NEPAL ELECTRICITY AUTHORITY

A YEAR IN REVIEW-FISCAL YEAR 2018/2019

AUGUST 2019 (BHADRA 2076)

DURBAR MARG, KATHMANDU, NEPAL

Generation Testing of Upper Trishuli 3A Hydroelectric Project.

Cooperation Agreement between State Grid Corporation of China (SGCC), China and Nepal Electricity Authority (NEA), Nepal

COMPLIMENTARY COPY

Contents

Message from the Minister	2
Message from the Secretary	4
Board of Directors	6
Corporate structure of NEA	7
Deputy Managing Directors	8
Managing Director's Report	9
Generation Directorate	19
Transmission Directorate	44
Distribution and Consumer Services Directorate	68
Planning, Monitoring and Information Technology Directorate	89
Engineering Services Directorate	96
Project Management Directorate	123
NEA's Subsidiary & Associate Companies	134
Central Activities	162
Administration Directorate	169
Finance Directorate	173
Statistics & Schematics	188
Tariff Rates	199
Appendix	205-224
Maps	225-226

NEPAL ELECTRICITY AUTHORITY
Head Office: Durbar Marg, Kathmandu, Nepal
Phone: +977-1-4153007/4153013, Fax: +977-1-4153009
Email: neamd@nea.org.np
Website: www.nea.org.np

Barsha Man Pun 'Ananta'
MINISTER
Energy, Water Resources and Irrigation

Government of Nepal

Singha Durbar, Kathmandu, Nepal
www.moewri.gov.np
barsha.pun@nepal.gov.np

Ref. No.:

Message from the Minister

On the occasion of 34th anniversary of Nepal Electricity Authority (NEA), I would like to share my great pleasure with entire team of NEA for their efforts made towards augmentation of power supply, both in terms of quality and quantity.

Fundamental shift from monopolistic business environment in generation, resulted through the enactment of Electricity Act-2049 along with associated supplementary changes, private sector investment in this business has become a normal phenomena. Since then, contribution of Independent Power Producers (IPPs), in augmenting the generation capacity of Integrated Nepal Power System is in increasing trend. With the enactment of Electricity Regulatory Commission Act 2074 and formation of Electricity Regulatory commission in recent past, involvement of private sector not only in generation, but also in transmission and distribution business is expected to accelerate in future.

Measures adopted towards institutional reform of NEA, establishment of province based distribution utilities in particular, is expected to play an important role in serving reliable, efficient, and better quality of electricity to its valued customers at affordable price.

Performance of NEA in the last fiscal year in terms of supply management, capital expenditure in transmission and distribution networks and loss reduction show encouraging results. Shift of completion time line of Upper Tamakoshi project has indicated shortfall in implementation plan which needs due care.

NEA has been very successful in managing the electricity load in the country at the time when the supply was minimal. Now with the improved generation and transmission capability to be witnessed in the near future, NEA has to come out with new set of expertise to best manage generation and transmission facilities including the cross border ones. I wish NEA every success to manage this new scenario that it will come across very soon.

NEA with increasing generation capacities anticipated in the days ahead, requires precise planning, implementation and operation modality of power system components.

Barshaman Pun 'Ananta'
Minister
ENERGY, WATER RESOURCES AND IRRIGATION

Office: Singha Durbar, Kathmandu
Tele: 977-14211513

Government of Nepal

Barsha Man Pun 'Ananta'
MINISTER
Energy, Water Resources and Irrigation

Singha Durbar, Kathmandu, Nepal
www.moewri.gov.np
barsha.pun@nepal.gov.np

Ref. No.:

Timely completion of new generating plants, transmission lines, expansion/upgradation of distribution system, construction of cross border transmission line along with development and adoption of standard procedures regarding energy banking and electricity trading are some of the pertinent fronts that NEA should work on.

With the Electricity Regulatory Commission in place and operational; and continued effort in reforming the power sector, ministry is now in the process of formulating new Electricity Act that will pave the way for the institutional reform in the power sector. In this context, NEA should now also prepare itself for such reform allowing it to make smooth transition from vertically integrated utility to restructured unbundled entities. I would like to assure that ministry is always in support, as has been in the past, in maintaining competitive advantage in country's energy sector and focus more on being a leader in market of power sector.

Further, I congratulate NEA team for their sincere efforts and valuable services rendered and wish every success for future course.

Barsha Man Pun 'Ananta'

Barshaman Pun 'Ananta'
Minister
ENERGY, WATER RESOURCES AND IRRIGATION

Office: Singha Durbar, Kathmandu
Tele: 977-14211513

Government of Nepal
Ministry of Energy, Water Resources and Irrigation
977-1-4211516
977-1-4211886
Fax: 977-1-4211510
Singha Durbar, Kathmandu, Nepal

Ref.

Government of Nepal, Ministry of Energy, Water Resources and Irrigation, 2074

Message from the Secretary

I, with immense pleasure and satisfaction, congratulate NEA and its entire staff on the auspicious occasion of its 34th anniversary for further improving the supply situation and achieving many important milestones in the last fiscal year. This has brought all of us to the comfort of having uninterrupted power supply round the clock.

The completion of chronically delayed Hydropower Projects like Upper Trishuli 3A and Kulekhani III can be considered as some of the major achievements of NEA during the past fiscal year. Furthermore, the completion of 757 circuit km of transmission lines and substations with a total capacity of 830 MVA has really uplifted the overall performance index of NEA. The reduction of the overall system loss to 15.32 percent is another milestone achieved by NEA. I also came to learn that NEA has been able to maintain a net profit for two consecutive years. All these performances, which have turned around NEA into a better performing utility, make me feel very proud to be a part of the NEA family.

With all the above mentioned achievements, I believe that the time has now come for NEA to push further and become a major player in the development of the whole Nation. Although the Nation is now free from load shedding and has the comforts of an uninterrupted power supply system, almost one third of the demand is being fulfilled by means of imported energy from India. Challenges ahead of NEA are now to reduce the import dependency by gradual enhancement of internal generations and secure new domestic and cross border markets to avoid spillage of excess energy that is going to appear in coming wet season only. Occasional export to Bihar in India through the Kushaha-Kataiya, Raxaul-Parawanipur and the Ramnager-Surajpura cross border points has to be converted into a fully formal commercial arrangement. This requires NEA to be a legal market participant to participate in Indian competitive markets so that the country will be able to sell not only the surplus energy but also energy from dedicated generation projects. I understand that NEA has already signed a MoU with NVVN (NTPC Vidyut Vyapar Nigam) of India to enter into the Indian Day Ahead Market and Term Ahead Market. India, in the spirit of historic Power Trade Agreement signed in 2014, is expected to grant approval for this which, if obtained, will truly be one of the biggest and game changing milestones, not only for NEA, but also for the Nation as a whole.

Today, 87 percent of the population has access to electricity. This is a gigantic leap from the days when access to electricity used to be limited to

Government of Nepal
Ministry of Energy, Water Resources and Irrigation
977-1-4211516
977-1-4211886
Fax: 977-1-4211510
Singha Durbar, Kathmandu, Nepal
Ref.

only the major cities of the country. This has been made possible due to the supply of energy from various on-grid and off-grid sources. The on-grid supply to 78% of the population has been made possible due to the diligent efforts of NEA in the expansion of the numerous transmission lines, distribution lines and substations throughout the country as well as due to remarkable contribution in generation augmentation from the private sector. Off-grid supply to remaining population from various other government entities, particularly the Alternate Energy Promotion Center (AEPC) has also been quite instrumental in making this happen.

NEA also deserves to be applauded for increasing the Nation's overall per capita energy consumption of electricity to 245 KWh. This has brought rays of hope to achieve the 700 KWh per capita consumption by 2021/2022 as targeted in the White Paper published by the Ministry of Energy, Water Resources and Irrigation in 2074. In order to make this happen we need to enhance the massive usage of electricity especially in cooking, water heating and electric transport.

NEA has to concentrate now more on strengthening its transmission facilities both along east-west highway and river basin corridors. The near-to-completion hydropower projects like Upper Tamakoshi, Rasuwagadi, Sanjen etc. should be given utmost attention to complete them by the end of this fiscal year as committed in the Ministry's action plan of this year's budget, policies and programs. The implementation of Upper Arun, DudhKoshi, Tamakoshi V, Upper Modi A and Upper Modi Hydroelectric Projects should also be among its top priorities.

Let me, finally, thank the entire staff of NEA for their relentless efforts to serve the Nation and its valued customers. I wish all of them a very bright and prosperous future.

Dinesh Kumar Ghimire
Secretary
Ministry of Energy, Water Resources and Irrigation

Board of Directors

Barsha Man Pun 'Ananta'
Hon'ble Minister
Ministry of Energy, Water Resources and Irrigation
Chairman

Mr. Dinesh Kumar Ghimire
Secretary, Ministry of Energy,
Water Resources and Irrigation
Member

Mr. Lal Shanker Ghimire
Secretary
Ministry of Finance, Revenue

Mr. Umesh Prasad Thani
Member

Mr. Chet Raj Joshi
Member

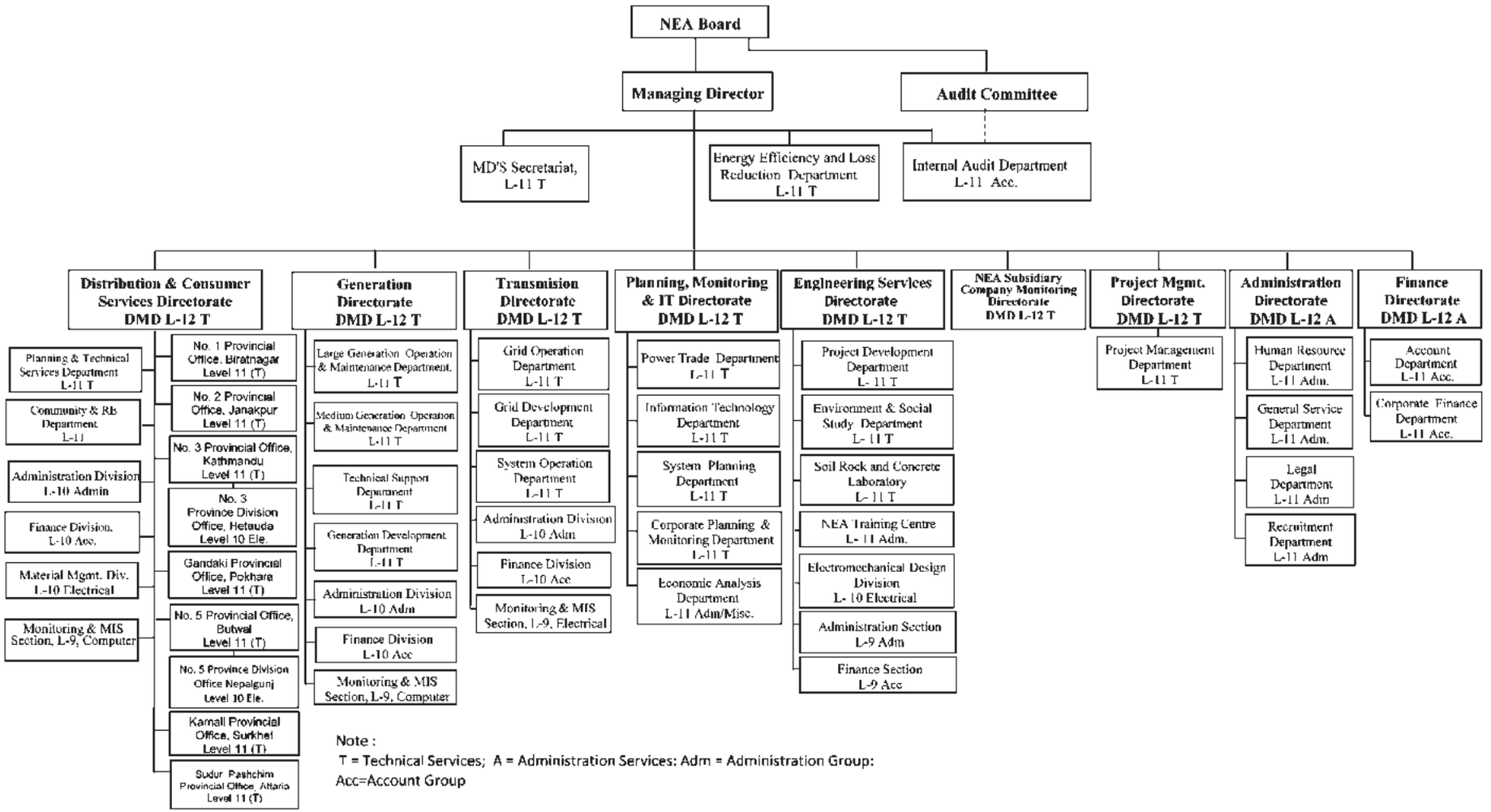
Mr. Bhakta Bahadur Pun
Member

Mr. Vishow Prakash Gautam
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. Jagadishwar Man Singh
Deputy Managing Director
Planning, Monitoring & IT Directorate
Engineering Services Directorate

Mr. Hitendra Dev Shakya
Deputy Managing Director
Deputed to NEA Engineering Company

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. Bigyan Prasad Shrestha
Deputy Managing Director
Deputed to Upper Tamakoshi
Hydropower Limited

Mr. Madhav Prasad Koirala
Deputy Managing Director
Deputed to Chilime Hydropower
Company Limited

Mr. Braj Bhusan Chaudhary
Deputy Managing Director
Transmission Directorate

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

Mr. Madan Timsina
Off. Deputy Managing Director
Generation Directorate

MANAGING DIRECTOR'S REPORT

Nepal Electricity Authority (NEA) has successfully completed thirty-four years of service in generating, transmitting and distributing electricity to its consumers. It is a matter of great satisfaction to every employee of NEA to bring forward this Annual Report describing its achievements in the year gone by. The past year can again be considered successful as NEA has managed to supply continuous power to its consumers, including industries, after the total eradication of the decade long load shedding from May 2018. I personally feel honored to be leading an organization of this magnitude that is heading in the right direction in achieving its goal of "Electricity for All" by the year 2023. Celebrating the 34th anniversary of NEA is an opportune moment to share our achievements of the past year as well as to assure our consumers on meeting our commitments with better performances this year. Following the end to load shedding successfully, NEA is making all efforts on supplying continuous, reliable and affordable power to its consumers.

I would like to take this opportunity to emphasize that the intermittent power cuts are purely due to technical glitches that the system may face from time to time. It will take some time and investment to get rid of such supply disturbances. NEA has already initiated bold measures to make the overall power system robust and significant investment is being poured into transmission and distribution system for their strengthening.

The aim of making NEA a profit making organization, after tumultuous years of losses, was achieved in the fiscal year FY 2016/17 and this trend has become more pronounced in the year under review (FY 2018/19) with the profit reaching a record high of NRs 7,204.67 million against the net profit of NRs 2,897.08 million in the FY 2017/18. The continuous supply of electricity, operational efficiency and the strict measures taken to reduce technical and non-technical losses has contributed significantly in this endeavor.

It is our pride to put forward that an outstanding performance has been achieved by NEA in the past fiscal year in reducing the system losses to 15.32 %, an all-time record low in NEA's history. It has, of course, contributed significantly towards maximizing NEA's profit and lowering the peak power demand of the system as well. However, we are committed to reduce it further up to the international standards with more concrete and consolidated action plans blended with technology interventions and awareness campaigns in the years ahead.

Some of the major projects of NEA, that had been delayed for many years due to various reasons, have been completed in the last couple of years by virtue of bold and appropriate decisions

taken by the management and untiring efforts put forward by the project team. This relentless initiative ultimately drove Chamelia HEP to completion in FY 2017/18 and the same work spirit culminated in prolific outcome to end the story of Upper Trishuli 3A HEP (60 MW) with a happy note of commissioning recently. Kulekhani III (14 MW), the other sick hydropower project, full of bitter stories regarding the construction activities since its kick off days is finally on the verge of commissioning soon. Likewise, Kabeli Corridor transmission project has been successfully completed after overcoming a myriad of tumultuous events. These success stories have paved the way to initiate upcoming 'Game-Changer' projects in generation, transmission and distribution sectors in the years to come.

NEA is in the process of benefitting from technology innovations taking place in other parts of the world, especially for automation of its systems, in keeping with the changing times. Some of the major initiatives to modernize NEA are implementation of Enterprise Resource Planning (ERP) , Geographical Mapping (GIS Mapping), Smart Metering, Substation Automation System and expansion of IT infrastructure in the years to come. Our endeavor in this direction will lead to a "Digital NEA" which will be in line with the GoN's vision of "Digital Nepal".

Last fiscal year also saw injuries and deaths of the employees of NEA while pursuing their duties and local individuals due to electrical casualties. I on behalf of the entire organization would like to pay homage to the departed souls and assure greater vigilance and awareness to minimize accidents in the days ahead.

The performances and achievements of NEA in the year under review, are highlighted below:

OPERATIONAL PERFORMANCE

The number of electricity consumers of NEA has been increasing gradually over the years. The total number of consumers increased by 9.38 % from 3.57 million to 3.91 million during the year under review. As has been in the past, the domestic consumer category with 3.66 million consumers remained the largest category with 93.56% share of the entire electricity consumers. Domestic and industrial consumer category contributed 37.69 % and 39.95 % to the gross electricity sales revenue respectively. Rest of the consumer category accounted for the remaining 22.36% of the gross sales revenue. The total population with access to grid electricity has reached about 78% in FY 2018/19.

NEA's hydropower plants including small power stations generated a total of 2,548.11 GWh of electricity in FY 2018/19, an increase by 10.39 % over the generation of 2,308.37 GWh in FY 2017/18. This is the all-time record high generation in NEA's history even though Kaligandaki A Hydroelectric Power Station (144 MW) had undergone plant shutdown for 10 days and unit shutdown for 24 days for maintenance work in the months of October/ November in the fiscal year under review.

The total power purchased from Independent Power Producers (IPPs) within Nepal was 2,190.05 GWh, an increase by 1.03 % from the figure of 2,167.76 GWh in the FY 2017/18. To meet the ever increasing demand, additional power had to be imported from India. The total energy imported from India was 2,813.07 GWh as compared to 2,581.80 GWh in FY 2017/18, an increase by 8.96 %. The total energy available in NEA's system increased by 6.99 % to 7,551.23 GWh over the corresponding figure of 7,057.93 GWh in FY 2017/18. Out of the total available energy, NEA's own generation contributed 33.75%, whereas those imported from India and domestic IPPs accounted for 37.25 % and 29.00 % respectively.

Total energy consumption in FY 2018/19 was 6,394.38 GWh, an increase by 13.89 % over the corresponding figure of 5,614.59 in the FY 2017/18. Annual system load factor has increased from 53.43 % in FY 2017/18 to 65.29 % in FY 2018/19.

A nationwide drive launched a few years ago to reduce system losses continued unabated in the last fiscal year as well. This has produced remarkable results with the system loss shrinking to 15.32 % in the FY 2018/19 over the previous figures of 25.78 %, 22.90 % and 20.45 % in the FYs 2015/16, 2016/17 and 2017/18 respectively. The efforts to bring it down to the least possible figure will continue in the years ahead.

FINANCIAL PERFORMANCE

The net profit of NEA in the year under review is NRs 7,204.67 million, an increase by 148.69 % over corresponding figure of NRs 2,897.08 million in FY 2017/18. NEA has been successful in reducing accumulated losses to NRs 15,220.12 million in FY 2018/19 from the corresponding figure of NRs 34,608.47 million in the FY 2015/16.

The gross revenue generated from energy sales and other income in the year under review reached NRs 74,341.01 million, with an increase of 18.40 % over the figure of NRs 62,788.62 million in the FY 2017/18. The continued growth in energy sales and subsequent increase in revenue is the result of the continuous power supply to the consumers. At the same time, it has also helped a great deal in saving valuable foreign currency reserve of the country which has been used to import batteries, inverters, solar panels and additional fossil fuels for generators,. NEA's operating expenses exluding power purchase stood at NRs 20,878.61 million, whereas that for power purchase alone was NRs 37,161.40 million in FY 2018/19. The overall operating expenses of NEA including power purchase in FY 2018/19 increased from NRs 53,019.39 million in the FY 2017/18 to NRs 58,040.01 million in FY 2018/19, an increase of 9.47%.

In FY 2018/19, net revenue of NEA stood at NRs 73,460.39 million as against the operational expenses of NRs 58,040.01 million resulting in an operational surplus of NRs 15,420.38 million, an increase by 72.79% over the figure of NRs 8,924.30 million in the FY 2017/18.

Energy purchase amounted to 66.25% of the total available energy and NEA paid 56.35% of the net electricity sales revenue of NRs 65,951.27 million for this purpose. The total cost of purchased power increased by 8.88% in the FY 2018/19 as compared to the figure of FY 2017/18 due to the increase in the volume of import and some price escalation involved in power purchase.

Other operating expenses for generation, royalty, transmission, distribution and administration in the year under review FY 2018/19 amounted to NRs 1,852.01 million, NRs 1,437.55 million, NRs 1,996.62 million, 8,691.45 million and NRs 2,190.72 million respectively.

NEA repaid principal of NRs 1,000.00 million against long term loan to GoN. During the year NEA paid NRs 1,500.62 million as royalties and NRs 13,155.14 million as arrears of interest on long term loan in FY 2018/19. Total contribution from NEA to GoN treasury reached NRs 15,655.76 million in the FY 2018/19.

NEA estimated a provision of NRs 3,500.00 million towards the long-term employee liabilities in respect of gratuity, pension, medical facilities and accumulated leave facilities under employees' benefit plan scheme.

ADMINISTRATIVE PERFORMANCE

In the administrative front, NEA, Employee Service By-laws, 2075 was approved in the last fiscal year. NEA recruited 534 new staff of various levels in FY 2018/19, whereas Organization & Management Survey report is on the verge of finalization.

ONGOING PROJECTS

The massive earthquake of 2015, its aftershocks and the subsequent Terai Bandh delayed the completion date of all under-construction projects. After the completion of Chamelia in FY 2017/18, Trishuli 3A started generation from one unit (30 MW) in May 2019, whereas the other unit (30 MW) was commissioned in the beginning of this fiscal year 2019/2020. Similarly, the preliminary

tests have been completed in Kulekhani III project and is expected to come into operation very soon.

There are several transmission lines that have been completed in the year under review. The total length of transmission line of 132 kV and above commissioned in FY 2018/19 is 606 Ckt. Km. Similarly, a total of 738 MVA substation capacity has been added to the system. The lengths of under-construction transmission lines at 132 kV, 220 kV and 400 kV levels are 1,112 Ckt. Km, 1,393 Ckt. Km and 756 Ckt. km respectively, with the total of 3,261 Ckt. km. Similarly, the total capacity of substations under construction is 9,500 MVA.

NEA commissioned 20 distributions substation of 33/11 kV corresponding to the capacity of 180.7 MVA in the FY 2018/19 to bring the total number to 138 corresponding to the total capacity of 1,305.5 MVA as of FY 2018/19. Likewise, the total line lengths corresponding to 33 kV, 11 kV and 0.4/0.23 kV voltage levels completed as of FY 2018/19 are 4,907.16 Ckt. km, 35,726.48 Ckt. km and 109,176.15 Ckt. km respectively,whereas the line lenghts commissioned in FY 2018/19 alone were 416.7 Ckt. Km, 2,796.21 Ckt. Km and 6,508.64 Ckt. Km corresponding to 33 kV, 11 kV and 0.4/0.23 kV voltage levels respectively. A total of 32,252 distribution transformers with the capacity of 3,241.33 MVA have been installed in the system upto the fiscal year under review.

NEA SUBSIDIARY COMPANIES

The successful implementation of Chilime Hydropower Project as a subsidiary company of NEA encouraged the development of more projects under the company mode to ensure early decision making, public participation and mobilizing domestic fund. The major projects operating under the Company mode and the progresses achieved so far are as follows;

Chilime Hydropower Company Limited (CHCL): CHCL was formed as a subsidiary of NEA and owns the Chilime HEP (22.1 MW). It has formed three subsidiary companies, namely; Rashuwagadhi Hydropower Company Limited (RGHCL) to develop Rashuwagadhi 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 four projects are in different stages of construction. Rasuwagadhi and Upper Sanjen are expected to be commissioned by the end of FY 2019/20. These projects have been included in GoN's programme, "Nepal ko Pani Janata ko Lagani: Harek Nepali Bidyut ko Share Dhani".

Similarly, CHCL has 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.

Upper Tamakoshi Hydropower Limited (UTKHPL): The under construction national priority project , Upper Tamakoshi HEP (456 MW), has been undergoing construction in the company mode under UTKHPL utilizing domestic financial resources. The project is expected to be commissioned in this FY 2019/20.

UTKHPL has signed a contract with NEA Engineering Company to prepare Detailed Engineering Design and Bidding Documents for Rolwaling Khola HEP (22 MW).

Tanahu Hydropower Limited: Tanahu Hydropower Limited (THL), established as a Subsidiary Company of NEA to promote the storage type Tanahu Hydropower Project (140 MW). After terminating the contract with the Package 1 (Headworks and River Diversion) Contractor, invitation for re-tender was issued. The four submitted proposals are being evaluated for their Technical qualification. Contract for Package 2 (Waterways, Powerhouse and related Equipment) was signed with M/s Sinohydro Corporationn Limited, China. Package 3 (220 kV Transmission Line) was signed with KEC International Limited, India and the Contractor

has already started the detailed survey and geotechnical investigations. All pre-construction activities have been completed. The Project is expected to be commissioned by the end of the year 2024.

THL has started a detailed engineering design of Lower Seti Hydropower Project (104 MW), about 15 km downstream of Tanahu Hydropower Project, with the intention of developing it in the near future.

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. GoN has included this project into its programme, "Nepal ko Pani Janata ko Lagani: Harek Nepali Bidyut ko Share Dhani". Construction works under the EPC contract with Shuifa ANHE Group Company Ltd., China started from 14th March, 2018. It is expected to be commissioned by March 2021.

Raghuganga Hydropower Limited (RGHL): RGHL was established as a subsidiary company of NEA to develop Rahughat Hydroelectric Project (40 MW). Contract Agreement, on EPC mode, for the construction of Civil and Hydro-mechanical works with Jaiprakash Associates Limited, India was approved by EXIM Bank of India and Notice to Proceed was issued on 23rd May, 2018. The Contractor has started works at different fronts. The evaluation of Technical and Price Bid for Lot 2: Electro-mechanical works under PDB contract has been approved by EXIM Bank of India. The Project is expected to be commissioned by January 2023.

Upper Arun Hydroelectric Ltd (UAHEL): UAHEL was formed as a subsidiary company of NEA for the development of Upper Arun Hydroelectric Project (1,160 MW) and Ikhuwa Khola Hydroelectric Project (30 MW). The Detail Engineering Design and Bidding Documents will be completed by February, 2020. Similarly, the Consultant for Detailed Engineering Design, Tender Document Preparation and Construction Supervision and Contract Management of Access Road construction has submitted the draft design report and the bidding documents for review. EIA study for the Project is being carried out in parallel with the Detailed Engineering Design. The World Bank has committed to lead the financing for this Project with other co-partners from multi-lateral financial institutions. GoN and NEA have taken up this Project as the priority project for development in the upcoming years.

Tamakoshi Jalvidyut Company Limited: Tamakoshi Jalvidyut Company Limited has been registered for the development of Tamakoshi V HEP (99.8 MW). This is a cascade development of the under construction Upper Tamakoshi HEP. Lahmeyer International GmbH has completed the Detailed Engineering Design and Tender Document preparation. EOI documents for construction supervision and Prequalification (PQ) for Contract 1 (Civil and Hydromechanical Works) have already been issued and their evaluation is underway. Preparatory works for preparing PQ documents for Contract 2 and Contract 3 have been initiated. Discussions and correspondences with different National and International Financing Agencies for Project Financing are also being carried out.

Dudhkoshi Jalvidyut Company Limited: This company, as a subsidiary of NEA, has been established for the implementation of Dudhkoshi Storage HEP. The Feasibility Study was completed for this Project in May, 2019 and the Consultant is expected to submit the final detailed design report based on 635 MW-option along with bidding documents by November, 2019. The Asian Development Bank has committed to lead the financing for this Project with other co-partners from multi-lateral financial institutions. GoN and NEA have taken up this Project as the priority project for development in the upcoming years.

NEA Engineering Company Limited (NEAEC): NEA formed the NEAEC to provide complete engineering solutions to the power sector

development. 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. At present the company is conducting studies at different levels of five hydropower projects. It has also undertaken the construction supervision of 400 kV Dhalkebar Substation very soon. 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.

Nepal Power Trading Company Limited (NPTC): NPTC has been established with the objective of carrying out power trading function within and outside the country. The company will come into operation once the Business Plan is finalized and some legal issues related to trading license is sorted out.

PRIVATE SECTOR PARTICIPATION

NEA has been facilitating the participation of the private sector through Power Purchase Agreements (PPA) to ensure meeting the energy demand. NEA has fixed posted rates for energy purchase from three categories of projects; viz Run of River (ROR), Peaking Run of River (PROR) and Storage type projects. Foreign Direct Investment has also been encouraged as is evident with the PPA signing of Upper Trishuli 1 HEP (216 MW) and Rasuwa-Bhotekoshi HEP (120 MW).

A total of 8 new projects developed by the Independent Power Producers (IPPs) with a combined installed capacity of 48.08 MW were commissioned in the FY 2018/19. This has increased the total number of IPP-owned projects in operation to 83 with a combined installed capacity of 560.78 MW.

A total of 120 projects to be developed by IPPs, with a combined installed capacity of 2,613.90 MW are under construction after financial closure. Similarly, 137 IPP-owned projects with a combined installed capacity of 2,869.38 MW are at various stages of development.

During the FY 2018/19, a total of 85 new PPAs were signed with a combined installed capacity of 1,480.43 MW, out of which 4 PPAs were signed with PROR projects, whereas 2 PPAs were signed with bagasse plants and 10 with solar projects. This has increased the total number of PPAs signed with the various IPPs to 340 with the combined installed capacity of 6,044.05 MW as of FY 2018/19.

PPAs with grid-tied solar power projects have also been signed at the new flat rate approved by NEA Board. Some more solar PPAs on tariff-based competitive bidding and Viability Gap Fund (VGF) are on the verge of signing after the consent from the Electricity Regulatory Commission. It has encouraged generation mix practice in Nepal following the policy directives of the Government of Nepal to develop all types of hydropower projects and other resources for electricity generation.

NEA has been very supportive to develop conducive environment for private sector to invest in hydropower projects and policy decisions in this regard have been taken towards increasing the capacity limits for ROR, PROR and storage/ pumped storage projects so as to sign the take-or-pay PPAs with the private sector developers. In the year under review, NEA decided to increase the take-or-pay limits of ROR, PROR and storage hydropower projects to 5,250 MW, 4,500 MW and 5,250 MW respectively. It has created a positive environment to encourage the financial institutions to finance in the hydropower sector of Nepal. Likewise, NEA has also decided to consider PROR projects on priority basis for signing PPA.

