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Government of Nepal, Hon'ble Minister of Energy, Water Resources and Irrigation, Private Secretariat, 2074

Message from the Minister

It is a moment of great pleasure to me to express my thoughts as the Minister for Energy, Water Resources and Irrigation on the auspicious occasion of Nepal Electricity Authority (NEA)'s 33rd anniversary. On this auspicious occasion, I would like to congratulate the entire team of NEA for their sincere efforts to provide better service in electricity delivery.

With the introduction of Electricity Act-1992, power sector was opened for private sector investment and NEA lost its monopolistic legacy in the country's power sector. Since then, number of Independent Power Producers (IPPs) have added to the generation capacity of Integrated Nepal Power System and contribution of IPPs in total power generation is in increasing trend.

Reforms in power sector are in high priority of GoN. Electricity Regulatory Commission Act-2074 has been inacted and the process for forming Electricity Regulatory Commission is initiated. Rastriya Prasaran Grid Company Limited and Vidhyut Utpadan Company Limited have been operationalized. Further, institutional reform of NEA is also in top agenda of GoN. Nevertheless, NEA is still the leader in power sector and has an important role to play in the future as well to serve reliable, efficient and high quality power to the customer at affordable price. NEA also serves as a medium for the GoN to meet its obligations of supplying electricity to all within next five years.

In the previous fiscal year, reliability of power supply to the customers has drastically improved. I felt proud to declare the end of load shedding to all consumer categories from May 2018. I must congratulate NEA team for better managing available power, energy and infrastructure to end load shedding. This could also be possible due to NEA's continuous effort to bring Chameliya project (30 MW) and some IPP projects in operation with import augmentation.

In the current fiscal year, Kulekhani-III (14 MW), Upper Tamakoshi (456 MW) and Upper Trishuli 3A (60 MW) are expected to be commissioned. In addition, significant quantity of generation capacity will be added from IPPs. This will help NEA to further strengthen its supply situation and have surplus energy in wet months. With the commissioning of number of hydropower projects in the next few years, there will be substantial surplus energy in the NEA power system during wet months and NEA will have to plan managing surplus energy. NEA should explore all the possibilities to consume surplus energy *including* but not limited to expanding and upgrading network capacity, increasing accessibility to grid network, energy banking and exporting power to India.

Ministry of Energy, Water Resources and Irrigation has come up with the White paper-2074 and has set up roadmap for the next decade in the energy sector. Public investment in financially

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attractive hydropower projects will be encouraged and about 3000 MW will be developed within the next five to seven years under the motto "*Nepal ko Pani Janata Ko Lagani, Harek Nepali Vidhyut Ko Share Dhani*".

Further, under the active initiation of the ministry, Energy Cooperation Agreement has been signed with China and Bangladesh, which will open the avenues for power trading and transmission connectivity with these countries.

NEA, being the State-owned power utility, will have to play a vital role to achieve the target set by GoN. It is worthwhile to mention here that NEA's generation, transmission and distribution projects that are under construction have undergone time and cost overrun problems and NEA must work hard to overcome such situation in the future. Further, NEA has to improve their distribution infrastructure immediately to minimize the pubic and staff casualties due to electric shocks.

NEA has initiated necessary steps to reduce technical and non-technical loss. NEA's efforts in loss reduction activities show encouraging results. I appreciate NEA for being able to reduce the system loss to 20.45% which is bare minimum in NEA's history.

NEA should continue and work hard to maintain its competitive advantage in country's energy sector and focus more on being a market leader in the power sector.

At the end, I wish to congratulate all the NEA staff for their sincere efforts and valuable services they have rendered.

Barsha Man Pun 'Ananta'
Minister for Energy, Water
Resources and Irrigation

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Message from the Chairman

Nepal Electricity Authority (NEA) has been able to achieve a couple of important milestones during this last fiscal year, the most important being elimination of the alarming load shedding situation throughout the country. NEA has also been able to complete the construction of the long-awaited Chameliya Hydropower Project. The charging of the Dhalkebar–Muzaffarpur Transmission Line at 220 kV voltage level can also be considered as a major achievement during this period. With achievements like these, NEA certainly deserves to be lauded for its efforts. These achievements are building blocks, which should ultimately lead NEA towards becoming a profit-making organization and will also lead the nation towards the path of prosperity and development.

With approximately 500 MW of power generated by NEA, about the same being supplemented by Independent power producers (IPPs) and the rest being imported from India, NEA has the responsibility today to manage around 1500 MW of power within the country. The existing transmission and distribution system is not adequate to handle this quantum of power. Hence, the challenge for NEA now is to shift its focus to operating and maintaining a robust transmission and distribution system. The existing system needs to be very urgently expanded, upgraded and rehabilitated so that uninterrupted and reliable supply of power can be supplied through the national grid. NEA also needs to ensure that there are no further delays in the completion of transmission lines to be able to evacuate power generated by IPPs. The delays will not only be detrimental to the respective IPPs but also cause embarrassment to NEA and economic losses to the country.

As NEA is still a major player in power generation, it has to seriously think about increasing its overall generation. This would mean concentrating on completing the Upper Trishuli 3A and Kulekhani-3 hydroelectric projects as well as the projects that are being constructed by its sister companies. The generation from these projects, once completed, will amount to approximately 1000 MW. With the addition of this quantum of power along with the generation by IPPs in the coming years, NEA will no longer have to import power from India, at least during the wet season or even for a greater part of the dry season. Rather, NEA needs to continue exploring the possibilities of power-banking with India to deal with the surplus energy, which is likely to be there.

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Along with the above projects, NEA is also embarking on the development of several storage projects as well as important run-of-river projects. With these projects, NEA will enter a critical period in its history as export of surplus power to neighbors will then be the next important agenda in NEA's strategy. Talks about the cross border lines have now been going on for quite some time. These lines, I believe, will not only help in exporting surplus power to neighbors but will also help in stabilizing the cross border network. Therefore, NEA should seriously do its part in realizing this transmission line at the earliest.

I am very happy to learn that NEA is finally trying to go smart. With the introduction of smart meters, smart grids, online payment arrangements and the implementation of Enterprise Resource Planning, NEA is certainly taking a great leap forward in updating its management system and is showing signs of finally leaving behind its age-old and rather conventional tradition.

I would like to congratulate NEA for having completed its thirty two years of service to the people and the nation. I would also like to take this opportunity to thank the Managing Director and the entire staff of NEA as well as the board members for their relentless efforts in leading the country from darkness to light, and in doing so, contributing to the prosperity of the nation.

Anup Kumar Upadhyay

Secretary

Ministry of Energy, Water Resources and Irrigation

Board of Directors

Mr. Anup Kumar Upadhyay
Secretary
Ministry of Energy, Chairman

Shishir Kumar Dhungana
Secretary
Ministry of Finance, Revenue

Mr. Chandra Tandon
Member

Mr. Umesh Prasad Thani
Member

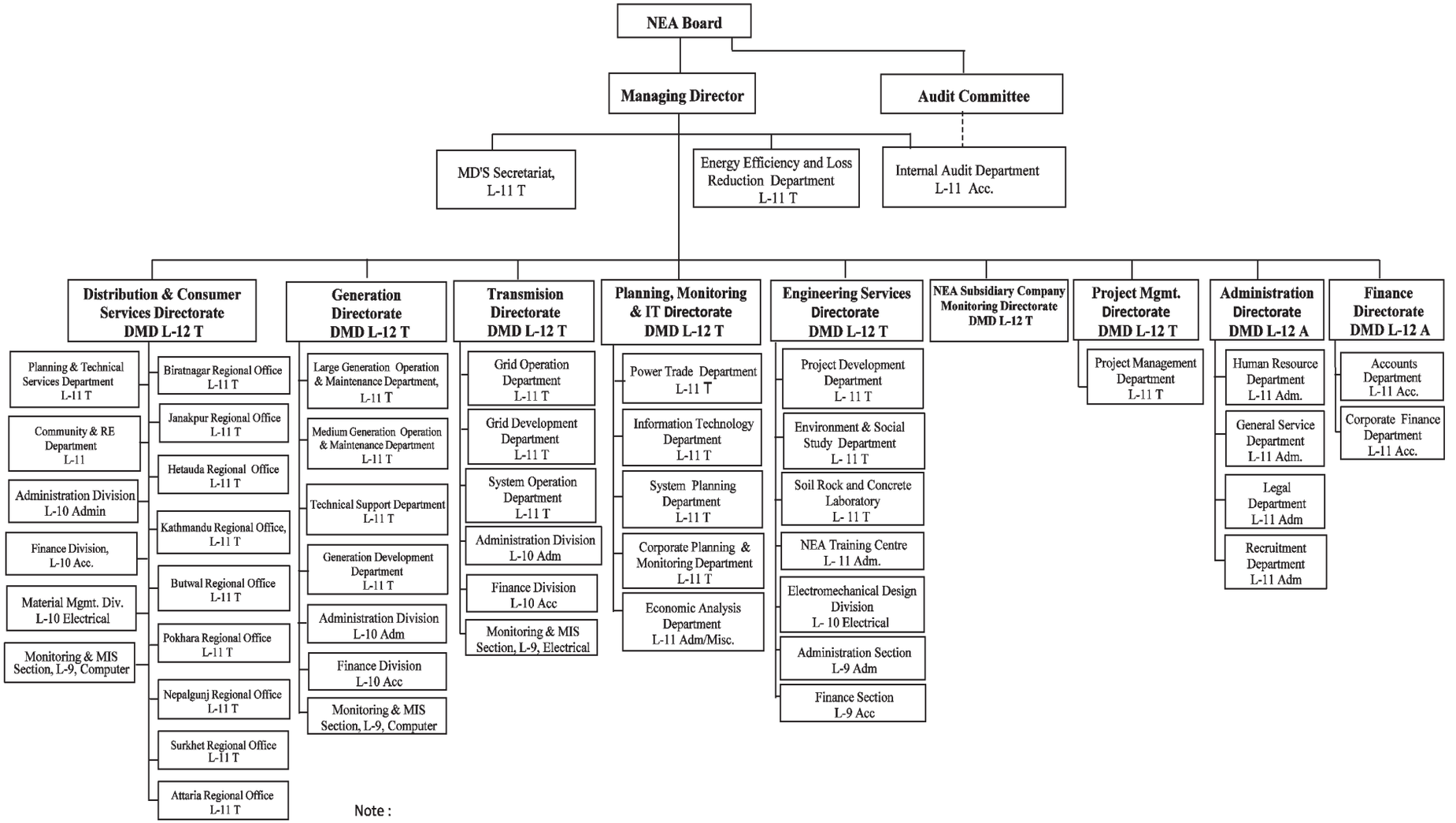
Mr. Bhakta Bahadur Pun
Member

Mr. Chet Raj Joshi
Member

Mr. Kul Man Ghising
Managing Director, NEA
Member Secretary

NEPAL ELECTRICITY AUTHORITY

Organization Structure



Note :
T = Technical Services; A = Administration Services: Adm = Administration Group: Acc=Account Group

Deputy Managing Directors

Mr. Sunil Kumar Dhungel
Deputy Managing Director
Generation Directorate

Mr. Rajeev Sharma
Deputy Managing Director
Engineering Services Directorate

Mr. Jagadishwar Man Singh
Deputy Managing Director
Planning, Monitoring & IT Directorate

Mr. Mohan Ratna Shakya
Deputy Managing Director
Budhigandaki Hydroelectric Project

Mr. Hitendra Dev Shakya
Deputy Managing Director
NEA Engineering Company

Mr. Anil Rajbhandari
Deputy Managing Director
NEA Subsidiary Company
Monitoring Directorate

Mr. Lekha Nath Koirala
Deputy Managing Director
Finance Directorate

Ms. Shanti Laxmi Shakya
Deputy Managing Director
Administration Directorate

Mr. Hara Raj Neupane
Deputy Managing Director
Distribution and Consumer
Services Directorate

Mr. Braj Bhusan Chaudhary
Off. Deputy Managing Director
Transmission Directorate

Mr. Manoj Silwal
Off. Deputy Managing Director
Project Management Directorate

MANAGING DIRECTOR'S REPORT

It is with great honor, privilege and a sense of satisfaction that I bring to you the Annual Report of Nepal Electricity Authority (NEA) in successfully completing thirty three years of service in generating, transmitting and distributing continuous power to its consumers. The past year can be considered successful as NEA achieved its primary goal of eradicating load shedding from the entire country from 14th May, 2018 with the end to power cuts during peak hours in the industrial sector too.

Celebrating the 33rd anniversary of NEA is an opportune moment to share our achievements in the past year as well as to assure our customers on meeting our commitments with better performances in the coming year.

The aim of making NEA a profit making organization again was achieved in the fiscal year 2016/17 with a net profit of NRs 1,512.22 million. This trend has continued into the year under review (2017/18) with a net profit of NRs 1,010.20 million (provisional). The continuous supply of energy and the strict measures taken to reduce energy theft have made a big impact in this endeavor.

The past year has also seen the commissioning of the long awaited Chameliya Hydroelectric Project in the far west. A couple of Transmission Line projects and a few Substation projects were also completed in the last FY 2017/18.

The level of public support that has been coming our way after the end to the decade long load shedding has been overwhelming. We look forward for continued public support and commit to ensure the supply of continued, reliable and efficient power in the days ahead. I would like to take this opportunity to emphasize that the intermittent power cuts is purely due to technical glitches that the system has to face from time to time. It will take some time and investment to get rid of such supply disturbances.

The last year also saw injuries and deaths of the employees of NEA while pursuing their duties and local individuals due to electrical related accidents. I on behalf of the entire organization would like to pay homage to the departed souls and assure greater vigilance to minimize accidents.

NEA is taking steps for automation of its systems, in keeping with the changing times. This has become necessary to meet the ever increasing demand. Some of the major plans that are in the process are Implementation of Enterprise Resource Planning (ERP) Management, Geographical Mapping System (GIS Mapping), Preparation of Distribution System Master Plan, Smart Meter/Grid Tied Meter (Net Meter), Substation Automation System etc.

The performances and achievements of NEA in the past year, 2017/18, are briefed below:

Operational Performance

The number of consumers has been increasing gradually. The total number of consumers increased from 3.26 million to 3.55 million including community and bulk buyers during the year. As has been in the past, the domestic consumer category with 3.33 million consumers remained the largest category with 93.83% share of the entire electricity consumers. Domestic and Industrial consumer category contributed

43.50 % and 37.53 % to the gross electricity sales revenue respectively. Rest of the consumer category accounted for the remaining 18.72% of the gross sales revenue. The total population with access to grid electricity has reached about 70% from 65 % in the last fiscal year.

NEA's hydropower plants including small power stations generated a total of 2,308.37 GWh of electricity, against the generation of 2,305.17 GWh in the last year. The generation within the country has not been sufficient in eradicating load shedding; additional power had to be imported from India. The total energy imported from India was 2,581.80 GWh as compared to 2,175.04 GWh in the last year, an increase by 18.70%. The total power purchased from Independent Power Producers (IPPs) within Nepal was 2,167.76 GWh, an increase by 21.97% from the last year's figure of 1,777.24 GWh. The total energy available in NEA's system increased by 12.79 % to 7,057.93 GWh over the previous year's figure of 6,257.73 GWh. Out of the total available energy, NEA's own generation contributed 32.71% whereas those imported from India and local IPPs accounted for 36.58% and 30.71% respectively.

A nationwide drive was launched to reduce system losses. This has shown positive results reducing the system losses from 25.78 % to 22.9 % in FY 2016/17 and to 20.45% in the year under review. The amount of loss that still persists is still not within acceptable limits and continued drive to minimize it is underway nationwide.

Financial Performance

After many years of huge financial losses, NEA managed to earn a net profit of NRs 1,512.22 million in the fiscal year 2016/17. The net profit in the last fiscal year 2017/18 is NRs 1,010.20 million (provisional). The total revenue generated from energy sales and other income in the year reached NRs 60,480.67 million as compared to NRs 51,703.11 million in the previous year. This is an increase of 16.98 % from the previous year.

The growth in energy sales and subsequently the increase in revenue should be attributed to the total eradication of load shedding during the year. At the same time it has also helped a great deal in saving valuable foreign currency reserve of the country that was being used to import additional petrol/ diesel for the generators, batteries, invertors and solar panels used to counter the darkness during load shedding hours.

NEA's overall operating expenses including power purchase increased from NRs 45,572.09 million in the FY 2016/17 to NRs 52,621.37 million in FY 2017/18, an increase of 16.98 %. The main reasons behind this increase in the operational cost are the increase in the power purchase cost and staff salary due to additional recruitment.

In the FY 2017/18 NEA had a total revenue of NRs 60,480.67 million as against the operational expenses of NRs 52,621.37 million resulting in an operational surplus of NRs 7,859.3 million as against NRs 6,717.77 in the FY 2016/17

The cost for purchasing power has again been the largest component in the total operating expenses in the year under review. NEA spent NRs 33,817.27 million in purchasing power from the various Independent Power Producers (IPPs) and import from India. This is 55.91 % of the total revenue generated.

Energy from purchased power amounted to 67.3 % of the total available energy and NEA paid 61.54 % of the net electricity sales revenue for this purpose. The total cost of purchased power increased by 19.36 % in the FY 2017/18 as compared to FY 2016/17 due to the increase in the volume of import and to some extent because of normal price escalation in power purchase.

Other operating expenses for generation, royalty, transmission, distribution and administration in the last FY 2017/18 amounted to NRs 1,775.94 million, NRs 1,351.55 million, NRs 1,998.93 million, 7,828.68 million and NRs 1,717.41 million respectively.

Interest expense for the year 2017/18 has been calculated as NRs 4,086.39 million as compared to NRs 3,546.15 million in the previous year 2016/17.

The growth in revenue should also be attributed to the increase in energy sales after the eradication of load shedding and supply of continuous power throughout the country.

NEA estimated a provision of NRs 2,500 million towards the long term employee liabilities in respect of gratuity, pension, medical facilities and accumulated leave facilities under employees' benefit plan scheme.

Administrative Functions

NEA approved "Service Contract Procedure 2074" and "Internship Procedure 2074" which have enabled outsourcing of staffs for its better performance. Organization and Management Reform Committee has been rigorously working on assessing organizational reform and staff requirements. NEA recruited 743 new staffs of various levels in FY 2017/18, which has increased the total staff to 9125.

Ongoing Projects

The delays caused by the massive earthquake and the subsequent Terai Bandh have definitely postponed the completion date by halting the progress in the under construction hydropower projects being undertaken by NEA. Though the regular construction work, after the earthquake, re-started just over a year ago, the projects still need some more time for completion.

Chamelia HEP had been stuck for years as decisions were not timely taken to sort out the various issues with the different contractors. One of the major achievements of the past year 2017/18 has been the completion of Chamelia. The project started generation from one unit on 12th January, 2018 and was formally inaugurated on 10th February, 2018 with generation from both units.

Kulekhani III HEP has not been completed even though nearly all of the civil works are complete and most of the electro-mechanical equipments are already at site. As of July 2018 all of the civil works except for some minor patches are complete and nearly 80% of the electromechanical works are also complete. It is expected to start generation by December, 2018.

The earthquake of April, 2015 caused maximum damage in the under construction Trishuli 3A HEP. The construction works by the Contractors CGGC and CWE restarted after nearly two years. The work progress in the last year has been satisfactory and the commissioning date of the project, as scheduled last year, is still April, 2019.

There are several transmission lines that have been completed in the year under review 2017/18. The total length of transmission line, above 132 kV, completed is 382 Ckt km. Similarly a total of 1190 MVA substation capacity has been added to the system. There are numerous transmission line projects under different phases of construction, some in the process of tendering and some in the Feasibility study stage. The line length of under construction transmission lines under 132 kV, 220 kV and 400 kV levels are 1,427 Ckt. Km, 5,782 Ckt km and 740 Ckt km respectively. Similarly the capacity of substation under construction under 132 kV, 220 kV and 400 kV level are 1,292 MVA, 4,905 MVA and 945 MVA respectively.

NEA Subsidiary Companies

The successful implementation of Chilime Hydropower as a subsidiary company of NEA encouraged the development of more projects under the company mode to ensure early decision making as well as proper public participation for the timely completion of the projects. The projects transferred or in the process of being transferred to company mode and the progresses achieved thus far are as follows;

Chilime Hydropower Company Limited (CHCL):

CHCL was formed as a subsidiary of NEA and owns the Chilime HEP (20 MW). After the successful completion and operation of Chilime HEP, CHCL has moved ahead with the formation of three subsidiary companies of its own, namely; Rashuwagadhi Hydropower Company Limited (RGHCL) to develop Rashwagadhi HEP (111 MW), Madhya Bhotekoshi Jalvidyut Company Limited (MBJCL) to develop Middle Bhotekoshi HEP (102

MW) and Sanjen Jalvidyut Company Limited (SJCL) to develop Sanjen HEP (42.5 MW) and Upper Sanjen HEP (14.8 MW). All these projects are in different stages of construction.

Similarly CHCL has invested and established Chilime Engineering and Services Company Ltd (ChesCo) to provide consultancy services for the development of Hydropower projects. There are three different hydropower projects in different phases of study for future development. CHCL is also in the process of constructing a corporate office building starting this fiscal year.

Upper Tamakoshi Hydropower Limited (UTKHPL): The biggest project till date, Upper Tamakoshi HEP (456 MW) is being built in the company mode under UTKHPL utilizing domestic financial resources. It is one of the national pride projects. Most of the civil works are complete and the project is expected to be commissioned in this FY 2018/19. The PPA was signed on 29th December, 2010. After completion of Upper Tamakoshi, UTKHPL intends to develop the 22 MW Rolwaling Khola HEP (RKHEP). A contract has been signed between UTKHPL and NEA Engineering Company to prepare Detailed Engineering Design and Bidding Documents of RKHEP.

Tanahu Hydropower Limited: Tanahu Hydropower Limited, established as a Subsidiary Company of NEA to promote the storage type Tanahu Hydropower Project (140 MW), aims to commence the major construction activities by the end of October 2018. After evaluation of Bids and subsequent approval from the respective co-financiers, Letters of Acceptance have been issued to substantially responsive and lowest evaluated bidders for both major construction packages. The pre-construction activities such as construction of access road to dam and powerhouse sites, camp facilities and a new 33/11 kV sub-station for construction power supply are in the final stage of completion. The compensation distribution to the affected people is also almost completed.

Trishuli Jal Vidhyut Company Limited (TJVCL): This Company was established as a joint venture of NEA and Nepal Telecom Company Limited, to develop Upper Trishuli 3B HEP (37 MW) as a cascade of Upper Trishuli 3A. An EPC contract was signed with Sichuan ANHE Hydraulic and Hydroelectric Engineering Co. Ltd., China on 12th February, 2018 for Civil, Hydro-mechanical and Electro-mechanical works. The scheduled completion date of the project is March, 2021.

Raghuganga Hydropower Limited (RGHL): RGHL was established as a subsidiary company of NEA to develop Rahughat Hydroelectric Project (40 MW). After terminating the main civil contractor and increasing the installed capacity to 40 MW, Contract Agreement, on EPC mode, for the construction of Civil and Hydro-mechanical works was signed on 21st November, 2017 with Jaiprakash Associates Limited, India. The Contractor was issued the "Notice to Proceed on 23rd May, 2018 after receiving the approval from the Exim Bank of India. The invitation for bids for the Electro-mechanical works was published with the final date of submission being 6th September, 2018. WAPCOS Limited is the Consultant for the Construction Management and Construction Supervision.

Upper Arun Hydroelectric Ltd (UAHEL): UAHEL was formed as a subsidiary company of NEA for the development of Upper Arun Hydroelectric Project (725 MW) and Ikuwa Khola Hydroelectric Project (30 MW). The Consultant for detailed Engineering Design and Preparation of Bidding Documents of Upper Arun (UAHEP) and Ikuwa Khola (IKHPP) has submitted the Inception Report. The final Detailed Engineering Design Report and Bidding Documents are expected by June 2020. Similarly the Consultant for Detailed Engineering Design, Tender Document Preparation and Construction Supervision and Contract Management of Access Road construction will submit its final reports by December, 2018.

Tamakoshi Jalvidyut Company Limited: Tamakoshi Jalvidyut Company Limited has been registered as a subsidiary Company of NEA for the development of Tamakoshi V HEP (95 MW). This is a cascade development of the under construction Upper Tamakoshi HEP. Lahmeyer International GmbH

is presently engaged in the Detailed Engineering Design and Tender Document preparation. Approximately 150m of the total 170m test adit excavation is completed. The interconnection system with Upper Tamakoshi tailrace is already under construction using the Contractor working for Upper Tamakoshi. EOI documents for the main construction [Contract 1-Civil and Hydro-mechanical works and Contract-2 Electro-mechanical works] are being prepared. Negotiation and correspondences with various National and International Financing Agencies for Project Financing are being carried out and the project intends to finalize its funding soon.

Dudhkoshi Jalvidyut Company Limited: This company, as a subsidiary of NEA, has been established for the implementation of Dudhkoshi Storage HEP (600 MW). The Updated Feasibility and Detail Design are being carried out by ELC Electroconsult S.p.A. (Italy) in association with NEWJEC Inc. (Japan) with the grant assistance of Asian Development Bank under Project Preparatory Facility for Energy (PPFE). The overall objective of the Consulting Services is to prepare the project for implementation. This study phase is to be completed in 30 months. The construction of the project is expected to commence from the third quarter of 2020.

Modi Jalbidhyut Company: The Company has been formed for the development in the company mode of two projects in cascade, Modi HEP (42 MW) and Modi A HEP (18.2 MW) with the combined conceived installed capacity of 60.2 MW. The Detail Design work has been awarded to AF Consult-Switzerland Limited in association with ITECO Nepal Pvt. Ltd. and Total Management Services Pvt. Ltd. The Consultant started the detailed design as per the TOR from April 29, 2018 with the total design period of 10 month. The construction will be through Single stage two envelop system of bidding and will be developed in the Company Model. The necessary land acquisition process has already been started.

Utter Ganga Power company: This company has been formed for the development of Utter Ganga Storage Hydropower Project (828 MW). This is a high head project with a gross head of more than 1,300 m with minimum resettlement issue. Geotechnical and topographical works have been carried out in the last fiscal year. Hydrological data at the dam site as well as the tailrace site are being collected. EIA study is under way.

Tamor Power Company Limited (TPCL): TPCL has been formed for the development of Tamor Storage Hydroelectric Project (762 MW). Project Development Department (PDD) carried out optimization study which shows the project to be more attractive at higher FSL even with inundation of Kabeli -A (37.6 MW) and Lower Hewa (21.6 MW). On this basis, PDD is conducting the feasibility study with an installed capacity of 762 MW and FSL of 550 masl. The EOI for shortlisting potential consulting firms, for the Detail Engineering Design of the project, are being evaluated. The preparation of RFP documents are in their final stage.

Andhi Khola Power Company Limited: The company has been formed to develop Andhi Khola Storage Hydroelectric Project (180 MW). PDD is currently carrying out the Updated Feasibility study. Field investigation and Survey works are being carried out. EIA study is also under way. During the current fiscal year, EOI and RFP will be called from International Consulting Firms for Detail Engineering Design and Tender Document preparation. Major environmental impact is the relocation of 500 households and inundation of headwork structure of 9.4 MW Andhikhola ROR project owned by BPC.

Chainpur Seti Hydroelectric Project (210 MW): This project is currently being studied by PDD as a PROR (six hour peaking) project located in Bajhang district. Project design, cost estimate and financial analysis have been conducted. The Detailed Design and Tender Document preparation is planned to be conducted by International Consultants, the EOI and RFP documents for same will be completed in the first half of this fiscal year.

NEA Engineering Company Limited (NEAEC): NEA has also formed the NEAEC to provide complete engineering services solutions to the power sector. NEA holds majority ownership (51 %), with remaining 49 % held by other companies. The company intends to build national engineering capability for large hydro-projects, extra high voltage engineering and similar techno-intensive areas and provide a resource pool of competent man-power tor the private sector to draw upon. At present the company is undertaking studies at different levels of five hydropower projects. It has also undertaken the construction supervision of 400 kV Dhalkebar Substation. To pursue research oriented work it has signed MOUs with Tribhuvan and Kathmandu Universities. It has also entered into MOUs with international companies to obtain international expertise whenever required.

Power Transmission Company Nepal Limited (PTCN): It is a subsidiary company of NEA with the objective of developing high voltage transmission interconnection system between Nepal and India for the mutual benefit of both countries. Two joint venture companies, one in India and other in Nepal, were incorporated for the implementation of 400 kV double circuit interconnection between Muzaffarpur and Dhalkebar.

Nepal Power Trading Company Limited (NPTC): NPTC is established with the objective of carrying out power trading function within and outside the country. The company is in the initial stage of operation. This will be a vital institution in future operation.

Similarly other subsidiary companies formed and in the initial stages of implementation are Transformer Utpadan Company Limited and Tower & Pole Utpadan Company Limited.

Private Sector Participation

NEA has been facilitating the participation of the Private Sector in Hydropower through Power Purchase Agreements (PPA). NEA has been making all efforts in promoting Private Sectors to support us fulfilling the energy demand. NEA has fixed posted rates for energy purchase from three categories of Hydropower projects; viz Run of River (ROR), Peaking Run of River (PROR) and Storage type projects. Foreign Direct Investment has also been encouraged with the PPA signing of Upper Trishuli 1 HEP (216 MW) and Rasuwa-Bhotekoshi HEP (120 MW).

A total of 15 new projects developed by the Independent Power Producers (IPPs) with a combined installed capacity of 71.643 MW were commissioned in the FY 2017/18. This has increased the total number of IPP owned projects in operation to 75 with a combined installed capacity of 512.6954 MW.

A total of 107 projects to be developed by IPPs, with a combined installed capacity of 2,356.313 MW are under construction after financial closure. Similarly, 74 IPP owned projects with a combined installed capacity of 1,658.817 MW are in the various stages of development.

During the FY 2017/18, a total of 45 new PPAs were signed with a combined installed capacity of 1,102.909 MW. This has increased the total number of PPA signed with the various IPPs to 256 with the combined installed capacity of 4,527.8254 MW.

PPAs with grid-tied solar power projects have also started at the new flat rate approved by the NEA Board.

Power Trading with India

Power exchange with India improved meaningfully in the last year. NEA was successful in holding India-Nepal Power Exchange Committee (PEC) meeting with Central Electricity Authority and the State Power Utilities of India in New Delhi on August 8, 2017 after 2011. In the absence of PEC meetings, NEA was bound to pay the energy tariff with 5.5 % escalation per annum at all voltage levels. The eleventh PEC meeting fixed the tariff at IRs. 5.55, 6.00 and 6.45 per kWh at 132 kV, 33 kV and 11 kV voltage levels respectively which helped NEA improve its financial performance in the fiscal year 2017/18. The quantum of the corresponding energy import under this power exchange mode reached 1507.39 GWh

corresponding to NRs.13,190.98 million in total.

Another notable activity in power trading was the signing of the Power Purchase Agreement on 28th March, 2018 between NEA and NTPC Viduyt Vyapar Nigam (NVVN), the nodal agency of the government of the India for dealing with power trading issues with Nepal. The quantum of power agreed was up to 120 MW to be transmitted to Nepal through Dhalkebar - Mujaffarpur Cross Board Transmission Line for the period of 15 months effective from April 1, 2018 and corresponding tariffs agreed were IRs. 3.98/KWh for the first sixth months and IRs.4.18/KWh for the remaining nine months. The quantum of the corresponding energy import under this power trading mode reached 883.49 GWh corresponding to NRs. 5,195.55 million in total.

Nepal also imported power through Tanakpur at IRs. 3.44/KWh under the Power Purchase Agreement with PTC India Limited for some months of the dry season as in the earlier fiscal years and the quantum of the corresponding energy import under this power trading mode reached 120.9 GWh corresponding to NRs. 652.73 million in total. NEA has also been making efforts to augment the capacity of Tanakpur Substation from 50 MVA to 100 MVA to enable Nepal to exchange higher quantum of power through this point in future.

Considering the power surplus scenario in Nepal during the wet season and deficit in dry season for some years to come, NEA proposed energy banking with India in light of the seasonal differences of demand and supply of electricity in Nepal as well as India. Preparation of a procedural framework in this regard is in progress after NEA recently gave a detailed deliberation on it with the concerned Indian entities in New Delhi. This issue has also been discussed in the last Joint Steering Committee (JSC)/Joint Working Group (JWG) meetings.

Two new 132 kV Transmission lines, Kataiya-Kushaha II and Raxaul-Parwanipur, were commissioned in the FY 2017/18 under the grant assistance of Ministry of External Affairs, Government of India. The commercial arrangement for drawing power of 50 MW from each of them through North Bihar Power Distribution Company Limited was made under India-Nepal PEC. Further, NEA proposed three new 132 kV transmission lines to be built between Nepal and the Indian State of Uttar Pradesh for the additional power exchange between Nepal and India in future.

Maximum power import from India in peak hours reached 521 MW in April/May, 2018, whereas the highest average power withdrawal recorded was 425 MW in January/February, 2018. The total quantum of energy transaction with a rise of 18.7 % reached to 2,581.78 GWh including 70 million units under the Mahakali Treaty. This corresponded to a payment of NRs. 19,371.76 million in the fiscal year 2017/18 against NRs 16,051.31 million for 2,175.04 GWh in the year 2016/17.

Way Forward

The main objectives of NEA as an organization is to satisfy its consumers with continuous, reliable and quality supply of electricity as well as to maintain reasonable financial returns to sustain as a business entity and plan for its future expansion. The end to the decade long load shedding through integrated resource planning including imports and efficient management has given hope of achieving the long standing goal of becoming self-reliant in electricity generation and supply.

The eradication of load shedding has also improved the financial health of NEA substantially. This has shown that proper management of the available resources can help improve a company's financial conditions. NEA has strategic plans to reduce operation cost, increase generation, maximize sales with reduction in system loss and increase additional income from mobilization of additional resources. Proactive efforts will be made to adjust electricity tariff to cover the cost of service.

Energy mix for Nepal's nearly all ROR hydro based system has to be considered at least on the short term basis, until sufficient energy generating

capacity is achieved to meet the all year demand. Imports from India as well as domestic grid connected solar generation have been considered. The 25 MW grid connected solar farm under construction in Devighat is a prime achievement in this regard. Similarly PPAs for private solar generation have also been initiated.

The completion of the Dhalkebar 220/132 kV substation has given an additional 100 MW of import capacity. Similarly the completion of the Kushaha-Kataiya second circuit and Raxaul-Parwanipur 132 kV Transmission Line will also add another 100 MW import possibility. With the completion of the above facilities, the importing capacity from India during the dry season will be more than 600 MW. Completion of Hydropower projects like Upper Tamakoshi and other IPP projects in the next year will see an addition of more than 600 MW to the system. Similarly with the completion of under construction generation and transmission projects, we can expect an addition of more than 1200 MW to the system within the next 2-3 years.

NEA has already signed PPAs with IPPs for more than 4500 MW. These are mostly ROR type projects with a few exceptions. PPA for one storage type project was signed with Tanahu Hydropower Company Limited. As a long term strategy to cater to the load demands at different time of the day as well as during the different seasons, we are focusing on Peaking Run-of-River (PROR) as well as Storage type projects to meet the generation mix defined in "National Energy Crisis Mitigation and Electricity Development Decade Concept/Action Plan, 2072". In this vein, we are developing Dudhkoshi (800 MW), Tamor (762 MW), Uttarganga (828 MW) and Andhikhola (180 MW) storage type projects and Upper Arun (725 MW) and Tamakoshi V (100 MW) PROR type projects. To attract private investment in Storage as well as PROR type projects, PPA rates for the same were also fixed.

Another important aspect that needs immediate attention to ensure that the power generated from the proposed plants be evacuated timely is the construction of a Transmission Line network. NEA is developing a 400kV transmission line backbone with support from the various donor agencies; such as the World Bank, Asian Development Bank, European Union, Exim Banks of India and China etc. Millenium Challenge Corporation (MCC) funded by the US government has also initiated the development of 400 kV transmission line in the central part of Nepal. Moreover, one 400 kV cross border link with India from New Butwal (Nepal) to Gorakhpur (India) and one with China from Galchi (Nepal) to Kerung (China) have already been initiated and are expected to be completed within the next five years. More cross border lines are proposed with India to be initiated in the near future.

These interconnections will enhance power wheeling possibility across the border and promote energy banking and export/ import opportunity.

In line with Government Policy to make access of electricity to all within next five years and to cater 10 thousand megawatts of power by next ten years, NEA has initiated distribution capacity expansion in the rural areas and distribution system upgrading in the industrial corridor in the Terai and the main cities including Kathmandu. Without major augmentation and reinforcement of Distribution network within the next few years, the increase in demand with the increase in supply will not be met. Similarly for safety and reliability reasons as well as from the aesthetic point of view, the main distribution lines of Kathmandu are planned to have an underground system.

NEA has started the procedure of adopting modern digital technology into its system to enhance its operational efficiency, reduce energy theft and enable itself to serve its customers in a better way. The implementation of Smart Grid and Smart Metering system will definitely increase efficiency and reduce losses. The integration of solar energy into its grid system through net metering is also planned to be expanded. Solar PPA signing with the new revised rates have already started. The online centralized bill payment system has been initiated and will be expanded to all the customers.

This will facilitate customers to pay their bills on time.

The demand side management with energy efficiency program announced last year will be NEA's focus area in the years ahead. LED lamps, efficient fans, capacitor banks etc are the major energy efficiency programs to be implemented to reduce peak and energy demands of the system as a whole.

NEA will be looking for ways to increase its revenue with the optimal use of its available resources. Steps have been taken to lease out the communication network of NEA, available all over the country, at reasonable prices. This can be an additional source of income. The communication system can also be expanded to the ward level through our distribution infrastructure. NEA owns land at prime locations in the cities. There are plans for developing business complexes in selected areas to augment its additional income sources.

NEA will have its corporate and system planning functions for its short term and long term strategic planning. NEA initiated the institutional reform and financial restructuring process last year. Financial Restructuring process should continue until the organization is fully sustainable in all respect. Engineering and Power Trading companies have already been established. The Engineering Company has been fully functional with quite a large work load. NEA has 48% share in the government owned Grid Company. The seven autonomous regional distribution offices, approved by NEA Board last year, should be established and made functional within this fiscal year. Once the distribution offices start functioning under the state governments, they can be used to initiate a system of multiple traders of electricity to facilitate the buyers to choose the cheapest option. Modern trading platform will be developed for short term trading of electricity. Load dispatch center will be augmented to central and regional levels with modern operational facilities.

The Power Trading system will have to be redefined once projects like Upper Tamakoshi and the projects being developed by subsidiary companies of Chilime are commissioned. A situation will arise when the Integrated Nepal Power System will experience a wet season surplus and deficit during the dry season. The idea of energy banking, devised last year, may be the only possible mechanism to cater to this surplus/deficit scenario. There are enough grounds to be optimistic for energy banking mechanism with neighboring states of India. Discussions on energy banking have been initiated in Joint Steering Committee (JSC), Joint Working Group (JWG) and PEC meetings. Another major focus in the future will be on energy leveling by increasing domestic energy demand during off-peak hours.

NEA has started the process of implementing the Enterprise Resource Planning (ERP) system to enhance the efficiency and management capability within the organization. A world class ERP software designed to rapidly adjust to changes in technology and business to maximize enterprise agility is in the process of being acquired. The ultimate target is to make the organization digitized and paperless.

NEA is planning to bring each and every generation, transmission and distribution related installation into a GIS base map with the implementation of Geographical Mapping System. Similarly a Distribution System Master Plan will help NEA bring reliable, affordable and sustainable electricity services to all households and businesses in the country. This will be achieved using the most appropriate, efficient and least cost on or off-grid technological solution to optimize allocation of resources from the country's perspective and will provide a detailed roadmap with strong consensus from the different stakeholders, encompassing the necessary regulatory, institutional, technical and financial arrangements.

NEA is underway to install Smart Meters to the end users to improve system management and loss reduction. It will solve different meter-reading related problems and facilitate Online Bill Payment System through commercial banks. Substation Automation System (SAS) is being implemented in all projects under construction and those coming

up in the future. The key benefits of implementing SAS are Substation control through Operator, Graphical presentation of safety procedures, enhances information management, minimizes outages, improves productivity, detects fault location-useful for distribution systems, security control with multiple access levels etc.

A large organization like NEA needs to focus on capacity building for efficient operation and implementation of its activities. Training for all levels of staffs within the organization will be conducted. The NEA Training Centre will be developed as a Center of Excellence by developing internal resource pool as well as building ties with international training organizations to meet the training requirements.

The "White Paper 2074" recently issued by Ministry of Energy, Water Resources and Irrigation (MOEWRI) has set up a roadmap for the next decade in the energy sector. NEA, as a Government organization, has to play a vital role to execute the plans and programs set out in this White Paper.

It is our firm belief that ensuring the best service delivery and improving morale and financial health of our organization will definitely improve our credibility and will open avenues for all round development of the organization in a better way. Our every endeavor should be focused for better and efficient NEA.

Acknowledgements

I on behalf of NEA would like to take this opportunity to acknowledge the contribution of everybody, directly or indirectly, in the performance and achievements of NEA. I would like to express my sincere gratitude to the honorable Minister of Energy, Water Resources and Irrigation for his dynamic and proactive leadership in boosting the morale of team NEA and providing the right direction to the organization. My sincere gratitude also goes to the Chairman and members of the NEA Board of Directors for their expert and valuable guidance in decision making and formulating policies for the overall organizational performance and achievements within the framework of authorities and responsibilities envisaged in the NEA Act 2041.

I would also like to thank the Government of Nepal, Ministry of Energy, Water Resources and Irrigation, Ministry of Finance and other concerned ministries of the GoN for their continued support, encouragement and patronage in the development of the energy sector. I sincerely acknowledge the great concern shown by the parliamentary committees in our regular operation and development pursuits.

I am also grateful to the donor communities, who have always helped us in the past and are willing to continue their involvement in the coming days for us to achieve our goal of fulfilling the growing needs of energy. I sincerely appreciate the banks, auditors, IPPs, suppliers and investors for bestowing faith on us and helping us move forward.

The role of the media in disseminating factual reports about the organization to the general public has been very encouraging. I look forward for similar support in the days ahead.

The entire staffs of NEA including the employee unions deserve the high degree of appreciation for their hard work, support and cooperation to the management for daily operation of activities and in implementing the formulated policies. Finally, I would like to express my sincere thanks and appreciation to our valued customers and different professional organizations for bearing with us at times of extreme difficulties and boosting our morale by recognizing our untiring efforts. I would like to assure our valued customers that every possible step will be taken to maintain a continuous, reliable and safe power supply in the coming days.

Thank You.

Kul Man Ghising
Managing Director

GENERATION DIRECTORATE

Generation Directorate, headed by Deputy Managing Director is responsible for construction of 3 ongoing hydropower projects together with operation and maintenance of NEA owned 19 power stations totaling 666.70 MW. The main objective of this directorate is to construct new projects owned by NEA and smooth operation and maintenance of existing power plants with optimal use of resources. The directorate is supported by four departments, namely Generation Development Department (GDD), Technical Support Department (TSD), Large Generation Operation and Maintenance Department (LGO&MD), Medium Generation Operation and Maintenance Department (MGO&MD) each headed by a Director. It is supported by three divisions/sections namely, Finance, Administration and Monitoring and IT. At present, this directorate is taking care of construction of the following three hydropower projects.

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

Chameliya Hydroelectric Project and Upper Trishuli 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 Project Manager and reports to the Director, GDD. The TSD provides technical support needed for the ongoing projects and existing power plants on coordination with respective Directors. LGO&MD is responsible for six (6) hydropower and one(1) thermal plant above 30MW installed capacity owned by NEA. Similarly, MGO&MD is responsible for twelve (12) hydropower and one (1) diesel plant which are below 30MW installed capacity ownedby NEA. Improved operation and maintenance practices have been instrumental to enhance generation and minimize load shedding in the last FY 2017/18. Some of them are-

- Kaligandaki 'A', Middle Marsyangdi and Marsyangdi hydropower plants were operated in their full capacity in peak time during dry season using their pondage capacity.
- Efforts were made to minimise the canal shutdown duration required by Indian irrigation department for headworks and canal maintenance for Gandak hydropower station. Efforts were made to ensure maximum plant availability in all other times. This helped to improve voltage of that area and import more power (upto 40 MW) from Balmikinagar-Gandak 132 kV line for supply in the adjacent areas.
- The machine overhauling time under scheduled maintenance were reduced to almost half by mobilizing extra staff and resources efficiently.
- Co-ordinated maintenance scheduling among the plants was efficiently carried out and operational practices were improved to get higher output.
- Constructive intervention from the Directorate was made by including 10 persons dedicated

team to ensure early completion of the remaining electromechanical works of the project. NEA's dedicated team was involved and are contributing constructively working together with the contractor's team as and where the complex works are carried out.

Various activities and features of all hydropower projects under construction, LGO&MD, MGO&MD and TSD during the FY are described as follows.

CHAMELIYA HYDROELECTRIC PROJECT

Project Background

Chameliya Hydroelectric Project is under joint funding of GoN, NEA and EDCF K-Exim Bank, Korea. Civil works was started in January 2007 and Electromechanical, Hydrometrical and 132 kV Transmission Line was started in May 2009. The power house site is located at Saile Sikhar Municipality-1, Balanch, Darchula and the Dam

Chameliya Hydro-power Dam

site is located at Marma Rural Municipality, Bitule of Darchula District. The plant capacity is 2*15 (30) MW, 6-hour Peaking Run of River with average annual energy generation of 184.21 GWh. The project has been in operation since February 10, 2018 and the project was inaugurated by Former Honorable Prime minster, Sher Bahadur Deuba on February 10, 2018 (Magh 27, 2074). The project has generated 52.46 GWh energy upto Ashad, 2075.

Project was delayed due to several factors, major problem faced by the project has been the excessive weak geological condition in the vertical shaft penstock forming the cavity with debris flow, poor geology in underground and shifting of powerhouse. Delay in acquisition of land and getting the clearance for cutting trees from concern authority has also disrupted the transmission line work.

Due to weak geology and presence of fault zones, squeezing in 843 m length of the Headrace tunnel (HRT) was encountered between Adit 2 downstream and Adit 3 up stream. This resulted in deformation of several lattice girders/steel ribs, localized cracking of shotcrete and extremely large deformations in the crowns and side walls which is upto maximum 40% of the design diameter.

The treatment of Squeezing of HRT started on May 2013 and was completed on May 2017. Similarly, the power house had to be relocated which resulted in requirement of slope protection, which was completed in 2015. The vertical shaft also encountered huge cavity formation with debris flow making the construction very difficult.

The Chameliya Project is not only generation project. It has also 131 km long 132 KV North South transmission line joining Darchula and Kailalai district which passes through 5 districts. The power from Chameliya Project is evacuated through this transmission and joins the national grid at Attariya Sub-station.

Upon commissioning of this transmission line, project has open the development of hydropower projects in Chameliya Basin, and other river basin in that region which is very important for national economy and development of far western region. The Chameliya HEP now become the backbone of development of in far western region despite its delayed completion.

The salient features of the project are shown in Table 1.

Table 1: Salient Features of Project

Salient Features of Chameliya Hydro Power Plant	
Type	Peaking run of river plant (with 6 hr daily peaking)
Maximum Gross Head	103.70 m
Rated Net Head	94 m
Designed Flow	36 m3/sec
Installed Capacity	30 MW (2 unit x 15 MW)
Dam/Spillway Type	Concrete Gravity, 88 m crest length, max. ht. 54 m
Intake	Side Intake
De-sanding Basin	Underground, 2 nos. (LxBxH, 80mx12mx25m)
Headrace Tunnel	4067 m, horse shoe size 5.2 (m)/4.2 (m)
Surge Tank	Restricted Orifice (ht. 48.4 m, dia. 8 m)
Penstock	Concrete Lined and Steel Lined, Length 302m, dia. 3.9 m
Powerhouse	Surface, LxWxH, 37.5 m, 23.5 m, 27.4 m
Tailrace	Box Culvert, LxWXH, 714m, 4.8 m, 3.8 m
Turbine	2 Vertical shaft, Francis, rated output 2X15.6 MW, rated speed 428.6 rpm
Generator	3-phase synchronous, rated output 2x16.5 MVA
Switchyard	Outdoor, LxB, 57m, 47 m.
Transmission Line	131 km, 132 KV single circuits from Balanch to Attariya Sub-station
	33.4 km, 33 kV transmission line from Balanch (Darchula) to Gothalapani (Baitadi)
Substation	11/132 kV Generation S/s, 2*16.5 MVA: 132/33 kV, 2*8/10 MVA Distribution S/s and 33/11 kV, 3 MVA S/s Local Area Distribution
Annual Average Energy	184.21 GWh
Inauguration Date	10th Feb 2018
Start Date	January 10, 2007
Completion Date	July, 2018 purposed

UPPER TRISHULI 3A HYDROELECTRIC PROJECT

Project Background

Upper Trishuli 3A Dam Site Area

Construction of Upper Trishiuli-3A HEP, a run-of-river project of 60 MW was initiated in June 2011. The estimated cost of the project is 125.775 Million US$ which is being funded by concessional loan from China Exim Bank. Contract for the major construction work (Civil, Electro-mechanical & Hydro-mechanical works) was signed with China Gezhouba Group Company Ltd., China (CGGC) at acost of 89.177 Million US$ while construction supervision of the project was awarded to Northwest Engineering Corporation Limited, China (NWH), at acost of 3.932 Million US$ excluding VAT. Contract for the Transmission line work was awarded to China International Water & Electric Corporation (CWE) at a contract price of 22.6 million US$ excluding VAT.

Main Plant Project Works

Underground Power House

To date main Contractor CGGC has completed 75% of the main works. The excavation of 4076m long headrace tunnel has been completed while 3932m (96.5%) of invert lining and shotcrete have been completed for 3171m (78%). Excavation and steel lining work of vertical shaft (121m) and horizontal pressure shaft are almost completed together with excavation and Concreting works of Surge shaft. Inside underground Powerhouse concreting work up to the level of Erection Bay are almost completed.

Powerhouse Gantry crane installation has been completed. Shop inspection of the Generator, Turbine, Butterfly valves and Power Transformer have been completed and are being delivered to site. Concrete lining in the tailrace tunnel has been completed and civil construction of tailrace pond is also in final stage. In total, more than 90% of civil works and around 65% of Hydro-mechanical works has been completed.

The Completion date for main plant project works is April 30, 2019.

Transmission Line Works

The total length of transmission line is 44.7 km, which comprises of 1.3 km long 132 kV line from powerhouse switchyard to Trishuli-3B hub and

220 kV Transmission Tower

43.4 km of 220 kV line from Trishuli-3B hub to Matatirtha, Kathmandu. In addition, about 1.35 km length of 220 kV underground cable route leading to the Matatirtha Substation is being constructed.

Till date, out of 140 no. of towers, 126 tower foundation concrete work has been completed, 109 no. of towers has been erected and other 7 are on progress.

In addition, out of 1.35 km underground cable trench works, 528 m has been completed and 80 m is in progress.

The completion date for transmission works is scheduled on January 17, 2019.

Others

Under Project Support Program (PSP) the construction of four school buildings, implementation of two water supply systems, upgrading of road from Trishuli to Champani, road improvement to Trishuli hospital, Supply of hospital equipment, and construction of Irrigation drainage works, pedestrian trails, various village roads and water supply systems in project-affected areas of Four District (Rasuwa, Nuwakot, Dhading and Kathmandu) are also almost completed.

The project work which was being carried out at a rapid pace came to a standstill by the devastating earthquake of 25 April 2015. A number of huge landslides occurred along the 5 km access road from powerhouse to the headworks, which made the headworks virtually inaccessible. The landslide also blocked the access road to Surge Shaft and adit-1. Many construction equipmentof the Contractor including the temporary labor camps located near the Headworks, Adit-1 tunnel, Adit-2 tunnel and powerhouse, were heavily damaged.

After the earthquake, Nepal army was entrusted to open the track from powerhouse to headworks. Now, the Nepal Army has almost completed construction of retaining structure in access road, slope protection measures in right side hill and rock fencing and rock netting works at the left side hill slope of headworks for its stabilization.

The construction works has been resumed from October 2017 and the remaining works are being undertaken at a rapid pace.

The access road of the project from Betrawati to Mailung is being widened by Department of Road, GoN. Currently, due to triggering of landslides at various stretches of the access road, the transportation of construction material is being hindered.

This project with an annual energy generation of 460 GWh is targeted to be completed by 2019 April.

GENERATION DEVELOPMENT DEPARTMENT

Generation Development Department (GDD) performs the regular monitoring, inspection and resource management of under-construction projects of Generation Directorate. Presently, Department is looking after the construction of Kulekhani III Hydropower Project (14 MW), which is a cascade project that utilizes the regulated flow of the Kulekhani Reservoir, the only storege power plant in Nepal

KL-III Hydroelectric Project

Project Description

Kulekhani III Hydroelectric Project (14 MW) is the cascade project Kulekhani II hydroelectric plant which utilizes the regulated flow of Kulekhani reservoir and additional water from Khani Khola. The Project is located on the southwest of Kathmandu in Makawanpur district, Narayani zone, No. 3 Province. It is expected to generate about 40.85 Gigawatthour (GWh) of electrical energy per annum.

The project is funded by the Government of Nepal and Nepal Electricity Authority (NEA). The total estimated cost of the Project is NRs. 4.63 billion.

The headworks site is located on the left bank of Khani Khola at Bhainse, about 11 km north of Hetauda. The Powerhouse is located about 5 km north of Hetauda at Sanutar village adjacent to the Tribhuwan Highway. The Civil works contract has been awarded to M/S Sinohydro Corporation, China and the Electromechanical & Hydro-mechanical Works contract has been awarded

to M/S Zhejaing Jinlun Electromechanical Co. Ltd., China. The Consultant is M/S WAPCOS Ltd., India.

Project Status as of 2074/075

The project was initiated in 2008 April with the contract award to the civil contractor while the contract for Electromechanical & Hydro-mechanical contract was awarded in 2010. Over the years, the project went through a lot of complexities of various natures which resulted in serious project delays. Nevertheless, every effort is being made to resolve the issues, overcome the problems and complete the project as early as possible. By the end of fiscal year 2074/075(July 2018) approximately 90 percent of the works in total has been completed. About 99.5 percent of the Civil construction works and 80 percent of the Electromechanical & Hydro-mechanical works has been completed.

The remaining civil works entails second-stage concreting works related with hydraulic gate-guides, which is dependent on the Hydro-mechanical contract.

The remaining EM works include ongoing installation of electrical equipment such as powerhouse cabling, switchyard equipment, control & protection equipment, ongoing transmission line works, ongoing gates/trash racks installation and completion of ongoing turbine-generator installation. Also remaining is the supply and delivery of some EM equipment including LV/MV switchgear equipment and communication some of which are already at customs point. The remaining works are expected to be completed by November 2018.

LARGE GENERATION OPERATION AND MAINTENANCE DEPARTMENT

The operation and maintenance of five (5) hydropower plants and one (1) Multi-fuel power plant (with capacity 30 MW and above) fall under the jurisdiction of this department. The total installed capacity of these plants is 414 MW. Chameliya Hydro Electric Power Plant (30MW) will fall under this department after formal handover from construction to Operation and Maintenance as final testing and commissioning is going on nowadays. Total generation from the hydropower plants under this department in the fiscal year 2074/75 is 1.89 TWh, with an increment of 1.21 % as compared to that of last fiscal year's generation. The generation from cascade Kulekhani I and Kulekhani II plants are mainly intended for meeting peak load demand as per system requirement.

Overhauling of generating units is a regular practice normally carried out in the lean season avoiding energy loss. This ensures that design capacity is available during wet season. Apart from preventive and corrective maintenance works, periodic major overhauling was carried out in Kaligandaki A, Middle Marsyangdi and Marsyangdi power plants. Kulekhani-I and Kulekhani-II being reservoir type power plants does not experience erosion problems and hence, only regular preventive maintenance activities were carried out. But one-unit generator of Kulekhani II Hydro Power Station is under repair by its OEM Company and will be completed by the end of Shrawn 2075.

The following sections provide a concise description of the power stations and highlight major activities carried out under this department during the fiscal year.

Kaligandaki 'A' Hydropower Station

Kaligandaki 'A' Hydropower Station is the largest Power Plant of Nepal having an installed capacity of 144 MW, with 3 units each having a capacity of 48 MW. It is a six-hour peaking run-of-river type power station, commissioned in 2002, having annual design generation of 842 GWh and is located at Beltari, Kaligandaki Village Municipality, Syangja of Province No. 4.

The actual generation of the plant in fiscal year

2074/75 is 865,075MWh which is 99.56% of yearly generation target 868,875.1 MWh. The significant maintenance works this year comprises overhauling of unit number 3 from January 26, 2018 to February 16, 2018 under which electrical works such as Cleaning of Excitation Transformer, ratio testing & meggering; Cleaning, Checking, Testing of Voltage ratio of 13.8Kv CTs and PTs, ratio testing of Power Transformer, BDV Testing of Transformer oil; Cleaning, checking and re-tightening of nut and bolts, ratio checking of Neutral Cubicle, Cleaning, retightening & meggering, checking the operation of Unit Breaker on Test mode of Casagrande Cubical (13.8 KV), GTA Control, Governor Control and Excitation System Cubicle Cleaning Re-tightening the electrical control wire connected terminals; Cleaning of Generator stator and rotor coil from top and bottom and Visual Inspection of all equipment of Generator Housing, Measurement of air gap, checking of PI values & Electrical connection and checking ,cleaning, length measurement and replacement of the new carbon brush along with mechanical works such as dismantling and replacement of worn out turbine components (i.e. balancing pipes, wicket gates, shaft seal, facing plates, wearing rings etc.), installation of the repaired HVOF coated runner, assembling of the repaired & HVOF coated wicket gate and installation of upper and lower stem bushes, installation of new fabricated balancing pipes were carried out.

Hydraulic pump units for Rural Transformer and unit no.3 Transformer Bay and MMI of 132kV controller were replaced in GIS s/s. 1 set of GIS type Potential Transformer (PT) on each Lekhnath line Feeder, Rural Transformer feeder and Transfer bus bar were installed. Also new set of Hydraulic cylinder and Accumulator on Butwal line feeder 1 were installed. These works were carried out from 2075/1/26 to 2075/1/28. Replacement of 132kV 86.5 MVA Power Transformer High Voltage Bushing and Oil temperature Indicator of Unit 2 were done.

The installation and commissioning of new Trash rack cleaning machine at dam site was completed this year. Rubber seals were replaced on Diversion gate no 1, 2 and 3. Severely worn out bottom steel plate and I-Beam of Diversion gate no 3 was replaced by underwater repair work. Damaged top, bottom and lateral bronze plates of Under sluice gates 1, 3, 4, 5, 6 and 7 were replaced. Damaged steel liners of Under sluice gates were repaired. Replacement of damaged corner joint on de-sander gate no 3, 4 and 5 were done. All hydraulic oil, silica gel, gear oil, different types of filter were filtered/ cleaned/ replaced.

Newly Installed GIS Potential Transformer

The cleaning of intake/under sluice structures obstructions and removal of clogged debris in Trash rack was done manually. Procurement of boat for Bote community and handling them was completed.

Epoxy application work was done in chute in diversion gate no. 3 which was seriously damaged exposing rebars. Ditches up to 1 feet were found over many areas. It consumed almost 16 Tons of epoxy materials in chute. Stop-log sill beam of diversion dam, radial gate no. 3 was damaged due to bombarding of boulders and other river bed materials during monsoon season. So underwater divers team were mobilized to complete the repair job which included underwater cutting, grinding, welding and concreting work. CCTV camera was installed to inspect every work occurred

underneath the water. After underwater work completion, leakage was found to be null during commissioning. Left bank dam site access road was partially washed away. Excavation was done along hill side to expand the roadway needed for vehicle. So, to prevent any casualties that may occur due to unstable slope, breast wall has been constructed along excavated region. NEA villages, both at PH site and Dam site, which comprise 80 plus buildings, including control building of dam site and power house building, works related to plumbing and cleaning are being carried in regular manner.

Other significant works carried out this year were replaced of FC1250 solenoid valve in unit no 2. Governor hydraulic oil (VG 46) in all three Units was replaced. Lower guide bearing oil reservoir trapezoidal seal was replaced. Regular replacement and cleaning of generator air cooler, repairing of balancing pipe, flushing and cleaning of main cooling de-sander tank and shaft seal tank, cleaning of dewatering and drainage pit were carried out. Repairing of main cooling pump, drainage/dewatering pump and shaft seal pump was done regularly.

Dismantling of Runner during Overhauling

Left Bank Protection Works and Clearance of Sediment from Reservoir and Dam Site

MIDDLE MARSYANGDI HYDRO POWER STATION

Middle Marsyangdi Hydropower Station (MMHPS) has been generating electricity by diverting the water of Marsyangdi River. Located in the Lamjung district of Province #4, MMHPS has an installed capacity of 70 MW and a designed annual generation of 398 GWh.

MMHPS is a peaking run off river (PRoR) plant with daily peaking capacity of 5 hrs at minimum discharge. The plant was commissioned in December, 2008 and commercial generation started one month later. The cumulative generation of MMHPS has reached 4009 GWh until the end of FY 2074/075. It generated 454 GWh of energy in FY 2073/074 and 437 GWh in FY 2074/2075, registering a decrease of 3.82% over the previous year's generation mainly because of low discharge availability during the dry season.

The Major Maintenance Activities carried out during FY 2074/075 were

Electrical Maintenance

Megger and BDV testing of all six power transformers during overhauling and plant shutdown period, changing of all carbon brushes of unit #1 during plant shutdown and four pairs of carbon brushes of Unit #2 during unit overhauling were carried out. Replacement of 1 bar water level sensor of sump pit by 4 bar sensors, Replacement of pressure switches to fix the auto pressure buildup of Unit #1 governor pump was done regularly.

Problem in the Distributed Control System and SCADA Display was solved with the help of Expert from GE. Installation of running hour counter meter in both units of generator control panel, Installation of 24V battery system for powerhouse 350 KVA DG and servicing of dam site DG, Installation and charging of 6/7.5 MVA power transformer for dam site supply was done as well. Replacement of Limit switch of Unit#1 MIV, Replacement of power supply card of Unit#1 cooling water and shaft seal water control system was also performed.

Mechanical Maintenance

Replacement of Runner and accessories during Overhauling of Unit # 2, Sill beam repair and rubber seal replacement in all 3 Spillway Radial Gates at Dam Site, Repair welding of sliding & fixed plates and repair of rubber seals & sill beams of Flushing Gates of De-sander at Dam Site, Replacement of Governor Oil Pump of Unit # 1, Replacement of Heat Exchanger plates of cooling water system of both units, Replacement of 3 nos. of broken spring-loaded studs of generator brake of Unit # 1, Replacement of pumps of online sand monitoring system and Replacement of Ventilation system motor were carried out apart from regular maintenance.

Civil Maintenance

Left bank protection works of reservoir at dam site, Clearance of Sediments from Reservoir at Dam Site, Application of high strength epoxy on chutes of spillway gates 1 and 3 and Application of high strength epoxy on chutes of spillway gates 1 and 3 were performed. Also, Maintenance and coloring of quarter buildings at colony, Epoxy Painting of cranes at Dam site, Maintenance of access road to Colony, Drainage clearance works at Dam site, powerhouse and access road to colony were carried out.

MARSYANGDI HYDROPOWER STATION

Marsyangdi Hydropower Station is a peaking run-of-river power station with installed capacity of 69 MW with three units of 23 MW each and its annual design generation is 462.5 GWh. It is located at Aanbu Khaireni, Tanahun in Province #4 about 114 km west of Kathmandu on Prithivi Highway and lies on the right bank of Marsyangdi River. It was commissioned in 1989 AD and developed with the assistance from IDA, KFW, KFED, SFD, ADB and GON at a cost of USD 22 million. In FY 2074/75, it generated a total of 447.4 GWh energy.

Assembly of Wicket Gate and Shaft of Turbine

Apart from regular maintenance works, major works carried out this year are overhauling maintenance works of unit no. 1, upgrading of injection-based rotor earth fault; installing, testing and commissioning 100 % stator earth fault protection relay with retrofit installation of all three units and integrating into existing generation protection system. Also, up-gradation of GPS satellite synchronized network time synchronization device, up-gradation and modification of control system of surge tank emergency gate by fiber optic remote I/O module and logic annunciator module of 132 kV feeders was completed. Further, road to Dhakaltar was repaired, epoxy compound was coated on ogee surface of radial gates of diversion weir and four nos. of type-C buildings of Dhakaltar colony, damaged from earthquake, was re-constructed in this fiscal year.

KULEKHANI-I HYDROPOWER STATION

Kulekhani –I, located at Dhorsing, Makwanpur is currently a sole large water storage type Hydro-electric Power Station in Nepal. It is situated in Lower Mahabharat Range of Makwanpur District, Central region of Nepal at about 30 Km to the Southwest of Kathmandu, whereas the Kulekhani Dam itself is located at about 21 Km Southwest of Kathmandu. It covers two basins of different river systems i.e. the Kulekhani river basin and the Upper Rapti river basin neighboring to south of the Kulekhani river basin. It's Installed Capacity is 60 MW with two units of 30 MW each. This station was designed as a peaking power station, but it is often operated to the system requirements for voltage improvement & system stability. Also, Kulekhani First Hydro Power Station is used for initiating Black Start in INPS during nationwide

Indrasarowar Dam Area

Power System collapse. The Power Station is designed to generate 165 GWh as primary energy and 46 GWh as Secondary energy.

The construction started in 1977 with financial assistance of the World Bank, Kuwait Fund, OPEC Fund and the Overseas Economic Co-operation Fund (OECF) of Japan. First Unit was commissioned in 14th May 1982 and the Project was completed in 4th December of the same year with project total cost US$ 117.843 Million and accordingly the project was transferred to NEA with a capital cost of approximately NRs. 1,550 million. The tele-metering system installed for the measurement of rainfall, water level etc. cost around NRs. 137.4 million. The cost of road check dams and inclined tunnel is about 23 crores. In 1994, an overhauling work of the power station was performed with the grant assistance of Japan.

The cumulative generation of Kulekhani-I HPS has reached 4760.253 GWh. The plant generated 62.131 GWh of energy in FY 2074/75. The maximum and minimum waterlevel of Kulekhani reservoir in FY 2074/75 was recorded as 1524.38 masl (2074/9/16) and 1505.33 masl (2075/2/25).

Major Features

Kulekhani Hydroelectric Power Station basically consists ofa Reservoir; a Rockfill Dam with 2 radial Spillway Gates and a non-controlled 65m long concrete crest spillway; two Tributary Intakes; Water way inclusive of Intake Structure, Headrace tunnel, Surge Tank, Penstock pipe line and Tailrace Tunnel; an Underground Power House; a Control House; Switchyard and Transmission Line.

