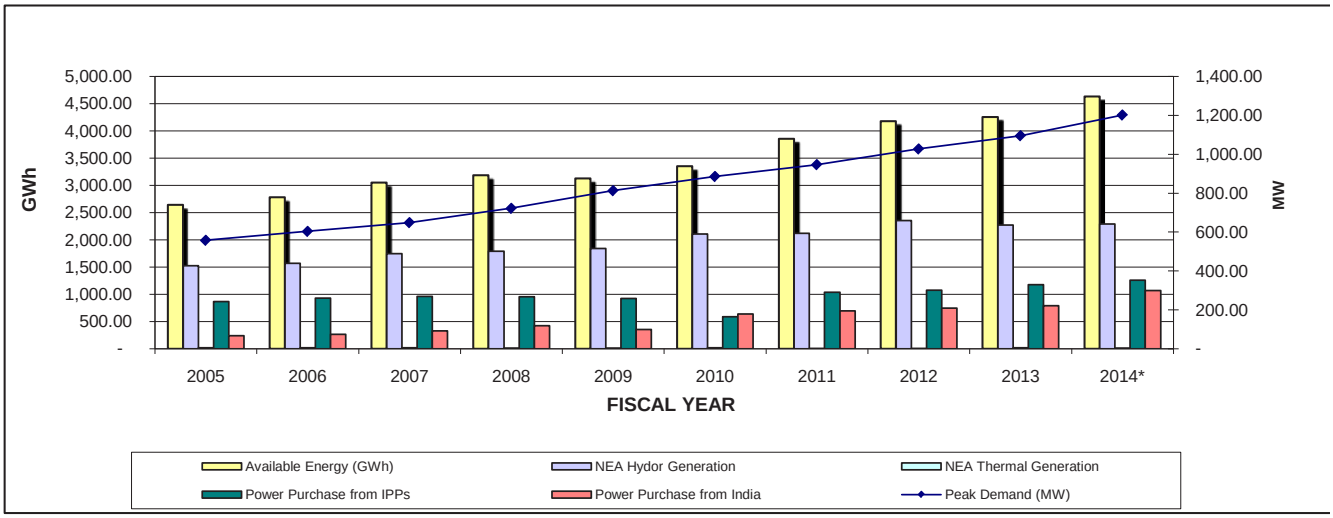








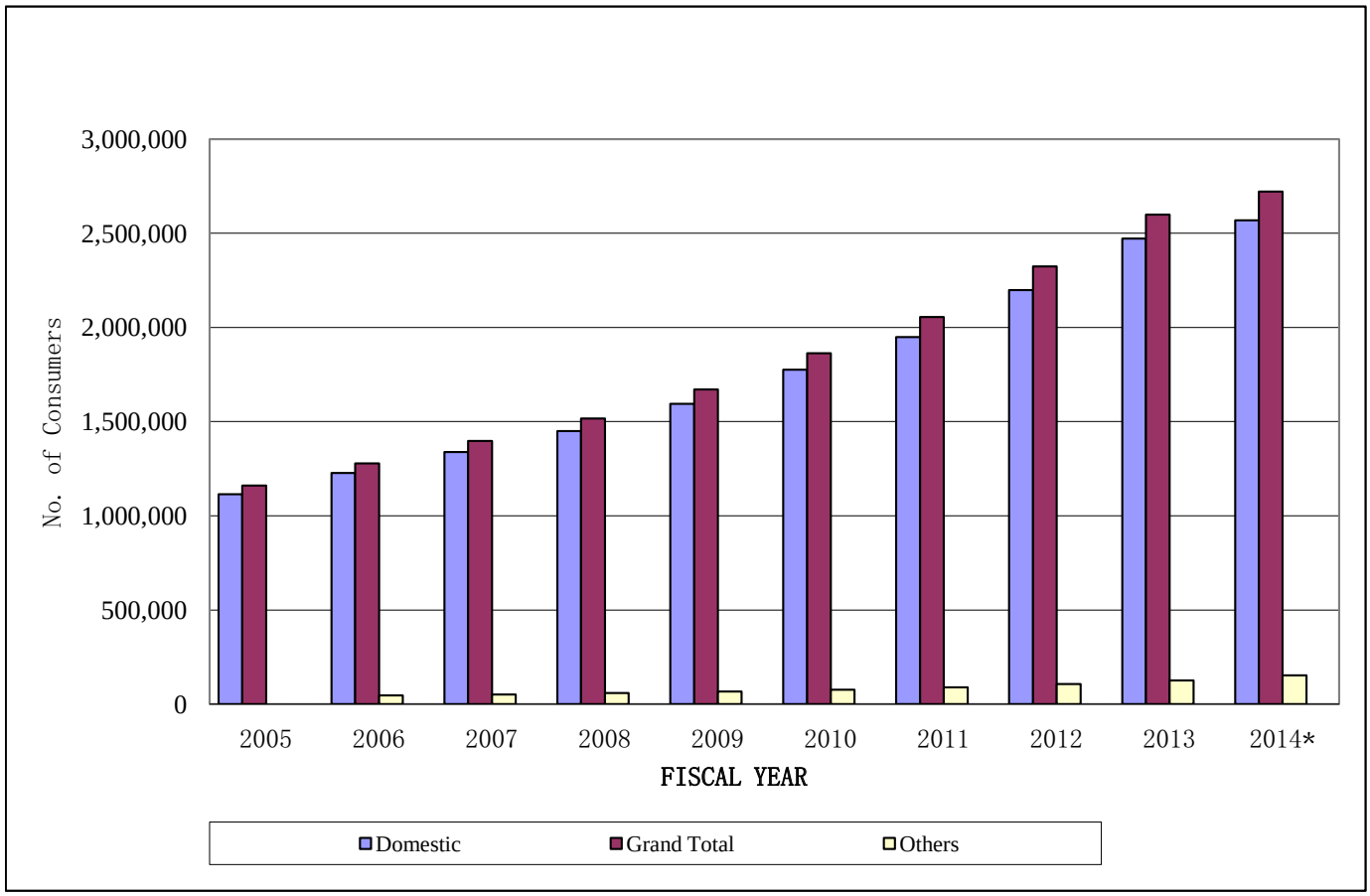
Total Energy Avaliable & Peak Demand



Particulars	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014*
Peak Demand (MW)	557.53	603.28	648.39	721.73	812.50	885.28	946.10	1,026.65	1,094.62	1,200.98
NEA Hydor Generation	1,522.90	1,568.55	1,747.42	1,793.14	1,839.53	2,108.65	2,122.08	2,357.43	2,273.11	2,290.78
NEA Thermal Generation	13.67	16.10	13.31	9.17	9.06	13.01	3.40	1.56	18.85	9.56
NEA Generation Total (GWh)	**1,536.57**	**1,584.65**	**1,760.73**	**1,802.31**	**1,848.59**	**2,121.66**	**2,125.48**	**2,358.99**	**2,291.96**	**2,300.34**
Power Purchase from India	241.39	266.23	328.83	425.22	356.46	638.68	694.05	746.07	790.14	1,072.23
Power Purchase from IPPs	864.80	930.04	962.26	958.42	925.74	591.43	1,038.84	1,073.57	1,175.98	1,258.94
Power Purchase Total (GWh)	**1,106.18**	**1,196.27**	**1,291.09**	**1,383.64**	**1,282.20**	**1,230.11**	**1,732.89**	**1,819.64**	**1,966.12**	**2,331.17**
Available Energy (GWh)	**2,642.75**	**2,780.92**	**3,051.82**	**3,185.95**	**3,130.79**	**3,351.77**	**3,858.37**	**4,178.63**	**4,258.08**	**4,631.51**

Note :- Peak demand is for all areas covered by integrated system including supply to India
* Provisional figures