CROSS BORDER POWER TRADING

Cross Border Power trading with India has been a successful story since the journey started a few years back. The first 400 kV Cross Border transmission line between Nepal and India, from Dhalkebar to Mujaffarpur, was charged at 220 kV voltage level on August 16, 2018. This has increased

the quantum of power withdrawal by Nepal to around 250 MW, following the installation of two units of 220/132 kV transformers of 160 MVA capacity each. The works associated with further upgrading of Dhalkebar Substation to 400 kV are in progress along with the installation of 400/220 kV, 3 x 315 MVA transformers with the target of completion by December 2019, before which its capacity augmentation plan at 220 kV will be accomplished by installing 220/132 kV, 2 x 315 MVA transformers at the substation switchyard.

The DPR for the second 400 kV Cross Border Transmission Line, from New- Butwal to Gorakhpur, has been updated and revised by India in consultation with NEA. This has led to the cost reduction on the Indian portion of the transmission line by approximately 128 Crore Indian Rupees at December 2018 price level. Bilateral understandings on the development modality related to funding and implementing agency are on the verge of being finalized. The modality is expected to be agreed in the forthcoming 7th India-Nepal Joint Steering Committee meeting to be held in India very soon. Further, NEA has been playing crucial role through representation in the Joint Technical Team of the two countries in conducting the detailed study of two more 400 kV cross border transmission lines, namely; New Duhabi-Purnia and Lumki-Bareilli.

Another significant achievement in cross border power trading was signing the agreement in the last fiscal year, 2018/19 with the Indian Power trading company, NVVN, for power trading through power exchange. This will enable Nepal to bid for power on both electronic platforms of India, IEX and PXIL. This agreement will come into effect as soon as the Conduct of Business Rules (CBR) drafted by Central Electricity Authority (CEA) as the designated authority for India as per the Guidelines on Import/ Export (Cross Border) of Electricity - 2018 is officially issued. Likewise, an initial understanding has already been reached on the much-awaited energy banking at NEA/CEA level. It was intimated during the 6th JSC/ JWG meeting that India's regulatory commission, CERC, is required to work out relevant regulations for the implementation of energy banking. It is hoped that energy banking will be truly instrumental in addressing Nepal's seasonal imbalance of power demand and supply in the years to come.

The present capacity of Tanakpur Substation in India is not adequate for the cross border power trading between Nepal and India through 132 KV Tanakpur-Mahendranagar transmission line. In this context, NEA has initiated the process of increasing the transformer capacity at the Tanakpur Substation from 50 MVA to 100 MVA through the cost estimation for associated procurement and installation as agreed in NEA-CEA meeting in line with the decisions of the 6th Nepal-India Joint Steering Committee meeting.

The cross border power trade has taken place in the last fiscal year with power flow in both directions between Nepal and India. A total of 2,813.07 GWh of electricity was imported through various transmission links including Dhalkebar-Mujaffarpur line, whereas Nepal has also been able to export 34.74 GWh of electricity to the Indian state of Bihar during generation surplus scenario of domestic hydropower plants in the last fiscal year 2018/19 through exchange mechanism under the purview of Nepal - India Power Exchange Committee. Another commendable step towards managing the daily fluctuations in supply and demand has been ensured through an agreement signed between NEA and NVVN, an Indian Power Trading Company, to purchase power from the electronic platform in the form of a product called Day Ahead Market (DAM).

An understanding was reached between Nepal and Bangladesh at the Power/ Energy Secretary level Joint Steering Committee meeting for Bangladeshi investment in suitable hydropower power plants in Nepal. India's cross-border Guidelines and subsequent regulations has also opened up avenues for power trading between Nepal and Bangladesh. The possibility of power trade with China is also under exploration with the Feasibil

ity study of Ratamate-Rasuwagadhi-Kerung 400 kV Transmission Line being undertaken by both sides in FY 2018/19.

WAY FORWARD

The main objectives of NEA as a power sector utility are to satisfy its consumers with continuous, reliable and quality supply of electricity as well as to maintain reasonable financial returns for further investment. The end to the decade-long load shedding through integrated resource planning including domestic generation, imports and efficient demand-side management has culminated in people's trust and optimism on our endeavors towards achieving the long-standing goal of becoming self-reliant in electricity generation and supply.

NEA's restructuring plan along with the establishment of provincial distribution entities will be moved forward with a greater momentum so that their business plans shall have to be worked out along with its initiation by preparing separate balance sheets from this fiscal year 2019/20 onwards.

In the context of establishment of Electricity Regulatory Commission (ERC), NEA is looking forward to adjusting the distribution tariff with a reasonable margin based on power purchase rates and NEA's expenses. An extensive Corporate Development Plan (CDP) of Nepal Electricity Authority is almost at the final stage and its effective implementation will be considered with high priority for improving the overall performance of NEA in the years to come.

NEA will continue its efforts in developing all types of power plants on its own and through IPPs as per the concept of generation mix in various proportions as envisaged in the White Paper issued by Ministry of Energy, Water Resources and Irrigation. It is hoped that it will make the system operation comfortable from the perspective of demand and supply patterns. NEA has already initiated the development of reservoir and PROR types of hydropower projects such as Dudhkoshi storage (635 MW) and Upper Arun HEP (1060 MW) so as to meet the long term power demand of the country.

More transmission interconnections are being planned between Nepal and India for commissioning in different timeframes. NEA is also developing a 400 kV transmission line backbone inside Nepal with the support from various donor agencies like the World Bank, Asian Development Bank, KfW, Norad, JICA and EIB. Millennium Challenge Corporation (MCC) funded by the US government has initiated the development of 400 kV transmission lines in the central part of Nepal. Moreover, the development modality for the second 400 kV cross border link with India from New Butwal (Nepal) to Gorakhpur (India) is expected to be finalized soon and the Feasibility study of 400 kV transmission line from Ratamate (Nepal) to Kerung (China) will be completed soon to trigger Nepal-China power trading in the years to come.

Following Government of Nepal's electricity roadmap, NEA is committed to light up every household of Nepal by the year 2023 through adequate network expansion plans all over the country. Similarly, for safety and reliability reasons as well as from the aesthetic point of view, the development of underground distribution system in Kathmandu valley has already been initiated. NEA has also 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 consumers in a better way. The implementation of Smart Grid and Smart Metering system will increase efficiency and reduce losses. The online centralized bill payment system has been initiated and is gradually expanding to all the distribution centers. The demand side management with energy efficiency program implemented in the past to reduce peak and energy demands of the system as a whole will be continued in the coming years.

NEA will be utilizing all of its available resources

including optical fibre network to increase its revenue in the years to come.

Power Trading will take a new turn 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. There are enough grounds to be optimistic for energy banking mechanism with India. NEA is looking forward to transacting power through Energy Banking and Day Ahead Market in short and medium terms, whereas we will be trading power with neighboring countries on long term basis through PPAs. Our ultimate goal will be to expand cross border power trading to sub-regional and regional levels.

Further, NEA will be focusing on increasing domestic demand through the promotion of electric vehicles by building charging station infrastructures and replacing cooking gas with electricity. For supplying increased demand in industrial and urbal areas, the strengthening and expansion of transmission and distribution infrastructures will be carried out on high priority. NEA will be improving its operational efficiency through the use of ERP system, implementation of system automation and expansion of IT infrastructure. With these initiatives, we are moving towards "Digital NEA" which will be in line with the GoN vision of "Digital Nepal".

It is high time to conduct capacity building program on a larger scale for efficient operation and implementation of NEA's activities. Training for all levels of employees within the organization will be effectively continued in the years to come. They will be carried out inside the country as well as abroad. Power System Protection is an area which has been identified to train our engineers further to cope with synchronous operation of Integrated Nepal Power System with the Indian grid.

The White Paper 2074 issued by Ministry of Energy, Water Resources and Irrigation (MOEWRI) has set up a roadmap for the next decade in the energy sector. It will continue to be a master document to NEA for its future action plans. in power sector development of Nepal.

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 shall 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, Chairman of NEA Board of Directors, for his dynamic and proactive leadership in boosting the morale of team NEA and providing the right direction to the organization. I am also grateful to the Secretary, MOEWRI for his continuous support and direction in meeting the targets assigned to NEA. My sincere gratitude also goes to the 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 1984.

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 always been 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 (DMD) is responsible for construction of 2 ongoing hydropower projects of 74 MW and operation and maintenance of NEA owned 20 power stations of capacity 552.7 MW. The main objective of this directorate is to construct new projects with license 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 & IT. At present, this directorate is taking care of construction of the following two hydropower projects.

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

Upper Trishuli 3A HEP is headed by respective Project Director and reports to DMD.

Upper Trishuli 3A main works including Headworks, Intake, Desander, Headrace Tunnel, Surge shaft, Vertical shaft, Tailrace Tunnel, Tailrace Pond, Power house Auxilliary Building, GIS building with accessories and facilities etc has been completed. On May 16, 2019, 72 hours generation test of Unit 1 (30 MW) has been completed by synchronizing with the national grid. After test generation, Unit 1 is in continuous operation and supplying electricity through 44.7 km long 220 kV Double circuit Transmission line to Matatirtha Substation presently charged at 132kV voltage level. The test run for a duration of 72 hours for Unit 2 has been completed and both units are connected to the national grid under trial run producing 60 MW of power. Soon after trial test run is completed both unit will supply continuous power to the national grid.

The substantial completion date of main project works is estimated by August 30, 2019.

Kulekhani III Hydroelectric Project is headed by Project Manager and reports to the Director, GDD. By the end of fiscal year 2075/076 (July 2019) approximately 96 percent of the works in total has been completed. Civil construction works is almost complete and 95 percent of the Electromechanical & Hydro-mechanical works is complete. Field-testing of most of the electromechanical equipment has been completed & tower erection and line stringing works will be completed in coming month.

Similarly, Chameliya Hydroelectric Project has already began its generation on Magh 27, 2074 and is running under defect liability period till Shrawan 29, 2075 (August 14, 2019) .The Project has under taken major works of upgradation of Gokuleshwor – Balanch access road. It has also initiated the modifications of existing cooling water filtration system by installing by-pass system with automatic pre-filter and automatic backwash filters and Intake with installation of Trashrack cleaning machine. The procurement filter equipment and Trash-rack cleaning machine (TRCM) is under process which were not included in the initial scope of project works.

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 instrumented to enhance generation with minimal shutdown so as to 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 peaking reservoir, resulting yearly generation more than the target.
- Efforts were made to minimize the shutdown period of Kali Gandaki 'A' power plant for repair of Inlet Valve and Desander in order to assure maximum availability of plant for generation.
- Similarly, maximum efforts were made to resume operation of Trishuli power plant after fire took place in switchgear.
- The unit shutdown time for under scheduled maintenance was reduced to almost half by mobilizing extra staff and resources efficiently.
- This year, the Kulekhani (Indrasarovar) reservoir got the maximum water level after 2071 B.S.(msl 1527.17 m), due to this the KL-I & KL-II are in generation mode with full capacity (92 MW) from 2076-3-30 with maximum inflow of water due to heavy rain on 2076-3-29 & 30.
- Co-ordinated maintenance scheduling among the plants was efficiently carried out and operational practices were improved to get higher output.
- Constructive continued intervention from the Directorate was made by including a dedicated team to ensure early completion of the remaining electromechanical works of the KL-III hydro project. Due to the engagement of NEA's dedicated teams 96% electro mechanical works completion achieved.

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

UPPER TRISHULI 3A HYDROELECTRIC PROJECT

Project Background

Construction of Upper Trishuli-3A HEP, a run-of-river project of 60 MW was initiated in June 2011. The estimated cost of the project is 125.775 MillionUS$ 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

Aerial View of Dam Site of Upper Trishuli 3A

Gezhouba Group Company Ltd., China (CGGC) at a cost of 89.177 Million US$excluding VAT while construction supervision of the project was awarded to Northwest Engineering Corporation Limited, China (NWH), at a cost of3.932 Million US$ 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

To date main Contractor CGGC has almost completed the main works including Headworks, Intake, Desander, Headrace Tunnel, Surge shaft,

Installation of Rotor Assembly

Vertical shaft, Tailrace Tunnel, Tailrace Pond, Power house Auxilliary Building, GIS building with accessories and facilities etc. From May 16, 2019, 72 hour generation test of Unit 1 (30 MW) has been started synchronizing with the national grid. After the successful test generation, Unit 1 is in continuous operation and supplying the electricity through the 44.7 km long 220 kV Double circuit Transmission line from Powerhouse to Matatirtha Substation charged with 132kV. The plant has already generated 15458.4 MWh till Ashad 2076. Another Unit is planned for the 72 hour generation test on July 28, 2019 and will supply continuous generation after final inspections and debugging works to the national grid.

The substantial completion of main plant project works will be August 30, 2019.

Transmission Line Works

The total length of transmission line is 44.7 km (total 142 numbers of towers), which comprises of 1.3 km long (8 No of Towers) 132 kV double circuit from GIS toTrishuli-3B hub, 38.6 km long (120 No of Towers) 220 kV Double circuit from Trishuli-3B hub to Badbhanjyang and 4.8 km long (14 No of towers) 220kV four circuit fromBadbhanjyang to Matatirtha,Kathmandu.In addition,about 1.35 km length of 220 kV four circuit underground cable routeleading to the Matatirtha Substation is also constructed.

Till date, all works of Transmission line have been substantially completed with testing and Taking over Certificate (TOC) has also been issued to the Contractor China International Water and Electric Corporation (CWE) on June 15, 2019. At present it is carrying the power generated form Upper Trihsuli 3A Hydroelectric Project. In future this line is planned to carry the power from the Rasuwagadi, Sanjen and other power project from the Trishuli Basin.

Others

Under Project Support Program (PSP) the construction of Eight school buildings, implementation of 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.

This project with an annual energy generation

of 490 GWh (gross) is targeted to be completed substantially by 2019 August.

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 storage power plant in Nepal.

Significant progress of construction have been achieved and it is about to complete. Currently its testing and commissioning work has been initiated.

KL-III Hydroelectric Project

Project Description

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

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

Switchyard of Kulekhani III Hydro Power Project

The headworks site is located on the left bank of KhaniKhola at Bhainse,about 11 km north of Hetauda. The Powerhouse is located about 5 km northof 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 ZhejaingJinlunElectromechanical Co. Ltd., China. The Consultant is M/S WAPCOS Ltd., India.

Project Status as of 2075/076

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 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 2075/076, (July 2019) approximately 96 percent of the works in total has been completed. Civil construction works has already been completed and 95 percent of the Electromechanical & Hydro-mechanical works has been completed. Field-testing of most of the electromechanical equipment and steel towers erection works are ongoing.

LARGE GENERATION OPERATION AND MAINTENANCE DEPARTMENT

The operation and maintenance of six (6) 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 444 MW. Total generation from the hydropower plants under this department in the fiscal year 2075/76 is 2115.67 GWh, with an increment of 11.57 % 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.

This year, the Kulekhani (Indrasarovar) reservoir got the maximum water level after 2071 B.S. (1527.17 masl) and both the plants KL-I & KL-II are in generation mode with full capacity (92 MW) from 2076-3-30 and will continue as long as the inflow is sufficient to maintaining the maximum level.

Similarly, on this F/Y 2075/76, Middle Marsyangdi Hydro Power Plant had generated electrical energy 471.33 GWh that is the maximum generation since plant is under operation.

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, located at Beltari, Syangja is the largest power station in Nepal with an installed capacity of 144 MW with 3 units each having capacity of 48 MW. It is a six-hour peaking run-of-river type power station having annual design generation of 842 GWh and was commissioned in 2002.

The cumulative generation of the station till F/Y 2018/19 has reached 12,918.85GWh from the first run. The plant generated 871.914GWh of energy this year which is an increase of 0.79% compared to that of previous year and 5.65 % more than annual design and 3.55% more than target generation this year.

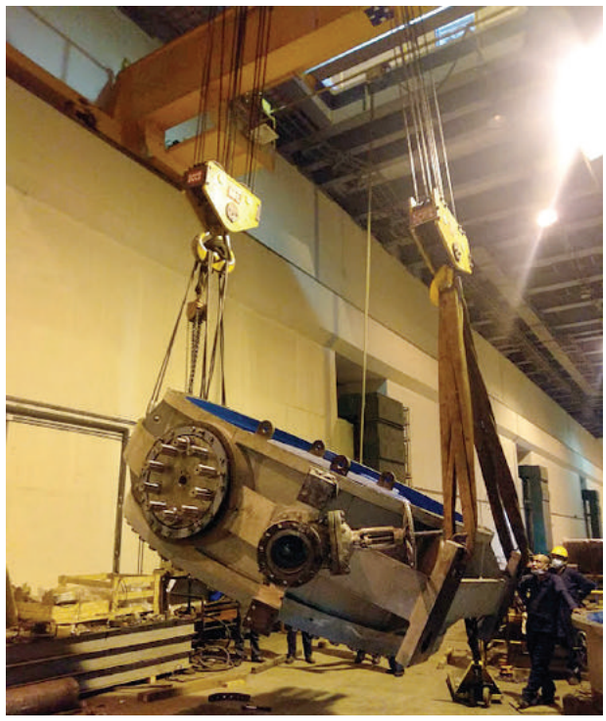
Main Inlet Valve Modification Work:

Problems in opening & closing due to wear and tear of main seal of Main Inlet Valve (MIV), the plant had to face severe difficulties in operation of the turbines. The MIV modification work was carried out under the supervision of Technical experts from TOSHIBA Japan. The MIV modification work of Unit No. 2 was started on 23rd September 2018 and completed on 24th October 2018.

Following other maintenance activities of different sections were carried out are as follows:

Electrical Maintenance

- Plant control system & SCADA (supervisory control and data acquisition) up-gradation work is in progress, drawing approval work has been completed and components are being designed at Factory. OPGW communication system has been fully upgraded & reconfigured by installing new set of IP-PABX, thereby establishing direct communication link between Power House, Beltari Office, Dam-site & Mirmi Colony. Installation of IP-CCTV



Disassembled MIV of Unit No. 2

Cameras in both Head-works & Power House areas for enhancing security system and monitoring Plant equipments & reservoir status. Installation of Radio Remote control system on Electrical overhead & Gantry cranes (4 nos.) has been completed in order to facilitate wireless operation of Electric Cranes.

During overhauling of unit #2 following works were carried out:

Cleaning, meggering and ratio test of excitation transformer Inspection of all the equipment of Generator Housing, measurement of air gap between rotor and stator, testing of 56.5 MVA power transformer, Maintenance of GIS and protection cubicles, Maintenance of gates and trash rack cleaner machine's electrical system and several other electrical works were carried out.

Mechanical Maintenance

Under mechanical maintenance, the following works have been carried out:

Repairing of two set of runner and wicket gates (2 runner and 40 wicket gates) is about to be completed and are ready for HVOF hard coating. 50 nos. of upper stem bush and 40 nos. of lower stem bush of turbine wicket gates have been repaired and are ready for use. 1 set of runner and wicket gates (1 runner and 20 wicket gates) are in process of repairing in which diametric portion is going to be coated by HVOF coating and remaining profile is going to be coated by soft coating. The newly procured bottom ring has been delivered and is ready to install. The installation of bottom ring will be carried out in presence of the manufacturers expert during overhauling Unit 1.

During overhauling of Unit No. 2 following works were carried out: Dismantling of Turbine components, installation of the repaired HVOF coated runner, assembling of the repaired & HVOF coated wicket gate and repaired upper stem bearings, installation of new fabricated

Assembly of HVOF coated runner and guide vanes

balancing pipes, installation of new spare turbine guide bearing. Replacement of governor's actuator/solenoid valve set of turbine of Unit No. 2 and other works required to be done during overhauling were carried out.

Dam Site Mechanical Works

- Damaged rubber seals have been replaced on diversion gates, De-sander flushing Radial gates. Repairing (welding and grinding) work of existing facing plates of diversion dam radial gate no 2 and 3 has been done. Corner joints (Rubber seal) of de-sander flushing radial gate no. 1, 2, 5, 7 and 12 have been replaced.

- De-sander stop log slot has been repaired with welding, grinding and painting during the plant shut down for MIV maintenance period. Replacement work of the bronze seal strips (top, bottom and lateral sides), stainless steel guide plates (top, bottom and lateral sides) and Guide blocks (both side) of under sluice gates has been done.

Civil Maintenance Work

Because of completely damaged stop-log sill beam placing of stop-log for downstream maintenance work of gates and spillway was not possible in diversion gate no. 1 and 2. So it was repaired by underwater repairing works during that period the vertical guide plates of stop-log

slots had been repaired. In addition to that the following works has been carried out: Repair and maintenance of access road, repair of de-sander basin, construction of left side breast wall for protection from land slide, Tatopani to aadhimuhan road improvement work, vehicle shed and badminton court construction, left bank toe protection work, colony and office buildings repair work, Thulabagar river bank protection work.

MIDDLE MARSYANGDI HYDRO POWER STATION

Introduction

Middle Marsyangdi Hydropower Station (MMHPS) has been generating electricity by diverting the water of Marsyangdi River originated from the Tilicho Lake in Manang district. Located in the Lamjung district ofGandaki Province, MMHPS has an installed capacity of 70MW 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 the station has reached 4,479.9 GWh until the end of FY 2075/076. The total generation during this FY is 471.32 GWh, which is an increase of 18.55%, compared to that of design generation and it was the maximum recorded till date generation from operation of hydro power plant.

Repair and Maintenance Activities in FY 2075/076:

Electrical Maintenance

The major electrical works performed are Megger test and BDV testing done in unit1 power transformersduring overhauling of unit1,Megger test and inspection of Generator unit no.1, problem in the Distributed Control System, S-8000 network, PLC and SCADA was solved, restoration of S-8000 optical ring network, testing of existing Vacuum Circuit Breakers and newly procured vacuum circuit breaker at MMHPS, changing of carbon brushes as per requirement basis in both the units, oil filtration and top-up process was carried out on the unit1 power transformers, regular operation and maintenance work, preventive maintenance, and breakdown maintenance at Power House and Dam Site, SF6 gas filling, servicing of 350KVA powerhouse DG, Servicing of 250 kVA Dam site DG,fault identification and changing of contactor of DOLof cooling water control system of both units, maintenance of 33kV, 11kV, 400V, and street light line etc.

Dismantling work during overhauling of Unit No.1

Mechanical Maintenance

The major mechanical works during this period are: Overhauling of Unit 1, replacement of Runner and accessories during Overhauling of Unit #1, 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 Desander at Dam Site, replacement of Heat Exchanger plates of cooling water system of both units, replacement of various valves of cooling water system of both units, replacement of regulating valve of Trash Rack Cleaning Machine, repair and maintenance of all vehicles of MMHPS.

Civil Maintenance

The major civil works during this period are:MS Plate lining work and Epoxy application work were carried out on the chutes of spillway no. 1 and 2, Sediment Flushing of reservoir was carried out to increase the volume of live storage and to reduce the concentration of sediment around intake area, Drain clearance and maintenance at the slope of left bank of dam site and alongside the road from Fedikuna to Siudibar were carried out, Self-level epoxy flooring work on floor no. 0, -1 and -2 of Powerhouse was completed, Repair and Maintenance of Quarter building, sewerage, road to Surge tank and Valve chamber were carried out, Switchyard pebbling work.

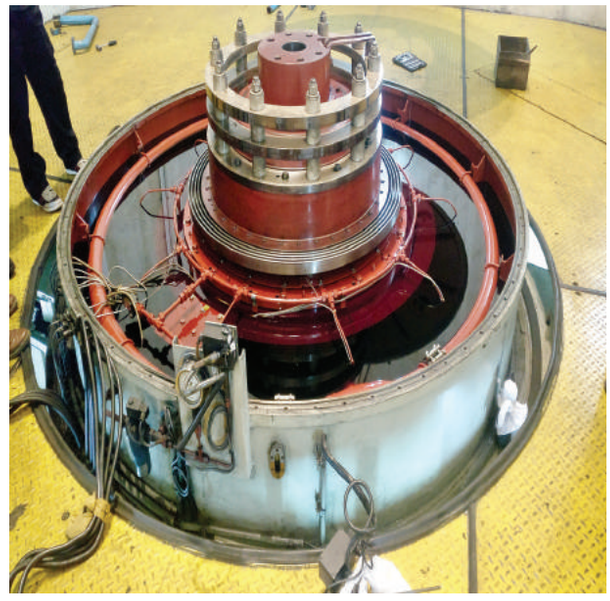
MARSYANGDI HYDROPOWER STATION

Marsyangdi Hydropower station is peaking run-off-river type power station, located at Aabookhaireni, Tanahun in the Gandaki province with installed capacity of 69 MW and annual design generation of 462.5 GWh. It was commissioned in 1989 AD and developed with the assistance from IDA, KFW, KFED, SFD, ADB and GoN at the cost of USD 221.57 million. In FY 2075/76, it generated 475.175GWh of energy which is slightly excess than design generation.

Repair and Maintenance Activities in FY 2075/076:

Electrical Maintenance

Other than regular maintenance activities, the major works, installation and commissioning of 110V/315A main cell with 24V/100A end cell battery charger rectifier, restoration of automatic operating system of surge tank emergency gate were successfully completed. During overhauling of unit no. 2, multiple tasks like filtering transformer oil, meggering, cleaning generator windings, etc. were done. The upgradation of existing single channel digital governor control system into double channel redundant type digital governor control system is ongoing and anticipated to be completed in the fiscal year 2076/77.



Slip ring of Excitation System

Mechanical Maintenance

Other than regular maintenance activities, the overhauling of was done. This year unit 2 suffered with problem in Turbine Guide Bearing Labyrinth ring which was solved by replacing with new one and technical assistance from VOITH Hydro for correction of misalignment of the unit. Installation of the newly procured turbine guide bearing oil coolers and generator air coolers were done. In this fiscal year, shaft seal of units two and three were replaced. Also, the general repair and maintenance of different components of turbine, crane, weir gates, air conditioning and ventilation system, etc. were done in order to guarantee the smooth functioning of the plant.

Civil Maintenance

Regular civil maintenance includes condition monitoring of weir site, maintenance of physical infrastructures of powerhouse and Dhakaltar colony. During rainy season, periodic flushing of desander basin is done as per requirement after performing Eco sounding to know the amount of settled sand in the basin. The major works completed under civil maintenance includes repairing of road to surge tank, black topping of road in Dhakaltar colony, coating of epoxy compound on OGEE surface of radial gate of diversion weir.

KULEKHANI–I HYDROPOWER STATION

Introduction

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 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 4851.437 GWh. The plant generated 91.184 GWh of energy in FY 2075/76. The maximum and minimum waterlevel of Kulekhani reservoir in FY 2075/76 was recorded as 1527.17 masl (2076/03/31) and 1505.43 masl (2076/03/21).

Major Repair and Maintenance Works done during F/Y 2075/76 at KL I HPS

Civil Maintenance

The major civil works during this period are:Concreting Pavement works at Dam site Kalanki road, Repair and Maintenance of Check wall at reservoir area for stopping debris entering into reservoir, Repair and maintenance of Staff Quarters at Colony, Replacement of Gravels at Switchyard, Repair and maintenance of access road at Control house, Painting of Control house as per NEA instruction, Procurement of Motorized and Non-motorized boat for reservoir inspection and survey works, Construction of water tank to supply clean water at colony area.

Electrical Maintenance

The major electrical works during this period areInstallation of 11KV Vacuum Circuit Breakers for Incomer and Outgoing Feeders at Dam site for local distribution, Installation 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, Corrosion resistant coating on 66KV live line Switchyard Gantry structures, Installation of New 66KV SF6 Circuit Breaker for machine synchronization, Installation of solar lighting system at Markhu Colony area.

Mechanical Maintenance

The major electrical works during this period are:Painting of penstock pipeline from BL No 3 to BL No 7 area, Repair and maintenance of Radial Spillway Gate with replacement of bottom seal, Installation of monorail hoist cranes for store and cooling water pump area of the powerhouse,Regular and Periodic Maintenance of Cooling Water Pump, Compressor and Vehicles.

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 designgeneration 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 addingthe water of ManduRiver 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 1993.64 GWh till F/Y 2075/076.

Dismantling of Rotor Assembly

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.

Major Activities

Electrical Maintenance

The major electrical works on this period are: Generator Coil maintenance of unit No-2, Supply, Delivery, Installation testing &commissioning of DC110V, 400AH Lead Acid battery, Application of Radio Remote Controller for electric Overhead Crane at Powerhouse.

Mechanical Maintenance

The major mechanical works on this period are: Supply & Delivery of Hydraulics scissors Lift, Supply & Delivery of Hydraulic Torque Wrench,Air Compressor & Submersible Pump, 48KW & 55KW Pump Repair and Maintenance at Rapti Intake, Installation of Fuel Dispenser at PH.

Civil Maintenance

The major civil works on this period are: Maintenance of some portions of Guest House &Colony staffs' quarter, Surge Tank Protection works at Surge Tank Area, Mandu Dam Protection & Check Wall Maintenance Works, Constructions of water tank at Staff Colony area, Construction of Temporary Reservoir on Rapti Intake which played the Major Role an Increment of the Generation.

CHAMELIYA HYDROPOWER STATION

Chameliya Hydropower Station (CHEPS) was inaugurated successfully through Chameliya Hydro electric Project (CHEP) on 10 February 2018. The Plant is under defect liability period (DLP) till August 14, 2019. CHEPS is a daily pondage run off river hydropower with daily peaking capacity of 6hrs at minimum discharge.

Electricity generation is being done by diverting

Bird eye view of CHEPS Power House

water of Chameliya River which is originated from Mount Apind flows from Himalaya towards south crossing major of Darchula District finally joining into river Mahakali River at Lali, Darchula. It has an installed capacity of 30 MW and designed annual generation of 184.21GWhr.

The site location of CHEPS is at distance of 950 km from Kathmandu and the major city is Dhangadhi (distance 300 km) in the Sudur Paschim Province (previously Far-western development region). The Powerhouse is located at Shailya-shikhar Municipality, Ward No. 1, Balanch, Darchula and the Dam site is located at Marma Gaupalika, Bitule, Darchula. The site is located 85 km from the District headquarter, Khalanga, Darchula.

The cumulative generation of CHEP since its first run is 213.85GWh of which 161.395 GWh has been generated in FY 2075/76.

Repair and Maintenance Activities in FY 2075/076

Since, the Plant is still under the defect liability period, the Contractor and Chameliya Hydroelectric Station are jointly performing repair works. The project is working to introduce alternate bypass cooling water supply system provision for cooling purpose and installation of trashrack cleaning machine at intake to control the debris and minimization of manual time in cleaning trashracks on chocking condition. These two works are undergoing and continuous progressing and will complete in next fiscal year.

Other repair maintenance works of the station are mentioned below.