Major Repair and Maintenance Works done during F/Y 2074/75 at KL1HPS

Civil Maintenance

Procurement Works for Dam/Reservoir Monitoring Equipment like eco sounder, weather station etc., Repair and Maintenance of Dhorsing colony staff quarter, Control House, Power House, Switchyard Area, Valve House, Repaire and maintenance of access road from Control House to Valve House, Check-Wall Maintenance Work at Sera,Palung, Chalkhu, Thado, Chakhel and Sim khola in response of mitigating sediment deposition rate in Indrasarovar, Repair and maintenance of access road from Kalanki to Dam Section, Reservoir Monitoring works along with eco-sounding works to know the status of the Kulekhani Reservoir were carried out.

Electrical Maintenance

Laying, Installation, Testing and Commissioning of Single Core 240 sq. mm, 66 kV XLPE Power Cable -4 km and Termination Kits, Transportation of 5

MVA, 66/11 kV power transformer at switchyard for local dedicated distribution to the Dhorsing colony after the repair and maintenance from the central workshop, Installation of CCTV Cameras for the monitoring of various equipment at the power house and control house, Up-gradation of the installed crane from manual operation to the remote operation installed at the power house, Laying of optical fiber from the control house to the valve house area for the remote operation of the butterfly valve, Installation of 18 Nos. 60kV lighting arrester for the protection of 66kV transmission line and XLPE power cable, Installation of paperless graphical recorder for monitoring of temperature of upper guide bearing, lower guide bearing and various equipment, Procurement works of control panel for the controlling operation of the intake caterpillar gate were performed.

Mechanical Maintenance

Repair and maintenance of cooling water pump of Unit #1, Painting of penstock pipeline from surge tank to BL-3 tunnel area, Repair and maintenance of intake gate foundation, its alignment and operating shaft at Simkhola dam site, Repair and maintenance of spillway gate foundation, hoisting channel, its alignment and operating shaft and replacement of seal of spillway gate at Chakhel Dam Site, Procurement works of shaft, bearings and various spare parts of cooling water pump installed at power house, Procurement and installation works of high pressure air compressor at the power house, Procurement and installation of air blower for the air conditioning and ventilation of the powerhouse were carried out in FY 2074/75.

Replacement of Turbine Governor Oil from the Sump

Ongoing Major Activities

Repair and Maintenance of Cooling water pump #2 with replacement of all three shaft and sleeve bearings of unit no 1, Installing of 5 MVA, 66/11 kV power transformer at switchyard for local dedicated distribution to the Dhorsing colony after the repair and maintenance from the central workshop is going on currently. Repairing and replacing of Steel wire rope of Intake caterpillar gate along with the control panel is in process. Periodic Maintenance and Condition monitoring work to check the status of PMG, Exciter, Generator, Turbine is also in process.

KULEKHANI-II HYDROPOWER STATION

Kulekhani-II Hydropower Station located at Bhimphedi Rural Municipality. -4, Nibuwatar, Makwanpur is a cascade of Kulekhani-I HPS with installed capacity of 32 MW and annual design generation of 104.6 GWh. It was commissioned in 1986 AD and developed by the financial assistance of Government of Nepal and the Overseas Economic Cooperation Fund (ODCF) of Japan at the cost of NRs. 1240 million.

The plant is designed to develop power utilizing the water from the tailrace of KL-I HPS, further adding the water of Mandu river and through Rapti pumping station. Every year Mandu Intake is cleaned after the wet season to allow the filtered water to the intake pond. Likewise, Rapti Pumping Station is operated as per requirement in dry season by doing effective maintenance works to generate power.

The cumulative generation of Kulekhani-II HPS has reached 1948.97 GWh till F/Y 2074/075. The Plant has generated 36.05 GWh in F/Y 2072/073, 37.79 GWh in F/Y 2073/074, and 31.75 GWh in F/Y 2074/075. The total target of F/Y 2074/075

was 33136.53 MWh and the actual generation is 31754.10 MWh which shows 95.82 % energy is achieved w. r. t the target. Since the station is cascade of Kulekhani-I HPS, it is operated as per instructions of Load Dispatch Center (LDC) according to the system requirements for voltage improvement & system stability.

Unit no. 2 is not in operation since 20 Jestha, 2075 due to problem occurred as the stopper ring for damper segment of rotor was slipped out and damaged some parts of R-phase of stator coil windings. Generator Exciter and Rotor parts have been disassembled by NEA's team effort. Further maintenance process is ongoing at site with involvement of OEM Company (Fuji Electric Co. Ltd., Japan) and is expected to be completed by the end of Shrawn 2075.

Major Activities carried out in the F/Y 2074/075 were

Electrical Section

Condition Monitoring Works of Electrical Equipment at Switchyard and Powerhouse, Repair and Maintenance of Motor Control System of Crane for Draft Tube Gate, Replacement 6.6 KV B-Phase bushing connection pad of Main Transformer at Switchyard and Installation of Lightning Arrestor at Office and Colony Area were carried out in fiscal year 2074/75

Mechanical Section

Replacement of Drain Water Submersible Pump at Powerhouse, Maintenance of Loader fuel Pump, Hydraulic System etc., Replacement of new tyres in Loader, Dismantling Rotor and Stator of Generator No. 2, Maintenance of Cooling Water System at Powerhouse were performed.

Civil Section

Maintenance of some portions of Guest House & Colony staffs' quarter, Surge tank and drain tunnel road maintenance, Maintenance of Rapti intake & its Coffer Dam, Landslide protection at Surge tank area by making gabion wall, Deposition of New Filter material on drinking water tank in order to supply suitable water for Colony Staffs' were the major works carried out by civil section.

Rotor Assembly of Unit No. 2

Future activities

Replacement of control cable, Installation of Remote Control System of EOT Crane, Repair and Maintenance of Stator Coil Winding of Generator No. 2, Assembly of Stator and Rotor of Generator No. 2., Dismantling and repair of Submersible Pumps at Rapti Intake, Modification of Damper Segment Stopper Ring of Rotor of Generator No. 2., Mandu filter plant maintenance, Gabion check wall Maintenance are the activities that are planned for this fiscal year.

DUHABI MULTI-FUEL POWER PLANT

Multifuel Power Plant located at Bansbari, Morang in the Eastern Industrial corridor of Nepal has an installed capacity of 39 MW. 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. Duhabi Multifuel Center has 6 (Six) Wartsila Diesel engines which use furnace oil (FO) as a source of energy. There are two units, each of

7.5 MVA from Leroy Somer France and four units, each of 8.144 MVA from Alsthom, France. Major overhauling of engines of all the six units were concluded in 2013. In FY 2074/75, it generated a total of 15.78 MWh and was operated only at emergency and power crisis situation to maintain the stable power system (INPS).

Major works carried out during FY 2074/75 by this center includes installation of new 6/8 KV transformer, installation, testing and commissioning of cooling tower fresh water pump, installation, testing and commissioning of

Duhabi Multi Fuel Diesel Center

2V 200 Ah Battery Bank of the control system, upgrading of DC system in power house and testing and maintenance of unit number five engine. Beside these, boundary wall construction, culvert construction and guard post construction, 33 KV line patrolling and maintenance, LT line maintenance in the power house compound and distribution of local line (11 KV Industrial Feeder) were also carried out.

MEDIUM GENERATION OPERATION AND MAINTENANCE DEPARTMENT

Medium Generation Operation and Maintenance Department (MGO&MD), headed by a Director, is responsible for the operation and maintenance of twelve (12) hydropower stations and one (1) diesel power plants with individual installed capacity below 30MW and owned by NEA with an objective to maximize energy generation 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 installed capacity of 12 hydropower stations and 1 diesel power plant with installed capacity below 30 MW is 108.7 MW. The actual generation from the hydropower generating stations under this department on FY 2017/18 is 400.007 MWh and have achieved about 89.33% of target generation this year. The Panauti hydropower station had been completely reinforcement with replacement of the Governor and SCADA system. Instead of periodic maintenance of power houses, breaking of runner blade of unit no.1 of Sunkoshi hydropower station and damage of rotor pole of unit no.2 of Devighat Hydro power station had create some disturbance in operation of power house. After repairing and maintenance of runner blade and rotor pole, the power houses were brought in operation on timely. Due to fire on Trishuli hydro power stations, there became huge loss on generating electrical energy in the end of this fiscal year. Complete repairing and maintenance of the Trishuli power house had been done for the damages created by fire in Trishuli power house. Now, the total seven units are operating and generating electrical energy. The Seti hydro power stations have achieved a maximum generation from their first run this year. Upon the installation and commissioning of turbocharger at Hetauda diesel plant, 14.41 MW installed capacity is in standby condition. The rehabilitation projects ongoing under this department is Sundarijal and Tinau with loan assistance from the Asian Development Bank (ADB) under Energy Access and Efficiency Improvement Project (EAEIP). The refurbishment of Chatara hydropower stations are on the progress.

The following sections provide a concise description of the power stations and highlight major activities carried out under this department during the Fiscal year.

TRISHULI HYDROPOWER STATION

Trishuli Hydropower Station is constructed on the banks of Trishuli River at Trishuli Bazar, Nuwakot. It was commissioned in 1967 AD in assistance with the Government of India at a cost of INR 140 million with its initial installed capacity of 21 MW having 7 units of 3 MW each. 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. The annual design generation is 163 GWh where as its actual generation of this year is 121.31 GWh. Cumulative generation from its first run is 5,182 GWh.

The major activities accomplished in this fiscal year 2074/75 were overhauling of unit No. 2 and 7. Repair of butterfly and by-pass valve of Unit no 2, with new Hydraulic Power pack unit for MIV operation. For unit No 1 similar type of Hydraulic Power pack has already been purchased and shall be installed during the overhauling period in F.Y.75/76

Installation of MIV (Unit #2)

At Head works site, repair work of under sluice structure was carried out for all main gate during the dry season. Leakage from under sluice has therefore been essentially minimized. Construction of new Guest house was completed. Partial cleaning of reservoir was carried out

New 60kv Lightening Arrestor and 66KV Isolator was installed for 66KV Trishuli-Balaju transmission line. After the failure of Unit no. 1 to synchronize to the grid, repair of Unit no 1 synchronizing system were carried out. Unit no. 7 rotor circuit was found to be rotor earth fault with lower insulation value therefore repair of 7 out of 12 rotor poles were carried out and put into operation. Similar type of problem was also detected in unit no 6 (4 nos. of rotor poles) which also was successfully diagnosed, repaired and put in to operation.

On 26th of Ashad, 2075, 6.6KV local supply Breaker inside the breaker room caught fire and along with it, 6.6 KV Bus coupler switchgear assembly and 6.6/66KV main Transformer Breaker switchgear assembly were completely burnt and the plant was shut down. Plant was partly put into the operation on 32nd after the isolation of Bus I &II and 12 MW was successfully evacuated through Main Transformer (Bay I) via Bus I.

As Trishuli river carries large quantity of silt, after upgrading of Trishuli Hydro power plant due to increase of discharge capacity, desander capacity has proven to be insufficient during wet season. NEA, Engineering Directorates is involved for detail recommendation and design of Trishuli Desander upgrading (Probably, construction of parallel desilting basin for more efficient plant management).

More than 20 years have passed since THPS was last upgraded. Most of the instrumentation and control equipment being operated have exceeded their service life and probably out dated. Hence, extensive research activities are underway in order to devise the scope of rehabilitation work in near future.

DEVIGHAT HYDROPOWER STATION

Devighat Hydropower Plant is a cascade development of Trishuli Hydropower Plant with installed capacity of 14.1 MW and annual design generation of 114 GWh. It is located at Devighat, Nuwakot and was commissioned in 1984 AD. Improved operational performance

is observed after successful completion of renovation, modernization and upgrading (RMU) in 2010/2011. The capacity of the units was improved and upgraded to 15MW and the actual generation of year 074/75 is 86.24 GWh.

Currently, all 3 units are operating satisfactorily, moreover major maintenance works completed in fiscal year 2017/18 include Maintenance & Overhauling of Unit number 2 due to problem in rotor poles, motorization of sluice gate instead of manual operation, maintenance of dewatering & drainage pump, repaired of Samari khola syphon, gabion protection works in the Samari Khola, fencing works on the side of open canals, repair and construction of school building, army building, office meeting hall, repaired of quarter building, damaged during earthquake and 66kV SF6 breaker maintenance by replacing new link pin of operating mechanism. Furthermore, Governor and SCADA system need repair and maintenance which will be carried by suitable experts in next fiscal year. Preparation for overhauling of runners is on the process and is being planned to be implemented by utilizing the shutdown period of Trishuli HPS during F/Y 2018/19.

Exciter Rotor (Unit #2)

GANDAK HYDROPOWER STATION

Gandak Hydro Power Station is located at Pratappur Gaunpalika ward no. -7, District: Nawalparasi, Nepal about 235 Kms from Kathmandu and about 5 Kms North from Indian border Jhulenipur, District: Mahrajgunj, Uttar Pradesh. The power house is a part of irrigation cum power generation scheme on Gandak River. A barrage has been constructed on the river Narayani at Bhainsa Lotan (Balmikinager, Bihar) on Indo-Nepal boarder. From the barrage, two canals take off namely Gandak Main Eastern Canal and Gandak Main Western Canal. This Power Station is located on the Gandak Main Western Canal approximately 18 Km downstream of barrage at Surajpura, Nepal. As the canal is mainly meant to meet the irrigation needs for Uttar Pradesh, India, the discharge through canal is regulated accordingly.

The plant has three Horizontal mounted tubular bulb turbines; 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. The project was built in assistance with the Government of India and Government of Nepal with the total cost of NRs. 170 million.

The actual generation of this year is 17.49 GWh which is 72.3 percent of its target generation 24.21 GWh. Presently, Unit no. 1 is in shutdown condition due to damages on generator's stator coil for last 11 years. The generation is disrupted mostly due to long shutdown (i.e. more than three months canal shutdown) of Main Western Canal for inspection and maintenance by Irrigation Department, Bihar, India; sometimes due to local issues & disagreement with MWC division relating to canal cause disturbance in canal. The non-synchronization and frequent tripping due to very low voltage from Indian grid also disrupt power generation. The plant is seeking rehabilitation for optimum performance of machine under funding from NEA/GON/GOI.

The Present status of the Station is among three units, the unit no. 3 is in operation & unit no.1 is out of operation for last 11 years due to problem in generator's stator coil & unit no 2 is under breakdown since 25th Falgun 2074 due to excitation problem.

The following major repair and maintenance activities that were performed during FY 2074/075 repair of Wicket Gate Servomotor in Unit no.2, repair of Oil pressure system and Lubrication oil system, repair and painting of Tailrace Gate in unit no 2 & 3 and also Repair & painting of Generator Sets, cooling pipelines

Gandak Power House

and accessories, Replacement of Battery Bank & charger for DC System, Condition Monitoring of Switchyard & Power house equipment, corrosion resistant coating at switchyard gantries structures, up-gradation of existing in house electrical wiring, repair and painting of staff quarters, construction of Boundary wall in office premises and installation of Main Gate, Interior & Exterior coloring of power house and guest house, repair of roads inside colony and office area.

MODIKHOLA HYDROPOWER STATION

Located at Dimuwa in Parbat district about 46 Km towards west from Pokhara city, Modikhola Hydropower Station has installed capacity of 14.8 MW with two vertical shaft Francis Turbines 7.4 MW each and annual design generation of 92.5 GWh. After its successful commissioning in 2000 AD, the plant operation has been adversely affected especially during rainy season reportedly due to sub-optimal design and inadequate sediment handling facilities as the Modikhola brings high content of abrasive sediments. The actual generation of this fiscal year is 66.42 GWh which is about 4.5% less than previous year's generation. The reason for this reduction is mainly due to 24 days of Plant shutdown permitted for Rehabilitation works under M/S Lumbini/ Prakritik JV Contract and 4 days of Plant shutdown for Modi-Lekhnath 132 kV transmission tower maintenance. This year, Turbine overhauling of Unit-2 was successfully completed by Plant's own manpower for the first time in its history.

Major maintenance works carried out this year under mechanical section are Unit-2 Turbine overhauling by replacing runner, guide vanes, Labyrinth ring, Sealing ring, Wearing plates of head cover and bottom ring, Generator thrust bearing repair & maintenance in Unit-2 with thrust collar repair, Generator oil cooler repair & maintenance in Unit-2, Generator air cooler repair & maintenance in Unit-1, replacement of all 4 sets of worn out filter elements with the new set of Hydac filter element in cooling water filtration system, repair & maintenance of Powerhouse crane 5 ton Hoist motor, complete overhauling of Powerhouse elevator by replacing Controller and

Rotor Being Removed for Overhauling (Unit #2)

other major parts, U/S & D/S Desander gates hoisting devices repair & maintenance, Intake flushing gate maintenance by placing new sill beams and concreting, repair of butterfly main inlet valve (MIV) and seal replacement in Unit-1 & 2, repair of butterfly type bypass valves in both units, Corrosion protection works for underwater components and exposed pipes in powerhouse etc. Similarly, major maintenance works carried out under electrical section include lightening arresters in 132 kV substation, Oil filtration of Transformer-1 (6.6 kV/132 kV) Power transformer, meggering of Generator Unit-1 Stator & Rotor windings, replacement of damaged capacitor on AVR Unit-1, repair & maintenance of Power & lighting circuits by replacing ABC 4.5 core and steel tubular poles including installation of new control panels and distribution boxes at Intake & Desander area etc.

Similarly, civil works carried out this year include construction of kitchen truss shed at Intake site for Army, Plastering of office building and Quarter buildings, Painting rooms and plaster surface, floor finishing works, construction of parapet wall etc.

The performance of the plant is largely affected during rainy season due to excessive sediment load thereby reducing capacity of poundage and Desander, eroding turbine, valves and other facilities. The rehabilitation work was started to address these problems with the agreement made between NEA and M/S Lumbini/ Prakritik JV on 2069-12-01.

The rehabilitation works in Civil Works side include construction of bypass gate & about 25 m bypass conduits, repair of scour part at downstream of two under sluice gates with RCC concreting, River training work and protection of right bank at headworks with plum concrete, Demolition of Desander wall for installation of safety rack, Dismantling of Slab D/S of tunnel gate for installation of bypass pipe, construction of about 150 m concrete road and drainage along the side of this road etc. Similarly, installation of about 25 m bypass pipe, fabrication and installation of bypass gate and support structure, fabrication and installation of safety rack etc. were completed under Modi Khola Rehabilitation Hydro-mechanical Works side.

The revised Contract cost of the above works (civil and hydro-mechanical) is NRs. 16.69 million. Initially the Contract period was one year. Due to some unfavorable condition the intended completion date was extended up to Jestha 10, 2075 BS. The construction of civil and hydro-mechanical works have been completed except testing & commissioning of Bypass control gate. The effect of By-pass system constructed under Modi Khola rehabilitation project on the power generation from MKHPS is yet to be seen during coming dry season.

SUNKOSHI HYDROPOPWER STATION

Sunkoshi Hydropower Station, located at 81 km east from Kathmandu, in Sindupalchowk district, is a run-of-river daily pondage power station with an installed capacity of 10.05 MW and annual design generation of 70 GWh. This station has 3 units of 3.35 MW each. The powerhouse was commissioned in January 1972 with a friendly cooperation of the Water Conservancy and electric Power Ministry of the People's Republic of China and Government of Nepal. Cost of the project was approximately NRs. 109.4 million including transmission line up to Kathmandu.

The cumulative generation of the station has reached 2316.281 GWh at the end of FY 2074/75 from its first run. It has generated 46.526 GWh in FY 2073/74 and 55.051 GWh in FY 2074/75 with an increase of 18.32% than the previous year.

Present Status:

Presently, all the three units of the station are in operation. During the Bhotekoshi flood 21st Ashad 2073, arms of radial gate no. 5 had been

broken and dam site upstream and downstream were filled with debris. The debris has been cleared from the dam site. The broken arms and seals of radial gate no. 5 has been replaced and hence all the gates are in full operation now. The seals of service gate of penstock 1 has been replaced with new ones. The station has kept on with the regular preventive maintenance works thereby increasing the machine running hours and reducing the outage hours.

The following activities were performed during FY 2074/75 Installation of new 11 KW Heavy Duty Dredge Pump at sump of powerhouse, Replacement of damaged LV bushing of 6 MVA power transformer, Changing of Wall Through Bush Insulator of power transformer; and oil filtration of all three power transformers, Installation of SCADA based remote gate control, operation and supervision system, Stringing of optical fiber, CCTV cameras and Digital IP PBX Telephone system between dam-site and powerhouse for better surveillance and communication, Installation of new 110 V, 400 Ah Battery Bank, overhauling of Unit no 1, Installation of new trash rack panels on Intake gates 1, 2, 3 & 4, Unit no 2 & 3 maintenance,

Dismantling of Rotor for Overhauling (Unit #1)

New shaft seal and New SS plate replacement, dismantling of the worn out seals and plates, Repair & maintenance of Excavator, wheel loader, dump trucks, etc. at dam site for debris removal works, Replacement of seals on barrage gates and service gates, Replacement of steel ropes of forebay service gates and Intake gates, Removal of debris (logs, tyres etc.) trapped inside runner blades through penstock manhole of unit no 1& 2. Under Civil Maintenance following works were carried out. Steel plate jacketing works on the face of piers of Barrage, Retrofitting works of Barrage at dam-site, retaining wall construction works at slope no. 1, River training works with Gabion to protect store and new quarter of Sunkoshi HPS, drain cleaning works at upstream of settling basin, Lapsikhola and Balka area, Debris removal works at Dam site's upstream and downstream area. Construction of cofferdam at Tauthali khola to withdraw water during Magh to Jestha for power generation.

ILAM (PUWAKHOLA) HYDROPOWER STATION

Puwakhola hydropower station is a run-off river type plant operating with the water of the Puwakhola River, a river in the Far East Nepal has installed capacity of 6.2 MW and annual design generation of 48 GWh. The plant was commissioned and constructed with the in-house management of the Nepal Electricity Authority and the source of fund was the Government of Nepal and Nepal Electricity Authority which was commissioned in 1999AD with a cost of US$15.7million dollars.

It has two identical units of 3.1 MW each and has generated 35.79 GWh of energy this fiscal year and till date generation of the plant is 555.62 GWh.

Major maintenance works that had been carried this fiscal year were Overhauling of Unit No. I with Replacement of Nozzle Needle Assembly set, Epoxy Painting on Steel Structures inside tunnel of Intake and Partial Section of Penstock

Stator Jumper Coil Repair (Unit # 1)

Surface, Repaired of Burned out Generator Stator's Jumper coils of Unit No. I, Meggering of Power Transformer, Cleaning Bushing Terminals of switchyard equipments and Oil top up in Power Transformer after BDV test including heating and filtration along with painting of Power Transformer, Performance and Setting Range testing of Electro-Mechanical Protection Relays of Both Units and Power Transformer and Adjustment of default setting to appropriate values after testing protection relays, Replaced water dispatcher to reduce abnormal noise and vibration of turbine casing of both Units.

CHATARA HYDROPOWER STATION

Chatara Hydropower Station, a canal drop type power station, is located at Chatara, Sunsari with an installed capacity of 3.2 MW and annual design generation of 6 GWh. It was commissioned in 1996 AD with the assistance from Government of India at a cost of NRs. 162.6 million. The plant which was originally designed to be a captive plant for powering drazer pumps to flush sediments from the Canal was later handed over to NEA by Sunsari Morang Irrigation Project (SMIP) on 29th March, 1999.

Pictorial View Unit No.2 Assembly

Both of the units of the station are not in operation (Unit no. 2 closed since September 2010 & Unit no. 1 shut down since September 2014) due to problems in turbine parts. The overhauling works for Unit no. 2 started taking spares and supervisory services from turbine original manufacturer Andritz Hydro India Pvt. Ltd. for which a a contract agreement for the renovation & modernisation of unit no. 2 was made on 31st May 2016. The spare parts were delivered at site and on testing & commissioning stage a problem occured in pinion & crown gear assembly causing damage on pinion & crown gear. For making the unit operable, a new set of pinion/crown gear & pinion shaft is to be procured which is estimated to take minimum of 10 months. Meanwhile the possibilities of operating Unit No. 1 using required spares from Unit No. 2 has been discussed & study is to be started. A single unit is expected to be in operation after January 2019.

PANAUTI HYDROPOWER STATION

Panauti Hydropower Station was commissioned in 1965 with the assistance from then Soviet Union at a cost of NRs 27 million. It is located at Khopasi, Kavre, 35 km east of Kathmandu. The scheme was of installed capacity of 2.4 MW and annual design generation of 6.97 GWh. The Project was designed for operation of only two units at a time with third unit as a standby. Open 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 near Khopasi.

The major activities accomplished this fiscal year 2017/018 were installation and commissioning of new governor with unit control system, Excitation

Commissioning of Unit-2 GCB with Protection Relay

system, Main Inlet Valve (MIV), Generator protection Relay with GCB of unit 2, PLC & SCADA based control, monitoring and protection system as a package of contract. Other works include repairing turbine and its components of unit no. 2, replacement of 110 V DC system including charger and batteries, painting of powerhouse building, canal cleaning works with repairing of damage portion during earthquake and fencing works for regulating reservoir. A contract has been awarded for the reinforcement works for switchyards of Khopasi and Bhaktapur. According to the Memorandum of Understanding (MoU) between Nepal Electricity Authority and Kathmandu University (KU) on 24th May 2018, the Panauti Hydro Power Station is going to develop as an education and research center on a mutual interest of NEA and KU.

SETI HYDROPOWER STATION

Seti Hydropower Station is a run of river type with installed capacity of 1.5 MW and design generation of 9.8 GWh consisting of 3 units each 0.5 MW. It is located at Nadipur, Pokhara and was commissioned in 1985 AD with assistance from Government of People's Republic of China and Government of Nepal. The power canal for this power station is jointly used for irrigation purposes looked after by Department of Irrigation and hence, the operation of this power station is affected by irrigation as well.

The station has generated 8.044 GWh in FY 2073/74 and 10.19 GWh in FY 2074/75 with increase of 21.05 %. Presently, all the three units are in normal operation and the station has the ability to operate at its full capacity round the year. The unprecedented flood level in Seti River in July last year damaged its head works which disrupted the operation of this station throughout the year. The disastrous flood inflicting significant damages elsewhere was subdued due to alert maneuver from the station avoiding any significant damages to hydro mechanical structures. However, major repair and maintenance works from irrigation office restore the original condition of head works of Seti. The major Repair and Maintenance Activities done during this F/Y 2017/18 were Maintenance of governor and high-pressure oil system, repair of governor air oil pressure in Unit No.3, Overhauling of Unit No. 3, guide bearing and slip ring of unit no 2 change, repair of big de-sander gate and stop log gate at Jaubari, replacement of steel rope at radial gate, Inspection of generator stator, rotor and checking of insulation and protective gear,11KV VCB maintenance work, Installation of CT and PT for energy Meter installation, Relay testing, meggaring and inspection, Rewinding of step-up transformer No.-2, Oil filtration and insulation improvement in transformers, Replacement of 11KV XLPE cable with cable termination, Rewinding of magnetic amplifier and phase compound transformer of excitation panel of Unit No. 2.

Seti Weir Construction Work

Under Civil Maintenance Works major activities were Construction of weir section of head works which was damaged by flood last year. Temporary diversion works at intake of headworks, relocating

de-sander basin flushing gate to original position, Removal of huge deposition of debris, logs and silt during flood at power canal and Cleaning, painting civil maintenance works, Protection works in old buildings and civil structures.

The ongoing modification and renovation works of control system and replacement of existing governor with digital governor and PLC based control panel will be completed by next year.

FEWA HYDROPOWER STATION

Fewa hydropower station is a canal drop type power station having an installed capacity of 1.0 MW and located at Pardi, Birauta, Pokhara with an annual design generation of 6.5 GWh. It consists of 4 units each 0.25 MW. It was commissioned in 1969 AD and developed jointly by Government of India and Government of Nepal. The public encroachment of power canal leading to power house is a concern for normal operation regardless of the availability of generating units.

Presently, only Unit No. 1, 2 & 3 are in operation at rated capacity while remaining Unit No. 4 has problems in generator turbine coupling. Efforts have been made to bring all the units into operation as soon as possible. However, operation of only two units at a time is possible due to insufficient canal inflow. The station has generated 1.92 GWh in FY 2074/75.

Unit #2 Overhauling

The following activities were performed during FY 2016/17 Maintenance of governor, excitation system, high pressure oil system, Installation of trash rack at intake of forebay, Repair maintenance of draft tube of Unit No. 1, Drain valve and cooling system maintenance.

Replacement of 11kV lightning arrester, drop out fuses and 200-400 A load disconnecting switches,

Repair and maintenance of generator of Unit no 1. Replacement of Air Circuit Breaker (ACB) of unit no 1, Replacement of damage and old pin insulator of 11KV line, Complete wiring change of unit no 1 and Generator maintenance.

Also, Repair maintenance of forebay gate, Protection works of old buildings and civil structure, Repair and maintenance of approximately 300 m power canal, Repair and maintenance of power house as well as tail race were carried out.

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 tail-water discharge is utilized for water supply system to Kathmandu Valley. It has two turbo-generator sets with total installed capacity of 640 kW & annual generation 4.77 GWh. This Plant was erected under Colombo Plan scheme whereby the main equipment was supplied by The English Electric Company Ltd., England. It was commissioned in 1934 AD, being second old hydro-power plant constructed in Nepal. The actual generation from this plant in this year is 4.335 GWh.

Sundarijal Dam Site

Major maintenance works carried out in this year for the plant are repair and maintenance of main inlet valve & auxiliary valve, construction of cover slabs for Nagmati canal, cleaning of balancing reservoir. Similarly, construction of two new building, one for museum and other for store and office & construction of colony compound wall are in progress have been completed. The rehabilitation of this power station is ongoing under the joint assistance from ADB, GON and NEA. Nepal Electricity Authority has received loan (Loan Number 2808-NEP, Grants 0270-NEP and 0271-NEP) from Asian Development Bank (ADB) towards the cost of Power Efficiency Improvement as part of Electricity Transmission Expansion and Supply Improvement Project. for Rehabilitation and upgrading of Sundarijal hydropower plant from 640 kW to 970 KW.

The proposed rehabilitation works largely consists of electromechanical rehabilitation. Almost all the electro-mechanical and hydro-mechanical equipment has been delivered and temporarily stored at NEA Training Center at Kharipati, Bhaktapur. Due to extensively damaged access road, the heavy equipment could not be delivered to the power house site. The upgradation of the access road has been approved under the rehab project by GoN. The rehab project is targeted to be completed by March 2019.

PHARPING HYDRO-POWER 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, 9th Jestha). It was erected with a grant from British Government at a cost of NRs. 0.713 Million. It is in Pharping of Kathmandu district, nearly 12 km south from the city. There are two units each 250 kW with an aggregate installed capacity of 500 kW. As the water from the penstock has been diverted to drinking water supply to Kathmandu by KUKL, the plant is not being operated for generation nowadays though it has been placed in standby mode to operate occasionally and to demonstrate to the visitors.

HETAUDA DIESEL POWER PLANT

Hetauda Diesel Power Plant located at Hetauda, Makawanpur has an installed capacity of 14.41 MW and acts as a backup to hydropower plants. In the first phase, three engine sets of English Electric Co. Ltd. were commissioned in 1963 and in the second phase, four engine sets of GEC Diesel Ltd. were commissioned in 1980 with assistance from British Government. The plant contributes to generation mix and provides operational flexibility and strengthens system reliability and hence, has great importance. However, the exorbitant fuel price has made its operation costly, compared to

Hetauda Diesel Power Plant

other hydro power. So, its operation is restricted. In FY 2074/75, it generated a total of 127.18 MWh.

Major works carried out in the FY 2074/75 are replacement of turbocharger and shaft assembly of engine of unit number three, repair and maintenance of cooling tower of unit number one, two and three, repair and maintenance of B bank fuel pump exchange of unit number two, repair and maintenance of nozzle ring exchange of engine of unit number three and repair and maintenance of Incomer breaker of plant.

TECHNICAL SUPPORT DEPARTMENT

Technical Support Department, headed by Director, provides expert advice for the under-construction projects and existing power plants, ongoing projects and Operation and Maintenance Department. Deputy Managing Director Coordinates between the Technical Support Department and Projects or Operation and Maintenance Department.

In the fiscal year 2074/75, Technical Support Department has carried out the following services:

1. Rehabilitation Study of Trishuli Hydropower Station

Trishuli Hydropower Rehabilitation was conceptualized by Technical Support Department on 2073 and initiated the study of Trishuli Hydropower Rehabilitation mainly to solve the problem of sediment deposition in the balancing reservoir. The balancing reservoir was used for the peaking of the plant, however, now it is not possible due to sediments/debris deposition. The present annual generation is below the design annual generation.

Memorandum of Understanding (MoU) was made between Technical Support Department (TSD) and Project Development Department (PDD) to carry out the rehabilitation study of Trishuli HPS. Rehabilitation study of Trishuli was conducted by joint effort of PDD and TSD.

Following works were performed under the rehabilitation study:

- Detailed Topographical Survey of reservoir and de-sander area
- Sediment sampling for quantitative and qualitative sedimentological analysis
- Design and estimate of bypass channel
- Design of rivulet training works
- Detailed design of additional desander
- Estimation of quantity for sediment removal from reservoir
- Checking of the financial viability of the rehabilitation works
- Tender document preparation
- Operational manual gate operation and maintenance for all civil structure

All these works were successfully completed and the Final Report has been submitted in Ashad 2075.

2. Review Works

Technical Support Department carried out review of various works at different hydropower stations. TSD reviewed the Trishuli head-works under sluice construction variation, reviewed the Kali-Gandaki A access road cost estimate, reviewed the downstream spillway surface repair at Kali-Gandaki, reviewed the design and cost estimate of mono rail crane at Modi Hydro-power Station and reviewed the pipeline construction for additional pump at Rapti intake of Kulekhani II Hydro Power Station.

After review, TSD recommended Kulekhani II HPS to carry out hydrological study to determine the discharge throughout the year at the Rapti River and re-design the various structure and components based on the hydrological studies.

Nepal Electricity Authority

Generation Operation and Maintenance

Actual Generation for the FY 2074/75 (FY 2017/18A.D.)

Unit: MWh

S.No.	Power Stations/ Month	Shrawan	Bhadra	Ashwin	Kartik	Mangsir	Poush	Magh	Falgun	Chaitra	Baishakh	Jestha	Ashad	Total
1	**Kaligandaki 'A'**	101,725.00	101,928.00	102,818.00	92,307.00	64,444.00	48,791.00	41,121.00	36,950.00	40,748.00	50,251.00	82,633.00	101,359.00	**865,075.00**
2	**Mid-Marsyangdi**	51,182.13	51,020.62	50,314.75	44,467.37	31,968.76	24,708.74	20,006.26	14,860.37	21,243.75	27,266.25	47,447.87	52,800.00	**437,286.87**
3	**Marsyandi**	45,329.20	45,978.30	48,568.00	46,168.50	35,988.50	28,317.70	23,420.80	21,454.80	24,396.60	31,968.80	48,696.90	47,202.20	**447,490.30**
4	**Kulekhani I**	860.00	313.00	202.00	225.00	202.00	4,345.00	5,283.00	14,322.00	12,845.00	12,669.00	6,428.00	4,437.00	**62,131.00**
5	**Kulekhani II**	526.50	185.20	236.90	266.30	280.40	2,350.20	2,727.40	7,151.20	6,523.10	6,364.30	3,051.60	2,091.00	**31,754.10**
6	**Chameliya**	-	-	-	-	-	-	5,856.48	5,343.07	7,261.59	8,966.13	12,292.57	12,739.74	**52,459.58**
6	**Trishuli**	10,953.50	9,649.00	10,999.80	12,007.90	11,326.50	9,556.30	8,501.50	8,418.30	9,115.70	9,873.00	10,528.00	10,387.00	**121,316.50**
7	**Gandak**	3,483.80	-	2,151.80	1,022.00	-	2,048.40	2,619.00	3,007.70	890.20	-	54.50	2,218.40	**17,495.80**
8	**Modi**	7,222.60	7,349.20	10,200.20	7,746.90	5,005.10	3,847.30	3,213.80	2,115.00	1,028.30	4,361.50	7,231.70	7,101.10	**66,422.70**
9	**Devighat**	7,824.09	6,707.18	8,294.65	8,827.25	8,431.31	7,041.39	6,389.00	6,236.40	6,753.05	7,166.19	7,327.03	5,241.25	**86,238.79**
10	**Sunkoshi**	5,174.90	5,271.40	5,895.00	6,618.70	4,728.80	4,197.90	3,574.40	3,137.20	2,783.20	3,248.10	4,736.30	5,684.60	**55,050.50**
11	**Puwa**	3,883.74	4,234.64	4,224.08	4,231.79	2,488.99	1,833.45	1,347.65	1,430.18	1,432.73	2,440.20	3,871.75	4,371.35	**35,790.53**
12	**Chatara**	-	-	-	-	-	22.25	-	-	-	-	-	-	**22.25**
13	**Panauti**	-	-	32.42	-	103.33	200.81	89.59	70.49	100.63	120.37	153.45	241.26	**1,112.34**
14	**Seti**	969.75	918.81	1,019.61	975.60	877.59	421.47	897.84	823.05	883.62	886.23	702.09	811.08	**10,186.74**
15	**Fewa**	197.55	214.59	243.39	130.34	223.82	250.41	237.35	219.53	102.27	-	-	92.43	**1,911.68**
16	**Sundarijal**	498.00	466.66	406.00	389.33	444.33	369.66	284.66	235.33	221.00	224.66	306.66	486.00	**4,332.29**
17	**Pharping**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
	Total (Hydro)	239,830.75	234,236.60	245,606.59	225,383.98	166,513.43	138,301.98	125,569.73	125,774.62	136,328.74	165,805.73	235,461.42	257,263.40	**2,296,076.97**
18	**Multifuel**	-	-	-	4.20	1.05	2.15	6.20	1.10	1.08	-	-	-	**15.78**
19	**Hetauda Diesel**	5.93	5.44	7.02	29.63	12.17	9.08	8.36	7.55	8.42	12.25	9.26	12.07	127.19
	Total (Thermal)	**5.93**	**5.44**	**7.02**	**33.83**	**13.22**	**11.23**	**14.56**	**8.65**	**9.50**	**12.25**	**9.26**	**12.07**	**142.97**
	Grand Total	**239,836.68**	**234,242.05**	**245,613.61**	**225,417.81**	**166,526.65**	**138,313.21**	**125,584.30**	**125,783.27**	**136,338.23**	**165,817.98**	**235,470.68**	**257,275.47**	**2,296,219.93**

Note: Provisional figures subjected to final audit

Nepal Electricity Authority

Generation Operation and Maintenance

Generation Related Statistics and Performance Factors for the FY 2074/75 (FY 2017/18)

S.N.	Power Stations	Total Installed Capacity (MW)	Total No. of Units Installed	Actual Generation(MWhr)			Maximum Generation in a year till date/year (MWh)	Design Generation (MWh)	Generation Target (MWh)	Backfeed (MWh)	Transmission to Grid (MWh) (include import from IPP's)	Local Distribution (MWh)	Self Sufficiency Ratio (%)	Plant Factor (%)	Current No. of Employees
				FY 2072/73	FY 2073/74	* FY 2074/75									
1	Kaligandaki 'A'	144.00	3	750,842.00	842,149.00	865,075.00	929,983.00 (2071/72)	842,000.00	833,643.99	104,860.00	966,812.63	893.86	99.77%	68.58	106
2	Middle Marsyangdi	70.00	2	435,558.76	454,651.62	437,286.87	457,318.09 (2071/72)	398,000.00	433,869.81	364,118.65	788,764.41	285.45	98.46%	71.31	64
3	Marsyandi	69.00	3	441,736.60	465,305.50	447,490.30	483,928.20 (2052/53)	462,500.00	464,734.93	40,664.00	511,245.80	-	#	74.03	65
4	Kulekhani-I	60.00	2	71,356.00	73,402.00	62,131.00	249,680.00 (2056/57)	211,000.00	97,904.80	81,816.81	134,600.16	8,281.08	99.26%	11.82	71
5	Kulekhani-II	32.00	2	36,055.35	37,795.13	31,754.10	122,757.00 (2056/57)	104,600.00	45,861.85	511.62	31,547.05	8.00	97.80%	11.33	40
6	Trishuli	24.00	7	125,025.70	125,969.40	121,316.50	154,423.75 (2053/54)	163,000.00	135,082.79	161,449.44	238,431.61	22,807.37	92.39%	57.70	69
7	Gandak	15.00	3	16,249.00	21,872.70	17,495.80	52,272.70 (2043/44)	106,380.00	24,218.05	130,308.99	112,027.44	40,680.81	#	13.31	37
8	Modi Khola	14.80	2	62,787.20	69,556.40	66,422.70	69,556.40 (2073/74)	92,500.00	69,600.60	68,907.82	126,492.81	7,460.40	98.98%	51.23	42
9	Devighat	15.00	3	94,306.49	97,609.96	86,238.79	106,277.70 (2056/57)	114,000.00	101,062.18	42,712.72	77,158.60	51,069.50	99.44%	65.63	46
10	Sunkoshi	10.05	3	35,994.20	46,190.70	55,050.50	66,383.10 (2068/69)	70,000.00	59,536.82	3,686.66	54,295.28	3,877.51	99.04%	62.53	48
11	Ilam (Puwa Khola)	6.20	2	33,831.51	36,414.24	35,790.53	36,414.24 (2073/74)	48,000.00	37,052.17	105.07	35,743.39	-	99.58%	65.90	39
12	Chatara	3.20	2	-	-	22.25	5,219.75 (2063/64)	6,000.00	1,560.57	-	-	-	-	-	24
13	Panauti	2.40	3	2,052.59	2,603.33	1,112.34	4,654.80 (2058/59)	6,970.00	2,908.36	-	1,098.11	-	98.72%	5.29	23
14	Seti	1.50	3	10,996.74	8,044.86	10,186.74	11,616.19 (2067/68)	9,800.00	10,051.25	1.22	4,626.57	-	#	77.52	31
15	Fewa	1.00	4	1,664.77	1,467.69	1,911.68	3,919.47 (2034/35)	6,500.00	1,959.55	-	-	-	#	21.82	
16	Sundarijal	0.64	2	4,293.95	4,490.73	4,332.29	4,530.26 (2071/72)	4,770.00	4,589.00	-	4,326.28	-	99.86%	77.27	24
17	Pharping	0.50	2	1.93	0.88	-	48.65(2064/65)	-	-	-	-	-	-	-	4
	Total (Hydro)	**469.29**	**48**	**2,122,752.79**	**2,287,524.14**	**2,243,617.39**	**-**	**2,646,020.00**	**2,323,636.72**	**999,143.00**	**3,087,170.15**	**135,363.99**	99.38%	54.58	**733**
18	Multifuel	39.00	6	-	26.66	15.78	86,215.07 (2055/56)	-	-	237.00	-	-	-	-	19
19	Hetauda Diesel	14.41	4+3	122.07	325.98	127.19	24,203.64 (2055/56)	-	-	-	107.23	-	84.31%	0.10	24
	Total (Thermal)	**53.41**	**13**	**122.07**	**352.64**	**142.97**	**-**	-	-	**237.00**	**107.23**	**-**	28.22%	0.03	**43**
	Grand Total	**522.70**	**61**	**2,122,874.85**	**2,287,876.78**	**2,243,760.35**	**-**	**2,646,020.00**	**2,323,636.72**	**999,380.00**	**3,087,277.38**	**135,363.99**	99.37%	**49.00**	**776**

Note: ***Provisional figures subjected to final audit***
 # Metering problem

TRANSMISSION DIRECTORATE

Transmission Directorate is responsible for development, implementation and operation of high voltage transmission system from 66 kV to 400 kV level. This business group is headed by a Deputy Managing Director and has Grid Operation Department (GOD), System Operation Department (SOD), Grid Development Department, Major Transmission Projects 220kV, Major Transmission Projects 400kV each headed by a Director.

This business group monitors, operates and constructs transmission lines and substation facilitating to evacuate power generated by both NEA and IPP owned power plants and undertakes reinforcement of the existing transmission system. Nepal's first-ever 400kV Nepal-India cross-border transmission link is completed in the previous fiscal year with the leading involvement of this business group. Currently this line has been charged at 132kV voltage level and importing upto 145 MW of power. Moreover the testing and commissioning of 220/132 kV, 2x160 MVA Power transformers at Dhalkebar substation have been completed successfully on 15th July 2018 and now they have been charged under no load using 132 kV power. NEA has planned to charge the above power transformer by charging the 400 kV Dhalkebar Muzzafarpur transmission line on 220 kV level within 15th August 2018. In order to develop a strong east-west Transmission Network the Hetauda-Dhalkebar-Inaruwa 400kV transmission line is under construction.

Transmission System Master Plan has been developed for upto 2035 & NEA intends to develop river basin wise transmission system as a long term strategy for power development of Nepal.

GRID OPERATION DEPARTMENT

The Grid Operation Department (GOD), has the main responsibility of transmitting reliable and quality power from distant generators to various load centers. The Department also provides connection facilities to IPPs and Bulk Consumers at different voltage levels by accomplishing Connection Agreement as per NEA Grid Code.

Re-routing of Marsyangdi-Kathmandu 132 kV Transmission Line

The other major responsibility of this 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, rehabilitation works etc. The three division offices in Kathmandu, Hetauda, Butwal and four branch offices in Duhabi, Pokhara, Attaria & Dhalkebar are working under GOD for the fulfillment of these responsibilities:

Major Works performed in the F/Y 2074/75 are as follows:

This department has executed numbers of Transformer reinforcement, upgrading works in various Substations. Up-gradation, Reactive Power Compensation and rehabilitation of power system equipments in the Substations are being carried out to meet the increase of power demand and Voltage problem. The existing Transformers after being replaced are reused in other Substations after necessary Overhauling and Maintenance works. Reallocations of such Power Transformers are a cost effective solution forload management.

Erection of 132 kV Tower damaged by wild elephants in Kohalpur - Kusum Section

Various works executed by this department have supported to reduce forced load shedding caused by inadequate substation capacity. The department has carried out and completed following major up-gradation and reinforcement works in FY 2074/75.

a. Major Up gradation and Reinforcement Works

- Installation of new 132/33kV, 63MVA Transformer Bay at Duhabi S/S.
- Installation of new 132/33kV, 63MVA Transformer to replace existing 30MVA at Lamahi S/S.
- Installation of new 33/11kV, 16.6MVA Transformer to replace existing 8MVA at Bolochowk S/S.
- Installation of new 33/11kV, 16.6MVA Transformer to replace existing 7.5MVA at Lamki S/S.
- Shifting and Installation of 132/33kV, 15MVA Transformer replacing the existing 7.5MVA at Lamki S/S.
- Shifting and Installation of 132/33kV, 15MVA Transformer replacing the existing 7.5MVA at Mahendranagar S/S.
- Shifting and Installation of 132/33kV, 12.5MVA Transformer replacing the existing 5MVA at Chanauta S/S.

b. Work in progress: Following major up-gradation & Reinforcement works for Substation are initiated and are under progress

- Installation of new 132/33kV, 63MVA Transformer to replace existing 30MVA at Godak S/S.

- Installation of new 132/66kV, 3x12.6MVA Single Phase Transformer to replace existing old 3x12.6MVA at Siuchatar S/S.
- Installation of new 66/11kV, 18MVA Transformer Bay at Patan S/S.
- Installation of new 33/11kV, 16.6MVA Transformer Bay at Butwal S/S.
- Installation of new 33/11kV, 16.6MVA Transformer to replace existing 8MVA at Yadukuwa S/S.
- Installation of new 132/33kV, 63MVA Transformer to replace existing old 30MVA at Kohalpur S/S.
- Installation of new 132/33kV, 63MVA Transformer to replace existing old 30MVA at Kamane S/S.
- Installation of new 132/11kV, 30MVA Transformer at Lekhnath S/S.
- Installation of new 132/11kV, 30MVA Transformer to replace existing old 30MVA at Matatirtha S/S. The 30 MVA Transformer taken out stored as spare.
- Installation of new 33/11kV, 16.6MVA Transformer to replace existing 16.6MVA at Butwal S/S. The 16.6 MVA Transformer taken out stored as spare.
- Installation of new 33/11kV, 16.6MVA Transformer to replace existing 16.6MVA at Anarmani S/S. The 16.6 MVA Transformer taken out stored as spare.
- Installation of new 132/11kV, 30MVA Transformer Bay at Siuchatar S/S.
- Installation of new 132/11kV, 22.5MVA Transformer Bay at Bhaktapur S/S.
- Installation of new 220/132kV, 2x315MVA Transformer to replace existing 160MVA at Dhalkebar S/S.
- Installation of new 132/33kV, 30MVA Transformer to replace existing old 12.5MVA at Chanauta S/S.
- Installation of new 132/11kV, 22.5MVA Transformer to replace existing old 7.5MVA at Bardghat S/S.
- Installation of new 132/11kV, 22.5MVA Transformer to replace existing old 15MVA at Bharatpur S/S.
- Installation of new 33/11kV, 16.6MVA Transformer to replace existing 8 MVA at Mirchaiya S/S.
- Installation of new 33/11kV, 16.6MVA Transformer to replace existing 8 MVA at Dhalkebar S/S.
- Installation of new 33/11kV, 16.6MVA Transformer to replace existing 3 MVA at Kohalpur S/S.
- Installation of new 132/66kV, 63MVA Transformer Bay at Parwanipur S/S.
- Installation of new 132/66kV, 49.5MVA Transformer Bay at Bhaktapur S/S.
- Installation of new 66/11kV, 30MVA Transformer to replace existing 18MVA at Baneshwor S/S.
- Installation of new 66/11kV, 22.5MVA Transformer at Balaju S/S.
- Installation of new 66/11kV, 2x30MVA Transformers to replace existing 2x12.5MVA at Birgunj S/S.
- Installation of 132kV,20MVAr Capacitor Bank at Lahan S/S.
- Installation of 33kV, 12.5MVAr Capacitor Bank at Chandranigahpur S/S.
- Installation of 11kV,10MVAr Capacitor Bank at Pathlaiya S/S.
- Installation of 33kV,20MVAr Capacitor Bank at Butwal S/S.
- Installation of 11kV,2x5MVAr Capacitor Bank at Bardghat S/S.
- Shifting of 132/33kV, 30MVA Transformer from Lamahi S/Sand Installationat Lekhnath

S/S replacing the existing 12.5MVA.

- Shifting of 132/33kV, 30MVA Transformer from Godak S/Sand Installation at Modi P/H replacing the existing 15MVA.
- Shifting of 132/33kV, 15MVA Transformer from Modi P/Hand Installation at Mahendranagar S/S.
- Shifting of 132/33kV, 30MVA Transformer from Kohalpur S/S and Installation at Singhati S/S.
- Shifting of 33/11kV, 8MVA Transformer from Lamki S/Sand Installation at Chanauta S/ Sreplacing the existing 3MVA.
- Shifting of 33/11kV, 8MVA Transformer from Mirchaiya S/S and Installation at Chanauta S/S replacing the existing 3MVA.
- Shifting of 33/11kV, 8MVA Transformer from Dhalkebar S/S and Installation at Lamahi S/S replacing the existing 3MVA.

c. Grid Connection Agreement

The Department has successfully accomplished the Grid Connection Agreement with 53 IPPs (Independent Power Producers) for 1888.43 MW Capacity to mitigate the future load demand.

d. Maintenance Works

- Tower Shifting/ Rerouting Work of Landslide damaged Tower No. 35 and 70 of Modi-Pokahra Sector
- Tower Protection Work of Tower No. 37 and 38 of Duhabi - Damak Sector
- New Tower erected to replace Tower No. 485 of Kohalpur - Kusom Sector after the damage caused by jungle elephants.
- Installation, Testing and Commissioning of various equipments were performed at different Substations.
- Routine Maintenance works were carried out as per schedule for Substations and Transmission Lines.
- Breakdown maintenance works were carried out as per requirement.
- Regular Relay Testing works were also carried out. Total of 118 relays were tested on 7 Substations (Balaju,Teku,Bhaktapur,Patan,Duhabi,Lekhnath and Pokhara Substations).
- Regular Energy Meter Testing works were also carried out on our Testing Lab. Total of 82 Energy Meters (68 Meters from NEA and 14 Meters from IPP) were tested.

e. Revenue Generation

The Department has made a total income of NRs. 1,41,39,913.26 from Grid Impact study, hiring testing equipments, programming and testing of energy meters and by selling Grid Code and Tender Documents.

SYSTEM OPERATION DEPARTMENT (SOD)

As in the preceding year, Load Dispatch Centre 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

f. Transmission Loss Status

Comparison of Transmission Line Loss of different F/Y

S. No.	F/Y	Total Import Energy(MWh)	Total Export Energy(MWh)	Transmission Line Loss Energy(MWh)	Transmission Line Loss in Percentage
1	2068/69	3736805.66	3520922.32	215883.34	5.78%
2	2069/70	3772905.51	3574865.10	198040.41	5.25%
3	2070/71	4120153.81	3889823.10	230330.71	5.59%
4	2071/72	4394005.17	4193004.03	201001.14	4.57%
5	2072/73	3097302.02	2934259.90	163042.12	5.26%
6	2073/74	5552927.57	5275058.79	277868.79	5.00%
7	2074/75	6347849.13	5990500.00	357349.13	5.63%

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 towards fast restoration of the power system in case of black-outs, thereby reducing loss of revenue.

In this fiscal year load shedding of industrial consumers has been completely abolished throughout nation from 31st Baisakh 2075 thus there is no load shedding throughout the nation for both industrial and domestic consumer. This has become only possible with vision of management, addition of new IPP power plants in the system, increase in import and incessant effort of LDC team with backing from concerned departments. The commissioning and operation of Raxual –Parwanipur 132 kV line and 2nd circuit of Kataiya-Kusaha 132 kV line in this fiscal year have supported enormously to operate INPS system efficiently catering the power demand of the nation.

Effective short term planning and daily scheduling of energy and power demand of INPS by LDC facilitated to optimize available generation and power import from India. This enables LDC to accomplish economic dispatch of power, Maintain voltage and frequency of the system within standard range which contribute significantly to improve financial health of NEA.

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, doing the regular maintenance works. Around Rs.280 million revenue is being received annually by leasing (to Nepal Telecom and other private companies) fibers from the fiber optic cable. This fiscal year around 470 km of fiber network has been added to our system. 120 km from LDC, around 210 km from 2nd circuit of Kolhapur –Mahendranager 132kv expansion project and about 140 km from Attaria- Chameliya 132 kV project.

Exiting software and hardware installed in the LDC control building were manufactured in 2002 and earlier. The frequency of malfunction of installed equipment has been increased compared to previous years and the spare parts are also not available in local and international market. To mitigate this problem process of upgrading and rehabilitation of existing hardware and software was initiated in last fiscal year.In this fiscal year contract for Supply and Works for the Rehabilitation/Upgrade of the existing Load Dispatch Centre (LDC) at Siuchatar, Kathmandu and for a Back-up LDC to be implemented at different location project has been awarded to SIEMENS LTD India through process of international competitive bidding. Presently Project is in software development and hardware design phase. After the earth quake of 2015, necessity of emergency control center as a backup for main LDC has been felt. To expedite the process tender notice for construction of emergency control center has been published in this fiscal year.

GRID DEVELOPMENT DEPARTMENT

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

Recently Completed Projects

1. Kusum-Hapure 132kV Transmission Line Project

The main objective of this project is to develop transmission system up to the site of Dang Cement to be established at Hapure of Dang. Further extension of this line will benefit Sonapur and Rolpa Cements. The project started in 2065/066 with estimated cost of NRs. 500 Million. Hapure 132/33kV Substation has been charged on September 2017 after completion of 132kV Transmission Line from Kusum Grid Substation. The project is financed by GoN via

Ministry of Industry. Main activities of the project include: construction of 22km Kusum-Hapure 132kV transmission line and 132/33kV, 30MVA Hapure substation at Panchakule of Dang district. Additionally installation of 33/11kV,6/8MVA power transformer is going on to provide reliable power to the local people.

2. Syaule 132/33kV Substation Project

The objective of this project is to strengthen the power supply system in hilly region of Province No: 7 and it aids also in evacuation of power from Chameliya HEP to INPS. The cost of this project is estimated to be US$ 5.11 million which is funded

Syaule substation

by GoN with the aim of improved supply system thereby ensuring power system reliability, quality and security of hilly districts such as Dadeldhura, Doti, Achham, Bajhang, Baitadi etc. This project was initiated in 2070/71 (2013/2014) and has been completed in 2074/75.

As of Asadh 2075, substation has been charged and currently feeding the load via four (4) 33 kV feeders and three (3) 11 kV feeders.

3. Chameliya- Attariya 132 kV Transmission Line Project

Objective of this project is to reinforce the power supply system in the far western region and power evacuation from Chameliya Hydro Project (30 MW) as well as different IPP's from Darchula and Bajhang districts. Scope of this Project is to construct 131 km 132 kV transmission line, construction of Chameliya 132 kV substation and Bay extension at existing Attariya substations. Cost of this project is NRs. 2000 Million and funded by GoN in co-operation of South Korean Government. This line is charged on November 23, 2017.

4. Kohalpur-Mahendranagar 132kV 2nd Circuit Transmission Line

Objective of 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, to provide power to the upcoming cement factories, to evacuate power from Chameliya HEP, to supply part of the Butwal area from Tanakpur Hydro power plant. Cost of this project is estimated to US$ 26.7 Million and jointly funded by GoN, NEA and ADB. Project started in 2068/069 (2011/012). Scope of the project includes construction of 189km second circuit transmission line from Kohalpur to Mahendranagar with two new 132/33kV substations at Pahalmanpur and Bhurigaon. Substation up gradation to double bus system and appropriate 132kV bay extension at Kohalpur, Attariya, Lamki and Lalpur Substations has also been taken care by the project.

Transmission line construction works have been completed. Work is going on to demolish civil structures to clear the RoW and charge the line. New substations under this project are charged in September 2017.

5. Dumre – Damauli – Marsyangdi 132kV Transmission Line

The construction of Middle Marshyangdi - Marshyangdi 39km second circuit transmission line is the one of the scope of Dumre – Damauli – Marsyangdi 132kV Transmission Line Project. The Objective of second circuit stringing is to evacuate power generated by Middle Marshyangdi power plant, Upper Marsyangdi and IPP's hydro power projects of Marshyangdi Corridor. Cost of the main

project is estimated to US$ 1.3 Million which was jointly funded by loan assistance of ADB, GoN and NEA. This line is charged on Chaitra 2074.

PROJECTS UNDER EXECUTION

1. Thankot – Chapagaon - Bhaktapur 132kV Transmission Line

The project was started in 2055/056 with the objective of enhancing transmission capacity, improving supply reliability in Kathmandu Valley, reducing losses and voltage drops through construction of 132kV ring main. The project cost is estimated to US$ 23 Million and project is financed by GoN and NEA. Scope of Thankot-Chapagaon-Bhaktapur 132kV Transmission Line Project includes construction of 28km 132kV transmission line from Matatirtha (Thankot) to Bhakatpur, construction and upgrading of different substations at Kathmandu valley. Upgrading and construction of substations in Kathmandu valley and transmission line portion within Kathmandu and Bhaktapur Districts have been completed in the previous fiscal year. However, construction of transmission line in Lalitpur district which was stopped due to protest of local inhabitants demanding 100% RoW compensation. NEA has taken initiations to start the construction work.

2. Kabeli 132kV Transmission Corridor (Second and Third Section)

Objectives of this project is to facilitate evacuation of power generated from Kabeli-A HEP as well as from Kabeli, Hewa, Mai and other river basin of eastern region. Construction of transmission line and associated substations will cater the increasing electricity demand of Damak area, relieve Anarmani substation and improve power supply situation in the eastern part of the country.

Cost of this project is estimated to US$ 31 Million and funded by WB, GoN and NEA. First section Damak-Godak about 35km of transmission line and associated substations Damak and Godak has been completed and evacuating power from differebt IPP's. Second section from Ilam to Phidim, 97 no. of tower erection completed out of 125 and 18 no. of tower foundation remaining and 22.5 km of conductor stringing completed out 42.88 km. Third section from Phidim to Amarpur, 2 no. of tower erection remaining out of 40 and 2.5 km of conductor stringing completed out 13.33 km.

Project was started in 2008/09 and estimated completion date is 31st December, 2018.

3. Singati-Lamosangu 132kV Transmission Corridor

Objective of this project is to evacuate power from different hydroelectric projects to be developed by different IPP's in the Tamakoshi-Singati basin. Total cost of the project is about US$ 13 million. The project was started in 2065/066 and is estimated revised scheduled to be completed within 31st December, 2018. Project will construct Lamosangu - Singati 40 km 132 kV Double Circuit Transmission Line and 132/33 kV, 30 MVA substation at Singati.

As of Ashadh 2075, about 80 % construction of substation and about 70 % of Transmission Line component are completed. Land acquisition for Tower Pad is in progress; rate for land compensation for both Dolakha and Sindhupalchok is finalized and distributed. Construction of approx. 62 towers out of 124 foundations has been completed and construction of foundations on more than 15 locations is underway. First lot of tower material has already arrived at site and tower erection works has been initiated.

4. Dumre – Damauli – Marsyangdi 132kV Transmission Line

The second part of this project scopes includes contruction of New Marsyangdi (Marchi Chwok) 30 MVA 132/33 kV substation, Expansion of existing Damauli, Middle Marsyangdi, Marsyangdi (Lower Marsyangdi) substations including 132kV

protection scheme of existing Lekhnath & Bharatpur 132 kV Line at Damauli Substation, Construction of new 132 kV double circuit which is 21 Kms from Dumre to Damauli, Breaking the Middle Marsyangdi- Marsyangdi 132 kV double circuit transmission line near Markichowk and construction of 132 kV 4 circuit transmission line about 1 km loop in-out double circuit line towards proposed New Marsyangdi Substation, Construction and installation (stringing) of OPGW.

The objectives of this part of the project are to evacuate power generated from Middle Marsyangdi power plant, Upper Marsyangdi and IPP in that region. Estimated cost of this project was approx. US$ 1.3 Million which was jointly funded by loan assistance of ADB, GoN and NEA. The contract agreement for Substation part of the project was done 23rd June 2014 (2071.03.09) and for Transmission part of the project was done 12th October 2010 (2067.06.26). Estimated revised schedule to complete all the scope of work is Asadh 2076.

5. Rupani 132/33kV Substation Project

Objective of this project is to reinforce the power supply system of different load centers of Saptari District and also certain part of the Udaypur district. Cost of this project is estimated to US$ 3.5 Million and funded by GoN. Project is expected to be completed by December 2018. Scope of the project includes construction of Rupani 132/33 kV, 63 MVA substation.

As of Asadh 2075, control room construction, equipment foundation work in the switchyard, erection of steel structure are completed and other civil construction works including staff quarter, store house, guard house are in progress.

6. Kusma-Lower Modi 132kV Transmission Line Project

Objective of this project is to increase power evacuation capacity of the IPP's up coming in the Kaligandaki Corridor. The project is started in 2070/071 (2013/014) and expected to be completed on December 2018. Cost of this project is estimated to US$ 3.5 Million and funded by GoN. Scope of the project includes construction of 6.2 km 132kV single circuit transmission line from Kusma to Lower Modi HEP and 132kV Bay extension at Lower Modi.

As of Asadh 2075, Erection of 17 towers out of 19 are completed and stringing of 3 km line completed, Bay extension at Lower Modi is in progress.

7. Hetauda-Birgunj 66 kV Transmission Line Capacity Increment Project

Objective of this project is to increase power transmission capacity to serve to the industrial corridor from Simra to Birgunj. The project was started in 2072/073 (2015/016) and expected to be completed on Ashadh 2076. The estimated cost of this project is NRs. 368 million and funded by GoN. Scope of the project includes replacement of ACSR 'WOLF' conductor used in existing double circuit 66 kV transmission line from Simra to Birgunj (22.2 km) via Parwanipur substation High Temperature Low Sag (HTLS) conductor. As of Asadh 2075, preparation for the preliminary works like check survey for replacement has been completed.

8. Ramechap Garjyang Khimti 132kV Transmission Line Project

The objective of this project is to evacuate the power generated by various IPP's in the Khimti and Likhu corridor. This project started in FY 067/68 and is expected to be completed by Asadh 2076. The estimated project cost is US$ 12 Million which is funded by the GoN. Construction of 30 MVA, 132/33 kV substation at Garjyang and construction of 31 km, 132 kV double circuit transmission line from Garjyang to New Khimti and construction of two line bays at New Khimti substation are the scope of this project.

Underconstruction Garjyang 132 kV Substation

As of Ashadh 2075, Forest Clearance/Tree cutting and Land Acquisition works has been completed and the contractor has mobilized its team for construction works of both Substation and Transmission Line. Civil and Electrical Design, Drawings and Equipment Drawing are under review for approval, while other major design drawings for transmission line and substation are completed. Transformer Foundation, Control Building construction work for Switchyard at Garjyang Substation has been started. Transmission Line tower foundation works are going on and expected to be completed by coming F/Y.

9. New Modi-Lekhnath 132kV Transmission Line Project

New Modi – Lekhnath 132kV Transmission Line Project has been considered for power evacuation from the Modi HEPs and from the other IPPs of the surrounding areas where number of HEPs are in pipeline of the construction. The project is located at Parbat and Kaski districts of Dhawalagiri and Gandaki zones. Construction contract has been signed for substation and transmission line packages. As of now detail survey of transmission line has been carried out from New Modi substation at Kerunga, Parbat to existing substation at Lekhnath, Kaski district through new 132/33/11 kV, 30 MVA Lahachowk Substation. The Project is funded by the Exim Bank of India. Land required for both New Modi Switching Station and Lahachowk Substation have been acquired. Contract for the Transmission Line and Substation is finalized, design and check survey work for transmission line as well as design layout of substation is in progress.

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

This project is intended for evacuation of around 217.5 MW of power from the candidate hydro Power Projects that will come in the Sagarmatha Zone (Pradesh 1) of Nepal. The proposed Transmission Line Project comprises of following components:

Construction of 90 km double circuit 132 kV Transmission Line with CARDINAL conductor from Mirchaiya to Tingla substation and Construction of 132/33/11 kV 30 MVA Substation at Tingla.

Erection of Tower

Exim Bank has approved this contract with the Effective Date of Contract (EDoC) being 17th June 2014. The project is set to be completed by 24 March 2019. As of FY 2074/75, out of 303 towers, 63 tower foundations have been completed along with erection of 11 numbers of towers. 33 kV section of the Tingla substation is going to be completed within 2018. Tree cutting of Siraha district is completed and that of Udayapur district in on the process. Land acquisition process for tower pad in all districts is going on.

11. Burtibang-Paudi Amrai-Gulmi-Arghakhanchi-Motipur 132kV Transmission Line Project

Objective of this project is to increase power evacuation capacity of the IPP's upcoming in the Baglung area and extension of National Grid in Baglung, Gulmi, Arghakhachi & Kapilvastu District. The scope of the project includes construction of five new 132/33/11 kV, 30 MVA Substations namely at Burtibang, Paudi Amrai, Tamghas, Sandikharka and Motipur and construction of 82 km, 132 kV double circuit transmission line from Motipur to Burtibang. Cost of this project is estimated to be US$ 30.08 Million and is funded by GoN. The project is initiated in 2066/067 (2009/10). The construction works of the first section (Motipur-Sandhikharka) of the Project has started on FY 2074/075 where the check survey works of Motipur- Sandhikharka 37km transmission line and the layout works of Motipur & Sandhikharka Substation are going. This section is scheduled to be completed by Ashad 2077. Bidding process has been started for construction of Sandhikharka Burtibang 48km transmission line on 2018/06/20 and or the construction of associated substations will be started soon. The total Project is intended to be completed by the end of FY 2079/080.