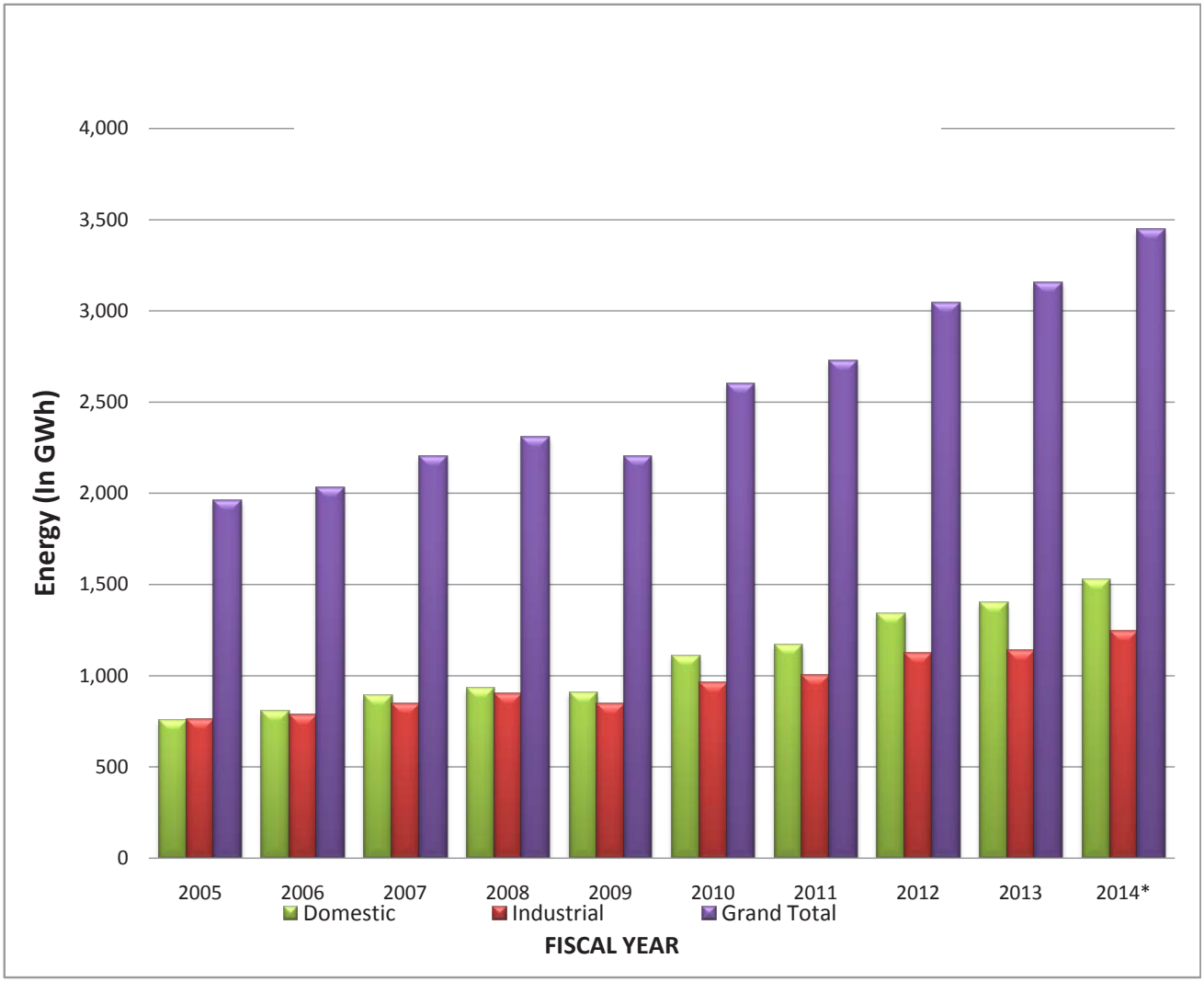
Growth of Consumers



Particulars	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014*
Domestic	1,113,740	1,227,295	1,339,253	1,450,254	1,595,015	1,775,571	1,949,530	2,198,680	2,472,264	2,568,870
Non-Commercial	9,950	10,010	10,215	10,556	10,518	10,952	12,520	14,055	15,179	16,454
Commercial	6,000	6,170	6,000	6,052	7,305	8,919	10,802	13,297	13,096	14,714
Industrial	22,500	23,020	24,089	25,548	28,559	29,410	33,030	36,409	37,498	40,158
Water Supply	370	380	414	434	584	609	688	860	834	1,142
Irrigation	3,400	6,450	13,183	18,614	22,335	32,089	42,494	53,165	51,520	71,438
Street Light	1,500	1,550	1,608	1,961	2,339	2,214	2,374	2,590	2,878	2,874
Temporary Supply	155	165	210	300	403	522	634	619	768	741
Transport	50	54	39	38	42	41	42	44	51	42
Temple	2,150	2,290	2,628	2,746	2,911	2,941	3,181	3,529	3,857	4,088
Community Sales	35	58	169	375	594	795	995	1,161	1,207	1,350
Total (Internal Sales)	**1,159,850**	**1,277,442**	**1,397,808**	**1,516,878**	**1,670,605**	**1,864,063**	**2,056,290**	**2,324,409**	**2,599,152**	**2,721,871**
Bulk Supply (India)	5	5	5	5	5	4	2	5	4	2
Grand Total	**1,159,855**	**1,277,447**	**1,397,813**	**1,516,883**	**1,670,610**	**1,864,067**	**2,056,292**	**2,324,414**	**2,599,156**	**2,721,873**

Note:- *Provisional figures

Electricity Sales

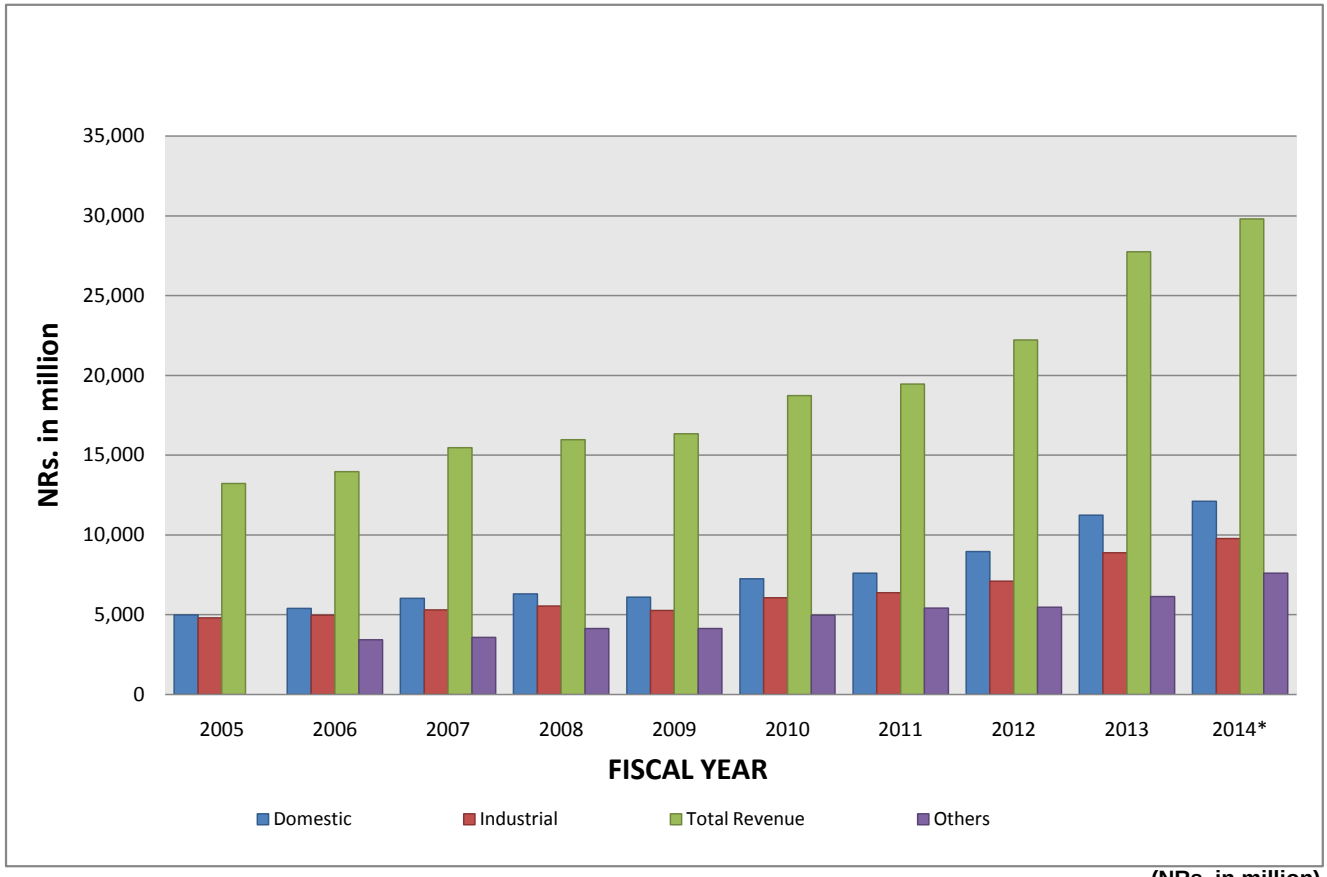


(in GWh)

Particulars	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014*
Domestic	758.19	805.72	893.27	931.35	908.67	1,108.87	1,169.31	1,342.67	1,401.64	1,526.84
Non-Commercial	100.54	95.29	100.52	109.93	98.89	103.47	109.49	115.68	115.21	125.87
Commercial	109.31	120.30	141.69	154.38	146.29	187.12	204.03	240.74	256.82	285.16
Industrial	764.00	785.55	849.13	901.09	845.68	960.43	1,001.73	1,123.94	1,141.07	1246.7
Water Supply & Irrigation	49.98	45.50	47.96	46.86	48.14	55.98	82.80	64.59	72.55	79.25
Street Light	54.86	63.24	66.90	70.26	67.51	65.58	67.21	72.06	76.24	83.31
Temporary Supply	0.39	0.87	1.26	0.70	1.04	1.00	1.00	1.20	1.47	1.61
Transport	5.80	5.65	6.31	5.88	5.22	5.42	5.54	6.72	6.26	6.85
Temple	4.58	4.77	4.78	5.12	4.76	3.64	3.46	3.95	4.11	4.49
Community Sales	6.03	9.18	15.51	24.65	32.01	34.95	51.95	69.02	77.04	84.18
Total (Internal Sales)	**1,853.68**	**1,936.07**	**2,127.33**	**2,250.22**	**2,158.21**	**2,526.46**	**2,696.52**	**3,040.57**	**3,152.41**	**3,444.26**
Bulk Supply (India)	110.70	96.55	76.87	60.10	46.38	75.07	31.10	4.12	3.60	3.32
Grand Total	**1,964.38**	**2,032.62**	**2,204.20**	**2,310.32**	**2,204.59**	**2,601.53**	**2,727.62**	**3,044.69**	**3,156.01**	**3,447.58**