Electrical Maintenance

Installation of City Operated TOD meters in the powerhouse. Repair, Maintenance and Installation of 4.5 kVA excitation transformer (11kV/195V), Repair of 11 kV dedicated feeder from powerhouse to dam damaged due to landslide. Maintenance of 132 kV transmission line damaged due to heavy snowfall in Dadeldhura and falling of trees in areas of Doti, Kailali and Dadeldhura Districts.Problem solving of unit no. 2 governor by adjusting the guide vane opening and closing time. Repair, maintenance and replacement of latch gear (trigger) of 132 kV SF6 breaker.

Mechanical Maintenance

Replacement of Inflatable seal and repair of turbine Shaft Seal of both the units in presence of Contractor M/S KHNP Consortium, Korea and maintenance team of CHEPS.

Mostly during rainy season high concentration of sediment, debris, leaves, jute pieces etc in the water causeschoking of filter element, which needs to be cleaned on daily basisfilters, valves and pipes etc. Due to high amount of stone and wooden logs piling in intake trashrack, regular cleaning of trashrack is being done on regular basis.

Civil Maintenance

As a newly commissioned project some minor civil works are under way such as Upgrading works of Gokuleshwor-Balanch road by CHEPS. Minor maintenance and outside coloring of staff quarter buildings. Road protection works in the upstream of reservoir, damaged due to impounding of reservoir.

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 of7.5 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 generate the total of 15.78 MWh and was operated only at emergency and power crisis situation to maintain the stable powersystem (INPS).

26 MW Engine Set

Major works carried out during FY 2075/76 by this center includes installation, testing and commissioning of 723 digital governor for unit no.5 and 2V-200 Ah Battery Bank of the control and protection system for 11 kV circuit breakers, Construction of Open Yard for dumping scraps, Construction of Black top access road in office compound and Condition Evaluation and Assessment of all the six engines by M/s Wartsila India Pvt. Ltd.,India. Beside these, repair and maintenance of 11 kV circuit breakers used for industrial feeders, LT line and transformers 'maintenance and staff quarter maintenance works were also carried out.

MEDIUM GENERATION OPERATION AND MAINTENANCE DEPARTMENT

Medium Generation Operation and Maintenance Department (MGO&MD), headed by 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 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 2075/76 is 409.15 GWh and has achieved an increment of 2.32 % generation as compared to previous fiscal year. Rehabilitation project 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 unit-II of Chatara hydropower station has been successfully completed and the refurbishment Unit-I is on the progress. NEA Management also decided to renovate and modernize Trishuli Power Station and tender of this work has been published. On this F/Y 2075/76, Sunkoshi Hydro Plant had made great achievement of achieving 100% generation target.

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

TRISHULI HYDROPOWER STATION

Introduction

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 and an annual design generation capacity of 163 GWh. The cumulative generation of THPS since its first run has reached 5306.66 GWh of which 123.74 GWh has been generated in FY 2075/76.

Trishuli Power House

Present Status

Currently, six out of seven units are in operation. However all the units shall be put into operation in the near future. Overhauling of Unit no 1 was accomplished in FY.2075.76 along with its MIV, which was not working properly since a long time, is now in operation after repair and addition of new power pack system. Two nos. of stop-log gate were added at the forebay opening which now has separate gates for each 4 penstocks. The dredger facility installed at the balancing reservoir has been renovated with all the power cables changed and now in normal operation. Renovation of EOT crane installed at powerhouse was done including the replacement of old DSL and operating panel. It has now been equipped with radio remote control facility. Extensive Repair and maintenance of switchgear and bus bar were done after the switchgear suffered some serious accidents.

Protection Fencing work at the canal area was done. Also maintenance works for Powerhouse access road was carried out. Numbers of Staff dormitory were repaired and renovated.

THPS had undergone some series of fire accident at its switchgear system during this period. On Asoj 25, 2075 high voltage caused severe damage in the DC system of the plant. Four nos. of units were later restored on Asoj 30, 2075. The accident recurred when the maintenance work of unit no.2 breaker was being carried out on 8 Mangsir, 2075. The seven units were restored on 26 Paush, 2075. On 18 Paush, 2075, switchgear of unit-6 caught fire and took a serious damage. This in turn affected the operation of other units also though the bus cabinet was restored within a week. New breaker for unit-6 has been already installed and control circuit are being checked after which unit shall be put into operation soon.

Works that need attention includes Gates and related auxiliaries be overhauled. Seizure of main bearing is a serious issue faced at the monsoon time when the grid failure is frequent although much care is being taken; water leakage mainly from shaft seal occasionally causes problems

With excess silt deposit in the balancing reservoir, the plant does not operate to its designed peaking feature. Choking of B-0 point is a common issue during monsoon which also obstructs the discharge to the canal and reduces the generation. However, Extensive workout has been carried out for the rehabilitation and modernization of THPS in this fiscal year for which the tender has already been published.

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 atDevighat, 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. The actualgeneration of year 075/76 is 86.85 GWh..

Devighat Hydropower Station, Nuwakot

The major activities accomplished in this fiscal year 2018/19 were removing the sand , stone and silts of the forebay reservoir, Replacement of seal at the escape gate was done utilizing the shutdown period of Trishuli power houses,By pass valve which was not in operation for many years was replaced with new one and is operating well now. Repair works of gates at Devighat powerhouse headgate and forebay gate was done by replacing old bearing and seal with new ones to stop the water leakage.

New high air pressure pipe line was installed in the powerhouse. Civil repair works of the cannel was carried out. Additional water flow was added to the water cannel from Samari Khola to increase the Generation. Construction of new Quarter building was done.

Repair of unit no 2 Excitation system was done replacing the damaged Rotating Diode. New 66 KV Sf6 breaker and Current Transformer was installed for 66 KV Devighat–Chabel transmission line. Repair and maintenance work of 33kV VCB breaker was done. Installation of Bus PT was done. New 33kV Vacuum breaker and Line control and relay panel was installed for 33 kV Devighat – Dhading power line.

Furthermore, Cleaning of trash rack were carried out frequently to remove the trash to increase the generation. Devighat power house is facing problem in its Governor, and SCADA system and needs for fault diagnose, repair and maintenancewhich will be carried by suitable experts in next fiscal year. Repair work for to stop water leakage from lower part of escape gate will be carried out utilizing the shutdown period of Trishuli Powerhouse.

GANDAK HYDROPOWER STATION

GandakHydroPowerStationislocatedatPratappur Gaunpalika ward no.-7, District: Nawalparasi, Nepal about 235 Kms from Kathmandu and about 5 Kms North from Indian boarder point called Jhulenipur, District: Mahrajgunj, Uttar Pradesh. The power house is a part of irrigation cum power generation scheme on GandakRiver. A barrage has been constructed on the river Narayani at BhainsaLotan (Balmikinager, Bihar) on Indo-Nepal boarder. From the barrage, two canals take off namely Gandak Main EasternCanal 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 headhigh discharge Kaplan Turbo-Generators of 5 MW each with aggregate

Overview of Gandak Powerhouse Interior.

capacity of 15 MW and annual designgeneration 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 (FY 2075/076) is 11.95GWh which is 35.8percent of its target generation 33.36GWh. Presently, Unit no. 1 is in shutdown condition due to damages on generator's stator coil for last 12 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 with local people causes disturbance in canal. The frequent system changing, high water level in tailrace controlled by Irrigation Dept. UP, high sediment & choking of trash rack and frequent tripping due to very low voltage from Indian grid also disrupt power generation. The plant is strongly seeking rehabilitation for optimum performance and reliable operation of machine.

The Present status of the station is among three units the unit no. 2 is in operation & unit no.1 is out of operation for last 12 years due to problem in generator's stator coil & unit no. 3 is under breakdown since Magh 2075due to problem inturbine guide bearing and other components.

The following major repair and maintenance activities that were performed during FY 2075/076: Replacement of rubber O-ring of runner blade and runner blade servomotor of unit no. 3, replacement of guide vane servomotor in unit no. 2, replacement of oil divider ring in unit no. 2, replacement of carbon seal (shaft seal) of unit no. 2,replacement of guide vane bush and seal of unit no. 2 & 3, replacing of chequered plate & installation of beam at tailrace gate no 2, replacing of PT set in 132 KV switchyard, repair of excitation system of unit no.2, installation of water level sensor in headwork and tailrace, repair and painting of staff quarters, office and store building, construction of shed for vehicle parking in powerhouse and office premises .

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 69.40 GWh, which is about 4.33%more than previous year's generation.

Repair and Maintenance Activities in FY 2075/076:

Electrical Maintenance

Major works carried out under electrical section includes replacement of the 15 MVA, 132/33 kV Power Transformer situated at 132 kV substation with 30 MVA transformer as previously installed transformer had insufficient capacity to evacuate power from 33 kV side to 132 kV Grid side since past few years during monsoon season when generation from power plants connected to 33 kV side is maximum, replacement of one set of 132 kV SF6 CB to Pokhara grid side on 132 kV substation and two sets of 33 kV VCB on 33 kV substation, replacement of 11 kV indoor incomer panel for 11 kV intake and local feeders and replacement of 400 V ACB for internal distribution system.

Mechanical Maintenance

This year, Turbine overhauling of Unit-1 was successfully completed by Plant's own manpower second time in a row following the successful completion of Turbine overhauling of Unit-2 in the previous year. Major Maintenance works in Fiscal Year 2075/76 under mechanical section includes successful completion of Unit-1 Turbine

Overhauling by replacing Francis runner, Labyrinth ring, Sealing ring, 20 nos. of Guide vanes, Wearing plates for head cover & bottom rings, replacement of old SS Generator Air Coolers with new ones in Unit-2, replacement of old Generator Thrust Bearing Oil Coolers with new ones in both units, replacement of old Turbine Guide Bearing Oil Coolers with new ones in Unit-1 during overhauling, modification, repair & maintenance of U/S Desander gate hoisting system with new modified gate spindle& other gate parts, installation of new driving system of Desander sand purging gate & regulation poundage outlet gate, repair & maintenance of inlet & outlet pipes for SS Generator Air Coolers & Generator thrust bearing oil coolers of both Unit-1 & Unit-2 by replacing with new set of pipe line. Other major works include installation of New Cooling Water Filtration System (In-line Strainer & Auto Self-Cleaning filter) by replacing the existing manual type of Duplex filtration system at both units. The new system being automatic, the maintenance burden to the plant operator due to frequent cleaning of choked filter element has been reduced significantly. This has also reduced the unit from unplanned shutdown especially during the period when the sand and silt level is very high in the river. Similarly, a Gantry Crane with 5 Ton monorail hoisting capacity has also been installed at the Powerhouse. With the installation of this Gantry Crane, the life of maintenance crews has been very much easy since any heavy component up to 5 ton weight can now be easily and conveniently taken out of the Powerhouse and any other piece can be easily placed at Generator floor inside the Powerhouse without taking help of Mobile Crane.

Guide Vane Set up of Unit 2

Civil Maintenance

Similarly, civil works carried out this year include Plastering of 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 completed last year by M/S Lumbini/ Prakritik JV. Although the construction of civil and hydro-mechanical works have been completed last year under the rehabilitation project, the testing & commissioning of Bypass control gate still remains to be outstanding.

SUNKOSHI HYDROPOWER STATION

Sunkoshi Hydropower Station, located 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 power house was commissioned in January 1972 with the 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 2378.431 GWh in 2075/76 from the first run. It has generated 55.051 GWh in FY 2074/75 and 62.151 GWh in FY 2075/76 with an increase of 12.9%.

Present Status

Presently, all the three units of the station are in operation.

Due to Rainy season, flushing of sand in damsite and desander basin and cleaning of trashrack chockage is being carried out daily in order to prevent the corrosion in turbine unit.

Repair & Maintenance Activities

The following activities were performed during FY 2075/76.

Mechanical Maintenance

Major mechanical works carried out during this period are: Unit no 3 complete overhauling, Repair & maintenance of Shaft seal housing and Shaft seal plate of Unit No. 1, Modification of Trashrack of Forebay, Maintenance of Gallery Gate No. 1 and 2 of Forebay, Replacement of New Gates of Peak load Pond.

Electrical Maintenance

Major electrical works carried out during this period are:Modification of Excitation System of Unit No. 1 by replacing with new Thyresistor, Changing of CT and control wiring of Unit No. 2, Changing of busing and cable heads; and oil filtration of 6.3 MVA, 6.3/66kV transformer for evacuation of power after interruption of 66 kV transmission line, Changing of post insulator on bus bar, Maintenance of breaker of 3 MVA, 6.3/33 KV transformerfor evacuation of power after interruption of 33 kV transmission line, Modification of Control panel of Gallery gate and Peak Load Pond.

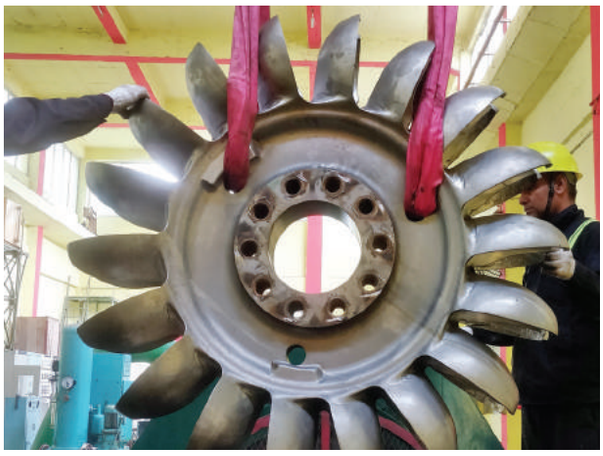
Civil Maintenance

Gabion Wall Protection Works

Major civil works carried out during this period are: River training works with Gabion to protect store of Sunkoshi HPS, Construction of Roof Truss for Water Seepage Control from Roof of Power House.

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. It has an installed capacity of 6.2 MW and annual design generation of 48 GWh.



Needle-Nozzle Assembly and Repaired Pelton Runner.

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 an it 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 34.19 GWh of energy this F/Y 2075/076 and till date generation of the plant is 589.82 GWh.

Major Maintenance Works

Major maintenance works carried out during the last FY are as follows:

Replacement of Cup Seals of Opening/Closing Device and Nozzle-Needle, replacement of 33 kV Outdoor SF6 Breaker with VCB 33 kV Outdoor

CT Installation work, testing of Battery Bank by taking shutdown approval with LDC, Power & Station Transformer Testing work by taking Plant Shutdown with Approval of LDC, oil filtration and replacement of Power Transformer, Seal replacement of Main gate, flushing Gates at Intake and head tank, epoxy Painting on Outer Surface of Remaining Section of PenstockPipe which was not completed in last F/Y, overhauling of Unit No. II, replacement of major turbine parts such as Turbine runner, Needles, Nozzles etc., welding of worn our surface of Upper and Lower Deflectors, meggeringand Varnishing the Jumper of Stator Coil of Unit No. II Generator, replacing water dispatcher to reduce abnormal noise and vibration of turbine casing of both Units, applying Metallic Ceramic Painting (UPS 210) on inner surface of casing and Needle-Nozzle Assembly.

CHATARA HYDROPOWER STATION

Chatara Hydropower Station, a canal drop type hydropower station, is located at Chatara, Sunsari with an installed capacity of 3.2 MW (2 units, each of capacity 1.6 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 dredger pumps to flush sediments from the Canal was later handed over to NEA by Sunsari Morang Irrigation Project (SMIP) on 29th March, 1999.

Front view Chatara Hydropower Station Office

After five years of complete plant shutdown, a single unit (Unit No. 2) started generating from the month of October 2018. The hydropower station has generated 2,625 MWh of energy meeting the energy declaration/target of 2,600 MWh in last 9 months of FY 2018/19. Since it is mainly an irrigation scheme, the hydropower station cannot be operated in full load throughout the year. Water released after power generation is used for the irrigation in Sunsari and Morang districts. Farmers do not require water throughout the year therefore during the crop harvesting time and canal maintenance time period, the hydropower station has to stop generation.

The 10 ton electric chain hoist of the gantry crane installed previously was not bearing rated load because of being too old with several wear & tear. That was upgraded to 12 ton with newly supplied electric wire rope hoist this year. The procurement of 1 set of new 3.5 MVA 33/11 kV OLTC Power Transformer of the switchyard is also in the process.

The hydropower station has planned for the overhauling of an another unit (Unit no. 1) this year. For this, its open competitive bidding procedures has been started.

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 in the vicinity of Khopasi.

The major activities accomplished this fiscal year 2018/019 were Rehabilitation and Modernization of Switchyards of Panauti Hydropower Station located at Khopasi and Bhakatpur, Installation and Commissioning of EOT Crane's Hoisting and

Radio Remote Control System of Power House, Repair & maintenance of Francis Runner and its components of unit 2, Repair & maintenance of Forebay and Flushing Gates, Replacing Bushing, Copper Studs, OTI and complete Oil of Power Transformers of Power House, Upgrading distribution lines of Office and Colony Areas, Cleaning works for Regulating Reservoir, Repair and maintenance of headrace canal, Repair, maintenance and restoration works for colony buildings, Painting Works for all Roofs of Office building and Colony and Construction of barbed boundary around Regulating Reservoir.

This F.Y. Panauti Hydropower Station is generating maximum annual energy which the power plant had not been able to do since the last 11 years, due to the proper utilization of available water and implementation of proper preventative maintenance schedule.

Removal of debris of regulating reservoir

FEWA HYDROPOWER STATION

Introduction

Fewa hydropower station is a canal drop type power station having an installed capacity of 1.0 MW and located at Birauta, Pokhara with an annual design generation capacity 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.

The cumulative generation of the station has reached 95.59 GWh till 2018/19 from its first run. The station has generated 1.53GWh in FY 2018/19.

Present status

Presently, only Unit No. 1 & 3are in operation at rated capacity while remaining Unit No. 2 and 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.

Fewa HPS

Repair and Maintenance Activities

The following activities were performed during FY2018/19.

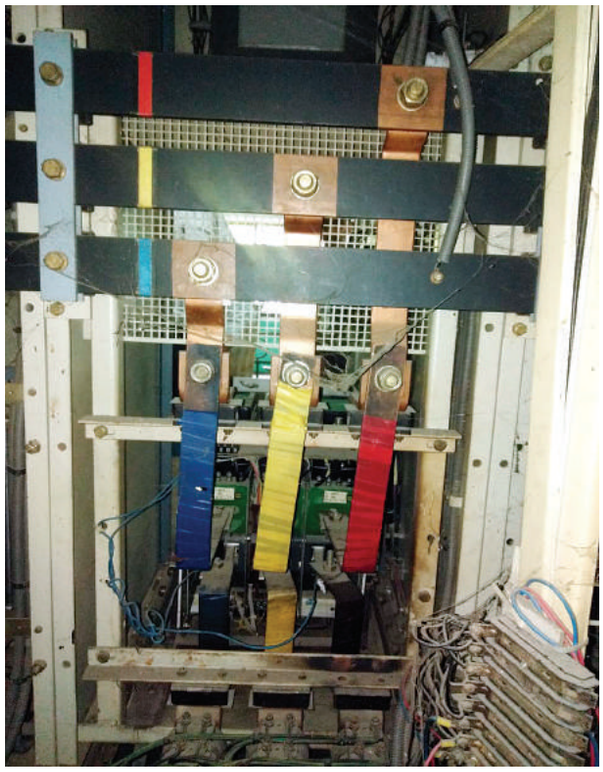
Mechanical maintenance

The major mechanical works done during this period are: Maintenance of governor, excitation system, high pressure oil system, Maintenance of main inlet valve and bypass valve, Repair maintenance of draft tube of Unit No. 1, Drain valve and cooling system maintenance &Unit no 3 overhauling.

Electrical maintenance

The major electrical maintenance works during this period are: 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 changes of unit no 1 and 2.



VCB Breaker Maintenance

Civil Maintenance

The major civil works during this period are: Repair and maintenance of forebay gate, Protection works of old buildings and civil structures, Repair and maintenance of approximately 300 m power canal, Installation of new intake gate along with slope protection work, Repair and maintenance of power house as well as tail race.

SETI HYDROPOWER STATION

Introduction

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 andwas 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 stationis affected by irrigation as well.

Seti HPS

The cumulative generation of Seti HPS has reached 325.66 GWh till 2018/19 from its first run. The station has generated 10.03 GWh in FY 2018/19.

Present status

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 maintenance of weir at headworks has been completed and it has helped to continue operation of this station throughout the year. However, major repair and maintenance works are required in headworks area in the near future.

Repair and Maintenance Activities

Mechanical Works

The major mechanical works carried out during this period are: Maintenance of governor and high pressure oil system Repair of governor oil pressure unit in Unit No. 3, Overhauling of Unit No. 3, the guide bearing and slip ring of unit no 1 had changed,Repair of big desander gate and stop log gate at Jaubari&Replacement of steel rope, rubber seal and steel plate lining works at jaubari radial gate.

Electrical Works

The major electrical works carried out during this period are: 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.

Overhauling of Unit No. 3

Civil Maintenance Works

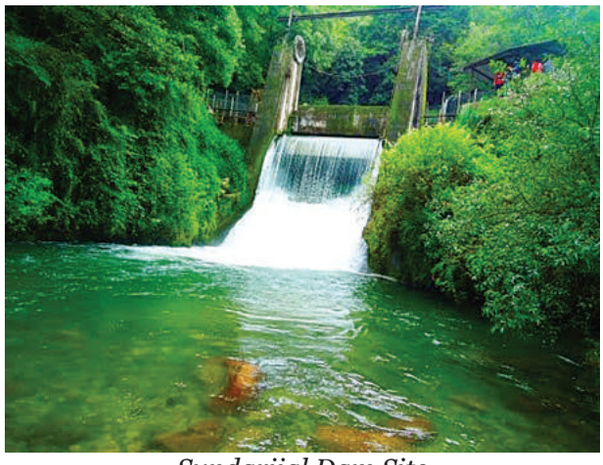
The major civil works carried out during this period are: Construction of weir section of head works which was damaged by flood last year, Relocating desander basin flushing gate to original position, Removal of huge deposition of debris, logs and silt during flood at power cannel, Cleaning, painting civil maintenance works, Protection works in old buildings and civil structures.

SUNDARIJAL HYDROPOWER STATION

Introduction

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's were supplied by The English Electric Company Ltd., England. It was commissioned in 1934 AD, and is the second oldest hydropower plant constructed in Nepal. The actual generation from this plant in this year is 4.335 GWh. 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 ofcontrol room & two new building, one for museum and other for store and office & construction of colony compound wall are in progress. The rehabilitation of this power station is underway under the joint assistance from ADB, GON. Nepal Electricity Authorityhas 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. NEA intends to apply a portion of the proceeds of this loan for Rehabilitation and upgrading of Sundarijal hydropower plant from 640 kW to 970kW.



Sundarijal Dam Site

Therehabilitationconstructionworksof Sundarijal Hydropower station is funded under the joint assistance from ADB and GON. 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 - a loan portion of which has been budgeted for Rehabilitation and upgrading

of Sundarijal hydropower plant from 640 kW to 970kW. The rehabilitation works largely consists of Electromechanical rehabilitation work with modernization of Plant Control System and civil improvement work at intake and headpond. The consulting part for the design of the plant served by individual international consultancy has been completed whereas the rehabilitation construction works of Sundarijal Hydropower station is in progress. The contract for Sundarijal Hydropower Station Rehabilitation in EPC model has been awarded on April 2017 based on the inception report of the consultant. The access road to the powerhouse has rebuilt with upgradation for easy transportation of heavy equipment, which was stored in NEA's Training Centre, Kharipati. The execution of the project is going on and now unit no. 2 is dismantled, primary foundation of same unit is completed. The erection of control and protection panel is on progress. The project is scheduled to be complete by December 2019. The power plant rehabilitation contract cost is INR 65,843,265.00 and the contractor for the Rehabilitation Work is Power Mech-Pentflo-Zillion JV. This Project is a part of an effort of Nepal Electricity Authority to renovate and modernize aged hydropower plants.

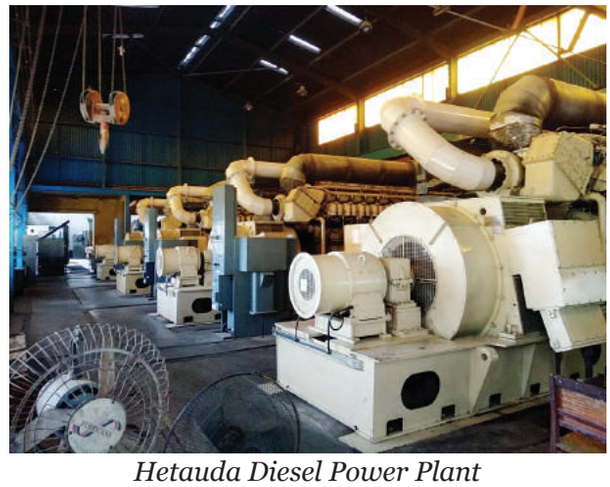
PHARPING HYDRO-POWER STATION

Pharping Hydropower Station is the first power station to be built in Nepal, and it has held 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.

Reservoir of Pharping Power House

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 other hydro power. So, its operation is restricted. In FY 2075/76, it generated a total of 113.17MWh.



Hetauda Diesel Power Plant

Repair and Maintenance Activities in FY 2075/76

Major works carried out in the FY 2075/76 are repair, maintenance, and servicing of 300kVa

station transformer; repair and maintenance of cooling tower's fan blade and motor housing of unit number three, repair , maintenance and servicing of Elgi air compressor no.1., replacement of mainswitch (100A) at pump house and schedule and preventive maintenance work for all the equipments and accessories were carried out thoroughly.

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 2075/76, Technical Support Department has carried out the designed of the rehabilitation works of Trishuli Hydropower Station and review of civil repair and maintenance works at Kali-Gandaki A, Middle Marsyangdi and Marsyangdi hydropower stations.

Nepal Electricity Authority

Generation Operation and Maintenance

Actual Generation for the FY 2075/76 (FY 2018/19A.D.)

Unit: MWh

S.No.	Power Stations/Month		Shrawan	Bhadra	Ashwin	Kartik	Mangsir	Poush	Magh	Falgun	Chaitra	Baishakh	Jestha	Ashad	Total
1	Kaligandaki 'A'	KGA	100,902.00	98,017.00	65,650.00	67,913.00	63,726.00	48,224.00	43,580.00	44,728.00	55,593.00	88,709.00	99,146.00	95,726.00	871,914.00
2	Mid-Marsyangdi	MMHPS	50,830.13	49,500.13	51,614.00	44,704.70	32,082.20	24,471.60	21,058.00	22,842.30	29,473.10	48,551.10	49,417.50	46,777.75	471,322.51
3	Marsyandi	MHPS	45,197.20	44,981.20	48,936.50	46,863.20	36,038.30	27,926.50	25,314.00	24,811.50	31,695.80	47,422.20	52,096.70	43,892.90	475,176.00
4	Kulekhani I	KLI	4,480.00	2,894.00	2,209.00	1,349.00	2,249.00	5,878.00	5,390.00	2,710.00	13,504.00	20,932.00	16,616.00	12,973.00	91,184.00
5	Kulekhani II	KLII	2,094.00	1,370.50	1,054.30	701.40	1,156.30	3,030.20	2,753.90	1,359.80	6,440.90	10,043.00	8,124.60	6,547.80	44,676.70
7	Chameliya	CHMPS	9,579.47	13,272.40	21,010.62	15,820.60	10,862.10	8,507.10	6,609.75	7,861.39	12,686.36	18,363.55	17,908.78	18,913.42	161,395.54
6	Trishuli	THPS	8,735.50	11,158.70	10,446.10	10,652.50	11,178.70	9,867.80	10,069.00	9,732.50	9,840.00	9,044.10	11,487.60	11,528.60	123,741.10
7	Gandak	GHPS	1,899.70	1,599.90	1,659.80	213.50	-	1,616.40	869.90	1,703.00	732.20	-	479.50	1,176.90	11,950.80
8	Modi	MKHPS	6,027.50	7,106.70	9,937.50	6,801.60	4,749.20	3,343.10	2,656.90	2,660.90	3,807.80	6,907.60	8,286.70	7,115.00	69,400.50
9	Devighat	DHPS	6,024.84	7,558.92	7,294.98	7,844.55	6,268.39	7,362.30	7,371.98	7,076.75	7,226.96	6,523.64	8,302.23	7,995.60	86,851.14
10	Sunkoshi	SKHPS	4,488.20	5,146.30	6,450.80	6,934.40	5,114.40	4,093.70	3,305.50	3,316.70	3,864.90	6,044.20	7,114.30	6,283.30	62,156.70
11	Puwa	PKHPS	4,412.66	3,859.84	4,357.75	3,747.97	2,317.63	1,862.38	1,433.26	1,834.42	1,948.12	2,565.89	2,517.80	3,335.09	34,192.81
12	Chatara	CHPS	-	-	73.75	447.75	354.25	362.25	289.50	223.50	212.00	115.25	421.25	198.75	2,698.25
13	Panauti	PHPS	432.49	464.00	504.66	361.89	262.05	214.08	176.54	163.79	129.06	173.17	30.21	93.91	3,005.84
14	Seti	SHPS	927.27	904.77	924.30	885.33	806.22	922.86	815.00	761.80	802.30	909.81	708.39	661.95	10,030.00
15	Fewa	FHPS	107.05	157.01	234.24	67.96	89.09	39.28	190.00	223.80	209.30	115.53	-	98.42	1,531.68
16	Sundarijal	SJHPS	470.33	468.99	453.66	382.00	231.33	240.00	229.66	226.33	209.67	215.67	211.67	248.00	3,587.30
17	Pharping		-	-	-	-	-	-	-	-	-	-	-	-	-
18	**Upper Trishuli 3A Project**	**UT3A**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3,348.000**	**12,837.600**	**16,185.60**
	Total (Hydro)		246,608.34	248,460.36	232,811.96	215,691.34	177,485.16	147,961.55	132,112.89	132,236.48	178,375.47	266,635.70	286,217.22	276,403.98	2,541,000.46
19	Multifuel	MFPS	-	-	-	-	-	-	-	-	-	-	-	-	-
20	**Hetauda Diesel**	**HDPS**	**7.25**	**9.71**	**9.95**	**9.37**	**10.20**	**10.73**	**11.85**	**8.59**	**11.23**	**10.38**	**8.65**	**7.84**	**115.74**
	Total (Thermal)		**7.25**	**9.71**	**9.95**	**9.37**	**10.20**	**10.73**	**11.85**	**8.59**	**11.23**	**10.38**	**8.65**	**7.84**	**115.74**
	Grand Total		**246,615.59**	**248,470.07**	**232,821.91**	**215,700.71**	**177,495.36**	**147,972.28**	**132,124.74**	**132,245.06**	**178,386.70**	**266,646.08**	**286,225.88**	**276,411.83**	**2,541,116.21**

Note: Provisional figures subjected to final audit

Nepal Electricity Authority

Generation Operation and Maintenance

Generation Related Statistics and Performance Factors for the FY 2075/76 (FY 2018/019)