12. Dordi Corridor 132kV Transmission Line

This project mainly compromises of two components, i.e. constructing Kirtipur 132/11 kV Substation and 10 km 132 kV D/C line from Kirtipur to Udipur of Lamjung District with the main objective of evacuating power from IPPs being constructed at tributaries or basin of Dordi River located at Lamjung District. The cost of this project is estimated to be US$8.4 million which is funded by GoN. The project was initiated in 2068/69 and scheduled to be completed by the Shrawan 2076.

As of Asadh 2075, major equipment design drawings has been approved and are under manufacturing process. Associated civil works on site is about to be initiated.

13. Kushaha (Inaruwa) - Biratnagar 132kV Transmission Line

Objective of this project is to reinforce the power supply system in Morang, Sunsari District as well as to relieve existing Duhabi Grid Substation from excessive load demand of local and Industrial Area of Biratnagar. After completion of this project will improve the reliability and quality of power supplyto the area. Scope of the project includes construction of 23km 132kV double circuit transmission line on steel monopole structure which will be started from Inaruwa 400/220/132kV substation to Barju VDC (Ramganj Belgachiya) and construction of New Biratnagar 132/33kV, 2*63MVA Substation.

Added to this, scope of project includes construction of double circuit 33 kV line from New Biratnagar Substation up to Rani and Tankisinwari Sub-stations including reinforcement and up gradation of 33kV existing Rani and Tankisinwari Sub-stations. Estimated Cost of this project is US$ 18.8 Million and funded by GoN. Project is expected to be completed on Ashad 2078.

As of Asadh 2075, contract agreement of 132/33kV, 2*63MVA Biratnagar Sub-station was signed on November 23, 2017. The civil construction work has been started on site from June 06, 2018. The drawing and design approval of electrical equipments are under the process.

Tender for transmission line has been called and technical evaluation of the received Bids are in process.

14. Purbi Chitawan 132/33kV Substation

Objective of this project is to supply the reliable, adequate power to eastern part of Chitwan district. The project is initiated in FY 2072/073 (2015/016) and scheduled to be completed on April 01, 2020.

Cost of this project is estimated to NRs 536 Million and funded by GoN.

As of Asadh 2075, the contract has been signed, construction work at site in commence to be started very soon.

15. Butwal-Lumbini 132kV Substation

Objective of this project is to reinforce the existing transmission system in this region and to supply reliable power to the load center of Rupandehi District. Cost of this project is estimated to US$ 9.5 Million and funded by GoN. The project is initiated in 2070/071 (2013/014) and scheduled to be completed by 2077.

As of Asadh 2075, Contract Agreements have been signed for both the substation and transmission line works. About 65% of Civil Construction work of Staff quarter and Compound Wall has been completed. Design works of the substation and check survey of Transmission line is completed.

16. Balefi-Barhabise Corridor 132kV Transmission Line Project

Objective of this project is to reinforce the power supply system and power evacuation from different IPP's at Balefi Corridor. Cost of the project is estimated to US$ 7.5 Million and is funded by GoN. This project is initiated in 2072/073 (2015/016) and expected to be completed by Asadh, 2078.

As of Asadh 2075, the land acquisition for the Pantang (Balefi) substation has been accomplished. Construction of approach road, compound wall fencing and protection works started at substation site. Detail route survey work of 132 kV transmission line is completed and IEE study work is underway.

17. Ghorahi-Madichaur 132 kV Transmission Line Project

Objective of this project is to reinforce the power supply system and power evacuation from different IPP's at Madi Khola and Lungri Khola of Rolpa district. Scope of this Project is to construct about 37 km of 132 kV d/c transmission line from Khungrri, Rolpa to Ghorahi Substation at Jhingani, Dang and new 132/ 33 kV substation at Khungri of Rolpa. Estimated Cost of this project is US$ 11 Million and funded by GoN. This project is initiated in 2073/074 (2016/017) and expected to be completed by Asadh. 2078.

As of Asadh 2075, the land acquisition for the Khungrri, Rolpa substation has been accomplished. Detail route survey work is completed. MoU has been signed for IEE study.

18. Chameliya-Syaule-Attariya 132kV Second Circuit Transmission Line Project

Objective of this project is to reinforce the power supply system and power evacuation from different IPP's from Darchula and Bajhang districts. Scope of this Project is to construct 131 km second circuit transmission line on same double circuit tower of existing Chameliya-Attariya 132kV transmission line and Bays extension work at associated substations. Cost of this project is NRs. 450 Million and funded by GoN. This project is initiated in 2074/075 (2017/018) and expected to be completed by end of Asadh 2077.

As of Asadh 2075, construction contract has been signed, conductors, insulators and hardware have been delivered at Site and stringing work is about to start.

19. Bhaktapur-Baneshwor- Patan 66kV Transmission Line Up gradation Project

Objective of this project is to reinforce existing power supply system of Lalitpur district via Patan substation and Baneshwor substation. Scope of the project includes replacement of about 19 km existing ACSR 120 sq. mm Chinese conductor and ACSR 'WOLF' conductor from Bhaktapur to Suichatar via Patan and Baneshwor substations with High Temperature Low Sag (HTLS) conductor. This project is initiated in 2074/075 (2017/018) and expected to be completed by the end of Asadh 2077. As of Asadh 2075, to adopt new HTLS technology proposal has been sought for consultancy to choose the appropriate conductor for the project. Submitted proposal sent to the management for approval.

20. Dhalkebar- Loharpatti 132 kV Transmission Line Project

Objective of this project is to reinforce the power supply system in this region by evacuating power to load center of Mahottari District. Cost of this project is estimated to NRs. 850 Million and funded by GoN.

Scope of the project includes construction of about 20km double circuit 132kV Transmission Line from Dhalkebar to Loharpatti, construction of 132/33/11 kV, 63 MVA Substation at Loharpatti, Mahottari and reinforcement of existing 33 kV substations of the area.

As of Asadh 2075, land acquisition for the substation has been accomplished. Detail Survey of the line is completed and IEE work is in the final stage.

21. Nawalpur 132 kV Substation Project

Objective of this project is to reinforce the power supply system in this region by evacuating power to load center of Sarlahi District. Cost of this project is estimated to NRs. 665 Million and funded by GoN.

Project components include construction of 132/33/11 kV, 63 MVA Substation at Nawalpur in between Dhalkebar and Chandranigahapur and reinforcement of existing 33kV Substations of the area.

As of Asadh 2075, land acquisition for the substation has been accomplished. Preparation of project cost estimate and the Bidding Document are under progress.

Projects for Power Supply to Cement Industries

In order to promote cement industries, the GoN has taken policy of developing transmission line networks up to the site of 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. 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 Industry allocated budget for this work. The project is scheduled to be completed by the end of Mangsir 2075. Project components includes construction of 15 km 132kV double circuit transmission line from existing Lamahi Substation to Ghorahi Municipality- 3, Jhingni and construction of 132/33 kV, 30 MVA substations at Ghorahi Municipality- 3, Jhingni.

2. Bardaghat- Sardi 132kV Transmission Line

The objective of this project is to provide power supply to Hongshi-Shivam Cement Industry. Cost of this project is estimated to US$ 4 Million and GoN through Ministry of Industry allocated budget for this work. The project is scheduled to be completed By Ashadh 2076. Project components

includes construction of 20 km 132kV double circuit transmission line from existing Bardaghat Substation to switchyard of Hongshi-Shivam Industry and construction of two 132 kV line bay at Bardaghat.

As of Ashadh 2075, EIA and construction License for Transmission Line has been approved. Construction Contract has been signed, survey/ check survey, soil test, tower design, tower spotting of transmission line work and design of 132kV bay extension work have been completed.

3. Sunuwal 132kV Substation

The objective of this project is to provide power supply to proposed Palpa Cement Industry as well as other existing industries along with the reinforcement of existing 33kV distribution network.

Cost of this project is estimated to US$ 6.1 Million and GoN through Ministry of Industry allocated budget for this work. The project is scheduled to be completed By Ashadh 2078.

Project components includes construction of 2x63 MVA 132/33 kV substation at Sunuwal-7, Charpala in between existing Butwal-Bardaghat 132 kV transmission line.

As of Ashadh 2075, IEE and Land Acquisition for substation is in progress.

Major Transmission Line projects 220kV

Projects under Execution

1. Khimti – Dhalkebar 220 kV 2nd Circuit Transmission Line

The project was started in 2059/60 with the objective of enhancing transmission capacity, improving supply reliability, reducing losses and voltage drops through construction of 220kV double circuit line. It will also help to evacuate the Upper Tamakoshi HEP power resulting in voltage improvement of Dhalkebar substation. The second circuit is scheduled to be completed by December 2018. The project cost is estimated at US$ 22 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 two nos. of 132kV line bays at Khimti and Dhalkebar substations in the first phase and stringing of second circuit in the second phase.

As of Ashadh 2075, About 7 km line of 2nd circuit is remaining to be strung.

2. Hetauda-Bharatpur 220kV Transmission Line

The objective of the project is to enhance the transmission capacity and reliability of the National Grid, 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 Ashadh 2076.

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.

As of Ashadh 2075, Acquiring Land for Tower Foundation is in final stage, RoW Clearance work is in progress. Earth Wire, OPGW cable, ACSR BISON conductor, Insulators, Hardware Fittings and partially Tower accessories received at site, out of 226 towers 161 Tower Foundations and 98 Tower Erection works are completed on Transmission Line Construction side.

Substation construction work at New Hetauda and Bardghat is in final stage. Land Acquisition for transmission towersis going on and, about 90% RoW clearance work has been completed.

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), 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 June 2018. Transmission Line Contract with old contractor has been terminated and new construction contract is about to sign with new contractor.

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 2075, 98 % of the transmission line construction materials have been received at site, out of 28000 trees only 6856 trees has been cut out. Out of 246 towers 70 Tower Foundations and 70 Tower Erection works are completed, 97000 trees have been planted on 61 hector land. Price fixation for 52 land parcel for tower pads from compensation committee has been completed and more than 30 land parcel has already been compensated for land Acquisition.

4. Chilime-Trishuli 220kV Transmission Line

Objective of this project is to increase power evacuation capacity of the IPP's upcoming in the Chilime-Trishuli Corridor. Cost of this project is estimated to US$ 35.0 Million and jointly funded by German Development Bank (KfW), European Investment Bank (EIB) and GoN. Project started at FY 067/68 and expected to be completed by FY 2075/76.

Scope of the project includes construction of about 19 km of 220kV double circuit transmission line from Chilime Hub Substation to Mailung, about

Survey works at Chilime Hub

8 km of 220 kV four circuit transmission line from Mailung to Trishuli 3B Hub substation and a 220/132kV a new GIS substation at Chilime.

As of Asadh 2075, Feasibility Study for 220 kV transmission line and Chilime Hub substation has been completed, updated IEE Report has been approved by DoED, detail Survey work and Check Survey is completed, Land acquisition of Chilime Hub Substation which was in limbo for more than 2 years was successfully concluded. The contract agreement for the construction of Transmission Line and Substation has been completed. In the fiscal year 2074/75 (2017/18 AD), the major works completed by contractor are: survey of transmission line and substation, soil investigation transmission line and substation, finalization of layouts of substation, preparation of tower schedule, submission of design of towers, submission of design and drawing of various equipment of substation, site preparation of substation by cutting and filling etc.

5. Trishuli 3B 220kV HUB Substation

Objective of this project is to facilitate evacuation of around 600MW of power of the IPP's generating stations up-coming in the Trishuli River basin. Major hydro power projects like Upper Trishuli 1 HPP (216MW), Upper Trishuli 3A HPP (60MW), Upper Trishuli 3B HPP (37MW) and Subsidiaries of Chilime Hydro Power Co. Ltd. (168MW) shall evacuate power through this 220/132/33 kV, 7x53.33 MVA Hybrid GIS Substation. Cost of this project is estimated to be US$ 16 Million with the joint funding of German Development Bank (KfW), European Investment Bank (EIB) and GoN. Contract was signed on November 13, 2017. The project is scheduled to be completed by June 19, 2019. Due to the urgency of the project to be commissioned to cope with RCOD of IPPs, the project completion period has been scheduled for 18 months in place of 24 months. Site leveling (cutting/filling) and soil investigation are being carried out at site. Most of the major equipment drawings/documents have been approved by the design review and supervision Consultant of the project.

6. Koshi 220kV Transmission Corridor

This project is being constructed to evacuate power from the various upcoming HEPs in the Koshi and Mechi zone of Nepal. This project is being financed under the Government of India supported Exim Bank of India 250 MUSD Line of credit to the government of Nepal out of which 90 MUSD has been set aside for the construction of Koshi Corridor Transmission Line Project.

Followings are the main components of the project.

Package-KC1: Construction of 105 km of 220 kV Double Circuit Transmission Line from Inaruwa-Basantapur- Baneshwar- Tumlingtar. Inaruwa-Basantapur section (74 Km) is being constructed as 220 kV, Quad Moose ACSR conductor but initially single circuit stringing on Double circuit tower. The rest section i.e Basantapur-Baneshwar-Tumlingtar Section (31 km) is being constructed as 220 kV, Twin Moose ACSR conductor but initially single circuit stringing on Double circuit tower. The Contract for the Package is signed. The cost of this package is 37.5 MUSD. The schedule date of completion of this package is June 2019 which may be extended up to January, 2020 due to delay in forest clearance and inherent RoW problem in Transmission line route.

Package-KC2: Construction of 220 kV new substations at Basantapur (2x100 MVA 220/132 kV+ 1x25/30 MVA, 132/33 kV), Baneshwor (2x25/30 MVA, 220/33 kV), Tumlingtar (2x100 MVA 220/132 kV+ 2x25/30 MVA , 132/33 kV) and 2 Nos. of Bays Extension at Inaruwa substation.. The construction contract is signed on July, 2018. The cost of this package is 25.3 MUSD. The expected completion date of the package is February, 2020.

Package-KC3: Construction of about 33 km of 220 kV double circuit Transmission Line (Twin Moose ACSR conductor on double circuit tower with stringing of single circuit initially) from Basantapur to Dhungesangu, Taplejung and construction of 132/33kV Substation at Dhungesangu. The transportation of 220 kV transformer and equipments is extremely difficult due to poor road condition and hence initially 132kV substation will be constructed at Dhungesangu. The contract is signed and contract being effective from June 2018. The cost of this package is 21 MUSD. The expected completion date of this package is December 2020.

7. Lekhnath-Damauli 220kV Transmission Line

Objective of this project is to increase power evacuation capacity of the generation units in the Western basin of Nepal and reinforcement of INPS. Cost of this project is estimated to US$ 65 Million and funded by German Cooperation (kfw) and GoN and expected to be completed on Ashadh 2078.

Scope of the project includes construction of 220kV, 45 km double circuit transmission line from New Lekhnath to New Damauli and 220/132/11kV substations at New Lekhnath and New Damauli.

As of Asadh 2075, detailed survey, feasibility study and IEE had been completed. The land acquisition for the substation is under progress.

Projects 220/132 kV Transmission Line under Feasibility Study

1. Borang-Ratmate 220 kV Transmission Line
2. Tumlingtar-Sitalpati 220 kV Transmission Line
3. Trishuli 3B- Ratmate 220 kV Transmission Line
4. Dadakhet-Rahughat 132 kV Transmission Line
5. Kohalpur-Surkhet-Dailekh 132 kV Transmission Line

MAJOR TRANSMISSION LINE PROJECTS 400KV

Projects under Execution

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

Nepal-India Electricity Transmission and Trade Project (NIETTP) funded by World Bank was started with the objective of establishing cross-border transmission capacity of about 1,000 MW to facilitate electricity trade between India and Nepal; and to meet the increasing demand of electricity in Nepal by the sustainable import of electricity.

The project includes design, supply and construction of approximately 285 km of Hetauda-Dhalkebar-Inaruwa 400 kV double-circuit transmission line that covers 10 different districts together with concomitant 220 kV substations at Hetauda, Dhalkebar and Inaruwa.

Out of 792 tower pads, 524 foundation and 449 erection works have been completed so far. The remaining parts mostly fall in the forest area and the process of tree- felling and stacking along the right-of-way of the route is under process in different districts.

Dhalkebar substation, which is at high priority of Government of Nepal is the pulling station for the Dhalkebar Muzzaffapur 400 kV Cross Border Line between Nepal and India and it is a major hub for the exchange of power in Integrated Nepal Power System. 220/132 kV Power Transformer at Dhalkebar substation has been successfully tested on 15 July 2018 and the substation is planned to be charged at 220 kV voltage level by mid of August 2018.

Tender for 220/132 kV Hetauda and Inaruwa substation had been floated and is under final stage of evaluation.

2. Hetauda- Dhalkebar-Inaruwa 400 kV Substation Expansion Project

Hetauda-Dhalkebar-Inaruwa 400kV Substation Expansion Project is funded by the Government of Nepal which includes Nepal's first three major grid substations of 400kV voltage level at Hetauda, Dhalkebar and Inaruwa. The Dhalkebar 400kV substation will be connected to the Muzaffarpur substation via. Dhalkebar- Muzaffarpur 400kV cross border transmission line that will also be

WB Team monitoring charging of 220/132 kV Transformer at Dhalkebar

connected to Hetauda and Inaruwa via. Hetauda-Dhalkebar-Inaruwa 400kV Transmission Line. The proposed three substations aim to serve as a backbone to transmission line system in the national grid of Nepal.

Six numbers of 400 kV lines bays, three numbers 315 MVA, 3-Phase, 400/220 kV autotransformers and 80 MVAr 400 kV bus shunt reactor at Dhalkebar Substation, two numbers of 400 kV lines bays, three numbers 315 MVA, 3-Phase, 400/220 kV autotransformers and 50 MVAr 400 kV bus shunt reactor at Inaruwa Substation and four numbers of 400 kV lines bays, four numbers 167 MVA, 1-Phase, 400/220 kV autotransformers and 50 MVAr 400 kV bus shunt reactor at Hetauda Substation are to be constructed under the scope of the project.

As of now, the contract is signed for the construction of Dhalkebar 400kV GIS substation on December, 2017 and schedule to complete by the end of December, 2019.

Similarly, for the construction of Hetauda and Inaruwa 400kV GIS substations, tender has been floated and aims to complete within eighteen months after effectiveness of the contract agreement.

3. Bheri Corridor 400 kV Transmission Line

Objective of this project is to evacuate power from Uttarganga Hydro Project as well as IPP's upcoming in the Bheri river basin. Government of Nepal is funding for this project currently.

Scope of the project includes construction of 400kV, 25 km double circuit transmission line from proposed Uttarganga HUB to Nalsingadh Hydropower project switchyard and 400 kV substations at Uttarganga Hub for the pulling of power from IPP's. As of Asadh 2075, field work of detailed survey has been completed and land acquisition for the substation is under progress.

A joint meeting between State Grid Corporation China and NEA team at Tibet Electric Power Company Limited, Lhasa

4. Ratmate-Rasuwagadhi-Kerung 400 kV Transmission Line

The Ratmate (Galchhi) - Rasuwagadhi - Kerung 400 kV Transmission Line Project is being implemented as the first power grid interconnection of Nepal with China in line with the government policy to ensure energy security by facilitating cross-border electricity trade between Nepal and Tibet autonomous region of China.

The cooperation agreement has been signed between the State Grid Corporation of China (SGCC) and Nepal Electricity Authority (NEA) to carry out the feasibility study of China-Nepal Power Grid Interconnection on 20th of June, 2018. Furthermore, a Joint Technical Group (JTG) has been set up, comprised of 5 members from each country, for the implementation of the project.The scope of the project consist of design, supply and construction of approximately 68 km of 400 kV double-circuit transmission line from Rasuwagadhi border point at Rasuwa district to Ratmate substation at Nuwakot district. Presently the detail survey works for this project is being carried out. For the study of environmental impact, proposals have been collected and are being reviewed.

Projects 400 kV Transmission Line under Feasibility Study

1. Arun- Inaruwa 400 kV Transmission Line

2. Tingla- Mirchaiya 400 kV Transmission Line

DISTRIBUTION AND CONSUMER SERVICES DIRECTORATE

Distribution and Consumer Services Directorate (DCSD) is responsible for overall management of electricity distribution network & services of NEA. The major activities of this directorate includes planning, expansion, operation, maintenance & upgradation 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 introduced some smart meter reading and billing techniques such as advanced metering infrastructures (AMI) with plans to introduce even better techniques and expand them in the entire country. The operation and maintenance of off grid small hydro power plants, also falls under the jurisdiction of this directorate.

This directorate is headed by the Deputy Managing Director as a chief of DCSD. There are Planning and Technical Services Department (PTSD) and Community Rural Electrification Department (CRED) at the central level and eight regional offices, headed by the Directors/regional chiefs, to manage the overall distribution and consumer services activities in more effective and efficient manner under this directorate.

DCSD is the largest directorate of NEA in terms of number of employees and business activities. Approximately 67% of the total staffs of NEA are employed under DCSD. DCSD is in leading front to earn revenue for sustaining operation, maintenance and development activities of NEA. DCSD is providing services to consumers through its 108 Distribution Centers spread over the whole country.

Performance Highlights

In FY 2017/18, total number of consumers under DCSD reached 35,51,226 an increase of 9.17% over the last fiscal year's figure.

Customer Category	No of consumer (% of total consumers)	Sales %	Revenue %
Domestic	93.83	43.50	40.29
Non-Commercial	0.59	3.11	4.78
Commercial	0.61	7.38	10.57
Industrial	1.37	37.53	37.25
Others	3.60	8.48	7.11

Similarly, in FY 2017/18, a total of 5526.12 GWh of energy was sold earning gross revenue of Rs. 55,468.156 Million. Industrial and Commercial consumer categories combined together represent only 1.98% of the total number of consumers but shared 44.91% of total sales. Similarly, the domestic consumer category represents 93.83% of total consumers and contributed 43.50% to the total sale.

Programs and Activities

As part of reinforcement and expansion of the distribution systems, many programs, projects

and the activities are undertaken in FY 2017/18 to expand and improve the service delivery. These programs and activities are executed by the Departments at center and Regional Offices. 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 10,39,30,459.4 was made from arrears (unbilled) consumers. During the FY 2017/18, a total of 25,178 numbers of consumer lines were disconnected from which Rs 404.971 million was recovered. Similarly, legal action was taken against 9,502 consumers for electricity pilferage and Rs 9.05 (millions) was recovered from it. The goods on stock were closely monitored which resulted in substantial decrease in the stock material/amount.

Safety Day:

"Electrical Safety Day" awareness program conducted by Pokhara Regional Office

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 awareness for electrical safety, right from the implementation of the Project till completion. As in past years, NEA organized awareness program to mark "Electrical Safety Day", in collaboration with Society of Electrical Engineers (SEEN) and conducted safety awareness campaign on April 9, 2018. Similarly, safety day programs and activities were executed by the various offices at Central, Regional & District Level on the same day.

Loss Reduction Activities

Distribution Loss Reduction is the high priority area and was addressed mainly by two separate ways: Reduction of Non-Technical losses and Technical Losses. In F/Y 2017/18, special efforts were taken to identify/segregate the high loss prone areas and special drives were undertaken to reduce technical and non-technical losses. Losses were monitored at the center level and directives were issued to the concerned offices to improve the loss situation. Regional Offices 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. During the year under review following steps were taken to reduce the technical and non-technical losses.

- Continuous loss reduction program is carried for hooking control. A team is deputed for meter resealing and instant inspection of meter in each distribution center.
- Regular monitoring, data downloading and analysis of the large industrial and commercial consumers with TOD meters were augmented.
- Replacement of electromechanical meters with electronic meters and replacement of unmatched current transformers to eliminate possible errors in multiplying factors.
- Various public awareness campaigns were made in the central as well as regional level through various media on the proper use of

electrical appliances, use of energy efficient lamps and awareness for electricity theft etc.

- Use of Handheld Meter Reading Devices (HHD) has helped to reduce human errors during meter reading and improve the energy sales consumption ratio. It also has helped for efficient functioning of online payment system.
- Special effort was made by employees with the support from local administration for investigation of meter tampering and action was taken for electricity pilferage.
- Replacement of bare conductor with Ariel Bundled Conductor (ABC) cable in loss prone areas.
- Upgrading of overloaded conductors and transformers were also carried out to reduce the 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 14.82% in this Fiscal Year.

Demand Side Management

The electricity supply-demand gap in the country is still on higher side as a result of the fast growing demand for electricity to meet industrial growth, increasing urbanization and electrification expansion. In order to resolve the existing energy crisis, an awareness campaign on the efficient use of electricity using more efficient LED lights instead of conventional, energy-intensive Incandescent lamps and CFL lamps was initiated. The advertisement was made in different

Electrical Vehicle Charging Station at Ratnapark Distribution Centre

electronic media as well as in the newspapers and hording board displays.

Besides, the electricity supply scenario is expected to improve significantly once the Upper Tamakoshi and other NEA/Chilime subsidiary projects are in operation. Various generation projects from IPPs are also under construction and are expected to complete soon. NEA, thus is, also trying to diversify the use of electricity in other areas as electric vehicles (EV), cooking, heating and cooling, etc.

Future Plans and Programs

NEA management with full cooperation from its consumer has become able to manage the load shedding problem which was crippling the nation since a decade. However, the peoples aspirations has now shifted and NEA is bound to supply safe, reliable and quality electricity to its consumers. NEA's future programs are thus directed to meet these aspirations through improved customer care services.

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 in its financial health. 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 are being addressed without delay and the procedure for new connection related

works are being 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. Plans are to make available the payment and billing information in internet so that consumer can access information on line. A system is already implemented for consumers to pay the electricity bill online through internet based payment system.

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. 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 equipment
- 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
- Preparing and updating the construction standards and guidelines for implementation of electrical installations and construction activities for 33 kV and below voltage level.
- Testing and locating faults of underground cables of 11 kV & 33 kV feeders throughout the country with the help of cable testing equipment and provide technical support.

146 collection centers out of 168 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 successfully completed the entire distribution centers within Kathmandu valley with 'Any Branch Payment System.

PTSD has recommended to approve Rs 10,39,30,459.40 for 170 consumer in connection with arrears (unbilled) files forward by different distribution Centers.

Energy Monitoring and Metering Enhancements

Under this program, static meters installed in community consumers of different regional offices especially Pokhara, Butwal, Janakpur & Hetauda, were monitored through field inspection and download, and recommended for re-programming, replacing & installing meters wherever necessary. For consumers like IPPs, Solar Power and our own grid, static meters were programmed along with the provision of net metering features. In order to make static meters compatible and communicable with the AMR system, Automatic Metering Infrastructure and static meters were communicated and validation of output data was done so that AMR could give required data in desired format.

GIS SMART GRID PROJECT

The scope of this project is to manage NEA asset inventories along with its position on earth. NEA has planned to develop GIS (Geographical Information System) software that keeps inventories of all the poles, transformers, cables, consumers' connections to each transformer along with geo-positioning. It helps concerned person to know the actual information about poles, transformers

and consumers' capacity and also to balance the transformer's load as per connection to the consumer. It also facilitates to provide consumer service faster & reliable and identify any fault in distribution system. GIS based Data Survey work will be conducted in F/Y 2018/19 for 31 branches namely Bhadrapur, Anarmani, Damak, Rangeli, Biratnagar, Duhabi, Ithari, Inaruwa, Rajbiraj, Lahan, Siraha, Mirchaiya, Sakhuwa, Janakpur, Jaleshwar, Gaur, Kalaiya, Birgunj, Simara, Banaeshwar, Pulchok, Thimi, Bhairahwa, Taulihawa, Nepalgunj, Ghorahi, Tulsipur Surkhet, Tikapur, Dhangadhi, Mahendranagar.

This project is funded by the Government of Nepal (GoN).

Work in Progress:

- A pilot survey for Jorpati DC is in progress.
- Procurement of hardware has already been initiated.
- Document for procurement of GIS based Survey is being prepared.

Glimpse of GIS Mapping at Jorpati DC

SOLAR STREET LIGHT PROJECT

The project has started with the objective of road lighting in different areas of Kathmandu & Lalitpur Metropolitan City to facilitate pedestrians and vehicular movements. Solar Street Lights are independent of utility grid resulting in less operational cost. Eco-friendly Solar Street Light helps to minimize crimes and violence in society.

Solar Street Light Project is funded by Government of Nepal (GoN). Procurement of solar street light has been initiated. This project is scheduled to be completed by F/Y 2018/19.

RASUWA - NUWAKOT DISTRIBUTION SYSTEM RECONSTRUCTION & IMPROVEMENT PROJECT

This project is being implemented with the assistance from German bank KFW and will be implemented in Rasuwa & Nuwakot districts. The major components of projects are as follows:

Neighborhood Electrification Project

Power Grid Corporation of India (POWERGRID) has been assigned as consultant for this part of project. Procurement phase has been completed and implementation phase is continuing and design drawings for electrical equipment and civil works are under review condition.

Field survey work has been completed by the contractor and design is under review by the consultant.

Survey license for 33 KV line has been issued from Department of Electricity Development (DOED). IEE study work is under study phase from NEA, Environmental and Social Study Department (ESSD). Other related social and environmental study reports and documents are being prepared by consultant. Environmental and Social Impact Assessment (ESIA) and Environmental and Social Management Plan (ESMP) report has been approved from Kfw bank. The construction work will be started after Pre-Construction


Dicussion with locals for 33 kV line route of Neighborhood Electrification Component at site

Survey Report is approved. Design drawings for major equipment have been approved from the consultant and manufacturing is underway.

Reconstruction & Improvement of Electricity Distribution System

Power Grid Corporation of India (POWERGRID) has been assigned for the consulting services for reconstruction during procurement phase. The consultant is preparing design report for project execution that consist electrification and social development components. The consultant has submitted design report to bank for approval. Preparation of Bid document and Cost estimate is in progress.

For immediate relief measure works, the contractor has completed the field survey reports which are approved by NEA.

Proposed site of 33 kV Bhalche Substation

BUIPA-OKHALDHUNGA 33KV TRANSMISSION LINE PROJECT (KHOTANG AND OKHALDHUNGA DISTRICTS)

The scope of this project includes the construction of 33 km of 33kV, 80 km each of 11kV and LV lines and two 33/11kV, 1.5MVA substations at Okhaldhunga and Khotang districts. Construction of 33km of 33kV, 69.79km of 11kV, 31.5km of LV line and charging of 27 nos. of Transformers have been completed. Buipa-Bakshila 11kV line construction has been completed & Bakshila, one of the remote VDC of Northern region of Khotang has been electrified.

Jaljale-Buipa 33kV line (69km), constructed by then Jaljale-Diktel 33kV project, had been charging at 11 kV. So, parallel new 11kV line was constructed to free this line. 33/11 kV 1.5 MVA Buipa S/S was charged on 2016 which solved the voltage drop problems, facilitated interconnection of IPPs and improved the quality of electricity in Khotang & Okhaldhunga districts.

Similarly, Buipa-Okhaldhunga 33kV line (33km) was also charging at 11kV. Therefore parallel 11kV line was constructed & freed it. Maintenance of Buipa (Khotang) to Okhaldhunga 33kV line was completed & successfully charged at its rated (33kV) capacity, as a breakthrough, on Oct. 30, 2017. This eventually paved road to charge newly built 33/11kV 1.5 MVA Okhaldhunga Substation on Dec. 17, 2017. Ultimately, Okhaldhunga district has been connected to the central grid system of Nepal this year.

Completion of this project is a breakthrough in power development history of the Eastern Region.

33/11kV Okhaldhunga Substation, Gorumare Bhanjyang, Okhaldhunga (now in operation)

RASUWAGHAT-KHOTANG S/S AND RE PROJECT

Works under this Project include the construction of 14km of 33kV line, one 33/11kV 3 MVA capacity substation at Bagedhunga and 90 km of each 11kV & LV line in Khotang and Udaypur districts. Out of these, 10 km of 33kV, 37.2km of 11kV,

33km of LV line and 11nos. of transformers have been installed and charged. Store building has been constructed in Bagedhunga. Rasuwaghat-Bagedhunga 33kV line was charged at 33kV level. 33/11kV, 750kVA transformer has been installed in Bagedhunga. Also, 33kV Bay extension at Jaljale substation has been completed & is in operation. 3 MVA Bagedhunga Substation work is in progress. All equipment for S/S has been imported except Transformer. levelling works completed, control building and other civil works are in progress. The project is expected to complete in F/Y 2018/19.

COMPUTERIZED BILLING AND NETWORKING DIVISION

Computerized Billing and Network Division have always been striving towards enhancing the revenue collection of NEA. Our mPower billing software has provided NEA, a competent billing system with several features and modules for monitoring the entire process and transparency of the revenue system.

mPower is already implemented in 146 revenue collection centers out of 168 revenue collection centers. This Division has targeted the data migration/implementation (Completion) of M-power Billing System in all the remaining revenue collection centers of NEA within this Fiscal Year. Currently mPower Billing System covers more than 95% of the total consumer count and also covers more than 97% of the total NEA revenue.

Handheld Meter Reading Device (HHD) also in operation has helped reduce human errors during meter reading and improve the energy sales consumption ratio. This Fiscal year the division has plans to procure Hand Held Device (HHD) with GPRS function such that the meter reading shall be directly uploaded to the server system immediately after it has been read from the consumer premises meter for efficient meter reading and online payment.

Web Based Services to the customer (to view the bills) and Interactive Voice Response System where the consumers can query the bills through phone lines. The Customer Management Information System (LAGAT) has been implemented in various revenue collection centers which will help in keeping the customer database up to date.

Any Branch Payment System (ABPS) which has been implemented inside Kathmandu valley has helped the customers to pay their bill in any locations within Kathmandu valley with ease. It has helped NEA to collect revenue and get analytical reports on time.

Online payment system has been introduced from Bhadra, 2074 and has been successfully implemented in 124 revenue collection centers. Online payment refers to money that is exchanged electronically. This system has focused both urban and rural consumers where the consumer can pay their billing through various services as online banking, mobile banking. Till date we have contracted with eight merchants namely Esewa, Paypoint, CFS Remit, City Express, Nepal Investment Bank Limited, Prabhu Bank Limited, Himalayan Bank Limited and Mahalaxmi Bikas Bank. Online system has eased the difficulty of the consumers standing in queue for hours just to pay the electricity bill. Now consumers can pay their bill from home or anywhere according to consumers preferred location if they have the internet connection. Customized training programs of the billing system are conducted to NEA staff frequently. In coordination with NEA Training Center, the division plans to conduct more training programs to enhance the skill and knowledge of these staff for smooth operation of the mPower Billing System.

GRID SOLAR ENERGY AND ENERGY EFFICIENCY PROJECT

The World Bank (WB) has financed towards the cost of Grid Solar Energy and Energy Efficiency Project (GSEEP) under IDA Credit No. 5566-NP

(Project ID P146344) for an amount of USD 130 million under a counter financing of USD 8 million by the GoN. The financial agreement between GoN and the WB was concluded on February 20, 2015. The GSEEP Project comprises of following two components:

I. Component 1: Grid–connected Solar PV Farms Development: Under this component, 25 MWp Grid Tied Solar Farm shall be developed in the NEA owned land at Devighat and Trishuli. The Contract for Design, Planning, Engineering, Procurement (Manufacturing/ Supply) Construction/Erection, Testing, Commissioning and Five Years of Operation & Maintenance of 25 MWp Utility Scale Grid Tied Solar Farms has been awarded. The Civil and Structural design is under approval of consultant and Site Preparation Work has been commenced.

2. Component 2: Distribution System Planning and Loss Reduction: The Status of project under this component is as follows:

a. The Contract for Design, planning, engineering, procurement, installation, testing and commissioning of 33/11kV substations and 33kV lines in the development of the NEA grid The Scope of this project covers Supply and installation of 5 nos. of new 33/11kV 3 MVA substations, 3 nos. of new 33/11kV 6/8 MVA substations at Kapilbastu, Arghakhachi, Sindhuli, Ramechap & Gulmi districts along with 55.50 km of new 33kV line in Ramechhap and 44.5 km of new 33kV line in Sindhuli district and 15km of new 33kV line in Gulmi district. The works under this project has already been initiated and is in progress.

b. The Contract for Design, Supply, Installation/ Erection, Testing and Commissioning of 11/0.4 kV Distribution System has been awarded. The Scope of this project covers design, supply and installation of total 347.13 km of 11kV Line and 928.22 km of 0.4kV Line and distribution transformers for electrification in Dolakha, Sindhuli & Ramechap districts. The works under this project has already been initiated and is in progress.

c. The Contract for Design, Supply, Installation/ Erection, Testing and Commissioning of 11/0.4 kV Distribution System has been awarded. The Scope of this project covers design, supply and installation of total 333 km of 11kV Line and 375 km of 0.4kV Line and distribution transformers for electrification in Gulmi, Arghakhachi & Kapilbastu districts. The works under this project has already been initiated and is in progress.

d. The Contract for Design, Supply, Installation/ Erection, Testing and Commissioning of 11/0.4 kV Distribution System has been awarded. The Scope of this project covers design, supply and installation of total 359.1 km of 11kV Line and 602 km of 0.4kV Line and distribution transformers for electrification in Taplejung, Panchthar & Illam districts. The works under this project has already been initiated and is in progress.

e. The Contract for Preparation of Distribution Loss Reduction Master Plan Along With Design, Supervision and Monitoring of Loss Reduction Activities shall be signed by the end of July 2018.

Parsa 33/11 kV Sub-Station Project

The project funded by GoN aims to meet the growing demand of electricity in Parsa and its vicinity. The scope of the project includes the construction of 33/11 kV, 6/8 MVA Substation with interconnection facilities.

About 90% of the substation construction work is completed and remaining underground 33 kV line is scheduled to be completed within FY 2018/19.

33 kV Line Expansion and Rehabilitation Project

The project funded by GoN aims to meet the growing demand of electricity in various parts of country. The scope of the project includes rehabilitation/ capacity upgradation/new construction of 33 kV line at various parts of country. Following works has been done till date.

1. Tender evaluation process is going on for construction of Bhurigaun-Gulariya (Bardia) 33 kV line (length 42 km) & Yadukuha-Dhanushadham 33 kV line (length 15 km).

2. Cost estimation for the construction of Anarmani-Chandragadhi 33 kV line (length 15 km) & Chandranigahpur- Jaynagar 33 kV line (length 26 km) has been done. Tendering and evaluation work is in progress.

SMART METERING SMART GRID PROJECT

The main objective of this project to replace existing TOD meters and 3 phase whole current meters with smart meters with automatic meter reading and billing system through GPRS/GSM. This project has been carried out in different phases to enhance progress according to classification of meter and working mechanism.

Phase 1: To implement Automatic Meter Reading (AMR) System with Automatic Metering Infrastructure (AMI) application in existing TOD meters. For this work, 2000 Intelligent GPRS/ GSM Modem has been shipped to NEA for implementation. The m-Power Billing Integration test and sending billing information to customer has been verified. Billing data of consumer can be sent via email and SMS. Server setup with all hardware and network has been completed. Field application of smart TOD meters shall be executed sooner.

Phase 2: Tender for replacement of three phase whole current electromechanical meter with Smart Three phase energy meter has been published and is under final stage of evaluation process. The medium of communication between meter and system is GPRS.

Phase 3: Replacement of single phase analog to Smart Energy meter in domestic consumer.

Phase 4: To replace all NEA meters to Smart meter. Further, implementation of DTMS (Distribution Transformer Management System) and replacing substation meter with smart meter and transforming distribution system into automation as whole.

This project is funded by the Government of Nepal (GoN) since F.Y.2016/17.

Testing Bench of modem used in smart TOD meter

TRANSFORMER TESTING LAB CONSTRUCTION PROJECT

The aim of this project is to construct the Transformer Testing Lab at Biratnagar, Butwal and Nepalgunj. With the construction of the project, testing facilities regarding various routine tests of power transformer up to 16 MVA and distribution transformer of various capacity & rating will be available in the Lab, under the corresponding regional/branch offices. Maintenance facilities for Distribution Transformer will also be available. Civil Construction works of Transformer Workshop Building at different regional offices is expected to be completed by Asoj, 2075. Electrical equipment is being manufactured regarding to be supplied and installed at corresponding sites.

The project is scheduled to be completed by FY 2019/20.

Transformer Testing Lab under construction at Biratnagar Site

MADANKUDARI-MAKAIBARI-SINGATI 33 KV LINE PROJECT

The project funded by Government of Nepal aims to meet the growing demand of electricity in Madan–Kudari–Majhifeda area of Kavre District and its vicinity. The scope of the project includes the construction of 33/11 kV, 6/8 MVA Substation. The land acquisition process has been completed and tender process of 33 kV sub-station & 33 kV Line is on progress. The Project is scheduled to be completed by FY 2019/20.

CHAUTARA-SINDHUPALCHOK 33 KV SUBSTATION PROJECT

The project funded by Government of Nepal aims to meet the growing demand of electricity in Chautara area of Sindhupalchok District and its vicinity. The scope of the project includes the construction of 33/11 kV, 6/8 MVA Substation. The construction of 33 kV line from Lamosanghu to Chautara is about to complete. Substation Civil construction works is being carried on. Major Electrical equipment has been manufactured at factory premises for inspection and testing works. The project is scheduled to be completed in FY 2019/20.

33/11 KV SUBSTATION REHABILITATION PROJECT

This project is financed by Govt. of Nepal (GON) and NEA. The aim of this Project is for the improvement in reliability of the distribution system of 36 different Substations under different distribution centers all around the country. The main aim of the Project is to rehabilitate substations and strengthen the distribution system by fiscal year 2018/19 under 5 different Packages.

The main scope under this project is:

Package 1: Rehabilitation of 33/11 KV Substation at Dharan, Inaruwa, Mirchaiya, Rajbiraj,Mujalia, Damak, Dhulabari, Buipa, Balardaha, Traghari(Udayapur), Bhojpur, Jirikhimti

Package 2: Rehabilitation of 33/11 KV Substation in Pokharia, Harsa, Simrangaud, Baglung, Bhiman, Jeetpur, Argakhachi

Package 3: Rehabilitation of 33/11 KV Substation in Mukundapur, Kawasoti, Kalaiya, Doti, Baitadi, Kirnetar (Dolakha)

Package 4: Rehabilitation of 33/11 KV Substation in Dadeldhura, Budar(Doti), Guleria, Bhalauria, Palpa, Lumbini

Package 5: Rehabilitation of 33/11 KV Substation in Jhalari, Belauri, Chaumala/Dhangadhi, Mahendranagar, Ghorahi

For all packages, contract has been awarded and scheduled to complete in FY 2018/19. For package 1, civil foundation work is in progress in Bharadaha Substation (Rajbiraj DC) and Mirchaiya

Substation (Janakpur DC). For other Substation / Packages, Pre Construction Engineering Survey has been completed and further process of PCS report acceptance is in progress. Drawing for different electrical equipment is under review.

EXPANDED ELECTRICITY DISTRIBUTION PROJECT

This project is a part of 'Electricity Transmission Expansion and Supply Improvement Project' financed by ADB under Loan No. 2808-NEP (SF). The scope of project is divided into three lots.

Lot 1: Up-gradation of substations at Gaur, Nijgarh, Chandragadhi, Jare, Belbari, Jaleshwor & Bolo-Damak

Lot 2: Augmentation of Distribution Services (East); Parasi, Gorkha, Krishnanagar, Tauliahwa, Amuwa, Gaddhachauki & Mirmi

Lot 3: Augmentation of Distribution Services (West) and development of 11 & 0.4 kV network in the affected area along the proposed Tamakoshi-Kathmandu 400 kV Transmission Line & upgrading of Distribution line.

The total cost of this project is USD 9.5 Million. All the works under Lot-1 and Lot 3 is completed while the works at remaining one substation under Lot-2 at Mirmi is under progress and to be completed by the end of October 2018.

33/11 KV SUBSTATION UPGRATION WORK

The Capacity of nine 33/11kV Sub-stations (Nepalgunj Old, Tulsipur, Shitalnagar/Butwal, Baraulia/Rupandehi, Milanchowk/Myagdhi, Balardaha/Saptari, Dhankuta, Malangawa and Multifuel Fuel Plant, Biratnagar) has been upgraded with installation of new 6/8 MVA power transformers out of Ten substations.

Remaining 33/11 kV Devight substation will be charged in near future. Funding of this work is bear by NEA itself. All work is scheduled to be completed F/Y 2017/18.

DISTRIBUTION SYSTEM REHABILITATION PROJECT

Capacity upgradation & other Rehabilitation of 33/11kV Sub-stations (Nepalgunj Old, Tulsipur, Shitalnagar/Butwal, Milanchowk/Myagdhi, Balardaha/Saptari, Dhankuta, Malangawa, Devight and Arghakhanchi has been completed this year. Scope preparation and estimation of other rehabilitation (33 kV Line & 33/11 kV Substation) work is under process.

33/11 KV, 6/8 MVA Power Transformer Upgrade at Myagdi Substation

COMMUNITY RURAL ELECTRIFICATION DEPARTMENT

In order to expand the access of electricity services to the rural areas on people's participation approach, Government of Nepal (GoN) has brought forward Community Rural Electrification Program (CREP) since 2003 which is being executed through Community Rural Electrification Department (CRED), NEA. CRED was dissolved in the process of restructuring of NEA on 2010 and activities of CREP were carried out through eight Regional Offices. However, the CREP activities slowed down due to lack of coordination at center and regional level. On this background, CRED was again formed in July 2013.

Under CREP, GoN is contributing 90% of the cost for Rural Electrification and Rehabilitation of electrified areas through NEA and the Community Rural Electrification Entities (CREEs) need to contribute remaining 10% of the cost. NEA

sells bulk power to the CREEs and CREESs are responsible for operation and management of electricity distribution within the area. NEA provides services up to 11 kV line and the CREE's are responsible for 400/230V line. NEA, Community Rural Electrification By-Law 2071 governs the activities of NEA, and CREP.

Community rural electrification programs are becoming more effective to promote energy access, consumer capacity building, and livelihood development empowering Community Rural Electrification Entities (CREEs). In the journey of 14 years, CREP has achieved major success making electricity access to more than 5,00,000 households of 52 districts through 282 nos. of different CREEs.

CRED is facing some technical and administrative issues despite which the performance of CRED in FY 2017/18 was satisfactory. During this review period, CRED initiated activities to resolve & complete ongoing community rural electrification works, and initiated new electrification works in different areas of Nepal. CRED's major activities of this year include:

- Twenty Four projects have been completed in this Fiscal Year benefitting thirty four CREEs.
- In order to bring uniformity in cost estimation, major line materials cost (Pole, Conductor, Insulator, Transformer and Stay set, etc) has been fixed.
- The details of projects of CRED in different stages of execution are as follows.
  - Electrification and System Rehabilitation: 80 nos.
  - Substation: 3 nos. (Baglung, Lamjung and Taplejung)
  - Transmission Line: 1 no. (33 KV Line, Palpa)
  - Building Construction: 1 no. (Pokhara)

CRED is planning different activities in FY 2018/19 to achieve meaningful result by augmenting implementation of CREP which will strengthen the CRED and support the sustainability of the CREEs too.

BIRATNAGAR REGIONAL OFFICE

Operational highlights

There are 18 Distribution Centers under Biratnagar Regional Office (BRO) spread over Mechi and Koshi zones. The distribution loss of BRO is 15.08%. Sales contribution to NEA system of this RO is 15.12%. The performance highlights of this regional office during review period are as under.

Energy sales (MWH) –835,293

Revenue (million) – Rs.7,945.26

Numbers of consumers –624,560

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 LT distribution line, construction of 33/11 kV, 6/8 MVA substation at Chisapani and 33 kV Switching Station at Ranke. Out of which, 33 kV line construction has been completed and land for Switching Station at Chamaita of Ranke has been already acquired. Construction of Substation at Chisapani is in progress, under the Project Management Directorate (PMD).

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 33/11 kV substation in Bhojpur district. Construction of 33 kV transmission line and 33 kV Bay/Switching Substation at Hile have been completed and are

in operation. Construction of 33/11 kV, 750 kVA Substation at Bhojpur is in progress. Installation of circuit breakers and construction of switchyard is scheduled to be completed by F/Y 2018/19.

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 construction of 6/8 MVA substation at Taplejung district. Construction of 33 kV line from Phidim to Taplejung is completed and civil construction for 6/8 MVA substation at Taplejung is in progress. Electrical drawings for substation equipments are under review for approval.

Aathrai Sakrantibazar 33 kV Substation Project

The project includes construction of 25 km of 33 kV line, 25 km of 11 kV line, 40 km of LT distribution line, construction of 33/11 kV, 6/8 MVA substation at Sakrantibazzar and 33 kV Bay at Jirikhimti, Terahthum. 15 km of 33 kV line is completed and polling works for 10 km of 33 kV line is completed and conductor stringing is in progress. Construction of Substation at Sakrantibazzar is in progress, under Project Management Directorate (PMD).

Bhedetar (Rajarani) 33/11 kV Transmission line and Substation Project

The project includes the construction of 15 km of 33 kV line, 15 km of 11 kV line, 15 km of LV distribution line, construction of 33/11 kV, 3 MVA substation at Rajarani and 33 kV Bay at Bhedetar, Dhankuta. Construction of boundary wall at substation site has been completed. PCS report for 33 kV line constructions is under review for approval.

Other Projects

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

- Panchthar, Taplejung and Bhojpur Distribution Line Strengthening Project
- Chainpur Sitalpati 33 kV transmission line and Substation Project
- Ahale Dadhipurkot Electrification Project.
- Belbari-Letang 33/11 kV Transmission line and Substation Project
- Damak Municipality – Dharampur Electrification Extension Project
- Bhojpur-Balardaha 33 kV Transmission Line Project

JANAKPUR REGIONAL OFFICE

Operational highlights

There are 14 Distribution Centers under Janakpur Regional Office (JRO) spread over Sagarmatha and Janakpur zones. The distribution loss of JRO is 31.30%. Sales contribution to NEA system from this RO is 7.87%. The performance highlights of this regional office during review period are as under.

Energy sales (MWH) –435,081

Revenue (million) – Rs.4,011.152

Numbers of consumers –555,053

Project highlights

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

Sangutar-Okhaldhunga 33 KV Transmission line project.

The scope of this project is to construct 33 kV line of length 40 km and 11 kV line of length 40 km at Sangutar, Almost 60% of 33 KV line pole erection works has been completed. Stringing of conductor for 33 kV line and works for 11 kV line is in progress.

Okhaldhunga-Salleri 33 KV Transmission line project

The major component of line project is to construct 38 km of 33 kV line and 11 kV line at Okhaldhunga including 33/11 kV, 1.5 MVA Substation & 40 KM of LT construction for Solu district.80 % of stringing of conductor for 33 kV has been completed.

Khurkot-Nepalthok-Rakathum 33 kV Transmission Line Project

The scope of this project is to construct 31 km of 33 kV, 15 km of 11 kV, 20 km of LV distribution line, 33 kV bay at Sindhuli District & 33/11 kV, 16.6 MVA Substation at Nepalthok. Almost 70% of 33kV transmission line has been constructe. Pre-Construction Survey Report for other scope of works are under review process

Gadahiya-Dumariya 33/11 kV S/S Construction Project.

Major components of the project include construction of 25 km of 33 kV line, 5 km of 11 kV line at Barahthwa & 33/11 kV, 16.6 MVA substation at Garahiya-Dumariya. PCS Report have been approved for construction of 33 KV line & 11 KV Line. Construction of Boundary Wall and filling work has been completed at substation site.

Haripurwa-Basatpur 33 kV Transmission Line & Sub-station Construction project.

Major components of the project is to construct 33 kV line & 11 kV line of 20 km, 33 kV bay & 33/11 kV, 16.6 MVA substation at Haripurwa-Basatpur. PCS Report has been approved for construction of 33 KV line & 11 KV Line. Construction of Boundary Wall and Filling work has been completed at Substation site.

Bhagwanpur 33/11 kV S/S Construction project.

The major components of the project include construction of 20 km of 33 kV line & 30 km of 11 kV line, 33 KV bay at lahan & 33/11 kV 16.6 MVA substation at Bhagwanpur. 2 PCS Report hasbeen approved for 33 kV & 11 kV line along with substation drawings. Construction of Boundary Wall and Filling work has been completed at substation site.

Khurkot-Ghurmi 33/11 kV S/S Construction project.

The major components of the project include construction of 60 km of 33 kV line & 40 km of 11 kV line, 20 KM of LV distribution line, 33 KV bay & 33/11 kV, 6/8 MVA substation at Ghurmi.

The procurement of land is under process.

Rupani-Sarswar-Kusumhar 33/11 kV S/S Construction project.

The major components of the project include construction of 25 km of 33 km, 50 km of 11 kV line, 33 KV bay & 33/11 kV 3 MVA substation at Kusumhar. Procurement of land for substation construction is under process.

Lohana-Janakpur 33/11 kV S/S Construction project.

The major components of the project include the construction of 20 km of 33 kV, 25 km of 11 kV line, 33 KV bay & 33/11 kV, 20/24 MVA substation at Lohana. Procurement of land for substation construction is under process.

Nirmalidada Line Construction project.

The major components of the project include the construction of 1.8 km of 11 kV line & 23 km of LV line. Erection of 345 out of 375 poles and stringing of 2.25 Km Line have been completed.

HETAUDA REGIONAL OFFICE

Operational highlights

There are 10 Distribution Centers under Hetauda Regional Office (HRO) spread over Narayani zone. The distribution loss of HRO is 13.37%. Sales contribution to NEA system from this RO is 20.41%. The performance highlights of this regional office during review period are as under.

Energy sales (MWH) –1128,033

Revenue (million) – Rs.11,118.575

Numbers of consumers –416,476

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 20116/17.

Godhiya Dumariya 33/11 KVA Transmission line and 6/8 MVA substation

The major component of this project is construction of 20 km 33 KV line out of which 9km is completed. 10 ropani land acquisition is completed and 8 km distribution line out of 35km is completed.

Other project

Haripurwa Banstpur -33/11 kV Transmission line and 6/8 MVA Substation Project

KATHMANDU REGIONAL OFFICE

Operational highlights

There are 19 Distribution Centers under Kathmandu Regional Office (KRO) spread over Bagmati and parts of Janakpur zones. The distribution loss of KRO is 8.47%. Sales contribution to NEA system from this RO is 26.13%. The performance highlights of this regional office during review period are as under.

Energy sales (MWH) –1444,119

Revenue (million) – Rs.16,528.324

Numbers of consumers –674,047

Project highlights

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

Budhasing, Dansing, Gorsyang, Khadgabhanjhyang, Phikure, Kaule, Bhalche Distribution Line Project

The project includes construction of distribution system in Budhasing, Dangsing, Gorsyang, Khadgabhanjhyang,Phikure, Kaule and Bhalche VDC of Nuwakot district. Construction work is in progress and is scheduled to be completed in FY 2018/19.

Sindhu-Dolakha Distribution Line Project

The project includes construction of distribution system in different VDCs of Dolakha and Sindupalchowk district. Construction work is in progress and is scheduled to be completed in FY 2018/19.

Sanghutar - Manthali 33/11 KV Transmission Line and Substation Project

The project includes construction of 33 kV line from Manthali to Sanghutar and construction of 33/11 kV, 6/8 MVA substation at Sanghutar. Land acquisition for substation construction is completed and construction of 33 kV line is almost complete.

Sindhupalchok Electricity Distribution Expansion and System Reinforment Project

The project includes constuction of distribution system in diffrent VDCs of Sindhupalchok district. The construction work is progress and is scheduled to be completed in FY 2018/19.

POKHARA REGIONAL OFFICE

Operational highlights

There are 11 Distribution Centers under Pokhara Regional Office (PRO) spread over Dhaulagiri and Gandaki zones. The distribution loss of PRO is 11.50%. Sales contribution to NEA system from this RO is 5.37%. The performance highlights of this regional office during review period are as under.

Energy sales (MWH) –296,623

Revenue (million) – Rs.2,892.091

Numbers of consumers –281,192

Project highlights

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

Udipur Besisahar Manang 33 KV Transmission Line Project:

The main objective of this project is to connect the Himalayan District of Manang with central INPS grid network. 33kV transmission line from Udipur substation, Lamjung District upto Thanchowk Substation, Manang District has been completed this year with lines passing parallel to harsh terrain along Marsyangdi river.

Currently, 300kVA 33/11kV Power transformer is installed in the Thanchowk Substation and will be charged soon after mitigation of some local issues. 11kV Line from Thanchowk Substation has been extended upto Manang and is ready for charging. The capacity of Thanchowk Substation will be 1.5MVA, 33/11kV and is under estimation and tendering process. Civil works for construction of boundary walls, quarter building and gaurd house is going on after acquisition of land.

The main hurdles of this project is harsh mountaineous terrain and bad road connection to transport the equipments and materials.

HT Metering Installation at Dharampani Cummunity

Since most of the lines passes through ACAP region, special attention has to be taken care while carrying forward any extension works given environmental and wildlife conservation policy.

Galkot 33kV Transmission Line and Substation Project:

The aim of this project is to extend more reliable gridline in Galkot region of Baglung district by constructing new 33kV, 11kV lines and 3MVA, 33/11kV substation. This line is important to evacuate power from IPPs under construction in Daram Khola. Construction of substation has been recently completed and final construction works for transmission line is going on. The schedule of transmission line construction has been delayed due to numerous right of way disputes along the route.

Sindhabesi (Lamjung) Lekhnath 33 kV Transmission Line and Substation Project

The scope of the project consists of the construction of 18 km of 33 kV transmission line, 10 km of 11 kV and 0.4 kV of LV distribution line and 33/11 kV 6/8 MVA substations at Sindhabesi Kaski and Construction of 33 KV Bay at Lekhnath Substation, Kaski districts. Land acquisition for Sindhabesi Substation has been completed. Construction of substation is near completion and construction of 33kV line will be completed once Right of Way issues are solved.

Bhorletar 33 kV Transmission Line and Substation:

This project is being implemented to provide electric supply and Grid connection to IPP of Bhorletar area in Lamjung district. The major component of this project are construction of 25 km 33 KV line, 5 km 11 kV and 0.4 kV line, one 33 kV bay construction at Damauli substation and 6/8 MVA SS at Bhorletar of Lamjung District. Land acquisition for Bhorletar Substation has been completed. Construction of 33kV transmission line is completed in this fiscal year. Construction

of boundary and retention walls, quarter building has been completed and substation layout has been approved and ready for construction. New 11kV outgoing feeders from this substation will be under construction this year.

Righa Kharwang 33 kV Transmission Line and Substation Project

This project is being implemented to provide electric supply and Grid connection to mid western Badigad and Kharbang area in Baglung district and for IPPs under construction. The major component of this project are construction of 25 km 33 KV line, 20 km 11 kV and 0.4KV line, one 33 KV bay construction at Galkot substation and 6/8 MVA Substation at Righa-Kharbang of Baglung District. Due to lack of suitable area and local disputes land acquition has been major challenge in this project. Construction for 33kV lines will begin this year.

Khairenitar 33 kV Transmission Line and Substation Project

Electronic Queue Management system

This project aims to increase the voltage regulation and reliability of the Southern and central region of Tanahun District by construction of 33kV lines from Damauli Substation to Khairenitar substation. The project has been delayed mainly due to Right of Way issues in Damauli Bazaar and Khairenitar Bazaar. This project is expected to complete within 3 months once local ROW issues are resolved.

Gorkha Siranchaur 33 kV Transmission Line and Substation Project

The aim of this project is to construct 33kV line and 33/11kV 6/8 MVA substation in Gorkha Siranchaur to boost up the rural electrification and provide grid connection to IPPs under construction in this area. Land acquition for substation is under process for this substation.

Burtibang 33 kV Transmission Line and Substation Project

The aim of this project is to extend gridline to western region of Baglung district by constructing 33kV lines and 33/11kV, 6/8MVA Substation in Burtibang region of Baglung. Land acquition and preliminary survey of this project will be carried out this year for this project.

Other Projects:

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

- Tatopani Small Hydropower Rehabilitation Project
- Lekhnath Distribution System Rehabilitation Project

BUTWAL REGIONAL OFFICE

Operational highlights

There are 10 Distribution Centers under Butwal Regional Office (BuRO) spread over Lumbini zone. The distribution loss of BuRO is 15.55% Sales contribution to NEA system from this RO is 15.08%. The performance highlights of this

regional office during review period are as under.

Energy sales (MWH) –833,327

Revenue (million) – Rs 7,901.639

Numbers of consumers –455783

Project highlights

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

Jeetpur Thada 33 kV Substation Project

The project scope includes construction of 30 km 33 kV line ,33/11 kV, 6/8 MVA substation , 15 km- 11 KV line, 5 km- 0.4kv LT line and along this line connecting 50 numbers of 11/0.4 kV distribution transformer at Thada, Arghakhachi. Purchasing of land has been completed for the construction of Thada Substation.

Upto this fiscal year 2017/18, compound wall work was completed and Poling works of 33 kV line almost completed but few places has been restricted due to Forest division and Local people. Construction of 11 KV line has been running. The project is scheduled to complete in next fiscal year.

Ridi 33/11 KV Transmission Line and S/S Project

The Major scope includes construction of 30 km 11 KV line and 33/11 KV 3 MVA substation , 30 km- 11 kV line and connecting 60 number of 11/0.4 KV distribution transformer at Ridi ,Gulmi. Construction of 11 KV line has been completed up to this year and out of 58 number of distribution transformers 22 nos. of distribution transformer has been replaced. The project is scheduled to complete in FY 2018/19.

Gulmi Birbas 33/11 KV Substation Upgrading Project

The major activities are construction of 30 km 11 KV transmission line and 33/11 KV, 6/8 MVA substation. Up to this year, 3 MVA 33/11 KV Power transformer upgrading by 6/8 MVA 33/11 kV. The substation construction work had been completed in FY 2017/18.

Amarai Dohali Wagla Including 10 VDC Project (Rural Electrification)

The major activities of this projects are construction of distribution 11 KV 100 km and LT line 350 km and connecting 60 number of 11/0.4 KV distribution transformer. Up to this fiscal year almost 80 % work was completed. The project is scheduled to complete in FY 2018/19.

Purkotdaha, Myalpokhari including 5 VDC Project (Rural Electrification)

The major activities of this project are construction of distribution line of 11 KV 50 km , connecting 30 number of 11/0.4 KV distribution transformer and LT line 0.4 KV 50 km. The polling work has been completed and Up to this year 80 % work was completed. The project is scheduled to complete in FY 2018/19.

Bhairahawa - Taulihawa line Reinforcement Project.

The major activities of this project are construction of distribution of 11 KV line 20 km , 0.4 KV line 50 km and connecting 40 number of 11/0.4 KV distribution transformer. Up to this fiscal year 2017/18, 80 % work was completed. The polling work of 11 KV line has been running and few places has been restricted due to road division and by local people. The project is scheduled to complete in FY 2018/19.

Gulmi Shantipur 33 kV Transmission line and Substation Project.

The Major scope included construction of 5 km 33 KV line and 33/11 KV 6/8 MVA substation and 5 km 11 KV line at Shantipur ,Gulmi. Purchasing of land has been completed in this fiscal year and construction of compound wall is in process for the construction of Shantipur Substation. The project is scheduled to complete by next fiscal year.

Jitpur Saljandi 33/11 KV Transmission line and Substation Project.

The Major scope included construction of 20 km 33 KV line and 33/11 KV 16 MVA substation and 10 km 11 KV line at Shantipur ,Gulmi. Land has been provided by Saina Maina municipality and land leveling and compound wall works is in process. The project is scheduled to complete in FY 2018/19.

Ramnagar 33 kV Transmission line and Substation Project.

The Major scope included construction of 30 km 33 KV line and 33/11 KV 16 MVA substation and 5 km 11 KV line at Ramnagar ,Nawalparasi. Land has been provided by Sunaul municipality and remaining work is on process. The project is scheduled to complete by next fiscal year.

Yogikuti Shitalnagar 33 KV Transmission line and Substation Project.

The major activities of this project are construction of distribution of 33 KV line 8 km Double Circuit. 80% polling work has been completed and Road division and forest division has been restricted the construction of transmission line.

Other Projects

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

- Distribution line reinforcement at Arghakhachi.
- Distribution line reinforcement at Gulmi.

NEPALGUNJ REGIONAL OFFICE

Operational highlights

There are 16 Distribution Centers under Nepagunj Regional Office (NRO) spread over Bheri, Rapti & Karnali zone. The distribution loss of NRO is 16.81% and sales contribution to NEA system from this RO is 6.32%. The performance highlights of this regional office during review period are as under.

Energy sales (MWH) –349,288

Revenue (million) – Rs 3,397.728

Numbers of consumers –334527

Project highlights

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

Pyuthan Substation Project

The project includes the construction of 3 MVA 33/11 kV substation and 33 KV Line at Damti, Pyuthan. Construction of 3 MVA Substation and staff quarter building has been completed and substation also has been charged at fiscal year 2017/18 and 33 KV Line construction will be finished at F/Y 2018/19.

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.

33 kV transmission line has been completed and all civil work has been finished and the kudu Substation has been charged in F/Y 2017/18 and remaining work of 11 KV and LT Line construction will be finished in this fiscal year.

Sitalpati -Musikot 33 kV Transmission Line and Substation 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 one 33/11 kV substations of 3 MVA capacity at Musikot and another 33/11 kV substations of 1.5 MVA Sitalpati.

33 KV Line, 11KV Line and LT line installation has been completed and Control building has been finished while for construction of substation will be finished in the F/Y 2018/19.

Kapurkot-Koilachaur 33 kV Transmission Line Project

The project includes the construction of 33 kV and 6/8 MVA, 33/11 KV at Koilachaur and Kapurkot. The construction of 33 KV Line has been completed and construction of Substation of Koilachuar will be finished at F/Y 2018/19. For Kapurkot, process has been initiated for land acquisition.

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 33/11 kV substations at Holleri & bay installation work at Ghorahi. Construction of 45 km 33 kV transmission line up to Holleri has been completed. 33/11 kV, 750 kVA sub-station at Holleri and bay Extension work at Ghorahi will be finished at F/Y 2018/19.

Dailekh Substation Project

The project includes the construction of 33 kV line from Dailekh Bazaar to Dailekh Dullu and 3 MVA Substation at Dullu. The Civil Works has been completed while the power transformer and others materials has been reached to the working site and construction of 33 kV line from Dailekh Bazaar to Dailekh Dullu will be started soon at F/Y 2018/19 .

Surkhet Bijaura 33 kV Substation Project

The project scope includes construction of 30 km 33 kV line, 20 km 11 kV line and construction of 33/11 kV substation at Bijaura, Surkhet. After finishing of Land acquisition work and construction of boundary fencing wall, the substation control building and staff quarter has been completed, and main equipment like Power Transformer and 33 kV switchgear has been delivered at the site and stringing of conductor for 33 kV line will be commenced once approval of IEE is received.

Rajapur 33 kV Substation Project

The project scope includes construction of 33 kV line upgrade and construction 33/11 kV substation at Rajapur, Bardiya. The 33/11 KV substation has been charged while the upgrade of 11 KV Line to 33 KV Line will be completed in F/Y 2018/19.