Note:- *Provisional figures

Revenue

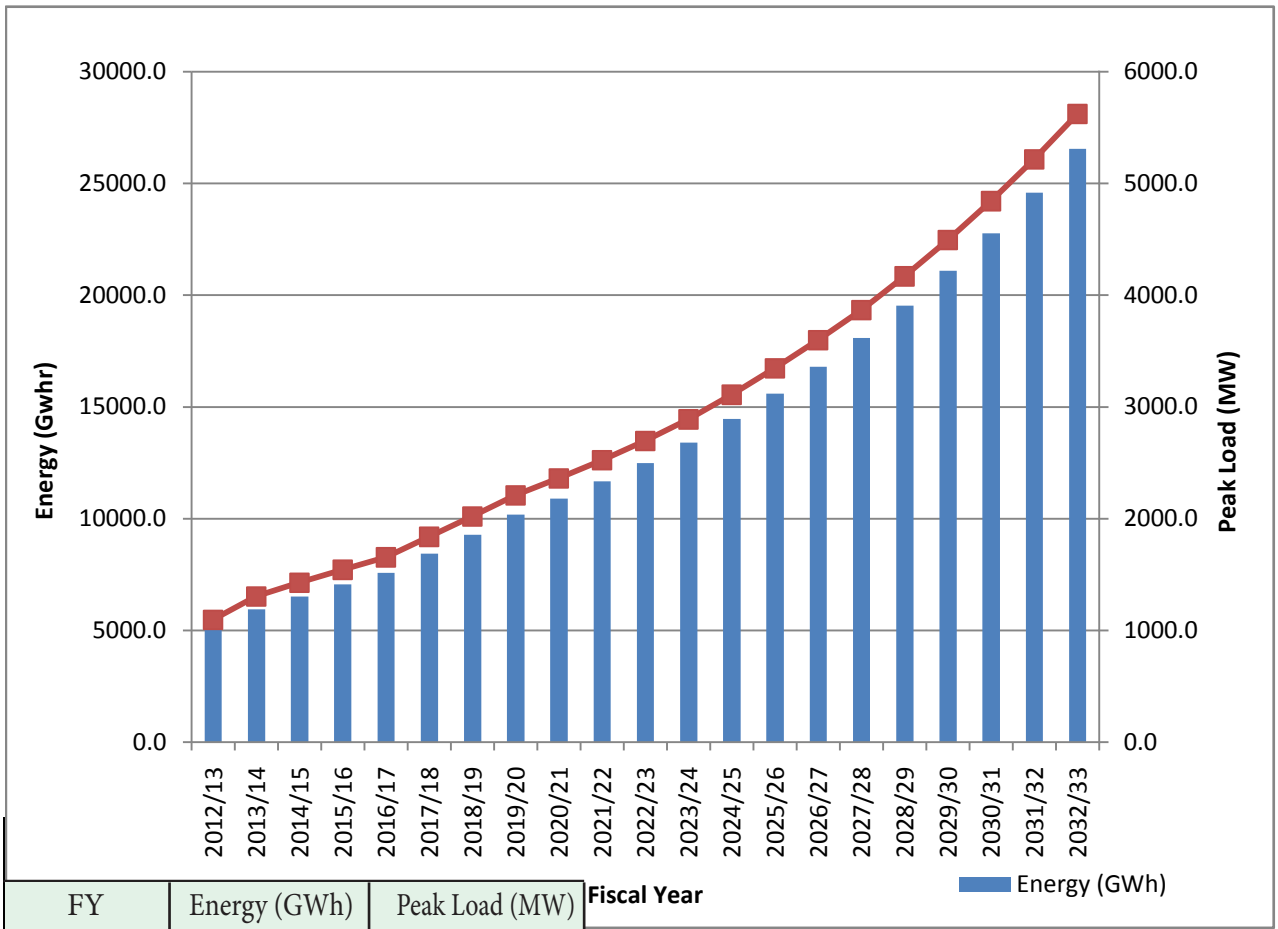


(NRs. in million)

Particulars	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014*
Domestic	4,987.04	5,405.12	6,021.40	6,297.65	6,100.65	7,252.06	7,602.34	8,967.77	11,247.77	12,107.87
Non-Commercial	862.37	881.73	940.20	982.08	900.75	983.63	1,020.51	1,091.52	1,355.17	1,475.22
Commercial	1,012.66	1,081.26	1,288.05	1,399.51	1,384.67	1,719.35	1,910.28	2,259.50	2,994.00	3,342.05
Industrial	4,799.74	4,978.69	5,300.91	5,544.80	5,264.33	6,060.20	6,378.25	7,102.37	8,885.21	9,774.17
Water Supply & Irrigation	171.57	197.96	214.18	204.67	215.62	353.14	250.60	294.82	389.34	397.93
Street Light	354.10	422.35	454.85	467.31	445.96	333.90	433.42	464.22	582.69	656.45
Temporary Supply	5.06	11.18	17.36	10.51	12.20	13.58	13.98	16.18	24.48	27.85
Transport	30.72	29.78	31.65	33.70	26.95	27.58	27.78	31.70	39.53	43.47
Temple	29.17	24.42	26.03	26.38	24.41	28.16	26.51	21.38	23.66	25.84
Community Sales	24.03	23.94	53.70	64.22	70.10	170.90	189.28	244.97	301.38	331.67
Total (Internal Sales)	**12,276.46**	**13,056.43**	**14,348.33**	**15,030.83**	**14,445.64**	**16,942.50**	**17,852.95**	**20,494.43**	**25,843.23**	**28,182.52**
Bulk Supply (India)	609.51	579.33	428.93	361.14	295.49	604.85	215.42	23.97	32.22	29.83
Gross Revenue	**12,885.97**	**13,635.76**	**14,777.26**	**15,391.97**	**14,741.13**	**17,547.35**	**18,068.37**	**20,518.40**	**25,875.45**	**28,212.35**
Net Income from Other Services	336.70	336.09	689.08	584.18	1,601.66	1,188.27	1,382.94	1,695.42	1,868.37	1,596.84
Total Revenue	**13,222.67**	**13,971.85**	**15,466.34**	**15,976.15**	**16,342.79**	**18,735.62**	**19,451.31**	**22,213.82**	**27,743.82**	**29,809.19**

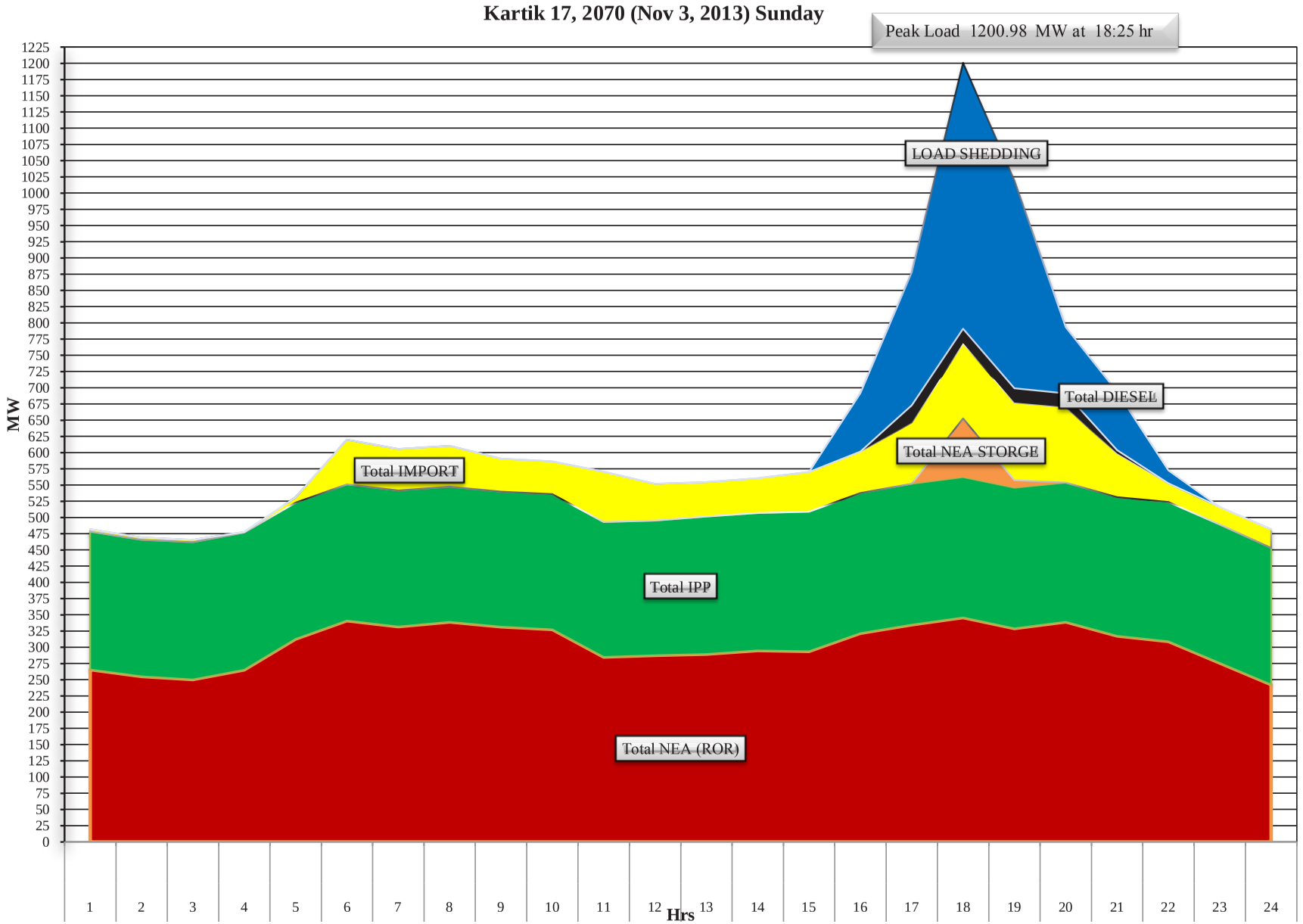
Note: * Provisional Figures

Load Forecast



FY	Energy (GWh)	Peak Load (MW)
2014/15	6509.9	1426.4
2015/16	7053.8	1542.6
2016/17	7576.4	1653.7
2017/18	8432.6	1837.1
2018/19	9284.3	2018.8
2019/20	10177.3	2208.7
2020/21	10899.4	2361.0
2021/22	11669.4	2523.0
2022/23	12490.6	2695.4
2023/24	13409.0	2888.1
2024/25	14461.5	3109.0
2025/26	15591.3	3345.5
2026/27	16797.5	3597.6
2027/28	18086.3	3866.4
2028/29	19537.5	4168.8
2029/30	21097.2	4493.2
2030/31	22774.4	4841.4
2031/32	24584.4	5216.4
2032/33	26544.2	5621.8