S.N.	Power Stations	Total Installed Capacity (MW)	Total No. of Units Installed	Actual Generation (MWh)			Maximum Generation in a year till date/year (MWh)	Design Generation (MWh)	Generation Target (MWh)	Backfeed (MWh) (B)	Available NEA Power Station Energy (C=A+B)	Transmission to Grid (MWh) (D)	Local Distribution (MWh) (E)	Station and/ or Internal Consumption (MWh) (F)	NEA Power Stations Utilized Energy (G = D+E+F)	Power Station Loss (%) (C-G) / (c)	Self Sufficiency Ratio (%) (D+E) / (C)	Plant Factor (%) (A / (Ins. Capacity *356 *24) *100)	Current No. of Employees
				FY 2073/74	FY 2074/75	* FY 2075/76 (A)													
1	Kaligandaki 'A'	144.00	3	842,149.00	865,075.00	871,914.00	929,983.00 (2071/72)	842,000.00	825,252.04	200,084.00	1,071,998.00	1,068,925.02	935.32	1,807.26	1,071,667.60	0.03%	99.80%	69.12	91
2	Middle Marsyangdi	70.00	2	454,651.62	437,286.87	471,322.51	471,322.51 (2075/76)	398,000.00	444,915.41	362,123.34	833,445.85	820,518.93	120.98	1,215.90	821,855.81	1.39%	98.46%	76.86	72
3	Marsyandi	69.00	3	465,305.50	447,490.30	475,176.00	483,928.20 (2052/53)	462,500.00	471,309.63	209,667.00	684,843.00	664,214.40	-	3,791.40	668,005.80	2.46%	96.99%	78.61	60
4	Kulekhani-I	60.00	2	73,402.00	62,131.00	91,184.00	249,680.00 (2056/57)	211,000.00	108,554.73	95,900.07	187,084.07	178,372.77	8,204.73	479.98	187,057.48	0.01%	99.73%	17.35	69
5	Kulekhani-II	32.00	2	37,795.13	31,754.10	44,676.70	122,757.00 (2056/57)	104,600.00	48,690.99	460.39	45,137.09	44,475.96	-	210.83	44,686.79	1.00%	98.54%	15.94	44
6	Chameliya	30.00	2	-	52,459.58	161,395.54	161395.54(2075/76)	184,200.00	184,200.00	34964.54	196,360.08	193,404.50	1,096.30	128.10	194,628.90	0.88%	99.05%	61.41	29
6	Trishuli	24.00	7	125,969.40	121,316.50	123,741.10	154,423.75 (2053/54)	163,000.00	137,613.64	172,411.57	296,152.67	268,994.48	24,217.83	232.69	293,445.00	0.91%	99.01%	58.86	55
7	Gandak	15.00	3	21,872.70	17,495.80	11,950.80	52,272.70 (2043/44)	106,380.00	33,360.19	125,126.83	137,077.63	53,359.75	82,329.79	670.09	136,359.63	0.52%	98.99%	9.09	32
8	Modi Khola	14.80	2	69,556.40	66,422.70	69,400.50	69,556.40 (2073/74)	92,500.00	70,971.48	82,513.00	151,913.50	145,122.26	5,469.60	560.19	151,152.04	0.50%	99.13%	53.53	40
9	Devighat	15.00	3	97,609.96	86,238.79	86,851.14	106,277.70 (2056/57)	114,000.00	93,195.47	46,966.90	133,818.04	102,232.00	31,041.86	156.00	133,429.86	0.29%	99.59%	66.10	37
10	Sunkoshi	10.05	3	46,190.70	55,050.50	62,156.70	66,383.10 (2068/69)	70,000.00	58,188.00	2,168.14	64,324.84	61,930.23	1,907.60	256.01	64,093.84	0.36%	99.24%	70.60	45
11	Ilam (Puwa Khola)	6.20	2	36,414.24	35,790.53	34,192.81	36,414.24 (2073/74)	48,000.00	36,053.52	131.89	34,324.70	34,152.13	-	44.89	34,197.02	0.37%	99.50%	62.96	37
12	Chatara	3.20	2	-	22.25	2,698.25	5,219.75 (2063/64)	6,000.00	3,546.40	1,418.63	4,116.88	2,663.00	1,369.34	15.22	4,047.56	1.68%	97.95%	9.63	24
13	Panauti	2.40	3	2,603.33	1,112.34	3,005.84	4,654.80 (2058/59)	6,970.00	3,400.78	-	3,005.84	2,985.41	-	20.46	3,005.87	#	99.32%	14.30	26
14	Seti	1.50	3	8,044.86	10,186.74	10,030.00	11,616.19 (2067/68)	9,800.00	10,564.25	1.00	10,031.00	9,302.38	-	38.99	9,341.37	6.87%	92.74%	76.33	33
15	Fewa	1.00	4	1,467.69	1,911.68	1,531.68	3,919.47 (2034/35)	6,500.00	2,990.36	-	1,531.68	-	-	18.69	18.69	#	#		17.48
16	Sundarijal	0.64	2	4,490.73	4,332.29	3,587.30	4,530.26 (2071/72)	4,770.00	4,033.83	-	3,587.30	3,580.33	-	6.97	3,587.30	#	99.81%	63.99	18
17	Pharping	0.50	2	0.88	-	-	48.65(2064/65)	-	-	-	-	-	-	-	-	-	-	-	4
18	Upper Trishuli 3A project	60.00	2	-	-	16,185.60	16185.60(2075/76)	489,760.00	-	-	16,185.60	16,023.74	-	9.66	16,033.40	0.94%	99.00%	3.08	59
	Total (Hydro)	**559.29**	**52**	**2,287,524.14**	**2,296,076.97**	**2,541,000.46**	**-**	**3,319,980.00**	**2,536,840.72**	**1,333,937.30**	**3,874,937.76**	**3,670,257.29**	**156,693.35**	**9,663.31**	**3,836,613.95**	**0.99%**	**98.76%**	**51.86**	**775**
19	Multifuel	39.00	6	26.66	15.78	-	86,215.07 (2055/56)	-	-	-	-	-	-	-	-	-	-	-	19
20	Hetauda Diesel	14.41	4+3	325.98	127.19	115.74	24,203.64 (2055/56)	-	-	-	-	105.47	-	11.01	116.48	#	91.13%	0.09	16
	Total(Thermal)	**53.41**	**13**	**352.64**	**142.96**	**115.74**	**-**	**-**	**-**	**0.00**	**0.00**	**105.47**	**-**	**11.01**	**116.48**	**#**	**91.13%**	**0.02**	**35**
	Grand Total	**612.70**	**65**	**2,287,876.78**	**2,296,219.93**	**2,541,116.20**	**-**	**3,319,980.00**	**2,536,840.72**	**1,333,937.30**	**3,875,053.50**	**3,670,362.76**	**156,693.35**	**9,674.32**	**3,836,730.43**	**0.99%**	**98.76%**	**47.34**	**810**

***** Above Generation Energy Datas were excluding NEA owned Small Power Houses***

\# Metering Problem

Total Generation Energy of NEA owned Power Stations including Small Hydro Power Houses = 2548.11 GWh

Total Available Energy of the System = 7551.23 GWh

Overall Generation Loss : 0.507 % ((C-G)/Total Available Energy of the system)

TRANSMISSION DIRECTORATE

Transmission Directorate is one of the nine directorates in the overall organization structure of NEA. This, like the other directorates, is headed by a Deputy Managing Director. Under this directorate there are four departments, namely; Grid Operation Department (GOD), System Operation Department (SOD), Grid Development Department (GDD) and Major 220 kV Transmission Line Department each of which is headed by a Director. Further, the major 400 kV Transmission Line Projects are also under this directorate.

The directorate develops, implements, constructs, operates, maintains, and monitors high-voltage transmission lines and substations from 66 kV to 400 kV voltage level that are necessary for transmission of power generated from the various NEA and IPP owned power plants to the distribution system networks and undertakes reinforcement / upgradations of existing transmission lines and substations.

The directorate conducts short term, medium term and long term plan for the development of transmission system network of 66 kV and above voltage levels to transmit the power generated as per GoN plan (15,000 MW in 10 years) as well as meet the rapid growing demand of the country.

Till now, INPS system has been charged up to 220 kV voltage level and planned to upgrade at 400 kV in current fiscal year. All the new under construction substations will be equipped with a state-of-the-art control, protection and automation system based on IEC 61850 open standards to facilitate communication between numerous devices within the substation and beyond the substation. Moreover, this directorate has additional responsibility to operate INPS in synchronous mode with Indian Grid in order to make system reliable, secured and robust.

Further, this directorate is responsible for power exchange across the cross-border countries. The first ever 400 kV Dhalkebar-Muzzaffapur cross-border transmission line has been charged successfully at 220 kV voltage level in previous fiscal year. In addition, financial modalities for the construction of Butwal-Gorakhpur 400 kV cross-border transmission line is in the final stage and the preparation of detail design of Inaruwa-Purniya and New Lumki (Dododhara)- Bareli cross border transmission lines are in progress.

RECENTLY COMPLETED PROJECTS

1. Middle Marsyangdi-Dumre-Damauli 132 kV Transmission Line

Objective of this project was to increase the reliabilityinsuringN-1contingencyoftransmission

line of the region, evacuate power from hydro power projects and decrease transmission line loss.

The scope of project was to string 39 km 132 kV second circuit Middle Marsyangdi-Marsyangdi transmission line on existing double circuit tower, construct 21 km of new lines for 132 kV loop in loop out scheme from taping point at Dumre (Chyangli) to existing Damauli substation, 132/33 kV, 30 MVA substation at new Markichwok and necessary 132 kV line bays at Switchyard of Marsyangdi Power Plant. The project cost was US$ 18.62 Million which is jointly funded by loan assistance of ADB, GoN and NEA.

Construction of 39 km of second circuit from Middle Marsyangdi to Marsyangdi has been completed and charged on Chaitra 2074 (March 2018); Construction of 21 km of loop in loop out transmission line to Damauli and 132/33 kV, 30 MVA substation at Markichowk, Tanahu have been completed and charged on 21st Chaitra 2075 (4th April 2019).

2. Dhalkebar 220/132 kV Substation

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 1,000MW 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 288 km of 400kV double-circuit Quad Moose transmission line through Hetauda-Dhalkebar-Inaruwa that covers 10 different districts along with the concomitant 220 kV substations at Hetauda, Dhalkebar and Inaruwa.

Dhalkebar substation is the pulling station for the Dhalkebar Muzzaffarpur 400kV Cross-Border Line between Nepal and India and it is a major hub for the exchange of power in the Integrated Nepal Power System. 220/132 kV, 2X160MVA Power Transformer at Dhalkebar substation has been successfully tested and charged on 32nd Ashadh 2075 (16th July 2018). Similarly, Dhalkebar-Muzzaffarpur 400kV line was charged at 220 kV on 31st Shrawan 2075 (16th August 2018) and started importing power from India.

3. Kusum - Hapure 132 kV Transmission Line

Objective of this project was to develop transmission system up to Dang Cement to be established at Hapure of Dang. Further Sonapur and Rolpa cements shall be benefited by the further extension of this line. The project cost was about US$ 5 Million and financed by GoN through Ministry of Industry, Commerce and Supplies.

Scope of the project was to construct 22 km Kusum-Hapure 132 kV transmission line and 132/33kV, 30MVA substation at Panchakule of Dang.

Construction of Panchakule 132/33kV, 30MVA Substation was started on 5th Falgun 2065 (16th February 2009) and Kusum Hapure 132 kV Transmission Line on Poush 2073 (December 2016)). As per demand of local people, 33/11kV, 8MVA Power Transformer was installed and put in operation on Poush 2075 (December 2018).

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

The objective of this project was 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, providing power to the upcoming cement factories, to evacuate power from Chameliya HEP and supplying part of the Butwal area from Tanakpur Hydro power plant. The project cost was US$ 26.7 Million and jointly funded by GoN, NEA and ADB.

Scope of the project was to string 189 km second circuit transmission line from Kohalpur to Mahendranagar in existing towers with two

new 132/33kV substations at Pahalmanpur and Bhurigaon. Substation upgradation to double bus system and appropriate 132 kV bay extension at Kohalpur, Attariya, Lamki and Lalpur Substations has also been taken care by the project.

Transmission line construction works have been completed on Falgun 2073 (February 2017) and substations on Shrawan 2074 (July 2017). Work is going on to demolish civil structures to clear the RoW and charge the line. Lamki-Pahalmanpur (29.4 km), Pahalmanpur-Attariya (35.4km) and Attariya –Lalpur (36.6km) Sections are charged on Falgun 2, 2075 (14th February 2019), Jesth 3, 2076 (17th May 2019) and Chaitra 23, 2075 (16th April 2019) respectively after clearing RoW.

5. Lamahi Ghorahi 132 kV Transmission Line

Objective of this project was to provide power supply to Ghorahi Cement Industry and Ghorahi Municipality. The project cost was US$ 4.3 Million and GoN through Ministry of Industry, Commerce and Supplies allocated budget for this work.

Project components includes construction of 12.5 km 132 kV 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.

Construction of Jhingni 132/33kV, 30MVA Substation was completed and charged on 25th Baishak 2076 (8th May 2019) after completion of Lamahi-Ghorahi 132 kV Transmission Line on Chaitra 2075 (March 2019) and put in to operation.

6. Kabeli 132 kV Transmission Corridor (Second Section)

Objective of this project was to facilitate evacuation of power generated from Kabeli-A HEP as well as from Kabeli, Hewa, Mai and other river basin HEPs 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 was estimated US$ 31 Million and funded by WB, GoN, NEA.

The first Damak-Godak section comprising of a 35 km of transmission line and its associated substations at Damak and Godak was completed on 2072-06-09 and has started to evacuate power from Sanima Mai Khola (22 MW), Mai Cascade (8.0 MW) and more to INPS.

The second section comprising of a 43 km of transmission line from Godak to Phidim was completed and charged on 24th Baishak 2076 (7th May 2019) and has started evacuating power from Hewa Khola A (14.9MW) and other projects.

The third section comprising of a 13.33 km of transmission line from Phidim to Amarpur/ Kabeli has been charged on 6th August 2019.

7. Rupani 132/33kV Substation

Objective of this project was to provide the reliable power to five different distribution substation of Saptari and Udaypur districts which was previously fed from Lahan substation through long double circuit 33 kV overloaded lines. The project cost was US$ 5 Million and funded by GoN.

The Rupani 132/33 kV, 63 MVA substation was charged on 13th Jestha 2076 (27th May 2019) and put in to operation. It has not only helped to reduce the technical losses, but also improved voltage quality in these areas.

8. Emergency Restoration Systems (ERS)

Failures and damages to transmission towers are always unplanned. Failures may occur due to Landslides, high wind loading, storm damage, rock slides, mud slides, erosion of foundations, river cutting, vandalism or sabotage. Total monetary and other losses resulting from an extended outage of a key transmission line may be huge and further it is site specific. The total losses may

be more than just the direct losses of the utility, especially if the utility is answerable to customers and government entities.

A few of the utility's direct losses are; cost of restoration, higher grid losses on alternate transmission lines, contractual penalties for non-availability of the transmission line, possible higher generation cost or costs for power plant reductions or shut downs. All these situations demand some quick, easy and reliable restoration system and Emergency Restoration System (ERS) may play this role and many more than this.

Realizing the need of ERS system for rapidly growing NEA Grid Network, NEA has procured ERS tower in FY 75-76 (2018/19) with the cost of US$ 1.2 million. The ERS tower consignment is stored at Pathlaiya 132 kV substation at Piluwa, Bara.

A) Use of ERS at Betrawati Trishuli

Foundation Setting Work for ERS Tower

After procurement of ERS system, NEA decided to use ERS at Betrawati, Trishuli for the first time. This was to bypass 66 kV transmission line from Chilime Hydroelectric Power Plant, so that 220 kV transmission line for Upper Trishuli 3A Hydroelectric Power Project can be constructed without long power interruption/ shut down causing huge loss. The work was in pending as large shutdown of about 3 weeks has been demanded but using 2-ERS towers, problem was solved with shutdown of about 36 hours.

ERS Tower just after Completion

B) Use of ERS at Parsa, Birgunj

Full View of Collapsed Tower

ERS Tower After Completion

Due to Tornado of 31 March, 2019 (2075-12-17), TN-60 of Parwanipur-Raksaul 132 kV transmission line was completely collapsed interrupting power import from India. The team moved to site the next day and performing all design and installation work of ERS, the line was restored after 8 days (2075-12-25) in spite of rain and wind disturbing continuously.

C) Use of ERS at Ropani Substation, Saptari

ERS Tower During Erection Works

ERS Tower after Completion

Equipment foundation erection work at Rupani substation was in pending since long due to shutdown problem of RTC transmission line from Dhalkebar to Inaruwa. Shutdown of about 2 weeks was demanded, which was not possible due to take or pay agreement of power coming from India in this line.2 set of ERS (51 meter high Angle tower and 35 m high suspension tower) was designed and installed at first and second week of Baisakh, 2076. The shutdown used for ERS erection was about 8 hours daily during off peak time for 3 days, which reduced the huge spilling of power. After ERS erection, substation was charged soon by finishing remaining works.

Each year, we encounter damaging of transmission towers across the country due to many reasons and in some cases we are facing long supply shutdown up to weeks. If spare tower of required type and design is available, restoration could be earlier but often this may not be the case. Restoration with spare tower in many cases may demand foundation construction and prior to foundation, land acquisition in some cases. Though restoration by stringing through trees in jungle have been seen in Nepal, it is quite unsafe. As transmission network is increasing in Nepal, failure events will surely increase and may give rise to several month restoration time. In such cases, ERS tower could be the solution as there is no need of foundation work and permanent land acquisition work.

I. Grid Development Department

This department is responsible for planning, developing, constructing, monitoring and commissioning of transmission line and substation projects up to 132 kV voltage level.

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

PROJECTS UNDER CONSTRUCTION

1. Thankot – Chapagaon – Bhaktapur 132 kV Transmission Line

Objective of this project is to enhance the transmission capacity, improve supply reliability, reduce loss and improve voltage through completion of 132 kV ring main in Kathmandu

Valley. The project cost estimated US$ 23 million and project was jointly financed by loan assistance of ADB and OPEC, GoN and NEA. As project construction work delayed due to various RoW issues, previous contract has been terminated. Revised cost estimate for the remaining work in Lalitpur district is about US$ 3.5 Million and will be financed by GoN.

The revised project scope of work includes construction of remaining 18 km 132 kV double circuit transmission line in Lalitpur district and 2 km underground transmission line in Bhaktapur district.

As of July 2019, up gradation and construction of substations in Kathmandu valley and transmission line portion within Kathmandu and Bhaktapur Districts have been completed. However, construction of 18 km transmission line in Lalitpur district was stopped due to protest of local inhabitants demanding 100% RoW compensation. NEA is taking initiations and conduct dialogs with concerned people and authorities to complete the construction work.

2. Singati-Lamosangu 132 kV Transmission Corridor

Objective of this project is to evacuate power from hydropower projects being developed by IPP's in the Tamakoshi and Singati basin. Total cost of the project is about US$ 13 million and financed by GoN. The project was started in FY 2065/066 (2008/09) and the expected completion date is 15th Paush 2076 (31st December, 2019).

The scope of project includes construction of 38 km double circuit Singati-Lamosangu 132 kV transmission line with ACSR Bear conductor, 132/33kV, 30MVA substation at Singati and 132 kV bay extension works at Lamosangu.

As of July 2019, about 80% construction works of substation and 85% of transmission line have been completed. Out of 125 towers, 118 tower foundations and 76 tower erection works have been completed. Conductor stringing works from both Dolakha and Sidhupalchok sections has been started. Stringing works for one circuit is expected to be completed by the end of September 2019.

3. Kusma-Lower Modi 132 kV Transmission Line

Objective of this project is to evacuate power from IPP projects and to provide N-1 contingency to power the plants in Modi basin. The project started in FY 2070/071 (2013/014) and expected to be completed in 2019/20. 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 132 kV single circuit transmission line from Kusma to Lower Modi HEP and 132 kV Bay extension at Lower Modi.

As of July 2019, construction of transmission line is completed and testing and commissioning work is in progress.

4. Hetauda-Birgunj 66 kV Transmission Line Capacity Increment

The existing Hetauda-Birgunj 66 kV double circuit transmission line (having ACSR Wolf conductor) supply power to small and medium industries like Hetauda Cement, Hulas Steel, Jagadamba steel, Surya Nepal, Ashok Steel etc through direct tapping in 66 kV lines. The quantum of power required to supply these industries and substations is increasing day by day. Because of low current carrying capacity of existing ACSR Wolf conductor, these industries are getting unreliable, interrupted and voltage fluctuating power supply. To address this problem, project was initiated with the objective of replacing Wolf conductor with High Temperature Low Sag (HTLS) conductor which will increase the power transmission capacity by twice. Estimated project cost is US$ 3 Million and funded by GoN. Project started on FY 2072/073 (2015/016) and as per revise schedule its expected completion date is September 2019.

Project scope includes replacing of 115 km Wolf conductor with HTLS conductor and associated hardware from Simara substation to Birgunj substation via Parwanipur substation.

As of July 2019, type test of the INVAR (HTLS) conductor, supply of disc insulator and detail survey of the existing 66 kV transmission line from Simara (tower no 276) to Birgunj substation (tower no 353) have been completed.

5. Ramechap Garjyang Khimti 132 kV Transmission Line

Objective of this project is to evacuate power generated from IPP projects in Khimti and Likhu Corridor. The scope of works include construction of 31 km 132 kV of double circuit transmission line with ACSR Bear conductor from Ramechap (Garjyang) to Khimti and construction of Garjyang 132/33kV, 30MVA and New Khimti 220/132 kV, 200MVA substations. The project started in FY 2067/68 (2010/11) and is expected to be completed in the year 2020/21. The estimated cost is US$ 20 Million and funded by GoN.

As of July 2019, 80 tower foundations out of 105 has been completed, line materials like conductors, insulators, tower parts are in process to receive at site, civil construction works at Garjyang substation such as control building, transformer foundation, gantries foundation etc. have been completed. Power Transformers have reached at site and put on the respective foundations. For New Khimti S/S, tender has been floated.

6. New Modi-Lekhnath 132 kV Transmission Line

Objective of this project is to improve supply situation in the Dhaulagiri zone and to evacuate power from hydro electric projects in Modi river basin of Parbat and Seti-Mardi-Sardi river of Kaski District. Cost of the project is estimated to be US$ 21.0 Million and jointly funded by EXIM Bank of India and GoN. Both transmission and substation contracts have been awarded on 21st June 2018. As per contract schedule substation

Lahachowk Substation

Lahachowk Switchyard Foundation

works will be completed on 20th December 2019 and transmission line works will be completed on 20th June 2020.

Project will construct 42.2 km of 132 kV double circuit transmission line with Bear conductor which connects the Modi HEP and Lekhnath substation through proposed New Modi & Lahachowk substation. It will also construct 132 kV Switching Substation at Korunga (New Modi) and132/33kV, 30MVA new substation at Lahachowk.

As of July 2019, regarding substation construction land acquisition at Korunga (Parbat) and at Lahchowk (Kaski) is completed, construction of control building and switchyard foundation work is near to completion in both substations and about 60% of substation equipment has been delivered to site. Regarding transmission line check survey of 42 km line, land profiling and

tower schedule has been completed, cadastral land survey has been carried out, some tower members, ACSR Conductors are delivered to site, 5 nos. of tower foundation out of total 138 towers has been completed.

7. Solu Corridor 132 kV Transmission Line

Objective of this project is to evacuate power from IPP's Projects of Solu river basin and commence rural electrification in Solukhumbu and Okhaldunga Districts. The estimated cost of the project is US$ 44 Million and jointly funded by GoN and EXIM Bank of India. Project initiated on FY 2067/068 (2010/11) and expected to be completed on 2019/20.

The project scope of works include construction of 90 km 132 kV double circuit transmission line with ACSR Cardinal conductor from existing 132 kV Mirchaiya substation (Siraha District) to 132 kV Tingla substation and construct 132/33kV, 30 MVA and 33/11kV, 8 MVA Tingla substation at Dudhkunda Municipality of Solukhumbu district.

As of July 2019, all the works at 132/33/11 kV Tingla substation has been completed. Further, construction of 2x4.5 km, 33 kV line from Belidada, Solukhumbu to Tingla substation has been completed. Regarding 132 kV transmission line construction out of 303 towers, 197 towers foundation work and 30 tower erection works has been completed. Forest clearance, Land acquisition and ROW clearance is taking more time than expected which makes difficult to complete the transmission line construction work in schedule.

132/33/11 kV Tingla Substation

8. Burtibang- Paudi Amrai-Tamghas-Sandhikharka-Gorusinghe 132 kV Transmission Line

Objective of this project is to extend the transmission line from Kapilvastu district to Arghakhachi, Gulmi and Banglung districts, which will limit the faults in distribution system and decrease the technical loss. It also provide the network for power evacuation of proposed hydroelectric projects in this region. The estimated cost of the project is US$ 30 Million and funded by GoN. This project was initiated in FY 2065/066 (2008/09) and as per revised schedule expected to be completed by 2020/21.

Scope of the project includes construction of 84 km, 132 kV double circuit transmission line with ACSR Bear conductor and construction of new 132/33kV, 30MVA & 33/11kV, 16 MVA substations each at Motipur (Kapilvastu district), Sandhikharka (Arghakhachi district), Tamghas & Paudi-Amarai (both in Gulmi district) and Burtibang (Baglung district).

As of July 2019, civil construction works of office building, control building, guard house and store building in Motipur & Sandhikharka substation is in progress; evaluation of bid for Tamghas substation is ongoing; check survey, tree counting, design drawings approval for tower & foundation has been completed for Motipur - Sandhikharka section and check survey work and design review work is in progress for Tamghas-Paudi-Amarai - Burtibang Section.

9. Dordi Corridor 132 kV Transmission Line

Objective of this project is to evacuate power from IPP projects of Dordi river and its tributaries in Lamjung District. The cost of this project is estimated to be US$ 8.4 million and funded by GoN. The project has been initiated in FY 2068/69 (2011/12) and expected to be completed by 2019/20.

Scope of the project includes construction of

10.167km long 132 kV double circuit transmission line from Kirtipur to Udipur with ACSR Cardinal Conductor and 132/11kV, 10 MVA substation at Kirtipur.

As of July 2019, in the substation, switchyard foundation work is complete, control building, staff quarter building, guard house cum store building and boundary wall are under construction. Major substation equipment has arrived at site and installation process is about to start. Regarding the transmission line, ACSR Conductor (Cardinal) has been delivered at site and out of 33 towers, foundation work for 13 towers is completed and others are in the process of construction.

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

Objective of this project is to reinforce the power supply system in Morang, Sunsari district and to minimize overloading problem of existing Duhabi grid substation because of high power demand from local and Industrial area of Biratnagar. The cost of the project is estimated to be US$ 19 Million and is funded by GoN. The project is expected to be completed by 2020/21.

Scope of the project includes construction of 23 km, 132 kV double circuit transmission line from Inaruwa 400/220/132 kV substation to new Biratnagar substation at Ramganj Belgachiya with HTLS (ACSR Bear Equivalent) conductor and construction of new Biratnagar 132/33kV, 2X63 MVA substation with 233kV capacitor Bank for reactive power compensation.

Construction of Civil Structure

As of July 2019, in the substation, civil construction work of control building, office building, store, guard house is in progress, foundation of major substation equipment is completed. Construction of 33 kV line has been delayed because of RoW problem in some of the places nearby road. For 132 kV transmission line tender has been called on June 2019 and evaluation of technical proposal of the received bids is going on.

11. Purbi Chitawan 132/33kV Substation

Presently, 132 kV substation at Bharatpur, which is approximately 21 km far from Parsa 33/11kV substation at Chainpur, Chitwan is feeding energy to the East Chitwan area by 33 kV single circuit. Because of long length of 33 kV line voltage profile at distribution end is poor and line loss is higher. To provide reliable, quality and adequate power to East Chitwan area (Ratnanagar, Khairahani, Rapti and Kalika Municipality), 132/33/11kV substation at Hardi-6, Chitwan is proposed. The project is initiated on FY 2072/073 (2015/016) and scheduled to be completed by 2019/20. Cost of this project is estimated to US$ 5.4 Million and funded by GoN.

The scope of works under this project includes construction of Purbi Chitawan 132/33kV, 2*30 MVA substation including approximately 10 km of double circuit 33 kV sub transmission line to feed 33/11 kV Parsa substation and 10 km 11 kV distribution line.

As of July 2019, civil construction of boundary wall, guard cum store building and RCC culvert bridge are completed. Construction of control building,

Construction of Boundary Wall

staff quarter building and equipment foundation works are in progress. Major substation equipment are in the process to dispatch after satisfactory completion of factory testing and inspection.

12. Butwal-Lumbini 132 kV Transmission Line

The objective of this project is to enhance transmission capacity and improve supply quality, reliability, voltage, line loss in Rupandehi district through construction of 132 kV double circuit transmission line. The cost of the project is estimated to be USD 9.5 Million and funded by GoN. This project has been initiated in FY 2070/071 (2013/14) and is expected to be completed by year 2019/20.

The scope of project includes the construction of 18 km double circuit 132 kV Transmission Line from Butwal (Jogikuti) substation to Mainahiya substation with ACSR Bear conductor including 2 km underground cable and one 132/33/11kV substation at Mainahiya with 132/33kV, 2x45 MVA and 33/11kV,16MVA power transformers.

As of July 2019, in the substation, civil construction works including all 132 & 33 kV equipment foundation, cable trench, staff quarter, compound wall and about sixty percent of control building has been completed. Major substation equipment excluding power transformer have delivered to site. Regarding transmission line, check survey, tree counting, soil investigation of tower pad is completed and land acquisition for tower pad and tower design approval is in progress.

Mainahiya S/S Civil Works Progress

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

Objective of this project is to reinforce the power supply system and lay down infrastructure for power evacuation from different IPP's in 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 USD 4.5 Million and funded by GoN. This project is initiated in FY 2074/075 (2017/018) and expected to be completed by 2019/20.

As of July 2019, 105 km of stringing works has been completed. For bay extension, civil works at Chameliya substation is completed and at Syaule substation construction is in progress and all major substation equipment for bay expansion has been delivered at site.

14. Bardghat - Sardi 132 kV Transmission Line Project

Objective of this project is to provide power supply to Hongshi - Shivam Cement Industry. Scope of the project includes construction of 20 km long 132 kV double circuit transmission line with ACSR Bear conductor from Bardghat substation to Sardi and 132 kV line bay extension at existing Bardghat substation. The cost of the project is estimated to be USD 4.0 Million and funded by GoN through Ministry of Industry, Commerce & Supplies. The project is initiated in FY 2073/074 (2016/17) and expected to be completed by 2019/020.

As of July 2019, out of 67 towers, 35 tower foundations have been completed, civil construction works including all 132 kV equipment foundation, staff quarters have been completed. Major substation equipment have been delivered to site. Land acquisition process for tower pad at Nawalpur east sector has been completed and for Nawalpur west sector is in progress. Acquiring permission for forest clearance under RoW from

the Ministry of Forest and Environment is under process.