Dang Lamahi 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.

Ramghat Surkhet 33 kV Transmission Line Project

The project includes construction of 6/8 MVA, 33KV/11KV and 11 KV Line at Ramaghat, Surkhet. The installation of substation has been completed and polling of 11 KV has been completed while the conductors and channel has reached to the site and reaming work will be finished at F/Y 2018/19.

Surkhet Gangate Matela Project 33 kV Transmission Line Project

The project includes the construction of 50 km 33 kV line from Ratanagla of Surkhet to Matela of Surkhet and 3 MVA 33/11 kV substation constructions at Matela, Surkhet. Polling for 33 KV line works of 33 kV line has been almost completed.

Substation construction and staff building has been almost been completed and Stringing of conductor for 33 KV Line is remaining due the IEE process. It is to be expected to complete it by 2018/019.

Surkhet Chingad (Surkhet no.02) Electricity Extension Project

The Project includes construction of 51 km 11 KV Line from Matela substation and 40 Km LT line. The Project status is under procurement process.

Kalikot Small Hydropower Rehab Project

The Project includes construction of canal lining

and headrace canal maintenance at power of kalikot. The canal lining works has been finished at F/Y 2017/18 and the status of headrace canal maintenance is in tendering process.

Seri Dailekh Electricity Extension Project

The Project Includes the 11 KV and LT Line Extension at Dailekh District. Due to Forest and Public issues, the project is not started up to now. But, the problem has been solved so the work will be finished in F/Y 2018/19.

Rajwada 33 kV Transmission line Project

The Project includes construction 33 KV Line, 11 KV Line, LT line and Substation at Rajawada. This project will be started for the land acquisition and tendering process in F/Y 2018/19.

Khawang 33 Transmission line Project

The Project includes construction 33 KVLine, 11 KV Line, LT line and Substation at Khawang. This project will be started for the land acquisition and tendering process in F/Y 2018/19.

Heldung Small Hydropower Rehab Project

The Project includes construction of Pond and canal lining and Headrace installation and maintenance at Heldung. Land acquisition process is finished and the construction of Pond is on the tendering process. Canal lining and Headrace installation and maintenance is on the process of agreement.

Tulsipur – Kapurkot 33 KV Transmission Line Project

The Project includes the construction of 33 KV Line and Substaion at Kapurkot. The 33 KV line constructions have been completed and the land acquisition is on the process.

Hapure Tulsipur Dudhraksha 33 KV Transmission Line Project

The Project includes the construction of 33 KV Line and Substation at Tulsipur . Both 33 KV line construction and substation construction will be finished at F/Y 2018/019.

Rapti Sonari Banke Electrification Project

This project includes construction of 11 KV and LT Line at Rapti Sonari,Banke. It is going on the process of PCS Report.

Koholpur Dhampur 33 KV Transmission Line Project

The project includes Construction of 33 KV line from Koholpur to Dhampur and 33/11 KV Substation at Dhampur. The constructin of substation has been finished and transformer will be charge at F/Y 2018/019. The 33 kV line is under construction condition. The project will be completed at the F/Y 2018/019.

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 3.70%. The performance highlights of this regional office during review period are as under.

Energy sales (MWH) –204,357

Revenue (million) – Rs.1,673.377

Numbers of consumers –209588

Project highlights

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

Sakayal-Dadeldhura 33 kV Transmission line and Substation Project

The scope of this Project includes the construction of 33/11 kV Substation at Sakayal of Dadeldhura District. It is also proposed to construct the HT and LT lines at nearby villages around the substation. Work progress of the project is as follows.

- Land acquisition is on progress.
- The proposed location is at about 500 m

distance from existing 33 kV Transmission line.

Khodpe (Baitadi) Chainpur (Bhajang) 33 kV Transmission Line and Substation Project

The scope of this Project includes the construction of 90 km of 33 kV line and construction of 33/11 kV substation and Baghthala and Chainpur of Bajhang Districts. It is also proposed to construct the HT and LT lines at nearby villages around the substation. Work progresses of the projects are as follows.

- About 95% of the construction of 33 kV transmission line has completed.
- Construction of control building, staff quarter and foundation of switchyard on progress at Baghthala and Chainpur of Bajhang district.
- It is aimed to Charge both of the substation within F/Y 2018/019.

Sanphe (Achham)-Martadi(Bajura) 33 kV Transmission Line and Substation Project

The scope of this project includes the construction of 50 km of 33 kV from Sanfebagar (Achham) to Martadi(Bajura) and construction of 33/11 kV Substation at Sanfebagar of Achham district. It is also proposed to construct the HT and LT lines at nearby villages around the substation. Work progresses of the projects are as follows.

- About 54% of the construction of 33 kV transmission line has completed.
- Construction of control building, staff quarter and foundation of switchyard on progress at Jhakale of Achham District.
- It is aimed to Charge the substation within F/Y 2018/019.

Gokuleshor-Balanch 33 kV Transmission Line and Substation Project

The scope of this project includes the construction of 25 km of 33 kV from Gokuleshor to Thaligad of Darchula District and construction of 33/11 kV, 3 MVA Substation at Thaligad of Darchula district. It is also proposed to construct the HT and LT lines at nearby villages around the substation. Work progresses of the projects are as follows.

- About 85% of the construction of 33 kV transmission line has completed.
- Construction of control building, staff quarter and foundation of switchyard on progress at Thaligad of Darchula District.
- It is aimed to Charge the substation within F/Y 2018/19.
- Construction of Transmission line is delayed due to issues of forest.

Sanfe-Kamalbazar-Manma 33 kV Transmission Line and Substation Project

The scope of this project includes the construction of 42 km of 33 kV from Sanfe to Kamalbazar of Achham district and Construction of 33/11 kV, 3 MVA Substation at Kamalbazar of Achham. It is also aimed to expand the 33 kV line upto manma of Kalikot District. It is also proposed to construct the HT and LT lines at nearby villages around the substation. Work progress of the project is as follows.

- 33 kV transmission line is under construction.
- Tender for Construction of 33/11 kV, 3 MVA Substation was awarded.

Sanfebagar-ChamarChautara 33 kV Transmission Line and Substation Project

The scope of this project includes the construction of 20 km of 33 kV from Pipalla to Tikhatar of Doti District and Construction of 33/11 kV, 3 MVA Substation at Tikhatar of Doti. It is also proposed to construct the HT and LT lines at nearby villages around the substation. Work progress of the project is as follows.

- About 65% of the construction of 33 kV transmission line has completed.

- PCS for construction of Substation has completed.

Doti Mauwa 33 kV Transmission Line and Substation Project

The scope of this project includes the construction of 10 km of 33 kV from Pipalla to Mauwa of Doti District and Construction of 33/11 kV, 3 MVA Substation at Mauwa of Doti. It is also proposed to construct the HT and LT lines at nearby villages around the substation. Work progress of the project is as follows.

- About 80% of the construction of 33 kV transmission line has completed.
- Construction of control building, staff quarter and foundation of switchyard on progress at Thaligad of Darchula District.
- It is aimed to Charge the substation within F/Y 2018/019.
- Construction of transmission line is delayed due to issues of forest.

Budar-Jogbuda-Bagarkot 33 kV Transmission Line and Substation Project

The scope of this project includes the construction of 33 kV line from Syaule to Bagarkot and Budar to Jogbuda of Dadeldhura District and also construct the 33/11 kV Substation at Bagarkot and Jogbuda of Dadeldhura District. Work progress of the project is as follows.

- 33 kV transmission line from Syaule to Bagarkot is under construction and it is carried out by Dadeldhura Distribution Center.
- Construction of 33 kV line is delayed due to public protest and issues of forest.
- Construction of control building, staff quarter and foundation of switchyard on progress at Bagarkot of Dadeldhura District.
- Survey work of 33 kV Transmission line from Budar to Jobuda has completed.
- Land acquisition is on progress at Jogbuda.

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

The scope of this project includes the construction of 33/11 kV Substation at Martadi of Bajura and expand the 33 kV line upto Gamgadi of Mugu district. It is also proposed to construct the HT and LT lines at nearby villages around the substation. Work progress of the project is as follows.

- Land acquisition process is on progress at Martadi of Bajura District.
- Construction of 33 kV line from Martadi to Gamgadi is on the process of survey.

Other 33 kV Transmission Line and Substation Project under survey stages are:

A. Patan-Melauli 33 kV Transmission line and Substation project at Baitadi.

B. Musya 33 kV Transmission line and Substation project at Baitadi.

C. Sillegada-Kataujpani 33 kV Transmission line and Substation Project at Baitadi.

D. Doti-Simichaur 33 kV Transmission line and Substation Project at Doti.

E. Lamki Sugarkhal 33 kV Transmission line and Substation Project at Kailali.

F. Attariya-Punarbas 33 kV Transmission line and Substation Project at Kailali and Kanchanpur.

S.No.	Category	Biratnagar	Janakpur	Hetauda	Kathmandu	Pokhara	Butwal	Nepalgunj	Attariya	Total
No. of Consumers (Nos) for F/Y 2074/075										
1	Domestic	568650	514500	382929	648096	270821	435816	312024	199235	**3332071**
2	Non-Commercial	3155	2313	1895	3564	2199	3069	2920	1979	**21094**
3	Commercial	3282	2011	2316	6507	1957	2427	2033	1183	**21716**
4	Industrial	7257	8396	7357	9849	3931	6222	3769	2019	**48800**
5	Water Supply	177	169	229	554	347	389	143	55	**2063**
6	Irrigation	39706	26576	20292	1306	510	6040	12757	4306	**111493**
7	Street Light	793	393	411	788	86	363	138	38	**3010**
8	Temporary Supply	47	38	104	1057	33	109	84	48	**1520**
9	Transport	0	0	1	41	2	0	0	0	**44**
10	Temple	1062	417	616	627	654	1018	463	325	**5182**
11	Community Sales	131	122	79	118	472	233	131	345	**1631**
12	Non-Domestic	93	25	152	1364	99	0	2	0	**1735**
13	Entertainment	34	7	22	22	17	0	5	0	**107**
14	Internal Consumption	173	86	73	154	64	96	58	55	**759**
15	Export to India	0	0	0	0	0	1	0	0	**1**
	Total	**624560**	**555053**	**416476**	**674047**	**281192**	**455783**	**334527**	**209588**	**3551226**

Sales Unit (MWh) for F/Y 2074/075										
1	Domestic	350274	228045	287381	784375	168837	307312	165697	111713	**2403634**
2	Non-Commercial	19260	7382	19450	77064	14174	16687	12132	5784	**171933**
3	Commercial	46972	18594	39338	194741	37477	32289	24193	13988	**407593**
4	Industrial	359822	146041	722785	228117	35391	436599	119203	26210	**2074168**
5	Water Supply	13950	3303	11422	20694	5771	13435	4504	2428	**75508**
6	Irrigation	19569	10316	14022	988	336	6422	7280	3449	**62383**
7	Street Light	7012	13208	20736	23168	2673	5501	3143	1914	**77355**
8	Temporary Supply	57	52	127	1640	122	545	110	426	**3079**
9	Transport	5	137	591	4542	24	0	0	0	**5298**
10	Temple	1147	1093	715	2034	520	1529	527	209	**7774**
11	Community Sales	14281	6317	6300	7393	30590	9744	12163	37891	**124678**
12	Non-Domestic	2054	69	4244	96358	377	0	46	0	**103148**
13	Entertainment	298	62	605	1523	166	0	54	0	**2709**
14	Internal Consumption	590	463	317	1482	164	454	235	316	**4021**
15	Bulk Supply						2810		28	**2838**
	Total	**835293**	**435081**	**1128033**	**1444119**	**296623**	**833327**	**349288**	**204357**	**5526120**

REVENUE(Nrs.in Thousands)										
1	Domestic	3139533	1879046	2619549	8045129	1499812	2809701	1498852	854200	**22345823**
2	Non-Commercial	278203	106942	300236	1260228	203057	220339	165481	81135	**2615621**
3	Commercial	644121	279540	551063	2839976	545713	449410	349218	202883	**5861924**
4	Industrial	3505568	1526890	7188025	2389194	401568	4140995	1221118	286966	**20660324**
5	Water Supply	102365	26937	85326	164662	46841	104634	33308	19090	**583163**
6	Irrigation	87307	48046	66113	4553	1553	31223	32612	12391	**283798**
7	Street Light	60395	98122	182213	222702	26160	40337	26808	19113	**675850**
8	Temporary Supply	1228	1354	2686	31918	2428	9061	2173	6463	**57312**
9	Transport	33	833	6252	29731	335	0	0	0	**37184**
10	Temple	7494	5643	4420	13810	3160	11797	3247	1294	**50865**
11	Community Sales	72500	29638	33229	35627	149357	46529	60327	185586	**612793**
12	Non-Domestic	34020	1140	65454	1445766	6718	0	807	0	**1553905**
13	Entertainment	5206	1141	10100	25552	3195	0	792	0	**45986**
14	Internal Consumption	7296	5880	3909	19476	2193	5766	2984	4259	**51762**
15	Bulk Supply						31847		0	**31847**
	Total	**7945268**	**4011152**	**11118575**	**16528324**	**2892091**	**7901639**	**3397728**	**1673377.91**	**55468156**

Loss percentage										
1	Received Energy, MWH	882,920,550	577,056,729	1,178,606,869	1,430,293,183	311,543,670	883,790,435	382,186,174	218,048,058	**5864445668**
2	Sales Energy, MWH	749,521,837	394,637,063	1,020,787,163	1,311,439,835	275,231,374	749,080,919	319,123,674	182,467,988	**5002289852**
3	Loss Unit, MWH	133,398,713	182,419,666	157,819,706	118,853,348	883,790,435	134,709,516	63,062,500	35,580,070	1709633955
4	Loss percentage (2017/18)	15.08	31.30	13.37	8.47	11.50	15.55	16.81	17.72	**14.82**
5	Loss percentage (2016/17)	17.65	36.45	15.39	10.24	11.86	16.52	18.53	16.31	16.83
6	Loss percentage (2015/16)	20.67	47.95	18.33	11.24	12.45	16.29	19.17	19.55	19.80

Description	**Status**	**Biratnagar**	**Janakpur**	**Hetauda**	**Kathmandu**	**Pokhara**	**Butwal**	**Nepalgunj**	**Attaria**	**Total**
Zonal Coverage	Zonal Coverage	Mechi & Koshi	Jankapur & Sagarmatha	Narayani	Bagmati &Janakpur	Gandaki & Dhaulagiri	Lumbini	Bheri ,Karnali & Rapti	Mahakali & Seti	
Metropolitan	Fully Electrified	0	0	1	2	1	0	0	0	4
	Partially Electrified	1	0	1	0	0	0	0	0	2
Sub-Metropolitan	Fully Electrified	0	1	0	0	0	1	0	0	2
	Partially Electrified	2	0	3	0	0	0	3	1	9
Municipalities	Fully Electrified	0	7	2	4	13	1	0	0	27
	Partially Electrified	38	50	27	29	9	23	30	27	233
	Non-Electrified	0	0	0	0	1	0	3	6	10
Rural Municipalities	Fully Electrified	0	6	1	4	12	4	0	0	27
	Partially Electrified	50	45	30	51	32	38	43	29	318
	Non-Electrified	10	12	0	5	10	2	36	25	100
No. of distriburtion center	No. of Distribution Center	18	14	10	19	11	10	16	10	108

PLANNING, MONITORING AND INFORMATION TECHNOLOGY DIRECTORATE

Planning, Monitoring and Information Technology Directorate, a corporate wing of NEA is headed by Deputy Managing Director. This directorate is entrusted with directing and monitoring the activities of five departments namely: System Planning Department, Corporate Planning and Monitoring Department, Information Technology Department, Power Trade Department and Economic Analysis Department. Each of these departments is headed by a director. System Planning Department is responsible for carrying out load forecasting, generation planning and transmission system planning of power system of Nepal. Corporate Planning and Monitoring Department is entrusted with the responsibility of developing Corporate Plan of NEA along with monitoring and evaluating NEA-implemented projects. Information Technology Department develops innovative IT services so as to modernize various activities of NEA. Power Trade Department is responsible for trading of power both in domestic as well as in international market as per NEA's strategy and policy. Finally, Economic Analysis Department carries out financial analysis of projects and proposes electricity tariff & service charge adjustments.

SYSTEM PLANNING DEPARTMENT

System Planning Department (SPD) is mainly responsible for Load forecast, Generation and Transmission Line Plan study. Besides, SPD conducts the feasibility study of transmission line projects of Nepal and further analyses the power evacuation study of generation projects in Nepal.

SPD 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.

Grid Impact Study (GIS) for new generation projects is also on 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.

Furthermore, SPD also assists other departments of NEA by providing necessary data and suggestions regarding implementation of planned projects.

The department is also involved to prepare Integrated Master Plan for Evacuation of Power

from Hydro Projects in Nepal prepared by Joint Technical Team (JTT) of India and Nepal.

Currently, the department is preparing a Transmission line Study of Nepal to provide an accurate transmission system development plan that caters the national energy demand at a GDP growth rate of 7.2%, addresses the networks necessary for power export to neighboring nation for up to the FY 2025/26, and further reviews the Transmission Master Plan prepared by EDF in 2015 and Integrated Master Plan for Evacuation of Power from Hydro Projects in Nepal prepared by JTT for up to the year 2035.

In FY 2017/18, System Planning Department carried out number of technical studies at the request of NEA's different departments. Notable among them are:

i. Energy Simulation for:

a. Surplus energy analysis

b. Corporate Development Plan

ii. Load Forecast Study as per the report by WECS

iii. Substation Load Forecast

iv. Reactive power compensation Study of:

a. New Khimti – Barhabise – Lapsiphedi 400 kV transmission line on the request of New Khimti – Barhabise –Lapsiphedi 400 kV Substation Project.

b. Molung Hydropower Project (7 MW) on the request on Power Trade Department.

v. 3 Phase fault current calculation of:

a. Dhalkebar 132 kV substation as requested by Nepal – India Electricity Transmission and Trade Project.

b. Matatirtha substation as requested by Upper Trishuli 3 A Hydropower Project

c. Chabahil substation based on the request of Sundarijal Power Station Rehabilitation Project.

vi. Load flow analysis of:

a. Dhalkebar – Loharpatti 132 kV transmission line as requested by Engineering Services Directorate.

b. Tingla – Mirchaiya transmission line as per the request of Solu corridor Transmission Line Project.

c. Solar Power Plants, a total of 60 MW capacities, being developed by different IPP's as per the request of Project Management Department, NEA.

vii. Network Analysis of:

a. Lekhnath- Damauli 220 kV transmission line as per the request of Lekhnath – Damauli 200 kV Transmission Line Project.

viii. Power Evacuation Study of:

a. Budi Ganga Hydropower Project (20 MW) as per the request of Department of Electricity Development.

b. Tamakoshi–V Hydropower Project (95 MW) as per the request of Electro-mechanical Division of Engineering Service Directorate, NEA.

ix. Grid Impact Study of total 2327 MW capacity of 72 hydropower projects to be developed by IPP'S.

x. Grid Impact Study of total 65 MVA capacities of 9 bulk load industries to be connected to the INPS.

List of GIS conducted projects of Hydropower Projects in FY 2017/18

S.N.	Name of Projects	Capacity (MW)	Connection Substation
1	Illep Tatopani HPP	23.675	Trishuli 3B Hub
2	Bhim Khola HPP	4.96	Bastu (Butwal)
3	Super Hewa HPP	5	Baneswor
4	Kasuwa Khola HPP	45	Khandbari
5	Saiti Khola HPP	1	Lahachowk
6	Upper Piluwa Hills HPP	4.9	Baneswor
7	Upper Suri HPP	7	Singati
8	Sagu Khola	20	Singati
9	Sagu 1 HPP	5.5	Singati
10	Tila I HPP	300	Chinchu
11	Tila 2 HPP	297	Chinchu
12	Ghar Khola HPP	14	Dana
13	Thulo Khola HPP	21.3	Dana
14	Ruru Banchu 2 HPP	2	Surkhet
15	Super Dordi Khola HPP	54	Kirtipur
16	Mid Hongu B HPP	22	Tingla
17	Super Trishuli HPP	70	New Marshyangdi(Markichowk)
18	Lower Jogmai Khola HPP	6.2	Godak
19	Super Mai Sana Cascade	3.8	Godak
20	Bhotekoshi 5 HPP	65	Barhabise
21	Dudhkunda HPP	12	Tingla
22	Upper Irkhuwa Khola HPP	14.5	Khandbari (Tumlingtar)
23	Nyadi Phidi HPP	21.4	Tadi Kuna
24	Mid Hongu A HPP	22	Tingla
25	Reliance Sugar Mills	18	Parwanipur
26	Upper Ankhu Khola HPP	25	Trishuli 3b Hub
27	Nupche Likhu HPP	25	Garjang
28	Seti Khola HPP	22	Loop In Loop Out Lekhnath-Damauli line
29	Sunigad Khola HPP	11.05	Chainpur
30	Tadi Cascade HPP	3	Samundratar
31	Phedi Khola HPP	3.52	Khandbari (Tumlingtar)
32	Jogmai Cascade HPP	6	Godak
33	Chepe Khola HPP	8.63	Kritipur
34	Nyasim Khola HPP	35	Pantang
35	Isuwa Khola HPP	97.2	Khandbari (Tumlingtar)
36	Kabeli B1 HPP	9.94	Kabeli
37	Super Ghalemdi Khola HPP	9.14	Dana
38	Manang Marshyangdi HPP	144	Dharapani
39	Bajra Madi HPP	24.8	Lekhnath
40	Upper Daraudi HPP	9.2	New Marshyangdi(Markichowk)
41	Palun HPP	21	Hangpang

42	Sona Khola HPP	9	Hangpang
43	Madame Khola HPP	24	Upper Madi
44	Daram Khola HPP	9.6	Harichaur
45	Upper Nyasem Khola HPP	21	Pantang
46	Hewa Khola A HPP	5	Phidim
47	Lower Hewa Khola HPP	22.1	Phidim
48	Dudh Khola HPP	65	Dharapani (Manang)
49	Menchet Khola HPP	7	Trishuli 3b Hub
50	Upper Thulo Khola A	15	Dana
51	Lower Balephi HPP	15	Pantang
52	Bhotekoshi 1 HPP	40	Barhabise
53	Mid Solu HPP	9.5	Tingla
54	Myagdi Khola HPP	57.3	Dadakhet
55	Molung Cascade HPP	3.5	Okhaldhunga
56	Kunban HPP	20	Dadakhet
57	Seti Nadi HPP	25	Lahachowk
58	Likhu Khola HPP	30	New Khimti
59	Landruk Modi HPP	86.59	Kushma
60	Sagu Sorung HPP	5	Singati
61	Upper Rawa HPP	2.8	Baksila
62	Middle Mewa HPP	49	Hangpang
63	Taman Khola HPP	4.85	Burtibang
64	Lower Manang Marsyangdi HPP	104	Dharapani (Manang)
65	Chauri HPP	6	Madankudari (Lamosangu)
66	Upper Machha HPP	4.55	Salyantar
67	Brahmayani HPP	35.47	Pantang
68	Upper Brahmayani HPP	15.15	Pantang
69	Luja Khola HPP	23.55	Tingla
70	Super Sabha HPP	4.1	Khandbari (Tumlingtar)
71	Upper Myagdi I HPP	53.5	Dadakhet
72	Balephi Khola HPP	40	Pantang
Total		**2327.275**	

List of GIS conducted projects of Bulk Load Consumer in FY 2017/18

S.N.	Name of Projects	Capacity (MVA)
1	Jagadamba Steels Pvt. Ltd.	10
2	Jagadamba Enterprises	4.8
3	Ashok Steels Pvt. Ltd.	4.5
4	Swastik Rolling Mills	7.5
5	Narayani Strips.	10
6	Narayani Spat Pvt. Ltd.	8.75
7	Nepal Ultratech cement Pvt. Ltd.	4.5
8	Maruti Cement Ltd.	10
9	Bijayashree Steels Pvt. Ltd.	5
	Total	**65.05**

CORPORATE PLANNING AND MONITORING DEPARTMENT

Corporate Planning and Monitoring Department is responsible for developing corporate and periodic development plans and programs, developing monitoring evaluation directives, carrying periodic monitoring and evaluation of projects implemented by NEA, and assisting National Planning Commission, Ministry of Energy, Water Resources and Irrigation and Ministry of Finance in the preparation of annual budget and programs for projects being undertaken by NEA. The Department 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 plays the coordinating role in the development of hydropower and transmission line project under different financing mode. During the year under review, the Department collected, evaluated and reviewed monthly, trimester and annual progress of 190 development projects implemented by NEA. Of these 190 projects: 10 projects were for feasibility study of storage and medium/large hydropower projects; 6 projects were hydropower projects that are under construction; 61 projects were transmission line projects; 101 projects were distribution system expansion and rural electrification projects and the remaining projects included rehabilitation and maintenance of hydropower stations, institutional strengthening and renewable capacity addition.

The Department also furnished various data and reports to Ministry of Energy, Water Resources and Irrigation and other concerned authorities of Government of Nepal.

INFORMATION TECHNOLOGY DEPARTMENT

Information Technology Department is responsible for core IT-related services within the organization with its rudimentary data center located in the IT department building at central office. Apart from the implementation of new IT systems, the Department provides continuous ICT support, maintenance and trainings at local and regional levels. A significant effort is also being made by the department towards the intranet expansion with fiber optics cable and wireless connectivity. Remote network services are also being provided through ADSL, Leased Line and VPN for NEA offices to use different applications. The department facilitates central procurement section for procuring the computer hardware, networking components by preparing tender documents, technical specifications and cost estimations.

Payroll and Pension Management Information System application, functioning in decentralized mode in more than 200 NEA offices is successfully tested and completed centralization. Accounting System running in more than 350 NEA offices has been successfully centralized as well.

By the end of this fiscal year, Fixed Asset Management System and Inventory Management System of NEA will be centralized. The department has introduced new NEA website and added some portal services in it.

E-attendance system has been implemented in more than 60 new NEA offices in this fiscal year. Online meter application and Complain management systems were developed and implemented in 5 regional offices and in their respective branches.

A total of 134 buyers and 865 bidders have been registered in our new e-bidding portal and 1427 contracts were facilitated. NEA management has decided to process e-bidding through government portal www.bolpatra.gov.np facilitated by the PPMO (Public Procurement Monitoring Office site) from Shrawan 2075 onwards.

IT department is constantly developing and

implementing, various IT related applications in all of NEA offices around the country and supporting them round the clock. The department is planning to upgrade the rudimentary Data Center to a full-fledged one backed up by a Data Recovery Center (DR) as well.

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:

i. PPA processing and signing:

   It covers PPA processing activities up to and including its signing.

ii. PPA implementation and monitoring

   It includes PPA administration after its execution till commercial operation.

iii. 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. The different stages involved are document study and investigation, technical review, grid connection agreement followed by Grid Impact Study and PPA draft preparation and negotiation.

A total of 15 new projects developed by the Independent Power Producers (IPPs) with their combined capacity of 71.643 MW was commissioned in FY 2017/18. Projects that were commissioned are: Upper Mai C (5.1 MW), Dhunge-Jiri (0.6 MW), Sabha Khola (4 MW), Puwa Khola -1 (4 MW), Phawa Khola (4.95 MW), Thapa Khola (13.6 MW), Sardi Khola (4 MW), Chake Khola (2.83 MW), Midim Karapu (3 MW), Syauri Bhumey (0.023 MW), Molung Khola (7 MW), Madkyu Khola (13 MW), Mai sana Cascade (8 MW), Theule Khola (1.5 MW) and Leguwa Khola (0.040 MW). With these 15 projects, the total number of IPP-owned projects that are in operation has reached 75 with their combined installed capacity of 512.6954 MW. Similarly, 107 projects of IPPs with their combined capacity of 2356.313 MW are under construction. Likewise, 74 projects of IPPs with their combined capacity of 1658.817

12th Power Exchange Committee (PEC) meeting held in New Delhi.

MW are in other stages of development. During FY 2017/18, 45 new PPAs with their combined capacity of 1102.909 MW were concluded. Additionally, the installed capacity of 6 projects, namely, Ghalemdi Khola, Bagmati Khola, Singati Khola, Sabha Khola A, Langtang Khola and Ghar Khola were upgraded by 1 MW, 2 MW, 9 MW, 1.69 MW, 10 MW and 5.7 MW respectively. With this, total number of PPAs concluded till the end of FY 2017/18 has reached 256 with their combined capacity of 4527.8254 MW.

ECONOMIC ANALYSIS DEPARTMENT

As a one of the major component of Planning, Monitoring, and Information Technology Directorate of Nepal Electricity Authority- Economic Analysis Department is mainly responsible for conducting the activities related to the economic and financial analysis of NEA. The department is assigned to the following tasks:

- Financial/ Economic, commercial and market analysis of NEA.
- Formulate criteria for economic and financial analysis of NEA's projects.
- Cost Benefit Analysis (CBA) of NEA projects.
- Prepare Log Frame of generation and transmission line projects of NEA.
- Cost analysis of services distributed by NEA.
- Prepare documents for review of electricity tariff to be submitted to regulatory body - Electricity Regulatory Commission of Nepal (ERC).
- Segregate the Embedded Cost of Supply (ECoS) of NEA into G, T & D activities so as to provide Average Cost of Supply (ACoS) in different activities.
- Carryout comparative benefit study of hydropower generation and transmissions lines of NEA.
- Carry out study and evaluation of economic and financial sustainability of completed projects by NEA.
- Assists other departments of NEA in prioritizing the selection of the projects.

The department is the focal point of NEA to coordinate with proposed ERC. The department also supports Power Trade Department in the process of concluding PPA with IPPs. Its role now has been both extensive and intensive in the context of increasing expected energy banking with and net exporter of electricity to India in the days to come. These all activities and responsibilities are tie-up with periodic tariff revision which encourage electricity producers and suppliers to supply more and at the same time provide the electricity to customers at the affordable rate to encourage the demand.

The main activities conducted by the Department in the FY 2017/18 are presented as:

- NEA Financial Viability Action Plan(2018)- It forecasts the future investment requirement for NEA in compatible with the strategy of concerned Ministry , GoN. It could the basis for tariff requirement under different scenarios and Financial Viability Gap Funding (FVGF) as a grant of GoN which will the basis for the prosperous future of NEA and overall electricity sector in the nation. This task has been completed.
- Retail Tariff Model of NEA- it has been developed to outline the average tariff requirement for different customer categories on which International Standard has been used molded as per our ground reality. It also develops the proper mechanism for cross subsidy between and within categories. It may calls for additional study. The work is in progress.
- Corporate Plan of NEA- it comprises the Vision, Mission, Goals and Activities (Action) plan of NEA developed by the core team in order to materialize the future prospects in coming five years. Planning team has been formed and action is in progress.

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 and geological and geotechnical studies. It is headed by a Deputy Managing Director. The Directorate renders 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 Department provide 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.

Some hydroelectric projects, initially under Engineering Services Directorate are being implemented through subsidiary companies of NEA and the Engineering Directorate is temporarily responsible for their management. Brief descriptions of these projects and departments have been outlined in sections that follow.

DUDHKOSHI STORAGE HYDROELECTRIC PROJECT

Dudhkoshi Storage Hydroelectric Project is a storage type hydropower project capable of addressing prevailing power and energy deficit during dry season. It is located at border of Khotang and Okhaldhunga districts on Dudhkoshi River in Province no. 1 of Nepal. The dam site of the project is at an aerial distance of 140 km east of Kathmandu, approximately 1.5 km northwest of Lamidanda airport, Khotang.

At present, NEA is conducting the updated feasibility study and detailed design of this project. The Consultant for this study, ELC Electroconsult S.p.A. (Italy) in association with NEWJEC Inc. (Japan),commenced the work on 19th July 2016 and shall complete the task in 30 months.Draft Updated Feasibility Study report has been prepared and detailed design is going on.

The updated feasibility study has recommended one tunnel power house of 600 MW and a toe power house of 200 MW. There is also additional 6 MW unit to generate energy from environmental flow at dam site. The annual energy production from alternative is 3449.83 GWh out of which 1116.87 GWh is produced during dry season and 2558.93 GWh during the wet season.

The proposed layout in the draft feasibility study report includes: a CFRD Dam 220 m high with a crest elevation of 640 m a.s.l. located on Dudhkoshi River in a gorge nearly one kilometer downstream of the confluence between Dudhkoshi river and ThotneKhola; a powerhouse with installed capacity of 600 MW located on Sunkoshi river with a 13.3 km long headrace tunnel; a powerhouse with an installed capacity of 206 MW located in the right abutment including a mini hydro turbine (6 MW) necessary to turbine the environmental flow; a combined spillway (gated and labyrinth

overflow, design discharge 9027 m3/s) located in the left abutment; a low level outlet and a middle level outlet located in the left abutment. The total storage capacity of the reservoir is 1503 Mm^3 out of which the live storage capacity is 1264 Mm^3.

Consultant is carrying out sediment sampling, geophysical survey, geological mapping of the project area including the reservoir area. The environmental and social impact of the project is manageable as only less than 150 households are directly impacted by the project.

The geo-technical investigations, Core Drilling and Construction of Test Adit, are being carried out with separate bids. A total of 1100 m out of 1500 m of core drilling has been completed and 120 m out of total 800 m test adit has been constructed till July 30, 2018.

As presently conceived, the project can be implemented and fully commissioned in 7years period. The construction of the project is expected to commence from third quarter of 2020 and complete by the end of2027.

Core Drilling at Dam site

Construction of test adit: Adit no.- AR2

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 UAHEP, which lies on the upper reach of the Arun River, is one of the most attractive projects in the Eastern Development Region of Nepal. It is located in Sankhuwasabha District about 700 km east of Kathmandu. The proposed dam site is located in a narrow gorge about 350 m upstream of the confluence with Chepuwa Khola near about to Chepuwa Village. The powerhouse lies at Sibrung in Hatiya Village, nearby the confluence of Arun River with Leksuwa Khola. The power house lies at the distance of about 32 km from Tumlingtar, the nearest air strip from the project site. The access to the project area starts from “Koshi Rajmarg” which is a national high way to Kimathanka (Chinese Border) and is presently under construction by Government of Nepal (GoN). The earthen track upto Barun Bazar has been completed. The power house site is just at the other side of the “Koshi Rajmarg” across Arun River. An access road with total length of 24 km will be required to reach headwork site along the left bank of Arun River. The access road will consist of 1.8 km long road tunnel. The power from UAHEP is proposed to be evacuated to national grid from Tumlingtar Hub through 49 km long double circuit 220 kV transmission line.

The stretch of Arun River in the project area is the boundary of the buffer zone of Makalu Barun

National Park. The right bank of Arun River in this stretch lies within the buffer zone. Except the head works, all the main structures of the project are located on the left bank of Arun River which is outside the buffer zone of Makalu Barun National Park.

Feasibility study of this project was carried out by the Joint Venture of Morrison Knudsen Corporation in association with Lahmeyer International, Tokyo Electric Power Services Co. and NEPECON on behalf of Nepal Electricity Authority (NEA) in 1991.

Based on the feasibility study carried out on 1991, the installed capacity of Peaking Run-offthe River type UAHEP is 335 MW. The design discharge of the project is 78.8 m3/sec (Q72) and generates the firm energy of 2050 GWh per annum.

As per the FS report 1991, the project consists of 7.8 km long headrace tunnel, weir with three gated spillway, underground desanding basin, 18 m diameter surge tank tank with 60 m long penstock tunnel; 454 m high, 2.8 m diameter pressure shaft and underground powerhouse with 4 unit of pelton turbine. The project has a design head of 492 m.

For expediting the implementation of the projects and effective project management including funding arrangement, NEA Board decided to develop both projects under the Public Company for which Upper Arun Hydroelectric Limited (UAHEL) has been formed. NEA Managing Director is the Chairman of the Company. Other two boards of directors have also been appointed and the Board has decided to appoint the current Project Director of UAHEP as one of its board directors which is also the Managing Director of the Company.

As preparation of the projects for implementation, the study of UAHEP & IKHPP (Detailed Engineering design and Environmental and Social Study) is being carried out with the financial assistance of World Bank (WB) under Power Sector Reform and Sustainable Development Hydropower Projects (PSRSHDP). The World Bank has provided a credit of US$ 20 Million on the proposed credit number 5728- NP to the Government of Nepal. The credit has been sub-lent to Nepal Electricity Authority (NEA) as a subsidiary loan under the subsidiary loan agreement between GoN and NEA. The loan became effective since June 2, 2016. The Detailed Engineering design and Construction Supervision of the Access Road for the UAHEP

Contract signing on date January 28, 2018

is being carried with funding of Government of Nepal. The construction of road is estimated to be completed in two and half years after the contract award (i.e. by August 2021). Land acquisition for Hydropower project is expected to be completed by November, 2019. In case of financial closure by June 2020 and contract is awarded to the contractor by January 2021, the project (the Q40 Option) is expected to complete by mid-2026. The optimization work is on-going. Preliminary study shows the following energy scenario for Q40 design discharge.

Discharge (m^3/s)	Installed Capacity	Total Annual Energy	Dry Energy (GWh)	Wet Energy (GWh)
169 (Q_{40})	725MW	4414 GWh	1448	2966

The license for study of IKHPP has been recently granted to UAHEL. The application for study license of UAHEP on the ownership of UAHEL has been made to the Government of Nepal. The GON is expected to decide on this soon.

The following is the present status of the main activities of the project:

- The Consultant for Detailed Engineering Design and Preparation of Bidding Document of UAHEP and IKHPP has recently submitted the Inception report and is expected to submit the updated feasibility Study Report by October, 2018 and the final DED reports and bid documents is expected by June 2020. The construction of the project is expected to kick off by Jan. 2021 with a target to start commercial operation by June 2026.

- The Consultant for Environmental and Social Impact Assessment (ESIA), Cumulative Impact Assessment (CIA) and Social Planning Studies (SPS) for UAHEP and IKHPP is expected to commence the works by August 2018.

- The Consultant for assignment "Detailed Engineering Design, Tender Document Preparation and Construction Supervision and Contract Management of Access Road Construction for UAHEP has commenced the work and will finalize the design reports and tender documents by December 2018. NEA is making effort to start the construction by the first quarter of 2019 so that the road is ready by June 2021.

Layout of Project Components


Installation of Gauging Station

Other activities being carried out:

- The Fishery baseline study is on the progress.
- Preliminary preparation work for the land acquisition works for the construction of Camp Facilities.
- EIA study of the Access Road for UAHEP and IEE study of the Camp facilities is ongoing

- Dam Safety Panel of Experts (DSPOE) will be on board soon. Procurement of Environmental and Social Panel of Experts ESPOE will start soon.

UPPER MODI 'A' & UPPER MODI HYDROELECTRIC PROJECT

Upper Modi Hydroelectric Projects consists of two hydropower projects in cascade. Upper Modi 'A' Hydroelectric Project (UMAHEP) at present is conceived as 42 MW project whereas Upper Modi Hydroelectric Project (UMHEP) will have installed capacity of 18.2 MW and will be operated using tailrace discharge of UMAHEP. Both of these projects are run-of-the-river projects. The EIA study of UMHEP with installed capacity of 14 MW with separate headwork was approved in the year 2002. Now, the project is conceptualized to be developed as cascade project of UMAHEP with installed capacity 18.2 MW

The total annual average energy generation for UMAHEP is estimated to be 214.874 GWh out of which dry season energy is 33.267 GWh and wet season energy is 181.607 GWh. The headwork site of UMAHEP is located approximately 100 m downstream of the confluence of Modi khola and Kimrung Khola and just 500 meter upstream of the suspension bridge (New Bridge) in Ghandruk Village Development Committee (VDC). Powerhouse is located at Kylue Village of Ghandruk VDC. Likewise, the average annual generation for UMHEP is estimated to be 107.2 GWh out of which the total dry season energy is estimated to be 14.86 GWh and the total wet season energy is 92.35 GWh. The headwork structure of UMHEP consists of interconnection arrangement, box culvert, headpond and inlet portal for Headrace Tunnel. The inlet portal is located in the vicinity of Syauli Bazar. Powerhouse of UMHEP is located at Birethanti Village of Dansin VDC.

At present, the project is proposed to be developed in the Engineering, Procurement and Construction (EPC) Model. Request for proposal (RFP) for the selection of International Consultant for Detailed Engineering Design and preparation of EPC Tender document was initiated at the end of fiscal year 2073/74. Based on the evaluation of RFP submitted by four international consultants, the AF-CONSULT Switzerland Limited was awarded the contract. The final contract between Upper Modi Hydroelectric projects, Engineering Services Directorate, Nepal Electricity Authority (Client) and the AF-Consult Switzerland Ltd in association with ITECO Nepal Pvt. Ltd and Total Management Services Pvt. Ltd has been made on 16th march 2018. The consultant has initiated detailed designed work as per the TOR from April 29, 2018. The total design period is scheduled to be 10 month.

Similarly, Supplementary EIA study of UMHEP has been carried out in the year 2017 for the changed capacity of 18.2MW. DoED has approved the SEIA report and send to the Ministry of Population and Environment (MoPE) for the final approval.

In this fiscal year, the VDC in cooperation with the local people completed the preliminary excavation of NayaPul- Ghandruk road. Apart from this, the road was extended to New Bridge area. Upgrading of this road is to be carried out so that it could be used as an access road for the project. Considering this fact, strip survey of the recently constructed road was carried out from April 6 to May 14, 2018.

NEA also initiated land acquisition process for the construction of UMAHEP and UMHEP. Land acquisition process for camp site, powerhouse area of UMAHEP and interconnection facilities to divert tailrace discharge to UMHEP has been completed. It includes about 157-0-3-2 (ropani-aana-paisa-daam) of private land.

Similarly, for UMHEP, total area of the land to be acquired in the Powerhouse and Surge tank area is estimated to be 33 Ropani. In this fiscal year, plot number and respective owner of private land

have been prepared. Likewise, for the preparation of camp drawings, a contract has been signed with M-tech Engineering and Consultancy Services Pvt. Ltd. The drawings prepared by the M-tech engineering consultancy shall later be reviewed by AF-consultant Switzerland LTD and shall prepare BOQ and tender document for the construction of camp facilities through local contractors. Single stage two envelop system of bidding is perceived for this purpose. Both of these projects are proposed to be developed in company Model.

Modi khola at Headwork site

For this purpose, Modi Jalabidhut Company has been registered as a public company. Required administrative work for the implementation of the Company is being carried out.

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.

ANDHIKHOLA STORAGE HYDROELECTRIC PROJECT

NEA is carrying out Updated Feasibility study of Andhikhola Storage Hydroelectric Project (180 MW) which is situated in Syangja district. There is an urgent need to implement storage hydropower projects in order to fulfill the power system requirement of Nepal. The existing Siddhartha Highway and Kali Gandaki 'A' access road provide an easy access to the project site. The proposed Dam site of this project has been located just 3.1 km upstream of Kaligandaki/Andhikhola confluence. The proposed Powerhouse site is located 12 km downstream of Kali Gandaki 'A' (KG-A) Powerhouse site.

The crest level of dam has been proposed at 710 masl so that Galyang Bazar on the highway will be protected. After the site visit by JICA/NEWJEC experts in November, 2017, an alternative dam site has been proposed for further study which is located at about 1.2 km upstream from the previously proposed dam site. The newly proposed rock fill dam will be 162 m high from the river bed. A sloping type intake has been proposed to convey the discharge from the reservoir through a 2.7 km long Headrace tunnel, Surge shaft, 216 m high Drop shaft and 1.2 km long Pressure tunnel to the powerhouse. A semi surface powerhouse with three turbine-generator units and ancillary facilities has been proposed on the left bank of Kaligandaki River instead of the underground powerhouse proposed in earlier study.

Field investigation works including Geological drilling, Geological mapping, ERT survey, Topo Survey has been carried out. Sediment sampling & Discharge measurement work of the river is being carried out. The EIA study of this project

is being conducted by Environment and Social Studies Department, NEA. Scoping document and ToR has already been submitted to Department of Electricity Development, MoE for approval. This project can generate about 623 GWh of total energy with 8 hour peak in dry season which is very much needed in the Power system.

Major Environmental impact comprises of acquisition of about 500 households and 9.4 MW Andhikhola run of river hydropower project owned by BPC. Base on the interaction made at Galyang Bazar with the local stakeholders in April 2018, the local people are positive for the implementation of this project

Sediment sampling at Andhikhola River

Due to easy access for construction, favorable location and moderate environmental impact, this storage project could be promising scheme for implementation in near term. Andhikhola Power Company Ltd. has been established as a subsidiary company of NEA to execute this project. In the fiscal year 2075/076 additional investigation and design work will be carried out. Furthermore, Expression of Interest and Request for Proposal will be called from International Consultant for Detail engineering design and Tender document preparation of this project.

UTTAR GANGA STORAGE HYDROELECTRIC PROJECT

There is seasonal imbalance in the Integrated Nepal Power System (INPS), in which only Kulekhani-I and Kulekhani-II totaling to 92 MW provide seasonal regulation. The insufficient existing peaking capacity to meet the peaking demand in the system is shown by the severe capacity shortage and import of power from neighboring country during the dry season. Compared to preceding fiscal year's figure of 1291.1MW, the peak power demand of INPS registered a growth rate of 7.3%. Storage plants with total capacity of atleast 30% of power system is required in order to effectively meet the dry/wet season imbalance. Government of Nepal (GON) has given high 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. Uttar Ganga Storage Hydropower Project is one of such potential projects, identified by NEA during "Identification and Feasibility Study of Storage Projects". After selecting as one of the prominent projects during coarse screening and ranking study, the pre-feasibility study of the project was carried out in the fiscal year 2003/2004. The third meeting of Project Facilitation Committee chaired by the Chief Secretary on April 29, 2013 decided to initiate the preparation of the Detail Project Report (DPR) and Environmental Impact Study at the earliest.

The proposed project is located about 398km west of Kathmandu in Baglung district of province number 4 of Nepal. The dam site is located at Gabavillage on Uttarganga river. The surge shaft and powerhouse-1 are located at Halechaur and powerhouse-2 is located at Samja Kharka. The project site is accessible from the Baglung -Burtibang road.

The nearest road head from the proposed Powerhouse site is at Burtibang Bazar. The access road to the powerhouse site forms a part of the Puspalal Mid-Hill highway (PushpalalLokmarg) between Burtibang and Rukum. About 48 km of new road is to be opened and about 27 km of road upgrading is required to access all project components in all seasons.

A survey license was received for conducting feasibility study for 300 MW in FY 2072/73 which was upgraded to 828MW in FY 2074/75 after carrying out the optimization study. In FY 2074/75, drilling work is being carried out at site through SRCL, NEA and ToR and scoping document of EIA issubmitted at MoFE, GoN for its approval.

Reservoir Area of Uttar Ganga Hydroelectric Project

Major components of the project are 200 m high rockfill dam, sloping type intake, 9,575m long headrace tunnel, surge shaft, 5.2 m diameter penstock pipe which is connected to powerhouse and surge shaft by series of vertical shafts and horizontal pressure shafts. The tailrace cum construction adit of powerhouse-1 has a length of 720 m, whereas powerhouse-2 tailrace has a length of 2760 m. Total waterway length starting from intake to outlet of tailrace of powerhouse-2 is 14.734 km.Both powerhouses 1 and 2 are underground powerhouse consisting of four units of vertical shaft Pelton turbines of each 104.25 MW installed capacity in each powerhouse. Tandem control arrangement is conceptualized between powerhouses 1 and 2 during its operation. A 105 km long 400 kV double circuit transmission line is proposed to evacuate the power to the proposed substation at Butwal.

The distinct features of the project are as follows:

- Availability of very high gross head of about 1350m making the project very cost effective.
- Less sediment yield of 3,690 t/km2/ year,thereby increasing the life of the reservoir.
- Inundation of only 250 ha of cultivated land and resettlement of 625 households thus having comparatively less socio-environmental impacts.
- Total cost of the project has been updated as 1,083,021,724 US$. The economic indicators are EIRR of 23.19% and B/C of 1.80.
- During the fiscal year 2074/75, the following works have been carried out:
- Geotechnical InvestigationPhase-II (Drilling) is being carried out by SRCL, NEA
- Topographical survey and Mapping of dam site are completed
- The ToR and scoping document for EIA is awaiting approval from MoFE, GoN
- The design of different project components are being carried out and reviewed
- The hydrological data is being collected at the dam site and tailrace site
- The downstream river basin development strategy after diversion is being carried out upto Kaligandaki-A HEP

TAMOR STORAGE HYDROELECTRIC PROJECT

Tamor Storage Hydroelectric project (TSHEP) was identified during the Koshi River Basin Master Plan Study, 1985. It is located in the Eastern Region, bordering Tehrathum, Taplejung and Panchthar District of Koshi and Mechizone. The project lies within Longitude 87°30'13" to 87°47'13" East and Latitude 27°01'47" to 27°20'37" North. The Dam site lies in Chhathar and Kummayak Gaupalika of Tehrathum and Pancthar District. TSHEP is a reservoir type of project with seasonal storage and suitably located about 75 Km away from energy intensive industries of Eastern Region. The project is one of the promising storage projects being studied by Nepal Electricity Authority (NEA). NEA has registered Tamor Power Company Limited with majority of its share for the further development of the project.

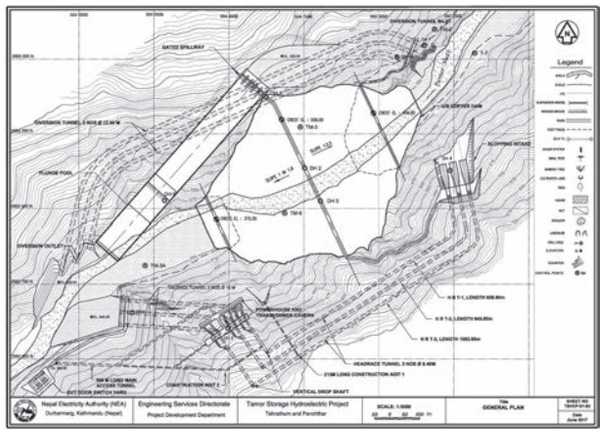
Project site is about 650 Km east form Kathmandu, connected by 175 Km (160 Km Blacktop and 20 Km Earthen) from the nearest airport at Biratnagar. Government of Nepal (GoN), Department of Road (DoR) opened track from Mulghat to Taplejung as Tamor Corridor, as the project site is accessible within 30 Km from mulghat, which will be used during construction.

DoED issued license of 200 MW with FSL of 450 masl with an issue of non-inundation of Kabeli -A (37.6 MW) and Lower Hewa(21.6 MW). Project Development Department (PDD) carried out optimization study which shows that the project is more attractive at higher FSL even with inundation of these projects. The study concludes that the project is optimum at FSL of 550 masl with an installed capacity of 762 MW. So that, NEA has applied for amendment in license boundary for further study of the project at optimum capacity.

NEA (PDD) conducted the feasibility study of TSHEP at FSL 550 masl and installed capacity of 762 MW. The estimated base cost of the project is about 1164.22 Million US dollar at 2016/17 level of rate. The project is planned to develop at FSL of 550 masl with operation hour of 8 hrs in dry and 16 hrs in wet season and energy has been estimated accordingly. The estimated average annual energy of this project is 2,984.03 GWh out of which dry energy is about 1111.82 GWh. Wet season energy was spill to maintain at least 35% of dry season energy. If there is no constrain for minimum dry season energy, net annual energy would be about 3353 GWh.

The general arrangement of the project consists of 210 m high rock fill dam from river bed with gated spillway on the right bank of the river capable to pass 10000 year flood. The conveyance system designed to draw a discharge of 517.00 m^3/s which consists of three individual intake followed by 965 m long horizontal headrace tunnel, 132 m long steel lined drop shaft followed by 135 m long penstock to the underground powerhouse consisting of six vertical axis Francis turbine of capacity 127 MW each. The powerhouse complex consists of 165mx20mx47m underground powerhouse and 168m x 15m x 19m underground transformer cavern. The transformer cavern accommodate single phase transformer with 400 kV GIS. The generated power will be evacuated by 75 Km long 400 kV double circuit transmission line.

Soil Rock and Concrete Lab (SRCL) conducted the geotechnical investigation work, which includes drilling of 764 m in Phase I and Phase II. As per the recommendation of JICA expert to NEA, additional drilling of 1200m along dam axis and river bed was proposed.



General Layout Plan of Tamor Storage Project

NEA expects to acquire grant form Asian Development Bank (ADB) under Project Preparatory Facility for Energy for the Detail Engineering Design of this project. To procure consulting services, NEA published the Expression of Interest (EoI) for shortlisting of international consultants in 12th April 2018. Seventeen consulting firm expressed interest to provide consulting services for the assignment and RFP will be sent to shortlisted consultant. In fiscal year 2075/76, consulting services is planned to recruit for Detail Engineering Design of TSHEP.

CHAINPUR SETI HYDROELECTRIC PROJECT

Chainpur Seti Hydroelectric Project (CSHEP), originally an RoR scheme, is being studied for feasibility by Project Development Department.

Currently, the scheme has been studied as a PRoR. The Project is located at Kada Gaupalika and Talkot Gaupalika in the Bajhang District, State No.7, Far Western Nepal.

The project features includes Dam, headworks, desanding basin, headrace tunnel, surge shaft, steel lined pressure shaft, powerhouse and tailrace structures. The proposed headworks site is located about 150 m downstream from the confluence of the Seti River and Ghatganga River while the proposed powerhouse site lies near the Basti village at the right bank of Seti River. Installed capacity of the project is fixed at 210 MW. The power generated from the project shall be connected to proposed 220 kV Attaria sub-station.

The Project site is partially accessible via Attariya-Chainpur black topped road and an earthen track road of about 16 km connecting Chainpur to the proposed powerhouse site. The GoN has been constructing a highway which links the district headquarter Chainpur to the Nepal-China Border. Other project components lie at the vicinity of this highway under construction.

During the fiscal year 2074/75, the project completed topographic survey for access road, Electrical Resistivity Tomography(ERT), Core drilling, Construction Material Survey, water discharge measurement and continuation of water level recording at project site. Similarly, project design, detailed cost estimate and financial analysis have been conducted in this fiscal year. The project has been designed with a 6 hours peaking facility in dry season. The project's environmental impact assessment has also been started in this year. The Detailed Project Design and Tender Documents preparation for the project has been planned to be conducted via International Consultants for which the EoI and RFP documents shall be prepared in the early of FY2075/76.

BEGNAS RUPA PUMPED STORAGE HYDROELECTRIC PROJECT

Begnas Rupa Pump Storage Hydroelectric Project (BRPSHEP), the first of its kind in Nepal, was identified in the year 2018 by the Project Development Department and is under feasibility study. The Project has received the survey license issued by DoED in November 2017. The Project is located at Pokhara Metropolitan City in the Kaski District, State No. 4, and Nepal. The natural head of 57m available between the Begnas Lake and Rupa Lake shall be utilized for reserving INPS spill energy anticipated in the near future. The project's major features include the two lakes serving as the

Begnas Rupa Pump Storage Hydroelectric Project Area

upper and lower reservoirs, headworks, headrace tunnel, surge shaft, steel lined pressure shaft, semi surface powerhouse and embankment dam structures at the lakes. The proposed headworks site is located at the base of Sundari danda near Jyamire in Begnas Lake and the proposed powerhouse site lies at the base of Simal danda near Rupa Lake. Installed capacity of the project is proposed to be 150MW.

Prithivi Highway, which connects Kathmandu with Pokhara, runs near site and thus is the access to the Project. Lekhnath-Sundari Danda feeder road joins the Project Area with the Prithvi Highway. The intake site at Begnas Lake will require about 2 km of the access road from the feeder road located on the Sundari Danda ridge whereas just upgrading of about 1 km of the existing track road can serve for the access of powerhouse site.

During the fiscal year 2074/75, the project has completed detailed topographic survey, Surface Geological Mapping, water discharge measurement and installation of water level recording at project site.

Similarly, Environmental Impact Assessment studies and Detailed Geological and Geotechnical Investigation of the project have been initiated in the same year. The feasibility study of the project is planned to be completed in the fiscal year 2076/77.

SURVEY OF TRANSMISSION LINES, SUBSTATIONS AND HYDROPOWER PROJECTS

PDD has been conducting topographical survey of various transmission lines, substations and hydropower projects. In the fiscal year 2074/75 following survey works was accomplished by survey division of PDD.

Transmission line Works carried out by Project Development Department, F.Y. 2074/75

S.N.	Transmission Line Projects	Districts	Length(km)	Status
1	Ghorahi Madichaur 132 kV T/L Survey and Feasibility Study	Rolpa, Pyuthan and Dang	38.00	Completed
2	Dadakhet-Rahughat 132 kV T/L Survey and Feasibility Study	Myagdi	25.00	Completed
3	Dhalkebar Loharpatti 132 kV T/L Survey and Feasibility Study	Dhanusa and Mohattari	18.85	Completed
4	Riddi-Siddhi Cement 33 kV Transmission Line Survey	Makawanpur	2.00	Completed
5	Rasuwagadhi Chilime Ratmate (Galchhi)400 kV T/L Survey and Feasibility Study	Rasuwa and Nuwakot	80.00	Field survey Completed
6	Borang Ratmate 220 kVand Feasibility Study	Dhading and Nuwakot		Field survey Completed
7	Lekhnath-Damauli 220 kV TRL Survey	Tanahu	2.60	Field survey Completed
8	Tumlintar-Sitalpati 220 kV T/L Project	Sankhuwasabha	18.00	Desk Study Report 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 2074/75.

- Trishuli Hydropower Station Rehabilitation Project

Trishuli Hydropower Station is located 75 km northeast of Kathmandu in Nuwakot District. It was constructed jointly by Government of India and Government of Nepal in 1968 with installed capacity of 21 MW. In 1995 it was upgraded to 24 MW by NEA. It is a peaking run-of-river hydropower station with annual design generation of 163 GWh. The powerhouse of the plant has six units each of installed capacity of 3.5 MW and one unit of 3 MW.

Presently, Trishuli hydropower plant is unable to operate in its designed capacity of 45.6 m3/s and cannot meet the designed energy output of 163 GWh. It has been able to produce only 125 GWh of energy, particularly because of the loss of storage in the regulation basin. Besides, there seems to have some serious insufficiency in the capacity of desanding basin as well.

In this context, Project development department was appointed by the Technical Support Department for investigating this problem and the former was appointed for providing consulting services for the appropriate facilities in order to get rid of the aforesaid problem. In this context, following scope of works was set by the department:

Sediment deposition downstream of Reservoir during emptying

- Detailed Topographical Survey of reservoir and desander area.
- Sediment sampling for quantitative and qualitative sedimentological analysis.
- Design and Estimation of bypass channel
- Design of Rivulet training works
- Detail design of additional desander
- Estimation of quantity for sediment removal from reservoir
- Check the financial viability of the rehabilitation works
- Tender document preparation
- Operational manual for gate operation and maintenance of all civil structure.

All the works were successfully completed and the Final Report has been submitted in Ashad 2075.

• Building and Physical Infrastructure Construction Project (BPICP)

Building and Physical Infrastructure Construction Project (BPICP) was established on 2074/06/09. The main objective of this project is to construct the Corporate Office building at Durbarmarg and other office building at prime location along with other infrastructures.

CORPORATE OFFICE BUILDING AT DURBARMARG

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. But due to rapid change in building technology, evolution in latest office design concept and changed scenario in commercial building requirements, NEA modified the existing master plan. 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.

The building consists approximately rectangular building of plinth area 807.38 m2. It is sixteen storied and double basement. The exterior

Corporate office building model.

finishing is of ACP (Aluminum Composite panel) and Windows are double glazed. The building is disable friendly and consists of three lifts.

- Construction Supervision of Chameliya Hydroelectric Project

  PDD has been associated with SHAH, SILT and ICON JV for the construction supervision of Chameliya Hydroelectric Project which was continued in this fiscal year as well.

- Identification of New Projects for study:

PDD has been involved in the identification of new projects for further studies in the country. In this context few projects were identified among which Arun-4 Hydroelectric Project and Lower Arun Hydroelectric Project with initially estimated capacity of 264MW and 430MW respectively has been identified for further studies. The desk study has been ongoing for the aforesaid projects and identification of few other projects has been under consideration.

ENVIRONMENT AND SOCIAL STUDIES DEPARTMENT

Realizing the need of addressing environmental and social issues associated with hydropower related development, an Environmental Unit was established as early as in the FY 1987/88. This unit functioned under the Project Preparation Department of Engineering Directorate of NEA. Later in 1993, the Environmental Unit was upgraded to Environmental Division. It was only in 2000, the division was finally upgraded to Environment and Social Studies Department (ESSD). Since then, ESSD is one of the integral departments of Engineering Service Directorate of NEA. In due course of time, with the evolution from a unit to a full-fledged department and increasing complexities of electricity development with environment and society, the scope of work of ESSD has increased significantly.

ESSD executes all the activities related environmental and social aspects of hydroelectric Projects (HEPs) and transmission line projects (TLPs) which are 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), Land Acquisition and Compensation Plan (LACP) 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 2017/18, ESSD was actively engaged in environment and social studies, monitoring and protection of the environment. The department has successfully completed and get clearance from concerned ministries for EIA of one HEP, IEE/Updated IEE of three Transmission Line (TL) projects, IEE of one solar power project and ToR of nine projects. The following sections provides a brief of different tasks done by ESSD.

1. Study Projects

Projects Requiring EIA

All the projects falling under Schedule-2 of Environment Protection Rules (EPR), 1997 requires EIA. The whole process of EIA in Nepal is primarily guided by EPA, 1997 and EPR, 1997. The EIA has two main phases, the first phase incudes the preparation of Scoping Document (SD) and Terms of Reference (ToR).

The second phase is the EIA Phase which is carried out based on the approved ToR. All the documents subject to EIA including the SD/ToR and main EIA document are subjected to be approved by the Ministry of Forests and Environment (MoFE). In the fiscal year 2017/18, ESSD was involved in the EIA of following 8 projects, out of which the Supplementary-EIA (S-EIA) of one project has been approved by the ministry and the EIA/S-EIA

of two project have been submitted to the MoFE through MoEWRI for approval.

- Tanahu (Upper Seti) HEP (140MW): S-EIA approved on Oct. 13, 2017
- Marsyangdi Corridor (Manang-Udipur) 220kV TLP: EIA report submitted.
- Upper Modi HEP (18.02MW): S-EIA report submitted.
- Uttarganga Storage HEP (828MW): SD/ToR submitted.
- Andhikhola Storage HEP (180MW): SD/ToR submitted.
- Rolwaling Khola HEP (22MW): SD/ToR submitted.
- Chainpur Seti HEP (210MW): SD/ToR under preparation.
- Begnas-Rupa Pump Storage HEP (150MW): SD/ToR under preparation.

b. Projects Requiring IEE

All the projects falling under Schedule-1 of Environment Protection Rules (EPR), 1997

Public hearing for SEIA of Upper Modi HEP at Birethanti, Kaski

requires IEE. The IEE has also two main phases, preparation of ToR is the first phase whereas the preparation of IEE based on ToR is the second phase. Both the documents, ToR and IEE are subject to approval from the concerned ministry as per EPA/EPR, 1997. For hydropower, solar and transmission line projects, the Ministry of Energy, Water Resources and Irrigation (MoEWRI) is responsible for approving IEE whereas for project such as camps and buildings, the Ministry of Urban Development (MoUD) is responsible. In the FY 2017/18, ESSD was involved IEE of a number of projects, whose status is presented as follows;

1. Lekhnath-Damauli 220kV TL Project: IEE approved on February 11, 2017
2. Dordi Corridor 132kV TL Project: IEE approved
3. 132/220kV Chilime Substation Hub and Chilime-Trishuli 220kV TLP: Updated-IEE approved on Dec. 6, 2017
4. Grid Tied Solar Power Project, Block No.1 (5.1MW): IEE approved on June 7, 2018
5. Sunwal 132/33kV Substation Project: ToR approved on Jan. 22, 2018; IEE submitted
6. Rahughat HEP (40MW): Supplementary IEE submitted
7. Grid Tied Solar Power Project Block No.2 (8.3MW): ToR approved on Aug., 24, 2017; IEE report submitted.
8. Grid Tied Solar Power Project Block No.3 (3.5MW): ToR approved on Aug., 24, 2017; IEE report submitted.
9. Grid Tied Solar Power Project Block No.4 (8.1MW): ToR approved on Aug., 24, 2017; IEE report submitted.
10. Dhalkebar-Loharpatti 132kV TLP: ToR approved on May 2, 2018; IEE report submitted.
11. Camp Facility of Upper Arun HEP: ToR approved on November 19, 2017, IEE submitted
12. Corporate Office Building: ToR approved on Nov. 19, 2017; IEE submitted to MoUD.
13. Butwal (Gorusinghe)-Lumbini 132kV TLP: IEE report under preparation.
14. Balefi Corridor 132kV TL Project: ToR approved on July 8, 2018.

15. Butwal-Dhakdhai 33kV TL Project: ToR approved on July 10, 2018.
16, Dadakhet-Rahughat 132kV TL Project: ToR submitted for approval
17. Tinau HEP Rehabilitation Project (3MW): ToR submitted for approval
18. Kaligandaki Corridor (New Butwal-Bardghat) 220kV TLP: ToR submitted for approval
19. Trishuli 3B Hub-Bhalche 33kV TL Project: ToR under preparation
20. Borang-Ratmate 220kV TLP: desk study undergoing
21. Ghorahi-Madichaur 132kV TLP: desk study undergoing
22. Kamane (Hetauda)-Ridhisidhi Cement 33kV TLP: desk study undergoing

c. Other Studies

In addition to nationally required documents like EIA or IEE, the donor funded projects demand for additional study of the environmental issues. In order to meet the donor's environmental safeguard requirements, ESSD has completed the required study of following projects.

Air Quality measurement for IEE of corporate building of NEA

1. Resettlement Action Plan (RAP) of Samundratar-Trishuli 3B Hub 132kV TLP submitted to European Investment Bank (EIB).
2. RAP of Marsyangdi Corridor (Manang-Undipur) 220kV TLP submitted to EIB.
3. Environment and Social Management Plan (ESMP) of Grid Tied Solar Power Project -Block No. 1, 2 and 3 cleared by World Bank.
4. ESMP of Supply and Installation of Distribution Project prepared and submitted to World Bank for Clearance.
5. Quarterly report on Fish and Aquatic Life Baseline for Upper Arun and Ikhuwa Khola HEPs submitted to the project

2. Monitoring Projects

ESSD has been undertaking environmental monitoring and mitigation of two under-construction hydroelectric projects (14MW to 60MW) and 13 transmission line projects ranging 132kV to 400kV and one substation project by establishing Environmental and Social Management Unit (ESMU) at project site. The ESMUs via ESSD are required to submit the quarterly monitoring reports to the respective projects. The status of different monitoring projects is as follows;

1. Upper Trishuli 3 'A' HEP (60MW): 22nd Quarterly report submitted
2. Kulekhani III HEP (14 MW): 16th Quarterly report submitted
3. Chameliya HEP (30MW): ESMU closed
4. Bhulbhule-Middle Marsyangdi 132kV TLP: ESMU closed
5. Kabeli Corridor 132kV TL Project: ESMU closed
6. Balach-Attariya 132kV TLP: 23rd Quarterly report submitted
7. Hetauda-Dhalkebar-Duhabi 400kV TLP: 17th Quarterly report submitted

8. Hetauda-Bharatpur 220kV TLP : 26th Quarterly report submitted
9. Bharatpur-Bardghat 220kV TLP: 16th Quarterly report submitted
10. 132/220kV Chilime Substation Hub and Chilime-Trishuli 220kV TLP: 4th Quarterly Report submitted.
11. Trishuli 3B Hub substation Project: 4th Quarterly report submitted
12. Kaligandaki Corridor (Dana-Kushma) 220kV TLP (SASEC Project): monthly report up to March, 2018) submitted
13. Marsyangdi-Kathmandu 220 kV TLP (SASEC Project): monthly report up to March, 2018) submitted
14. Kaligandaki Corridor (Kushma-New Butwal) 220kV TL Project (SASEC Project): ESMU established
15. Samundratar- Trishuli 3B Hub 132kV TLP: 9th Quarterly report submitted
16. Tamakoshi-Kathmandu 400kV TLP: ESMU established.
17. Garjyang-Khimti 132kV TLP: ESMU established.