System Load Curve of Peak Load Day



Electricity Generation Power Plants and Projects

Major Hydropower Stations		
S. No.	Power P ants	Capacity (kW)
1	Kal igandaki A	144,000
2	Middle Marsyangdi	70,000
3	Marsyangdi	69,000
4	Trisuli	24,000
5	Sunkoshi	10,050
6	Gandaki	15,000
7	Kulekhani I	60,000
8	Devighat	14,100
9	Kulekhani II	32,000
10	Puwa Khola	6,200
11	Modi Khola	14,800
	Sub Total	459,150
	Small Hydropower Plants	
12	Sundarijal	640
13	Panauti	2,400
14	Fewa	1,000
15	Seti (Pokhara)	1,500
16	Tatopani	2,000
17	Chatara	3,200
18	Tinau	1,024
19	Pharping***	500
20	Jomsom**	240
21	Baglung***	200
22	Khandbari**	250
23	Phidim**	240
24	Surnaiyagad	200
25	Doti***	200
26	Ramechhap	150
27	Terhathum**	100
28	Gamgad	400
	Sub Total	14,244
	Total	473,394

Small Hydropower Plants (Isolated)	
Dhankuta***	240
Jhupra (Surkhet)***	345
Gorkhe (Ilam)***	64
Jumla**	200
Dhading***	32
Syangja***	80
Helambu	50
Darchula**	300
Chame**	45
Taplejung**	125
Manag**	80
Chaurjhari(Rukum)**	150
Syaprudaha (Rukum)**	200
Bhojpur**	250
Bajura**	200
Bajhang**	200
Arughat (Gorkha)	150
Okhaldhunga	125
Rupalgad (Dadeldhura)	100
Achham	400
Dolpa	200
Kalokot	500
Heldung (Humla)	500
Total	4,536

S. No.	Thermal Power Pl ants	Capacity (KW)
1	Duhabi Mu tifuel	39,000
2	Hetauda Diesel	14,410
	Total	53,410
	Solar Power Plants	
1	Simikot	50
2	Gamgadhi	50
	Total	100
Total Major Hydro (NEA) - Grid Connected		473,394
	Total Small Hydro (NEA)- Isolated	4,536
	Total Hydro (NEA)	477,930
	Total Hydro (IPP)	255,647
	Total Hydro (Nepal)	733,577
	Total Thermal (NEA)	53,410
	Total Solar (NEA)	100

Total Installed Capacity (NEA and IPP) 787,087
Total Installed Capacity (NEA & IPP)-Grid 782,451

Under Construction		Capacity (KW)
1	Upper Tamakosi Hydropower Project	456,000
2	Tanahu Hydropower Project	140,000
3	Chameliya HEP	30,000
4	Kulekhani III	14,000
5	Upper Trisuli 3 A HEP	60,000
6	Rahughat HEP	32,000
7.	Upper Sanjen	14,600
8.	Sanjen	42,500
9.	Rasuwagadi	111,000
10.	Madhya Bhotekoshi	102,000
11	Upper Trisuli 3 B	42,000
	Total	1,044,100

Planned and Proposed		Capacity (KW)
1	Upper Arun HEP	335,000
2	Upper Modi A HEP	47,000
3	Dudh Kosi Storage HEP	640,000
4	Tamor Storage HEP	530,000
5	Uttar Ganga Storage HEP	300,000
	Total	1,852,000

Note
** Leased to Private Sector
*** Not in Normal Operation

High Voltage Transmission Lines & Substrations

	EXISTING	Type of Ckts	Length	Conductor	Conductor
	132 kV Transmission Line		Circuit km	Type	Size (Sq.in.)
1	Anarmani-Duhabi	Single	75.76	BEAR	0.25
2	Kusha-Katiya(India)	Single	15	BEAR	0.25
3	Duhabi-Lahan-Cha-pur-Pathaliya/Parwanipur-Hetauda	Double	598	BEAR	0.25
4	Hetauda-KL2 P/S	Single	8	BEAR	0.25
5	Bharatpur-Marsyangdi P/S	Single	25	DUCK	0.3
6	Hetauda-Bharatpur	Single	70	PANTHER	0.2
7	Marsyangdi P/S-Suichatar	Single	84	DUCK	0.3
8	Suichatar-KL2 P/S	Single	36	BEAR	0.25
9	Suichatar-Balaju-New Bhaktapur	Single	26.9	BEAR	0.25
10	New Bhaktapur-Lamosangu	Double	96	BEAR	0.25
11	Lamosangu-Khimti P/S	Single	46	BEAR	0.25
12	Lamosangu-Bhotekoshi P/S	Single	31	BEAR	0.25
13	Bharatpur-Damauli	Single	39	WOLF	0.15
14	Bharatpur-Kawasoti-Bardghat	Single	70	PANTHER	0.2
15	Bardghat-Gandak P/S	Double	28	PANTHER	0.2
16	Bardghat-Butwal	Double	86	BEAR	0.25
17	Butwal-KGA P/S	Double	116	DUCK	0.3
18	KGA P/S-Lekhnath	Double	96	DUCK	0.3
19	Lekhnath-Damauli	Single	45	PANTHER	0.15
20	Lekhnath-Pokhara	Single	7	DOG	0.1
21	Pokhara-Modikhola P/S	Single	37	BEAR	0.25
22	Butwal-Shivapur-Lamahi	Single	112	BEAR	0.25
23	Lamahi-Jhimruk P/S	Single	50	DOG	0.1
24	Lamahi-Kohalpur-Lumki-Attariya	Single	243	BEAR	0.25
25	Attariya-Mahendranagar-Gaddachauki	Single	49	BEAR	0.25
26	Marsyangdi -M. Marsyangdi	Single	40	CARDINAL	420 sq mm
	Total		**2,129.7**		
	66 kV Transmission Line				
1	Chilime P/S-Trishuli P/S	Single	39		0.15
2	Trisuli P/S-Balaju	Double	58		0.1
3	Trisuli P/S-Devighat P/S	Single	4.56		0.15
4	Devighat P/S-Balaju	Single	30		0.1
5	Devighat P/S-New Chabel	Single	33		0.1
6	Balaju-Lainchor	Single	2		0.2
7	Balaju-Siuchatar-KL1 P/S	Double	72		0.15
8	KL 1 P/S-Hetauda-Birgunj	Double	144		0.15
9	Suichatar-Teku	Single	4.1		0.25
10	Suichatar-New Patan	Double	13		0.15
11	Teku-K3 (underground)	Singlecore	2.8	XLPE Cable	400 sq.mm.
12	Suichatar-K3	Single	6.9	XLPE Cable	0.25+500 sq.mm.
13	New Patan-New Baneswor	Single	2.8		120 sq mm
14	Bhaktapur-New Chabel	Single	23		250 & 100 sq.mm.
15	Bhaktapur-Banepa-Panchkhal-Sunkoshi P/S	Single	48		120 sq. mm.
16	Indrawati- Panchkhal	Single	28		95 sq.mm.
	Total		**511.16**		

EXISTING GRID SUBSTATIONS

	132 & 66KV SUBSTATIONS (CAPACITY IN MVA)				66KV SUBSTATIONS (CAPACITY IN MVA)	
1	Mahendranagar	20.0	15. Kamane, Hetauda	30.0	1. Birgung	55.0
2	Attariya	41.6	16. Shyangja	38.0	2. Amlekhgunj	3.2
3	Lumki	22.5	17. Dhalkebar	55.5	3. Simra	20.1
4	Kohalpur	64.6	18. Lahan	74.0	4. K-3	45.0
5	Lamahi	43.5	19. Duhabi	159.2	5. Teku	45.0
6	Shivapur	41.0	20. Anarmani	92.4	6. Patan	36.0
7	Butwal	150.1	21. Pokhara	30.0	7. Baneshwor	36.0
8	Bardghat	13.5	22. Lekhnath	12.5	8. Indrawati	7.5
9	Kawasoti	38.0	23. Damauli	26.0	9. Banepa	22.5
10	Bharatpur	67.5	24. Lamosangu	30.0	10. Panchkhal	10.0
11	Hetauda	60.0	25. Bhaktapur	94.5	11. Lainchour	45.0
12	Parwanipur	135.0	26. Balaju	90.0	12. New-Chabel	45.0
13	Chandranigahapur	68.0	27. Siuchatar	149.4	13. Balaju	67.5
14	Pathlaiya	22.5	28. Matatirtha	52.5	**Total**	**437.75**
	Total			**1,721.80**		