15. Kushaha Kataiya 132 kV Second circuit Transmission Line Project

Considering the sufficient power generation in Nepal and high power demand in India at wet seasons and vice versa scenario of power generation/demand in dry seasons, both countries government have planned to construct cross border transmission line to import/export the power. Kushaha-Kataiya 132 kV second circuit transmission line project is proposed for strengthening of Nepal-India power transmission line. Scope of this Project is to construct 16.5 km second circuit transmission line on same double circuit tower of existing Kushaha-Kataiya 132 kV transmission line and to upgrade existing Kusaha switching station to full phase substation with 132/11kV, 22.5 MVA Power Transformer and necessary 132 kV line bays to connect transmission lines from Rupani, Duhabi and Kataiya substations. The estimated cost of the project is US$ 5.5 Million and funded by GoN.

As of July 2019, bidding process has started for the transmission line and substation works. Evaluation of received technical proposals is in process.

16. Nawalpur 132/33kV Substation

Objective of this project is to reinforce the power supply system and to cater load of Sarlahi District. The estimated cost of the project is US$ 6.9 Million which is funded by GoN. The project is initiated in FY 2074/75 (2017/18) and expected to be completed by 2020.

Scope of the project includes construction of Nawalpur Substation with transformer capacity of 132/33kV, 63MVA; 33/11kV, 16 MVA . It will also construct 10 km of 33 kV sub transmission line from Nawalpur substation to existing Haripur 33/11 kV substation to supply the reliable power in that area.

As of July 2019, Substation construction works has started. Boundary wall construction is completed and site preparation work for substation construction and staff quarter construction is going on. Approval of substation equipment design drawing is in progress.

17. Sunwal 132 kV Substation

The objective of this project is to provide power supply to Palpa Cement Industry as well as other existing industries in the Sunwal area and reinforcement of existing 33 kV distribution network. The cost of the project is estimated to be US$ 6.9 Million and funded by GoN through Ministry of Industry, Commerce & Supplies. The project is expected to be completed by 2020/21.

Main component of this project includes construction of Sunwal 132/33 kV, 2x63 MVA and 132/11kV, 22.5 MVA capacity substation at Charpala, ward no 7 of Sunwal Municipality of Nawalparasi (Susta Paschim) district.

As of July 2019, IEE study is completed and approved by Ministry of Energy, Water and Irrigation. The Bid for above works has been invited and received technical proposals of the Bidder is in evaluation process.

Projects under Planned and Proposed

1. Balefi-Barhabise Corridor 132 kV Transmission Line
2. Kohalpur-Surkhet-Dailekh 132 kV Transmission Line
3. Ghorahi-Madichaur 132 kV Transmission Line
4. Bhaktapur-Baneshwor-Patan 66kV Transmission Line Up-gradation
5. Dhalkebar- Loharpatti 132 kV Transmission Line
6. Dadakhet Rahughat 132 kV Transmission Line

7. Raxaul Parwanipur 132 kV Second Circuit Transmission Line
8. Mainahiya - Sampatiya 132 kV Transmission Line
9. Kaligandaki-Ridi 132 kV Transmission Line
10. Amarpur-Dhungesaghu 132 kV Transmission Line
11. Lalbandi-Salimpur 132 kV Transmission Line
12. Keraun 132/33kV Substation
13. Dhalkebar – Balganga 132 kV Transmission Line
14. Bhumahi – Hakui Transmission Line
15. Godak – New Anarmani Transmission Line
16. Inaruwa – Dharan Transmission Line
17. Kohalpur – Nepalgunj Transmission Line
18. Pathlaiya – Harniya Transmission Line
19. Sunkoshi 132 kV Substation
20. Bafikot-Khungri 132 kV Transmission Line
21. New Pokhara 132 kV Substation
22. Godak-Soyak 132 kV Transmission Line
23. Lamahi Ghorahi 132 kV Substation Expansion

II. Major 220 kV Transmission Line Department

Projects under Construction

1. Khimti – Dhalkebar 220 kV Second Circuit Transmission Line Project

Objective of this project is to enhance the transmission capacity, improve supply reliability and to reduce losses and voltage drops in the grid through the construction of 220 kV double circuit line. Power generated from the Upper Tamakoshi HEP will be evacuated through this line resulting in voltage improvement of Dhalkebar substation. The project started in the year 2002. 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 220 kV transmission line on double circuit tower with single circuit of twin Bison ACSR conductor (initially charged at 132 kV) and two nos. of 132 kV line bays at Khimti and Dhalkebar substations in the first phase and stringing of second circuit in the second phase.

As of June 2019, only 7 km line of the 2nd circuit remains to be strung. The second circuit is scheduled to be completed by March 2020. The first line stringing was completed and charged back on January 17, 2017.

2. Chilime-Trishuli 220 kV Transmission Line

Objective of this project focuses on the development of power transmission facilities to evacuate the hydro power generated in the Upper Trishuli Valley by the planned expansion projects of NEA's sister company Chilime Hydropower Company Limited notably Upper Sanjen, Sanjen and Rasuwagadhi and other Independent Power Producers (IPPs). The project started in the year 2009 (Contract date: December 20, 2017). The

Chilime Hub Substation Site after completion of cutting filling and compaction

project cost is estimated at US$ 39 Million. The project is executed by Nepal Electricity Authority (NEA) and funded by Government of Nepal, Credit Institute for Reconstruction, Germany (KfW) & European Investment Bank (EIB).

The scope of the project includes construction of 27 km long 220 kV transmission line. The line has two sections. One section is 19 km line of double circuit twin Bison ACSR conductor and the other section is 8 km line of four circuit twin Bison ACSR conductor. The scope also includes construction of 220/132/33 kV, 320 MVA substation.

As of June 2019, survey, soil investigation and site preparation works of substation have been completed. Construction of boundary wall and retaining wall are going on at the site. Most of the vendors, approval of General Arrangement Drawing, approval of drawings of most of civil and electrical components of the substation have been finalized.

Also, check survey, detail survey and soil investigation along with measurement of earth resistivity of transmission line are completed. Proto-testing of DD & DB tower is successfully completed. Vendors are finalized and the design drawings of different components of the transmission line are approved. Land acquisition process for tower pad is completed and the respective land owners are receiving the compensation. Excavation works for tower foundation on nine locations are going on. Stubs for DB & DD tower have been manufactured and they are being delivered at the site. Tree-cutting is approved from the ministry cabinet and the contract with the Forest and Soil Conservation Department is completed. The expected completion date is (Substation: December 31, 2019 & Transmission Line: February 29, 2020).

3. Koshi Corridor 220 kV Transmission Line Project

For its size, Nepal has a great potential for hydropower generation. From the Arun and her tributaries alone, more than 3,000 MW capacity has been identified and some IPPs are already under various stages of progress. Koshi Corridor 220 kV Transmission Line Project was proposed with the objective of evacuating that power to the national grid and it is now under construction. The project area covers the five districts viz. Taplejung, Sankhuwasabha, Terhathum, Dhankuta and Sunsari. The project is being financed under the Exim Bank of India US$ 250 Million Line of Credit supported by the Government of India. US$ 90 Million has been set aside for the construction of the project out of US$ 250 Million line of credit to the government of Nepal.

Tower foundation under construction

The scope of this project has been split into three packages: Package- KC1, Package-KC2, and Package- KC3.

Package-KC1, signed with M/s Kalpataru Power Transmission Limited, India on June 2016 with a contract value of US$ 37.5 Million, covers the construction of 105 km long 220 kV level Double Circuit Transmission Line from Inaruwa-Basantapur-Baneshwor-Tumlingtar. This 105 km long line can be further segmented into two sections: the 30 km long twin section from Tumlingtar to Basantapur via Baneshwor, and the 75 km long quad section from Basantapur to Inaruwa. Both sections shall carry Moose ACSR conductors and, under the present scope, shall be strung on one side only.

Package-KC2, signed with M/s Larsen and Toubro Limited, India on October 2018, with the contract value US$ 25.3 Million, covers the construction of substations at Tumlingtar (220/132/33 kV, 7X33.33 MVA single phase

Bank with one transformer as spare), Baneshwor (220/33 kV, 2X25/30 MVA three phase) and Basantapur (220/132/33 kV 7X100 MVA single phase bank with one transformer as spare), and 2 bay extensions at Inaruwa substation.

Package-KC3, signed with M/s KEC International Limited, India, on June 2018 with the contract value US$ 21 Million, covers the construction of 132/33 kV substation at Dhungesangu, Taplejung and a 35 km long 220 kV Double Circuit transmission line from Dhungesangu Substation (132/33 kV, 7x5 MVA single phase bank with one transformer as spare) to Basantapur Substation. Although, the design is of a 220 kV double circuit, the present scope is limited to single line stringing to be charged at 132 kV.

Stringing work undergoing in plain section

Construction of KC1 started simultaneously from three different sections and as of June 2019, 253 tower foundations and 135 tower erections out of 320 towers have been completed. Stringing of a 5 km stretch has also been completed. Similarly, earthing work and construction of revetment wall is also under progress. In case of Package KC2, construction of all three substations is under progress. In Tumlingtar Substation: site development work has been completed, and construction of transformer foundation, gantry tower foundations, and control-room building is under progress. In Baneshwor Substation, site development work has been completed and construction of stone masonry wall is under progress. In Basantapur Substation, site development work is ongoing. Under Package KC3, cadastral survey has been finalized and compensation has been fixed. 11 out of 125 tower foundations have been completed and parts for 100 towers have been supplied.

Tower erection ongoing

The expected completion date for Package- KC1, Package-KC2 and Package- KC3 are May 2020, June 2020, and December 2020 respectively.

4. Lekhnath-Damauli 220kV Transmission Line

Objective of this project is to augment the power evacuation capacity of the Integrated National Power System from the western basin of Nepal with the construction of a 220 kV, 45 km long double circuit transmission line with Moose ACSR conductor from New Lekhnath to New Damauli, and 220/132/11kV substations at Lekhnath (320 MVA) and New Damauli (64 MVA). Cost of this project is estimated at US$ 65 Million. The project will be funded by the Government of Nepal and Credit Institute for Reconstruction, Germany (KfW). The project is expected to be completed on June 2023.

As of June 2019, detailed survey, feasibility study, and IEE have been completed. Land acquisition for Damauli substation, procurement of the Project Implementation Consultant (PIC), and the Environment and Social (E&S) Consultant are under progress.

5. Trishuli 3B 220 kV HUB Substation

There are numerous projects in progress in the Trishuli basin, namely: Upper Trishuli 3A, Upper Trishuli-1, Upper Trishuli 3B, Sanjen, Rasuwagadhi and other IPPs in 220 kV voltage level. The objective of this project is to evacuate those power via Trishuli-Matatirtha Transmission Line to National Grid. The Trishuli 3B 220 kV substation will act as a hub to accommodate around 600 MW power that is soon to be generated from the Trishuli river basin. As such, this hub is in a prominent position in the national grid and in the national economy. The project cost is estimated to be US$ 16 Million with the joint funding of Government of Nepal, Credit Institute for Reconstruction, Germany (KfW) and European Investment Bank (EIB). Contract was signed with M/s PINGGAO GROUP CO., LTD (China) on November 13, 2017 with the contract value of US$ 12.5 Million and the contract was effective from December 20, 2017.

The scope of the project includes construction of 220/132/33 kV, 7x53.33 MVA Trishuli 3B Hub Substation. The substation includes two Banks of 160MVA Auto transformers formed with 7 numbers of 220/132 kV, 53.33MVA Single phase auto transformers and 50 MVA, 132/33 kV, 3 Phase Power Transformer. The 220 kV bays will be of Hybrid GIS type.

Overall Site view

As of June 2019, the overall physical progress of the project is 62%. The progress on design/drawing is about 90%. Though site development work was a challenge, 90% of that task has been completed. Preliminary works such as quarter building and boundary walls were completed last year. Foundations of almost all single phase auto transformers are complete. Foundations of gantry structures and other equipment like CB, CVT, and Isolator etc. are under construction. Control-room building is being constructed and construction of transit camp is about to start as well. Rivulet RCC work is almost complete and river protection work is under progress. Gabion protection works and RRM works are on the verge of completion.

Various studies such as the feasibility study, SEP, IEE, ESIA & LACP were completed in different phases of the project; technical, social & environmental monitoring & implementation is under progress with support from ESSD, NEA, and the Consultant POWERGRID, India.

As the need for power evacuation various IPPs is rather urgent (250 MW in FY 2076/77 and 350MW in near future), this project is given a high priority and is scheduled for completion by December 31, 2019.

Projects under Planned and Proposed

1. Tumlingtar-Sitalpati 220 kV Transmission Line
2. Borang-Ratmate (Naubise) 220 kV Transmission Line
3. Trishuli 3B - Ratmate 220kV Transmission Line Project
4. New Anarmani-Inaruwa-Arun-Dudhkoshi-Tingla 400 kV Transmission Line

III. Major 400 kV Transmission Line Project

Projects under Construction

1. Hetauda- Dhalkebar-Inaruwa 400 kV Substation Expansion

Objective of this project is to serve as a backbone to transmission line system in the national grid

of Nepal. The Dhalkebar 400kV substation will be connected to the Muzaffarpur substation via. Dhalkebar- Muzaffarpur 400kV cross border transmission line that and will also be connected to Hetauda and Inaruwa via Hetauda-Dhalkebar-Inaruwa 400kV Transmission Line. The Dhalkebar- Muzzaffarpur cross-border link will facilitate the exchange of electricity between Nepal and India in which electricity from India will be imported in the dry season and exported from Nepal in the monsoon. This project was started in the fiscal year 2017/18. The estimated project cost is around US$ 60 Million and it is funded by Government of Nepal/Nepal Electricity Authority.

The scope of this project is to construct 400/220 kV substations at Hetauda, Dhalkebar and Inaruwa. The scope of Hetauda substation includes 400/220 kV, 4X167 MVA autotransformer and its associated bays; 400 kV, 50 MVA Bus Shunt Reactor and its associated bay and 400 kV GIS bays for the termination of 400 kV Double Circuit lines from Dhalkebar. The scope of Dhalkebar substation includes 400/220 kV, 3X315 MVA autotransformer and its associated bays; 400 kV, 80 MVA Bus Shunt Reactor and its associated bay and 400 kV line bays for the termination of 400 kV Double Circuit lines from Hetauda, Inaruwa and Muzaffarpur (India). The scope of Inaruwa substation includes 400/220 kV, 3X315 MVA autotransformer and its associated bays; 400 kV, 55 MVA Bus Shunt Reactor and its associated bay; 400 kV line bays for the termination of 400 kV Double Circuit lines from Dhalkebar. All three substations are 400 kV gas insulated switchgear (GIS) type with one and half breaker busbar scheme. These substations will be equipped with a state-of-the-art control, protection and automation system based on IEC 61850 open standards to facilitate communication between numerous devices within the substation and beyond.

As of June 2019, NEA Engineering Company has been appointed as a design check and construction supervision Consultant for this project. For the construction of 400 kV GIS Substation at Dhalkebar, Contract has been awarded to ABB India Limited on December 2017 and is scheduled for completion by the end of December 2019. Similarly, for the construction of 400 kV GIS Substation at Hetauda and Inaruwa, Contract has been awarded to Siemens Limited, India on December, 2018 and scheduled to be completed by the end of September 2020.

As of now, for Dhalkebar Substation majority of the engineering design drawings has been approved. Majority of supplies like 400 kV GIS, 400 kV CVT, 400/220 kV Surge Arrester, Control Relay Panel, Substation Automation System, Pre-Engineered building (PEB), Structures, Electric Overhead Travelling (EOT) crane etc. are delivered at site. Out of three transformers, first unit 315 MVA, 400/220 kV transformer and 80 MVAr, 400 kV Bus Shunt Reactor, Factory Acceptance Test completed on June, 2019. The second and third unit of transformers Factory Acceptance Test is scheduled on August 2019. At site, till now, PEB building for GIS, Transformers/ Reactors foundations, Gantry towers/equipments foundations are about completion and control room building/GIS Busduct foundations, road, drains etc. are in progress. The site erection activities of Gantry Towers/Beams, equipments structures, PEB buildings are under progress and major erections for GIS, transformers etc. will be started by August 2019.

Under construction 400 kV GIS Substation at Dhalkebar

As of now, for Hetauda and Inaruwa Substations the approval of engineering design drawings are in advanced stage as majority of engineering

was already completed. Majority of equipments like 400 kV GIS, 400/220 kV outdoor equipments, transformers/reactors etc. are under manufacturing stage. At Hetauda site, drain shifting works and control-room building foundation works are in progress whereas, at Inaruwa, soil filling and stone pile works below the foundations are in progress. The project is likely to complete by the Year 2021.

2. Bheri Corridor 400 kV Transmission Line

Objective of this project is to evacuate power from Uttarganga Hydro Power Project as well as IPP's upcoming in the Sani Bheri river basin and its tributaries. Power transmitting capacity of this line has not been finalized and will be designed as the future dictates. The project started in the year 2015. This project was initiated by Nepal Government (NG) under Energy Crisis Eradication budget head to electrify Rukum (West) district, since it hasn't been connected to National grid yet.

The scope of the project comprises of construction of about 25 km long 400 kV double circuit Transmission Line from Bafikot (Rukum west) to Nalsingadh Hydropower project (Jajarkot), which crosses various municipality/VDC's of Rukum (West) & Jajarkot district. Also it includes with one 400/132 kV, 150 MVA Uttarganga substation hub at Bafikot, Rukum (West).

As of June 2019, the land acquisition for the Uttarganga substation hub at Bafikot, Rukum (West) has been completed after a deadlock of around 3 years due to numerous reasons. Detail field survey of substation areas, line route, IEE works along with preparation of office estimate and tendering for civil works is aimed to be started by this year.

3. Ratmate-Rasuwagadhi-Kerung 400 kV Transmission Line

The Ratmate – 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. This will open new avenues in terms of electricity market in Nepal and China. The project started in the year 2017. The project cost is estimated at US$ 96.79 Million. The funding agency has not been finalized yet. However, pre-feasibility study being funded by Nepal Government

Scope of the project consists of design, supply and construction of about 70 km of 400 kV double-circuit transmission line with Quad Moose ACSR conductor from Rasuwagadhi border point at Rasuwa district to Ratmate substation at Nuwakot district. Furthermore, a converter station is to be constructed at Gyirong County, Tibet and a 400 kV substation is to be constructed at Ratmate, Nepal for evacuation of the power to load centers.

As of June 2019, the detail survey works for this project is being carried out by the Project Development Department (PDD), Engineering Services Directorate of NEA, while the draft report has been submitted. For the study of environmental impact, proposals have been collected and are currently being reviewed. Moreover, the project is currently in the process for obtaining permission, from Department of National Parks and Wildlife Conservation, Nepal Government, to carry out feasibility study/ environmental study as about 5 km of the proposed route alignment passes through Lamtang National Park.

Cooperation Agreement between the State Grid Corporation of China and NEA

Nepal-India Electricity Transmission and Trade Project (NIETTP)

Nepal-India Electricity Transmission and Trade Project (NIETTP) funded by World Bank began with the objective of establishing high voltage cross-border transmission link capacity of about 1,000 MW to facilitate exchange of power with India and to improve the reliability of electricity supply. Furthermore, under NIETTP additional funding, construction work of Hetauda-Bharatpur-Bardaghat 220 kV transmission line and concomitant 132 kV substations at Hetadua, Bharatpur and Bardaghat is being executed. In addition, Transmission System Master Plan of Nepal has been prepared under this project which is now being implemented by NEA. All substations are Air Insulated Switchgear (AIS) type with double main and transfer bus bar scheme for 220 kV and double main bus bar scheme for 132 kV. These substations will be equipped with a state-of-the-art control, protection and automation system based on IEC 61850 open standards to facilitate communication between numerous devices within the substation and beyond.

Projects under Construction

1. Hetauda-Dhalkebar-Inaruwa 400kV Transmission Line

Objective of this project is to establish high voltage cross-border transmission link capacity of about 1,000 MW to facilitate exchange of power with India and to improve the reliability of power supply. The project started in the year 2012. The estimated project cost is around US$ 150 Million and is funded by World Bank. The Power Grid Corporation of India (PGCIL) was appointed as a design check and construction supervision consultant for 400kV Hetauda-Dhalkebar-Inaruwa Transmission Lines and Hetauda-Dhalkebar-Inaruwa 220 kV substations construction works. For the construction of Hetauda-Dhalkebar-Inaruwa 400 kV Double circuit Transmission lines, contract has been awarded to AIL-LTB JV on February 3, 2013.

Erected Gantry Towers at 220/132 kV Hetauda Substation

The scope of the project includes design, supply and construction of approximately 288 km of Hetauda-Dhalkebar-Inaruwa 400 kV, Double Circuit Quad Moose ACSR conductor transmission line with concomitant 220 kV substations at Hetauda, Dhalkebar and Inaruwa.

The scope of Hetauda substation includes 220/132 kV, 2X100 MVA and 132/11 kV, 10 MVA Transformers and its associated bays, and 220 kV line bays for the termination of 220 kV Double Circuit lines from Bharatpur. The scope of Dhalkebar substation includes 220/132 kV, 2X160 MVA Transformer and its associated bays, and 220 kV line bays for the termination of 220 kV Double Circuit lines from Khimti. The scope of Inaruwa substation includes 220/132 kV, 2X100 MVA and 132/11 kV, 2X63 MVA Transformers and its associated bays; 132 kV, 25 MVAr Bus Reactor and its associated bay; 220 kV line bays for the termination of 220 kV Double Circuit lines from Basantpur and 132 kV line bays for loop in loop out of existing 132 kV Double Circuit lines from Lahan to Duhabi. All substations are Air Insulated Switchgear (AIS) type with double main and transfer bus bar scheme for 220 kV and double main bus bar scheme for 132 kV. These substations will be equipped with a state-of-the-art control, protection and automation system based on IEC 61850 open standards to facilitate communication between numerous devices within the substation and beyond.

220 kV Substation at Dhalkebar

As of June 2019, out of 792 tower pads, 582 foundations have been completed and 530 towers have been erected. The remaining parts mostly fall in the forest area and the process of tree cutting and stacking along the right-of-way of the route is under process in different districts. Pile foundation work at Koshi River has been started.

Similarly, for the construction of 220/132 kV Substation at Hetauda, Dhalkebar and Inaruwa, Contract was awarded to Central China Power Grid International Economic & Trade Co., China on June, 2014 but due to non-performance of the contractor, the contract was terminated on September 22, 2017. After termination of the contract, 220/132 kV Dhalkebar substation balance works has been awarded to M/s Telmos Electronics on January 23, 2018. Initially, Dhalkebar-Muzzaffaur 400kV Transmission Line was charged at 132kV importing 100 MW power from India. After successfully charging of 220 kV Dhalkebar substation at 220 kV voltage level on August 16, 2018, 260 MW power is importing during peak hours through Dhalkebar-Muzzaffaur 400 kV Transmission Line at 220 kV.

In addition, the 220/132 kV Hetauda and Inaruwa substation balance works has been awarded to M/s Consortium of Siemens Limited and Telmos Electronics on December 20, 2018. Now, the contractor has been mobilized and started work on both Hetauda and Inaruwa substation. The project is expected to be completed by the year 2020.

2. Hetauda – Bharatpur - Bardaghat 220kV Transmission Line

This World Bank funded project started in 2008 with the objective of enhancing the transmission capacity and bolstering the reliability of the Integrated Nepal Power System (INPS). With its 220 kV transmission line the project aims to evacuate the power to be generated by various hydropower plants and to serve as a highway for the power flow from the western to eastern region of Nepal and vice versa.

2.1 Bharatpur-Bardaghat 220 kV Transmission Line

In the scope of this project is the construction of a 74 km long, 220 kV Double Circuit Transmission Line with Twin Moose ACSR Conductor (initially charged at 132 kV) from Bharatpur to Bardaghat. After the termination of contract with M/S Central China Power Grid International Economic & Trade Co. Ltd, China (CCPG) on June 5, 2017, new contract for balanced work (contract No. NIETTP/BB/AF/5/ICB) was awarded to M/S Hengton-Optics Electric Company, China on August 6, 2018 with the contract value of US$ 5.5 Million.

Foundation Work

Erection Work

As of June 2019, out of 246 tower pads, 149 tower foundations and 117 tower erections have been completed. About 85% of the site is cleared and remaining section will be cleared after the forbidden period of forest (from June to September). The tender for tree cutting of the remaining sections has been awarded. The line is expected to be completed by January 20, 2020.

2.2 Hetauda-Bharatpur 220 kV Transmission Line

The scope of this project is construction of 74 km long, 220 kV double circuit transmission line with twin Moose ACSR Conductor (to be charged initially at 132 kV) from Hetauda to Bharatpur. The contract with M/s ICOMM Tele Ltd, India for the same was signed on March 9, 2009 with the contract value of US$ 15.3 Million. The scope also includes construction of new 132 kV substations at Hetauda and Bharatpur and bay extensions at Old Hetauda and Bardaghat Substations. The contract with M/S ZHONGDING INTERNATIONAL Co. LTD., CHINA for the same was signed on December 16, 2009 with the contract value of US$ 5.8 Million.

As of June 2019, the overall progress of the construction of substation is about 93%. Almost all the equipment have been supplied and the installation works is about to complete.

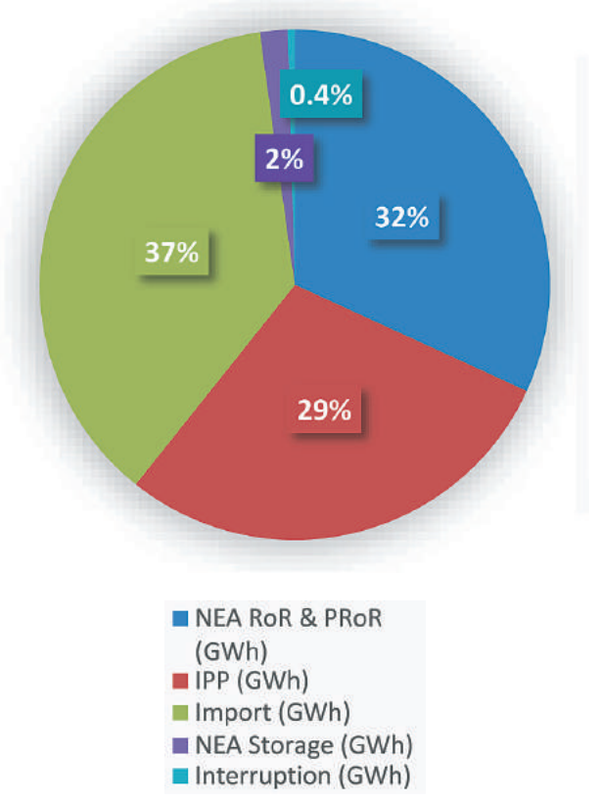
Hetauda Bharatpur line section: out of 226 tower pads, 173 tower foundations have been casted, 119 towers have been erected, a 16 km stretch has been strung and almost 97% of the tree cutting and its supplementary tasks have been completed. Almost all compensation amount has been disbursed barring only the unregistered land. The contract with M/s ICOMM Tele Ltd, India, was terminated on 29th April, 2019. For what remains, project has prepared the tender documents that will soon be floated.

IV. System Operation Department

System Operation Department (SOD) has the main responsibility of managing & controlling reliable and quality power from distant generators to various load centers through Load Dispatch Centre (LDC) centrally located at Siuchatar, Kathmandu. As of now, Load shedding was completely eliminated and hence the focus of SOD has now shifted more towards maintaining quality and security of power supply. Skillful handling of system by operator, effective short term planning, daily scheduling of energy and power of INPS has made possible to optimize available generation and power import from India. This enables LDC to accomplish economic dispatch of power, maintaining voltage and frequency of the system within standard which contribute significantly to improve financial health of NEA. In last fiscal year Dhalkebar- Muzzaffarpur and Upper Trisuli Three A-Matatirtha transmission line were energized at 220 kV and 132 kV voltage level respectively which contribute significantly to strengthen the transmission network and system operation. The major highlights of the system are given in the table below.

1.	Annual Peak Demand	1320.28 MW
2.	Energy Demand	7583.92 Gwh
3.	Annual Load Factor	65.57%
4.	Export	42.50 Gwh

The major contribution of energy in the INPS for the fiscal year 2075/76 are given below.



Total Energy Contribution F.Y. 2075/76

LDC under SOD has been working round the clock to keep the operation of the Integrated Nepal Power System (INPS) on the right track by using computer based Supervisory Control and Data Acquisition (SCADA) tools. The availability of real time data and better communication system have improved the overall availability of power stations and transmission lines which have helped towards fast restoration of the power system in case of black-outs, thereby reducing loss of revenue.

For the continued smooth functioning of the INPS, 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. This year syaule, Bhurigaun and Pahalmanpur substations have been integrated in SCADA system. The trained manpower in the LDC has been able to keep the data up-to-date in the SCADA software in the LDC, through the regular maintenance works. Significant amount of revenue is being received annually by leasing (to Nepal Telecom and other private companies) optical fiber cable.

In future, NEA is going to synchronize Indian system with INPS. The objective of this scheme includes installation of SPS (Special protection Scheme), Communication and SCADA system within the Nepalese power system for synchronous operation of the Nepal grid and Indian grid. For the same, Joint NEA and Indian team had already visited different substations within Nepal. The study suggested that synchronization of two grids shall be achieved with installation of SPS system at existing Dhalkebar, Chandranigahapur, Kamane, Bharatpur, Butwal, Hetauda, Bhaktapur and Lamahi substations and some strengthening on protection, communication system of present INPS. NEA has already requested to Power grid cooperation of India (PGCIL) for submission of techno-commercial proposal towards implementation of SPS and communication system.

Synchronization of two grids will increase the reliability and security of the INPS system as well as creates opportunity of power exchange between two countries through electricity market transaction.

Projects under Construction-LDC Upgradation Project

Objective of this project is to upgrade the existing LDC master station with the latest SCADA/EMS (and related hardware, incl. central IPABX - system) and enhance the capacity of the LDC in a way to meet the expansion works of INPS (Integrated Nepal Power System) and contribute towards the smooth operation of INPS and also to establish an emergency/backup control Centre in Hetauda that will help to increase the availability of the power system control facilities and will increase the flexibility in power system operation.

For the scope of rehabilitation of existing LDC at Suichatar includes a complete new version of SCADA system for the control of the country's

transmission system is to be supplied. Beside Basic SCADA functionality the control system shall also include energy management system (EMS) and network application (NA) functions whereas scope of Emergency / Backup Control Centre (ECC) at Hetauda includes the installation of same hardware components as the main LDC which shall act as a backup centre for the main LDC in Kathmandu and shall allow the control of the countries transmission system in case of emergency or failures of the main load dispatch Centre.

All required hardware and software have been supplied and installation of Video projection system, servers, IPABX and UPS have already completed in main LDC. The Site Acceptance Test (SAT) of hardware and software are scheduled in near future. The construction work of emergency control center building which acts as a backup for main LDC has been already completed in

VPS Installation at LDC, Suichatar

premises of New Hetauda s/s at Hetauda. In synopsis installation phase of project is completed in LDC, testing phase will begin soon. In back up LDC installation from contractor side is yet to be started.