3. Mitigation and Enhancement Programs

Under mitigation, enhancement and community support programs, different activities were conducted in this FY 2017/18 and their status is as follows;

UPPER TRISHULI 3"A" HEP (60 MW)

A 7-days NTFP Management Training was conducted at two places of project affected area. A total of 50 participants were trained under this program from Feb. 12 to 18, 2018 at Thuloagaun, Rasuwa District. ESSD conducted four-day Fisheries Training Program at three places (Thuloagaun, Shalletar-Rasuwa and Shantibazar, Nuwakot) on Feb. 16 to 19 (two places) and Feb. 19 to 22 (one place) benefitting 60 local people.

NTFP Training at Rasuwa

HETAUDA-DHALKEBAR-DUHABI 400KV TL PROJECT

The department is conducting site based environmental monitoring and implementation of mitigation works of the project through its three site based unit offices located in Inaruwa, Bardibas and Nijgadh. Under the mitigation program, about 60,000 seedlings have been planted in 6 project affected districts.

The major works performed in fiscal year were 6 days training on agricultural productivity intensification and 6 days training on animal husbandry. These two trainings benefitted 70 project affected people.

SASEC Projects:

Under SASEC, currently four projects are under construction which include Kali Gandaki corridor (Dana-Kusma) 220kV TL Project, Kaligandaki Corridor (Kushma- New Butwal) 220kV TL Project, Marsyangdi-Kathmandu 220kV TL Project and Samundratar-Trishuli 3B Hub 132kV TL Project.

ESSD has been carrying out environment and social monitoring of these projects by establishing the site based Environment and Social Management Units (ESMUs). In the FY 2017/18, the following activities were carried out in these projects.

a. Kaligandaki Corridor (Dana-Kushma) 220kV TL Project

The ESMU of the project is established at

Galeshwor of Myagdi. Two full time safeguard (environmental and social) officers are deployed for day-to-day monitoring. A 2-day awareness program on Forest and Wildlife Conservation was organized for the 20 members of project affected community forests.

b. Marsyangdi-Kathmandu 220 kV TL Project

The ESMU for the project is established at Aanbu-Khaireni, Tanahun on April 27, 2017 and two safeguard officer are fully deputed at site. One-day social awareness program were conducted at 10 different places which benefitted a total of 300 local people. Similarly, one-day awareness program on Forest and Wildlife conservation was organized at 10 places which benefitted a total of 200 locals. For the project workers, one day awareness program on occupational safety and hazards was conducted at three place and a total of 60 project site labours/workers were benefitted.

c. Samundratar-Tishuli 3B Hub 132kV TL Project

Under the skill development program, a 30-hours light vehicle driving training and a 390-hours electric wiring training were completed. A total of 20 (10 from each) project affected people were benefitted. Similarly, one-week long mushroom farming training for 55 locals was also completed.

132/220kV Chilime Substation Hub and Chilime-Trishuli 200kV TL Project

A one-day awareness program on Biodiversity Conservation and Cash Management was completed at three places in which a total of 117 project affected people participated. Similarly, Hoarding boards having informative and warning sign were affixed at 10 different places along the major settlements and villages located close to the project area.

Trishuli 3B Hub Substation Project

Hoarding boards having informative message and warning sign were affixed at 10 different places close to the project area. Similarly, one day awareness program on environment conservation were completed at 3 different places.

Hetauda-Bharatpur 220kV TL Project

Under the mitigation and enhancement programs, different programs ranging from 7 days course to 3 months were competed which benefitted a total of 194 project affected people.

Bhulbhule-Middle Marsyangdi 132kV TL Project

Under the skill development program, House Wiring Training of 390 hours (CTEVT standard) was provided to 25 participants from project

One day awareness program organized at Thulo Haku, Rasuwa

House Wiring Training at Chitwan

affected families of Lamjung district. Similarly, compensatory plantation has been completed at Kalika Thulokhoriya Community Forest area.

4. Community Support Programs

Under Community support programs of under-construction projects, different activities were completed in the FY 2017/18 which are as follows;

Hetauda-Bharatpur 220 kV TL Project

School support program including maintenance work of toilet of Bhole Baba Primary School, Piple and wall construction of National Primary School, Amritpani-Birendranagar were completed.

Bharatpur-Bardaghat 220kV TL Project

The reconstruction of Ganesh Temple at Gaidakot was completed and handover to local people. Similarly, for 10 Musahar family, construction of house with 10 rooms at Bardaghat Municipality-5 was completed and handed over to them. Under the school support program, construction of 8000 litres capacity water tank for Saraswoti Secondary School at Hasaura, Kawasoti Municipality has been done.

Hetauda-Dhalkebar-Duhabi 400kV TL Project

Toilet construction has been completed at Kushmanda Sarobar Triveni Dham of Hetauda. Likewise, for 16 Dalit and poor households, toilets for each households at Bardibas of Mahottari is being constructed. In Siraha, the relocation of Stahaniya Gramin Deveta Mandir is under progress. In Dhanusha, the renovation of a pond has been completed.

In addition to these activities, ESSD has published its fourth and fifth bi-annual newsletter (ESSD-Newsletter). The newsletter covers all the activities of ESSD carried out from July 2017 to June 2018.

Soil, Rock and Concrete Laboratory

Soil, Rock and Concrete Laboratory (SRCL) established and developing as Geotechnical Department is under the Engineering Services Directorate of Nepal Electricity Authority. It provides services in geological and geotechnical investigations, in-situ and laboratory testing 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 sectors. In the feld of soil and rock engineering, it also provides services of carrying out in-situ tests and laboratory tests.

Following are the major works executed by SRCL in Fiscal year 2074/75

1. Geophysical investigation works of Andhikhola Storage Hydroelectric Project:

As a phase I of additional geotechnical investigation; 2D-ERT (8000 m) at the Damsite and Galyang pass area of the project is completed in this fiscal year. Core drilling works is to be started after the rainy season.

2. Geological and geotechnical investigation of Uttarganga Storage Hydropower Project:

The geotechnical investigation works at the Damsite of the project is completed in this fiscal year. Additional geotechnical investigation

including core drilling works at proposed underground powerhouse area of the project will be started soon.

3. Additional Geological and geotechnical investigation works of Tamor Storage Hydropower Project:

Additional geotechnical investigation works (Phase II) includes exploratory core drilling (total 1200m) at the dam site is in completion stage.

4. Additional Geological and geotechnical investigation works of Chainpur Seti Hydropower Project:

The geotechnical investigation works (Phase II) includes core drilling and 2-D ERT Survey works at the Powerhouse site, and Surge Shaft area of the project has been completed.

5. Geological and geotechnical investigation works of Begnas Rupa Pump Storage Project:

Detailed engineering geological mapping has been completed in this fiscal year and preparatory works for the geotechnical and geophysical investigation work is in progress.

Core drilling works at Upper Modi A, HEP, KASKI

6. Geological, Geophysical and geotechnical investigation works at Phukot Karnali HEP

Regional geological and detailed engineering geological maping & 2-D ERT Survey of project area is completed in this fiscal year where as Geotechnical investigation including core drilling (1120m) at proposed hydraulic structure is in progress.

7. Geological and geotechnical investigation works of Betan Karnali HEP:

Regional geological and detailed engineering geological mapping of project area is completed in this fiscal year. Geotechnical investigation work is to be started soon.

8. Geological and geotechnical investigation works of Jagadulla HEP:

2-D ERT Survey of project area is completed in this fiscal year where as Geotechnical investigation including core drilling (560m) at proposed hydraulic structure site is in progress.

9. Geotechnical and Geophysical investigation works of Upper Modi and Upper Modi 'A' Hydroelectric Project:

Geological and Geotechnical investigation works includes detail engineering geological mapping, 2D-ERT (2800 m) and Core drilling (360 m) at the Dam site, Surge shaft and powerhouse site of these two projects is completed.

Laboratory Works:

Data acquisition works for ERT Survey.

SRCL provides laboratory services of carrying out in-situ tests and laboratory tests including construction material survey/quarry site investigations of various hydroelectric project and field geotechnical investigation works (SPT/DCPT in test pit/borehole) to determine the bearing capacity for structural design purposes.

Following are the major works carried out in this fiscal year 2074/75.

A. Construction Material Survey and Laboratory Tests:

- Andhi Khola Storage Hydroelectric Project, Syangja.
- Chainpur-Seti Hydroelectric Project, Bajhang.
- Phukot - Karnali Hydroelectric Projec, Kalikot.

B. Geotechnical Investigation and Laboratory Tests:

- Geotechnical Investigation Works of proposed district office buildings of Kabhreplanchowk, Ramechhap and Sindhuli districts (Nepal Red Cross Society, National Headquarters, Earthquake Resistance Programme), Kalimati, Kathmandu.
- Geotechnical Investigation Works of proposed Warehouse buildings at Bhaktapur (Nepal Red Cross Society, National Headquarters, Earthquake Resistance Programme), Kalimati, Kathmandu.

Test pitting SPT at site

- Geotechnical Investigation Works of proposed health post building at Sudal Bhaktapur (Nepal Red Cross Society, National Headquarters, Earthquake Resistance Programme), Kalimati, Kathmandu.
- Geotechnical Investigation Works of proposed Emergency Control Building at Hetauda, System Operation Department, Transmission Line Directorate, NEA.
- Sub-surface Investigation at Duhabi-Anarmani Transmission Line Project (Tower No. 37 & 38) of Grid Department, Transmission Line Directorate, NEA.
- Geotechnical Investigation Works of proposed Inaruwa 400 kV GIS Substation at Bhokraha, Sunsari, Grid Department, Transmission Line Directorate, NEA.

c. Miscellaneous Laboratory Tests:

- Compressive strength tests on compressed stabilized bricks of Build UP Nepal.
- Compression and various test on core samples of proposed mines site at Palpa/ Nepal Donghua Construction Engineering Co. Ltd. Baluwatar, Kathmandu
- Laboratory tests on construction material samples of Seti Nyadi HPP/ Nilatara W & E Pvt. Ltd.
- Laboratory tests (Point load & uniaxial compression) on Jure Landslide studies and research project/ Himalayan Research Expedition, Kathmandu.
- Laboratory tests on construction materials sample of Pegu Khola Small HPP/ Samyak Consulting Engineers Pvt. Ltd.
- Laboratory tests on construction materials sample of Mathillo Sagu Khola Small HPP/ Samyak Consulting Engineers Pvt. Ltd.
- Laboratory tests including uniaxial compression,

Laboratory test of soil sample

tensile and direct shear (rock) on core samples of Budhi Ganga HPP/ ERMC Geotech Services Pvt. Ltd.

- Laboratory tests on construction material samples of Kabeli – A & Nyadi HPP/ Zhejing HPP Construction & Installation Co, Ltd. Nepal Branch Office.
- Laboratory test (grain size analysis, proctor, permeability, unit weight, hydrometer analysis, natural moisture content and atterberg limits) on Detailed Dang Valley Irrigation Project/ Irrigation Department, Ministry of Energy, Water Resources & Irrigation, GoN.
- Sediment tests (particle size distribution, hydrometer analysis & ppm determination) on Jawa Khola Hydropower Project, Jumla/ Jade Consults.
- Other various laboratory tests are performed on construction material, rock core, brick, concrete and aggregate samples supplied by different private client/parties.

Electromechanical Design Division

Established under Engineering Services Directorate, the Electromechanical Design Division has been providing technical supports for all electro-mechanical issues associated with its own concrete pole plants as well as transformer workshop. The issues range from the design of electro-mechanical and hydro-mechanical equipment of hydropower projects under various stages of study as well as electrical installations for various projects. Apart from it, the Division is also involved in procurement and maintenance of vehicles under Engineering Services Directorate. From two years it has been fully involved for the establishment of a new concrete pole plant in Tankisinuwari, Morang. Apart from the design issues, this Division has been monitoring the overall functioning of Central Workshop in Hetauda which is involved in maintenance and repair of transformers. Similarly it has also been monitoring the overall functioning of Kotre Pole Plant, Tanahu as well as Concrete Pole Plant, Amlekhgunj. In Fiscal Year 2075/076, this Division is continuing the establishment of a new concrete pole plant in Tankisinuwari, Morang. In near future, it is also planning the establishment of concrete pole plants in central and western regions of Nepal.

Central Workshop, Hetauda

Located at Bhairav Road, Hetauda-5, Makawanpur and established in 2055 BS, the Central Workshop has been contributing to Nepal Electricity Authority being an entity under Engineering Services Directorate with its purpose of repairing Distribution and Power transformers of Regional Offices of NEA, Power transformers of various Hydroelectric Plants, testing of transformers and providing rental services of its available heavy equipment. Considering the increasing demand of electricity in Nepal and contributing to maintain best quality of supply, transformer itself being a major component of power system, the workshop has been striving to its best, using its available

The achievement of the workshop in the last four fiscal years are tabulated below:

S.N.	Description	F.Y. 2071/072	F.Y. 2072/073	F.Y. 2073/074	F.Y. 2074/075
1	Distribution Transformer Repair	363	433	636	805
2	Power Transformer Repair	12	10	13	8
3	Transformer Testing	1909	2448	4041	2359
4	Heavy Equipment (in Thousands NRs.)	4,543.08	5937.59	11,125.05	1,21,51,388.34
5	Turnover (in Thousands NRs.)	38,555.92	49,760.24	85,205.44	9,81,76.96

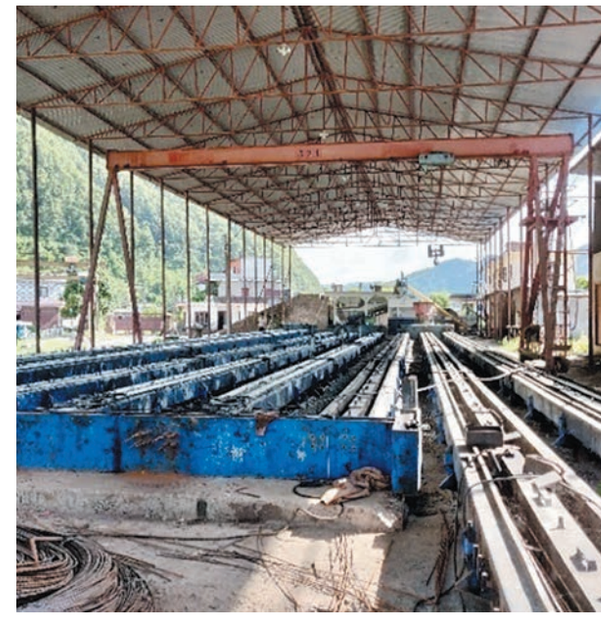
resources to meet time bound repair and testing services.

Major Accomplishment of FY 2074/075

- Repaired highest number of distribution transformer (805 numbers) till FY 2074/075.
- Highest Income or Revenue Generation Record of above NRs. 9,81,76,959.29 in the history of Central Workshop.
- Contract Agreement for the Construction of Power Transformer Repair Workshop Building was performed in FY 2074/075.
- Contract Awarded for Construction of first floor in the Quarter Building and Construction of Connecting Truss between old repair workshop building and oil filtration section hall.
- Completion of Installation of vacuum drying autoclave plant which has enhanced the efficiency of transformer repair works.
- Completion of Installation of 5 T and 10 T heavy duty single girder EOT cranes which has enhanced the efficiency of different works.
- Completion of Procurement of 5 T heavy duty double girder EOT cranes which has enhanced the efficiency of different works.

Kotre Pole Plant, Kotre

Kotre Pole Plant is located in Shuklagandaki Municipality, Kotre of Tanahu along Prithvi Highway. It was jointly established by Government of Nepal & Finland Government in 2042 B.S. to implement Pokhara Electrification Project. After termination of that project, this plant was handed over to Nepal Electricity Authority (NEA). From FY 2061/62 the plant has been working under Electromechanical Design Division and producing



Pole Production at Kotre Pole Plant, Tanahu

PSC Pole commercially. Now it has been working with separate budget center to implement concrete pole production and sales of different sizes poles to DCS, NEA. Currently the plant is producing poles of different sizes 8.0m, 9.0m, 10.4m and 11m respectively. After upgradation work, the capacity of plant is 60 poles per day.

Concrete Pole Plant, Amlekhgunj

Established in 2051 BS and located at Amlekhgunj road, Bara, the pole plant has been contributing to Nepal Electricity Authority being an entity under Engineering Services Directorate with its objectives of producing 8m, 9m and 11m size PSC poles for distribution to Regional office of NEA and private firm as well. Since the permanent employees are not sufficient to meet the current production target, so daily wages employees are also involved. The plant has been striving to its best using its available manpower and resources to meet time bound production and delivery of the poles.

Pole Production at Concrete Pole Plant, Amlekhgunj

Production Chart

S.N.	Type of Pole	F.Y. 2072/073	F.Y. 2073/074	F.Y. 2074/075
1	8m	6212	10150	6936
2	9m	3563	6009	5828
3	11m	1002	1638	1806
	Total	10777	17797	14570

NEA Training Center

NEA Training Center (NEA TC) has been contributing different skill enhancing trainings to the staffs as well as Nepalese citizens since 2046 B.S.to 2057 B.S. from Ratnapark and from Kaharipati, Bhaktapur since 2057 B.S. During the last 29 years, NEA TC has trained 19,357 employees from the different core group of NEA and some of other organizations.

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 21 (Technical 7 and Nontechnical 14) staffs under the control of Director. Those staffs cover electrical, mechanical, computer, civilengineering as well as administrative and financial functions. They prepare trainings/seminar programs annually and provide services effectively. The main function is to prepare trainings/allocate resources management/collect appropriate trainees and other general management activities.

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 staffs.

Objectives

- Provide Knowledge, Skill and Attitude enhancing tips.
- Supply need based trainings to NEA employees for enhancing their work efficiency and enabling them for serving the customers effectively.
- Train the employees enabling them to plan, implement, maintain and operate NEA's system today and in the future.
- Promote knowledge and skill of the employees 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

NEA TC 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 TC aims to be developed as an 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 2074/75

The term training refers to the acquisition of knowledge, skills and competencies as a result of the teaching of vocational or practical skill 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 TC has been providing need based short term training covering 3 days to 10 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-service or refreshers and as per requirement. The training programs are designed as per training needs assessment of an organization and at the personnel level after discussion with the management and feedbacks provided by trainees.In the fiscal year 2074/75 most of the trainings were conducted in the regional level especially for the assistant level staff from DCS. In this fiscal year 2074/75total number of trainings conducted were 77 with trainees number 2744 which is the highest number of trainings and trainees till now.

The summary of trainings conducted on F.Y. 2074/75 by Training Center is presented below.

S.N.	Name of Training	Level	Service	Duration (Days)	No. of Trainees
1	Induction (Accountant)	Asst.	Account	3	125
2	Fake Note Detection	Asst.	Account	1	125
3	Induction (Foremen)	Asst.	Tech.	3	322
4	Induction (Meter Reader)	Asst.	Adm.	3	34
5	Induction (Electrician)	Asst.	Tech.	3	97
6	ArcGIS	Off.	Tech.	10	19
7	Heavy Equipment Training	Asst.	Tech.	6	21
8	Primavera (P6)	Off.	Tech.	10	19
9	Electrical Safety and Health -**Butwal**	Asst.	Tech.	4	34
10	Induction	Off.	Adm.	3	14
11	Induction	Off.	Adm./ Acc/ Economics/law	3	16
12	M-Power and Billing System - **Chandranigahpur**	Asst.	Adm.	6	16
13	Electrical Safety and Health – **Hetauda**	Asst.	Tech.	4	37
14	Induction	Off.	Tech.	3	36
15	Induction	Off.	Tech.	3	24
16	M-Power Billing System - **Anarmani**	Asst.	Adm.	6	18
17	Structured Analysis Program (SAP)	Off.	Tech.	7	17
18	Electrical Safety and Health – **Janakpur** (Group A)	Asst.	Tech.	4	39
19	Electrical Safety and Health – **Janakpur** (Group B)	Asst.	Tech.	4	33
20	M-Power Billing System – **Kathmandu**	Asst.	Admin/ Acc	7	16
21	Distribution Transformer Repair and Maintenance – **Hetauda**	Asst.	Tech.	10	30
22	Induction	Asst.	Account.	3	18
23	Induction	Asst.	Adm.	3	19
24	Induction	Asst.	Tech.	3	39
25	Electrical Safety and Health – **Nepalgunj (**Group A)	Asst.	Tech.	4	32
26	Electrical Safety and Health – **Nepalgunj (**Group B)	Asst.	Tech	4	38

S.N.	Name of Training	Level	Service	Duration (Days)	No. of Trainees
27	M Power Billing System -**Bardibas**	Asst.	Admin/Acc	6	19
28	Electrical Safety and Health – **Biratnagar** (Group A)	Asst.	Tech	4	33
29	Electrical Safety and Health – **Biratnagar** (Group B)	Asst.	Tech	4	36
30	E-attendance- **Bardibas**	All	Admin	3	37
31	Electrical Safety and Health – **Attariya** (Group A)	Asst.	Tech	4	38
32	Electrical Safety and Health – **Attariya** (Group B)	Asst.	Tech	4	35
33	E-Attendance System- **Attariya R.O.**	All	Admin	3	30
34	Induction	Asst.	Admin	3	28
35	Induction	Asst.	Admin	3	34
36	Induction	Asst.	Account	3	18
37	Induction (Foreman)	Asst.	Tech	3	52
38	Induction (Foreman)	Asst.	Tech	3	45
39	M-Power Billing System **- Lamahi**	Asst.	Admin/Acc	6	21
40	E-Attendance –**Nepalgunj**	All	Admin	3	30
41	E-Attendance- **Butwal R.O.**	All	Admin	3	39
42	AutoCAD Basic	Off.	Tech	9	17
43	Distribution Transformer Repair & Maintenance	Asst.	Tech	10	30
44	E-Attendance**- Hetauda R.O**.	All	Admin	3	36
45	E-Attendance – **Pokhara R.O.**	All	Admin	3	36
46	Electrical Safety & Health **Pokhara** (Group A)	Asst.	Tech	4	34
47	Electrical Safety & Health **Pokhara** (Group B)	Asst.	Tech	4	31
48	Induction (Electrician)	Asst.	Tech	3	79
49	Induction (Meter Reader)	Asst.	Admin	3	30
50	Distribution Transformer Repair & Maintenance	Asst.	Tech	10	32
51	E-Attendance –**Biratnagar R.O.**	All	Admin	3	40
52	Electrical Safety & Health **– Hetauda** (Group A)	Asst.	Tech	4	24
53	Electrical Safety & Health – **Hetauda** (Group B)	Asst.	Tech	4	29
54	Mind Management Workshop	Off.	All	1	52
55	E-Attendance –**Kathmandu R.O.**	All	Admin	3	41
56	E-Attendance –**Kathmandu R.O.**	All	Admin	3	36
57	M-Power Billing System	Asst.	Admin/Acc.	8	18
58	E-Attendance –**Kathmandu R.O.**	All	Admin	3	38
59	Distribution Transformer Repair & Maintenance-**Hetauda**	Asst.	Tech	10	32
60	ArcGIS 10.5	Off	Tech	9	19
61	Induction	Off.	All	3	53
62	CAIS (Account) and Payroll	Asst.	Admin/Acc.	5	15
63	Electrical Safety & Health	Asst.	Tech	4	32

S.N.	Name of Training	Level	Service	Duration (Days)	No. of Trainees
64	Electrical Safety and Health	Asst.	Tech	4	32
65	CAIS (Inventory) and Fixed Assets	Asst.	Admin/Acc.	5	14
66	Structural Analysis Program (SAP)	Off.	Tech	7	16
67	M-Power Billing System	Asst.	Admin/Acc.	6	17
68	CAIS (Account) and Payroll	Asst.	Admin/ Acc.	5	15
69	M-Power Billing System	Asst.	Admin/Acc.	6	18
70	Primavera	Off.	Admin/Acc.	10	19
71	CAIS (Inventory) and Fixed Assets	Asst.	Admin/ Acc.	5	15
72	CAIS (Account) and Payroll	Asst.	Admin/ Acc.	5	16
73	M-Power Billing System	Asst.	Admin/ Acc.	7	17
74	M-Power Billing System	Asst.	Admin/ Acc.	7	16
75	M-Power Billing System	Asst.	Admin/ Acc.	7	16
76	Electrical Safety and Health-**Kathamndu**	Asst.	Tech	4	17
77	Electrical Safety and Health-**Kathmandu**	Asst.	Tech	4	27
	Total				**2744**

Extra Activities

In addition to training programs, NEA TC provides seminar halls, class rooms, hostels and ground space on rent to different users, groups / organizations etc. Various Engineering Colleges, Political Parties, Co-operatives, INGO, Film Shooting Unit and other institutions used the facilities available in the NEA TC for various purposes. The total income generated from these services amounted to Rs. 29,33540/74 in the fiscal year 2074/75.

The Training Center has also provided space and services to various offices of NEA at its premises in Kharipati. A Transformer Testing Lab is being constructed in the premises of the Training Centre. In this fiscal year almost 300 plants of different species have been planted in order to utilize free open space within the premises of training center. Along with that, GI net bar is used to protect the plants.

PROJECT MANAGEMENT DIRECTORATE

Project Management Directorate (PMD) in the Nepal Electricity Authority Organogram has a role to execute and facilitate the projects funded by Asian Development Bank. PMD is responsible for project preparation, procurement and construction of all new and existing projects that is or will be funded by ADB. In addition to the execution of SASEC-Power System Expansion Project and PTDEEP (Power Transmission and Distribution Efficiency Enhancement Project) PMD is coordinating, monitoring and reporting the implementation activities of the projects that are being run under Energy Access and Efficiency Improvement Project (ADB Loan 2587, Grant 0182 and Grant 0183) and Electricity Transmission Expansion and Supply Improvement Project (ADB Loan 2808, Grant 0270 and Grant 0271) and Project Preparatory Facility for Energy (PPFE). PMD is now preparing the procurement of sub-projects under Power Transmission and Distribution System Strengthening Project (PTDSSP) which is going to be financed by ADB as indicated in their Country Bussinees Operation Plan of 2019.

PROJECTS BEING CURRENTLY EXECUTED BY PMD:

(A) Electricity Transmission Expansion and System Improvement Project (ETESIP)

1. Tamakoshi- Kathmandu 220/400 kV Transmission Line Project

This is one of the sub-projects recently undertaken and being executed by PMD under Loan No. 2808 - NEP : Electricity Transmission Expansion and System Improvement Project (ETESIP). The objective of this project is to evacuate power from generating power stations upcoming in the Khimti (Tamakoshi)-Kathmandu area. This project includes three sub-projects packages viz. New Khimti- Barhabise 400 kV Transmission Line, Barhabise-Kathmandu 400 kV Transmission Line & Lapsiphedi-Duwakot 132 kV Transmission Line and 220 kV Barhabise GIS substation. Due to inadequate fund available in ETESIP, one of the subprojects "220 kV GIS Substation Construction in Barhabise" has been financed through Loan No. 3542 - NEP: PTDEEP. Total cost of the project is estimated to be USD 90 million jointly funded by ADB and GoN. The Project has signed Contract Agreement with (i) The JV of Guangxi Transmission & Substation Construction Co. and Shenzhen Clou Electronics Co. Ltd, China for construction of New Khimti- Barhabise 400kV Transmission Line (ii) Larsen and Toubro Ltd, India for Barhabise-Kathmandu 400kV and 132 kV Lapsiphedi-Barhabise Transmission Line and (iii) The JV of Guangxi Transmission & Substation Construction Co. and Shenzhen Clou Electronics Co. Ltd, China for procurement of Plant for GIS 220 kV Barhabise substation.

Detail survey of all three projects has been completed. Land acquisition for tower pads for the former two packages has already been started. Tree marking and enumeration with in ROW has been completed for New Khimti-Bahrabise 400 kV TL and initiated for Bahrabise-Kathmandu 400 kV TL & Lapsiphedi-Duwakot 132 kV TL. Layout and engineering works of the GIS substation is being carried out. Compensation has been provided

to the land owners of the substation area and compensation for houses and shed is ongoing. This project is planned to be commissioned in March 2020 and satisfactory progress has been achieved.

(B) SASEC Power System Expansion Project (SPSEP)

1. Samundratar- Trishuli 3B 132kV Transmission Line

Samundratar-Trishuli 3B Hub 132kV Transmission Line project has initiated the construction of transmission infrastructures. The Project includes construction of 26 km double circuit transmission line (including 3 km of four circuits) from Samundratar to Trishuli 3B Hub and new 132/33kV, 2x30 MVA + 33/11kV, 2x8 MVA Substation at Samundratar, Nuwakot. In coordination with ADB, the project financing agreement was concluded in April 20, 2015 with European Investment Bank (EIB) to provide funding (Loan) of US$ 12.0 Million.

Till date, land acquisition for the substation and tower pads, forest clearance throughout the transmission route of 26 km and soil investigation of transmission line and substation has been completed. Design approval of equipment, structures and civil foundation for transmission line and substation has been finalized. Construction works at site are ongoing with the target to commission the transmission facilities within FY 2075/76.

2. Marsyangdi Corridor 220 Transmission Line Project

Marsyangdi Corridor 220 kV Transmission Line Project once completed will evacuate approximately 1600 MW of power generated by various hydropower stations in the Marsyangdi basin/ Marsyangdi River Corridor. The Project comprises of construction of approx. 110 km long Double Circuit Transmission Line from Manang (Dharapani) to Chitawan (Bharatpur) and associated 220/132/33 kV, 100 MVA substations at Dharapani of Manang, 220/132/33 kV, 160 MVA substations at Khudi and Udipurat Lamjung and New Bharatpur at Chitawan. The length of upper section of 220 kV, double circuit transmission line from Dharapani to Udipur is 45.57 km. Similarly, the length of lower section of 220 kV, double circuit transmission line with twin HTLS Drake conductor from Udipur to Bharatpur is 64.46 km.

Survey being conducted at the site

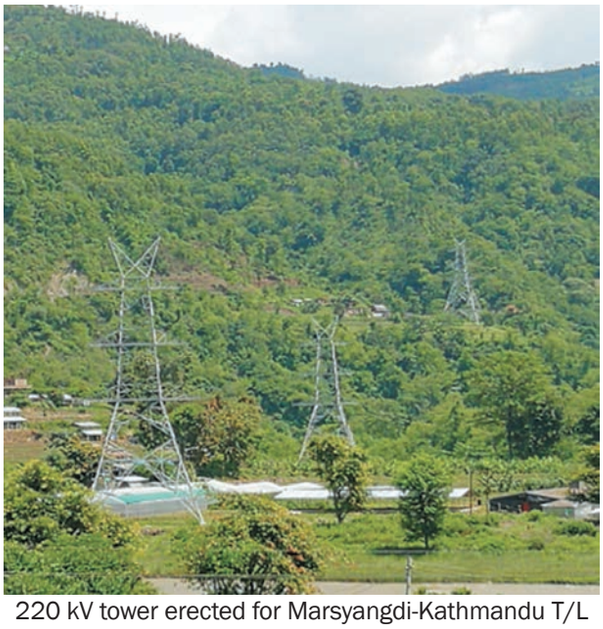
The contract of transmission line for Udipur to Bharatpur section has been awarded and the construction work is in progress. Check survey and tower spotting is nearing completion. Design of DB and DC type tower are under approval and design of remaining towers are underway. Now, the process for land parceling and tree cutting has been initiated.

The bids for construction of Udipur and Bharatpur 220/132/33 kV substation is under evaluation and is expected to award the contract in August 2018. Similarly, tender document preparation Dharapani (Manang) and Tadikuna (Lamjung) and Manang-Udipur Transmission Line is underway.

Estimated total project cost is US$ 90 million and is funded by European Investment Bank. Both the sections of transmission lines and associated substations of the Project are expected to be commissioned by end of FY 2078/079 (2020/021).

3. Marsyangdi-Kathmandu 220 kV Transmission Line Project

The objective of this project is to increase power transfer capacity from Marsyangdi corridor to Kathmandu Valley which ultimately reinforces the INPS and improves the reliability of transmission system. The initial cost estimate of the project was 56MUSD for 82 km 220 kV double circuit transmission line and two substations at



220 kV tower erected for Marsyangdi-Kathmandu T/L

Matatirtha, Kathmandu and Marsyangdi, Tanahu. This project is jointly funded by ADB, Government of Norway and Government of Nepal.

The scope of the project is to construct 82 km double circuit 220kV transmission line from Markichowk (Marsyangdi) to Kathmandu with twin "MOOSE" ACSR conductor in each phase. Also, there shall be construction of 220/132 kV substations at Markichowk (Marsyangdi) and Matatirtha (Kathmandu). The substation in Matatirtha shall be Air Insulated (AIS) type while in Marsyangdi the substation shall be of Gas Insulated (GIS) type. The contract agreement for transmission line has been concluded on June 2016 with Tata Projects Ltd., India. Similarly, the contract agreement for substations has been concluded on December 2017 with Shenzhen Farad Electric Co. Ltd., China.

Center line view of 220 kV transmission tower

As of Asadh 2075 in transmission line part, survey, design works and tower testing have been completed and construction activities are underway. Approximately 90% of materials like tower parts, hardwares, insulators, ASCR conductors, earthing materials etc. have been delivered to the site. Required land for tower foundation in Dhading, Gorkha and Chitawan Districts have been acqisited while for Kathmandu and Tanahu districts land acquisition have been initiated. Construction of tower foundations and tower erection activities are underway in Dhading, Gorkha and Chitawan districts. Till the end of Asadh 2075, out of 230 nos. of towers, 123 nos. of tower foundation have been completed and 21 nos. is in progress. Similarly, 36 nos. of towers have been erected with 14 nos. are in progress.

For substation part, approximately 70% of design work ishave been completed. Major equipment are being manufactured and shall be delivered to the site by the end of 2018. Site leveling works for both the substations have been completed. The construction of retaining wall, boundary wall and transformer foundations are being carried out. Both the Transmission line and Substations are planned to be commisionned by July 2019.

4. Kaligandaki Corridor 220kV Transmission Line Project

The scope of the Project is to construct 3 (three) nos. of 220/132 kV, 100 MVA Substations at

Dana (Myagdi), Kushma (Parbat) and New Butwal (Bhumahi, Nawalparasi) and their interlinking 148 kM, 220 kV D/C transmission lines (Dana - Kushma - New Butwal - Bardaghat).

70 tower foundations & 37 tower structure erections out of 114 have been completed in Dana - Kushma section transmission line and remaining works are in full swing. Satisfactory construction progresses have been observed in both the Dana and Kushma SS. Most of the T/L and SS equipments / material have already been supplied. Dana to Kushma T/L , Dana SS and Kushma SS have been constructed by the JV Contractor M/s Tata projects Limited India and CHINT electric Co. Limited, China and planned to be commissioned by March 2019.

The contract of 88 kM long, 220 kV D/C Transmission line construction from Kushma to New Butwal has been awarded to M/s Larsen & Toubro Limited, India. Tower Design has been completed and check Survey is in progress. This line is planned to be commissioned in December 2020.

The Contract of 220/132 kV, 100 MVA SS construction in New Butwal (Nawalparasi) has been awarded to M/s Tata projects Limited, India. Site Levelling works at site and Design work of SS is in progress. This SS is planned to be operated by December 2020.

Sealed bids are invited for Construction of 21 kM long, 220 kV D/C T/L from New Butwal - Bardaghat. This line will also be commissioned by the end of December 2020.

5. Grid Substation Reinforcement and Capacity Expansion Project

The major objective of this project is to reinforce & upgrading the eight (8) numbers of existing grid substations of NEA which includes reinforcement and upgradation of 132 kV Gandak S/S, Butwal S/S, Bharatpur S/S, Kawasoti S/S, Damauli S/S, Banepa S/S, Dhalkebar S/S and Lahan S/S. The reinforcement and upgradation work of all these eight (8) Grid SS was completed on December 2017 which added substation capacity by total 280 MVA. Protection upgradation and addition of Substaion Automation System in Gandak SS and Baneswar SS were also concluded successfully.

Upgradation of Dhalkebar - Mujeliya 33 kV Line by replacing the existing 0.10 sq. Inch ACSR Conductor with HTLS conductor and addition of capacitor banks at Mujeliya substations is another scope of this project. The Contract has been awaded to the JV Contractor M/s Mudhbary & Joshi and APAR, India and planned to be commissioned by July 2019.

6. Distribution System Augmentation and Expansion Project

This project is to augment and expand the Distribution system of NEA. The project work includes the construction of twenty-five (25) numbers of 33/11 kV new substations, upgrading of eleven (11) numbers of existing 33/11 kV substations and construction of 33kV, 11 kV and 400 Volt Lines at various districts of the country. With the completion of this project 260 MVA of 33/11 kV SS, 383 km of 33 kV line, 572 km of 11 kV Line, 710 km of 400 Volt line and 91 MVA total capacity of Distribution transformer will be added in the distribution system. The project is being executed in following 3 Lots of contracts namely:

Lot 1: Expansion of Distribution Network in the Eastern Region including 13 substations, lines and transformers

Lot 2: Expansion of Distribution Network in the West Regions including 12 substations, lines and transformers

Lot 3: Reinforcement of distribution system including 11 substations upgradation

All three Lots of Contract were awarded in F/Y 073/74 and the project is scheduled to be completed by July 2019.

7. Distribution System Master Plan Project

The principal objective of this project is to prepare a Distribution system/Rural Electrification Master Plan of Nepal (DS/REMP-N) for the entire country, with emphasis on providing electricity for all and enhancement of livelihoods in the remote settlements of the country in an efficient way. Consulting firm M/s Gesto Energy, Portugal has been working closely with NEA to develop the master plan. The prime assignment of the consultant is to identify the least cost and economically viable means to reinforce, upgrade and expand Nepal's electricity system, including on- and off-grid, to achieve universal access to electricity by 2025 A.D. The master plan will include policy recommendations, a comprehensive electrification and distribution augmentation program and detailed case studies. The Project is funded by Norwegian Grant and administered by ADB and planned to be completed by December 2019.

8. Utility Scale Grid tied Solar Project:

The aim of this project is to promote the grid tied Solar PV Projects in Nepal through Viability Gap Funding (VGF). GoN has received grant of USD 20 Million from Strategic Climate Change Fund under ADB administration of SASEC Power System Expansion Project. NEA will utilize 18.5 Million of the grant as VGF to purchase sloar power from the eligible Solar Power Developer. The Solar Power Developer will be encouraged by the uofront payment they would receive from NEA for the power they sell upto June 2022. Under this scheme, NEA will purchase power from grid tied solar plant for 25 years at the posted rate of NRs. 6.60. The VGF will be utilized to fill the gap of posted solar power purchase rate of NRs. 6.60 per Kwh and the competitive rate quoted by the Solar power Developer for up to June 2022.

As per notice published and RFP issued, numbers of proposals have been received from the interested Solar Power Developer to generate solar power and sell to NEA. The proposals are under evaluation and selection of the Solar Power Developers are in the advance stage.

(C) Power Transmission and Distribution Efficiency Enhancement Project (PTDEEP):

This project has been envisioned to strengthen the distribution system capacity of Kathmandu Valley including modernization of distribution system to provide reliable electricity supply in Kathmandu valley. The project value is of USD 189 Million and will be jointly funded by ADB and GoN. As part of the funding, Loan Negotiation for USD 150 Million has already been concluded between ADB and GoN on 19th May 2017 in Kathmandu. Out of the Project cost of USD 189 Million, USD 2.0 Million will be provided as grant from JFPR. Different sub-projects and their status under PTDEEP are as below:

1. Kathmandu Valley Transmission Capacity Reinforcement Project

The primary focus of the project is to augment the Grid substation capacity by adding 3 new 132/11kV substations, 90 MVA each at Mulpani, Futung and Chapagaon. The project will enhance the transmission substation capacity and improve reliability and quality of electricity supply in the Kathmandu Valley by reducing distribution system overload. The contract package for these substations has already been awarded and Design works are on going.

2. Lapsephedi and Changunarayan Substation Construction Project

220/132 kV, 160 MVA GIS SS will be constructed at Lapsephedi and 132/11 kV, 90 MVA SS will be constructed at Changunarayan. These substations will play major role to evacuate the Power generated by the IPPs and Upper Tamakoshi Hydro Electric Plant through Khimti–Barhabise–Kathmandu 400/220 kV Line. The contract for this package has also been awarded and design works of the substations are underway.

3. Kathmandu Valley Smart Metering Project

Kathmandu Valley Smart Metering Project is one of the sub-project of PTDEEP which will modernize the distribution bussiness and improve the financial health of NEA with reduction of distribution losses and increment of overall efficiency of the distribution system operation. NEA intends to introduce the smart meters and deploy the Advanced Metering Infrastructure (AMI) System with its auxiliary system all across Kathmandu valley (Kathmandu, Lalitpur and Bhaktapur) within a radius of 220 sq. miles. Through AMI implementation, NEA aims to mirror the benefits to the customers that can be seen in a number of countries and replicated in Nepal Electricity Authority (NEA). In the initial stages of program rollout, the immediate benefits such as reduced meter reading costs, access to time of use-based tariffs and the cut back in AT&C losses will be realized. Hence, Nepal Electricity Authority (NEA) plans to implement Advance Metering Infrastructure to bring about reform in the distribution sector.

As mentioned, the introduction of smart meters will bring the immediate benefits to customers. The project is to design, supply, establish, install, testing, commissioning, operate and maintain the Advanced Metering Infrastructure (AMI) for consumers equipped with Single Phase and Three Phase Whole Current meters. The first stage of overall smart metering project shall include the 98,000 metering nodes in the areas of Kathmandu central region and Kathmandu north region (Maharajung and Ratnapark) with an approx. area of 60 sq. miles. AMI system includes the communications links provided by Network provider, which is the backbone of the AMI. The communication infrastructure is based on RF mesh network and GPRS/GSM system. Further, communication network shall provide reliable medium for two-way communication between various nodes (smart meter) & HES.

Project is supposed to increase the accessibility of real-time data and provide all information on a single console in an integrated manner with the possibility to remotely control the entire network and increase operational efficiency and to establish network platform that can support the multiple applications like AMI, DMS, DER, Street Light Management and Home Area Network etc. over a single communications platform using RF communication technology. Hence the Network canopy is to be established using RF communication technology which shall communicate with field devices using intermediate network elements such as routers/repeaters/collectors/gateways/data concentrator units/access points etc. In case the RF communication technology is not feasible at the specific consumer/metering location the bidder shall provide the GPRS/GSM based network connectivity for metering point.

The Contractor selection process has aleady begun. Numbers of sealed bids have been received and the technical proposals evaluation has been completed and the report has been sent to ADB for concurrence.

4. Enhancement of Distribution Networks in Central & Northern Region of Kathmandu Valley

This project intends the enhancement of distribution system and/or rehabilitation of the distribution system (11kV and 0.4kV) with the provision of automation for the areas under Maharajgunj Distribution Center in the Northern region of the Kathmandu Valley.

The scope of the project includes Design, Supply, Installation and Commissioning of Underground Distribution Network using Trenchless boring methodology under Maharajgunj Distribution Center including Reinforcement and Automation. This project is in the advance stage of Contractor selection.

5. Kathmandu Valley East & South Distribution System Enhancement Project

This project intends the enhancement of distribution system and/or rehabilitation of the distribution system (11kV and 0.4kV) with the provision of automation for the areas under Ratnapark Distribution Center. The scope of the project includes Design, Supply, Installation and Commissioning of Underground Distribution Network using Trenchless boring methodology under Ratnapark Distribution Center including Reinforcement and Automation.

The Financial bid evaluation was completed & the report was submitted to ADB for concurrence. ADB advised for negotiation with lowest bidders to reduce the quoted bid price. Bid price negotiations completed and the contractor selection is in the advance stage.

(D) Other Projects

1. New Butwal Kohalpur, Surkhet and Upper Karnali 400 kV Transmission Line project

As a part of the development of East – West 400 kV trunk line, PMD is proud to be associated with the development of 400 kV Line and Substation in western part of the country i.e.; from Butwal to Attariya with the ADB grant assistance under Project preparatory Facility for Energy. ELC Electro consult S.P.A, Italy has been awarded the job of the detail engineering and complete design of 400 kV TL and associated Substations along the route. As of now, the consultant has presented the inception report.

The detail study on due diligence related activities and engineering design is targeted to be completed by July 2019. The proposed Transmission route and Substation under the scope of detail study and engineering design are as follows:

Transmission Lines:

- New Butwal - New Kohalpur (Tulsipur) 400 kV Transmission Line (about 150 km);
- New Kohalpur (Tulsipur) - Chhinchu 400 kV Transmission Line (about 80 km);
- Chhinchu–Dododhara (New Lumki) 400kV Transmission Line (about 70 km);
- Chhinchu-Surkhet 132kV Transmission Line (about 20 km);
- Dododhara (New Lumki) – New Attariya 400 kV Transmission Line (about 50 km);

Substations:

- New Butwal 400kV Substation;
- New Kohalpur (Tulsipur) 400kV Substation;
- Dododhara (New Lumki) 400kV Substation;
- Surkhet 132kV Substation;
- New Attariya 400kV Substation;
- Upper Karnali 400kV Substation.

2. Power Transmission and Distribution System Strengthening Project

This project is almost continuation of the PTDEEP and is already in the ADB's CBOP. The main purpose of this project is to deliver energy efficiently and reliably in Kathmandu valley and industrial corridors. The project is expected to reinforce transmission and distribution system, improve energy access and modernize and utilize high level technology.

The total estimated cost of the project is $240 million, $40 million of which is funded by NEA/ Government, $150 is concessional OCR loan from ADB, whereas remaining $50 million is still unfunded and GoN has requested ADB to increase its investment support to $200 million. The project is supposed to take pace after loan signing with ADB in March 2019. Proposed sub projects under this project are:

- Hetauda-Parwanipur 132 kV DC line upgradation and Construction of 132 kV Parwanipur- Pokhariya TL and 132 kV substation at Pokhariya
- Upgradation of Khimti-1, Barhabise and Lapsifedi substation to 400 kV

- Construction of 132/11 kV GIS substations at Koteswar and Teku.
- Construction of Thapathali 132/11 kV substation
- Distribution System Reinforcement and Modernization of Eastern – Western Part of Kathmandu Valley (Kirtipur, Kuleshwor, Baneshwor and Jorpati DCs)
- Smart metering expansion in Kathmandu valley
- Rural Electrification in Dhading and Kavrepalanchowk
- Project Supervision Consultant

PMD already have prepared the Bidding Documents for the procurement of all the above projects and submitted to ADB for review.

3. Upgrading 220 kV Substations to 400 kV along the New Khimti–Barhabise–Kathmandu Transmission Line Section

As in near future New Khimti – Barhabise – Kathmandu 220/400 kV Line is going to be charged in 400 kV, three major under construction 220 kV SS along this TL route (i) New Khimti SS (ii) Barhabise SS and (iii) Lapsifedi SS is required to be upgraded to 400 kV. PMD has formulated this project and requested for financial assistance of USD 64 Million from ADB. The Project will comprise the upgrading of existing/under construction new Khimti S/S by 400/220 kV, 630 MVA, Barhabise S/S and Lapsifedi SS by 400/220 kV, 160 MVA.

4. Automation of Existing Grid Substation

PMD has strongly felt the need of automation of existing grid SS to have efficient, reliable and automatic operation of the grid system. This will be a move of NEA towards modernization of NEA grid system. PMD has prepared a project for automation of existing grid SS. Under this project all Forty-six (46) NEA grid SS will be fully automated and be operated remotely from Control Centre.

There will be all together 6 (six) Control Center for the operation and control of the SS, each at the Grid operation division office of Grid operation branch office. The estimated Project Cost is USD 18 Million. ADB is positive to provide financial assistance for this project. This project is very important for NEA in the sense of reduction of ongoing operational cost, improvement of grid reliability, lengthening the life of the equipment and improvement of organizational effectiveness.

In the first stage, PMD has plan to implement SAS in all the Grid SS and switching stations under Baneswar Grid Division, Kathmandu. Accordingly the Bidding document has been prepared and submitted to ADB for review and approval. This Project will be financed under the proposed project of PTDEEP.

5. 400 kV TL and SS in Eastern Region of Nepal:

To strengthen the transmission system and power evacuation from power plants in districts like Sankhuwasabha, Solukhumbu, Okhaldhunga, Dolakha, Ramechhap in Eastern Region of Nepal two (2) projects : (a) Arun Hub –Tingla - Dhalkebar 400 kV Transmission line and associated substation at Arun Hub and Tingla (b) Tingla – Likhu - New Khimti - Sunkoshi Hub - Dhalkebar 400kV transmission line and associated substations at Likhu, Sunkoshi Hub and substation expansion at New Khimti and Dhalkebar has been formulated. Estimated cost for the procurement of consulting services for engineering and detail design of this project is about USD 3.0 million. EOI document for selection of Consultant has already been prepared. Discussion with ADB is underway to provide necessary fund for the procurement of consulting services for engineering and detail design.

Brief features of the projects are as follows:

(i) Arun Hub-Tingla- Dhalkebar 400kV Transmission Line Project

This 400 kV line is required to evacuate power generated from the projects situated in the Eastern hilly region of Nepal especially in the districts of

Sankhuwasabha, Solukhumbu, Okhaldhunga. Estimated line length of 400 kV double circuit Arun Hub – Tingla – Dhalkebar TL is 185 km. Two new 400/220 kV SS, 630 MVA at Arun Hub and 315 MVA at Tingla Hub including Bay extension at existing Dhalkebar SS has been proposed. Estimated Project Cost is USD 230 Million.

(ii) Tingla- New Khimti-Sunkoshi Hub-Dhalkebar 400kV Transmission Line Project

This 400 kV double circuit Tingla- New Khimti-Sunkoshi Hub-Dhalkebar transmission line has been planned keeping in the mind of huge hydro power potential of the Likhu, Khimti, Tamakoshi and Sunkoshi river basins & corridors and the limited power transfer capability of existing under construction 220kV line from Khimti to Dhalkebar. The estimated length of the line is 165km. Two new SS, each 400/220 kV, 630 MVA at Sunkoshi Hub and at Likhu Hub and Bay extension at existing New Khimti SS has also been planned. Estimated Project Cost is USD 208 Million.

6. Grid Connected Battery Energy Storage System (BESS)

In the perspective of energy arbitrage, spill energy management of generating station, grid stabilization, reliability, power quality, loss reduction, deferral value and flexibility, installation of grid connected Battery Energy Storage System (BESS) in the proximity of grid SS is considered as one of the best option. Technical Assistance has been requested to ADB to procure consulting services for NEA for detail study and construction of viable size of BESS in the substations inside Kathmandu valley in context of load management, dedicated feeder and uninterruptable power supply to the President Office and residence at Maharajgunj, Prime Minister Office and different ministry at Singhadurbar area, Prime minister Quarter at Baluwatar, Army, Police headquarters, hospitals, business complex, factories etc. With the kind support of ADB, the consulting assignment is underway for study, design, cost estimation and technical specification preparation. The Consultant has submitted the Draft report of the assignment and is under review.

7. Kathmandu Valley 220kV Ring Main Project

To meet the future demand of Kathmandu Valley this project has been formulated. This project comprises the construction of 75 km 220 kV double circuit line on monopole along the proposed outer ring road being developed by Kathmandu Valley Development Authority. Total three numbers of 220/132 kV SS of 400 MVA each and 132/11 kV SS of 90 MVA each at Kathmandu, Bhaktapur and Lalitpur districts are proposed. Due to rapid urbanization in Kathmandu valley, land acquisition for TL and SS construction is being very tough, as such using monopole for TL along the outer ring road and initiating construction along with is the best opportunity for NEA. Estimated cost of the project is USD 150 Million. PMD will initiate the study of this project by early 2019. ADB will be requested for financing the study of this Project.

NEA SUBSIDIARY COMPANY MONITORING DIRECTORATE

Apart from development activities which NEA is undertaking on its own, quite a few generation projects are being executed through NEA's subsidiary companies. In addition, subsidiary companies related to consulting services, cross border power transmission and power trading have also been established. For smooth co-ordination between the subsidiary companies and NEA and also for the monitoring of their activities, NEA Subsidiary Company Monitoring Directorate headed by a Deputy Managing Director was created in February, 2018. NEA's existing subsidiary companies are listed below:

1. NEA Engineering Company Limited
2. Upper Tamakoshi Hydropower Company Limited
3. Tanahu Hydropower Limited
4. Raghuganga Hydropower Limited
5. Chilime Hydropower Company Limited
6. Sanjen Jalavidhyut Company Limited
7. Rasuwagadi Hydropower Company Limited
8. Madhya Bhotekoshi Jalavidhyut Company Limited
9. Trisuli Jalavidhyut Company Limited
10. Power Transmission Company Nepal Limited
11. Tamakoshi Jalavidhyut Company Limited

The subsidiary companies as listed below are in their transitional stages and are still being managed by the Engineering Services Directorate except for Nepal Power Trading Company Limited, which is being managed by the Power Trade Department under the Planning, Monitoring and IT Directorate

12. DudhKoshi Jalavidhyut Company Limited
13. Upper Arun Hydropower Company Limited
14. Modi Jalavidhyut Company Limited
15. Aandhikhola Power Company Limited
16. Uttarganga Power Company Limited
17. Tamor Power Company Limited
18. Nepal Power Trading Company Limited
19. Transformer Utpadan Company Limited
20. Tower& Pole Utpadan Company Limited

NEA ENGINEERING COMPANY LTD.

Introduction

NEA Engineering Company Ltd (NEAEC) was established on July 13, 2017 to provide complete engineering services and solutions to hydropower and other power sector. Our services include feasibility study, detail design and engineering, hydropower planning, hydrology and hydraulic analyses, energy analyses, efficiency testing, assessment of equipment and facility condition, automation design, dam engineering, dam safety inspections, hydro mechanical engineering/ civil /structural, electrical design, operation/ maintenance, rehabilitation and specialized

services, project management, transmission and distribution system design etc.

The company intends to build national engineering capability for large hydro-projects, extra high voltage engineering and similar techno-intensive areas and provide a resource pool of competent man-power for the private sector to draw upon it aspires to be a renowned regional consulting institution in power sector.

Ownership

Nepal Electricity Authority (NEA) holds the majority ownership (51%) and the remaining 49% shares are held by VidhyutUtpadan Company Limited (VUCL) 17%, RastriyaPrasaran Grid Company Limited (RPGCL) 17% and Hydroelectricity Investment and Development Company Ltd. (HIDCL) 15%.

Establishment and Business License:

The Company was registered in Office of Company Registrar (OCR) on March 3,2017. It obtained permission to operate from OCR on July 13, 2017. The Company was registered in VAT on September 20, 2017. The Company had its first Assembly of General Members (AGM) on June 14, 2018. The Company's issued capital is 1 billion rupees while its paid-up capital is 100 million rupees.

Initially operating from a single room in the Head Office of NEA one year ago, it is now established in Trade Tower, Thapathali in the second and fifth floor. The Company had only one staff, Managing Director in 2074 Shrawan and has now grown to be 70 plus staffs, the majority of whom are highly skilled and qualified engineers and specialists.

Projects completed by NEA Engineering Company:

Study And Analysis Of Optimal Distributed Generation For Access To Grid Electricity For All In Five Years With Participation From Local Government

National Planning Commission Secretariat (NPC) and NEAEC jointly entered into a Consulting Contract on September 22, 2017 to undertake the study of Optimal Distributed Generation and Grid Access by 2022 provides a workable solution to provide access to grid electricity with the active participation of local government. The study was completed on December 15, 2017 within 3 months. It is a matter of honor and privilege for a new company like NEAEC to carry out this study and design work for the apex planning body of the country and complete it in schedule. The study concluded that a two-pronged strategy of constructing distributed generation at local levels of governance and extending national grid to each of these municipalities is a solution that is most viable and implementable one to remove darkness from the remote villages of Nepal in five years.

Workshop organized by NPC

Projects being currently studied by NEA Engineering Company:

1. Phukot Karnali Peaking Ror Hydroelectric Project (PKHeP) (426 MW)

The Contract agreement was signed on 10th October 2017 between NEAEC and VUCL to conduct the detailed feasibility / engineering study report of PKHEP incorporating the technical, financial and relevant aspects of the project development based on detailed survey and investigations including preparation of bidding document of PKHEP.

PKHEP is located in Kalikot District. The project is a peaking run-of-river (PROR) type with an

estimated capacity of 426 MW and annual energy generation of 2326 GWh. The main objective of the assignment is to carry out Detailed Feasibility/ Engineering Study of PKHEP including technical, financial assessment and prepare tender document.

2. Betan Karnali Hydroelectric Project (BKHeP) (688 MW)

A Contract between Betan Karnali Sanchayakarta Hydropower Company Limited (BKSHCL) and NEAEC was signed on November 23rd, 2017 for the Detailed Feasibility / Engineering Study of Betan Karnali Hydro Electric Project (BKHEP) with an installed capacity of 688 MW.

BKHEP is proposed as a Peaking RoR project located in Surkhet District. It has a design discharge of 373.10 m3/s and a gross head of 220 m. The average annual energy generation is estimated to be 4377.87 GWh

3. Jagadulla Storage Hydroelectric Project (307 MW)

The Contract agreement was signed on December 6, 2017 between NEAEC and VUCL to conduct the detailed feasibility / engineering study report of JSHEP incorporating the technical, financial and relevant aspects of the project development based on detailed survey and investigations including preparation of bidding document of JSHEP.

Jagdulla Storage Hydro Electric Project (JSHEP) is located in Dolpa District. JSHEP is a storage type project with a capacity of 307 MW and the annual energy generation of around 1098.53 GWh

The main objective of the assignment is to carry out Detailed Feasibility/Engineering Study of PKHEP including technical, financial assessment and prepare tender document.

4. Kimathanka Arun Hydroelectric Project (KAHeP) (450 MW)

The Contract was made on 6th December 2017 between NEAEC and VUCL to perform detailed feasibility engineering study of KAHEP.

KimathankaArun HEP (KAHEP) is located in Sankhuwasabha district. KAHEP is proposed as a peaking run-of-the-river scheme with a design discharge of 149 m3/s having minimum daily peaking of 4 hours and an installed capacity of 450 MW. The main objective of the assignment is to carry out Detailed Feasibility/Engineering Study of PKHEP including technical, financial assessment and prepare tender document.

5. Rolwaling Khola Hydroelectric Project (22 MW)

The Contract agreement was signed on March 29, 2018 between NEAEC and Upper Tamakoshi Hydropower Ltd. (UTKHPL) to conduct the detailed feasibility/engineering study report of RKHEP incorporating the technical, financial and relevant aspects of the project development based on detailed survey and investigations.

The Consultant is assigned to complete the Detailed Engineering Design of generating equipment and transmission line for 22MW RKHEP along with detailed Engineering Design of remaining civil and hydro-mechanical structures of RKHEP and prepare single package EPC bidding documents for financing and appointment of an EPC contractor.

6. Environmental Impact Assessment Of Phukot Karnali Peaking Ror Hydroelectric Project (PKHEP), Kimathanka Arun Hydroelectric Project (Kahep) And Jagadulla Storage Hydroelectric Project (JSHEP)

NEAEC has signed the Contract agreement with VUCL to carry out the detailed Environmental Impact Assessment of PKHEP, KAHEP and JSHEP. The EIA study of all three projects have already been initiated. The first phase of the field work under PKHEP has been completed. Desk study and field preparation of other two projects are in progress.

Public consultation with local villagers in Manma, Kalikot

7. Design Check And Construction Supervision Of 400 KV Dhalkebar Substation

The Contract agreement was signed on February 28, 2018 between NEAEC and Nepal Electricity Authority, Hetauda- Dhalkebar -Inaruwa 400KV Substation Expansion Project as a consulting service contract to conduct design check and supervision of 400KV Dhalkebar substation. The prime objective of consultant is to review the designs submitted by the Contractor ABB India, supervise the construction for smooth operation of construction activities.

8. Research, independent study and business Exploration.

The Company is actively engaged in research and study of Electrical Vehicles (EV), charging stations and other infrastructure to promote the use of EV into nation.

NEAEC promoting Electric Vehicle

The Company is also carrying its research and indigenous design of floating solar plants that can be used in lakes and reservoirs.

UPPER TAMAKOSHI HYDROPOWER LIMITED (UTKHPL)

UTKHPL was established on 09 March 2007 as an autonomous public company for the construction and operation of Upper Tamakoshi Hydroelectric Project (UTKHEP) utilizing domestic financial resources. The majority shares (51%) of the company belong to Nepal Electricity Authority (NEA), Nepal Telecom (NT), Citizen Investment Trust (CIT) and Rastriya Beema Sansthan (RBS) with stakes of 41%, 6%, 2% and 2% shares respectively. The company has already issued the shares to the contributors in Employees' Provident Fund (17.28%), NEA and UTKHPL staffs (3.84%) and staffs of debtor institutions (2.88%) in the Fiscal Year 2014/15. The remaining 25% of equity capital have been allocated to General Public (15%) and Residents of Dolakha district (10%).

Headworks structure of UTKHEP.

Project Features

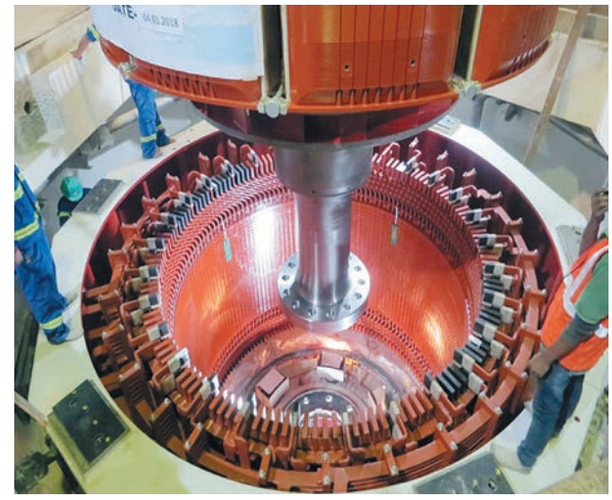
UTKHEP, one of the national pride projects of Nepal, is located in Bigu Rural Municipality, ward No.1 of Dolakha district in Central Development Region of Nepal. The project is a daily peaking run-of-the river project of installed capacity 456 MW with a live storage volume sufficient for four hours daily peaking operation in the driest month. 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 major components of the project are as follows: 22 m high and 60 m long diversion dam integrated with 35 m wide intake; 225 m long and 26 m wide each twin settling basin; Headrace tunnel having inverted D-shape section with 6m x 6m size and length 8.45km; 3.6 m diameter penstock of length 1,165m; Powerhouse cavern (142m x 13m x 25 m) along with a Transformer cavern (167m x 13m x 17.5 m); 3 km long Tailrace tunnel; Electro-mechanical equipment consisting of 6 nos. vertical Pelton Turbines (rated power of 79.5 MW each), 6 nos. synchronous generators (rated power of 90 MVA each) and 18 (plus 1 spare) single phase transformers (rated capacity of 90 MVA each) ; 47 km long double circuit 220 kV transmission line from Gongar to New Khimti Sub-station.

Transmission line alignment for UTKHEP

Power Purchase Agreement (PPA) & Financial Arrangement

PPA for the project has been signed with NEA on 29 December 2010. As per the PPA, the 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. The project is being financed through debt-equity ratio of 70:30. The financial closure with all financial institutions has been concluded on 12 May 2011 for the required debt portion. As per the separate loan agreements, EPF and NT have invested NRs. 10 Billion and NRs 6 Billion respectively whereas CIT and RBS have invested loans of NRs. 2 Billion each. Similarly, Government of Nepal (GoN) has



Assembling of Electromechanical works for UTKHEP

provided loan of NRs. 11.08 Billion to fulfill the financial gap. Furthermore, debtor institutions (EPF, NT, CIT and RBS) have also agreed to provide additional loan to cover increment in the project cost.

Present status of Works Progress

The project is being implemented with four separate contract lots listed as below:

S.N.	Contract Lot	Name of Contractors
1	Lot 1 - Civil Works	Sinohydro Corporation Ltd., China
2	Lot 2 – Hydro-mechanical Works	Texmaco Rail & Engineering Ltd., India
3	Lot 3 - Mechanical and Electrical Works	Andritz Hydro GmbH, Austria
4	Lot 4 - Transmission Line & Substation Works	KEC International Ltd., India

J/V Norconsult AS (Norway)–Lahmeyer International GmbH (Germany) has been entrusted as the Engineer/Consultant for construction supervision of the Project. The project has achieved overall physical progress of 96.5% by the end of the fiscal year 2074/75 (2017/18). The breakdown of progress in major Civil Works is as follows:

SN	Project Components	Progress
1	Headworks Concrete	99.9%
2	Headrace Tunnel Excavation	100.0%
3	Adit/Other Tunnels Excavation	93.3%
4	Powerhouse/Transformer Caverns Excavation	100.0%
5	Tailrace Tunnel Excavation	100.0%
6	P/H and Transformer Caverns Concrete	100.0%

Lot 1 Contractor has completed most of the concrete works at Headworks. Left bank protection works and some repair works are ongoing. Excavation of Headrace tunnel was completed with successful breakthrough on 19 November 2017. Invert concrete works on Headrace Tunnel is completed while concrete lining is ongoing. The excavation of tunnels under Surge System is ongoing and about 480 m is remaining (total length = 1,258 m). Excavations of two vertical penstock shafts have already been completed and preparation for installation of vertical penstock pipes is ongoing.

Lot 2 Contractor completed the installation of skin plates and arms of all dam radial gates. Transportation and installation works of steel penstock pipes are very slow and hence necessary steps have been taken to overcome further delays.

Lot 3 Contractor has completed the installation of (Turbine-Generator Set) of Unit No 1, 2 ,3 and 4. Installation Works of (Turbine-Generator Set) of Unit No. 5 and 6 are in final stage. All 19 Power Transformers are placed in the Transformer Cavern. Out of 19 Transformers, installation of complete accessories and oil filling for 6 Transformers is completed until June 2018. Installation of Main Inlet Valves (MIVs) and digital governors for Unit 1, 2, 3 and 4 have been completed and the same for Unit 5 and 6 are in final stage. Installation of Gas Insulated Switchgear (GIS) for all units is in final stage. In the main control room, installation of Control Panels, DC supply unit and other required works are in final stage.