	UNDER CONSTRUCTION	Type of Ckts	Length	Conductor	Conductor
	132 kV Transmission Line		Circuit km	Type	Size
1	132 kV Thankot-Chapagaon	Double	57	BEAR	0.25
2	132 kV Chameliya-Attaria	Single	118	BEAR	0.25
3	132 kV Butwal-Kohalpur-Mahendranagar 2nd Circuit	Double	398	BEAR	0.25
4	132 kV Mid. Marsyangdi-Dumre- Damauli-Marsyangdi	Double	76	BEAR	0.25
6	132 kV Kabeli-Damak	Double	180	BEAR	0.25
7	132 kV Singati-Lamosangu	Double	76	BEAR	0.25
8	132kV Kusum -Hapure	Single	22	BEAR	0.25
9	132kV 2nd Circuit Hetauda-KL-II-Siuchatar	Double	45	BEAR	0.25
	Total		**972.0**		
	220 kV Transmission Line	Type of Ckts			
1	220 kV Khimti-Dhalkebar	Double	150	BISON	
2	220 kV Hetauda-Bharatpur	Double	73	BISON	
3	220kV Bharatpur-Bardghat	Double	150	BISON	
	Total		**373**		
	4000 kV Transmission Line	Type of Ckts			
1	Hetauda-Dhalkebar-Duhabi	Double	570	MOOSE	
	Total		**570**		
	PLANNED & PROPOSED				
	220 kV Transmission Line				
1	Koshi Corridor	Double	286		
2	Kaligandaki Corridor	Double	219.8		
3	Lekhnath-Damauli	Double	80		
4	Marsyangdi-Kathmandu	Double	170	MOOSE	
5	Marsyangdi-Bharatpur	Double	50		
6	Marsyangdi Transmission Corridor	Double	180		
7	Chilime-Trishuli	Double	80		
8	Tamakoshi-Kathmandu 220/400kV	Double	170		
	Total		**1235.80**		
	132 kV Transmission Line				
1	Butwal-Lumbini	Double	44	BEAR	0.25
2	Dhalkebar-Loharpatti	Double	40	BEAR	0.25
3	Gulmi-Arghakhanchi-Gorusinghe	Double	220	BEAR	0.25
4	Ramechap-Garjyang-Khimti	Double	60	BEAR	0.25
4	Dordi Corridor	Double	32	BEAR	0.25
6	Modi-Lekhnath	Double	84	BEAR	0.25
7	Samundratar-Naubise/Chapali	Double	40	BEAR	0.25
8	Kohalpur-Surkhet	Double	100	BEAR	0.25
9	Karnali Corridor	Double	120	BEAR	0.25
10	Bajhang-Deepayal-Attariya	Double	260	BEAR	0.25
11	Hapure-Tulsipur	Double	36	BEAR	0.25
12	Surkhet-Dailekh-Jumla	Double	214	BEAR	0.25
13	Kaligandaki-Gulmi (Jhimruk)	Double	86	BEAR	0.25
14	Solu Corridor (Katari-Okhaldhunga-Solu)	Double	180	CARDINAL	
15	Baneshwor-Bhaktapur	Double	24	XLPE	800 sq.mm.
	Total		**1540.00**		
	Planned & Proposed 400kV Transmission Line				
1	400 kV Dhalkebar-Muzzaffarpur Cross Border Line*	Double	78	MOOSE	
2	Hetauda-Butwal-Lamki-Mahendranagar	Double	1140	MOOSE	
3	New Butwal-Bardghat	Double	90		
	Total		**1308**		

UNDER CONSTRUCTION GRID SUBSTATIONS

1	132/33/11 kV Damak, Illam, Phidim, Kabeli	124.0
2	132/11 kV Chapali	120.0
3	132/33/11 kV Matatirtha	52.5
4	132/33 kV Hapure	30.0
5	132/33 kV New Marsyangdi	30.0
6	132/33 kV Singati	30.0
7	132/33 kV Kusum	30.0
8	132/33kV Mirchaiya	30.0
9	132/33kV Ghorahi	30.0
10	132/11kV New Bharatpur	30.0
	Total	**506.5**

PLANNED & PROPOSED GRID SUBSTATIONS

Voltage Level	No. of Substations	Total Capacity (MVA)
1. Up to 400kV	5	2025
2. Up to 220kV	18	3876
3. Up to 132kV	21	917
Total		**7257.50**

Power Purchase Agreement Concluded Projects (in Operation)

S. No.	Name of Company	Name of Project	Location (District)	Capacity (kW)
1	Himal Power Ltd.	Khimti Khola	Dolkha	60,000
2	Bhotekoshi Power Company Ltd.	Bhotekoshi Khola	Sindhupalchok	45,000
3	Chilime Hydro Power Company Ltd.	Chilime	Rasuwa	22,000
4	National Hydro Power Company Ltd.	Indrawati - III	Sindhupalchowk	7,500
5	Butwal Power Company Ltd.	Jhimruk Khola	Pyuthan	12,000
6	Butwal Power Company Ltd.	Andhi Khola	Syangja	5,100
7	Syange Bidyut Company Limited	Syange Khola	Lamjung	183
8	Arun Valley Hydro Power Company Ltd.	Piluwa Khola	Sankhuwasava	3,000
9	Rairang Hydro Power Development Co. (P) Ltd.	Rairang Khola	Dhading	500
10	Sanima Hydro Power Company Ltd.	Sunkoshi Khola	Sindhupalchok	2,500
11	Alliance Power Nepal Pvt.Ltd.	Chaku Khola	Sindhupalchok	3,000
12	Khudi Hydro Power Ltd.	Khudi Khola	Lamjung	3,450
13	Unique Hydel Co. Pvt.Ltd.	Baramchi Khola	Sindhupalchowk	4,200
14	Thoppal Khola Hydro Power Co. Pvt. Ltd.	Thoppal Khola	Dhading	1,650
15	Gautam Buddha Hydropower (Pvt) Ltd	Sisne Khola	Palpa	750
16	Kathmandu Small Hydropower Systems Pvt. Ltd.	SaliNadi	Kathmandu	232
17	KhorangaKhola Hydro Power Co. Ltd.	PhemeKhola	Panchtar	995
18	Unified Hydropower (P) Ltd.	Pati Khola	Parbat	996
19	Task Hydropower Company (P.) Ltd.	Seti-II	Kaski	979
20	Ridi Hydropower Development Co. (P.) Ltd.	Ridi Khola	Gulmi	2,400
21	Centre for Power Dev. And Services (P.) Ltd.	Upper Hadi Khola	Sindhupalchowk	991
22	Gandaki Hydro Power Co. Pvt. Ltd.	Mardi Khola	Kaski	4,800
23	Himal Dolkha Hydropower Company Ltd.	Mai Khola	Ilam	4,500
24	Baneshor Hydropower Pvt. Ltd.	Lower Piluwa	Sankhuwasabha	990
25	Barun Hydropower Development Co. (P.) Ltd.	Hewa Khola	Sankhuwasabha	4,455
26	Nyadi Group (P.) Ltd.	Siuri Khola	Lamjung	4,950
27	United Modi Hydropwer Pvt. Ltd.	Lower Modi I	Parbat	9,900
28	Bhagawati Hydropower Development Co. (P.) Ltd.	Bijayapur-1	Kaski	4,410
29	Kathmandu Upatyaka Khanepani Board	Solar	Lalitpur	680.4
30	Synergy Power Development (P.) Ltd.	Sipring Khola	Dolkha	9,658
31	Aadishakti Power Dev. Company (P.) Ltd.	Tadi Khola (Thaprek)	Nuwakot	5,000
32	Laughing Buddha Power Nepal (P.) Ltd.	Middle Chaku	Sindhupalchowk	1,800
33	Nepal Hydro Developer Pvt..Ltd	CharanawatiKhola	Dolakha	3,520
34	Laughing Buddha Power Nepal (P.) Ltd.	Lower Chaku Khola	Sindhupalchowk	1,765
35	Ankhu Khola Jal Bidhyut Co. (P.) Ltd.	Ankhu Khola - 1	Sindhupalchok	8,400
36	Bhairabkunda Hydropower Pvt. Ltd.	Bhairab Kunda	Sindhupalchowk	3,000
37	Radhi Bidyut Company Ltd.	Radhi Khola	Lamjung	4,400
38	Pashupati Environmental Eng. Power Co. Pvt. Ltd.	Chhote Khola	Gorkha	993
39	Mailung Khola Hydro Power Pvt. Ltd.	Mailung Khola	Rasuwa	5,000
	Total			**255,647.4**