This project was funded by grant assistance to Nepal Government by KFW, the German Bank. The contract cost of project is Euro 1972239 and NRs. 2375953. The consultant cost for tendering phase is Euro 129170.06 and for supervision of project is Euro 532178.50. The start date of project is Jan 31, 2018 and expected completion date is 31st December, 2019.

V. Grid Operation Department

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. The other major responsibility of this department is to look after the operation of 66kV & above voltage Substations and Transmission Lines along with routine and breakdown maintenance works including up-gradation, extension, replacement works, reactive compensation, rehabilitation works etc. Apart from that GOD is also looking after the operation and maintenance of Nepal portion of 400kV Dhalkebar - Muzzaffurpur Transmission line charged at 220 kV Voltage level which is owned by Power Transmission Company of Nepal (PTCN). 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.

A. Major Works performed on the F/Y 2075/76 (2018/19) 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 drop 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 and immediate solution for load management. 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 on FY 2075/76 (2018/19) are follows:

Substation	Voltage Ratio kV	Previous Capacity MVA	New Capacity MVA	Remarks
Godak	132/33	30	63	30MVA was Replaced by new 63MVA
Kohalpur	132/33	60	93	30MVA was Replaced by new 63MVA
Lekhnath	132/33	12.5	30	30 MVA was shifted from Lamahi replacing 12.5MVA (Bhagwati Hydropower)
Mahendranagar	132/33	25	30	30MVA was shifted from Godak S/S replacing 15MVA
Total 132/33 kV			**88.5 MVA**	
Bharatpur	132/11	37.5	52.5	15MVA was Replaced by new 30MVA
Total 132/11 kV			**15 MVA**	
Indrawati	66/11	7.5	10	7.5 MVA was Replaced by new 10 MVA
Patan	66/11	54	72	A new 18MVA Transformer Bay was Installed
Total 66/11			**20.5 MVA**	
Butwal	33/11	33.2	48.8	A new 16.6MVA Transformer Bay was Installed
Anarmani	33/11	24.6	33.2	8MVA was Replaced by new 16.6MVA
Chanauta	33/11	6	11	8MVA was shifted from Lamki replacing 3MVA
Total 33/11 kV			**38.8 MVA**	
Total Grid Upgradation in FY 2075/76			**162.8 MVA**	

B. Work in progress

The major up-gradation & reinforcement works for substation are initiated and are under progress are tabulated and given in Annexure.

C. Grid Connection Agreement

The Department has successfully accomplished the Grid Connection Agreement with 60 IPPs (Independent Power Producers) for 1830.65MW capacity (55 IPPs for 1793.65MW for Hydropower Projects and 5 IPPs for 37MW for Solar Photo Voltaic Projects) to mitigate the future load demand.

D. Major Maintenance Works

The following major maintenance works are completed in FY 2075/76.

a. Re-routing work from Tower No. 5 to 8 on Sunkoshi – Bhaktapur 66kV transmission line at Andheri in Sindhupalchowk district.

b. Re-routing work of Tower No. 204 on Hetauda – Birgunj 66kV transmission line nearby Churiya Mai temple of Bara district.

c. Routine Maintenance works were carried out as per schedule for substations and transmission lines.

d. Breakdown maintenance works were carried out as per requirement.

e. Total of 240 relays were tested on various substations.

f. Total of 127 energy meters (95 Meters from NEA and 32 Meters from IPP) were tested.

E. 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	2070/71	4,120,153.81	3,889,823.10	230,330.71	5.59%
2	2071/72	4,394,005.17	4,193,004.03	201,001.14	4.57%
3	2072/73	3,097,302.02	2,934,259.90	163,042.12	5.26%
4	2073/74	5,552,927.57	5,275,058.79	277,868.78	5.00%
5	2074/75	6,347,849.13	5,980,995.92	366,853.21	5.78%
6	2075/76	7,005,397.48	6,700,648.12	304,749.37	4.35%

Recently Completed Projects

Power Efficiency Project

Objective of this project was to improve the 132kV system voltage at Lahan substation and of those 33kV and 11kV feeders fed from Lahan substation. The project started in F/Y 2073/074 with estimated cost of US$ 0.3 Million. The 132kV, 20MVAr Capacitor Bank was charged on January 2019. The project was financed by GoN.

Projects under Execution

Grid Substation Capacity Increment Project

Objective of this project is to increase the capacity of the Grid Substations to cater the increasing load demand and to buy spare power transformers as an immediate replacement where necessary. The project was started in F/Y 2073/074 with the estimated cost of US$ 8.4 Million by GoN funding.

The main activities of the project includes replacement of 132kV, 66kV & 33kV old circuit breakers with new one; installation of 33/11kV, 16.6MVA power transformer replacing existing 7.5MVA at Yadukuwa substation; supply and delivery of spare power transformers; installation of 132/11kV, 22.5MVA new power transformer bay at Bhaktapur substation and installation of 220/132kV, 2x315MVA auto transformer at Dhalkebar substation.

For the replacement of circuit breakers, total 18 nos. of 132kV, 2 nos. of 66kV and 11 nos. of 33kV circuit breakers were supplied out of which 16 nos. of 132kV, 1 no. of 66kV and 11 nos. of 33kV circuit breakers were replaced and remaining were kept as spare.

The existing 33/11kV, 7.5MVA power transformer at Yadukuwa substation was upgraded to 16.6MVA on April 2019 after the supply and installation of new 16.6MVA power transformer. This has helped to fulfill the increasing demand of that area.

Total 6 nos. of spare power transformers (132/33kV, 2x63MVA; 132/11kV, 2x30MVA and 33/11kV, 2x16.6MVA) were supplied, out of which 1 no. of 132/33kV, 63MVA power transformer was installed at Kohalpur substation, 1 no. of 132/11kV, 30MVA was installed at Bharatpur substation and 1 no. of 33/11kV, 16.6MVA power transformer was installed at Anarmani substation. 1 no. of 132/33kV, 63MVA power transformer is in the process to be installed at Kamane substation and 1 no. of 132/11kV, 30MVA is in the process to be installed at Bharatpur substation.

Similarly, the civil foundation works at Bhaktapur substation for the new 132/11kV, 22.5MVA transformer bay has been completed and the transformer has already arrived at site. The work is scheduled to complete within 2 months.

The 2 nos. of 220/132kV, 315MVA auto transformer is to be installed at Dhalkebar substation. This will help in evacuating bulk power import from India and also to export power to India. The civil foundation work and construction of 220/132kV transformer bays are under progress. Similarly, the transformer final acceptance test has been completed and is ready for dispatch. The work is expected to complete within 4 months.

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 74.53% 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 129 Distribution Centers (including 14 new DCs) spread over the whole country.

Performance Highlights

In FY 2018/19, total number of consumers under DCSD reached 39, 09,641 an increase of 10.09% over the last fiscal year's figure.

Customer Category	No of consumer (% of total consumers)	Sales %	Revenue %
Domestic	93.54	42.20	37.77
Non-Commercial	0.60	2.95	4.29
Commercial	0.66	7.39	10.19
Industrial	1.35	38.40	40.13
Others	3.85	9.06	7.62

Similarly, in FY 2018/19, a total of 6306.002 GWh of energy was sold earning gross revenue of Rs. 66,101.004 Million. Industrial and Commercial consumer categories combined together represent only 2.01% of the total number of consumers but shared 45.79% of total sales. Similarly, the domestic consumer category represents 93.54% of total consumers and contributed 42.20% to the total sales.

Programs and Activities

As part of reinforcement and expansion of the distribution systems, many programs, projects and the activities are undertaken in FY 2018/19 to expand and improve the service delivery. These programs and activities are executed by the Departments at Central and Regional Offices. DCSD took special drives to expedite the activities for loss reduction, metering & billing and decreasing amount receivables from black listed consumers.

Safety of Personnel and Equipments

Safety has become a big challenge for DCSD and thus is entrusting major priority on it. In this regard, not only the NEA employees, awareness to public is also important. For this, the directorate is giving priority for awareness & electrical safety, right from the implementation of the Project till completion and also in operation and maintenance. As in past years, NEA organized awareness program to mark "Electrical Safety Day", in collaboration with Society of Electrical Engineers (SEEN) at the central level. Similarly, safety day programs and activities were also executed by the various offices at Regional & District Level on the same day. A safety oath to recall its importance and mandatory use of safety tools and tackles are also emphasized assigning a safety officer in each distribution center.

Awareness program organized by Kuleshor Distribution Center on Safety Day

Loss Reduction Activities

Distribution Loss Reduction is the high priority area and was addressed mainly by two separate ways: Reduction of Non-Technical and Technical Losses. In F/Y 2018/19, 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 centre.
- Regular monitoring, data downloading and analysis of the large industrial and commercial consumers with TOD meters were augmented.
- Replacement of electromechanical meters with programmable 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 11.28% 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 electronic media as well as in the newspapers and hoarding board displays.

Installation of 33/11 kV, 20/24 Power Transformer at Belauri S/S

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 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 people's aspiration 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.

- NEA is executing distribution system expansion plan to avail electricity for all within next 3 years and upgrade its networks so as to enhance per capita consumption to 700 units within next five years.

Free distribution of Single Phase Meter for under privilege community at Siraha Distribution Centre

- 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 adversely in its financial health.
- NEA 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 has initiated centralized customer care center (one door system) 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 in some distribution centre and has plan to expand it fully.

- NEA plans to make available the billing and payment online so that consumer can access information as desired. A system has already been implemented for online billing of 3-phase high value consumers and pay the electricity bill online through internet based payment system.

Initiation of One Door System for assistance to public at Bhairahawa DCs

- DCSD has also initiated electronic metering system for its domestic (low value) consumers and also to make its distribution network underground in some selected urban areas.

On-The Job Training for Hand Held Device at Thimi Distribution Centre

- DCSD has initiated the power factor correction panel installation work in the distribution transformer in order to improve power factor, voltage profile and loading of the system.

- NEA started gird connected smart street light as a pilot project in Lalitpur Municipality.

Some of the major highlights of work executed by various departments under DCSD are listed in the following pages.

PLANNING AND TECHNICAL SERVICES DEPARTMENT

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 equipments.

- Monitoring and evaluation of region wise monthly distribution system losses. Assist to identify and implement programs for loss reduction in distribution systems

- Initiate modern facilities for the electricity consumers in the field of meter reading, billing and revenue collection
- Plans to execute distribution planning incorporating demand side management and loss reduction as an integral part of it.
- Preparing and updating the construction standards and guidelines for implementation of electrical installations and construction activities up to 33 kV and below.
- Testing and locating faults of underground cables of 11 kV & 33 kV feeders throughout the country with the help of cable testing van along with technical support.

168 collection centers out of 173 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 14, 22, 03,756.15 for 182 consumer in connection with the missed 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 & 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.

Major projects executed under PTSD are listed with brief description in the following pages.

COMPUTERIZED BILLING AND NETWORKING DIVISION

Computerized Billing and Network Division has always been striving towards enhancing the revenue collections of NEA. Our MPower Billing System 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 has already been implemented in 168 revenue collection centers out of 173 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 99% of the total consumer count and also covers more than 99.7% of the total NEA revenue.

Handheld Meter Reading Device (HHD) is currently operating in more than 110 locations which have helped in reducing human errors during meter reading and improve the energy sales consumption ratio. With the innovation in new technology, the division is in the process of implementing Online Meter Reading Handheld Device (HHD) with GPRS functions. The meter reader directly uploads the meter reading data to the concerned branch server system after collecting the data from the consumer premises which results in efficient meter reading and swift payment.

Web Based Services provided to the customers to view the bills, where the consumers can query the bills through NEA website. 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.

Online payment system was introduced from Bhadra, 2074 and has been successfully

implemented in 160 revenue collection centers. This system has focused all the groups of consumers where the consumer can pay their electricity bills through various online banking, mobile banking services, kiosks, cooperatives etc. Online system has eased the difficulty of the consumers standing in queue for hours just to pay the electricity bill as well as spending money on transportations to pay electricity bill.

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.

On the process of striving to the excellence, Computerized Billing and Network Division is planning to enhance the online meter reading Hand Held Device by providing SMS facilities to the consumers after meter reading to make paperless environment which will help in financial savings.

With the concept of making centralized system, Computerized Billing and Network Division are planning to move on Digital Collection Centre to reduce the hustle and bustle of the collection counters.

Furthermore, Computerized Billing and Network Division along with IT department has done enhancement on existing DCS Activities to get a Real time Revenue Management Information which will help MIS for Data Analysis and NEA health (financial/revenue status).

GIS SMART GRID PROJECT

The scope of this project is to manage 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 2019/20 for 35 branches namely Bhadrapur, Anarmani, Damak, Gauradah, Rangeli, Biratnagar, Duhabi, Ithari, Inaruwa, Rajbiraj, Kanchanpur, Lahan, Siraha, Mirchaiya, Sakhuwa, Janakpur, Jaleshwar, Gaushala, Gaur, Kalaiya, Birgunj, Simara, Banaeshwar, Pulchok, Thimi, Bhairahwa, Butwal, Taulihawa, Nepalgunj, Ghorahi, Tulsipur Surkhet, Tikapur, Dhangadhi, Bhajani. This project is funded by the Government of Nepal (GoN). GIS Server hardware has been procured. Document for procurement of GIS based Survey is being prepared.

Rasuwa–Nuwakot Reconstruction & Distribution System Improvement Project

The project concerns the construction of the 220 kV Chilime-Trishuli Transmission System ("Portion I") as well as a Neighborhood Electrification Component ("NEC") ("Portion II"). The purpose of the Project is to expand and improve the grid infrastructure for the efficient evacuation of electricity from hydropower to the Integrated Nepalese Power System and contribute thereby to an increased power supply and reduction in transmission losses In addition, the project aims for reliable distribution of power evacuated

Staff Quarter under construction at Bhalche S/S

through the Trishuli-Chilime transmission line and upstream hydropower projects to new customers in some specific locations in the vicinity of the transmission line.

The Portion II (NEC) related to the neighborhood electrification in Salme, Valche and Kaule VDC and further measures benefitting the population in the vicinity of the transmission line. The project includes consulting services during project implementation for design, procurement and supervision. It includes construction of 6/8 MVA, 33/11 kV substation at Bhalche of Nuwakot district, construction of 12 km 33 kV line from Trishuli 3B Hub substation to Bhalche substation, construction of 50 km of 11 kV & 50 km of 0.4 kV lines using covered conductor & ABC cable and installation of 30 numbers of distribution transformers in the vicinity of the 220 kV Chilime-Trishuli Transmission line corridor.

Civil construction works for control building, staff quarter, and office buildings are ongoing. Construction of switchyard is nearly in completion stage. Retaining wall construction work is already completed. Few section of boundary wall construction is underway. The civil construction works shall be completed by end of October 2019.

Reconstruction and Improvement of Electricity Distribution System

The project aims at improving the access to electricity in the respective districts by rehabilitating and improving the electricity distribution infrastructure after the earthquake in April 2015. The project comprises the financing of immediate relief measures with respect to the distribution network and short to medium term electrification measures as well as related project measures that will be identified in the further development of the project. F/Y 2016/17.

The envisaged scope of the project consists of Social Development (civil work and supply of ambulance) and Electrical Components.

Electrification component: The electrification measures will comprise the construction and reconstruction of several medium and low voltage distribution lines, the construction of small substations, the installation of distribution transformers and other related project measures that will be identified during the design of the final project measures.

Nijgadh - Kolhabi 33kV Project

The Nijgadh-Kolhabi 33kV project funded by Government of Nepal aims to meet the growing demand of electricity in Kolhabi as well as nearby area of Kolhabi of Bara District. This Project also covers the demand of electricity for Proposed Nijgadh International Airport. The scope of this project includes the construction of 33kV Sub-Transmission Line from Nijgadh 33/11kV Substation to Kolhabi Municipality as well as 33/11kV, 20/24 MVA Substation at Kolhabi Municipality, Bara. The land of Nepal Government under Kolhabi Municipality acquisition is under more than 70% progress for lease. The published Tenders for construction of 33kV line 19KM as well as 33/11kV, 20/24 MVA Substation is under evaluation condition. The Project is scheduled to be completed by F/Y 2020/21.

Khokana Nijgadh 33/11kV Substation Project

The project funded by Government of Nepal aims to meet the electricity demand of Kathmandu-Nijgadh Fast Track Road as well as growing demand of electricity in Thingan, Len Danda, Dhedhre Simpani and its vicinity of Makanwanpur District. The scope of this project includes the construction of 33kV Sub-Transmission Line and 33/11kV, 10/12 MVA Substation. The land acquisition is under process. The Project is scheduled to be completed by F/Y 2020/21.

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. Delivery of electrical materials is going on for construction of Bhurigaun-Gulariya (Bardia) 33 kV line project (length 42 km) & and construction of Yadukuha-Dhanushadham 33 kV line project (length 15 km) is on process.

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 substations 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 12nos. of transformers have been installed

Recently Charged 33/11 kV, 3 MVA Baghedhunga, Khotang Substation

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 (Khotang) Substation was completed and tested/charged on B.S. 2075/12/30.

33/11kV Line and Substation Feasibility Study Project

The project funded by Government of Nepal aims to plan new distribution substation and 33kV Sub-transmission Line. This project helps to meet the strategy plan for new 33kV line as well as 33/11kV new substation where it needs and feasible. This project studies two 33kV transmission Line i.e. from Keroun 132/33kV (New) substation to Katahari 33/11kV, 6/8MVA substation and Dalkebar 132/33kV Grid substation to Bardibas 33/11kV (New Proposed) substation. The Project is scheduled to be completed by F/Y 2020/21.

Transformer Testing Lab Construction Project

The aim of this project is to construct the Transformer Testing Lab at Biratnagar, Butwal and Nepalgunj under three regional offices namely Biratnagar, Butwal and Nepalgunj regional offices. This lab will be beneficial to NEA branches as well as medium and big consumers for testing of transformer for installation on their premises and factories, too. The construction of transformer testing lab workshop building at all the three places has been constructed and Transformer testing equipments has been installed in these lab as well. The testing facilities are readily available

Transformer Testing Workshop Building at Kohalpur, Nepalgunj.

in these labs. Various Routine Test of Distribution Transformers and Power Transformer up to 16 MVA capacities will be available in the Lab. Now, other civil works and crane installation works are on progress to make the workshop well facilitated. Supply & Installation of Electrical Equipment procuring processes for maintenance facilities of Distribution Transformer is on process. The project is scheduled to be complete by FY 2020/21.

Smart Metering Smart Grid Project

The scope of the project includes

Phase 1: To implement Automatic Meter Reading (AMR) System with implementing Advanced Metering Infrastructure in TOD meters like (EDMI, Bluestar, Actarius, Wasion, Risesun (2017). For this purpose, 10,000 Intelligent GPRS/GSM Modem shipped in NEA for implementation. Out of the shipped modems, 7,916 modems have been installed in consumer sites. The information of installed consumer regarding billing data, load profile, instantaneous data, event tampers can be retrieved via AMR/AMI system. The Integrated Branch Billing data can be retrieved through email and SMS. Server setup with all hardware and Network is completed.

Phase 2: Implementation of Smart Three phase energy meter to replace three phase whole current electromechanical meter. The programming of the smart meter can be executed remotely with control of consumer's supply to be disconnected in case of due payment incurs. The mode of communication between meter and system is GPRS.

Phase 3: To implement smart meter throughout NEA with DTMS (Distribution Transformer Monitoring System) for automation system in distribution network.

Matatirtha Naubise 33 kV Transmission Line Project

Charging of Matatirtha- Naubise 33 kV Transmission Line

This project aims to supply power for cement industry at Naubise, Dhading and existing NEA consumers in its vicinity. The scope of the project includes the construction of 33/11 kV, 2*6/8 MVA substations along with 13 km 33 kV double circuit line. Construction of the transmission line & substation at Naubise is completed and Naubise substation is charged from Matatirtha Substation through the newly completed Matatirtha - Naubise 33 kV double circuit transmission line.

Matatirtha Malta 33 kV Transmission Line Project

This project aims to supply power for Laxmi Cement Industry Pvt. Ltd. in Malta, Lalitpur and evacuation of power produced by Pashupati Energy Pvt. Ltd. (6MW) and supply existing NEA consumers in its vicinity. The project will help to improve the quality of supply and reduce the technical loses of the area. The scope of the project includes the construction of 33/11 kV, 10/13.3/16.6 MVA substation at Malta along with double circuit 35 km 33 kV line. Civil and electrical work of Malta substation is completed

Underground Cable laying works for Matatirtha Malta 33 kV Transmission Line

and the substation is in operation, charged with Khani khola hydropower feeder. Construction of 33 kV line from Matatirtha to Malta is in progress. Line construction work has been obstructed at different location by local community. Most of the local community issues have been sorted out by addressing some issues related with electricity supply, transformer, poles, etc. Since, number of

trees in the ROW (Right of Way) has increased than approved IEE report, the project in process of preparing Updated IEE report which is in final approval stage. About 70% of the transmission line construction work is completed and remaining work is scheduled is to be completed within FY 2076/77.

Dailekh (Dullu)–Kalikot 33 kV Transmission Line, Substation & Electrification Project

This project aims to connect Kalikot District with National Grid. The project will supply electricity to Kalikot district and its vicinity. The main scope of the project is construction of 33/11 kV, 6/8 MVA substation at Manma Bazar, Kalikot with 33 kV single circuit about 55 km Transmission line from Dullu, Dailekh to Kalikot Substation. Transmission line construction work is in progress. Pole erection work from Dullu Substation to Manma Bazar (Kalikot) is completed and around 1145 poles have been erected. Conductor stringing work is in progress. Land acquisition for the construction of substation in Kalikot is in final stage. After finalizaion of the land acquisistion, tender for construction of substation shall be started. The project was started in FY 2075/76 with funds from GoN and is expected to complete in FY 2076/77.

Matatirtha Markhu 33 kV Transmission Line Project

This project aims to meet the growing demand of electricity in Kulekhani area of Makawanpur district and its vicinity. The project will help to improve the quality of supply and reduce the technical losses of the area. The main scope of the project is construction of 33/11 kV, 6/8 MVA substation at Markhu with single circuit 15 km Transmission line from Matatirtha to Markhu. Substation, Control Building & Installation of Electrical instruments including Power Transformer has been completed. 33 kV Bay extension work and 33 kV Control Panel Installation works at Matatirtha Substation has been also completed. Transmission line construction work is in progress. The project is expected to complete in FY 2076/77.

33/11 kV Markhu Substation

Madankudari-Makaibari-Singati 33 kV line Project

The project funded by GoN aims to meet the growing demand of electricity in Madan Kudari–Majhifeda area of Kavre District and its vicinity. Also, power generated by IPP will be connected to this substation and part of this power will be consumed locally and other will be evacuated at Mude-Lamosanghu. The scope of the project includes the construction of 33/11 kV, 6/8 MVA Substation with interconnection facilities. The land acquisition process has been completed. The 33 kV substation and 33 kV transmission line construction works are on the way. The Project is scheduled to be completed by FY 2020/21.

Chautara-Sindhupalchok 33 kV substation Project

The project funded by GoN 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 with interconnection facilities. The construction of 33 kV line from Lamosanghu to Chautara is completed. Substation control building works and guard house has been completed and other civil construction works including bay construction works are on the way. Major Electrical equipments have been manufactured and custom duty & VAT facilities processes for most of the electrical items have been completed. Importing and delivery of equipments to site is on the way. The project is scheduled to be completed by FY 2020/21.

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 F/Y 2076/077 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 with 33/11 kV Power Transformers of 10/13.3/16.6 MVA capacity. It is intended to complete within first quarter of F/Y 2076/077.
- **Package 2:** Rehabilitation of 33/11 KV Substation in Pokharia, Harsa, Simrangaud with 33/11 kV Power Transformers of 20/24 MVA capacity. It is intended to complete within first quarter of F/Y 2076/077.
- **Package 3:** Rehabilitation of 33/11 KV Substation in Mukundapur, Kawasoti, Kalaiya with 33/11 kV Power Transformers of 20/24 MVA capacity. It is intended to complete within F/Y 2076/077.
- **Package 4:** Rehabilitation of 33/11 KV Substation in Guleria, Jeetpur, Bhairahawa and Lumbini with 33/11 kV Power Transformers of 20/24 MVA capacity. It is intended to complete within first quarter of F/Y 2076/077.
- **Package 5:** Rehabilitation of 33/11 KV Substation in Jhalari, Belauri, Dhangadhi, Mahendranagar and Ghorahi with 33/11 kV Power Transformers of 20/24 MVA capacity. It is intended to complete within first quarter of F/Y 2076/077.

Solu Corridor Rural Electrification Project

Under the project, distribution system will be expanded and reinforced for people and places affected by Solu Corridor 132 kV Transmission Line Project, by constructing 139 km of HT line, 247 km of LT line and installation of 67 numbers of 11/0.4 kV distribution transformers and also upgrading of existing poles, conductors and transformers in Solukhumbu, Okhaldhunga and Udaypur districts of Nepal.

The scope of project includes Solu-Dudhkunda Municipality, Necha-Salyan Rural Municipality and Thulung-Dudhkoshi Rural Municipality of Solukhumbhu District, Siddhicharan Municipality and Manebhanjyang Rural Municipality of Okhaldhunga Districts and Katari Municipality of Udaypur District.

The project is funded by Government of Nepal (GoN). Contact agreement has been signed on July 25, 2019 for both packages. The project is scheduled to be completed by January 24, 2020.

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

Survey works for Substation and HT Line Upgradation at Dodhara-Chadani, Kanchanpur

last year. Scope preparation and estimation of other rehabilitation (33 kV Line & 33/11 kV Substation) work is under process.

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, revived in 2013, which is being executed through Community Rural Electrification Department (CRED), NEA. 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 15 years, CREP has achieved major success making electricity access to more than 5,17,000 households of 53 districts through 506 nos. of different CREEs (including 290 CBOs, 216 entities of Kailali Kanchanpur Gramin Bidhyut Chhata Sanstha and Rural Municipalities/ Municipalities).

CRED is facing some technical and administrative issues despite which the performance of CRED of FY 2018/19 was satisfactory. During this review period, CRED initiated activities to resolve & complete ongoing community rural electrification works, and initiated new electrification works and substations in different areas of Nepal. CRED's major activities of this year include:

- Seventy One projects, initiated in this year and previous years, have been completed in this Review Period including 40 projects executed by Contractors and 31 projects executed by CREEs.
- Two substations in the rural area of Sindhuli and Panchthar along with 33 kV line extensions have been initiated.
- Technical, Administrative and accounting training has been provided to the CREEs of Gandaki Province and Province 3.

The details of projects of CRED in different stages of execution from FY 2013/014 to FY 2018/019 are as follows.

- Electrification, System Improvement and Rehabilitation: 148
- 33/11 kV 6/8 MVA Substation with 33kV line Construction: 5 (Lamjung, Baglung, Sindhuli, Taplejung,Panchthar)
- 33kV Line Construction: 1 (Palpa)
- Building (Division Office) Construction: 1 (Pokhara)
- Material Procurement: 2 (Steel Tubular Pole and Distribution Transformer)

CRED is planning different activities in coming fiscal years to achieve meaningful result by augmenting implementation of CREP which will strengthen the CRED and support the empowerment and sustainability of the CREEs too.

BIRATNAGAR REGIONAL OFFICE

Operational Highlights

There are 20 Distribution Centers under Biratnagar Regional Office (BRO) spread over Mechi and Koshi zones. The distribution loss of BRO is 12.15%. Sales contribution to NEA system of this RO is 15.54%. The performance highlights of this regional office during review period are as under.

Energy sales (MWH) – 835,293

Revenue (million) – Rs. 10,697.867

Numbers of consumers – 682,859

Project Highlights

The major projects being implemented under this regional office for construction of 33 kV line, 33/11 kV Substations and 11 distribution line network under following headings.

Construction of access road to Katahari S/S, Morang

- Ilam-Phidim-Taplejung 33 kV Transmission Line Project
- Aathrai Sakrantibazar 33 kV Substation Project
- Bhedetar (Rajarani) 33/11 kV Transmission line and Substation Project
- Panchthar, Taplejung and Bhojpur Distribution Line Strengthening Project
- Chainpur Sitalpati 33 kV transmission line and Substation Project
- Ahale Dadhipurkot Electrification Project.
- Biratchowk-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 20 Distribution Centers under Janakpur Regional Office (JRO) spread over Sagarmatha and Janakpur zones. The distribution loss of JRO is 23.36%. Sales contribution to NEA system from this RO is 8.08%. The performance highlights of this regional office during review period are as under.

Energy sales (MWh) – 509,284

Revenue (million) – Rs. 4,911.776

Numbers of consumers – 633,664

Project Highlights

The major projects being implemented under this regional office for construction of 33 kV line, 33/11 kV Substations and 11 distribution line network under following headings.

- Sangutar-Okhaldhunga 33 kV Transmission line project.

Charging of Bodebarsain Substation at Saptari

Inauguration of One Door Service established at Siraha Distribution Centre

- Ohaldhunga-Salleri 33 kV Transmission line project
- Khurkot-Nepalthok-Rakathum 33 kV Transmission Line Project
- Gahariya-Dumariya 33/11 kV S/S Construction Project.
- Haripurwa-Basatpur 33 kV Transmission Line & Sub-station Construction project.
- Bhagwanpur 33/11 kV S/S Construction project.
- Khurkot-Ghurmi 33/11 kV S/S Construction project.
- Rupani-Sarswar-Kusumhar 33/11 kV S/S Construction project.
- Lohana-Janakpur 33/11 kV S/S Construction project.
- Nirmalidada Line Construction project.
- Singhdevi-Raniban Electricity Expansion Project

HETAUDA REGIONAL OFFICE

Operational Highlights

Cable Trench Works at Substation, Rautahat

There are 13 Distribution Centers under Hetauda Regional Office (HRO) spread over Narayani zone. The distribution loss of HRO is 8.39%. Sales contribution to NEA system from this RO is 20.46%. The performance highlights of this regional office during review period are as under.

Energy sales (MWh) – 1,290,338

Revenue (million) – Rs.13, 223.203

Numbers of consumers – 464,237

Project Highlights

The major projects being implemented under this regional office for construction of 33 kV line, 33/11 kV Substations and 11 distribution line network under following headings.

- Chandranigahpur-Manpur 33/11 kV Substation Rehabilitation Project
- Maulapur-Pataura RE and Distribution Line Rehabilitation Project
- Devnagar-Chanauli-Chitwan 33/11 kV, 16 .6 MVA Substation Project

KATHMANDU REGIONAL OFFICE

Operational Highlights

There are 20 Distribution Centers under Kathmandu Regional Office (KRO) spread over Bagmati and parts of Janakpur zones. The distribution loss of KRO is 7.40%. Sales contribution to NEA system from this RO is 25.13%. The performance highlights of this regional office during review period are as under.