Lot 4 Contractor has completed the foundations of 123 towers and erections of 108 towers out of total 127 towers until 15 July 2018. Stringing of 24.21 km conductor and 11.66 km OPGW out of 47 km has been completed. The site preparation and grading works of the Khimti Substation is completed. Transformer foundation and other Civil Works at Khimti Substation is in progress.

Project Cost & Schedule

The approved cost estimate of the project prior to bidding of different construction lots and consultancy services in different stages was US$ 456 Million excluding Interest during Construction (IDC). Considering the effects of earthquake of 25 April 2015, Nepal India boarder blockade during 2015 and some additional works due to design modifications a new Integrated Time Schedule comprising water on in Headrace Tunnel on 15 November 2018 and starting of generation from first unit in December and starting of generation from all units in May 2019 has been established.

The project cost has been revised as NRs. 49,295 Million (Foreign Currency Portion: US$ 304 Million and Euro 14.7 Million; Local Currency Portion: NRs. 25,008 Million) excluding IDC as of December 2017 because of multiple reasons such as design modifications of Headrace Tunnel and Surge System, upgrading and rehabilitation of project access roads, time delays and additional scope of works due to the great earthquake of April 2015, some other design changes in the project components etc. In consideration of the delays due to above reasons including poor access conditions, the project is expected to be commissioned in the fiscal year 2018/19.

Rolwaling Khola Hydroelectric Project (RKHEP)

As the second stage development of UTKHEP, UTKHPL intends to implement Rolwaling Diversion Scheme with stand alone power plant of installed capacity of about 22MW. UTKHPL has obtained survey license for electricity generation of 22 MW from Rolwaling Khola from GoN/DoED on 10 September 2017. Apart from the energy generated

from 22 MW power plant itself, additional 167 GWh of annual energy mainly during the dry season shall be generated from Upper Tamakoshi Hydropower Plant. A Contract was signed between UTKHPL and NEA Engineering Company on 13 March 2018 to prepare Detailed Engineering Design and Bidding Documents of Rolwaling Khola Hydroelectric Project (RKHEP). The consultancy services are expected to be completed by March 2019.Similarly, another contract was signed between UTKHPL and ESSD (Environmental and Social Studies Department) of NEA to carry out EIA Study of RKHEP. As part of RKHEP, it is planned to construct cable car/rope way from Chhet Chhet to Rikhu to transport material, equipment and manpower for the construction of RKHEP's headrace tunnel (upstream side) and headworks sites. Prequalification for prospective international bidders for construction of cable car/rope way has already been accomplished while notice for Invitation for Bids will be published soon.

TANAHU HYDROPOWER LIMITED (THL)

Tanahu Hydropower Limited (THL) was established as a subsidiary company of Nepal Electricity Authority (NEA) on25 March 2012 to implement Tanahu Hydropower Project (previously known as Upper Seti Hydropower Project). The management of THL is entrusted to a Board of Directors which is constituted as follows:

1. Managing Director, NEA: Chairman
2. DMD, Finance Directorate, NEA: Member
3. DMD, Engineering Services Directorate, NEA: Member
4. Managing Director, THL: Member

Background of Project

The feasibility study of the project was carried out by NEA in July 2001. J-Power upgraded the Feasibility Study in 2007 and further conducted the Detail Engineering Design in 2015 under technical assistance fromthe Japan International Cooperation Agency (JICA) and the Asian Development Bank (ADB) respectively.

THL has signed a contract agreementwith M/S Lahmeyer International GmbHin association with Manitoba Hydro International as Project Supervision Consultant (PSC) on June 29, 2015. The Consultant will provide services for twelve years including 5 years of plant operation after the completion of the Project. The first phase of the services including review of the detail design, preparation of bidding documents and the assistance for bid evaluation for major construction packages are nearby completion. As an addendum to the Contract, PSC also completed the rock mechanical tests inside the powerhouse cavern.

Key Features of Project

The Project site is located,about 150 km west of Kathmandu,nearby Damauli, the district headquarters of Tanahu District,The storage type project is envisaged to have an installed capacity of 140 MWwith estimated average annual energy generation of 502.6 GWh, The Project is designed for minimum six hours of peaking operation even

Headworks site of Tanahu HEP

during the driest month of the year. The main components of the Project are as follows:

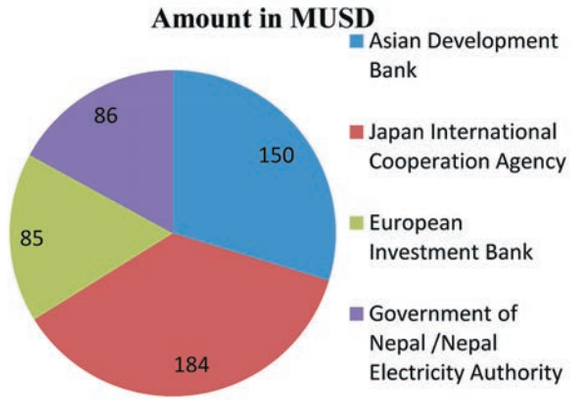
- A 140 m high concrete gravity dam with acrest length of 215 m creating a reservoir with a total surface area of 7.26 km2 at FSL of 415 masl;

Powerhouse Site of Tanahu Hydropower Project

- A 1,162 m long 7.4 m diameter headrace tunnel;
- A 61.5 m high restricted orifice type surge shaft of internal diameter 28m;
- An underground powerhouse of dimensions 89m long x 22m wide x 44m high ;
- A 243 m long 7.4m diameter tailrace tunnel to discharge the tail water back into Seti River
- Hydro-mechanical equipment consisting of four spillway radial gates of size 12.8m x 18.7m, two water lowering gates of size 3.8m x 3.8m, two sets of sediment flushing facilities of size 5m x 5m with steel liners and a 160m long steel penstock pipe.
- Electro-mechanical equipment consisting of two units of Francis Turbines with the maximum output of 71.8MW each coupled with a three phase synchronous generator of maximum output 82.3 MVA
- 220 kV double circuits Transmission lineof length 34 km to evacuate the generated power to the New Bharatpur Sub-station.
- Additionally, the Project will electrify 18 VDCs of the district with construction of two new 33/11 kV sub-stations through the Rural Electrification (RE) Program.

Funding Arrangement

As per the Project Administration Manual (PAM), the total financial cost is of the project was estimated to be USD 505 million as of January 2013 for which the funding arrangement has been made as shown below:



The loan agreements between GoN and the respective co-financier have already been concluded and the GoN and NEA have entered into subsidiary agreements pursuant to which GoN will relend the loan proceeds ofeach co-financier to NEA. NEA and THL have further signed the subsidiary financing agreements pursuant to which NEA will relend part of the loan proceeds to THL and contribute the remainder to THL's equity in accordance with the debt:equity (60:40) arrangements.

Bidding Process for Major Construction Packages

It is envisaged that the project will be implemented through following three major construction packages:

Package 1: Headworks & River Diversion

Package 2: Waterway, Powerhouse and Related Equipment

Package 3: Transmission Line

After the pre-qualification process, THL issued a notice of Invitation for Bids from eligible applicants for Package 1and Package 2 on 01 February 2017. After evaluation of the technical and price bids from all those Bidders, who have submitted their Bids by the deadline of the bid submission, and subsequent concurrence from the respective co-financiers, THL conducted pre-award discussion and concluded interface agreements with the bidders of both Packages in June-July, 2018. Accordingly, Memorandum of Understandings (MoU) has been signed with the successful bidders of Package 1 and Package 2 on 08 July 2018 and 13 July

2018 respectively. It is expected that the contract agreements of both packages will be concluded in august, 2018 so that the Commencement of Works for both Packages could be achieved by October, 2018.

THL has also issued a notice of Invitation for Bids for the Package 3-Transmission Line on 12 July 2018 giving 45 days for bid submission.

Pre-Construction Activities

Access Road & Bridge across Seti River

The construction of the 2,400 m long access road from Chapaghat (Prithbi Highway) to the RCC Bridgewith Double Bituminous Surface Treatment (DBST) has been completed. Track opening in the remaining section of the road from RCC Bride to Beni Patan towards the dam site will be initiated soon after the acquisition of some plots of private land along the alignment.

The access road, 3,314m long,from RCC Bridge to the powerhouse along the right bank of Seti River has also been completed with Double Bituminous Surface Treatment (DBST).

The 150 m long RCC Bridge across the Seti River was also completed as a part of access road to the powerhouse site of the project.

Camp Facilities

Altogether 33 nos. of buildings, (28 nos. of office/ residential buildings,1 Guest house, 1 health post, 2 restaurants and 1 guard house) are being constructed for camp facilities. Structural works of all buildings have been completed, whereas the finishing works are underway. It is expected that the entire construction of camp facilities will be completed by the end of October, 2018.

Construction Power Sub-station of Tanahu HEP.

Construction Power Sub-Station

For the reliable power supply to construction works of both Packages, a33/11 kVSub-station of capacity 6/8 MVA has been constructed along with the installation of power transformers and all other accessories.

Power Purchase Agreement/Licenses & Clearances

NEA and THL have signed the Power Purchase Agreement (PPA) for purchase and sale of energy to be generated from Tanahu Hydropower Project on 29 June 2018 as the maiden PPA for storage type projects in Nepal. The agreement has become effective from the date of signing and shall remain valid for thirty years from the Commercial Operation Date or till the validity of the Generation License, whichever is earlier. The Required Commercial Operation Date (RCoD) has been slated as 12 April 2024.

Subsequent to the approval of SEIA by the Ministry of Population and Environment (MoPE), the MoEn has issued the first amendment to the Generation License of the project, thereby upgrading the installed capacity from 127 MW to 140 MW on 28 December 2017. Likewise, the DoED has issued the License for Damauli-Bharatpur 220 kV on 02 May 2018 subsequent to the approval of SIEE for the new route alignment of Transmission Line.

The Ministry of Forestry and Soil Conservation (MoFCS), following the decision of the Council of Ministers, gave the clearance for 417.31 Ha of forest area having total 181,571 numbers of trees on 11 September 2017. Accordingly, THL has made an agreement with the Department of Forest on 01 November 2017 for the further process of forest clearance.

Engagement of ESMSP/PoE

THL has established the Environmental and Social Monitoring Unit (ESMU) in order to implement the environmental monitoring and social safeguard activities. In order to support ESMU, THL has initiated the procurement process for engagement of Environmental and Social management Service Provider (ESMSP).

Five international firms have been shortlisted and Request for Proposal (RFP) documents were issued to those shortlisted firms on 27 June 2018. In order to fill the gap until the ESMSP is in place, THL has appointed three individual specialists (Fishery, Environmental and Social Safeguard) as bridging consultants.

As provisioned in the PAM, THL has also initiated the process for engagement of Panel of Experts comprising of Dam Safety Expert, Environmental Expert and Social Safeguard Expert. The notice for EoI was published on 13 June 2018 and the evaluation of the received applications is under way.

THL has established four Local Consultative Forums (LCFs) as part of Grievance Readdress Mechanism in four Municipalities namely, Vyas Municipality, Bhimad Municipality, Rising Rural Municipality and Myagde Rural Municipality in addition to two Public Information Centers (PICs) at Damauli and Bhimad for dissemination of project related information to APs.

Land Acquisition& Compensation

THL has distributedabout USD 10.17 Million to 447 affected HHs out of identified 525 affected HHs for land acquisition and resettlement costs within the camp site, access road and reservoir area. The compensation distribution will be continued during the current FY 2017/18. Further after approval of the Due Diligence Report as prepared by the local NGO, ADB has reimbursed almost all compensation payments made by THL so far.

Closing of Vocational & GESI Training Program

As the livelihood restoration program, THL also conducted the first phase of the vocational training to sixty affected people in the building electrician and junior plumber through the Rural Training Center, Bhimad-a training wing of CTEVT. Under the community development program, THL has signed an agreement with Roha Singh Kershide Water Supply and Sanitation Consumer Committee for the implementation of Jhaputar Water Supply Project, which will directly benefit 300 affected families of Jhaputar. THL, with the support of ADB Resident Mission, also conducted Environmental and Social Awareness Orientation Program along with the training program for Gender Equity and Social Intrusion (GESI)at Rising Patan, Bhimad Municipality on 16 May 2018.

Future Development: Lower Seti (Tanahu) HEP:

THL envisages to develop Lower Seti (Tanahu) Hydropower Project located about 15 km downstream of the tailrace of Tanahu Hydropower Project. The proposed project will utilize the flows of Madi River in addition to the regulated discharge of Seti River from the tailrace of Tanahu Hydropower Project.

The MoEn has issued the Survey License of Generation to THL for the installed capacity of 104 MW on 09 November 2017. ADB has agreed to provide the grant assistance of USD 3.3 Million to conduct the Detailed Engineering Design and Preparation of Bidding Documents under Grant-0361-NEP, Project Preparation Facility for Energy. Accordingly, THL has issued a notice for EoI on 11 April 2018 and 19 international consulting firms have submitted their EoIs. The evaluation of the received EoIs is in progress and it is expected that RFP documents will be issued to the shortlisted firms by the end of August, 2018.

RAGHUGANGA HYDROPOWER LIMITED

Raghuganga Hydropower Limited was registered at the Office of the Company Registrar, Government

of Nepal with registration No. 165063/073/074 dated 7th March 2017(24thFalgun 2073) with 100% ownership of NEA to develop and manage 40 MW Rahughat Hydroelectric Project. From 16th December 2017(1stPoush 2074), all the works and duties related to Rahughat Hydroelectric Project (NEA) are being carried out by Raghuganga Hydropower Limited.

The office of Raghugang hydropower limited has been shifted from NEA Training Centre, kharipati, Bhaktapur to Raghuganga Rural Municipality Ward No. 3, Piple, Myagdi, Nepal with effect from 15th March 2018(1stChaitra 2074).

The project is being implemented under financial arrangements involving a soft loan from the EXIM bank of India and funds from Government of Nepal and Nepal Electricity Authority. The estimated cost of the project is USD 81.89 million (excluding IDC) out of which USD 67 million is available from EXIM Bank of India.

Rahughat Hydroelelctric Project is located in Raghuganga Rural Municipality ofMyagdiDistrict and is a peaking run-of- river type of project with 292.83m gross head, design discharge of 16.67 m3/s and installed capacity of 40 MW. The project will generate about 248.53 GWh of energy annually. The entire project has been envisaged through two packages, namely EPC mode for Lot 1: Civil and Hydro-mechanical works and PDB mode for Lot 2: Electro-Mechanical works.

The major components of the Project lie at the left bank of RaghugangaKhola. It is one of the major tributaries of Kaligandaki River that flows from west to east to meet Kaligandaki River at Galeshwor. RaghugangaKhola will be diverted through the headworks to 6.270 km headrace tunnel to generate 40 MW of power in the powerhouse located on the right bank of the Kaligandaki River at Galeshwor, which is about 300m upstream of the confluence of RaghugangaKhola with Kaligandaki River on the Beni- Jomsom highway.

Key features of the project

District	Myagdi
Design Flow(m^3/s)	16.67
Concrete lined length(m)	6270.106
Turbine type	Pelton
Gross Head(m)	292.83
Rated net head(m)	281.56
Installed Capacity(MW)	2*20=40
Transmission line from Dana Kushma line to RGHEP switchyard under the scope of Dana-Kushma 220 kV Transmission Line Project(km)	0.6

WAPCOS Limited is the consultant for construction management and construction supervision of Civil works, Hydro-Mechnaical works, Electro-mechanical works and Transmission Line Works of Rahughat Hydroelectric Project.

Contract Agreement for the construction of the Civil Works and Hydro-Mechanical works was signed on 21st November 2017 with Jaiprakash Associates Limited, India. The Contract Agreement has been approved by Exim Bank of India on 23rd May 2018. The Consultant issued the "Notice to proceed"(NTP) on 24th May 2018 to the Contractor. The Contractor mobilizes on site and started designed works, preparatory works. Access road works started on 1st July 2018 and work on progress.

The Invitation for Bids for Lot -2 Electro-Mechanical Works was published in the national daily "The Rising Nepal", on July 8, 2018 with the last date of submission of bids on 6th September, 2018.

Access Road Construction on progress, Rahughat HEP

CHILIME JALAVIDHYUT COMPANY LIMITED

Chilime Jalavidhyut Company Limited (CJCL), 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.

ChilimeJalavidyut Company Limited (CJCL) has been facilitating project affected people under Corporate Social Responsibility (CSR) activities like health, education, infrastructure, drinking water, irrigation etc.

Ongoingconstruction Project Under CJCL

Four hydroelectric projects with total capacity of 270.3 MW are under construction through three subsidiaries of ChilimeJalavidyut Company Limited (CJCL)namely Rasuwagadhi Hydropower Company Limited (RGHCL), Madhya BhotekoshiJalavidyut Company Limited (MBJCL) and SanjenJalavidyut Company Limited (SJCL).

(A) Sanjen Jalavidhyut Company Limited (SJCL)

Sanjen Jalavidhyut Company Limited (SJCL), is a subsidiary of Chilime Hydropower Company Limited (CHPCL) established on 1st February, 2010 AD. SJCL is developing two hydroelectric projects, namely, Sanjen (Upper) Hydroelectric Project (SUHEP) (14.8 MW) and Sanjen Hydroelectric Project(SHEP) (42.5 MW) in cascade, with equity and loan arrangement of 50:50 ratio. All the debt portion has been arranged from Employer's Provident Fund (EPF) of Nepal.

Among the total equity portion, 51% is invested by the promoters of the company, which is composed of CHPCL (39.36%), Nepal Electricity Authority (10.36%) and District Development Committee (DDC) and all 18 Village Development Committees (VDCs) of Rasuwa (1.28%). Remaining 49% of equity has been arranged from public share which compose 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 of Rasuwa district (10%).

Sanjen (Upper) Hydroelectric Project (SUHEP) - 14.8 MW

The project is located in Chilime VDC (now Amachhodingmo Rural Municipality). The headworks of this project is in Tiloche and powerhouse is in Simbu Village. The project has approx. 161 gross head and design discharge of 11.07 m3/s. Total annual saleable energy is 82.43 GWh. This project has peaking ponds with one hours peaking capacity.

The overall progress of SUHEP is approx. 70 %. The civil works (Lot 2), the contractor is ECI-Bajraguru JV. The headrace tunnel of the project around 1386.00 m is completed. The headworks weir, intake and desander, flushing canal and bypass canal are almost 95 % completed. Vertical penstock excavation is almost completed. The works in peaking pond and powerhouse is ongoing. The slope protection works, excavation and foundation preparation work is in progress.

Sanjen Hydroelectric Project (SHEP) - 42.5 MW

This project is cascade project of SUHEP and has gross head 442 m. Additional 0.5 m3/s discharge from Chhipchung is added into SHEP having total design discharge 11.57 m3/s.This project will produce total 251.94 GWh with total

annual salable energy is 241.86 GWh. The overall progress of the project is approx. 60%.

For Civil Works (Lot2), the contractor is SEW-TUNDI J/V. Out of total 5300 m tunnels around 3500 m has been already excavated. Out of 3540 m headrace tunnel 2250 m around (62%) has been excavated. The foundation concreting of powerhouse has been already finished. In headworks, the balancing pond, Chhipchung headworks, syphon pipes, inlet slopes and tunnel from inlet has been ongoing. Overall headworks is almost 70 % completed.

The Electro-mechanical Works (Lot-3) of the both projects, the contractor is Dongfang Electric Corporation, China. Under this contract, design is almost completed and manufacturing and factory inspection and test of almost all of the electro-mechanical equipment like turbine, generators, transformer etc. has been completed.

Hydro mechanical Works (Lot-4), contractor for both projects is Nepal Hydro & Electric (NHE). Under this contract, design part is almost completed and fabrication of hydro mechanical components of both projects are almost completed. Gates and Penstock pipe installation in SUHEP is in progress. Consultancy Services: Chilime Engineering and Services Compnay Ltd. (Chesco) has been engaged inDetailed Engineering Design & Construction Supervision of both projects after SMEC International Pty. Ltd., Australia left the consulting service.

SHEP Headworks- Balancing Pond and Inlet Slope

Lot 5 Transmission Line Works: Mudbhary and Joshi Construction Pvt. Ltd. has been awarded for construction of approx. 6 km 132 kV transmission line works. Detail survey, design works is almost completed. Acquisition of land for the purpose of transmission lines is in progress.

(B) Rasuwagadi Hydropower Company Ltd.

Rasuwagadhi Hydropower Company Limited (RGHPCL), promoted by Chilime Hydropower Company Limited (CHPCL) was established on Shrawan 17, 2068. The company is developing Rasuwagadhi Hydroelectric Project (RGHEP) of 111 MW capacity in Rasuwa district. The project can be accessed through Kathmandu-Trisuli-Rasuwagadhi road which is about 150 km North from Kathmandu. The project has been scheduled to be completed on 19th Feb, 2020.

Rasuwagadhi Hydroelectric Project

The project is located in Thuman and Timure village (ward no. 1 and 2 of Gosaikunda Gaupalika) of Rasuwa district. The headworks site is about 400m downstream from the confluence of Kerung and Lende khola which are the Boundary Rivers between Nepal and China. The project is a run-of-river type having installed capacity of 111 MW and the annual energy generation will be 613.875 GWh.

The construction of the project has been categorized into three different Lots. For the construction of Lot 1: Civil and Hydro-Mechanical Works under Engineering, Procurement and Construction (EPC) contract model, the contract agreement was signed with the Contractor M/S China International Water and Electric Corp. (CWE) on 5th January, 2014. Similarly, for Lot 2: Electromechanical Works, the contract agreement was signed with the Contractor M/S VOITH Hydro Pvt. Ltd, India on 31st July, 2014. For Lot 3: Transmission Line works which

Key Features of the Project:

Type of Project:	Run-of-River(ROR)
Design Discharge (Q_{40}):	80.00m³/s
Geology:	Quartzite, Migmatite and Gneiss Rock
Gross Head:	167.9 m
Headwork:	Overflow Diversion Weir with Undersluice and Side Intake
Desander, Type and Size:	Underground (3 -125mx15mx23m)
Headrace Tunnel length and size:	4185m, dia. - 6m~7m
Powerhouse type and size:	Underground, 76.3m x 15.0m, 35.0m
Turbine, Type & No:	Francis, Vertical Axis & 3 Nos.
Turbine Unit Capacity	38.50 MW each
Generator, Capacity & No.:	3 Phase Synchronous AC, 3x43.75 MVA
Installed Capacity:	111.0 MW
Annual Energy Generation	613.87GWh
Dry Months Energy	84.32GWh
Wet Months Energy	529.55GWh
T/L length, Voltage	10km, 132kV Double Circuit up to Chilime Hub

includes construction of about 10 km long 132 kV double circuit transmission line, the contract agreement has been signed with the contractor M/S Mudbhary and Joshi Construction Pvt. Ltd., Kathmandu on 15th June, 2017. The project Consultant M/S SMEC International Pty. Ltd., Australia has been continuously supervising the Lot 1 & Lot 2 construction works, reviewing and approval of the design submitted by the contractors and co-coordinating the contractors for smooth operation of construction work activities.

Present Status of the Project

The progress summary of the major construction activities are as follows:

Infrastructure works

Due to the effect of Earthquake 2072, the under construction permanent camp facilities was heavily damaged and stopped till date for its construction continuation. In an alternative, the construction of the Employer's temporary camp facilities (Pre-fab buildings) which includes both the project office and residence camp on the Timure/Thuman area has been completed and the whole project team has been working from the site office.

Lot 1: Civil and Hydro-Mechanical Works

The re-construction of 1st stage coffer dam and re-excavation in the foundation area of the intake and undersluice, which was heavily damaged by the earthquake, has been completed and the concreting works in that area is being continued.

The excavation and primary rock support of Main Access Tunnel to Powerhouse, Access Tunnel to Transformer Cavern, Valve Chamber, Surge Tank Aeration Tunnel and all the Construction Adits (total length= 1501.45) has already been completed. The excavation and rock support for the underground Powerhouse has been completed, concreting in foundation and super structure at the powerhouse is going on. The excavation and rock support for Transformer Cavern has been

Visit to the Project site by Hon'ble Minister of Energy

completed and concreting in foundation is going on. Similarly, the excavation and primary rock support of Desander Intake Tunnels, operation tunnel, flushing tunnel & outlet tunnels (total length=1155.10m) has been completed. The excavation and rock support works of underground Desanding Basin is going on.

The excavation and primary rock support of Headrace Tunnel of length 4060m out of 4185m has been completed. The remaining excavation of the headrace tunnel is expected to be completed within a month. The pilot tunnel excavation using raise boring machine for vertical penstock shaft and surge shaft has been completed.

Ongoing works at the powerhouse site.

Lot 2: Electro-Mechanical Works

The Lot 2: Electromechanical Works Contractor M/S VOITH Hydro Pvt. Ltd, India has been mobilised at site and the detail design and manufacturing of the electromechanical equipment components are ongoing. Some of the equipment components have already been delivered to the site and is in process of installation.

Lot 3: Transmission Line Works

For the construction of Lot 3: 132 KV double circuit Transmission Line Works, the Contractor has completed the detail survey and the detail design work is being continued. The private land acquisition required for the Transmission line is in progress.

The overall progress of the project construction work is approximately 65%.

Because of various unforeseeable events (i.e. April, 2015 earthquake followed by Nepal-India boarder blockade and massive landslides in the public road as well as the project work fronts due to heavy rainfall during the monsoon season of 2073 B.S.), the project completion schedule has been revised.

The updated project completion date is 19 Feb, 2020.

Financial Arrangement

The company has planned to manage the capital requirement for the construction of the project from debt and equity provision in the ratio of 50:50. The debt requirement has been managed from Employees Provident Fund (EPF), under the long term loan agreement signed on 22nd Marg, 2068. The equity portion has the investment proportion of 51% promoter share and 49% public share. The promoter share comprises of 32.79% from Chilime Hydropower Company Ltd., 18% from Nepal Electricity Authority and 0.21% from local level (District Coordination Committee and Gaupalika) of Rasuwa district. Similarly, the public share comprises of 19.50% from Depositors of EPF, 4.5% from Employees of Promoter & Investor Institutions, 15% from General Public and Employees of the Company and 10% from the Locals of Rasuwa district.

The equity investment has already been paid up by the Promoter group as per their commitment on the equity proportions. Among the public share investment, 24% Public Shares, that include 19.50% to the Depositors of EPF, 3.5% to the Employees of Promoter Institutions & 1% to the Employees of Investor Institution have already

been issued in the first lot. Now the necessary preparation for the issuance of the remaining Public Shares is going on. This includes 10% to the Locals of Rasuwa district and 15% to the General Public and Employees of the Company.

(C) Madhya Bhotekoshi Jalavidhyut Company Ltd.

Madhya BhotekoshiJalavidhyut Company Ltd. a subsidiary of ChilimeJalavidhyut Company Ltd., is constructing Middle Bhotekoshi Hydroelectric Project (102MW) located in Sindhupalchowk District of Bagmati Zone of the central Development Region.

I. Capital Structure

The Company has managed its capital requirement from Debt and Equity under the debt equity ratio of 50:50 Debit has been managed from EPF.

Financial Detail equity parts are as follows:-

Promoter Shares (51%)

1. Chilime Hydropower Company Ltd. -37 %
2. NEA -10%
3. Nepal Araniko Hydropower Company Pvt. Ltd. -1%
4. Sindhu Investment Pvt. Ltd. -1%
5. Sindhupalchowk Hydropower Co. Ltd. -1%
6. SindhuBhotekoshi Hydropower Ltd. -1%

Public Shares (49%)

1. Employees of Promoter Companies -3.5%
2. Employees of EPF -1%
3. Depositors of EPF -19.5%
4. Local Public (Sindhupalchowk citizens)-10%
5. General Public -15%

Key features of the Project

Type of Project:	Run-of-River (ROR)
Design flow:	50.8 m3/sec
Gross Head:	235 m
Installed Capacity:	102 MW (3 x 34 MW)
Annual Salable Energy:	542.2 GWh
Project Cost	NRs 14.84 billion

II. Key Project Activities

1. Land acquisition Activities:

The project has acquired most of the necessary lands by land acquisition process and some from negotiation process.

2. Construction Activities

The Construction works are divided into following packages:

- Construction of camp facilities.
- Civil and Hydro-mechanical works(Lot-1)
- Electromechanical works (Lot-2)
- Construction of Transmission line

Construction of Camp Buildings:

The construction ofthecamp Buildingsforthe employerandconsultant accomodationcompleted and they are in operation.

Civil and hydro-mechanical works (Lot-1)

Civil and Hydro-mechanical works are being carried out by the Chinese company " China Energy Engineering Group, Guangxi Hydroelectric Construction Bureau". It has completed 50%

Pilot Shaft for Surge Tank

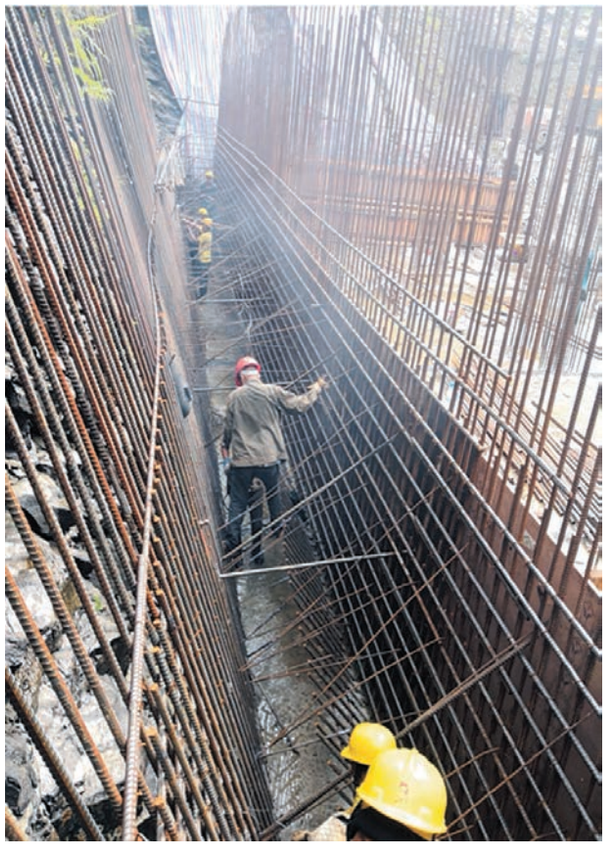
of excavation and Support works of Headrace tunnel, 75% of excavation for Penstock Tunnel and Support for Powerhouse and Headworks. It is planned to complete the project in June 2019.

Electromechanical Works (Lot -2)

Electromechanical works are being carrying out by AndritzHydroPrivateLimited,India. The company manufactured and supplied 50% of the equipment and stored at site.

Transmission Line works:

The project has awarded the contract to Urja-Ac JV for the construction of 4 Km 220 kV transmission



Reinforcement placement in Power House

line. Initial Environmental Examination (IEE) for Transmission Line has been completed and it is on the process of approval.

2. Consulting Services

Chilime Engineering and services Company Ltd. (ChesCo) was established to give complete engineering and services for hydropower project development in Nepal. The Company is initiated and invested by ChilimeJalavidyut Company Limited (CJCL)as pre-dominant share-holder and contains 100% ownership of CJCL. Chesco's main motive is to develop the skilled manpower

Drilling for Pilot Shaft in Penstock

and gives complete solution for the sustainable hydropower development.

3. Hydropower Projects in study Phase

A. BudhiGandaki Prok Hydroelectric Project (420 MW)

The Feasibility study of the project is being carried out by Chilime Engineering and Services Company Ltd. (100% holding Company Chilime Jalavidyut Company Limited). The project is located in Gorkha district.It is a RoR type project with net turbine head 650 m, design discharge of 17.14 m3/s, installed capacity 420 MW and average annual energy 2395.54 GWh.

B. Seti Nadi-3 Hydroelectric Project (165 MW)

Chilime Jalavidyut Company Limited has recently completed the feasibility study contract with Chilime Engineering and Services Company Ltd. The project is located in Bajhang district.It is a PRoR type project with net turbine head 300 m, design discharge of 76 m3/s, installed capacity 165 MW and average annual energy 827.45 GWh.

C. Chumchet SyarKhola Hydroelectric Project (60 MW)

The CJCL has obtained the survey license of Chumchet Syar Khola from Department of Electricity Development(DOED). The project is located in Gorkha district.It is a RoR type project

with net turbine head 420 m, design discharge of 17.14 m3/s, installed capacity 60 MW and average annual energy 348.05 GWh.

4. Construction of Chilime Tower

Chilime Jalavidyut Company Limited (CJCL) has decided to construct the Chilime Tower, a Corporate building of the company in the its own premises at Dhumbarahi. Building Consists of 11 floors including two basements. The total floor area cover up above the building is around 97,000 sq.ft.

TRISHULI JALVIDHYUT COMPANY LIMITED

Trishuli JalVidhyut Company Limited (TJVCL) was established in 2011 as a joint venture of Nepal Electricity Authority (NEA) and Nepal Doorsanchar Company Limited (NDCL). The main objective of the Company is to develop the Upper Trishuli 3B Hydroelectric Project (37 MW) located in Nuwakot and Rasuwa District. Both NEA and NDCL have equal equity shareholding in the Company. The equity share structure of the Company is as follows:

- Nepal Electricity Authority: 30 %
- Nepal Doorsanchar Company Limited: 30 %
- VDCs and DDCs of Nuwakot and Rasuwa: 5 %
- Financial institutions formed by the natives of Rasuwa and Nuwakot District: 5 %
- Natives of project affected districts (Nuwakot and Rasuwa): 10 %
- General Public: 15 %
- Employees of NEA and NDCL in proportion to employee ratio: 5%

The Company is working to develop Upper Trishuli 3B Hydroelectric Project (37 MW) which is a cascade scheme of Upper Trishuli 3A Hydroelectric Project (60 MW). The installed capacity of the Project is 37 MW and annual energy generation after outage is 292.59 GWh (Dry Energy: 134.88 GWh& Wet Energy: 157.71 GWh). Power Purchase Agreement (PPA) between NEA and TJVCL was signed on 22 August 2017. Loan agreement with the consortium of Nepalese Banks led by Nabil Bank and co-led by JalvidhyutLaganiTathaBikas Company Ltd. as part of financial closure for the debt portion required for the Project will be signed within August 2018. The company aims to commission the Project by March 2021. The current status of the Project is as follows:

- Sichaun ANHE Hydraulic and Hydroelectric Engineering Co. Ltd., China has been awarded the Contract for "EPC Construction of Upper Trishuli 3B Hydroelectric Project". The Contract was signed on 12 February, 2018. All the works of the Project relating to civil, electro-mechanical and hydro-mechanical except transmission line is within the scope the EPC Contractor. Transmission line will be constructed by NEA as per the MoU between NEA and TJVCL on cost sharing basis.

- The Contractor has commenced the Works of "EPC Construction of Upper Trishuli 3B Hydroelectric Project" from 14 March, 2018 and is expected to complete the Works by 13 March 2021. Since the commencement date, the Contractor has completed the Topographic Survey, Geotechnical Investigation and Basic Design of the Project.

Core Drilling at Surge Tank Area

Signing of Power Purchase Agreement (PPA) between TJVCL and NEA

- Construction of Contractor's Camp Facilities is in progress and is expected to be completed by July, 2018.
- Excavation of Headrace Tunnel (HRT) is expected to start from 15 October 2018.
- Acquisition of private land required for the Project has been completed. Process of leasing of government land by the Company is going on.

POWER TRANSMISSION COMPANY NEPAL LIMITED

(A Joint Venture company of Nepal Electricity Authority, Power Grid Corporation of India Limited, Hydroelectricity Investment & Development Company Limited and IL&FS Energy Development Company Limited)

kV D/C Dhalkebar - Bhittamod Transmission Line

Power Transmission Company Nepal Limited (PTCN), a subsidiary of Nepal Electricity Authority (NEA) was established with the main objective of developing high voltage transmission interconnection system between Nepal and India for the mutual interest and benefit of both the countries. Power Transmission Company Nepal Ltd. (PTCN) was incorporated on Bhadra 30, 2064 (i.e. 16th September, 2007) with the objective of developing infrastructure, management & executing job related to transmission of electricity. Nepal Electricity Authority (NEA), Power Grid Corporation of India Limited (PGCIL), Hydroelectricity Investment & Development Company Limited (HIDCL) and IL&FS Energy Development Company Limited (IEDCL) havesubscribed 50%, 26%, 14% and 10% Shares of PTCN respectively.

Two Joint Venture companies - one in India and other in Nepal were incorporated for implementation of 400 kV double circuit line interconnection between Muzaffarpur in India and Dhalkebar in Nepal.

(i) Nepal Portion of line consists of 42.1 km long from Nepal Border at Bhittamod to NEA 400/220/132 kV Substation at Dhalkebar in Nepal has been implemented by 'Power Transmission Company Nepal Limited' (PTCN) - a Joint VentureCompany of NEA, POWERGRID, HIDCL & IEDCL

The estimated revised cost of Nepal Portion of the project is NRs 1616 Mn (≈ INRs 1010 Mn). & is being funded in D: E as 70:30. Nepal Government & EXIM Bank of India has entered into a Loan agreement on September 14, 2007, where EXIM Bank agrees to provide 100 Million US Dollar to Nepal Government. NEA has signed Subsidiary Finance Agreement with Power Transmission Company Nepal Ltd. (PTCN) on 2070.11.27 (11th March, 2014). As per the agreement, NEA shall provide in Nepali currency amount equivalent to US Dollar 13.2 Million, for execution of 400 kV Nepal India Cross Border Transmission Line.

(ii) India portion of Line consists of about 86 km from Muzaffarpur Substation of POWERGRID in Bihar to India Border at Sursand/Bhittamod has been implemented by 'Cross Border Power Transmission Company Limited' (CPTC) - a Joint Venture of IL&FS Energy Development Company Limited (IEDCL), POWERGRID, SJVN Ltd. and NEA . The estimated cost of India portion is NR 3880 Mn(≈INR 2425Mn) and debt funding of NRs 3313

Mn (≈ INRs2070Mn) is tied through Power Finance Corporation of India Ltd. Contracts for EPC for both Nepal & India Portions were awarded to M/s TATA Projects Limited and M/s KEC International Limited respectively following the International Competitive Bidding process undertaken by POWERGRID as Consultant.The 42.1 km long section of Dhalkebar-Mujaffarpur 400kV double circuit Transmission Line lying within the Nepalese territory was successfully constructed by PTCNandinitially charged at 132kV voltage level under contingency arrangement in 19th Feb, 2017.

NEA is presently drawing up to 145 MW of power from India through this line. Import of power through this cross border Transmission line has been major backbone in reducing the load shedding in Nepal. Upon the completion of the 220 kV substation at Dhalkebar, this line is expected to be charged at 220kV by Aug 2018, Nepal would be able to draw around 270 MW of power through this line from India.

TAMAKOSHI JALVIDHYUT COMPANY LIMITED

Tamakoshi JalVidhyut Company Limited was established on Falgun 20,2073 as a subsidiary company of Nepal Electricity Authority to implement Tamakoshi V Hydroelectric Project.

Adit Tunnel to Interconnection

Generation license of the project was obtained from Department of Electricity Department (DOED) with revised license area on 2074/02/09 and Environment Impact Assessment (EIA) of the project has already been approved by Ministry of Population and Environment. Tamakoshi Jalvidyut Company Limited has been registered from Company Registration Office for development of Tamakoshi V HEP in a company model. Generation License of Tamakoshi V was transferred from NEA to Tamakoshi Jalvidyut Company Limited on 2074/09/05

Tamakoshi-V Hydroelectric Project

Tamakoshi V Hydroelectric Project is a cascade development of the Upper Tamakoshi Hydroelectric project(UTHEP) with tandem operation.The project area is located approximately 170 km north east of Kathmanduand approximately 40 km away from the district head-quarter of Dolkha District-Charikot Bazaar. The road connecting Singate Bazaar and Lamabagar for the construction of UTHEP passes through both powerhouse and headwork sites of this project.Feasibility study of the project was carried out by NEA in fiscal year 2010/11.The project being a cascade development to UTHEP,it does not require separate headwork. It takes necessary design discharge from the tailrace of the Upper Tamakoshi Project through an underground interconnection arrangement and conveys to headrace tunnel of this Project. An underground powerhouse is proposed at Suri Dovan.

The design discharge of the project is 66m3/sec and has installed capacity of 99.8 MW. Although an installed capacity of the project is 99.8 MW ,the maximum generating capacity of the project is only 96 MW. An additional 3.8 MW E/M equipment is installed to utilize minimum flows coming through the Upper Tamakoshi powerhouse during the off-peak operation hours. Hence, the 3.8 MW equipment will be operational for about 18 hours a day during 6 dry months).

Test Adit Construction

The general arrangement of the project comprises of underground interconnection system 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 at the pressurized head race tunnel entrance, spillway and spillway tunnel. The water from tailrace of Upper Tamakoshi HEP is diverted through an interconnection system and conveyed to the 8.16Km long concrete lined headrace tunnel, a 138.76 m high drop shaft, 74.37 m long pressure tunnel, 445 m long tailrace tunnel, and underground powerhouse containing four Francis turbines, from where it is released into the Tamakoshi river at about 0.7 km downstream from the confluence of Tamakoshi River and Khari Khola at Suri Dovan.

For the speedy implementation of Tamakoshi V, NEA has already initiated the construction of Interconnection system between Upper Tamakoshi tailrace tunnel and headrace tunnel of Tamakoshi V through UTHEP using the Contractor working for the UTHEP with the arrangement of work variation of UTHEP.Construction of Interconnection Tunnel, Chamber and Gate Shaft has been completed whereas the construction of Adit Tunnel is ongoing and will be completed soon.

The Detailed Engineering Design and Tender Document Preparation work for the project is being carried out by consultant Lahmeyer International GmbH.Detailed Engineering Design and Tender Document Preparations are in the final stage of its completion. As a part of Geotechnical investigation task for Detailed Engineering Design, Test Adit excavation was mobilized on 18thApril, 2018with the first blast on 4th May, 2018.The total Test Adit excavation progress as upto 11th July, 2018 is 146.80 m out of total 170m Test Adit length.

Land required for the powerhouse and interconnection area has been identified and necessary land acquisition process through District Administration Office, Dolkha has been completed. Total amount required for the land acquisition has been transferred by NEA to the District Administration Office for distribution to the locals.Beside this, preparatory works for Construction supervision and project construction of Tamakoshi V Hydroelectric project; Expression of interest (EOI) document along with Prequalification of Bidderdocuments [Contract 1-Civil and Hydro-mechanical works and Contract-2 Electro-mechanical works] are being prepared.

Negotiation and correspondences with various National and International Financing Agencies for Project Financing are being carried out and the project intends to finalize its funding soon.

CENTRAL ACTIVITIES

INTERNAL AUDIT DEPARTMENT

The Internal Audit Department, guided by the Audit Committee and headed by the Director is responsible for the planning, conducting 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. Additionally, department is also responsible for settlement of audit irregularities and non-compliances mentioned in audit report as well as submitting the report after rechecking and rectifying the audit irregularities and non-compliance issues of every budget centers.

Audit Committee

As per international practices, and to provide independency to the internal audit system as well as to improve 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 sectorial experts. The committee is responsible for reviewing the accounts, financial statements and reports of final audit and conducting internal audit functions. The department holds regular meetings and interactions with audit committee for their directions on matters related to audit.

The division-wise summary of the audits performed during FY 2017/18 are given below in brief:

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. "Annual Financial Audit FY 2016/17" of 167 budget centers was completed during FY 2017/18, and the annual audit report was submitted. "Half Yearly Financial Audit FY 2017/18" was also carried out during FY 2017/18. Total of 227 out of 261 budget centers were covered for "Half Yearly Financial Audit FY 2017/18".

Technical Audit

The technical audit covers the audit of technical norms and standards, energy balance, preventive as well as breakdown maintenance, condition monitoring and electricity loss as per the guidelines available. The division also carried out technical audits of 51 out of 50 targeted budget centers during FY 2017/18. A vehicle audit under technical audit division has conducted vehicle audit of 52 offices in the FY 2017/18 which was in excess of the initial target of 40.

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. The division also carried out management audit of 86 offices out of 83 targeted budget centers including Regional and Directorate offices during FY 2017/18.

Challenges

The main hurdle faced by the Internal Audit Department is the shortage of manpower, both qualitatively and quantitatively. There must be some kind of incentive and trainings to the auditors, as a motivational factor, to attract and retain good auditors thereby increasing the overall effectiveness of the internal controls of NEA.

NEA BOARD MATTERS

The Secretary at the then Ministry of Energy has been chairing the NEA Board Meetings since 10th Poush, 2072. The Ministry has been renamed Ministry of Energy, Water Resources and Irrigation. Mr Anup Kumar Upadhyay took over as the Chairman of NEA Board of Directors after his appointment as the Secretary at the Ministry of Energy. He has been chairing the meetings of NEA Board of Directors since 28th Bhadra, 2073.

The Secretary at the Ministry of Finance is also a nominated Board of Director of NEA. The last one year saw three different Secretaries taking office at the Ministry of Finance. Dr. Shanta Raj Subedi was the Board of Director till 28th Bhadra, 2074 (760th Board Meeting). Mr Shanker Prasad Adhikari held it from 9th Kartik, 2074 (761st Board Meeting) to 19th Chaitra, 2074 (767th Board Meeting). From 31st Baisakh, 2075 (768th Board Meeting) Dr. Rajan Khanal, as the Secretary at the Ministry of Finance, is the NEA Board of Director. The Ministry of Finance has nominated Mr. Sashi Kumar Dhungana, Secretary (Revenue) as the Board of Director of NEA in place of the Secretary (Finance) by the decision taken on 32nd Ashad, 2075. The rest of the Board of Directors have remained unchanged; Mr. Chandra Tandon, Mr. Bhakta Bahadur Pun, Mr Chet Raj Joshi and Mr, Umesh Kumar Thani are the other Board of Directors with Mr Kul Man Ghising, MD, NEA as the Member Secretary.

A total of 16 Board Meetings (758th to 773rd) were held in the last fiscal year, 2074/075. Important decisions relating to and for the benefit of NEA were taken. Some of the more significant decisions taken and under review are;

- Approval of Net Metering Procedure, which has since started implementation.
- The Grid Solar rate has been reviewed and approved.
- The Financial Bylaws (Modification 2068) were modified.
- The Employees Services Bylaws is under review.
- Mode of Power Purchase Agreement (PPA), namely “take or pay” and “take and pay” are also under the Boards’ review.

ENERGY EFFICIENT AND LOSS REDUCTION DEPARTMENT

This department was established in 2073. The aim of this department is to carry out the work related to energy efficient activities likereplacement of energy efficient appliances, smart street light, energy storage system etc. The department also looks about the system loss, electricity theft and other etc. The department controls the activities done by the two divisions.

A. Energy Efficiency Division

1. Current Ongoing Program and Projects

1.1 Automatic Power Factor Controller Installation in distribution transformers for loss reduction Project.

The project aims to reduce the distribution loss by providing reactive power to the consumer from the end of distribution transformers. Currently, it is targeted to response the consumers connected from NEA owned distribution transformers in major cities of Nepal. For the first phase, the overloaded and high capacity transformed will be connected with APFC panel. Later, it is targeted

to install APFC panel to all industrial, commercial and water pump consumers with a proper plan and program.

The department is also working with large and medium scale industries to install APFC panel this year.

1.2 Smart Street Light Programs

Currently, the program is going in cooperation with Lalitpur Municipality. This concept is very new in Nepal. The street light under this program will be operated by AC current and feeded by NEA distribution line. The entire light fixture will have own individual Internet Protocol Address. They will be controlled by central server.

The project will continue in other municipalities this year.

1.3 Online Data Monitoring System of NEA Substations

The first phase of the project is completed in last fiscal year. Actually, it is the web based data processing and presenting tool that provided from substations. It aims to change the current paper based data keeping and monitoring system by digital technology. The web based program can analyze and present these data to user friendly version like graph, chart etc. These real time data updated by substation people will save in central server of NEA. It will compare history of power inflow and outflow, substation loss, peak load of the feeders etc. It will help for future plan of the substations.

1.3 GIS based Asset Mapping and Consumer Indexing in Distribution Feeders program

The project is already started via two distribution feeders in Kathmandu and Pokhara. The project aims to reach each and individual consumers with a unique digital indexing. The program also provide unique index to every substations, transformers and pole so that it would help to find the feeder loss and ease the consumer service practices.

1.4 Energy Efficiently Appliances promotion Program

The energy efficient equipment's like pumps, fans, bulbs etc. will be promoted in close cooperation with the manufacturer and suppliers.

2. Proposed Programs and projects for this fiscal year

2.1 Grid Tie Energy Efficient Solar Water Pumping and Irrigation Project

The project aims to provide sustainable solution to the farmers suffering from low voltage in water pumping. It will also provide a scheme to the existing solar water pumping projects to sell the surplus electricity to grid in Net Metering Scheme. The projects will also cover the existing AC pumps in irrigation to be replaced by efficient pumps with grid tie provision.

2.2 Energy Storage and Rural Electrification Enhancement Program

The division is working in the cutting edge technology which store energy at off peak hour in bulk amount and it could be supplied to the consumers in peak hours. The prefeasibility is already done for two existing NEA Micro Hydro (Kalikot and Bajura). The project will execute this year.

1.3 Grid Tied Energy Storage System

The Program aims to do a prototype project to see the impact of energy storage system in Integrated Nepalese Power System.

1.4 Electric Charging Stations and EV promotion Program

The Program aims to find out the proper place to install electric charging stations in various parts

of country especially the boost charging stations in national highways.

1.5 Public Campaigning on Energy Efficiency Program

The program aims to do various activities in national level to increase the awareness in energy efficiency and demand side activities.

3. Nepal Energy Efficiency Program (NEEP III)

Nepal Energy Efficiency Programme (NEEP) is being implemented to promote and realize energy efficiency in Nepal since 2010. The Nepali-German programme NEEP is implemented by the Ministry of Energy, Government of Nepal with technical assistance provided by the Deutsche GesellschaftfürInternationaleZusammenarbeit (GIZ), acting on behalf of the German Federal Ministry for Economic Cooperation and Development (BMZ). After completing its second phase in June 2014, NEEP continues to support improving the efficiency use of energy in Nepal in its third phase from December 2018 to June 2022. The programme assists with the introduction of market based energy efficiency services for the private and public sector. NEA is the major partner organization to implement the NEEP III program. NEEP-III program will help the energy efficiency and loss reduction departmetn to collect the financial and technical resources as the need of NEA.

B.LOSS REDUCTION DIVISION

Loss & Leakage Control Activities:

The Loss Reduction Division led by Manager is entrusted with the responsibility to control the electricity theft, energy leakage and loss. Division has been conducting activities that involves inspection of energy meters and responsible for conducting field raid operation as and when required.Division is dedicated towards supporting additional revenue generation by controlling electricity theft, pilferage, tampering, demand leakage, CT/PT outage,loss due to oversized transformers in LT consumers, wrong MF calculation, and wrong connection.

Target of Loss Reduction Division of FY 2074-075:

In the fiscal year2074/075,Division had set target to inspect 450 consumers with TOD meter installed and 1000 consumers with whole current meter installed under different Regional offices and thereby recovering 15,00,000 units. The focus has been given to Industrial Consumers. Division has also set target for monitoring, inspection and data download of rural community consumers.Beside the annual target, Division has also conducted activities as directed by Managing Director,NEA,as and when required. Division has also aimed at the control of stock units, theft, demand leakage and pilferage in energy meters.

Three phase meter hooking arrangement found

Major Activities and Achievements of FY 2074-075: TOD meter:

This year Division has performed its monitoring and inspection activities to the consumers of 42 different Distribution Centers of Distribution and Consumer Services Directorate of NEA. This year around 470 TOD meters have been inspected, out of which31% were found with remarks. The major Remarks found during inspection were Reverse unit, C.T./P.T outage, wrong MF calculation,

Burned Meter of Community Consumer

Display outage of meter andPilferage of energy meter.In few consumers, demand leakage, burnt meter,un-metered, and direct tapping in community consumers werealso observed. Amongthe TOD meters inspected,35 were found with either CT/ PT outage, 5 meters were found either CT / PT wrong connection, 1 meter was found in Stop Mode, 5 meters had display outage, 10 had without meter, 1 meter found burnt,4consumers were observed having billed with incorrect multiplying factor. The total units is in billing process by concerned Distribution Centre are around 1760339unit amounting rupees 1,55,68,389.00 . Furthermore, totalunits of five TOD meters which are found with outage, wrong MF billed and stop mode are remained to calculate by concerned Distribution Centers which are not included in the above calculation.

Whole Current Meter:

A total of 1058Whole current meters were inspected this year, 9.5% of which were found with remarks. The major remarks found among the inspected meters were demand leakage due to oversized fuse/ MCB / No MCB installed at all, Pilferage of meter, stock units, clogged/stopped meter, meter burnt etc.

In this year the Division has recovered 1,35,681 units from pilferage amounting Rs.29,30,050.00, From demand leakage Rs. 3,62,111.00 and from stock units 1,78,255.

This year following units are recommended for billing by the Division to concerned Regional Offices and Distribution Centrs.

Monitoring and data collection:

The loss reduction division is also regularly monitor the loss reduction and revenue collection activities of distribution centers and regional offices as well by collecting the activity data weekly and monthly basis and verify if with its set target figure of the loss of concerned distribution centers and regional offices.

S.N.	Regional Office	Number of Whole Current Meter inspected	Number of TOD meter inspected	Approximate Units to be billed (Reverse,Outage,Stock and Pilferage)	Approximate amount to be billed (Rs.	Remarks
1	Biratnagar	159	98	25113	225959	1- Outage. 2-Theft, 3-Reverse, 2-Stock unit.
2	Janakpur	246	56	129193	1563647	28-Theft, 4-Outage, 19-Stock unit, 2- Stop, 3- Hooking, 9-Reverse,
3	Hetauda	119	69	114634	1773267	9-Theft ,4 -Outage . 1-Stop Mode, 6-Stock unit, 23-Reverse, 1-CT/PT wrong connection, 2-Display out.
4	Kathmandu	236	30	180488	1071039	2-Theft ,1-CT/PT wrong connection , 11-Stock unit, 6-Reverse,
5	Pokhara	187	77	966727	5212858	20-Outage, 1- Stop, 25-Reverse, 1-CT/PT wrong connection,1-Meter Burnt,3-Display out, 10- without meters.
6	Butwal	56	76	102049	3149256	3-Theft , 3- Burnt,2-Wrong MF calculation, 8-Reverse,3-Stock unit, 3-Meter burnt ,1-CT/PT wrong connection.
7	Nepalgunj	0	41	538684	5725204	4-Outage , 4-Reverse, 1-CT/PT wrong connection
8	Attariya	55	23	17387	139320	1-Theft, 10-Stock unit, 1- Outage not quantified, 9-Reverse,2- transformer loss not taken in to bill.
Total		**1058**	**470**	**20,74,275**	**1,88,60,550**	

ADMINISTRATION DIRECTORATE

Administration Directorate headed by Deputy Managing Director is entrusted with planning, organizing, directing, implementing &monitoring of polices related to human resource management and general administrative works as logistic support, property management, public relations enhancement, legal services etc. This wing is responsible to ensure the productivity of human resource, general administrative works, implementation of the decision of NEA board and Managing Director, public service delivery and coordination of different directorate activities. It also coordinates to conduct the periodic office and management survey (O&M), oversight agencies directions and other government agencies in relation to administrative activities of NEA.This directorate is supported by four departments namely Human Resource Department, General Services Department, Legal Department and Recruitment Department.

HUMAN RESOURCE DEPARTMENT

Human Resource Department is responsible for planning, organizing, directing and controlling of policies related to human resource management which consists of job analysis, placement, transfer, training and development, staff welfare, disciplinary actions etc.

NEA has approved and implemented "Service Contract Procedure 2074" by which all employees of level 1, 2 and level 3 drivers will outsource from service contract basis for effective performance.

"Internship Procedure" has also approved and implemented. This procedure will be helpful to fulfill the gap between approve position and actual working of employees as well as on the job training and sharing of new knowledge, skill and expertise of outsiders. The enthusiastic candidate can apply for internship which make them sharper to enhance their professional career.

In the year under review the specific job description for administrative chief has been approved and implemented.

To track and update the day to day performance of each employee, HRD is going to deploy "Centralized E-Attendance" very shortly to the entire offices of NEA.

The manpower planning has to review frequently for further expansion and proficient work by offices. For this purpose NEA Management formed a committee "Office and Management Survey (O&M)", the committee report will shortly be submitted the draft report to NEA management.

NEA Board formed a committee to review the existing employee bylaws of "NEA Employee Service Bylaws 2062". The committee has submitted draft copy of bylaw "NEA Employee Service Bylaws 2075" to NEA board for further proceed.

The total numbers of approved position in NEA stands at 11,142 whereas working staff by the end of F/Y 2017/18 remained 9123. Remaining vacant positions are in the process of recruitment. During the year under review, 431 employees got retirement, this retirement comprises of compulsory retirement of 292,

Employees Status FY 2017/2018

The statistics of employed personnel till the end of fiscal year 2017/18 is given in the table.

Level	Service	Approved Position			Existing situation			
		Regular	Project	Total	Permanent	Periodical	Daily wages / contract	Total
Managing Director		1	0	1	**0**	1	0	**1**
DMD(Level-12)		9	0	9	9	0		9
Officer Level (Level 6-11)	Technical	1248	113	1361	1151	0	0	1151
	Non-tech	582	23	605	559	0	0	559
	Total	1830	136	1966	1710	0	0	1710
Assistant Level (Level 1-5)	Technical	5883	0	5883	4591	22	47	4660
	Non-tech	3284	0	3284	2711	12	21	2744
	Total	9167	0	9167	7302	34	68	7404
Grand Total		**11006**	**136**	**11142**	**9021**	**34**	**68**	**9123**

voluntary retirements of 53, resignation of 51 and 35 employees have died during their service period.

Under disciplinary action 5 employees were warned, 3 were dismissed from service, 12 were suspended, 2 employees suspended were resumed, 3 were terminated from services and 7 employees were punished in various charges.

Staff welfare loan in the topics of land/house purchase, house maintenance, social events & rituals was given agreed to 3332 employees with amounting to Rs.65,53,08,000. Life insurance scheme of organization benefited 877 employees with amount of Rs. 70,60,78,107.72, 6 employees were granted accidental insurance and 974 got medical facilities amount altogether of Rs. 2,88,17,420.00. In the topics of Kaj Kiriya Anudan, these facilities had been given to 314 employees and 10 employees had been provided addition medical assistance for treatment of chronic diseases.

A Separate authentic email has been created for each offices of NEA through which flow information/notices/circulars/Letters to entire of its branches would be quickly & effectively.

GENERAL SERVICE DEPARTMENT

General Service Department (GSD) deals for vehicle management, logistic support and security management of corporate office; Record keeping, safeguarding of related documents and provides necessary support to concerned offices. It also manages the land of NEA against encroachment and misuse. Department has prepared and implemented the "Scrap Papers Decompose Guidelines" this year. The department is also entrusted with responsibility of events management, publishing regular magazine "Vidyut", public relation and public grievance handing. In the year under review 748 grievances were lodged through toll free number, social media (Facebook, Twitter) SMS and other channels, Out of those, 736 complaints were settled. NEA has 32,170-5-3-2 Ropani land spread all over the country. Similarly NEA has 1114 vehicles in service throughout the country. Of which, 856 are in running condition.

Stakeholders can submit their complaints and give suggestions through various hotline media through toll free number 16600130303,www.facebook.com/hello bidhut and www.twitter.com/hello_nea&can get immediate solutions.

RECRUITMENT DEPARTMENT

Recruitment Department recruits and promotes the employees. The major function of this department is to prepare and update syllabus,

vacancy announcement & application collection as per public service commission's schedule and directions. The written exam is conducted by public service commission but the interview will be conducted by RD. Similarly, it performs staff promotion as per the prevailing employees' service bylaws. During the year in review period, 743 deserving candidates for different level has recommended for permanent services after completing the selection procedure,500 candidates are on the process of selection. Likewise, 623 employees of different levels were recommended for promotion to higher level. Among of them 219 employees were promoted on seniority basis, 280 on performance evaluation basis and 124 were under internal competition.

LEGAL DEPARTMENT

The Legal Department is accountable for legal matters of NEA. It defends all legal cases of NEA in different courts of the country and abroad. It provides legal advice/suggestion to the NEA management as well as involves in arbitration, legal drafting, bid evaluation, investigation, case study and negotiations.

During the year under review, the department provided 110 numbers of legal advices to the NEA Management & its entire organization. Out of 137 cases for and against of NEA registered in different courts, based on the final verdict, 58 verdicts came in favor of NEA and 10 cases were against of NEA, 2 cases were settled by reconciliation and 67 cases are under consideration for courts judgment.

Likewise out of 11 cases registered in arbitration tribunal, 1 verdict came in favor of NEA, 4 cases were against NEA and 6 cases are under consideration for tribunal judgment. In this fiscal year, department is planning to execute the workshop/seminar in different provincial regions to aware and update the applicable acts/rules/ by laws/ guidelines and other legal issues of the decision makers.

FINANCE DIRECTORATE

The Finance Directorate, headed by a Deputy Managing Director (DMD), is responsible for carrying 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, control and monitoring at corporate level of decision-making process. Two functional departments, namely Accounts Department and Corporate Finance Department, are structured to support the finance wing. 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 placed in operation to implement Integrated Financial Management Information System (IFMIS) through Enterprise Resource Planning (ERP).

This year 2017/18 remained another successful year for Nepal Electricity Authority (NEA) in terms of operational and financial performance improvement. The country was facing load shedding due to deficit of power for many years before, is now completely load shedding free including large industry sectors with effect from 14th May, 2018. This was made possible by efficient management of power including demand side management, commissioning of new power plants by Independent Power Producers (IPPs), commissioning of long awaited Chameliya Hydropower plant (30MW) and increase in the quantum of import from 400 KV and 132 KV Cross Boarder transmission link with India on commercial arrangement. The loss reduction activities, which were carried out throughout the year, reduced loss from 22.90% to 20.45% (provisional) during the year. All these elements contributed to increase in the total revenue from NRs. 51,703.11 million in FY 2016/017 to NRs 60,480.67 million in 2017/018 and this resulted in operating surplus of NRs. 7,859.30 million in FY 2017/18.

NEA maintained reasonably progressive year in terms of electricity sales, power supply and financial performance. Energy generation from NEA's hydro power plants recorded 2,308.24 GWh as compared to actual generation of 2,305.17 GWh in previous year 2016/17. During the year, Kaligandaki A, Middle Marshyangdi and Marshyangdi power plants continued operation in their designed generation capacity and contributed higher energy to the integrated power system.

Total energy supplied by IPPs during the year stood 2,167.76 GWh which is higher by 390.52 GWh as compared to previous year 2016/17. Similarly, NEA increased power import from India in order to minimize long prevailed load shedding in the country. Total import from India constituted 2,581.80 GWh which is 18.70 % excess import against the previous year's import of 2,175.04 GWh. NEA succeeded in increasing the total available energy in the distribution system to 7,057.93 GWh by constructing its own power plants and purchasing additional energy from IPPs and India.

NEA's contribution to the total availability of power is reduced to 32.71% as compared to 37% in the previous year. Energy supplied by IPPs and import from India constitutes 30.71% and 36.58% respectively. Out of the total available energy, NEA's billing system measured only 5,557.30 GWh energy as power consumed by the consumers along with our station consumption and rest of the units considered as system losses. During the review period, NEA initiated substantial efforts to minimize leakage by implementing, monitoring and conducting awareness programs which brought positive impact on loss reduction by 2.45 % from 22.90% to 20.45% (provisional).

Domestic consumers continued to be the largest consumer category with 93.83% share of entire consumer base. However, contribution to the gross revenue by domestic consumers stands only 43.50%. On the other side, Industrial consumer category holds only 1.37% of entire consumer volume but contributes 37.53% to the total gross revenue. During the year, NEA's total consumers increased from 3.26 million to 3.55 million including community and bulk buyers.

NEA achieved attractive growth in total sales of electricity figuring to 5,560.24 GWh in FY 2017/18 from 4,776.53 GWh in FY 2016/17. The factors behind this were higher energy availability in the system expansion of electrification and reduction in system losses. Overall growth in gross sales revenue measured 16.41% higher as compared to the previous year sales revenue and individual growth in domestic and industrial consumer category noted 15.98% and 16.92% respectively. NEA reduced rebate rate from 3% to 2% with effective from FY 2017/18. Out of the total gross revenue, NEA allowed NRs. 847.47 million as rebate in order to motivate consumers to pay their electricity bills earlier than given credit period. Additionally, NEA earned NRs. 5,526.05 million from non-core business activities in a form of surcharge, dividend, interest, lease rent and sale of goods and services. During the year, NEA received NRs. 2,777.87 million as interest income on bank deposits, loans and as dividend income from investment in subsidiaries. NEA's total income including income from non-core business activities reached to NRs. 60,480.67 million as compared to NRs. 51,703.11 million in the previous year 2016/17. The growth in the overall income maintained 16.98% as compared to the corresponding year.

NEA's total operating expenses increased from NRs. 44,985.34 million to NRs. 52,621.37 million for the year 2017/18. Major growth in operating expenses experienced under the head of generation expense, power purchase cost, and transmission and distribution expense. Power purchase cost continued to be the largest cost element since long time. NEA paid NRs. 33,817.27 million for power purchase which is 19.36 % higher than the previous year. Similarly, transmission cost increased to NRs. 1,998.93 million from NRs. 1,822.83 million in the previous year with a growth of 9.66%. This includes wheeling charge for power import through Cross Boarder Transmission Line which is NRs 1,040.00 million. NEA increased expenses for strengthening distribution system throughout the country that resulted into increase in distribution costs from NRs. 7,041.57 million to NRs. 7,828.68 million. Other operating expenses included generation, royalty and administration that remained NRs. 1,775.94 million, NRs. 1,351.55 million and NRs. 1,717.41 million respectively.

Interest cost on long term borrowing increased by NRs. 540.24 million during this year. Interest expense for the year calculated as NRs. 4,086.39 million in FY 2017/18 as compared to NRs. 3,546.15 million in corresponding FY 2016/17. Likewise, depreciation expenses on property, plant and equipment resulted into NRs. 4,131.59 million in FY 2017/18 million against NRs. 3,755.22 million in last financial year. NEA recorded foreign exchange translation loss of NRs. 26.27 million in FY 2017/18 due to fluctuation

of Japanese Yen vis-a-vis Nepali Rupees for the loan taken on Kulekhani Disaster Prevention Project. NEA estimated provision of NRs. 2,500 million towards long term employee liabilities with respect to gratuity, pension, medical facilities and accumulated leave facilities under employees' benefit plan scheme.

NEA experienced continuous improvement in its operating performance as compared to last financial year. Net profit for the year maintained at NRs. 1,010.20 million from NRs. 1,512.22 million in FY 2016/17. Reduction in system losses, power import at lower rate and continuous supply of power all contributed to achieve net profits for the year under review. NEA's accumulated losses still appears to be NRs. 27,157.92 million.