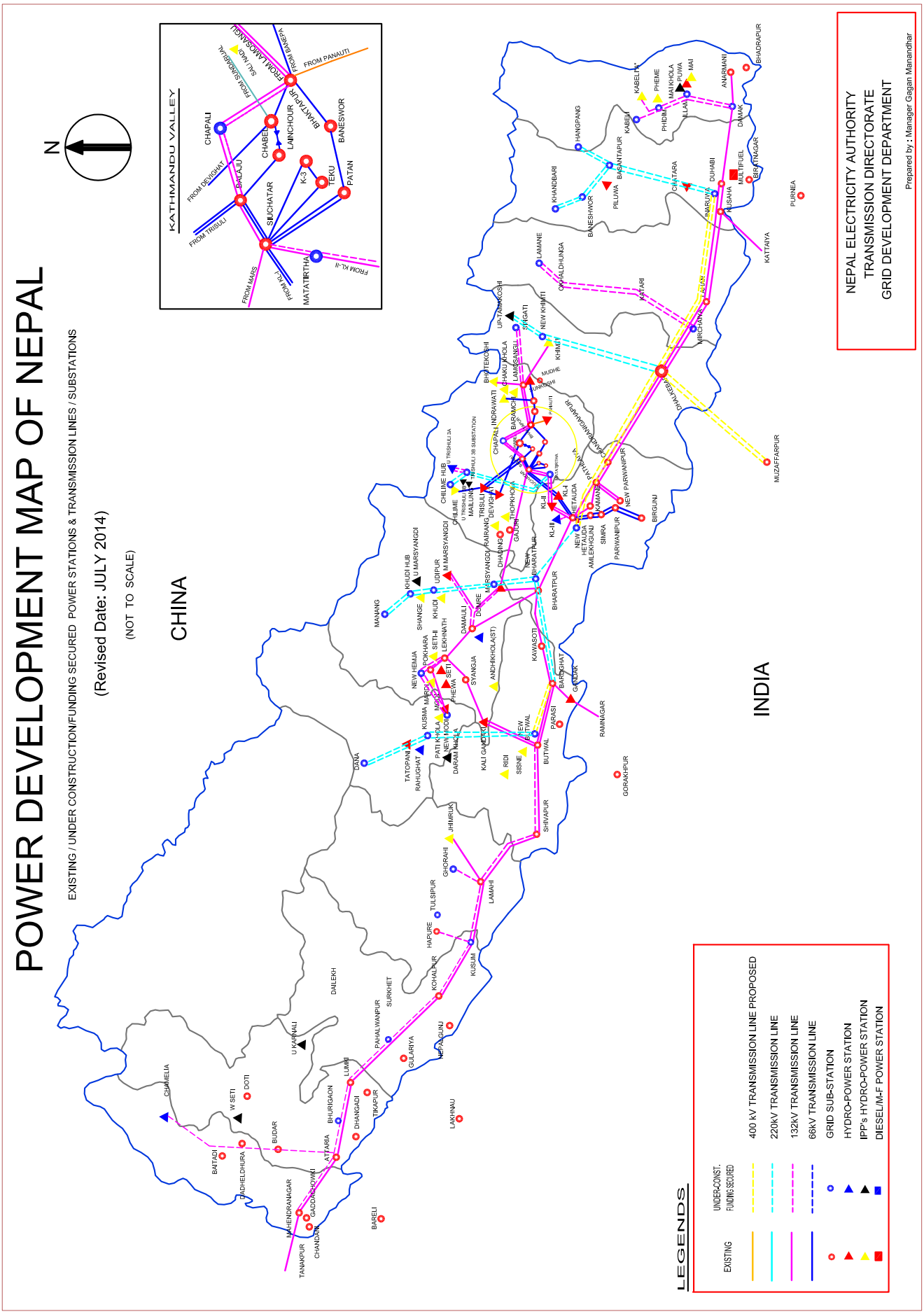
Power Purchase Agreement Concluded Projects (under Construction)

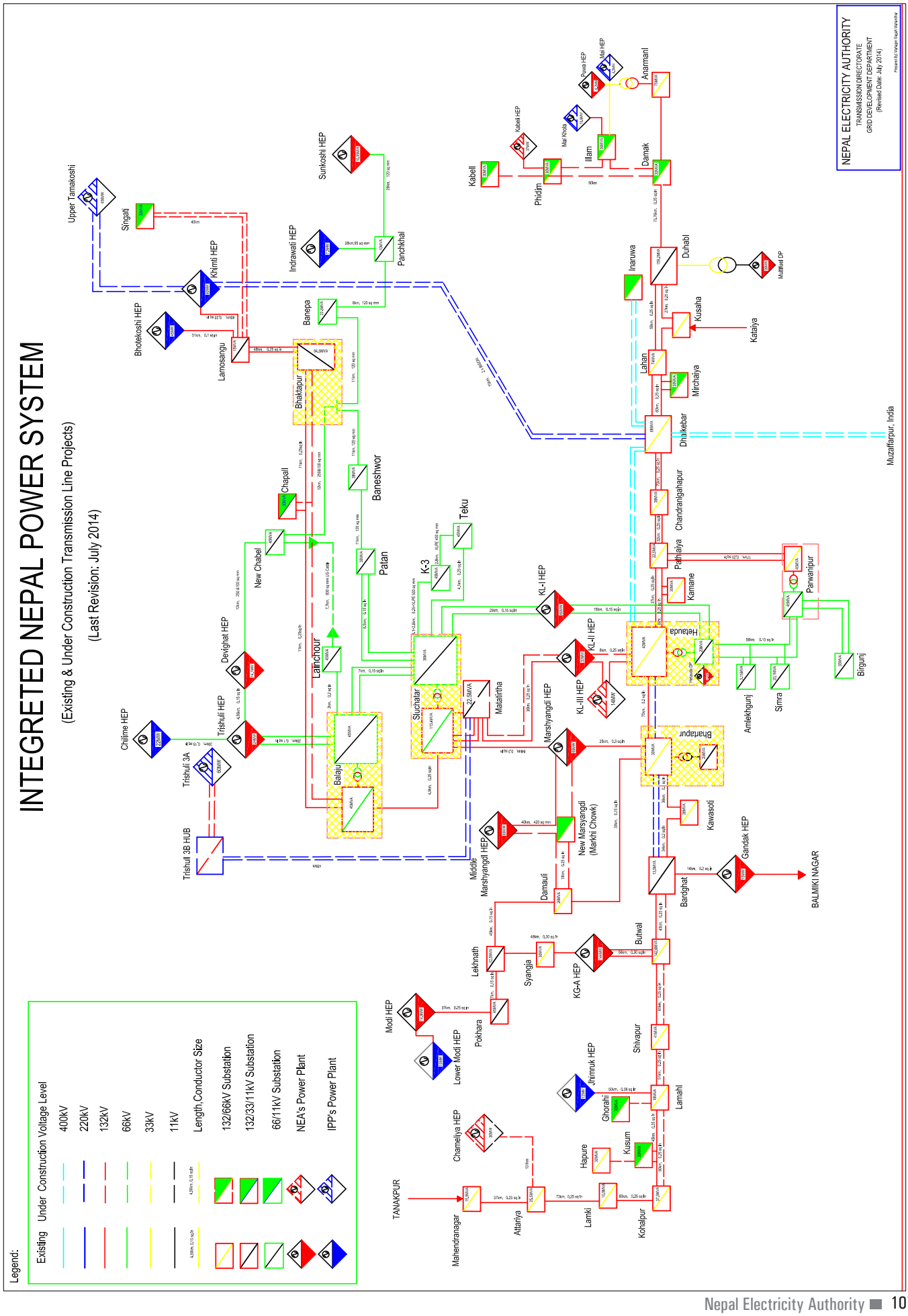
S. No.	Name of Company	Name of Project	Location (District)	Capacity (kW)
1	Abiral Hydropower Co. Pvt. Ltd.	Upper Khadam	Morang	990
2	Api Power Company Pvt.Ltd	NauGad Gad Khola	Baitadi	8,500
3	Bojini Company Private Limited	Jiri Khola	Dolkha	2,200
4	Butwal Power Company Ltd.	Andhikhola (Upgrading)	Syangja	4,300
5	Chilime Hydro Power Company Ltd.	Rasuwa Gadi	Rasuwa	111,000
6	Chyangdi Hydropower Privated Limited	Chhandi	Lamjung	1,700
7	Daraudi Kalika Hydro Pvt. Ltd.	Daraudi Khola A	Gorkha	6,000
8	Dariyal Small Hydropower Pvt.Ltd	Upper Belkhu	Dhading	750
9	Deurali Bahuudesiya Sahakari Sanstha Ltd.	Midim Khola	Lamjung	100
10	Dibeshwori Hydropower Company Limited	Saba Khola	Sankhubasha	3,300
11	Dovan Hydropower Company (P).Ltd	Junbesi Khola	Solukhumbu	5,200
12	Dronanchal Hydropower Co.Pvt.Ltd	Dhunge-Jiri	Dolakha	600
13	East Nepal Development Endeavour (P) Ltd	Upper Mai Khola	Ilam	9,980
14	Eastern Hydropower (P.) Ltd.	Pikhuwa Khola	Bhojpur	2,475
15	Electro-com and Research Centre Pvt.Ltd	Jhyadi Khola	Sindhupalchowk	2,000
16	Energy Engineering Pvt.ltd	Upper Mailun A	Rasuwa	5,000
17	GarjangUpatyaka Hydropower (P.) Ltd.	Chake Khola	Ramechhap	2,830
18	Gelun Hydropower Co.Pvt.Ltd	Gelun	Sindhupalchowk	3,200
19	Greenlife Energy Pvt.Ltd	Khani khola-1	Dolakha	25,000
20	Himal Dolkha Hydropower Company Ltd.	Mai Sana Cascade	Ilam	8,000
21	Himalayan Power Partner Pvt. Ltd.	Dordi Khola	Lamjung	27,000
22	Hira Ratna Hydropower P.ltd	Tadi Khola	Nuwakot	5,000
23	Hydro Innovation Pvt. Ltd.	Tinekhu Khola	Dolakha	990
24	Joshi Hydropower Development Co. (P.) Ltd.	Upper Puwa Khola-1	Ilam	3,000
25	Jumdi Hydropower Pvt.Ltd.	Jumdi Khola	Gulmi	1,750
26	Kutheli Bukhari Small Hydropower (P).Ltd	Suspa Bukhari	Dolakha	350
27	Liberty Hydropower Pvt. Ltd.	Upper Dordi A	Lamjung	22,000
28	Lohore Hydropower Co. Pvt. Ltd.	Lohore Khola	Dailekha	4,200
29	Madi Power Pvt. Ltd.	Upper Madi	Kaski	19,008
30	Mai Valley Hydropower Privated Limited	Upper Mai C	Ilam	5,100
31	Manang Trade Link Pvt. Ltd.	Lower Modi	Parbat	20,000
32	Mandakani Hydropower Privated Limited	Sardi Khola	Kaski	3,500
33	Middle Bhotekoshi Jalbidhyut Company	Middle Bhotekoshi	Sindhupalchowk	102,000
34	Middle Modi Hydropower Ltd.	Madhya Modi	Parbat	15,100
35	Mount Kailash Energy Pvt. Ltd.	Thapa Khola	Myagdi	11,200
36	Nama Buddha Hydropower (P) Ltd	Tinau Khola	Palpa	990
37	Pachathar Power Company Pvt. Ltd.	Hewa Khola 'A'	Pachathar	14,900
38	Pashupati Energy Development Co. Pvt. Ltd.	Tungun-Thosne	Lalitpur	4,360
39	Pashupati Energy Development Co. Pvt. Ltd.	Khani Khola	Lalitpur	2,000
40	Prime Hydropower Co. Pvt. Ltd.	Belkhu Khola	Dhading	518
41	Reliable Hydropower Co. Pvt. Ltd.	KhorungaKhola	Terhathum	4,800