Energy sales (MWh) – 1,584,765

Revenue (million) – Rs.18,395,800

Numbers of consumers – 724,319

Project Highlights

The major projects being implemented under this regional office for construction of 33 kV line, 33/11 kV Substations and 11 distribution line network under following headings.

- Budhasing, Dansing, Gorsyang, Khadgabhanjhyang, Phikure, Kaule, Bhalche

Replacement of burnt Transformer under Ratnapartk Distribution Center

Distribution Line Project

- Sanghutar - Manthali 33/11 KV Transmission Line and Substation Project
- Sindhupalchok Electricity Distribution Expansion and System Reinforment Project
- Khaire-Marbu Line Expansion Project

POKHARA REGIONAL OFFICE

Operational Highlights

There are 12 Distribution Centers under Pokhara Regional Office (PRO) spread over Dhaulagiri and Gandaki zones. The distribution loss of PRO

View of Pokhara DCS with HT Distribution Network

Line and Transformer under Maintenance

is 9.0 %. Sales contribution to NEA system from this RO is 5.13%. The performance highlights of this regional office during review period are as under.

Energy sales (MWh) – 323,741

Revenue (million) – Rs.3, 286,458

Numbers of consumers – 297,198

Project Highlights

The major projects being implemented under this regional office for construction of 33 kV line, 33/11 kV Substations and 11 distribution line network under following headings.

- Udipur Besisahar Manang 33 KV Transmission Line Project:

- Galkot 33kV Transmission Line and Substation Project:
- Sindhabesi (Lamjung) Lekhnath 33 kV Transmission Line and Substation Project
- Bhorletar 33 kV Transmission Line and Substation:
- Righa Kharwang 33 kV Transmission Line and Substation Project
- Khairenitar 33 kV Transmission Line and Substation Project
- Gorkha Siranchaur 33 kV Transmission Line and Substation Project
- Burtibang 33 kV Transmission Line and Substation Project
- Tatopani Small Hydropower Rehabilitation Project
- Lekhnath Distribution System Rehabilitation Project

BUTWAL REGIONAL OFFICE

Operational Highlights

There are 12 Distribution Centers under Butwal Regional Office (BuRO) spread over Lumbini zone. The distribution loss of BuRO is 12.39% Sales contribution to NEA system from this RO is 15.54%. The performance highlights of this regional office during review period are as under.

Loss Reduction Interaction Program at Taulihawa Distribution Centre

Energy sales (MWh) – 979,892

Revenue (million) – Rs 9,586,678

Numbers of consumers – 492,604

Project Highlights

The major projects being implemented under this regional office for construction of 33 kV line, 33/11 kV Substations and 11 distribution line network under following headings.

- Jeetpur Thada 33 kV Substation Project
- Ridi 33/11 KV Transmission Line and S/S Project
- Gulmi Shantipur 33 kV Transmission line and Substation Project.
- Jitpur Saljandi 33/11 kV Transmission line and Substation Project.
- Ramnagar 33 kV Transmission line and Substation Project.
- Distribution Line Reinforcement at Arghakhachi
- Distribution Line Reinforcement at Gulmi
- Distribution Line Reinforcement at Palpa

NEPALGUNJ REGIONAL OFFICE

Operational Highlights

There are 20 Distribution Centers under Nepalgunj Regional Office (NRO) spread over Bheri, Rapti & Karnali zone. The distribution loss of NRO is 11.57% and sales contribution to NEA system from this RO is 6.62%. The performance highlights of this regional office during review period are as under.

Energy sales (MWh) – 417,313

Revenue (million) – Rs 4,095,830

Numbers of consumers – 381,861

Construction of Hapure-Tulsipur 33 kV Transmission Linea

View of Substation Switchyard at Kudu, Jajarkot

Project Highlights

The major projects being implemented under this regional office for construction of 33 kV line, 33/11 kV Substations and 11 distribution line network under following headings.

- Chhinchu-Rakam-Jajarkot 33 kV Transmission Line Project
- Sitalpati -Musikot 33 kV Transmission Line and Substation Project:
- Ghorahi-Holeri 33 kV Transmission Line Project
- Dailekh Substation Project
- Surkhet Bijaura 33 kV Substation Project
- Dang Lamahi Bhalubang 33 kV Transmission Line Project
- Pyuthan Substation Project
- Ramghat Surkhet 33 kV Transmission Line Project
- Surkhet Gangate Matela Project 33 kV Transmission Line Project
- Surkhet Chingad Electricity Extension Project
- Kalikot Small Hydropower Rehab Project
- Seri Dailekh Electricity Extension Project
- Rajwada 33 kV Transmission line Project
- Khawang 33 kV Transmission line Project
- Heldung Small Hydropower Rehab Project

ATTARIYA REGIONAL OFFICE

Operational Highlights

There are 12 Distribution Centers under Attariya Regional Office (ARO) spread over Mahakali and Seti zones. The distribution loss of ARO is 14.39%. Sales contribution to NEA system from this RO is 3.50%. The performance highlights of this regional office during review period are as under.

Energy sales (MWh) – 220,859

Revenue (million) – Rs. 1,903,391

Numbers of consumers – 232,899

Project Highlights

The major projects being implemented under this regional office for construction of 33 kV line, 33/11 kV Substations and 11 distribution line network under following headings.

- Sakayal-Dadeldhura 33 kV Transmission line and Substation Project
- Khodpe (Baitadi) Chainpur (Bhajang) 33 kV Transmission Line and Substation Project
- Sanphe (Achham)-Martadi(Bajura) 33 kV Transmission Line and Substation Project
- Gokuleshor-Balanch 33 kV Transmission Line and Substation Project
- Sanfe-Kamalbazar-Manma 33 kV

Transmission Line and Substation Project

- Sanfebagar-Chamar Chautara 33 kV Transmission Line and Substation Project
- Doti Mauwa 33 kV Transmission Line and Substation Project
- Budar-Jogbuda-Bagarkot 33 kV Transmission Line and Substation Project
- Martadi (Bajura)-Gamgadi (Mugu) 33 kV Transmission Line Project
- Patan-Melauli 33 kV Transmission line and Substation project at Baitadi.
- Musya 33 kV Transmission line and Substation project at Baitadi.
- Sillegada-Katauchpani 33 kV Transmission line and Substation Project at Baitadi.
- Doti-Simichaur 33 kV Transmission line and Substation Project at Doti.
- Lamki Sugarkhal 33 kV Transmission line and Substation Project at Kailali.
- Attariya-Punarbas 33 kV Transmission line and Substation Project at Kailali and Kanchanpur.

Construction of Substation Switchyard at Chainpur, Bajhang

Construction of Substation Switchyard at Bagthala, Bajhang

No. of Consumers (Nos) for F/Y 2075/076

S.No.	Category	Biratnagar	Janakpur	Hetauda	Kathmandu	Pokhara	Butwal	Nepalgunj	Attariya	Total
1	Domestic	619415	583872	426087	695892	285540	470058	356148	220080	3,657,092
2	Non-Commercial	3537	2811	2098	3866	2463	3169	3330	2219	23,493
3	Commercial	3916	2382	2588	7540	2380	3135	2385	1420	25,746
4	Industrial	7881	8957	7792	10354	4259	6736	4438	2280	52,697
5	Water Supply	199	214	268	644	425	466	172	72	2,460
6	Irrigation	45090	33987	23785	1450	582	6748	14334	5959	131,935
7	Street Light	882	479	415	816	150	364	138	22	3,266
8	Temporary Supply	54	65	118	1129	49	134	86	47	1,682
9	Transport	0	0	1	37	2	0	0	0	40
10	Temple	1241	470	683	737	722	1123	536	378	5,890
11	Community Sales	173	128	76	138	390	234	176	344	1,659
12	Non-Domestic	266	194	209	1534	150	321	51	10	2,735
13	Entertainment	44	13	25	24	21	14	5	4	150
14	Internal Consumption	161	92	92	158	65	101	62	64	795
15	Export to India	0	0	0	0	0	1	0	0	1
	Total	**682859**	**633664**	**464237**	**724319**	**297198**	**492604**	**381861**	**232899**	**3909641**

Sales Unit (MWh) for F/Y 2075/076

S.N.	Category	Biratnagar	Janakpur	Hetauda	Kathmandu	Pokhara	Butwal	Nepalgunj	Attariya	Total
1	Domestic	384425	263120	320327	861888	178674	342944	191573	118387	2,661,338
2	Non-Commercial	20782	9865	21245	86628	14552	12793	13027	7268	186,160
3	Commercial	52585	24088	47956	216715	44702	37127	27077	15461	465,710
4	Industrial	441631	165136	830234	236919	37350	530204	150867	29184	2,421,523
5	Water Supply	17388	4471	14582	24719	7168	15790	5395	2876	92,388
6	Irrigation	27139	19218	16950	1278	383	6731	8461	3555	83,716
7	Street Light	7674	12331	22040	23025	2708	5702	3297	2083	78,860
8	Temporary Supply	81	78	191	2229	194	537	74	98	3,482
9	Transport	0	0	737	3816	28	0	0	0	4,581
10	Temple	1244	666	725	2145	540	1650	619	259	7,848
11	Community Sales	15815	9190	6438	8221	33671	11031	14181	41030	139,577
12	Non-Domestic	8894	396	6909	113810	3410	12185	2333	253	148,190
13	Entertainment	1543	77	1645	1774	185	185	128	84	5,620
14	Internal Consumption	612	648	359	1598	175	431	283	321	4,426
15	Bulk Supply	0	0	0	0	0	2582	0	0	2,582
	Total	**979811**	**509284**	**1290338**	**1584765**	**323741**	**979892**	**417313**	**220859**	**6306002**

REVENUE(NRs.in Thousands) for F/Y 2075/076										
S.N.	Category	Biratnagar	Janakpur	Hetauda	Kathmandu	Pokhara	Butwal	Nepalgunj	Attariya	Total
1	Domestic	3447110	2095060	2910838	9008276	1683993	3186784	1662286	973121	24,967,469
2	Non-Commercial	282605	145285	321447	1413944	214080	174479	184715	101483	2,838,037
3	Commercial	756126	349293	679691	3148999	644532	544901	386887	226481	6,736,911
4	Industrial	5633088	2037143	8755109	2514095	430706	5189501	1639601	325466	26,524,709
5	Water Supply	126663	33005	103390	197803	58972	123257	41539	23114	707,743
6	Irrigation	120580	86416	75878	6614	1830	33845	38142	16506	379,811
7	Street Light	68399	97023	190988	222804	26631	44314	26416	19363	695,938
8	Temporary Supply	1735	1654	4508	40838	3809	8043	1468	2136	64,191
9	Transport	0	0	8226	25673	379	0	0	0	34,278
10	Temple	7801	4101	4677	14275	3300	12411	3839	1556	51,960
11	Community Sales	81566	46859	34210	38578	161393	53516	71552	204008	691,682
12	Non-Domestic	138178	6834	103522	1713387	50696	177181	33380	3861	2,227,039
13	Entertainment	26592	1530	26276	29765	3568	3470	2405	1839	95,444
14	Internal Consumption	7424	7573	4443	20749	2569	4909	3602	4457	55,725
15	Bulk Supply	0	0	0	0	0	30067	0	0	30,067
	Total	**10697867**	**4911776**	**13223203**	**18395800**	**3286458**	**9586678**	**4095830**	**1903391**	**66101004**

Loss Percentage										
S.N.	Category	Biratnagar	Janakpur	Hetauda	Kathmandu	Pokhara	Butwal	Nepalgunj	Attariya	Total
1	Received Energy, MWH	1,116,349,110	670,745,292	1,412,413,668	1,716,797,535	358,839,058	1,143,129,569	459,205,007	258,494,900	7,135,974,139
2	Sales Energy, MWH	980,672,754	514,056,711	1,293,868,882	1,589,738,670	323,704,793	1,001,442,786	406,061,478	221,294,094	6,330,840,168
3	Loss Unit, MWH	135,676,356	156,688,581	118,544,786	127,058,865	35,134,264	141,686,783	53,143,529	37,200,806	805,133,971
4	Loss percentage (2018/019)	12.15%	23.36%	8.39%	7.40%	9.79%	12.39%	11.57%	14.39%	11.28%
5	Loss percentage (2017/018)	15.08%	31.30%	13.37%	8.47%	11.50%	15.55%	16.81%	17.72%	14.82%
6	Loss percentage (2016/017)	17.65%	36.45%	15.39%	10.24%	11.86%	16.52%	18.53%	16.31%	16.83%
7	Loss percentage (2015/016)	20.67%	47.95%	18.33%	11.24%	12.45%	16.29%	19.17%	19.55%	19.80%

Distribution System Data for F/Y 2075/076								
S.N.	Regional Office	Number of 33/11 kV Substations	Substation Capacity (MVA)	Line Length (km)			Distribution Transformers	
				33 kV	11 KV	0.4/0.23 kV	Quantity	Approx. Capacity (MVA)
1	Biratnagar	23	320.40	688.93	5,936.40	17,464.20	4,875	489.94
2	Janakpur	24	263.45	774.70	5,364.05	14,500.00	4,249	427.02
3	Hetauda	10	115.60	239.70	3,831.44	9,327.74	3,961	398.08
4	Kathmandu	11	60.10	360.27	5,978.18	22,343.24	6,391	642.30
5	Pokhara	16	102.00	389.56	3,586.54	9,570.34	3,000	301.50
6	Butwal	20	212.70	937.85	3,896.88	13,131.89	4,078	409.84
7	Nepalgunj	15	133.25	927.92	3,267.31	10,185.36	3,204	322.00
8	Attariya	19	98.00	588.23	3,865.68	12,653.38	2,494	250.65
	Total	138.00	1305.50	4,907.16	35,726.48	109,176.15	32,252	3,241.33

Electrification Status of Distribution System of NEA for 2075/076										
Description	Status	Biratnagar	Janakpur	Hetauda	Kathmandu	Pokhara	Butwal	Nepalgunj	Attaria	Total
Zonal Coverage		Mechi & Koshi	Janakapur & Sagarmatha	Narayani	Bagmati &Janakpur	Gandaki & Dhaulagiri	Lumbini	Bheri ,Karnali & Rapti	Mahakali & Seti	
Metropolitan	Fully Electrified	1	0	2	2	1	0	0	0	6
	Partially Electrified	0	0	0	0	0	0	0	0	0
Sub-Metropolitan	Fully Electrified	1	1	2	0	0	1	0	1	6
	Partially Electrified	1	0	1	0	0	0	3	0	5
Municipalities	Fully Electrified	22	17	2	27	19	11	7	9	114
	Partially Electrified	16	42	28	6	3	14	23	16	148
	Non-Electrified	0	0	0	0	0	0	6	8	14
Rural Municipalities	Fully Electrified	10	16	3	23	24	14	7	2	99
	Partially Electrified	42	38	27	32	26	26	38	28	257
	Non-Electrified	10	17	0	3	4	3	43	24	104
No. of Distribution Center		20	20	13	20	12	12	20	12	129

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, 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 and service charge adjustments.

SYSTEM PLANNING DEPARTMENT

System Planning Department (SPD) is mainly responsible for preparation of Power System Master Plan for NEA that includes Load forecast, Generation Plan 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 one 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.

The department has prepared 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 2018/19, 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 formulation of Corporate Development Plan

ii. Five year Transmission Line Study of Nepal

iii. Power supply reinforcement study of the Eastern Region of Nepal - Kabeli corridor.

iv. Symmetrical fault current calculation of:

a. Trishuli 3B Hydropower Project

b. Rasuwagadhi Hydropower Project

c. Devighar substation as requested by Grid solar and efficiency project

v. Load flow Study of:

a. 132 kV Sunwal substation

b. 60 MW Solar power plants to be developed by IPP's in various substation of Nepal as per the request of Project Management Directorate

vi. Power Evacuation Report and Load flow study of:

a. Upper Modi A Hydroelectric Project(42 MW) and Upper Modi Hydroelectric Project(18.2 MW)

b. Rahughat Hydropower Project (40 MW)

vii. Energy / Power balance study report of Nepal as requested by Transmission Directorate

viii. Preparation of Report on new cross-border interconnection by 2025 from Integrated Master Plan for Evacuation of Power from Hydro Projects in Nepal. The report was prepared by Joint Technical Team (JTT) of India and Nepal.

ix. Scope finalization of Lumki – Bareilly 400 kV D/C cross-border interconnection and New-Duhabi – New-Purnea 400 kV D/C cross-border interconnection.

x. Preparation of PSSE data for Millennium Challenge Nepal (MCC) for the FY 2023/24 and FY 2029/30.

xi. Involved in preparing Phase Shifting Transformer Resizing Report prepared by by Millennium Challenge Account Nepal (MCA-N).

xii. Preparation of Load forecast, transmission line data, generation data, and energy simulation data of Nepalese INPS for JICA.

xiii. Grid Impact Study of total 1838 MW capacity of 76 hydropower projects to be developed by IPP'S.

xiv. Grid Impact Study of total 132.25 MVA capacities of 12 bulk load industries to be connected to the INPS.

List of GIS conducted projects of Hydropower Projects in FY 2018/19

S.No.	Project	Capacity (MW)
1	Mai Beni	9.51
2	Upper Chameliya	40.00
3	Indu Shanker	3.00
4	Middle Tamor	73.00
5	Super Kabeli	12.00
6	Super Kabeli A	13.50
7	Tamor Mewa	128.00
8	Chepe	7.00

9	Dudhpokhari Chepe	8.84
10	Dordi I	12.00
11	Dhaad Khola	1.80
12	Chisang Khola	1.80
13	Madhya Super Daraudi	10.00
14	Tiplyang Kaligandaki	58.00
15	Midim 1	13.42
16	Tinau Khola	3.44
17	Aayu Malun	21.00
18	Upper Khudi	21.21
19	Kabeli 3	21.93
20	Madhya Rawa	2.20
21	Mewa	23.00
22	Hidi Khola	6.82
23	Tamor Khola 5	37.50
24	Rauje	17.71
25	Upper Bhurundi	4.50
26	Badigad Kolti	4.50
27	Pegu	3.00
28	Lower Kaligandaki	8.00
29	Sunigad	17.50
30	Shaba C	4.20
31	Super Chepe	9.05
32	Bhalaudi	2.65
33	Mudi	14.70
34	Lower Nyadi	12.60
35	Upper Bhurundi A	3.75
36	Rahughat	40.00
37	Upper Tamor	255.28
38	Miwaje	4.95
39	Upper Daraudi B	8.30
40	Upper Daraudi C	9.60
41	Super Melamchi	23.60
42	Garchyan	6.60
43	Balefi A	22.14
44	Gasali	4.50
45	Upper Madi 0	43.00
46	Upper Seti I	13.00
47	Super Sabha A	9.55
48	Middle Kaligandaki	53.54
49	Super Machha	4.60
50	Jum Khola	59.70
51	Lower Rupse	1.86
52	Lower Hewa A	6.90
53	Ankhu II	20.00
54	Balephi A	22.14
55	Lyangdi	3.26
56	Upper Dudhkhola	30.40
57	Lower Khani B	6.20
58	Upper Maiwa Khola	17.85
59	Bagar Khola	5.50
60	Machha Khola	18.50
61	Mistri Khola 2	11.80
62	Barun Khola	132.00
63	Sani Bheri	44.52
64	Jaldigad	20.73
65	Malta	6.50
66	Lower Bhim Khola	3.60
67	Upper Seti	20.00
68	Upper Sardi Khola	2.90
69	Upper Marshyangdi 1	112.60
70	Lodo Khola Small	1.60
71	Upper Sagu Khola	10.00
72	Nyadi	30.00
73	Upper Trishuli 2	102.00
74	Arun Khola 2	2.00
75	Jurimba Khola	7.63
76	Khimti Ghwang	9.00
	Total	**1,838.98**

List of GIS conducted projects of Bulk Load Consumer in FY 2018/19

S.No	Load	Capacity (MVA)
1	United Cement	4.5
2	Sarvottam Steels	25
3	Jagadamba Wire	15
4	Shree Steel	8
5	Palpa Cement	7
6	Sarbottam Cement	6
7	Siddhi Laxmi Steels	5
8	Narayani Spat	8.75
9	Pashupati Iron And Steels	20
10	Jay Ambe Steels	8
11	Riddhi Siddhi Cement	15
12	Swastik Rolling Mills	10
	Total	**132.25**

Load Forecast

S.No.	Fiscal Year	System Peak (MW)	Total Generation Requirement (GWh)
1	2019/20	2225.65	10,138.28
2	2020/21	2638.29	12,017.96
3	2021/22	3062.87	13,952.00
4	2022/23	3365.97	15,332.65
5	2023/24	3703.27	16,869.13
6	2024/25	4078.75	18,579.53
7	2025/26	4519.06	20,585.22
8	2026/27	5011.11	22,826.63
9	2027/28	5561.23	25,332.50
10	2028/29	6171.26	28,111.30
11	2029/30	6848.52	31,196.38
12	2030/31	7542.04	34,355.49
13	2031/32	8311.62	37,861.08
14	2032/33	9166.27	41,754.21
15	2033/34	10115.87	46,079.83
16	2034/35	11171.28	50,887.42
17	2035/36	12295.37	56,007.87
18	2036/37	13540.05	61,677.62
19	2037/38	14918.68	67,957.59
20	2038/39	16445.72	74,913.54
21	2039/40	18137.67	82,620.73

INFORMATION TECHNOLOGY DEPARTMENT

IT Department is responsible for core IT related activities 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. The Department has started the procurement of essential computer hardware and network components required within the organization from 2075/76 FY.

IT Department has been working for computer network implementation, support and maintenance. 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 software applications running within NEA. Department has also planned to expand the existing computer network throughout the NEA offices within country in forthcoming years. This Department is running the various software applications such as CAIS (Customized Account & Inventory System), Payroll, Pension, Asset Management, E-attendance system, DCS-Activity's Information System, Online meter application, Complain Management System, Kaaj Management, Document Management, NEA Anudan, PPA Management, Bidhut Subidha etc. Department also maintains the NEA web site as and when required by the management. Supply/Demand data display is maintained at NEA web site. Data upload & download management is being carried out by this Department as per requirements through NEA Web site. NEA Web site is being upgraded by this department time to time. E-mail upgradation has been carried out and E-mail IDs for all the NEA offices has already been created. Consumption Pattern System, NEA Telephone Directory has been created those are displayed through NEA Web site. Intranet web site has also been developed to display the private information of NEA within NEA network.

IT Department has also planned for Server upgradation, Communication backbone establishment in all NEA offices and IT Audit. Department has also published the tender for upgradation of server, network and IT audit. EPABX (Telephony System) will also be upgraded in 2076/77 FY. IT Department has also planned for establishing the DC (Data Center) & DR (Disaster Recovery) in 2076/77 FY. The department has also planned to implement the Centralized E-attendance System in all the NEA offices. A PIS (Personnel Information System) will be implemented in 2076/77 FY. This PIS includes the functioning of PDB, Darbandi management, and Transfer management etc. A computer network backbone expansion will be carried out in whole

NEA offices in 2076/77 FY. Online Recruitment System will be used from next vacancy.

Other application software such as AMR (Automatic Meter Reading), GIS (Geographical Information System) & ERP (Enterprises Resource Planning) will be implemented by concerned Projects and finally governed by IT Department.

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 projects under different financing mode. During the year under review, the Department collected, evaluated and reviewed monthly, trimester and annual progress of 231 development projects implemented by NEA. Of these 231 projects: 5 projects were for feasibility study of storage and medium/large hydropower projects; 10 projects were hydropower projects that are under construction; 83 projects were transmission line projects; 112 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.

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 8 new projects developed by the Independent Power Producers (IPPs) with their combined capacity of 48.08 MW were commissioned in FY 2075/76. Projects that were commissioned are: Super Mai (7.8 MW), Sobuwa Khola-2 (0.09 MW), Bishnu Priya Solar Farm

Project (0.96 MW), Midim Khola (0.1 MW), Rudi Khola A (8.8 MW), Bagmati Khola (22 MW), Kapadi Gad (3.33 MW), and Pikhuwa Khola (5 MW). With these 8 projects, the total number of IPP-owned projects that are in operation has reached 83 with their combined installed capacity of 560.775 MW. Similarly, 120 projects of IPPs with their combined capacity of 2613.895 MW are under construction. Likewise, 137 projects of IPPs with their combined capacity of 2869.384 MW are in other stages of development. During FY 2075/76, 85 new PPAs with their combined capacity of 1480.432 MW were concluded. Among which, 2 PPAs were for concluded to purchase electricity form Co-generation (Bagasse) plants, 4 PPAs were concluded for PROR projects and 10 PPAs were concluded for Solar projects with combined installed capacity of 6 MW, 231.2 MW and 51.5 MW respectively. In addition to this, the installed capacity of 8 projects, namely, Upper Rawa, Mai Beni, Daram Khola, Middle Tamor, Tallo Hewa, Super Dordi 'Kha', Dordi-1 and Chauri Khola were upgraded by 0.2 MW, 0.5 MW, 2.3 MW, 20.9 MW, 0.5 MW, 4.4 MW, 1.7 MW and 1 MW respectively. Similarly, 2 projects, namely, Dhansi Khola (0.955 MW) and Ludee Khola (0.75 MW) were terminated in FY 2075/76.

With this, total number of PPAs concluded till the end of FY 2075/76 has reached 340 with their combined capacity of 6044.054 MW.

ECONOMIC ANALYSIS DEPARTMENT

As a focal unit of tariff revision and one of the major components 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:

- Study on Financial Resource Requirement & tariff adjustment.
- 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).
- Adhere with regulatory compliance while preparing and analyzing data.
- Carry out 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. It also assists to conduct Cost- Benefit Analysis related to G,T,&D activities of NEA. Its role now has been both extensive and intensive in the context of identifying the factors that leads to manage the internal demand and studying the avenues for export as well as Nepal is expected to be net exporter of electricity to India and other neighboring countries in the near future- in fact by 2020. It also contribute to Demand Side Management (DSM) via revision of tariff. A study on encouraging off- peak demand and reducing peak demand has been planned- via Time -of -Day tariff revision will be conducted in addition to the periodic tariff revision.

The main activities conducted by the Department in the FY 2018/19 are presented as:

- Update of NEA Financial Viability Action Plan (2018)- Final audited data has been taken as basis and the estimated energy balance, revenue, and cost related figures have been replaced by the Actual figure of 2018. To cop-up with the changing scenario Investment Requirement and NEA's contribution on it has been Identified and Estimation is further revised in the coming years of the plan period. It basically focus on the: i) Study of Cost of Service, ii) Study on financial Resource Requirement, & iii) Tariff Adjustment. 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 for 2018/19 and will be conducted as regular job of the Department..

- 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 call for additional study. The work is in progress and it is the regular job of the Department.

- Corporate Development Plan (CDP) of NEA- it comprises the Vision, Mission, Themes, Goals and Activities (Action) plan of NEA developed by the core team in order to materialize the future prospects in coming five years. Corporate Development Plan team has a report prepared which contains Key Performance Indicators (KPI) each Directorate and Department to achieve the target. The targets and KPI set for the Department will be achieved on through ongoing regular activities.

- Tariff Proposal has been prepared and will be submitted to the NEA Board considering cost-revenue scenario in addition to the Socio-Political-Economic aspects. It is ongoing and regular job of the Department.

ENGINEERING SERVICES DIRECTORATE

Engineering Services Directorate is entrusted with the responsibility to carry out engineering studies beginning from the identification to detailed engineering design, environmental studies, geological and geotechnical studies. It is headed by a Deputy Managing Director. The Directorate has rendered its services to NEA and private sector particularly for the study of hydropower and transmission line projects. The Project Development Department, Soil Rock and Concrete Laboratory, Environmental and Social Studies Department, and Training Center 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.

DUDHKOSHI STORAGE HYDROELECTRIC PROJECT

Dudhkoshi Storage Hydroelectric Project is a storage type hydropower project capable of addressing prevailing power and energy deficit during the dry season. It is located at border of Khotang and Okhaldhunga districts on Dudhkoshi River in Province no. 1 of Nepal. Thedam 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 taskwithin18 November 2019.The consultant has submitted Final Updated Feasibility Study Report, Draft final Detailed Design Report, Draft Pre-qualification Document and Draft Bidding Documents for Civil Works and Hydro Steel Structures (HSS) and & Access Roads contract, Plant contract and 400 KV Transmission Lines contract.

Dam Site of Dudhkoshi Storage Hydroelectric Project

Final Upgraded Feasibility Study envisages two alternatives. First alternative is with total installed capacity of 835 MW comprising a underground powerhouse with an installed capacity of 600 MW

located on Sunkoshi river with a 13.3 km long headrace tunnel and a underground powerhouse with an installed capacity of 235 MW located in the right abutment immediately downstream of the dam site including a small hydro unit necessary to release the environmental flow. Second alternative is with total installed capacity 635 MW comprising a powerhouse with installed capacity of 600 MW located on Sunkoshi river with a 13.3 km long headrace tunnel and a surface powerhouse small hydro (35 MW) at dam toe to release the environmental flow.

The annual energy production from first alternative i.e. 835 MW is 3,586 GWh per year, with an average energy production of 1,184 GWh in Dry season and 2,177 GWh in Wet season and from second alternative i.e. 635 MW layout is 3,350GWh per year, with an average energy production of 1,271 GWh in Dry season, 2,079 GWh in Wet season.

For the alternative with the 835 MW, the Financial Internal Rate of Return is 9.2%, the Project Net Present Value is 211 million US $ and the Average Debt Service Coverage Ratio is 2.4. For Layout 635 MW, the Financial Internal Rate of Return is 9.6%, the Project Net Present Value is 280 million US $ and the Average Debt Service Coverage Ratio is 2.5. For both the layouts, the debt-service indicators as well as the Project Financial Internal Rate of Return are higher that the reference figures for similar cases. Nevertheless, the Layout 635 MW is the best option from the economic and financial point of view and detailed design is being carried out for 635 MW.

The proposed layout in the Draft Detailed Design Report includes: 220 m high Concrete Face Rockfill Dam (CFRD) with a 630 m long crest at elevation 648 m. asl located on Dudhkoshi River in a gorge nearly one kilometer downstream of the confluence between Dudhkoshi River and Thotne Khola; a underground powerhouse with the installed capacity of 600 MW located on Sunkoshi river with a 13.3 km long headrace tunnel; a surface powerhouse with an installed

Construction of test adit: Adit no. - TT 1

Inclined Core Drilling at Dam Site

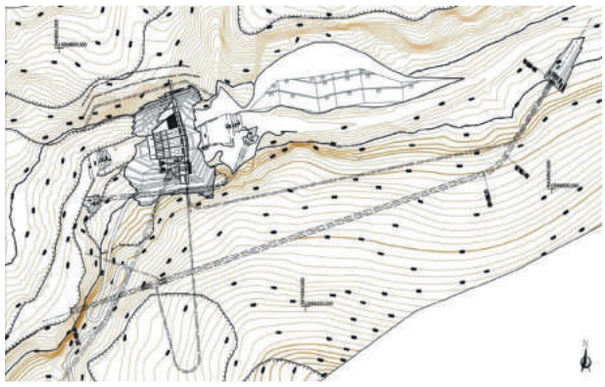
capacity of 35 MW located in the right abutment immediately downstream of the dam site to release the environmental flow; a combined spillway (gated and labyrinth overflow, design discharge 9027 m3/s) located in the left abutment. The total storage capacity of the reservoir is 1581 Mm^3 out of which the live storage capacity is 1342 Mm^3 and the dam body volume is about 26.7 million m^3.