The total trade receivables including dues from government offices and local bodies remained NRs. 14,361.18 million at the end of the financial year. Total receivables increased by NRs. 775.32 million as compared to previous year due to the non-recovery of government dues and significant increase in sales revenue. As per decision of Council of Ministers, GoN, on Financial Restructuring Plan of NEA, dues of GoN offices and street lights till the end of financial year 2016/17 shall be settled by concerned line ministry upon the verification which is still under process of settlement.

Property, plant and equipment (PPE) constitute the largest component of NEA's return generating assets. Net carrying amount of PPE reached to NRs. 109,631.40 million at the end of the FY 2017/18. During the year, NEA completed various distribution system reinforcement, rural area electrification projects and Chameliya Hydroelectric Project which contributed an additional net capitalization of NRs. 19,290.20 million in property, plant, and equipment.

During the review period, NEA invested significant amount of resources in various projects relating to generation, transmission and distribution. Total investment in capital works in progress reached to NRs. 92,820.07 million with net addition of NRs. 12,547.74 million for the year 2017/18. The sources of investment included government equity and loan, foreign loan and grants and NEA's internal cash generation. However, returns on investment on those assets are not being obtained due to considerable delays in project completion schedule. The major investment is in hydroelectricity projects, namely Kulekhani III (14 MW), Trishuli 3A (60 MW), transmission line projects of different voltage level and rural electrifications in the various parts of the country.

Investment in subsidiaries, associates, joint ventures and others reached NRs. 28,565.72 million in the year 2017/18. During the year, NEA increased its investment in subsidiaries and other companies by NRs. 2,720.36 million. NEA holds 51% of equity investment at a cost of NRs. 489.60 million in Chilime Hydro Power Company Limited (CHPCL), a subsidiary company of NEA. NEA, being the promoter of three under construction generation projects with CHPL holds direct equity investment ranging from 10% to 18%. During the year, Total equity investment in Middle Bhotekoshi, Sanjen and Rasuwagadi reached to NRs. 600 million, NRs. 378.14 million and NRs. 1,231.58 million respectively.

During the year, NEA received NRs. 153.86 million, NRs. 3.82 million, NRs. 10.00 million and NRs. 41.5.00 million as net cash dividend from CHPCL, Butwal Power Company Ltd., Cross Boarder Power Transmission Co. Ltd. and Power Transmission Company Nepal Ltd. respectively. Further NEA received 35% Bonus share from Transmission Company Nepal Ltd. in FY 2017/18. NEA holds 41% interest in equity share capital in Upper Tamakoshi Hydro Power Co. Ltd. At the end of the FY 2017/18, total investment in Upper Tamakoshi Hydro Power Company Limited reached NRs. 4,341.90 million as equity and NRs. 14,535.70 million as long-term loan.

NEA adopted company model to develop its existing projects and formed 12 companies in Company Registrar Office. Newly registered companies included Upper Arun Hydro Electric Co. Ltd., Tamakoshi Jalabidhyut Co. Ltd., Dudhkoshi Jalabidhyut Co. Ltd., Modi Jalabidhyut Co. Ltd., NEA Engineering Co. Ltd., Nepal Power Trading Co. Ltd., Raghugunga Hydropower Co. Ltd., Uttargunga Power Co. Ltd., Tamor Power Co. Ltd., Aandhikhola Power Co. Ltd., Tower and Pole Production and Transformer Production Comapny. These newly incorporated companies require significant investment in the form of equity and loan in the succeeding financial years.

During the year, NEA invested in these newly formed companies NRs. 140.00 million in Electricity Generation Co. Ltd., NRs. 50.00 million in Betan Karnali Sanchayakarta Hydropower Co. Ltd., NRs. 43.35 million in NEA Engineering Co. Ltd., NRs. 11.00 million in Tamor Power Co. Ltd., NRs. 11.00 million in Aadhikhola Power Co. Ltd., NRs. 11.00 million in Upper Arun Hydroelectric Co. Ltd., NRs. 11.00 million in Tamakoshi Jalbidyut Co. Ltd., NRs. 11.00 million in Dudhkoshi Jalbidyut Co. Ltd., NRs. 11.00 million in Modi Jalbidyut Co. Ltd., NRs. 11.00 million in Uttar Ganga Power Co. Ltd., NRs. 20.00 million in National Transmission Grid Co. Ltd and NRs. 244.00 million in Raghuganga Hydropower Co. Ltd. Similarly, NEA invested NRs. 155.01 million in Trishuli Hydro Power Co. Ltd., NRs. 140 million in Tanahu Hydro Company Ltd during the year FY 2017/18 and NRs. 78.21 million in Cross Border Power Transmission Company Ltd.

Further, NEA maintained share investment NRs. 225.00 million including bonus share and loan investment of NRs. 922.99 million in Power Transmission Company Nepal Ltd. at the end of FY 2017/18 and holds rest of the investments in various subsidiaries and associate companies.

At the end of the financial year, total long-term borrowings from GoN, the main source of project financing, reached to NRs. 121,253.39 million from NRs. 110,681.69 million in FY 2017/18. NEA received NRs. 2,328.00 million as long-term loan from GoN internal source to invest in different projects relating to generation. Likewise, donor agencies provided around NRs. 9,000 million as long-term loans through direct payment to the consultant and contractors in the FY 2017/18. In addition to this, GoN also provided NRs. 21,361.89 million as equity investment in NEA.

NEA repaid NRs. 1,019.01 million against long term loan to the GoN. During the year, NEA contributed NRs. 1,351.55 million towards royalties and paid NRs. 2,981.00 million as interest on long term loan 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). During the year, NEA could not achieve required financial performance to meet loan covenants set by the funding agencies.

Office of the Auditor General has appointed Mr. Anup Kumar Shrestha, Mr. Gyanendra Bahadur Bhari and Mr. Hem Kumar Kafle, Fellow Chartered Accountants, to carry out statutory audit for the financial year 2017/18. The auditors have commenced their audit procedures by attending physical verification and submitting audit-planning memorandum. Mr. Nanda Kishore Sharma, Mr. Gyanendra Bahadur Bhari and Mr. Hem Kumar Kafle, Fellow Chartered Accountants jointly completed the statutory audit for the year 2016/17 and the audit report was issued by the Office of the Auditor General in April 11, 2018.

Large Tax Payer's Office has concluded final income tax assessment up to the FY 2013/14. NEA has deposited Rs. 1,611.36 million till the end of FY 2016/17 as advance tax, which is yet

to be settled by Large Tax Payer's Office. NEA expects to settle long pending audit qualifications of NRs 1.10 million which is being brought since FY 1993/94. NEA Board periodically reviews the audit qualifications and instructs the management to settle by complying applicable rules and procedures. Management is in a process of resolving policy related audit qualifications by implementing time bound action plan.

NEA is in a process of strengthening financial accounting and management decision support system. Currently, centralisation of computerised accouting & inventory system (CAIS) and Payroll system is completed. It plans to introduce 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, accounting and internal control system. Consultation with World Bank is in progress to finalize the bid documents for ERP system.

The ERP system being procured consists of Financial Management Module, Material Management Module, Fixed Assets Module, Payroll Module, Project Accounting Module and Human Resource Management Module under Integrated Financial Management Information System (IFMIS) and Billing and Collection Module and Energy Audit Module under Revenue Management System (RMS). The scope of the project includes the Supply and Installation of Hardware & Software for Data Centre and Backup Site. After the completion of the procurement process, the customization of ERP software will be done and piloting of the system will be carried out in NEA offices from different directorates. The piloting of IFMIS and RMS modules will be carried out separately. After the successful completion of piloting, the system will be rolled out in all of the NEA offices.

Implementation of Nepal Financial Reporting Standards (NFRS) is a mandatory obligation from fiscal year 2016/17 for public sector entities. During the year, 6 professional firms through competitive national bidding process to implement NFRS in NEA had submitted Request for Proposal (RFP) which is under evaluation. NEA expects to prepare NFRS complied financial statements with effective from FY 2018/19 for the first time.

Nepal Electricity Authority

Highlights of FY 2017/18

Description	FY 2018*	FY 2017	Increase/(Decrease)	
			Amount	%
Revenue				
Net Sales Revenue of Electricity (M.NRs.)	54,954.62	46,795.78	8,158.84	17.43
Income from other Services (M.NRs.)	5,526.05	4,907.33	618.72	12.61
Total Revenue (M. NRs.)	**60,480.67**	**51,703.11**	8,777.56	16.98
Operating Expenses				
Generation Expenses (M. NRs.)	1,775.94	1,463.94	312.00	21.31
Power Purchase (M. NRs.)	33,817.27	28,332.84	5,484.43	19.36
Royalty (M. NRs.)	1,351.55	967.37	384.18	39.71
Transmission Expenses (M. NRs.)	1,998.93	1,822.83	176.10	9.66
Distribution Expenses (M. NRs.)	7,828.68	7,041.57	787.12	11.18
Administrative Expenses (M. NRs.)	1,717.41	1,601.57	115.84	7.23
Depreciation (M. NRs.)	4,131.59	3,755.22	376.36	10.02
Total Operating Expenses (M. NRs.)	**52,621.37**	**44,985.34**	7,636.03	16.97
Operating Surplus (M. NRs.)	**7,859.30**	**6,717.77**	1,141.53	16.99
Interest on Long-Term Loans (M. NRs.)	4,086.39	3,546.15	540.24	15.23
Foreign exchange translation losses/(Gain) (M. NRs.)	262.71	(410.70)	673.41	(163.97)
Provision for Employee Benefits (M. NRs.)	2,500.00	2,050.00	450.00	21.95
Provisions for Employees' Bonus (M. NRs.)	-	30.05	(30.05)	(100.00)
Net Income/(Loss) (M. NRs.)	**1,010.21**	**1,502.28**	(492.07)	(32.75)
Long-Term Loans (M. NRs.)	121,253.39	110,681.69	10,571.70	9.55
Net Property, Plant & Equipment (M. NRs.)	109,631.40	90,341.20	19,290.20	21.35
Number of Consumers	**3,551,226**	**3,257,814**	293,412	9.01
Total Sales of Electricity (GWh)	**5,560.24**	**4,776.53**	783.71	16.41
Internal Sold/Utilized (GWh)	5,557.30	4,773.84	783.46	16.41
Annual Average Consumer's Consumption (kWh)**	1,565.72	1,466.18	99.55	6.79
Average Price of Electricity (NRs./kWh)	10.04	10.00	0.04	0.37
Peak Load Demand (MW)	1,508.16	1,444.10	64.06	4.44
Total Available Energy (GWh)	**7,057.93**	**6,257.73**	800.20	12.79
NEA Hydro Generation (GWh)	2,308.24	2,305.17	3.07	0.13
Thermal Generation (GWh)	0.13	0.28	(0.15)	(52.73)
Purchased Energy (GWh) - India	2,581.80	2,175.04	406.76	18.70
- Nepal (IPPs)	2,167.76	1,777.24	390.52	21.97
Average Power Purchase Rate (NRs./kWh)***	7.12	7.17	(0.05)	(0.68)
Exported Energy (GWh)	2.94	2.69	0.25	9.29
Self Consumption (GWh)	54.35	48.19	6.16	12.78
Net System Losses (Percentage)	20.45	22.90	(2.45)	(10.70)

Note: *Provisional figures,
**On internal sales
***On total purchase

Nepal Electricity Authority

Statement of Financial Position as at July 16, 2018

(NRs. in million)

Particulars	2018*	2017	2016	2015	2014	2013	2012	2011	2010	2009
Assets										
Non Current Assets										
Property, Plant & Equipment	109,631.40	90,341.20	88,521.09	86,439.05	84,238.72	83,873.47	85,460.71	84,725.47	83,105.63	81,238.50
Capital Work in Progress	92,820.07	80,272.33	66,684.09	58,052.39	46,993.93	39,843.17	29,905.45	22,832.03	17,040.47	13,550.46
Investments	28,565.72	25,845.37	21,755.05	17,550.91	12,288.26	6,807.56	5,049.17	4,855.07	3,445.74	2,501.14
Total Non-Current Assets	**231,017.19**	**196,458.89**	**176,960.24**	**162,042.34**	**143,520.91**	**130,524.20**	**120,415.33**	**112,412.57**	**103,591.84**	**97,290.10**
Current Assets										
Inventories	5,096.54	4,217.99	3,376.41	3,169.78	2,859.44	3,043.02	3,033.83	2,502.93	2,431.99	2,159.12
Trade and other Receivables	14,361.18	13,585.86	11,186.84	9,927.45	9,015.61	7,930.03	6,693.17	6,871.19	6,097.74	4,854.02
Cash and Cash Equivalents	26,849.06	24,823.79	15,361.60	10,621.60	6,121.57	4,714.98	2,697.48	2,016.58	1,244.65	1,724.76
Prepaid, Loans & Advances and Deposits	7,328.42	5,875.85	3,804.28	3,782.99	3,644.70	3,300.57	4,222.65	2,976.82	4,585.60	2,495.13
Total Current Assets	**53,635.21**	**48,503.49**	**33,729.14**	**27,501.82**	**21,641.33**	**18,988.60**	**16,647.13**	**14,367.52**	**14,359.98**	**11,233.03**
Total Assets	**284,652.40**	**244,962.38**	**210,689.37**	**189,544.17**	**165,162.24**	**149,512.80**	**137,062.46**	**126,780.09**	**117,951.82**	**108,523.13**
Equity and Liabilities										
Capital and Reserves										
Share Capital	103,773.14	82,411.25	58,527.86	49,275.07	44,510.75	37,364.90	31,422.44	25,694.81	38,651.77	33,659.46
Reserves and Accumulated Profits										
Reserve	1,833.28	1,833.28	2,089.24	2,021.87	1,908.53	1,721.41	1,706.03	1,677.55	1,631.30	1,497.85
Accumulated Profits (Loss)	(27,157.92)	(28,168.13)	(34,608.47)	(25,751.42)	(20,238.58)	(13,238.16)	(9,866.97)	0.00	(21,022.36)	(14,098.83)
Total Equity	**78,448.50**	**56,076.41**	**26,008.62**	**25,545.52**	**26,180.69**	**25,848.15**	**23,261.50**	**27,372.36**	**19,260.71**	**21,058.48**
Non-Current Liabilities										
Borrowings	121,253.39	110,681.69	111,303.64	98,253.08	82,691.67	75,034.89	68,909.20	62,631.85	58,231.66	53,788.45
Deferred Tax	693.20	693.20	693.20	693.20	693.20	693.20	693.20	693.20	693.20	693.20
Total Non-Current Liabilities	**121,946.59**	**111,374.89**	**111,996.85**	**98,946.28**	**83,384.87**	**75,728.09**	**69,602.40**	**63,325.05**	**58,924.86**	**54,481.65**
Current Liabilities										
Borrowings	-	-	-	-	700.00	1,200.00	3,500.00	790.00	1,280.00	250.00
Sundry Creditors and Other Payables	58,331.50	54,085.28	51,324.45	45,742.90	37,637.22	33,019.22	29,137.09	27,825.95	32,909.45	29,402.22
Provisions	25,925.81	23,425.81	21,359.45	19,309.45	17,259.45	13,717.34	11,561.47	7,466.73	5,576.80	3,330.78
Total Current Liabilities	**84,257.31**	**77,511.09**	**72,683.90**	**65,052.36**	**55,596.67**	**47,936.56**	**44,198.56**	**36,082.68**	**39,766.25**	**32,983.00**
Total Liabilities	**206,203.90**	**188,885.98**	**184,680.75**	**163,998.64**	**138,981.55**	**123,664.65**	**113,800.96**	**99,407.73**	**98,691.11**	**87,464.65**
Total Equity and Liabilities	**284,652.40**	**244,962.38**	**210,689.37**	**189,544.17**	**165,162.24**	**149,512.80**	**137,062.46**	**126,780.09**	**117,951.82**	**108,523.13**

Note:- *Provisional figures

Nepal Electricity Authority

Income Statement for the year ended July 16, 2018

(NRs. in million)

Particulars	2018*	2017	2016	2015	2014	2013	2012	2011	2010	2009
Net Sales Revenue	54,954.62	46,795.78	**31,824.21**	**30,168.77**	**28,205.70**	**25,354.62**	**20,088.64**	**17,946.82**	**17,164.60**	**14,405.93**
Cost of Sales										
Generation	1,775.94	1,463.94	1,333.13	1,383.95	1,886.51	1,604.31	1,147.69	929.56	1,541.27	1,119.71
Power Purchase	33,817.27	28,332.84	22,332.39	19,210.19	17,041.53	13,572.46	11,948.41	10,493.74	9,746.57	7,691.28
Royalty	1,351.55	967.37	883.13	892.46	888.67	890.49	941.60	854.76	849.77	796.12
Transmission	1,998.93	1,822.83	1,094.58	579.63	519.45	416.74	421.38	345.96	337.73	328.16
Gross profit	**16,010.93**	**14,208.80**	**6,180.97**	**8,102.54**	**7,869.54**	**8,870.62**	**5,629.56**	**5,322.80**	**4,689.26**	**4,470.66**
Other Income	5,526.05	4,907.33	3,249.33	3,116.26	2,156.90	1,868.37	1,695.42	1,382.94	1,188.27	1,601.67
Distribution Expenses	7,828.68	7,041.57	5,671.35	5,341.48	4,575.15	4,087.97	3,685.15	3,004.18	3,091.21	2,575.09
Administrative Expenses	1,717.41	1,601.57	1,218.58	1,339.02	1,239.19	1,327.50	973.38	866.74	789.52	651.69
Interest Expenses	4,086.39	3,546.15	5,079.73	4,670.21	4,234.51	4,039.65	3,885.49	3,594.01	3,668.65	2,492.55
Depreciation	4,131.59	3,755.22	3,554.36	3,471.02	3,296.62	3,228.68	3,175.80	3,031.33	2,902.92	2,361.20
Loss (Gain) on Foreign Exchange	262.71	(410.70)	746.48	(523.17)	(52.77)	(652.14)	896.57	85.01	28.67	813.96
Provisions & write offs	-	-	-	-	-	-	(549.79)	(323.68)	(112.36)	(959.68)
Provision under Employees' Benefits Plan	2,500.00	2,050.00	2,050.00	2,050.00	3,542.11	2,112.74	4,106.68	1,890.01	2,246.02	1,246.00
Provisions for Employees' Bonus	-	30.05	-	-	-	-	-	-	-	-
Net Profit/(Loss) before Tax	**1,010.21**	**1,502.28**	**(8,890.19)**	**(5,129.76)**	**(6,808.36)**	**(3,405.41)**	**(9,947.88)**	**(6,089.22)**	**(6,961.82)**	**(5,027.84)**
Provision for Income Tax	-	-	-	-	-	-	-	-	-	-
Total Profit Available for Appropriation	**1,010.21**	**1,502.28**	**(8,890.19)**	**(5,129.76)**	**(6,808.36)**	**(3,405.41)**	**(9,947.88)**	**(6,089.22)**	**(6,961.82)**	**(5,027.84)**
Appropriation for Corporate Social Responsibility Fund	10.10	15.02	-	-	-	-	-	-	-	-
Appropriation for Insurance Fund	20.00	20.00	-	-	-	-	-	-	-	-
Profit/(Loss) Transferred to Statement of Financial Position	**980.10**	**1,467.25**	**(8,890.19)**	**(5,129.76)**	**(6,808.36)**	**(3,405.41)**	**(9,947.88)**	**(6,089.22)**	**(6,961.82)**	**(5,027.84)**

Note:- *Provisional figures

Significant Accounting Policies and Explanatory Notes

For the year ended July 16, 2018 (Ashad 32, 2075)

1. 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.

2. SIGNIFICANT ACCOUNTING POLICIES

2.1 Basis of preparation of Financial Statements

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

   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 cash 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.

2.2 Functional and Presentation Currency

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

2.3 Property, Plant and Equipments

Property, plant and equipments are stated at cost of acquisition and/or cost of construction less accumulated depreciation. The cost of property, plant and equipments 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. Write-downs are made for impairment, if any, in the value of such Property, plant and equipments.

2.4 Depreciation/Amortisation

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

2.5 Capital Work in Progress (CWIP)

All expenditures in developing property, plants and equipment 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 capitalized upon commissioning or identified as being ready to use. Provisions are made for impairment and obsolescence, if any, in the value of such CWIP.

2.6 Investments in Shares

All investments in the form of shares and long term loans are carried at cost. Provision for Diminution in the values 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.

2.7 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, provision for losses and obsolescence are made for those inventories identified by management as obsolete or otherwise.

2.8 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. Provisions for doubtful debts are made for doubtful trade receivables, if any, in the value of such receivables.

2.9 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 short-term 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. Provision for loss in lieu of shortage

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	2.5%
(f)	Transmission lines (66 KV, 132 KV and above)	3%
(g)	Transmission lines (33 KV)	3%
(h)	Transmission Substations	3%
(i)	Distribution system (including below11 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

of cash and cash equivalents are made for, if any, in the value of such cash and cash equivalents.

2.10 Share Capital

Share capital amount received in the form of cash and cash equivalent from Government of Nepal are accounted as and when received. Such amount includes initial contribution made by Government of Nepal. Eligible amounts are capitalised as share capital such as interest during construction period, grant amount received from Government of Nepal and on behalf of Government of Nepal as per the decision of Government of Nepal (Council of Ministers). Share capital is accounted as share allotment suspense until reconciliation pending with Government of Nepal and share allotment suspense presented under share capital.

2.11 Reserves

Non-revenue nature income are accounted directly to reserves and surplus which includes capital reserve, general reserve, insurance fund and corporate social responsibility fund. Assets created by utilizing consumer contribution are recognised at gross value corresponding amount is recognised as consumer contribution as reserve.

2.12 Corporate Social Responsibility Fund

Corporate Social fund is created by setting aside one percent of net profits as per the provision of Industrial Enterprises Act.

2.13 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.

2.14 Provision Employees' Bonus

Provision for employees' bonus is made at the rate of 2% of Net Profits as per the provision of Electricity Regulations, 2050.

2.15 Finance Cost

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.

Finance costs that are directly attributable to the construction of a qualifying asset are included in the cost of that asset irrespective of the physical progress. Other borrowing costs are treated as an expense in the period in which it occurs.

2.16 Foreign Currency Loans

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

2.17 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 NEA.

2.18 Provisions

Provisions are recognised when the NEA 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.

2.19 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, Retirement 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 management estimate.

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

Grants-in-Aid received from the GoN or other Agencies 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.

2.21 Contingent Assets and Liabilities

Contingent assets and 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.

2.22 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 Ashad End (Mid-July) has been recognised on estimated basis. Revenue from sale of electricity is shown net of rebate amount.

b. Rebate amount on payment before due date, surcharge on delayed payment etc. are accounted for on cash basis.

2.23 Income from Other Sources

a. Interest on loan 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, is recognised on cash basis.

d. Penalty chargeable on late commercial operation date (COD) under power purchase agreement (PPA) are accounted for on cash basis.

2.24 Cost of Sales

Cost of Sales includes cost of generation, power purchase, royalties to Government of Nepal, transmission and wheeling charges. Cost of generation includes cost directly attributable to generation of electricity of NEA's power plants. Power purchase cost comprises power purchase from independent power producers and power imports.

Royalties to Government of Nepal accounted as per the provisions of Electricity Act and Regulations. Transmission and wheeling cost involves cost that are directly attributable to transmission of power within NEA transmission networks and wheeling charges for cross boarder power transmission.

2.25 Distribution Expenses

Distribution expenses includes cost that are attributable to distribution of power & expenses relating consumer services and expenses of community rural electrification expenses. Distribution expenses includes maintenance of low voltage transmission lines and system operation costs also.

2.26 Taxes

a. Current tax

Current Tax is determined as the amount of tax payable in respect of taxable income for the year considering the applicable provisions of Income Tax Act.

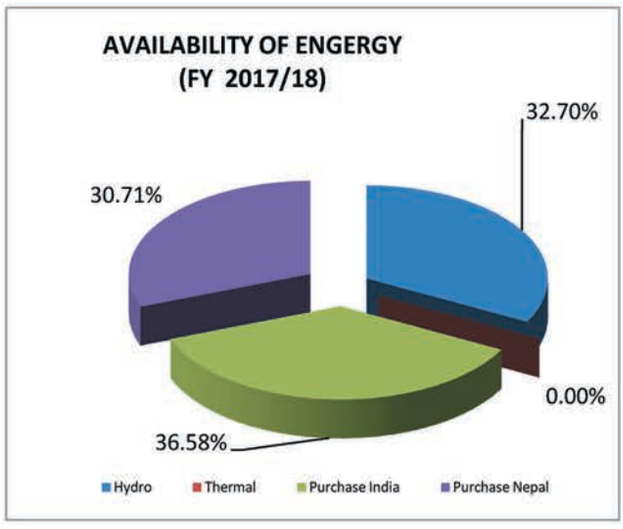
b. Deferred tax

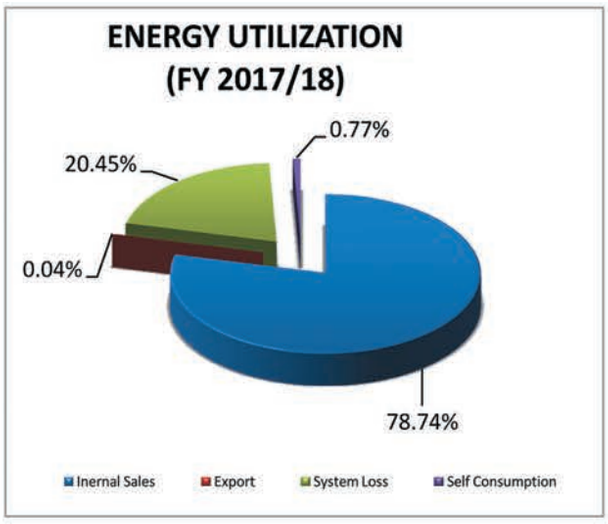
Deferred tax is recognised on temporary difference, being the difference between tax base of assets and liability and carrying amount thereto. Where there is carry forward losses, deferred tax asset are recognized only if there is virtual certainty of realization of such assets. Other deferred tax assets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

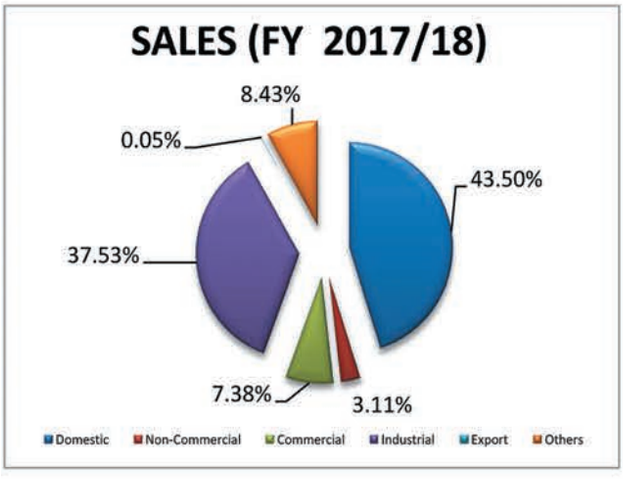
2.27 Foreign Currency Transactions

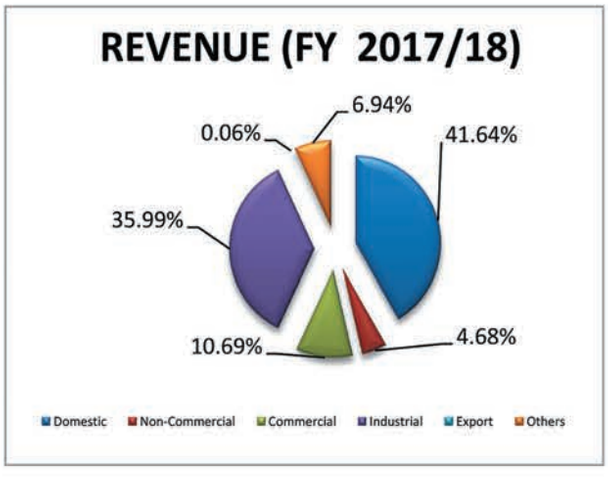
The transactions in foreign currency are recognised at the prevailing rate on transaction date. The balances of monetary assets and liabilities in foreign currencies are translated at closing rate. The resulting gain or loss due to the translation is taken to statement of Profit or Loss.

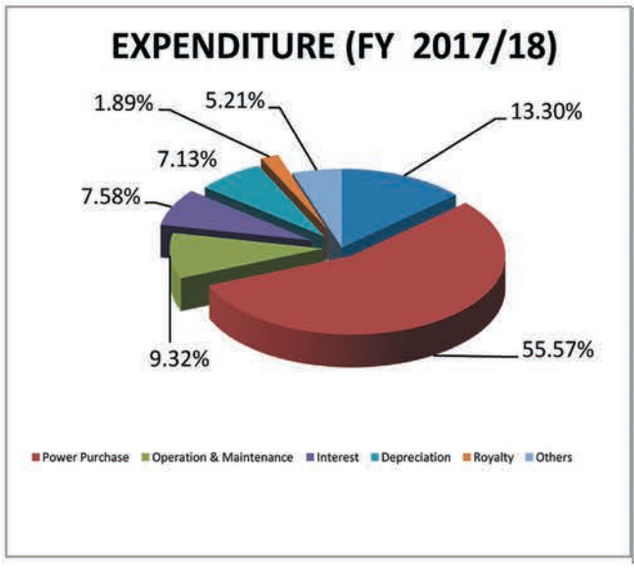
Statistics & Schematics

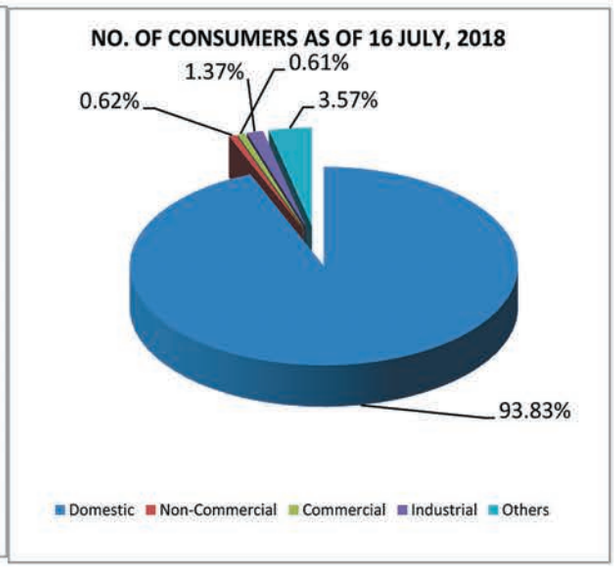




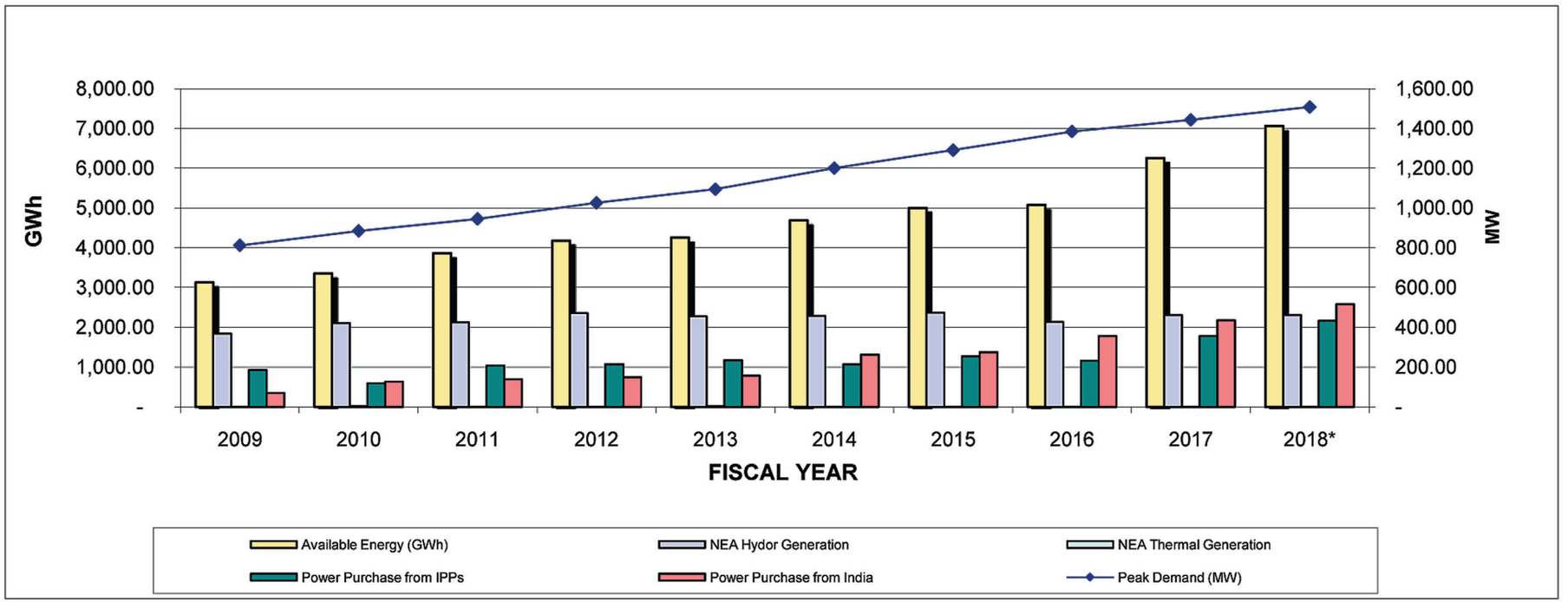








Total Energy Available & Peak Demand

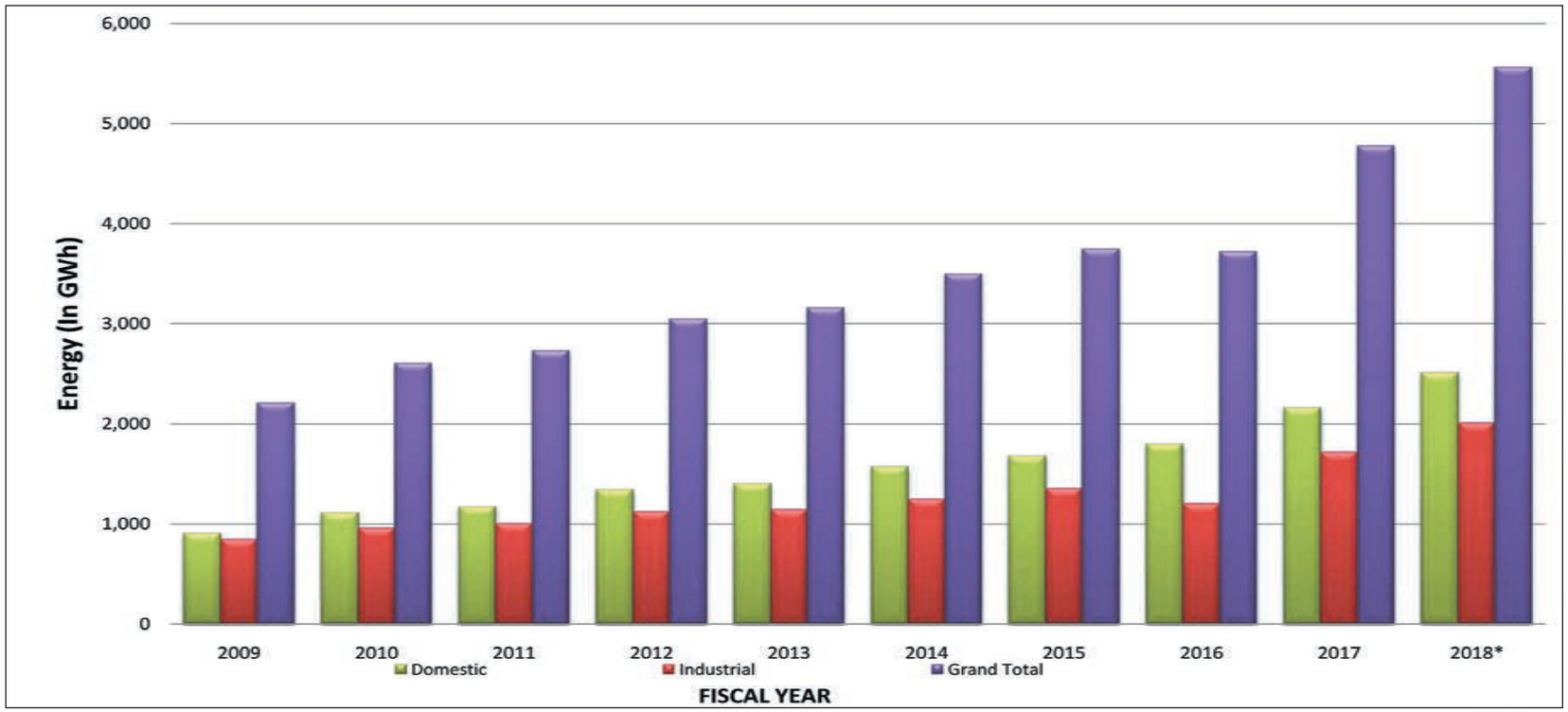


Particulars	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018*
Peak Demand (MW)	812.50	885.28	946.10	1,026.65	1,094.62	1,200.98	1,291.10	1,385.30	1,444.10	1,508.16
NEA Hydor Generation	1,839.53	2,108.65	2,122.08	2,357.43	2,273.11	2,288.23	2,366.88	2,133.14	2,305.17	2,308.24
NEA Thermal Generation	9.06	13.01	3.40	1.56	18.85	9.65	1.24	0.08	0.28	0.13
NEA Generation Total (GWh)	**1,848.59**	**2,121.66**	**2,125.48**	**2,358.99**	**2,291.96**	**2,297.88**	**2,368.12**	**2,133.22**	**2,305.45**	**2,308.37**
Power Purchase from India	356.46	638.68	694.05	746.07	790.14	1,318.75	1,369.89	1,777.68	2,175.04	2,581.80
Power Purchase from IPPs	925.74	591.43	1,038.84	1,073.57	1,175.98	1,070.47	1,268.93	1,166.24	1,777.24	2,167.76
Power Purchase Total (GWh)	**1,282.20**	**1,230.11**	**1,732.89**	**1,819.64**	**1,966.12**	**2,389.21**	**2,638.82**	**2,943.92**	**3,952.28**	**4,749.56**
Available Energy (GWh)	**3,130.79**	**3,351.77**	**3,858.37**	**4,178.63**	**4,258.08**	**4,687.09**	**5,005.70**	**5,077.14**	**6,257.73**	**7,057.93**

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

* Provisional figures

Electricity Sales

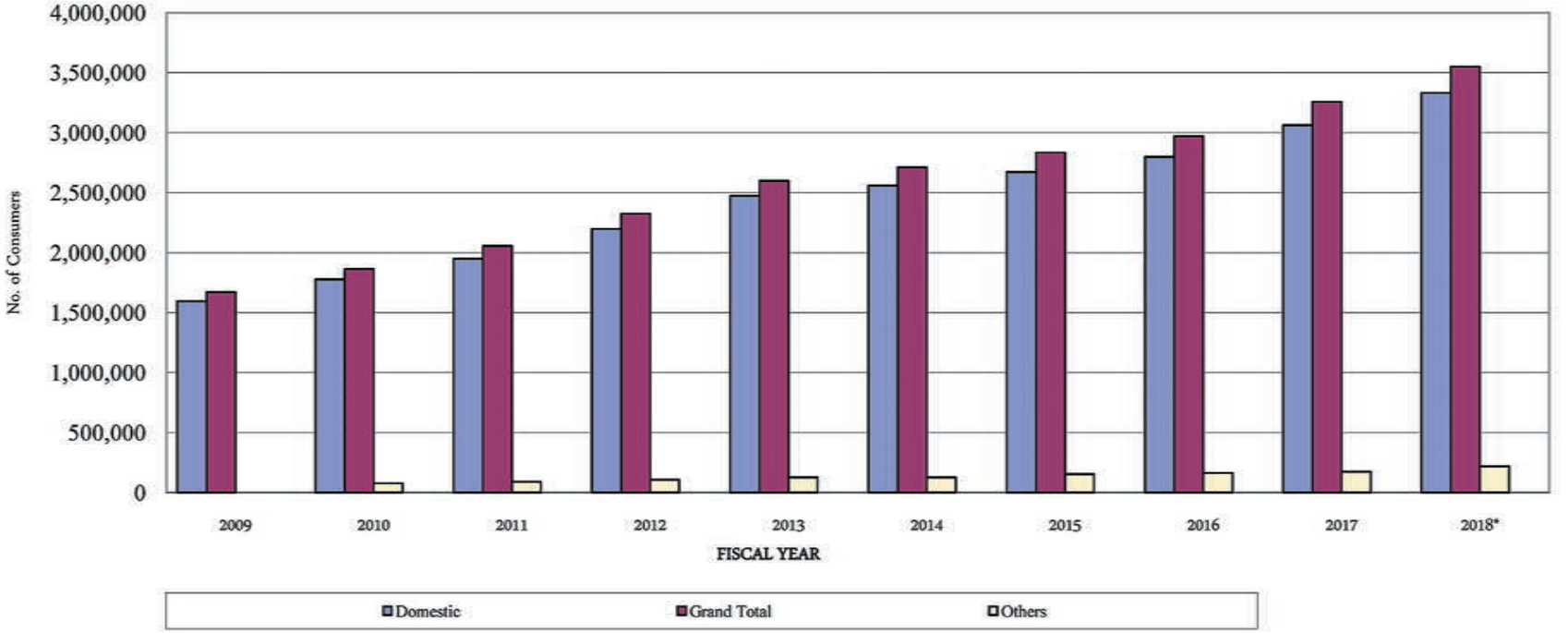


(in GWh)

Particulars	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018*
Domestic	908.67	1,108.87	1,169.31	1,342.67	1,401.64	1,571.39	1,679.35	1,796.78	2,163.51	2,509.29
Non-Commercial	98.89	103.47	109.49	115.68	115.21	126.64	130.53	134.37	160.79	170.21
Commercial	146.29	187.12	204.03	240.74	256.82	285.42	300.25	286.48	350.58	413.07
Industrial	845.68	960.43	1,001.73	1,123.94	1,141.07	1,251.69	1,352.15	1,205.69	1,719.26	2,010.09
Water Supply & Irrigation	48.14	55.98	82.80	64.59	72.55	82.52	86.56	100.42	115.93	126.20
Street Light	67.51	65.58	67.21	72.06	76.24	76.44	76.48	73.88	76.12	78.07
Temporary Supply	1.04	1.00	1.00	1.20	1.47	1.34	1.52	2.10	3.03	2.67
Transport	5.22	5.42	5.54	6.72	6.26	6.22	6.24	6.09	6.33	5.34
Temple	4.76	3.64	3.46	3.95	4.11	5.18	4.85	5.53	7.10	6.86
Non- Domestic	-	-	-	-	-	-	-	-	53.74	103.80
Entertainment	-	-	-	-	-	-	-	-	1.21	2.62
Community Sales	32.01	34.95	51.95	69.02	77.04	86.08	102.62	104.48	116.24	129.08
Total (Internal Sales)	**2,158.21**	**2,526.46**	**2,696.52**	**3,040.57**	**3,152.41**	**3,492.91**	**3,740.54**	**3,715.82**	**4,773.84**	**5,557.30**
Bulk Supply (India)	46.38	75.07	31.10	4.12	3.60	3.40	3.17	3.15	2.69	2.94
Grand Total	**2,204.59**	**2,601.53**	**2,727.62**	**3,044.69**	**3,156.01**	**3,496.31**	**3,743.71**	**3,718.97**	**4,776.53**	**5,560.24**

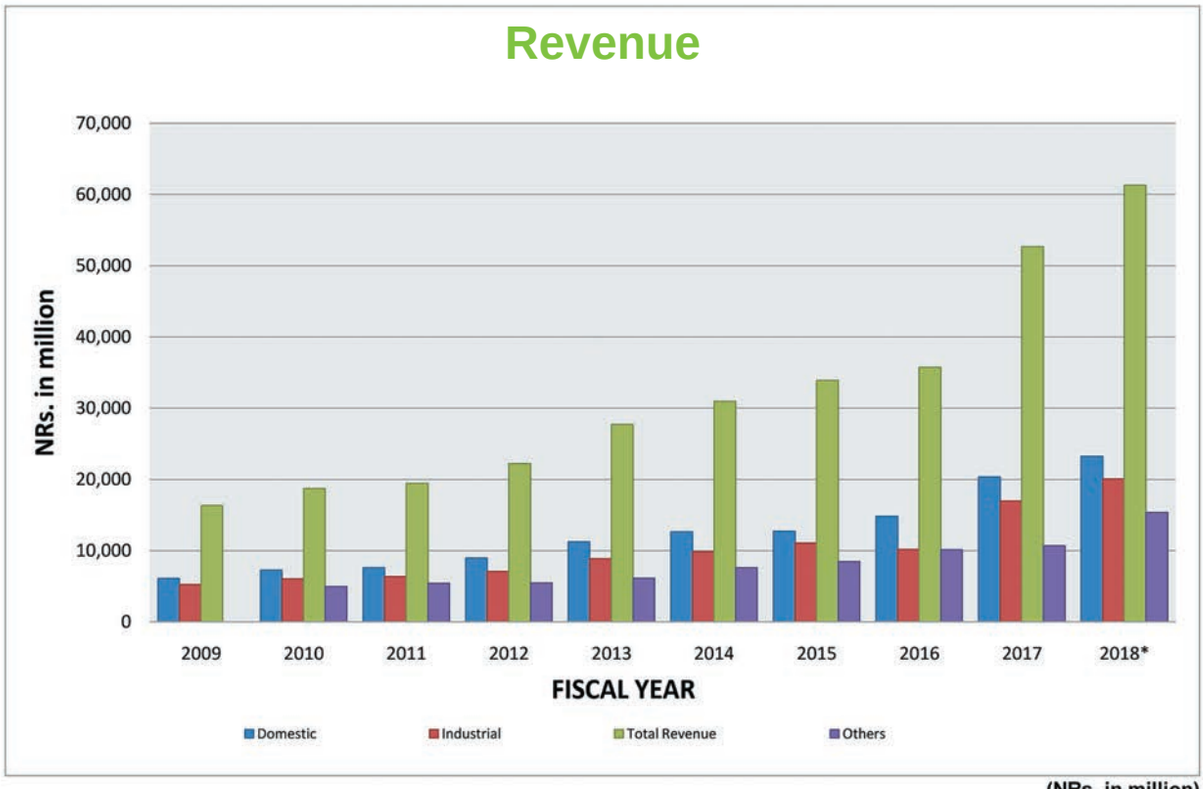
Note:- *Provisional figures

Growth of Consumers



Particulars	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018*
Domestic	1,595,015	1,775,571	1,949,530	2,198,680	2,472,264	2,558,726	2,671,039	2,796,621	3,061,709	3,332,071
Non-Commercial	10,518	10,952	12,520	14,055	15,179	16,155	16,717	17,732	19,257	21,853
Commercial	7,305	8,919	10,802	13,297	13,096	14,955	15,899	17,191	18,860	21,716
Industrial	28,559	29,410	33,030	36,409	37,498	40,265	41,825	43,639	46,345	48,800
Water Supply	584	609	688	860	834	1,141	1,266	1,426	1,675	2,063
Irrigation	22,335	32,089	42,494	53,165	51,520	71,845	77,066	83,283	98,626	111,493
Street Light	2,339	2,214	2,374	2,590	2,878	2,774	2,813	2,829	2,935	3,010
Temporary Supply	403	522	634	619	768	726	733	883	1,070	1,520
Transport	42	41	42	44	51	1	44	43	44	44
Temple	2,911	2,941	3,181	3,529	3,857	4,048	4,181	4,391	4,673	5,182
Non- Domestic	-	-	-	-	-	-	-	-	977	1,735
Entertainment	-	-	-	-	-	-	-	-	45	107
Community Sales	594	795	995	1,161	1,207	1,377	1,459	1,537	1,597	1,631
Total (Internal Sales)	**1,670,605**	**1,864,063**	**2,056,290**	**2,324,409**	**2,599,152**	**2,712,055**	**2,833,042**	**2,969,575**	**3,257,813**	**3,551,225**
Bulk Supply (India)	5	4	2	5	4	2	1	1	1	1
Grand Total	**1,670,610**	**1,864,067**	**2,056,292**	**2,324,414**	**2,599,156**	**2,712,057**	**2,833,043**	**2,969,576**	**3,257,814**	**3,551,226**

Note:- *Provisional figures

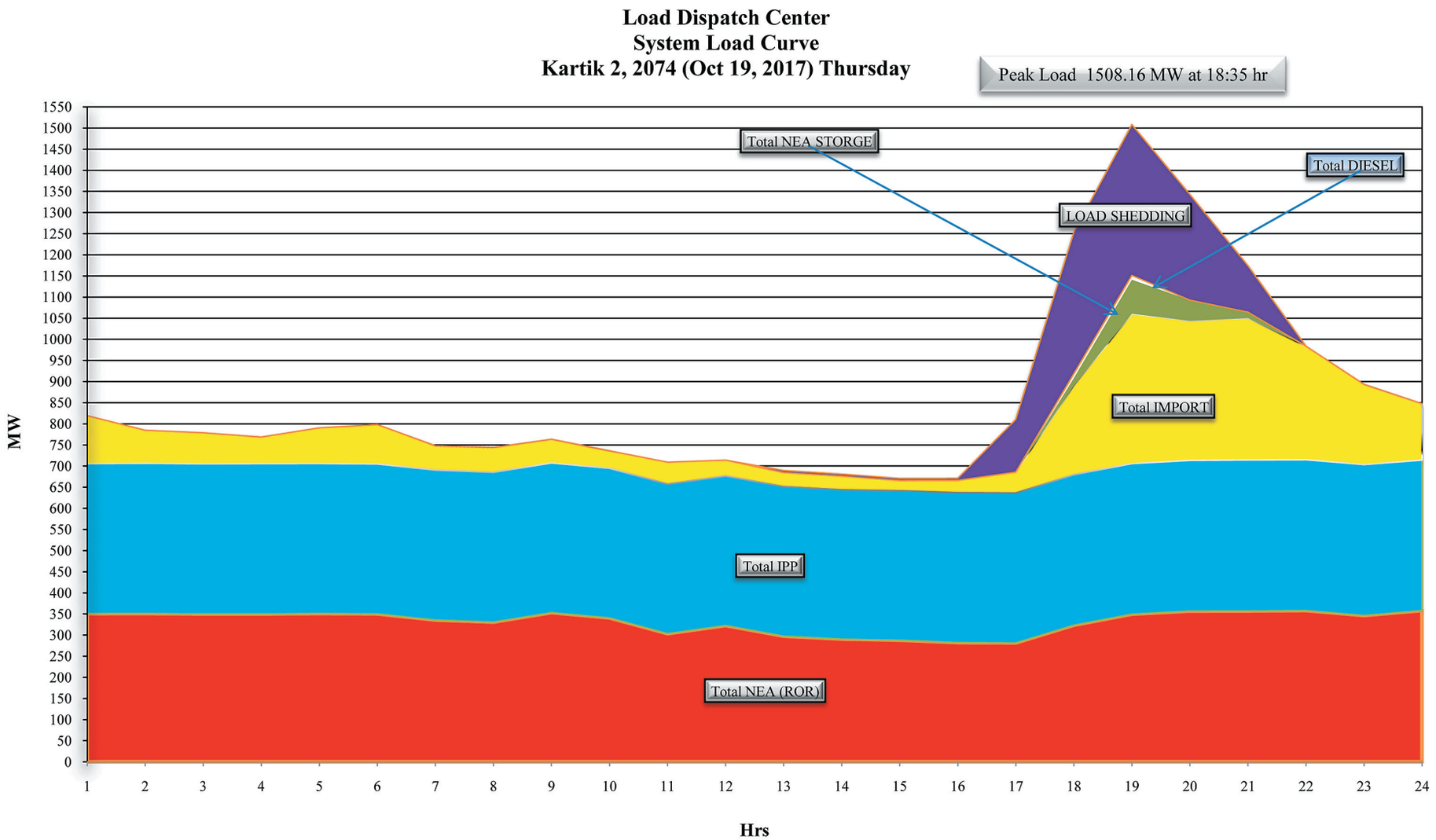


(NRs. in million)

Particulars	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018*
Domestic	6,100.65	7,252.06	7,602.34	8,967.77	11,247.77	12,622.11	12,706.55	14,833.65	20,329.92	23,235.99
Non-Commercial	900.75	983.63	1,020.51	1,091.52	1,355.17	1,486.63	1,644.45	1,995.10	2,479.08	2,612.74
Commercial	1,384.67	1,719.35	1,910.28	2,259.50	2,994.00	3,359.69	3,735.00	3,788.76	5,114.29	5,964.75
Industrial	5,264.33	6,060.20	6,378.25	7,102.37	8,885.21	9,844.18	11,064.84	10,182.32	16,977.17	20,080.83
Water Supply & Irrigation	215.62	353.14	250.60	294.82	389.34	418.20	480.71	525.30	727.54	815.18
Street Light	445.96	333.90	433.42	464.22	582.69	601.84	629.65	602.37	665.62	685.44
Temporary Supply	12.20	13.58	13.98	16.18	24.48	23.07	27.39	29.25	53.35	49.34
Transport	26.95	27.58	27.78	31.70	39.53	39.32	41.44	39.74	43.87	37.60
Temple	24.41	28.16	26.51	21.38	23.66	26.34	29.17	33.92	39.10	46.38
Non- Domestic	-	-	-	-	-	-	-	-	654.53	1,566.34
Entertainment	-	-	-	-	-	-	-	-	16.97	44.79
Community Sales	70.10	170.90	189.28	244.97	301.38	334.94	400.12	411.50	630.66	629.93
Total (Internal Sales)	**14,445.64**	**16,942.50**	**17,852.95**	**20,494.43**	**25,843.23**	**28,756.31**	**30,759.31**	**32,441.91**	**47,732.10**	**55,769.31**
Bulk Supply (India)	295.49	604.85	215.42	23.97	32.22	30.90	39.36	32.07	45.75	32.78
Gross Revenue	**14,741.13**	**17,547.35**	**18,068.37**	**20,518.40**	**25,875.45**	**28,787.21**	**30,798.67**	**32,473.98**	**47,777.85**	**55,802.09**
Income from Other Services	1,601.66	1,188.27	1,382.94	1,695.42	1,868.37	2,156.90	3,116.26	3,249.33	4,907.33	5,526.05
Total Revenue	**16,342.79**	**18,735.62**	**19,451.31**	**22,213.82**	**27,743.82**	**30,944.11**	**33,914.93**	**35,723.31**	**52,685.18**	**61,328.14**

Note:- *Provisional figures

System Load Curve of Peak Load Day



ANNEX-1

ELECTRICITY TARIFF

TARIFF RATES

1. Domestic Consumers

(a) Service and Energy Charge (Single Phase)

kWh (Monthly) Units	5 Ampere		15 Ampere		30 Ampere		60 Ampere	
	Service Charge	Energy Charge	Service Charge	Energy Charge	Service Charge	Energy Charge	Service Charge	Energy Charge
0-20	30.00	3.00	50.00	4.00	75.00	5.00	125.00	6.00
21-30	50.00	7.00	75.00	7.00	100.00	7.00	150.00	7.00
31-50	75.00	8.50	100.00	8.50	125.00	8.50	175.00	8.50
51-150	100.00	10.00	125.00	10.00	150.00	10.00	200.00	10.00
151-250	125.00	11.00	150.00	11.00	175.00	11.00	225.00	11.00
251-400	150.00	12.00	175.00	12.00	200.00	12.00	250.00	12.00
Above 400	175.00	13.00	200.00	13.00	225.00	13.00	275.00	13.00

(b) Service and Energy Charge (Three Phase)

Low Voltage (230/400 V)

kWh	Up to 10 KVA		Above 10 KVA	
	Service Charge	Energy Charge	Service Charge	Energy Charge
Up to 400	1100.00	12.50	1800.00	12.50
Above 400		13.50		13.50

(c) Service and Energy Charge: Three Phase

Medium Voltage (33/11 KV)

kWh	Up to 10 KVA	
	Service Charge	Energy Charge
Up to 1000	1100.00	11.00
1001-2000		12.00
Above 2001		13.00

Billing Method (For 5 Ampere)

S. No.	Electricity Consume Block	Rate Rs. Per Unit	Billing Method
1	Up to 20 units	3.00	Minimum Monthly Service Charge Rs. 30.00 for up to 20 units and Energy Charge Rs. 3.00 per unit
2	21 to 30 units	7.00	Minimum Monthly Service Charge Rs. 50.00 and Energy Charge per unit Rs. 3.00 for per unit up to 20 units and Rs. 7.00 per unit for 21 units to 30 units
3	31 to 50 units	8.50	Minimum Monthly Service Charge Rs. 75.00 and Energy Charge per unit Rs. 3.00 for per unit up to 20 units and Rs. 7.00 per unit for 21 units to 30 units and Rs. 8.50 per unit for 31 units to 50 units
4	51 to 150 units	10.00	Minimum Monthly Service Charge Rs. 100.00 and Energy Charge per unit Rs. 3.00 for per unit up to 20 units and Rs. 7.00 per unit for 21 units to 30 units and Rs. 8.50 per unit for 31 units to 50 units and Rs. 10.00 per unit for 51 units to 150 units
5	151 to 250 units	11.00	Minimum Monthly Service Charge Rs. 125.00 and Energy Charge per unit Rs. 3.00 for per unit up to 20 units and Rs. 7.00 per unit for 21 units to 30 units and Rs. 8.50 per unit for 31 units to 50 units and Rs. 10.00 per unit for 51 units to 150 units and Rs. 11.00 per unit for 151 units to 250 units
6	251 to 400 units	12.00	Minimum Monthly Service Charge Rs. 150.00 and Energy Charge per unit Rs. 3.00 for per unit up to 20 units and Rs. 7.00 per unit for 21 units to 30 units and Rs. 8.50 per unit for 31 units to 50 units and Rs. 10.00 per unit for 51 units to 150 units and Rs. 11.00 per unit for 151 units to 250 units and Rs. 12.00 per unit for 251 units to 400 units
7	Above 400	13.00	Minimum Monthly Service Charge Rs. 175.00 minimum charge and Energy Charge per unit Rs. 3.00 for per unit up to 20 units and Rs. 7.00 per unit for 21 units to 30 units and Rs. 8.50 per unit for 31 units to 50 units and Rs. 10.00 per unit for 51 units to 150 units and Rs. 11.00 per unit for 151 units to 250 units and Rs. 12.00 per unit for 251 units to 400 units and Rs. 13.00 per unit for above 400 units

Similarly, billing will be made for 15, 30 and 60 Ampere.

2. Other Consumers

2.1 Low Voltage (230/400 V)

Consumer Category	Tariff Rate	
	Demand Charge	Energy Charge
	Rs. per KVA/ month	Rs./unit
1. Industrial		
a) Rural and Domestic	60.00	7.80
b) Small Industry	110.00	9.60
2. Commercial	325.00	11.20
3. Non-Commercial	215.00	12.00
4. Irrigation		4.30
5. Water Supply		
a) Community Water Supply	155.00	5.20
b) Other Water Supply	230.00	7.20
6. Temple		6.10
7. Street Light		
a) Metered		7.30
b) Non-Metered	2475.00	
8. Temporary Supply		19.80
9. Non-Domestic	350.00	13.00
10. Entertainment Business	350.00	14.00

2.2 High Voltage

Consumer Category	Tariff Rate	
	Demand Charge	Energy Charge
	Rs./KVA/month	Rs./unit
A. High Voltage (66 KV or above)		
1. Industrial	240.00	7.50
B. Medium Voltage (33 KV)		
1. Industrial	255.00	8.40
2. Commercial	315.00	10.80
3. Non-commercial	240.00	11.40
4. Irrigation	55.00	4.80
5. Water Supply		
a) Community Water Supply	220.00	6.00
b) Other Water Supply	220.00	6.60
6. Transportation		
a) Trolley Bus	230.00	5.60
b) Other Transportation	255.00	8.60
7. Non-Domestic	350.00	12.55
8. Entertainment Business	350.00	13.50
C. Medium Voltage (11 KV)		
1. Industrial	255.00	8.60
2. Commercial	315.00	11.10
3. Non-commercial	240.00	11.50
4. Irrigation	55.00	4.90
5. Water Supply		
a) Community Water Supply	220.00	6.20

b) Other Water Supply	220.00	6.80
6. Transportation		
a) Trolley Bus	230.00	5.60
b) Other Transportation	255.00	8.80
7. Temple	220.00	9.90
8. Temporary Supply	330.00	12.00
9. Non-Domestic	350.00	12.90
10. Entertainment Business	350.00	13.90

Under Non-Domestic: Embassy, Foreign Mission, INGO, Private Campus, Star Hotel, Shopping Mall etc.

Under Entertainment: Cinema Hall, Fun Park, Theater etc.

3. Time of Day (ToD) Tariff Rate

a) Electricity Tariff Rate from Baishakh to Mangsir

Consumer Category	Tariff Rate			
	Demand Charge Rs. per KVA/ month	Pick Time (17.00-23.00)	Off Pick Time (23.00-5.00)	Normal time (5.00-17.00)
A. High Voltage (66 KV or above)				
1. Industrial	240.00	9.30	4.15	7.50
B. Medium Voltage (33 KV)				
1. Industrial	250.00	10.20	5.25	8.40
2. Commercial	315.00	12.30	6.75	10.80
3. Non-Commercial	240.00	13.20	7.00	12.00
4. Irrigation	55.00	6.30	3.15	4.70
5. Water Supply				
a) Community Water Supply	220.00	7.30	3.60	5.90
b) Other Water Supply	220.00	10.20	5.25	8.40
6. Transportation				
a) Trolley Bus	230.00	7.00	3.70	5.50
b) Other Transportation	255.00	9.35	3.70	8.40
7. Street Light	80.00	8.40	3.50	4.20
C. Medium Voltage (11 KV)				
1. Industrial	250.00	10.50	5.40	8.55
2. Commercial	315.00	12.60	6.90	11.10
3. Non-commercial	240.00	13.50	7.15	12.25
4. Irrigation	55.00	6.40	3.50	4. 75
5. Water Supply				
a) Community Water Supply	220.00	7.45	4.40	6.10
b) Other Water Supply	220.00	10.50	5.40	8.50
6. Transportation				
a) Trolley Bus	230.00	7.15	4.20	5.60
b) Other Transportation	255.00	9.65	4.20	8.50
7. Street Light	80.00	8.80	3.75	4.40
8. Temple	220.00	11.30	5.15	9.10
9. Temporary Supply	330.00	14.40	6.60	11.75

b) Electricity Tariff Rate from Paush to Chaitra

Consumer Category	Tariff Rate		
	Demand Charge Rs. per KVA/ month	Pick Time (17.00-23.00)	Normal Time (23.00-5.00)
A. High Voltage (66 KV or above)			
1. Industrial	240.00	9.30	7.50
B. Medium Voltage (33 KV)			
1. Industrial	250.00	10.20	8.40
2. Commercial	315.00	12.30	10.80
3. Non-Commercial	240.00	13.20	12.00
4. Irrigation	55.00	6.30	4.70
5. Water Supply			
a) Community Water Supply	220.00	7.30	5.90
b) Other Water Supply	220.00	10.20	8.40
6. Transportation			
a) Trolley Bus	230.00	7.00	5.50
b) Other Transportation	255.00	9.35	8.40
7. Street Light	80.00	8.40	4.20
C. Medium Voltage (11 KV)			
1. Industrial	250.00	10.50	8.55
2. Commercial	315.00	12.60	11.10
3. Non-commercial	240.00	13.50	12.25
4. Irrigation	55.00	6.40	4.75
5. Water Supply			
a) Community Water Supply	220.00	7.45	6.10
b) Other Water Supply	220.00	10.50	8.50
6. Transportation			
a) Trolley Bus	230.00	7.15	5.60
b) Other Transportation	255.00	9.65	8.50
7. Street Light	80.00	8.80	4.40
8. Temple	220.00	11.30	9.10
9. Temporary Supply	330.00	14.40	11.75

4. Community Wholesale Consumer:

Voltage Level	Energy Charge (Rs./unit)
a) Medium Voltage (11KV/33KV)	
Upto (N* x 30) units	4.25
Above (N* x 30) units	6.00
b) Lower Voltage Level (230/400 Volt)	
Upto (N* x 30) units	4.25
Above (N* x 30) units	6.25

N*= Total Number of Consumers of a Community Group

Notes:

a) Low Voltage refers to Electricity Supply of 230/400 V, Medium Voltage refers to 11 KV and 33 KV and High Voltage refers to 66 KV or above.

b) 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/07.

c) 10% rebated in total bill amount will be given to the Government of Nepal approved Industrial Districts, if the bill is paid within 21 days of billing date.

d) If the Crematory House, Governmental Hospital and Health Centers (except Residential Complex or part thereof) under the Government of Nepal pay the bill within 21 days, 20 percent rebate will be given in total bill amount.

e) Consumers supplied at High Voltage (66 KV or above) and Medium Voltage (33 KV and 11 KV) should compulsorily install ToD Meter.

f) 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.