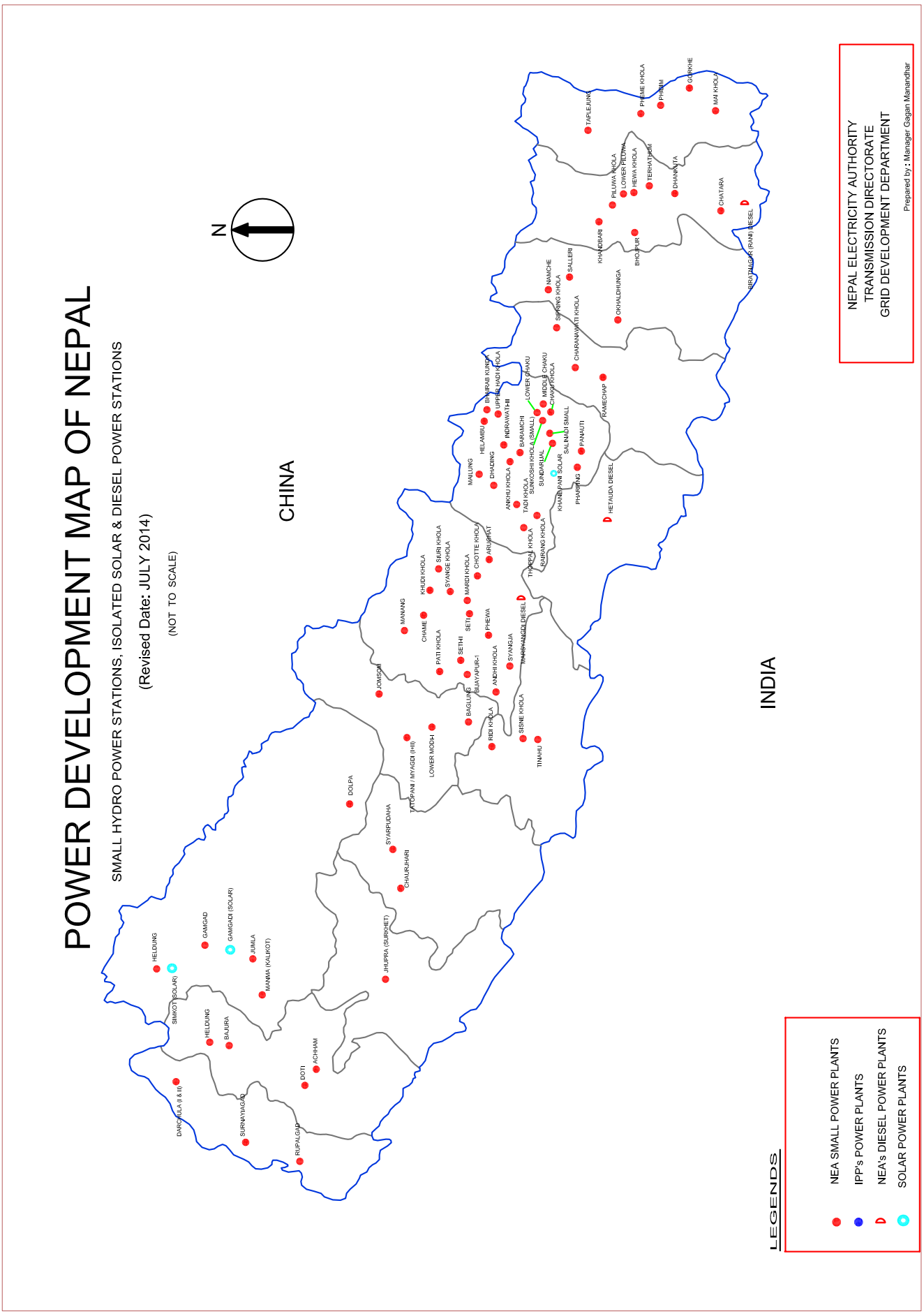
42	Rising Hydropower Compnay Ltd.	SelangKhola	Sindhupalchowk	990
43	Robust Energy Pvt. Ltd.	Mistri Khola	Myagdi	42,000
44	Ruru Hydropower Project (P) Ltd.	Upper Hugdi Khola	Gulmi	5,000
45	Salankhu Khola Hydropower Pvt. Ltd.	Salankhu Khola	Nuwakot	2,500
46	Sanima Mai Hydro Power Ltd.	Mai Khola	Ilam	22,000
47	Sanima Mai Hydropower Ltd.	Mai Cascade	Ilam	7,000
48	Sanjen Hydropower Co.Limited	Upper Sanjen	Rasuwa	14,800
49	Sanjen Hydropower Co.Limited	Sanjen	Rasuwa	42,500
50	Sapsu Kalika Hydropower Co. Pvt. Ltd.	MiyaKhola	Khotang	996
51	Sasa Engingeering Hydropower (P). Ltd	Khani Khola	Dolakha	30,000
52	Sayapatri Hydropower Privated Limited	Daram Khola A	Baglung	2,500
53	Shiva Shree Hydropower Pvt.Ltd	Upper Chaku A	Sindhupalchowk	22,200
54	Shivani Hydropower Company (P.) Ltd.	Phawa Khola	Taplejung	4,950
55	Sikles Hydropower (P) Ltd.	Madkyu Khola	Kaski	9,968
56	Sinohydro-Sagarmatha Power Company (P.) Ltd	Upper Marsyangdi A	Lamjung	50,000
57	Sunkoshi Hydro Power Co. Pvt. Ltd.	Lower Indrawati Khola	Sindhupalchok	4,500
58	Teleye Samyak Company Pvt.Ltd	Dhansi Khola	Rolpa	955
59	Universal Power Company (P) Ltd.	Lower Khare	Dolakha	8,260
60	Upper Tamakoshi Hydropower Co. Ltd.	Upper Tamakoshi HPP	Dolkha	456,000
61	Volcano Hydropower Pvt. Ltd.	Teliya Khola	Dhankuta	996
62	Water and Energy Co. Pvt. Ltd	Badi Gad	Baglung	6,600
	Total			**1,205,606**

Power Purchase Agreement Concluded Projects (in Different Stages of Development)

S. No.	Name of Company	Name of Project	Location (District)	Capacity (kW)
1	Annapurna Group Pvt. Ltd.	Madi-1 Khola	Kaski	10,000
2	Apolo Hydropower Pvt. Ltd.	Buku Khola	Solukhumbu	6,000
3	Arun Kabeli Power Ltd.	Kabeli B-1	Taplejung, Panchthar	25,000
4	Baishno Devi Hydro Power (P.) Ltd.	Lower Sunkoshi -III	Sindhupalchowk	9,900
5	Balefi Jalbidhyut Com. Pvt. Ltd	Balefi	Sindhupalchowk	24,000
6	Barahi Hydropower Pvt.ltd	Theule Khola	Baglung	1,500
7	Beni Hydropower Project Pvt. Ltd.	Upper Solu	Solukhumbu	18,000
8	Betrawoti Hydropower Company (P).Ltd	Phalankhu Khola	Rasuwa	13,700
9	Bhugol Energy Dev. Compay (P). Ltd	Dwari Khola	Dailekha	3,750
10	Bidhyabasini Hydropower Dev. Co. Pvt.Ltd.	Rudi A	Lamjung, Kaski	6,800
11	Buddhabhumi Nepal Hydropower Co. Pvt. Ltd.	TalloTadi Khola	Nuwakot	4,993
12	Cemat Power Dev Company (P).Ltd	Ghalendi Khola	Myagdi	4,000
13	Conrorium Power Developer (P) Ltd	Khare Khola	Dolakha	24,100
14	Dudhkoshi Power Company Pvt. Ltd.	Rawa Khola	Khotang	6,500
15	Dupcheshowr Mahadev Hydro Co. (P) Ltd.	Middle Tadi	Nuwakot	5,325
16	Eklekunda Hydropower Co.Pvt.Ltd	Dorkhu Khola	Nuwakot	990
17	Essel Clean Solu Hydropower (P).Ltd	Lower Solu	Solukhumbu	82,000
18	Gayatri Hydro Power (P.) Ltd.	Charanawati	Dolakha	980
19	Green Venture Pvt.Ltd.	Likhu-IV	Okhaldhunga	52,400
20	Himalaya Urja Bikash Company (P).Ltd	Upper Khimti II	Ramechhap	7,000
21	Himalayan Hydropower Pvt. Ltd.	Namarjun Madi	Kaski	11,880
22	Himalayan Urja Bikas Co. Pvt. Ltd.	Upper Khimti	Dolkha	12,000
23	Idi Hydropower Co. P.ltd.	Idi Khola	Kaski	975
24	Ingua Hydropower Company Pvt.Ltd	Upper Ingua Khola	Ilam	9,700
25	Jywala Sajhedari Hydropower Company P.Ltd.	Tame Khola	Dailekha	1,250
26	Madhya Midim Jalbidhyut Company P. Ltd.	Middle Midim	Lamjung	3,100
27	Manakamana Engineering HP. Co. Pvt. L.	Ghatte Khola	Dolakha	5,000
28	Mandu Hydropower Company Pvt.Ltd	Bagmati Khola	Makabanpur	20,000
29	Maya Khola HP Co. P. Ltd.	Maya Khola	SankhuwaSabha	14,900
30	Midim Hydropower Pvt. Ltd.	Midim Khola	Lamjung	3,400
31	Molnia Power Ltd.	Upper Mailung	Rasuwa	14,300
32	Molung Hydropower Co. Pvt. Ltd.	Molung Khola	Okhaldhunga	7,000
33	Moonlight Hydropower Pvt. Ltd.	Balefi A	Sindhupalchowk	10,600
34	Puwa 1 Hydropower P.Ltd.	Puwa Khola -1	Ilam	4,000
35	Rairang Hydro Power Dev. Co. (P) Ltd.	Iwa Khola	Taplejung	9,900
36	Rara Hydropower Co. Pvt. Ltd.	Upper Parajuli Khola	Dailekha	2,150
37	Salmendevi Hydropower (P).Ltd	Kapadigad	Doti	3,300
38	Sanvi Energy pvt. Ltd.	Jogmai	Ilam	7,600
39	Singati Hydro Energy (P) Ltd	Singati Khola	Dolakha	16,000
40	Suryakunda Hydroelectric Pvt. Ltd.	Upper Tadi	Nuwakot	11,000
41	Swoyembhu Hydropower Pvt. Ltd	Upper charnawati	Dolakha	2,020
42	Tallo Midim Jalbidhut Company (P) Ltd.	Lower Midim	Lamjung	996
43	Tangchhara Hydro Pvt. Ltd.	Tangchhahara	Mustang	2,200
44	TMB Energietechnik	Narayani Shankar Biomass	Rupandehi	600
45	Union Hydropower Pvt Ltd.	Midim Karapu	Lamjung	3,000
46	Upper Piluwa Khola Hydropower Co. Pvt. Ltd.	Upper Piluwa Khola	SankhuwaSabha	9,622
47	Upper Solu Hydroelectric Company (P).Ltd	Solu Khola	Solukhumbu	23,500
48	Welcome Energy Development Company (P.) Ltd.	Lower Balephi	Sindhupalchowk	18,514
	Total			**535,445**


POWER DEVELOPMENT MAP OF NEPAL
EXISTING / UNDER CONSTRUCTION/FUNDING SECURED POWER STATIONS & TRANSMISSION LINES / SUBSTATIONS
(Revised Date: JULY 2014)
(NOT TO SCALE)
N
CHINA
INDIA
KATHMANDU VALLEY
CHAPALI
SUCHATAR
BALAJU
CHABEL
LAINCHOUR
BHAKTAPUR
K-3
TEKU
BANESWOR
PATAN
MATATIRTHA
FROM TRISULI
FROM DEVIGHAT
FROM BANEPA
FROM PANAUTI
FROM KL-II
FROM MARS
FROM SUNKOSHI
SALI NADI
FROM LAMOSANGU
NEPAL ELECTRICITY AUTHORITY
TRANSMISSION DIRECTORATE
GRID DEVELOPMENT DEPARTMENT
Prepared by : Manager Gagan Manandhar
LEGENDS
EXISTING
UNDER-CONST. FUNDING SECURED
400 kV TRANSMISSION LINE PROPOSED
220kV TRANSMISSION LINE
132kV TRANSMISSION LINE
66kV TRANSMISSION LINE
GRID SUB-STATION
HYDRO-POWER STATION
IPP's HYDRO-POWER STATION
DIESEL/M-F POWER STATION


INTEGRETED NEPAL POWER SYSTEM
(Existing & Under Construction Transmission Line Projects)
(Last Revision: July 2014)
NEPAL ELECTRICITY AUTHORITY
TRANSMISSION DIRECTORATE
GRID DEVELOPMENT DEPARTMENT
(Revised Date: July 2014)
Legend:
Existing Under Construction Voltage Level
400kV
220kV
132kV
66kV
33kV
11kV
Length,Conductor Size
132/66kV Substation
132/33/11kV Substation
66/11kV Substation
NEA's Power Plant
IPP's Power Plant
Upper Tamakoshi
Singati
Khimti HEP
Bhotekoshi HEP
Lamosangu
Sunkoshi HEP
Indrawati HEP
Panchkhal
Banepa
Bhaktapur
Chapali
New Chabel
Devighat HEP
Chilime HEP
Trishuli HEP
Trishuli 3A
Trishuli 3B HUB
Baneshwor
Patan
Lainchour
Balaju
Teku
K-3
Sluchatar
Matatirtha
KL-I HEP
KL-II HEP
KL-III HEP
Marshyangdi HEP
Middle Marshyangdi HEP
New Marsyangdi (Markhi Chowk)
Damauli
Bharatpur
Kawasoti
Gandak HEP
BALMIKI NAGAR
Bardghat
Butwal
KG-A HEP
Syangja
Lekhnath
Modi HEP
Lower Modi HEP
Pokhara
Shivapur
Jhimruk HEP
Ghorahi
Lamahi
Chameliya HEP
Hapure
Kusum
Attariya
Lamki
Kohalpur
TANAKPUR
Mahendranagar
Kabeli
Kabeli HEP
Phidim
Mai Khola
Illam
Puwa HEP
Mai HEP
Anarmani
Damak
Inaruwa
Duhabi
Multifuel DP
Kusaha
Kataiya
Lahan
Mirchaiya
Dhalkebar
Muzaffarpur, India
Chandranigahapur
Pathlaiya
Kamane
Hetauda
Parwanipur
Birgunj
Amlekhgunj
Simra


POWER DEVELOPMENT MAP OF NEPAL
SMALL HYDRO POWER STATIONS, ISOLATED SOLAR & DIESEL POWER STATIONS
(Revised Date: JULY 2014)
(NOT TO SCALE)
N
CHINA
INDIA
LEGENDS
NEA SMALL POWER PLANTS
IPP's POWER PLANTS
NEA's DIESEL POWER PLANTS
SOLAR POWER PLANTS
NEPAL ELECTRICITY AUTHORITY
TRANSMISSION DIRECTORATE
GRID DEVELOPMENT DEPARTMENT
Prepared by : Manager Gagan Manandhar
HELDUNG
SINKOT (SOLAR)
GAMGAD
GAMGADI (SOLAR)
JUMLA
MANMA (KALIKOT)
DARCHULA (I & II)
HELDUNG
BAJURA
SURNAYAGAD
DOTI
ACHHAM
RUPALGAD
DOLPA
JHUPRA (SURKHET)
SYARPUDAHA
CHAURJHARI
TATOPANI / MYAGDI (HII)
LOWER MODHI
JOMSOM
MANANG
CHAME
KHUDI KHOLA
SIURI KHOLA
SYANGE KHOLA
PATI KHOLA
SETI HI
SETI
MARDI KHOLA
CHOTTE KHOLA
ARUGHAT
PHEWA
BAGLUNG
BIJAYAPUR-I
ANDHI KHOLA
SYANGJA
TAMAHANGDI DIESEL
RIDI KHOLA
SISNE KHOLA
TINAHU
MALUNG
HELAMBU
DHADING
BHAIRAB KUNDA
UPPER HADI KHOLA
INDRAWATI HII
BARAMCHI
ANKHU KHOLA
TADI KHOLA
SUNKOSHI KHOLA (SMALL)
SUNDARIJAL
THOPAL KHOLA
RABRANG KHOLA
LOWER CHAKU
MIDDLE CHAKU
CHAKU KHOLA
SALNADI SMALL
KHANEPANI SOLAR
PHARPING
PANAUTI
HETAUDA DIESEL
RAMECHAP
NAMCHE
SIPRING KHOLA
SALLERI
CHARANAWATI KHOLA
OKHALDHUNGA
KHANDBARI
BHOJPUR
PILUWA KHOLA
LOWER PILUWA
HEWA KHOLA
TERHATHUM
DHANKUTA
PHEDIM
PHIDIM
GARKHE
MAI KHOLA
TAPLEJUNG
CHATARA
BIRATNAGAR (RANI) DIESEL