Electricity Generation Power Plants and Projects

Major Hydropower Stations		
S.No	Power Plants	Capacity(kW)
1	Kaligandaki A	144,000
2	Middle Marsyangdi	70,000
3	Marsyangdi	69,000
4	Trishuli	24,000
5	Sunkoshi	10,050
6	Gandak	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
12	Chameliya	30,000
Sub Total		**489,150**
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	Ramechahap	150
27	Terhathum**	100
28	Gamgad	400
Sub Total		**14,244**
Total		**503,394**
Small Hudropower Plants(Isolated)		
1	Dhankuta***	240
2	Jhupra(Surkhet)***	345
3	Gorkhe(Illam)***	64
4	Jumla**	200
5	Dhanding***	32
6	Syangja***	80
7	Helambu	50
8	Darchula**	300
9	Chame**	45
10	Taplejung**	125
11	Manag**	80
12	Chaurjhari(Rukum)**	150
13	Syaprudaha(Rukum)**	200
14	Bhojpur**	250
15	Bajura**	200
16	Bajhang**	200
17	Arughat(Gorkha)	150
18	Okhaldhunga	125
19	Rupalgad(Dadeldhura)	100
20	Achham	400
21	Dolpa	200
22	kalokot	500
23	Heldung(Humla)	500
Total		**4,536**

S.No	Thermal Power Plants	Capacity(KW)
1	Duhabi Multifuel	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		503,394
	Total Small Hydro(NEA)-Isolated	4,536
	Total Hydro(NEA)	507,930
	Total Hydro(IPP)	512695.4
	Total Hydro(Nepal)	1,020,625
	Total Thermal(NEA)	53,410
	Total Sola(NEA)	100
Total Installed Capacity		**1,074,135**
Total installed Capacity(NEA & IPP)-Grid		**1,069,499**
Under Construction		**Capacity(kW)**
1	Upper Tamakoshi Hydropower Project	456,000
2	Tanahu Hydropower Project	140,000
3	Kulekhani III HEP	14,000
4	Upper Trishuli 3A HEP	60,000
5	Rahuganga HEP	40,000
6	Upper Sanjen	14,600
7	Sanjen	42,500
8	Rasuwagadi	111,000
9	Madhya Bhotekoshi	102,000
1	Upper Trishuli 3B	37,000
Total		**1,017,100**
Planned and Proposed		**Capacity**
1	Upper Arun HEP	335,000
2	Upper Modi A HEP	42,000
3	Upper Modi HEP	18,200
4	DudhKoshi Storage HEP	300,000
5	Tamor Storage HEP	762,000
6	Uttar Ganga Storage HEP	828,000
7	Tamakoshi V HEP	95,000
8	Aadhikhola Storage HEP	180,000
9	Chainpur Seti HEP	210,000
10	Begnas Rupa Pump Storage HEP	150,000
Total		**2,920,200**

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

Existing High Voltage Transmission Lines

S.N	400/220 kV Transmission Line	Configuration	Length Circuit km
1	Dhalkebar-Muzzaffarpur 400 kV Cross Border Line	Double	78
2	Khimti- Dhalkebar 220 kV Transmission Line	Single	75
Total			**153**
S.N	**132 kV Transmission Line**	**Configuration**	**Length Circuit km**
1	Anarmani-Damak-Duhabi	Single	75.76
2	Duhabi-Kusaha-Lahan-Mirchaiya-Dhalkebar	Double	290
3	Dhalkebar-Chandranigahapur-Pathaliya	Double	206
4	Pathlaiya-Hetauda	Double	76
5	Pathlaiya-Parwanipur	Double	36
2	Kushaha-Katiya(India)	Single	15
4	Hetauda-KL2 P/S	Double	16
8	KL2 P/S-Siuchatar	Double	72
9	Suichatar-Balaju-Chapali-New Bhaktapur	Double	26.9
10	New Bhaktapur-Lamosangu	Double	96
11	Lamosangu-Khimti P/S	Single	46
12	Lamosangu-Bhotekoshi P/S	Single	31
6	Hetauda-Bharatpur	Single	70
5	Bharatpur-Marsyangdi P/S	Single	25
7	Marsyangdi P/S-Suichatar	Single	84
13	Bharatpur-Damauli	Single	39
14	Bharatpur-Kawasoti-Bardghat	Single	70
15	Bardghat-Gandak P/S	Double	28
16	Bardghat-Butwal	Double	86
17	Butwal-KGA P/S	Double	116
18	KGA P/S-Lekhnath	Double	96
19	Lekhnath-Damauli	Single	45
20	Lekhnath-Pokhara	Single	7
21	Pokhara-Modikhola P/S	Single	37
22	Butwal-Shivapur-Lamahi	Double	230
23	Lamahi-Jhimruk P/S	Single	50
24	Lamahi-Kohalpur-Lumki-Attariya	Double	486
25	Attariya-Mahendranagar-Gaddachauki	Double	98
26	Marsyangdi -M. Marsyangdi	Double	78
27	Damak-Godak	Single	35
28	Kusum-Hapure	Single	22
29	Raxual-Parwanipur (Cross Border-Nepal Portion)	Single	16
30	Kusaha-Kataiya (Cross Border-Nepal Portion)	Single	13
31	Bhulbhule- Middle Marsyangdi P/S	Single	22
32	Chameliya Power Plant-Attaria	Single	131
Total			**2,871**

Existing High Voltage Transmission Lines

S.N	66 kV Transmission Line	Configuration	Length Circuit km
1	Chilime P/S-Trishuli P/S	Single	39
2	Trisuli P/S-Balaju	Double	58
3	Trisuli P/S-Devighat P/S	Single	4.56
4	Devighat P/S-Chapali	Double	58.6
5	Chapali-New Chabel	Double	10
6	Chabel-Lainchor	Single	7
7	Balaju-Lainchor	Single	2
8	Balaju-Siuchatar-KL1 P/S	Double	72
9	KL 1 P/S-Hetauda-Birgunj	Double	144
10	Suichatar-Teku	Single	4.1
11	Suichatar-New Patan	Double	13
12	Teku-K3 (underground)	Singlecore	2.8
13	Suichatar-K3	Single	6.9
14	New Patan-New Baneswor-Bhaktapur	Single	16.5
15	Bhaktapur-Banepa-Panchkhal-Sunkoshi P/S	Single	48
16	Indrawati- Panchkhal	Single	28
Total			**514**

Under Construction High Voltage Transmission Lines

S.N.	400 kV Transmission Line	Configuration	Length Circuit km
1	Hetauda-Dhalkebar-Duhabi	Double	570
2	Tamakoshi-Kathmandu 220/400kV	Double	170
Total			**740**
S.N.	**220 kV Transmission Line**	**Configuration**	**Length Circuit km**
1	Khimti-Dhalkebar 2nd Ckt Line	Single	75
2	Hetauda-Bharatpur	Single	73
3	Bharatpur-Bardghat	Double	150
4	Inaruwa-Basantpur	Double	148
5	Basantpur-Baneshwor-Tumlingtar	Single	31
6	Baneshwor-Dhungesangu	Single	35
7	Marsyangdi-Kathmandu	Double	170
8	Kaligandaki Corridor	Double	286
9	Marsyangdi Corridor	Double	224
10	Chilime-Trishuli	Double	80
11	Borang-Ratmate	Double	110
Total			**5,782**
S.N.	**132 kV Transmission Line**	**Configuration**	**Length Circuit km**
1	Thankot-Chapagaon	Double	57
2	Dumre- Damauli-Marsyangdi 2nd Circuit	Single	44
3	Dumre- Damauli	Double	36
4	Kabeli-Godak	Double	145
5	Singati-Lamosangu	Double	76
6	Solu Corridor	Double	180
7	Butwal-Lumbini	Double	44
8	Burtibang -Paudi Amrai - Gulmi- Arghakhanchi - Motipur	Double	170
9	Ramechap (Garjyang) -Khimti	Double	60
10	Samundratar-Trishuli 3B	Double	50
11	Dordi Corridor	Double	32
12	New Modi-Lekhnath	Double	84
13	Lamahi-Ghorahi	Double	38
14	Bardaghat-Sardi	Double	40
15	Kushaha- Biratnagar	Double	46
16	Chameliya- Syaule -Attaria 2nd Circuit	Single	131
17	Kusma-Lower Modi	Single	6.2
18	Lapsiphedi-Changunarayan-Duwakot	Double	28
19	Dadakhet- Rahughat	Double	80
20	Ghorahi-Madichaur	Double	80
Total			**1,427**

Existing 220/132 Kv Substations

S.N.	Substation	Capacity (MVA)	Remarks
1	Dhalkebar	320	No Load Charged
Total		**320**	

EXISTING 132 kV SUBSTATIONS

S.N.	Substation	Capacity (MVA)	S.N.	Substation	Capacity (MVA)
1	Mahendranagar	25.0	20	Duhabi	189.0
2	Attariya	60.0	21	Anarmani	60.0
3	Lamki	30.0	22	Pokhara	60.0
4	Kohalpur	60.0	23	Lekhnath	22.5
5	Lamahi	93.0	24	Damauli	60.0
6	Shivapur	42.5	25	Lamosagu	30.0
7	Butwal	189.0	26	Bhaktapur	94.5
8	Bardghat	30.0	27	Balaju	45.0
9	Kawasoti	30.0	28	Suichatar	113.4
10	Bharatpur	97.5	29	Matatirtha	52.5
11	Hetauda	90.0	30	Hapure	30.0
12	Parwanipur	193.5	31	Chapali	129.0
13	Chandranigahapur	60.0	32	Mirchaiya	30.0
14	Pathlaiya	22.5	33	Damak	30.0
15	Kusum	12.5	34	Godak	30.0
16	Kamane	30.0	35	Phidim	16.0
17	Syangja	30.0	38	Syaule	30.0
18	Dhalkebar	93.0	39	Bhurigaon	30.0
19	Lahan	63.0	40	Pahalwanpur	30.0
Total				**2,333**	

66 kV SUBSTATIONS

S.N.	Substation	Capacity (MVA)	S.N.	Substation	Capacity (MVA)
1	Birgung	85.0	8	Baneshwor	36.0
2	Amlekhgunj	7.5	9	Indrawati	7.5
3	Simra	30.0	10	Banepa	45.0
4	K-3	45.0	11	Panchkhal	10.0
5	Teku	45.0	12	Lainchour	45.0
6	Patan	54.0	13	New-Chabel	67.5
7	Balaju	45.0	14	Hetauda	20.0
Total				**543**	

Underconstruction Grid Substations

S.N.	Substation	Capacity (MVA)
400kV Voltage Level		
1	400/220 kV Dhalkebar	945
Total		**945**
220kV Voltage Level		
1	220/132 Trishuli 3B HUB	320
2	220/132 Chilime HUB	373.31
3	220/132kV Basantapur	233.1
4	220/33kV Baseshwor	50
5	220/132kV Tumlingtar	233.1
6	220/132kV Dhalkebar	950
7	220/132kV New Hetauda	200
8	220/132kV Inaruwa	200
9	220/33kV Inaruwa	126
10	220/132kV Barhabise	160
11	220/132kV Lapsiphedi	160
12	220/132 kV, Dana	99.99
13	220/132 kV, Kusma	99.99

14	220/132 kV, New Butwal	99.99
15	220/132kV Dhapapani HUB (Manag)	320
16	220/132kV Khudi HUB	320
17	220/132kV Udipur HUB	320
18	220/132kV Markichwok HUB	320
19	220/132kV New Bharatpur	320
Total		**4905**
132kV Voltage Level		
1	132/33 kV Singati	30
2	132/33 kV Purbi Chitwan	60
3	132/33kV Ghorahi	30
4	132/33 kV Markichwok	30
5	132/33 kV Rupani	63
6	132/33kV Garjyang	30
7	132/33kV Mainhaiya (Lumbini)	90
8	132/33kV Biratnagar	126
9	132/33kV Kirtipur (Dordi)	10
10	132/33kV Motipur	30
11	132/33kV Arghakhanchi	30
12	132/33kV Marchichwok	30
13	132/33kV Tingla (Solu)	30
14	132/33kV Lahachwok	30
15	132/11kV New Bharatpur	22.5
16	132/33kV Samundratar	60
17	132/33kV Dhungesangu	30
18	132/33kV Tumlingtar	60
19	132/11kV Mulpani	90
20	132/11kV Phutung	90
21	132/11kV Chapagaon	90
22	132/11kV Koteshwor	90
23	132/11kV Teku	90
24	132/11kV Lapsiphedi	5
25	132/11kV Changunarayen	45
Total		**1292**

Planned and Proposed High Voltage Transmission Lines

S.N.	400 kV Transmission Line	Configuration	Length Circuit km
A	**Cross Boarder interconnection with India**		
1	Inaruwa-Purniya (India)	Double	132
2	New Dhalkebar- Muzzafarpur	Double	199
3	New Butwal - Gorakhpur	Double	131
4	Phulbari (Lumki)- Lucknow	Double	180
5	Dododhara- Barelly	Double	600
6	Attariya-Bareli	Double	260
Total			**1501**
B	**Cross Boarder interconnection with China**		
7	Ratmate-Chilime Hub- Kerung	Double	110
8	Arun 3- U Arun - Latse	Double	127
	Total		**237**
S.N.	**400 kV Transmission Line (East- West)**	**Configuration**	**Length Circuit km**
1	Damak-Duhabi-Inaruwa	Double	130
2	New Hetauda- New Butwal	Double	300
3	New Butwal-Phulbari-Mainatara-Dododhara-Attariya-(Rupalgadh)-Pancheswor	Double	800
Total			**1230**

S.N.	400 kV Transmission Line (North- South)	Configuration	Length Circuit km
1	Dhungesangu-Inaruwa	Double	190
2	Arun 3 Hub- Inaruwa	Double	190
3	Tingla- Dudhkoshi St.- Mirchaiya	Double	190
4	Tingla HUB 2 (Lamane) - Dudhkoshi-4(Taksindu)	Double	32
5	New Khimti- Sunkoshi St. 3- Dhalkebar	Double	90
6	Ratmate-New Hetauda (MCC)	Double	110
7	Gumda- Ratmate	Double	110
8	Ratmate- Budhigandaki	Double	70
9	Damauli- New Butwal (MCC)	Double	160
10	Bafikot- Phulbari	Double	180
11	Dunai- Jagdulla- Nalsyaugadh	Double	150
12	Nalsyaugadh-(Bheri-4)-Mainatara	Double	168
13	Mugu Karnali- Phukot	Double	130
14	Phukot- Betan(Karnali Hub)-Dododhara	Double	180
15	Bajhang-West Seti	Double	120
16	West Seti - Dododhara	Double	150
Total			**2220**
S.N.	**400 kV Transmission Line (Mid Hill)**	**Configuration**	**Length Circuit km**
1	Hangpang(Change)-Arun 3-Tinla 2	Double	108
2	Tingla 2-New Khimti	Double	150
3	Lapsephedi-Ratmate- New Damauli (MCC)	Double	140
4	New Damauli-Burtibang-Bafikot	Double	220
5	Bafikot-Nalsyau-Phukot	Double	138
6	Uttarganga-Bafikot	Double	31
7	Phukot- West Seti-Pancheswor	Double	160
Total			**947**
S.N.	**220 kV Transmission Line (North- South)**	**Configuration**	**Length Circuit km**
1	Tamor HUB - Dhungesangu	Double	40
2	New Khimti- Upper Tamakoshi- Barhabise	Double	160
3	Borang(Ankhu)- Ratmate	Double	96
4	Khudi- New Damauli	Double	100
5	New Damauli- Bharatpur (Tanahu HPP)	Double	70
6	New Damauli-Lekhnath	Double	80
Total			**546**
S.N.	**132 kV Transmission Line (North- South)**	**Configuration**	**Length Circuit km**
1	Mewa- Dhungesangu	Double	60
2	Anarmani- Bhadrapur	Double	30
3	Dhalkebar-Balganga	Double	40
4	Dhalkebar- Loharpatti	Double	40
5	Lalbandhi-Salimpur	Double	40
6	Balefi-Barhabise	Double	44
7	Kohalpur-Nepalgunj	Double	40
8	Kohalpur-Surkhet-Dailekh	Double	132
9	Dailekh-Phukot- Jumla	Double	230
10	Balanch-Upper Kalangad - West Seti	Double	130
Total			**786**
S.N.	**132 kV Transmission Line (Mid Hill)**	**Configuration**	**Length Circuit km**
1	Amarpur- Dhungesangu	Double	36
2	Baneswor-Bhaktapur	Double	24
3	Kaligandaki-Ridi-Tamghash	Double	96
Total			**156**

NEPAL ELECTRICITY AUTHORITY

IPPs' Hydro Power Projects (Operation) as of FY 2074/75

S.N.	Developer	Projects	Location	Capacity (kW)	PPA Date	Commercial Operation Date
1	Himal Power Ltd.	Khimti Khola	Dolkha	60000	2052.10.01	2057.03.27
2	Bhotekoshi Power Company Ltd.	Bhotekoshi Khola	Sindhupalchowk	45000	2053.04.06	2057.10.11
3	Syange Electricity Company Limited	Syange Khola	Lamjung	183	2058.10.03	2058.10.10
4	National Hydro Power Company Ltd.	Indrawati - III	Sindhupalchowk	7500	2054.09.15	2059.06.21
5	Chilime Hydro Power Company Ltd.	Chilime	Rasuwa	22100	2054.03.11	2060.05.08
6	Butwal Power Company Ltd.	Jhimruk Khola	Pyuthan	12000	2058.03.29	1994
7	Butwal Power Company Ltd.	Andhi Khola	Syangza	9400	2058.03.29	2071.12.22
8	Arun Valley Hydropower Development Co. (P.) Ltd.	Piluwa Khola Small	Sankhuwasabha	3000	2056.10.09	2060.06.01
9	Rairang Hydro Power Development Co. (P) Ltd.	Rairang Khola	Dhading	500	2059.08.27	2061.08.01
10	Sanima Hydropower (Pvt.) Ltd.	Sunkoshi Small	Sindhupalchok	2500	2058.07.28	2061.12.11
11	Alliance Power Nepal Pvt.Ltd.	Chaku Khola	Sindhupalchok	3000	2056.11.03	2062.03.01
12	Khudi Hydropower Ltd.	Khudi Khola	Lamjung	4000	2058.03.04	2063.09.15
13	Unique Hydel Co. Pvt.Ltd.	Baramchi Khola	Sindhupalchowk	4200	2058.12.14	2063.09.27
14	Thoppal Khola Hydro Power Co. Pvt. Ltd.	Thoppal Khola	Dhading	1650	2059.11.23	2064.07.13
15	Gautam Buddha Hydropower (Pvt.) Ltd.	Sisne Khola Small	Palpa	750	2061.04.29	2064.06.01
16	Kathmandu Small Hydropower Systems Pvt. Ltd.	Sali Nadi	Kathmandu	250	2062.04.24	2064.08.01
17	Khoranga Khola Hydropower Dev. Co. Pvt. Ltd.	Pheme Khola	Panchtar	995	2057.12.31	2064.08.05
18	Unified Hydropower (P.) Ltd.	Pati Khola Small	Parbat	996	2062.10.28	2065.10.27
19	Task Hydropower Company (P.) Ltd.	Seti-II	Kaski	979	2063.06.08	2065.11.14
20	Ridi Hydropower Development Co. (P.) Ltd.	Ridi Khola	Gulmi	2400	2063.05.08	2066.07.10
21	Centre for Power Dev. And Services (P.) Ltd.	Upper Hadi Khola	Sindhupalchowk	991	2064.04.07	2066.07.22
22	Gandaki Hydro Power Co. Pvt. Ltd.	Mardi Khola	Kaski	4800	2060.07.07	2066.10.08
23	Himal Dolkha Hydropower Company Ltd.	Mai Khola	Ilam	4500	2063.11.19	2067.10.14
24	Baneswor Hydropower Pvt. Ltd.	Lower Piluwa Small	Sankhuwasabha	990	2064.07.21	2068.04.01
25	Barun Hydropower Development Co. (P.) Ltd.	Hewa Khola	Sankhuwasabha	4455	2061.04.02	2068.04.17
26	Bhagawati Hydropower Development Co. (P.) Ltd.	Bijayapur-1	Kaski	4410	2066.03.30	2069.05.04
27	Kathmandu Upatyaka Khanepani Bewasthapan Board	Solar	Lalitpur	680.4	2069.06.12	2069.07.15
28	Nyadi Group (P.) Ltd.	Siuri Khola	Lamjung	4950	2064.04.17	2069.07.30
29	United Modi Hydropwer Pvt. Ltd.	Lower Modi 1	Parbat	10000	2065.10.20	2069.08.10
30	Synergy Power Development (P.) Ltd.	Sipring Khola	Dolkha	9658	2065.10.20	2069.10.03
31	Laughing Buddha Power Nepal (P.) Ltd.	Middle Chaku	Sindhupalchowk	1800	2066.11.03	2069.11.15
32	Aadishakti Power Dev. Company (P.) Ltd.	Tadi Khola (Thaprek)	Nuwakot	5000	2061.12.15	2069.12.14
33	Ankhu Khola Jal Bidhyut Co. (P.) Ltd.	Ankhu Khola - 1	Dhading	8400	2066.02.22	2070.05.05
34	Nepal Hydro Developer Pvt. Ltd.	Charanawati Khola	Dolakha	3520	2067.01.13	2070.02.24
35	Laughing Buddha Power Nepal Pvt. Ltd.	Lower Chaku Khola	Sindhupalchowk	1800	2063.07.02	2070.04.24
36	Bhairabkunda Hydropower Pvt. Ltd.	Bhairab Kunda	Sindhupalchowk	3000	2065.08.02	2071.02.22

37	Radhi Bidyut Company Ltd.	Radhi Khola	Lamjung	4400	2066.10.18	2071.02.31
38	Pashupati Environmental Eng. Power Co. Pvt. Ltd.	Chhote Khola	Gorkha	993	2067.11.09	2071.03.09
39	Mailung Khola Hydro Power Company (P.) Ltd.	Mailung Khola	Rasuwa	5000	2058.04.09	2071.03.19
40	Joshi Hydropower Development Company Limited	Upper Puwa -1	Illam	3000	2066.01.23	2071.10.01
41	Sanima Mai Hydropower Limited	Mai Khola	Ilam	22000	2067.01.08	2071.10.14
42	Bojini Company Private Limited	Jiri Khola Small	Dolkha	2200	2065.10.23	2071.11.01
43	Ruru Hydropower Project (P) Ltd.	Upper Hugdi Khola	Gulmi	5000	2066.04.04	2071.12.09
44	Prime Hydropower Co. Pvt. Ltd.	Belkhu	Dhading	518	2064.04.04	2071.12.30
45	Api Power Company Pvt. Ltd.	Naugadh gad Khola	Darchula	8500	2067.01.19	2072.05.02
46	Kutheli Bukhari Small Hydropower (P).Ltd	Suspa Bukhari	Dolakha	998	2069.04.32	2072.06.03
47	Sanima Mai Hydropower Ltd.	Mai Cascade	Ilam	7000	2069.10.12	2072.10.29
48	Chhyangdi Hydropower Limited	Chhandi	Lamjung	2000	2068.12.23	2072.12.13
49	Panchakanya Mai Hydropower Ltd. (Previously Mai Valley and prior to that East Nepal)	Upper Mai Khola	Ilam	9980	2061.12.19	2073.03.09
50	Sayapatri Hydropower Private Limited	Daram Khola A	Baglung	2500	2068.12.19	2073.03.12
51	Electro-com and Research Centre Pvt. Ltd.	Jhyadi Khola	Sindhupalchowk	2000	2067.01.30	2073.05.31
52	Khani Khola Hydropower Company Pvt. Ltd.	Tungun-Thosne	Lalitpur	4360	2069.04.05	2073.07.09
53	Daraudi Kalika Hydro Pvt. Ltd.	Daraudi Khola A	Gorkha	6000	2068.05.19	2073.08.13
54	Khani Khola Hydropower Company Pvt. Ltd.	Khani Khola	Lalitpur	2000	2069.04.05	2073.08.20
55	Sapsu Kalika Hydropower Co. Pvt. Ltd.	Miya Khola	Khotang	996	2069.08.10	2073.09.03
56	Sinohydro-Sagarmatha Power Company (P) Ltd.	Upper Marsyangdi "A"	Lamjung	50000	2067.09.14	2073.09.17
57	Madi Power Pvt. Ltd.	Upper Madi	Kaski	25000	2066.05.21	2073.09.25
58	Panchthar Power Company Pvt. Ltd.	Hewa Khola A	Panchthar	14900	2068.05.30	2073.10.22
59	Sanvi Energy pvt. Ltd.	Jogmai	Ilam	7600	2069.08.07	2074.01.18
60	Bhugol Energy Dev Compay (P). Ltd	Dwari Khola	Dailekha	3750	2069.12.30	2074.1.23
61	Mai Valley Hydropower Private Limited	Upper Mai C	Ilam	5100	2068.12.23	2074.04.09
62	Dronanchal Hydropower Co.Pvt.Ltd	Dhunge-Jiri	Dolakha	600	2068.09.25	2074.06.01
63	Dibyaswari Hydropower Limited	Sabha Khola	Sankhuwasabha	4000	2068.11.17	2074.06.02
64	Puwa Khola-1 Hydropower P. Ltd.	Puwa Khola -1	Ilam	4000	2070.10.09	2074.06.23
65	Shibani Hydropower Co. Pvt. Ltd.	Phawa Khola	Taplejung	4950	2063.12.01	2074.07.14
66	Mount Kailash Energy Pvt. Ltd.	Thapa Khola	Myagdi	13600	2067.10.11	2074.08.22
67	Mandakini Hydropower Limited	Sardi Khola	Kaski	4000	2068.11.11	2074.08.23
68	Garjang Upatyaka Hydropower (P.) Ltd.	Chake Khola	Ramechhap	2830	2065.11.06	2074.08.28
69	Union Hydropower Pvt Ltd.	Midim Karapu	Lamjung	3000	2069.10.28	2074.10.15
70	Syauri Bhumey Microhydro Project	Syauri Bhumey	Nuwakot	23	2072.11.16	2074.10.18
71	Molung Hydropower Company Pvt. Ltd.	Molung Khola	Okhaldhunga	7000	2069.11.21	2074.12.12
72	Sikles Hydropower Pvt. Ltd.	Madkyu Khola	Kaski	13000	2066.08.03	2074.12.19
73	Himal Dolkha Hydropower Company Ltd.	Mai sana Cascade	Ilam	8000	2069.11.14	2074.12.26
74	Barahi Hydropower Pvt.ltd	Theule Khola	Baglung	1500	2066.12.16	2074.3.24
75	Leguwa Khola Laghu Jalbidhyut Sahakari Sastha Ltd.	Leguwa Khola	Dhankuta	40	2072.11.21	2074.03.28
			TOTAL	**512,695.40**		

NEPAL ELECTRICITY AUTHORITY

IPPs' Hydropower Projects (Under Construction) as of FY 2074/75

(Financial Closure concluded projects)

S.N.	Developers	Projects	Location	Installed Capacity (kW)	PPA Date	Required Commercial Operation Date
1	Eastern Hydropower Pvt. Ltd.	Pikhuwa Khola	Bhojpur	5000	2066.07.24	2076.03.30
2	Upper Tamakoshi Hydropower Ltd.	Upper Tamakoshi	Dolkha	456000	2067.09.14	2072.9.10 - 4 Units, 2073.3.30 - 2 Units
3	Nama Buddha Hydropower Pvt. Ltd.	Tinau Khola Small	Palpa	1665	2065.03.31	2066.11.1 (990kw) 2077.09.15 (675kw)
4	Himalayan Hydropower Pvt. Ltd.	Namarjun Madi	Kaski	11800	2066.05.30	2071.4.1
5	Jumdi Hydropower Pvt. Ltd.	Jumdi Khola	Gulmi	1750	2066.10.21	2069.10.11
6	Hira Ratna Hydropower P.ltd	Tadi Khola	Nuwakot	5000	2067.01.09	2075.10.01
7	Energy Engineering Pvt. Ltd.	Upper Mailung A	Rasuwa	6420	2067.03.25	2075.10.01
8	Teleye Samyak Hydropower Company Pvt. Ltd.	Dhansi Khola	Rolpa	955	2067.04.12	2069.11.28
9	Shiva Shree Hydropower (P.) Ltd.	Upper Chaku A	Sindhupalchowk	22200	2067.05.22	2073.01.25
10	Greenlife Energy Pvt. Ltd.	Khani khola-1	Dolakha	40000	2067.06.24 2074.02.21	2074.12.17 (25MW) 2076.09.03 (15MW)
11	Himalaya Urja Bikas Co. Pvt. Ltd.	Upper Khimti	Ramechhap	12000	2067.10.09	2075.3.32
12	Green Ventures Pvt. Ltd.	Likhu-IV	Ramechhap	52400	2067.10.19	2077.06.30
13	Robust Energy Ltd.	Mistri Khola	Myagdi	42000	2067.10.20	2076.05.14
14	Manang Trade Link Pvt. Ltd.	Lower Modi	Parbat	20000	2068.05.20	2074.3.31
15	Mathillo Mailung Khola Jalbidhyut Ltd. (Prv. Molnia Power Ltd.)	Upper Mailun	Rasuwa	14300	2068.05.23	2075.10.01
16	Sanjen Hydropower Co.Limited	Upper Sanjen	Rasuwa	14800	2068.06.23	2075.10.01
17	Middle Bhotekoshi Jalbidhyut Company Ltd.	Middle Bhotekoshi	Sindhupalchowk	102000	2068.07.28	2076.12.28
18	Chilime Hydro Power Company Ltd.	Rasuwagadhi	Rasuwa	111000	2068.07.28	2075.10.01
19	Water and Energy Nepal Pvt. Ltd.	Badi Gad	Baglung	6600	2068.08.13	2072.2.14
20	Sanjen Hydropower Company Limited	Sanjen	Rasuwa	42500	2068.08.19	2075.10.01
21	Gelun Hydropower Co.Pvt.Ltd	Gelun	Sindhupalchowk	3200	2068.09.25	2074.06.14
22	Dariyal Small Hydropower Pvt.Ltd	Upper Belkhu	Dhading	750	2068.11.28	2071.7.16
23	Suryakunda Hydroelectric Pvt. Ltd.	Upper Tadi	Nuwakot	11000	2068.12.03	2075.10.01
24	Himalayan Power Partner Pvt. Ltd.	Dordi Khola	Lamjung	27000	2069.03.01	2076.05.14
25	Sasha Engingeering Hydropower (P). Ltd	Khani Khola(Dolakha)	Dolakha	30000	2069.03.25	2074.12.17
26	Arun Kabeli Power Ltd.	Kabeli B-1	Taplejung, Panchthar	25000	2069.03.29	2075.01.09
27	Rising Hydropower Compnay Ltd.	Selang Khola	Sindhupalchowk	990	2069.03.31	2071.6.15
28	Liberty Hydropower Pvt. Ltd.	Upper Dordi A	Lamjung	25000	2069.06.02	2076.05.14
29	Hydro Innovation Pvt. Ltd.	Tinekhu Khola	Dolakha	990	2069.06.08	2074.12.30
30	Salankhu Khola Hydropower Pvt. Ltd.	Salankhu Khola	Nuwakot	2500	2069.06.14	2071.11.30
31	Moonlight Hydropower Pvt. Ltd.	Balephi A	Sindhupalchowk	10600	2069.07.14	2076.12.28
32	Middle Modi Hydropower Ltd.	Middle Modi	Parbat	15100	2069.08.21	2077.03.31
33	Reliable Hydropower Co. Pvt. Ltd.	Khorunga Khola	Terhathum	4800	2069.08.26	2077.08.16
34	Rara Hydropower Development Co. Pvt. Ltd.	Upper Parajuli Khola	Dailekh	2150	2069.08.28	2071.12.17
35	Lohore Khola Hydropower Co. Pvt. Ltd.	Lohore Khola	Dailekh	4200	2069.09.08	2073.06.20

36	Beni Hydropower Project Pvt. Ltd.	Upper Solu	Solukhumbu	18000	2069.09.16	2074.10.01
37	Dudhkoshi Power Company Pvt. Ltd.	Rawa Khola	Khotang	6500	2069.09.26	2073.05.31
38	Universal Power Company Ltd.	Lower Khare	Dolakha	11000	2069.10.22	2074.9.16 (8.26MW) 2076.04.03 (2.74MW)
39	Mandu Hydropower Ltd.	Bagmati Khola Small	Makawanpur/ Lalitpur	22000	2069.10.07	2076.03.30 (20MW) 2077.05.30 (2MW)
40	Madhya Midim Jalbidhyut Company P. Ltd.	Middle Midim	Lamjung	3100	2069.10.23	2072.5.1
41	Volcano Hydropower Pvt. Ltd.	Teliya Khola	Dhankuta	996	2069.10.25	2071.7.24
42	Bindhyabasini Hydropower Development Co. (P.) Ltd.	Rudi Khola A	Lamjung and Kaski	8800	2069.10.28	2076.02.32
43	Betrawoti Hydropower Company (P).Ltd	Phalankhu Khola	Rasuwa	13700	2069.12.06	2075.10.01
44	Himalaya Urja Bikas Co. Ltd.	Upper Khimti II	Ramechhap	7000	2069.12.09	2075.12.01
45	Salmanidevi Hydropower (P). Ltd	Kapadi Gad	Doti	3330	2069.12.11	2073.08.15
46	Dovan Hydropower Company Pvt. Ltd.	Junbesi Khola	Solukhumbu	5200	2069.12.29	2076.08.30
47	Ghalemdi Hydro Limited (Previously, Cemat Power Dev Company (P). Ltd.)	Ghalemdi Khola	Myagdi	5000	2069.12.30	2074.07.30 (4MW) 2077.05.03(1MW)
48	Tallo Midim Jalbidhut Company Pvt. Ltd.	Lower Midim	Lamjung	996	2070.01.19	2071.8.1
49	Rairang Hydropower Development Company Ltd.	Iwa Khola	Taplejung	9900	2070.01.29	2075.4.1
50	Tangchhar Hydro Pvt. Ltd	Tangchhahara	Mustang	2200	2070.02.20	2073.7.1
51	Abiral Hydropower Co. Pvt. Ltd.	Upper Khadam	Morang	990	2070.02.21	2071.08.01
52	Manakamana Engineering Hydropower Pvt. Ltd.	Ghatte Khola	Dolakha	5000	2070.04.28	2075.03.16
53	Essel-Clean Solu Hydropower Pvt. Ltd.	Lower Solu	Solukhumbu	82000	2070.07.15	2076.8.30
54	Consortium Power Developers Pvt. Ltd.	Khare Khola	Dolakha	24100	2070.07.15	2075.08.15
55	Upper Solu Hydroelectric Company Pvt. Ltd	Solu Khola	Solukhumbu	23500	2070.07.24	2075.4.1
56	Singati Hydro Energy Pvt. Ltd.	Singati Khola	Dolakha	25000	2070.07.27	2075.05.31 (16MW) 2077.04.01 (9MW)
57	Maya Khola Hydropower Co. Pvt. Ltd.	Maya Khola	Sankhuwasabha	14900	2070.08.30	2076.9.1
58	Idi Hydropower Co. P. Ltd.	Idi Khola	Kaski	975	2070.09.01	2074.09.16
59	Buddha Bhumi Nepal Hydro Power Co. Pvt. Ltd.	Lower Tadi	Nuwakot	4993	2070.12.10	2075.10.01
60	Mountain Hydro Nepal Pvt. Ltd.	Tallo Hewa Khola	Panchthar	21600	2071.4.9	2075.01.09
61	Bindhyabasini Hydropower Development Co. (P.) Ltd.	Rudi Khola B	Lamjung and Kaski	6600	2071.4.20	2076.02.32
62	Dordi Khola Jal Bidyut Company Ltd.	Dordi-1 Khola	Lamjung	10300	2071.07.19	2076.08.16
63	River Falls Hydropower Development Pvt. Ltd.	Down Piluwa	Sankhuwasabha	9500	2071.10.18	2076.09.01
64	Rangoon Khola Hydropower Pvt. Ltd.	Jeuligad Small	Bajhang	996	2071.10.20	2075.03.32
65	Peoples' Hydropower Company Pvt. Ltd.	Super Dordi 'Kha'	Lamjung	49600	2071.11.13	2077.03.29
66	Hydro Venture Private Limited	Solu Khola (Dudhkoshi)	Solukhumbu	86000	2071.11.13	2077.06.10
67	Global Hydropower Associate Pvt. Ltd.	Likhu-2	Solukhumbu/ Ramechap	33400	2071.11.19	2077.04.01
68	Paan Himalaya Energy Private Limited	Likhu-1	Solukhumbu/ Ramechap	51400	2071.11.19	2077.04.01
69	Numbur Himalaya Hydropower Pvt. Ltd.	Likhu Khola A	Solukhumbu/ Ramechap	24200	2071.11.22	2077.04.01
70	Dipsabha Hydropower Pvt. Ltd.	Sabha Khola A	Sankhuwasabha	9990	2071.12.02	2076.07.15
71	Research and Development Group Pvt. Ltd.	Rupse Khola	Myagdi	4000	2071.12.17	2076.08.02
72	Hydro Empire Pvt. Ltd.	Upper Myagdi	Myagdi	20000	2071.12.17	2077.05.30
73	Chandeshwori Mahadev Khola MH. Co. Pvt. Ltd.	Chulepu Khola	Ramechhap	8520	2071.12.23	2075.04.15

74	Nyadi Hydropower Limited	Nyadi	Lamjung	30000	2072.02.12	2077.01.06
75	Suri Khola Hydropower Pvt. Ltd.	Suri Khola	Dolakha	6400	2072.02.20	2074.12.30
76	Bungal Hydro Pvt. Ltd. (Previously Sanigad Hydro Pvt. Ltd.)	Upper Sanigad	Bajhang	10700	2072.03.15	2076.05.29
77	Kalanga Hydro Pvt. Ltd.	Kalangagad	Bajhang	15330	2072.03.15	2076.05.29
78	Sanigad Hydro Pvt. Ltd.	Upper Kalangagad	Bajhang	38460	2072.03.15	2077.04.15
79	Dhaulagiri Kalika Hydro Pvt. Ltd.	Darbang-Myagdi	Myagdi	25000	2072.04.28	2075.12.25
80	Menchhiyam Hydropower Pvt. Ltd.	Upper Piluwa Khola 2	Sankhuwasabha	4720	2072.05.11	2076.04.01
81	Kabeli Energy Limited	Kabeli-A	Panchthar and Taplejung	37600	2072.06.07	2076.11.03
82	Upper Syange Hydropower P. Ltd.	Upper Syange Khola	Lamjung	2400	2072.06.14	2075.10.01
83	Peoples Energy Ltd. (Previously Peoples Hydro Co-operative Ltd.)	Khimti-2	Dolakha and Ramechhap	48800	2072.06.14	2078.04.01
84	Chauri Hydropower (P.) Ltd.	Chauri Khola	Kavrepalanchowk, Ramechhap, Sindhupalchowk, Dolakha	5000	2072.06.14	2075.12.30
85	Pashupati Environmental Power Co. Pvt. Ltd.	Lower Chhote Khola	Gorkha	997	2072.08.04	2076.05.15
86	Huaning Development Pvt. Ltd.	Upper Balephi A	Sindhupalchowk	36000	2072.08.29	2075.10.06
87	Upper Hewa Khola Hydropower Co. Pvt. Ltd.	Upper Hewa Khola Small	Sankhuwasabha	8500	2072.09.23	2076.03.17
88	Multi Energy Development Pvt. Ltd.	Langtang Khola	Rasuwa	20000	2072.09.29	2076.12.30 (10MW) 2078.04.03 (10MW)
89	Ankhu Hydropower (P.) Ltd.	Ankhu Khola	Dhading	34000	2073.01.30	2076.12.30
90	Myagdi Hydropower Pvt. Ltd.	Ghar Khola	Myagdi	14000	2073.02.11	2076.08.30 (8.3 MW) 2078.10.17 (5.7 MW)
91	Richet Jalbidhyut Company Pvt. Ltd.	Richet Khola	Gorkha	4980	2073.02.23	2075.03.31
92	United Idi Mardi and R.B. Hydropower Pvt. Ltd.	Upper Mardi	Kaski	7000	2073.02.25	2075.04.01
93	Rapti Hydro and General Construction Pvt. Ltd.	Rukumgad	Rukum	5000	2073.03.07	2076.09.01
94	Rawa Energy Development Pvt. Ltd.	Upper Rawa	Khotang	2800	2073.04.24	2076.03.30
95	Siddhi Hydropower Company Pvt. Ltd.	Siddhi Khola	Illam	10000	2074.05.29	2077.03.31
96	Api Power Company Pvt. Ltd.	Upper Naugad Gad	Darchula	8000	2073.07.12	2077.04.01
97	Terhathum Power Company Pvt. Ltd.	Upper Khorunga	Terhathum	7500	2073.07.29	2076.09.01
98	Nilgiri Khola Hydropower Co. Ltd.	Nilgiri Khola	Myagdi	38000	2073.11.30	2080.08.30
99	Super Mai Hydropower Pvt. Ltd.	Super Mai	Illam	7800	2073.12.06	2077.04.01
100	Siuri Nyadi Power Pvt. Ltd.	Super Nyadi	Lamjung	40270	2074.02.19	2079.04.01
101	Swet-Ganga Hydropower and Construction Ltd.	Lower Likhu	Ramechhap	28100	2073.09.14	2078.08.15
102	Nilgiri Khola Hydropower Co. Ltd.	Nilgiri Khola-2	Myagdi	62000	2074.03.05	2081.08.30
103	Sano Milti Khola Hydropower Ltd.	Sano Milti	Ramechhap and Dolakha	3000	2073.01.13	2075.08.01
104	Diamond Hydropower Pvt. Ltd.	Upper Daraudi-1	Gorkha	10000	2072.08.14	2075.09.17
105	Chhyangdi Hydropower Limited	Upper Chhyangdi Khola	Lamjung	4000	2074.03.22	2078.04.05
106	Taksar-Pikhuwa Hydropower Pvt. Ltd.	Taksar Pikhuwa	Bhojpur	8000	2073.09.01	2076.10.23
107	Rasuwa Hydropower Pvt. Ltd	Phalanku Khola	Rasuwa	5000	2071.08.24	2076.08.01
			TOTAL	**2,356,313**		

NEPAL ELECTRICITY AUTHORITY

IPPs' Hydropower Projects in Different Stages of Development as of FY 2074/75

(Without Financial Closure)

S.N.	Developers	Projects	Location	Installed Capacity (kW)	PPA Date	RCOD
1	Balephi Jalbidhyut Co. Ltd.	Balephi	Sindhupalchowk	23520	2067.09.08	2077.06.30
2	Ingwa Hydro Power Pvt. Ltd	Upper Ingwa khola	Taplejung	9700	2068.03.10	2073.04.01
3	Deurali Bahuudesiya Sahakari Sanstha Ltd.	Midim Khola	Lamjung	100	2070.02.20	2070.5.1
4	Ludee Hydropower Development Co. Pvt.Ltd	Ludee Khola	Gorkha	750	2071.4.21	2073.4.1
5	Makari Gad Hydropower Pvt. Ltd.	Makarigad	Darchula	10000	2072.08.29	2076.02.32
6	Civil Hydropower Pvt. Ltd.	Bijayapur 2 Khola Small	Kaski	4500	2072.09.12	2075.03.32
7	Yambling Hydropower Pvt. Ltd.	Yambling Khola	Sindhupalchowk	7270	2072.09.29	2077.03.17
8	United Modi Hydropwer Ltd.	Lower Modi 2	Parbat	10500	2072.11.14	2076.03.17
9	Salasungi Power Limited	Sanjen Khola	Rasuwa	78000	2072.12.02	2077.03.08
10	Siddhakali Power Limited	Trishuli Galchi	Nuwakot and Dhading	75000	2073.02.20	2077.02.01
11	Him River Power Pvt. Ltd.	Liping Khola	Sindhupalchowk	16260	2073.02.28	2077.01.22
12	Chirkhwa Hydropower Pvt. Ltd.	Upper Chirkhwa	Bhojpur	4700	2073.03.01	2077.04.01
13	Energy Venture Pvt. Ltd.	Upper Lapche	Dolakha	52000	2073.04.20	2078.12.30
14	Sindhujwala Hydropower Ltd.	Upper Nyasem	Sindhupalchowk	41400	2073.07.24	2077.03.30
15	Samling Power Company Pvt. Ltd.	Mai Beni	Illam	9008	2073.07.26	2078.08.02
16	Tamor Sanima Energy Pvt. Ltd.	Middle Tamor	Taplejung	52100	2073.09.26	2078.05.28
17	Daram Khola Hydro Energy Ltd.	Daram Khola	Baglung and Gulmi	7300	2073.10.09	2076.09.08
18	Pahadi Hydro Power Company (P.) Ltd.	Madhya Tara Khola Small	Baglung	1700	2073.10.26	2075.08.29
19	Himal Hydro and General Construction Ltd.	Super Madi	Kaski	44000	2073.10.27	2078.02.28
20	Sisa Hydro Electric Company Pvt. Ltd.	Sisa Khola A	Solukhumbu	2800	2073.10.28	2077.12.12
21	Chirkhwa Hydropower Pvt. Ltd.	Lower Chirkhwa	Bhojpur	4060	2074.01.20	2078.04.01
22	Him Consult Pvt. Ltd.	Rele Khola	Myagdi	6000	2074.01.28	2077.02.19
23	Himali Rural Electric Co-operative Ltd.	Leguwa Khola Small	Dhankuta	640	2074.02.08	2075.12.28
24	Sabha Pokhari Hydro Power (P.) Ltd.	Lankhuwa Khola	Sankhuwasabha	5000	2074.02.21	2077.09.14
25	United Mewa Khola Hydropower Pvt. Ltd.	Mewa Khola	Taplejung	50000	2074.02.21	2078.04.01
26	Parbat Paiyun Khola Hydropower Company Pvt. Ltd.	Seti Khola	Parbat	3500	2074.02.22	2076.12.30
27	Sewa Hydro Ltd.	Lower Selang	Sindhupalchowk	1500	2074.02.22	2075.12.30
28	Gorakshya Hydropower Pvt. Ltd.	Super Ankhu Khola	Dhading	23500	2074.03.15	2080.09.15
29	Orbit Energy Pvt. Ltd. (Previously Pokhari Hydropower Company Pvt. Ltd.)	Sabha Khola B	Sankhuwasabha	15100	2074.03.26	2078.2.31
30	Nyam Nyam Hydropower Company Pvt. Ltd.	Nyam Nyam Khola	Rasuwa	6000	2074.03.27	2077.12.31
31	Surya Power Company Pvt. Ltd.	Bishnu Priya Solar Farm Project	Nawalparasi	960	2074.04.08	2074.04.17
32	Saptang Hydro Power Pvt. Ltd.	Saptang Khola	Nuwakot	2500	2074.04.08	2076.04.12
33	Jhyamolongma Hydropower Development Company Pvt. Ltd.	Karuwa Seti	Kaski	32000	2074.04.20	2079.01.12
34	Century Energy Pvt. Ltd.	Hadi Khola Sunkoshi A	Sindhupalchowk	997	2074.05.05	2076.11.03
35	People's Power Limited	Puwa - 2	Illam	4960	2074.05.05	2078.06.11
36	Trishuli Hydropower Company Ltd.	Upper Trishuli 3B	Rasuwa	37000	2074.05.06	2078.11.17
37	Mount Nilgiri Hydropower Company Pvt. Ltd.	Rurubanchu-1	Kalikot	13500	2074.05.08	2077.11.03
38	Bhujung Hydropower Pvt. Ltd.	Upper Midim	Lamjung	7500	2074.05.29	2078.04.01
39	Himalayan Water Resources and Energy Development Co. Pvt. Ltd.	Upper Chauri	Kavrepalanchowk	6000	2074.07.27	2078.04.04

40	Nasa Hydropower Pvt. Ltd.	Lapche Khola	Dolakha	99400	2074.07.29	2079.04.14
41	Dolti Power Company Pvt. Ltd.	Padam Khola	Dailekh	4800	2074.08.01	2077.11.08
42	IDS Energy Pvt. Ltd.	Lower Khorunga	Terhathum	5400	2074.08.24	2078.04.01
43	Langtang Bhotekoshi Hydropower Company Pvt. Ltd.	Rasuwa Bhotekoshi	Rasuwa	120000	2074.09.07	2078.09.07
44	Upper Richet Hydropower Pvt. Ltd.	Upper Richet	Gorkha	2000	2074.09.20	2077.04.01
45	Him Star Urja Co. Pvt. Ltd.	Buku Kapati	Okhaldhunga and Solukhumbu	5000	2074.10.11	2077.04.15
46	Khechereswor Jal Vidhyut Pvt. Ltd.	Jadari Gad Small	Bajhang	1000	2074.10.12	2077.07.30
47	Khechereswor Jal Vidhyut Pvt. Ltd.	Salubyani Gad Small	Bajhang	233	2074.10.12	2077.09.29
48	Nepal Water and Energy Development Company Pvt. Ltd.	Upper Trishuli - 1	Rasuwa	216000	2074.10.14	2080.12.18
49	Gaughar Ujjyalo Sana Hydropower Co. Pvt. Ltd.	Ghatte Khola Small	Sindhupalchowk	970	2074.11.11	2077.03.01
50	Unitech Hydropower Co. Pvt. Ltd.	Upper Phawa	Taplejung	5800	2074.11.11	2078.04.16
51	Seti Khola Hydropower Pvt. Ltd.	Seti Khola	Kaski	22000	2074.11.11	2079.04.15
52	Sagarmatha Jalabidhyut Company Pvt. Ltd.	Super Mai 'A'	Illam	9600	2074.11.14	2077.09.29
53	Chimal Gramin Bidhyut Sahakari Sanstha Ltd.	Sobuwa Khola-2 MHP	Taplejung	90	2074.11.15	2074.11.30
54	Vision Energy and Power Pvt. Ltd.	Nupche Likhu	Ramechhap	57500	2074.11.28	2080.05.02
55	Omega Energy Developer Pvt. Ltd.	Sunigad	Bajhang	11050	2074.11.30	2080.02.07
56	Mai Khola Hydropower Pvt. Ltd.	Super Mai Cascade	Illam	3800	2074.12.07	2078.04.01
57	Asian Hydropower Pvt. Ltd.	Lower Jogmai	Illam	6200	2074.12.07	2078.04.01
58	Gaurishankar Power Development Pvt. Ltd.	Middle Hyongu Khola B	Solukhumbu	22900	2074.12.08	2079.04.01
59	Upper Lohore Khola Hydropower Co.Pvt.Ltd.	Upper Lohore	Dailekh	4000	2074.12.08	2077.04.11
60	Super Hewa Power Company Pvt. Ltd.	Super Hewa	Sankhuwasabha	5000	2074.12.27	2078.04.01
61	Khimti Gramin Bidhyut Sahakari Sanstha Ltd.	Jhankre Khola Small	Dolakha	600	2075.02.04	2076.05.14
62	Baraha Multipower Pvt. Ltd.	Irkhuwa Khola B	Bhojpur	15524	2075.02.14	2079.04.15
63	Aashutosh Energy Pvt. Ltd.	Chepe Khola Small	Lamjung	8630	2075.02.15	2078.11.09
64	Lower Irkhuwa Hydropower Co. Pvt. Ltd.	Lower Irkhuwa	Bhojpur	13040	2075.02.16	2079.04.03
65	Sungava Foundation Pvt. Ltd.	Thulo Khola	Myagdi	21300	2075.02.17	2079.04.15
66	Jhilimili Hydropower Co. Pvt. Ltd.	Gulangdi Khola	Gulmi	980	2075.02.24	2078.01.14
67	North Summit Hydro Pvt. Ltd.	Nyadi Phidi	Lamjung	21400	2075.02.24	2079.12.15
68	Himali Hydro Fund Pvt. Ltd.	Sona Khola	Taplejung	9000	2075.03.14	2080.07.30
69	Tanahun Hydropower Ltd.	Tanahun	Tanahun	140000	2075.03.15	2080.12.30
70	Sailung Power Company Pvt. Ltd.	Bhotekoshi-1	Sindhupalchowk	40000	2075.03.15	2079.07.01
71	Jalshakti Hydro Company Pvt. Ltd.	Ilep (Tatopani)	Dhading	23675	2075.03.25	2081.08.25
72	Three Star Hydropower Company Ltd.	Sapsup Khola	Khotang	6600	2075.03.25	2078.06.31
73	Tundi Power Pvt.Ltd	Rahughat Mangale	Myagdi	35500	2075.03.29	2079.08.29
74	Tundi Power Pvt.Ltd	Upper Rahughat	Myagdi	48500	2075.03.29	2080.08.29
			Total	**1,658,817**		

NEPAL ELECTRICITY AUTHORITY

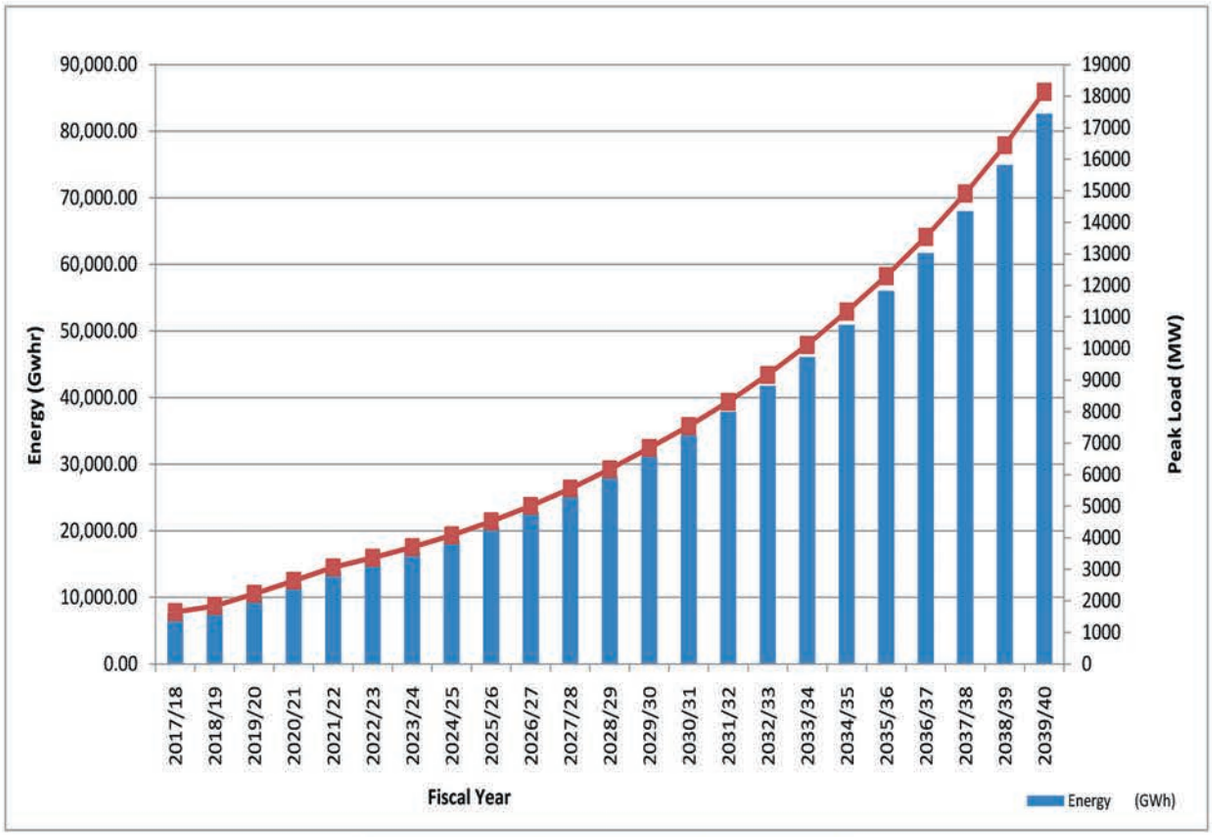
IPPs' Hydro Power Projects (Terminated Projects) in FY 2074/75

S.N.	Developer	Project	Location	Capacity (kW)	Reason for Termination
1	TMB Energietechnik	Narayani Shankar Biomass	Rupandehi	600	Event of Default
2	Jywala Sajhedari Hydropower Company Pvt. Ltd.	Tame Khola	Dailekh	1250	Event of Default
			Total	**1850**	

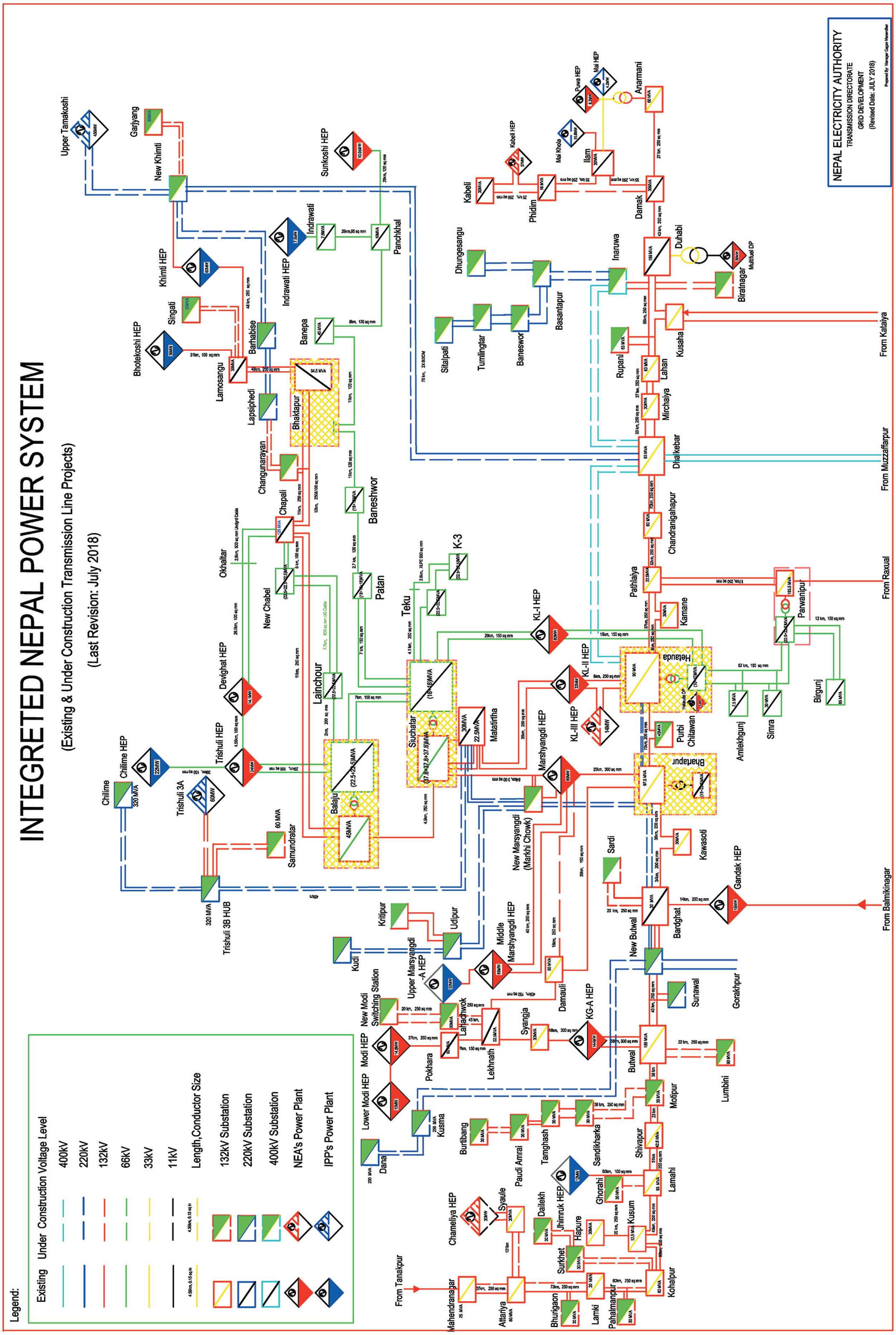
IPPs' Hydro Power Projects for which Notice of Default was issued in FY 2074/75

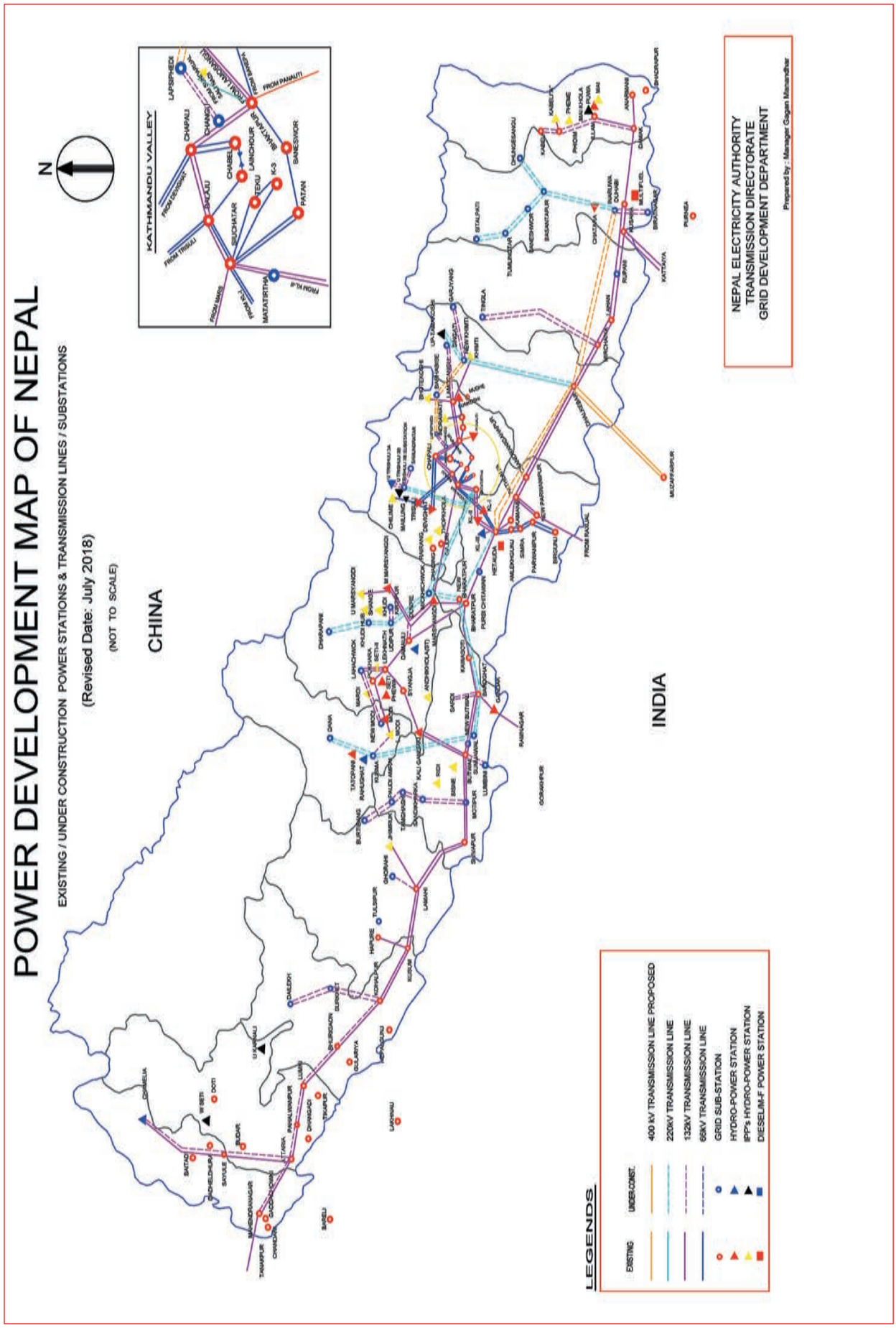
S.N.	Developers	Projects	Location	Installed Capacity (kW)	PPA Date
1	Jumdi Hydropower Pvt. Ltd.	Jumdi Khola	Gulmi	1750	2066.10.21
2	Teleye Samyak Hydropower Company Pvt. Ltd.	Dhansi Khola	Rolpa	955	2067.04.12
3	Ingwa Hydro Power Pvt. Ltd	Upper Ingwa khola	Taplejung	9700	2068.03.10
4	Water and Energy Nepal Pvt. Ltd.	Badi Gad	Baglung	6600	2068.08.13
5	Salankhu Khola Hydropower Pvt. Ltd.	Salankhu Khola	Nuwakot	2500	2069.06.14
6	Lohore Khola Hydropower Co. Pvt. Ltd.	Lohore Khola	Dailekh	4200	2069.09.08
7	Volcano Hydropower Pvt. Ltd.	Teliya Khola	Dhankuta	996	2069.10.25
8	Tallo Midim Jalbidhut Company Pvt. Ltd.	Lower Midim	Lamjung	996	2070.01.19
9	Tangchhar Hydro Pvt. Ltd	Tangchhahara	Mustang	2200	2070.02.20
10	Ludee Hydropower Development Co. Pvt. Ltd.	Ludee Khola	Gorkha	750	2071.04.21
			Total	**30,647**	

Load Forecast



Fiscal Years	Energy (GWh)	Peak Load (MW)
2017/18	7,489.62	1644.19
2018/19	8,391.28	1842.13
2019/20	10,138.28	2225.65
2020/21	12,017.96	2638.29
2021/22	13,952.00	3062.87
2022/23	15,332.65	3365.97
2023/24	16,869.13	3703.27
2024/25	18,579.53	4078.75
2025/26	20,585.22	4519.06
2026/27	22,826.63	5011.11
2027/28	25,332.50	5561.23
2028/29	28,111.30	6171.26
2029/30	31,196.38	6848.52
2030/31	34,355.49	7542.04
2031/32	37,861.08	8311.62
2032/33	41,754.21	9166.27
2033/34	46,079.83	10115.87
2034/35	50,887.42	11171.28
2035/36	56,007.87	12295.37
2036/37	61,677.62	13540.05
2037/38	67,957.59	14918.68
2038/39	74,913.54	16445.72
2039/40	82,620.73	18137.67


INTEGRATED NEPAL POWER SYSTEM
(Existing & Under Construction Transmission Line Projects)
(Last Revision: July 2018)
Legend:
Existing
Under Construction
Voltage Level
400kV
220kV
132kV
66kV
33kV
11kV
Length,Conductor Size
132kV Substation
220kV Substation
400kV Substation
NEA's Power Plant
IPP's Power Plant
NEPAL ELECTRICITY AUTHORITY
TRANSMISSION DIRECTORATE
GRID DEVELOPMENT
(Revised Date: JULY 2018)
Upper Tamakoshi
Garjyang
New Khimti
Sunkoshi HEP
Khimti HEP
Indrawati
Indrawati HEP
Panchkhal
Bhotekoshi HEP
Singati
Lamosangu
Barhabise
Banepa
Lapsiphedi
Bhaktapur
Changunarayan
Chapali
Baneshwor
Okhaltar
New Chabel
Patan
K-3
Teku
Devighat HEP
Lainchour
Trishuli HEP
Balaju
Chilime
Chilime HEP
Trishuli 3A
Samundratar
Trishuli 3B HUB
Siuchatar
Matatirtha
KL-I HEP
KL-II HEP
KL-III HEP
Marshyangdi HEP
New Marsyangdi (Markhi Chowk)
Hetauda
Bharatpur
Kamane
Pathlaiya
Parwanipur
Birgunj
Amlekhganj
Simra
Purbi Chitawan
Kawasoti
Sardi
Gandak HEP
Bardghat
New Butwal
Sunawal
Gorakhpur
Butwal
Lumbini
Motipur
Shivapur
Lamahi
Kohalpur
Dhalkebar
Chandranigahapur
Mirchaiya
Lahan
Rupani
Kusaha
Duhabi
Biratnagar
Inaruwa
Dhungesangu
Sitalpati
Tumlingtar
Baneswor
Basantapur
Damak
Anarmani
Ilam
Phidim
Kabeli
Kabeli HEP
Mai Khola
Mai HEP
From Kataiya
From Muzzaffarpur
From Raxual
From Balmikinagar
From Tanakpur
Kritipur
Udipur
Kudi
Middle Marshyangdi HEP
Upper Marsyangdi -A HEP
New Modi Switching Station
Damauli
KG-A HEP
Syangja
Lekhnath
Lahachwok
Pokhara
Modi HEP
Lower Modi HEP
Kusma
Dana
Burtibang
Paudi Amrai
Tamghash
Sandikharka
Ghorahi
Jhimruk HEP
Kusum
Hapure
Dailekh
Surkhet
Syaule
Chameliya HEP
Attariya
Mahendranagar
Bhurigaon
Lamki
Pahalmanpur


POWER DEVELOPMENT MAP OF NEPAL
EXISTING / UNDER CONSTRUCTION POWER STATIONS & TRANSMISSION LINES / SUBSTATIONS
(Revised Date: July 2018)
(NOT TO SCALE)
CHINA
INDIA
N
KATHMANDU VALLEY
NEPAL ELECTRICITY AUTHORITY
TRANSMISSION DIRECTORATE
GRID DEVELOPMENT DEPARTMENT
Prepared by : Manager Gagan Manandhar
LEGENDS
EXISTING
UNDER-CONST.
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