The ToR and scoping report for EIA has been submitted and approved by Ministry of Forests and Environment, GoN and the Consultant has submitted the Draft EIA report.

As presently conceived, the project can be implemented and fully commissioned in 7 years period. ADB has committed to finance for the development of the project. NEA and ADB are having conversation with other development partners and multinational agencies for co-financing the project. The financial arrangement is expected to complete by January 2020. The Detailed Design of Project including Tender Document preparation is expected to complete by November 2019. The construction of the project is expected to commence from the start of 2021 and complete by the end of 2027.

UPPER ARUN HYDROELECTRIC PROJECT

Upper Arun Hyrdoelectric Project (UAHEP) is Peaking Run-off River type of Hydropower Project being developed in the Arun River that is located in Sankhuwasabha District about 200 km east of Kathmandu. 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 22 km including 2.0 km long road tunnel will be required to reach headwork site along the left bank of Arun River. The power from UAHEP is proposed to be evacuated to national grid from Arun Hub at Hitar which is then connected to Inaruwa Substation via Sitalpati Substation using165 km long double circuit400 kV transmission line.



Head works Layout of UAHEP

Ikhuwa Khola Hydropower Project of 30 MW capacity is also studied as an integral part of the current study with the initial aim of benefit sharing of the project to the local people.

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 Detailed Engineering design and Construction Supervision of the Access Road for the UAHEP is being carried with funding of Government of Nepal.

The project optimization from the ongoing study till June 2019, shows that the project (UAHEP) will have a nominal installed capacity of 1040 MW generating annual energy about 4,500 GWh on an average. Based on the sum of the nameplate rating of the individual units, the rated capacity of the project is determined to be about 1061 MW. The main project features are: 8.36 km long low pressure headrace tunnel of 8.4 m net diameter, 94 m high concrete gravity dam with three gated low level outlet for flood and sediment discharge, 20 m inner diameter surge shaft, 467 m high and7.3 m diameter pressure shaft and underground powerhouse with six units of pelton turbines each with rated capacity of about 176.8 MW. Sediment management in the project is proposed through efficient head works configuration combined with reservoir settling and periodic flushing and sediment by pass tunnel of 8.5 m diameter avoiding costly yet ineffective desander basins. The design envisages intake integrated with the dam itself utilizing 15 m drawdown at a rate of 2.5 m/hr from FSL of 1640 m to 1625 masl. The project has a rated discharge of 235.44 m^3/s and firm capacity of 697 MW. The project also consists of Eco-flow power station at dam toe of installed capacity 5 MW generating about 22.6 GWh annually to utilize the mandatory e-flow. The study till date shows that the economic indicators LCOE, EIRR and B/C ratio of the project are about 3.3 US Cent/kWh, 18.3% and 2.1 respectively.

However, it should be noted the final project footprint and final details shall be confirmed after the completion of the additional investigations and review of the updated feasibility study.

The contract period for the consulting services for the detailed engineering design and bidding document preparation including the interface is up to February 28, 2021. The consultant has completed a test adit excavation up to 150 m at power house area and the test adit excavations at dam site are expected to start soon. The core drilling at different project locations of length more than 1000 m is also complete. Given the large capacity and consequent complexity of the project, intensive additional site investigations and studies on topography, hydrology, meteorology and sediment investigation; geology, seismicity; glacier lake outburst flood (GLOF) etc. are underway.

Test Adit Excavation at Power House

The consultant for Detailed Engineering Design of Access Road of Upper Arun has already provided a draft design report and bidding documents of Access Road and the review of the reports is ongoing. The prequalification of bidders for the procurement of contractor of access road construction of UAHEP is on the final stage.

The consultant for ESIA, CIA and Social Planning Studies of UAHEP and IKHPP has provided a screening document in February 14, 2019. The scoping document and ToR for EIA of Hydropower and Access Road are submitted to the Department of Electricity Development, Ministry of Energy, Water Resources and Irrigation for approval. IEE Report for Camp Facilities has been approved by Department of Urban Development and Building Construction, Ministry of Urban Development. Process for land acquisition for the Employer's camp facilities at Limbutar has been initiated.

The Project has hired and engaged seven renowned international experts as members of Dam Safety Panel of Expert (DSPOE) for the independent technical review of consulting services of the consultant for Detailed Engineering Design and bidding documents and three renowned international experts as members of Environmental and Social Panel of Expert (ESPOE) for the review of reports of Environment and social study Consultant of UAHEP and IKHPP. There has been two Mission visit by DSPOE and one Mission visit by ESPOE to Nepal this year to carry out the review of the study and reports of the respective Consultants. Experts from the Word Bank are also assisting for the review of the studies carried out by the Consultants.

For expediting the implementation of the projects, for greater benefit sharing with the local people and effective project management, NEA Board decided to develop both projects (UAHEP and IKHPP) through a special purpose company for which Upper Arun Hydroelectric Limited (UAHEL) was formed. NEA Managing Director is the current Chairman of the Company. The Government of Nepal also made a decision to implement the project through the Company on 21 September, 2018.

The DoED had issued the Survey License of Ikhuwa Khola Hydropower Project under the ownership of UAHEL Company on 2075/1/7. The application for survey license for UAHEP has been submitted to the DOED under the ownership of UAHEL Company with rated capacity of 1061 MW.

The construction of road for UAHEP is estimated to be completed in two years i.e. by September 2022. Given the land acquisition for the project planned to be completed by August, 2020 and financial close for the project to complete by February 2021, the construction of the project is scheduled to commence by June 2022 and complete by Mid-2027.

UPPER MODI 'A' & UPPER MODI HYDROELECTRIC PROJECT

The Upper Modi Cascade Hydroelectric Project consists of two Run of the River Hydropower plants in cascade which is located in Annapurna Rural Municipality of Kaski district. Upper Modi A hydroelectric project (UMAHEP) was conceived by NEA as a 42MW project whereas Upper Modi hydroelectric project (UMHEP) would have an installed capacity of 18.2 MW and will be operated using the tailrace discharge of UMA. The total annual average energy generation for UMAHEP is estimated to be 208.72 GWh out of which dry season energy is 27.12 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. Powerhouse is located at Kylue Village of Ghandruk. Likewise, the average annual generation for UMHEP is estimated to be 93.92 GWh out of which the total dry season energy is estimated to be 10.75 GWh. The headwork structure of UMHEP consists of interconnection arrangement, box culvert, head pond and inlet portal for Headrace Tunnel. The project is located about 18km from Nayapul (Pokhara Baglung highway).

Village Development Committee in cooperation with the local people completed the excavation of Nayapul- Ghandruk road. Upgrading of road is to be carried out so that it could be used as an access road for the project. In this fiscal year, the Gandaki Province has started the upgrading of access road of 10km from Nayapul. Remaining improvement of the access road is in the process.

The updated feasibility study reports have been completed in this fiscal year. After investigation of detailed hydrological and metrological study, energy production from both the projects has been revised. Detailed geological, geotechnical study and geological mapping of both the projects have been completed. Similarly, detailed topographical survey works for both project and transmission line works were completed. Sediment sampling and river discharge measurement works were continued as in the previous year. Consultant has submitted detailed engineering design report, bidding document of camp facilities and draft detailed engineering design report of access road. Preparation of final detailed engineering design report is in the final stage and preparation of draft bidding documents of civil, hydro-mechanical and electromechanical works for both the projects have been completed.

Similarly, Supplementary EIA study of UMHEP for increased installed capacity from 14MW to 18.2MW has been continued from the year 2017. Presentation on SEIA was held on 6th may, 2019 in DoED. Incorporating the comments from the concerned authority, Environmental and Social Department of NEA is preparing the final SEIA report.

In order to provide access to campsite, topographical survey and detailed engineering design of access road extending from Sadhi Khola to campsite was carried out in this fiscal year.

Power Evacuation study of UMAHEP has been completed in this fiscal year and for evacuated power of UMAHEP power purchase agreement (PPA) with NEA has been initiated.

ANDHIKHOLA STORAGE HYDROELECTRIC PROJECT

NEA is carrying out Updated Feasibility Study of Andhikhola Storage Hydroelectric Project (180 MW) which is situated in Syangja district, Gandaki Province. 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 CFRD Dam site of this project has been located at about 2.7 km upstream of Kaligandaki and Andhikhola confluence. Similarly, the proposed Powerhouse site is located at about 12 km downstream of Kali Gandaki 'A' (KGA) powerhouse site.

The crest level of dam has been proposed at 710 m asl so that Galyang Bazar and Siddhartha Highway will be protected. Many experts from JICA/NEWJEC and NEA have visited the project site in 2017 and 2018 and have suggested for better layout design. Newly proposed (CFRD) Concrete Faced Rockfill dam will be 167 m high from the river bed. A sloping type intake has been proposed to convey the discharge from the reservoir through a 3.112 km long Headrace Tunnel, 137.1 m high Surge Shaft, 227.5 m drop shaft and 1.28 km long Pressure tunnel to the powerhouse. A semi underground powerhouse with three turbine-generator units and ancillary facilities has been proposed on the left bank of Kaligandaki River.

In the year of 2019, Geological Field Investigation is ongoing at different locations with total core drilling of 680 m at CFRD dam site, Surge Shaft, Intake and Galyang Bazar saddle. Similarly, additional Topographic Survey, Hydrological measurement & Sediment Sampling and Laboratory Analysis works are ongoing. EIA study of this project is being conducted by Environment and Social Studies Department, NEA. Ministry of Forests and Environment has already approved ToR and Scoping Document of EIA. The EIA Report will be completed in this Fiscal Year. The engineering team of this project has already prepared Updated Feasibility Study Draft Report 2019.

The project is found to be feasible with EIRR of 9.4 % (at 5% Discount rate), B/C of 1.626, NPV (000xUS$) of 199,207.53 US$ and Total Project Cost of 498 MUS$ for CFRD Dam Option. The study shows that the project will generate total

Core Drilling at CFRD damsite, 2019

energy of 674.45 GWh with dry energy percentage of 40.56%. It can operate for 8.25 hours peaking in dry season and minimum 3 hours peaking in wet season throughout the year. The electric energy produced from this project will be evacuated through 8.5 km long 220 kV TL up to Kaligandaki Corridor (Kushma-New Butwal 220 kV TL).

Sediment Sampling at Andhikhola River

However, major Environmental Impact comprises of acquisition of about 570 households and 9.4 MW Andhikhola hydropower plant owned by BPC. Based on the interaction made at Galyang Bazar with local stakeholders in April 2018, the local people are positive for the implementation of this project.

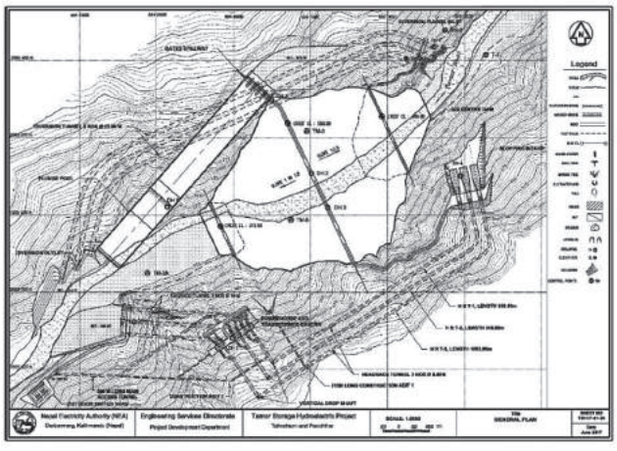
Due to centrally located, easily accessible and affordable project cost, which can provide peak energy demand for both dry and wet season, it is advisable to implement this project for the benefit of the country.

TAMOR STORAGE HYDROELECTRIC PROJECT

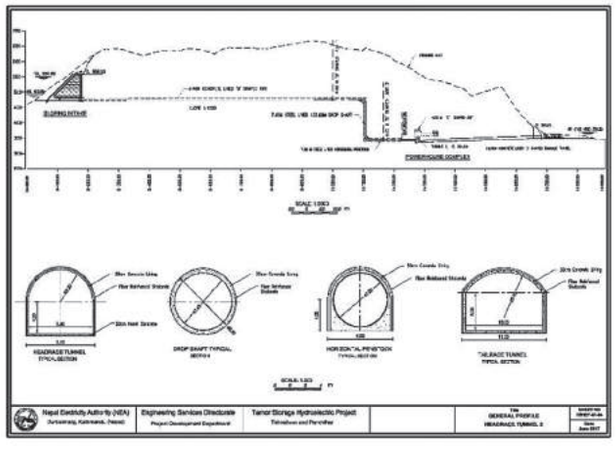
Tamor Storage Hydroelectric project (TSHEP) was identified during the Koshi River Basin Master Plan Study, 1985. It is located in the Eastern Region, bordering Teharathum, Taplejung and Panchthar District of Koshi and Mechi zone. The project lies within Longitude 87°30'13" to 87°47'13" East and Latitude 27°01'47" to 27°20'37" North. The Dam site lies in Chhatharand Kummayak Gaupalika of Teherathum and Pancthar District. TSHEP is a reservoir type of project with seasonal storage and suitably located about 75 Km away from energy hungry industries of Eastern Region, this is one of the promising storage projects being studied by Nepal Electricity Authority (NEA).

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.

Department of Electricity Development (DoED) issued license of 200 MW with FSL of 450 m asl with an issue of non-inundation of Kabeli -A (37.6 MW) and Lower Hewa (21.6 MW). Project Development Department (PDD) carried out investigation and optimization study of TSHEP which shows that the project has huge potential



General Layout Plan



General Profile

Project Site

Client Camp Site

Drll Logs

Construction Camp Site

Dam Axis Left Bank

Dam Axis Right Bank

having average annual discharge of 310 m^3/s with minimum discharge of 51 m^3/s. The study shows that the project is financially and economically more attractive above the FSL of license, 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. At this FSL the discharge utilization factor approach to unity which indicates that the additional increase in energy with rise in FSL is mainly due to increase in dam height and consequently the head of the project. NEA concluded to develop the project at FSL of 550 masl with Installed Capacity of 762 MW, hence applied for amendment in license boundary for further study of the project. Regarding the compensation modality to the affected projects, an understanding between NEA and the Companies to finalize the compensation after detail study and design, was conducted.

NEA, Project Development Department (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

1341.39Million US dollar on base rate of 2018. The total annual energy generation is about 3578 GWh. Out of this, 1073 GWh energy is generated in dry season (December to May) and rest of the energy is generated in wet season.

The general arrangement of the project consists of 210m 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 designed discharge of 517.00 m^3/s which consists of three individual intakes followed by 965 m long, 8.40 m diameter horizontal concrete lined horse shoe headrace tunnel, 132m long, 6.6 m diameter, steel lined drop shaft followed by 135m long, 6.6m diameter penstock to the underground powerhouse consisting of six vertical axis Francis turbine having capacity of 127MW each.

The powerhouse complex consists of 165m x 20m x 47m underground powerhouse and 168m x 15m x 19m underground transformer cavern. The transformer cavern accommodates single phase transformer with 400-kV GIS. The generated power will be evacuated by 75 Km long 400-kV double circuit transmission line to Inuruwa sub-station.

Besides this, 400-kV transmission line to Basantapur, Tehrathum is under study by NEA. If this transmission line is materialized, the transmission line of the TSHEP will be only 26 Km.

Soil Rock and Concrete Lab (SRCL) conducted the geotechnical investigation work, which includes drilling of 1846 m in Phase I, Phase II and Phase III. The feasibility study of the project was completed. However, Environmental Impact Assessment (EIA) was not conducted.

NEA published the Expression of Interest for detail engineering design and preparation of tender document and six firms were shortlisted. In addition, request for proposal (RFP) for detail engineering was prepared. Pending the decision of license, the RFP was not issued.

CONSTRUCTION OF CORPORATE OFFICE BUILDING PROJECT

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 multiplex 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

Proposed Corporate Office Building at Durbarmarg

office design concept and changed scenario in commercial building requirements, NEA modified the existing master plan. NEA has selected a consultant to carry out the detail design of Corporate Office Building and multiplex building, which was completed in FY 2070/71.

NEA had submitted the design drawing to Kathmandu Metropolitan City (KMC) for approval. However, due to change in building by-laws, imposed by Ministry of Urban Development (MoUD) after earth quake of 2015 as "बस्ती विकास, सहरी योजना तथा भवन निर्माणसम्बन्धि आधारभूत निर्माण मापदण्ड, २०७२", demanding setback of one fourth of the building height in all sides of building, the above design could not meet the requirement of the new by-laws. But the Kathmandu Valley Development Authority (KVDA), one of executive body under MoUD, had allowed a planning permit to execute the construction as per building by-laws "काठमाडौँ उपत्यकाभित्रका नगरपालिका, नगरोन्मुख गा.बि.स.हरूमा गरिने निर्माणसम्बन्धी मापदण्ड, २०६४". Similarly the main execution body, Kathmandu Metropolitan City (KMC) had released the new by-laws on building construction on 27th Asadh 2075, as "काठमाडौँ महानगर पालिका भवन निर्माण मापदण्ड २०७५", demanding setback of 5 m in all sides of building, conflicting with the by-laws of MoUD. MoUD is insisting to follow his by-laws for approval of Initial Environmental Examination (IEE). Therefore, the difference in by-laws between MoUD and KMC, has created the delay in the construction of the corporate building and once it is settled, the tendering process will be proceeded.

Other activities

BPICP had published Expression of Interest (EOI) notice for procurement of consultancy services for Detail Engineering Design of Office Building at Central Transformer Workshop, Lainchaur and Soil, Rock and Concrete Laboratory, Bhagwanpau. The consultant selection process is ongoing. Similarly BPICP is carrying out a study to identify the lands located at urban and commercial area, owned by NEA and propose the suitable building and infrastructure as required

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.

CHAINPUR SETI HYDROELECTRIC PROJECT

Chainpur Seti Hydroelectric Project (CSHEP), a PRoR scheme, is being studied for feasibility by Project Development Department. The Project is located at Saipal, Talkot and Mastha Rural-Municipality in the Bajhang District, Sudur-paschim Province. 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 210 MW with annual generation of energy 1122.20 GWhr. The power generated from the project shall be connected to proposed 220 kV Substation at Chainpur.

The Project site is 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.

Powerhouse Area of Chainpur Seti Hydroelectric Project

During the fiscal year 2075/76, updated feasibility report has been completed. The Scoping Document and Terms of Reference for the environmental impact assessment of the project have been submitted to DoED. The consultant has been selected for review, update of the feasibility Study and preparation of EPC tender documents.

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 2074 by the Project Development Department. The Project has obtained the survey license issued by Department of Electricity Development (DoED) in Kartik, 2074. 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 upper and lower reservoirs, headworks, steel lined pressure tunnel, 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.

Bathymetric Survey of Begnas Lake

During the fiscal year 2075/76, the project has completed feasibility study of the project which included detailed bathymetric survey of two lakes, detailed geotechnical investigation, hydrological studies, reservoir simulation, power evacuation studies, project design estimate and financial analysis of the project. Similarly, the Environmental Impact Assessment studies of the project have been initiated for which the Scoping and ToR documents have been forwarded to DoED after its first revision. The detailed design and tender documents for the project is planned to be initiated 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.

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.

Transmission line Works carried out by Survey Division, F.Y. 2075/76

S.N.	Transmission Line Projects	Districts	Length(km)	Status
1	Rasuwagadhi-Chilime-Ratmate (Galchhi) 400 kV T/L Survey and Feasibility Study	Rasuwa and Nuwakot	80.00	Draft Report Completed
2	Borang-Ratmate 220 kV T/LSurvey and Feasibility Study	Dhading and Nuwakot	45.00	Completed
3	Tumlintar-Sitalpati 220 kV T/L Survey and Feasibility Study	Sankhuwasabha	18.00	Completed
4	Mainahiya-Sampatiya 132kV T/L Survey and Feasibility Study	Rupandehi	35.00	Completed
5	Amarpur-Dhangesagu 132 kV T/L Survey and Feasibility Study	Panchthar and Taplejung	20.00	Draft Report Completed
6	Dhalkebar-Balganga 132 kV T/L Survey and Feasibility Study	Dhanusa		Field Survey completed
7	Kaligandaki-Ridi 132 kV T/L Survey and Feasibility Study	Palpa and Syanjga	26.00	Field Survey completed
8	Lalbandi-Salimpur 132 kV T/LSurvey and Feasibility Study	Siraha	20.00	Draft report Completed
9	Surkhet-Dailekh 132 kV T/L Survey and Feasibility Study	Surkhet and Dailekh	36.00	Field Survey Completed
10	Dhalkebar-Bardibas 33 kV T/L Survey and Feasibility Study	Dhanusa and Mahottari	15.00	Field Survey Completed

Topographical Survey Works Carried out by Survey Division, F.Y. 2075/76

S. No.	Projects	Districts	Status
1	Lower Tanahu HEP	Tanahu	Completed
2	Chainpur Seti HEP (Road Survey)	Bajhang	Completed
3	UttarGanga Storage HEP	Baglung	Completed
4	Modi HEP(Topographical & Road Survey)	Kaski	Completed.
5	Begnas-Rupa Pumped Storage HEP	Kaski	Completed
6	AndhiKhola HEP (Topographical & ERT Survey)	Syangja	Completed

New Projects to be Survey/Study by PDD within in F.Y. 2076/77

S.No.	Projects	Districts	Length(km)	Status
1	Khungri-Bhedakhet 132 kV T/L Survey and Tower Spotting	Rolpa and Rukum	75.00	Technical & Financial proposal sent at 2076/01/03
2	Bhumahi-Hakui 132 kV T/L Survey and Feasibility Study	Nawalparasi	16.00	MoU Signed at 2076/03/15
3	Godak- Anarmani 132 kV T/L Survey and Feasibility Study	Ilam and Jhapa	35.00	MoU Signed at 2076/03/15
4	Inaruwa-Dharan 132 kV T/L Survey and Feasibility Study	Sunsari	30.00	MoU Signed at 2076/03/15
5	Kohalpur-Nepalgunj 132 kV T/L Survey and Feasibility Study	Banke	20.00	MoU Signed at 2076/01/31
6	Hetauda-Parawanipur-Pathlaiya 132 kv T/L Survey and Feasibility Study	Parsa and Bara	20.00	Desk Study Report sent at 2076/02/09
7	Pathlaiya-Harnaiya 132 kv T/L Survey and Feasibility Study	Bara	27.00	MoU Signed at 2076/03/29

- **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.

Sediment deposition downstream of Reservoir during emptying

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:

- 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.

- **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.

- **Study of New Hydroelectric Projects**

Government of Nepal has allocated the budget for the study and identification of new hydropower projects in the FY 2075/76. The activities conducted for the study and identification of new hydropower projects in the FY 2075/76 are presented below:

- **Kagbeni Mustang Hydroelectric project (50.53MW)**

Kagbeni Mustang Hydroelectric Project is studied as Peaking RoR project. This project is proposed on Kaligandaki River at Mustang district of Gandaki Province. The study shows the installed capacity of 50.53MW. The project features includes Dam, headworks, desanding basin, headrace tunnel, forebay, steel lined pressure shaft, powerhouse

and tailrace structures. A 50m height rockfill and concrete faced dam is proposed to divert 37.63 m^3/s of water through approx. 7.4Km headrace tunnel and canal to generate 356.80GWh energy annually. The power generated will be connected to nation grid at proposed substation in Dana.

❍ Kokhajor Storage Hydroelectic Project (111.5MW)

Kokhajor Storage Hydroelectric project is proposed on Kokhajor River at confluence of Makwanpur, Sindhuli and Kavre district of Province No 3. The installed capacity of the project is 111.5MW. The project features includes Dam, headworks, desanding basin, headrace tunnel, Surge tank, steel lined pressure shaft, powerhouse and tailrace structures. A 107m height rockfill dam is proposed to divert 63.9 m^3/s of water through approx. 7.1Km headrace tunnel and canal to generate 278.9GWh energy annually. Net head is of 205.6m. The updated study of this project has been conducted during this FY2075/76 which was previously conducted by JICA.

❍ Namlan P-ROR Hydroelectric Project (169.20MW)

Namlan Peaking Hydroelectric project is proposed on Namlan River at Mugu district of Karnali Province. Namlan Storage project has installed capacity of 169.20MW. The project features includes Dam, headworks, desanding basin, headrace tunnel, Surge tank, steel lined pressure shaft, powerhouse and tailrace structures. Different Option for Headwork's and Powerhouse developing project has been studied.

❍ Madi Storage Hydroelectric Project (173.80MW)

Madi Storage Hydroelectric project is proposed on Madi River at Rolpa district of Province No 5. This project has installed capacity of 173.80MW. The project features includes Dam, headworks, headrace tunnel, Surge tank, steel lined pressure shaft, powerhouse and tailrace structures. A 200m height rockfill dam is proposed to divert 62.5 m^3/s of water through approx. 8Km headrace tunnel to generate 620.54GWh energy annually. Net head is of 324m.

Different Option for Headwork's and Powerhouse developing project has been studied during updated study after JICA master plan.

❍ KhimtiShivayala Storage Project (200MW)

KhimtiShivayala Hydroelectric project is proposed on Khimti River at Dolakha and Ramechhap district of Province No 3.KhimtiShivayalaStorage project has installed capacity of 200MW. The project features includes Dam, headworks, headrace tunnel, Surge tank, steel lined pressure shaft, powerhouse and tailrace structures. A 200m height rockfill dam is proposed to divert 85 m^3/s of water through approx. 4.5Km headrace tunnel to generate 534.37GWh energy annually. Net head is of 280m.The detailed desk study report has been prepared and applied for the Survey license to Department of Electricity Department.

❍ Bagmati Storage Hydroelectric Project (200MW)

Bagmati Storage Hydroelectric project is proposed on Bagmati River at Sarlahi district of Province No 2. Bagmati Storage project has installed capacity of 200MW. The project features includes Dam, headworks, headrace tunnel, Surge tank, steel lined pressure shaft, powerhouse and tailrace structures. This project proposed with minimal impact on present Bagmati Irrigation Project. Different Option for Headwork's and Powerhouse developing project has been studied.

❍ Arun-4 Hydroelectric Project (264MW)

Arun-4 Hydroelectric Project is a run-of-river schemed project, located in Sankhuwasabha District, near Gola Bazaar. The headworks site is proposed at an elevation about 1000 m at Pathibhara and Pawa Khola village. The major structures of the project including diversion

weir, desanding basin, water conveyance lie near Pathibhara village, Sankhuwasabha. The powerhouse site is located at the elevation about 850 m at Hedanna of Pathibhara and Pawa Khola VDC, Sankhuwasabha. The project has an annual energy generation capacity of 1508 GWh.

Environment and Social Studies Department

Realizing the need of addressing environmental and social issues associated with hydropower related development, an Environmental Unit was established in 1987. 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 hydropower 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 2018/19, 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 TL Project, IEE/Updated IEE of one HEP, six TL projects, IEE of one solar power project, one substation project and one permanent camp facility. In addition ToR of five TL projects were also approved by the Ministry. The following sections provides a brief of different tasks carried out by ESSD in the FY 2018/19.

1. Study Projects

a. 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 Environment Protection Act, 1997 and EPR, 1997. All the documents subject to EIA including the Scoping Document (SD); Terms of Reference (ToR) and main EIA document are subjected to approval by the Ministry of Forests and Environment (MoFE). In the fiscal year 2018/19, ESSD was involved in the EIA of following 11 projects, out of which EIA of one project has been approved by the ministry and the EIA/S-EIA of three projects have been submitted to the MoFE through MoEWRI for approval.

1. **Marsyangdi Corridor (Manang-Udipur) 220kV TLP: EIA approved on Oct. 13, 2018**
2. Upper Modi HEP (18.02MW): S-EIA report submitted for approval.
3. Uttarganga Storage HEP (828MW): SD/ToR approved by MoFE; EIA report submitted for approval.
4. Kohalpur-Surkhet 132kV TLP: EIA report submitted for approval.
5. Kaligandaki Corridor (Butwal-Bardghat) 220kV TLP: SD/ToR approved by MoFE; EIA under preparation
6. Andhikhola Storage HEP (180MW): SD/ToR approved by MoFE.

7. Access Road of Upper Arun HEP: SD/ToR submitted for approval.
8. Ghorahi-Madichaur 132kV TLP: SD/ToR submitted for approval.
9. Rolwaling Khola HEP (22MW): SD/ToR submitted for approval.
10. Chainpur Seti HEP (210MW): SD/ToR submitted for approval.
11. Begnas-Rupa Pump Storage HEP (150MW): SD/ToR submitted for approval.

Public hearing for EIA of Uttarganga Storage HEP (828MW) at Dhorpatan and Nisi, Baglung

b. Projects Requiring IEE

All the projects falling under Schedule-1 of Environment Protection Rules (EPR), 1997 requires IEE. The documents, ToR and IEE are subject to approval from the concerned ministry as per EPA/EPR, 1997. In the FY 2018/19, ESSD was involved IEE of a number of projects, whose status is presented as follows;

Approved IEE Reports

1. 8.3MW Grid Tied Solar Power Project- Block No.2 (IEE approved on Sept. 20, 2018)
2. Kabeli Corridor 132kV TLP: U-IEE (September 21, 2018)
3. Sunwal 132/33kV Substation Project (October 7, 2018)
4. Dhalkebar-Loharpatti 132kV TLP (October 7, 2018)
5. Butwal (Gorusinghe)-Lumbini 132kV TLP (December 24, 2018)
6. Camp Facility of Upper Arun HEP (January 20, 2019)
7. Kamane (Hetauda)-Ridhisidhi Cement 33kV TLP (April 17, 2019)
8. Hetauda-Dhalkebar-Duhabi 400kV TLP: U-IEE (April 26, 2019)
9. Butwal-Dhakdhai 33kV TLP (May 5, 2019)
10. 40MW Rahughat HEP: U-IEE (May 31, 2019)

Approved ToR and completed/ongoing IEE

1. Grid Tied Solar Power Project Block No.4 (1.37MW): IEE report submitted.
2. Dadakhet-Rahughat 132kV TL Project: ToR approved, IEE report submitted.
3. Balefi Corridor 132kV TLP: ToR approved, IEE report submitted.
4. Trishuli 3B Hub-Bhalche 33kV TLP: ToR approved, IEE report submitted.
5. Borang-Ratmate 220kV TLP: ToR approved, IEE report under preparation.
6. Lekhnath-Damauli 220kV TLP: U-IEE under preparation
7. Tumlingtar-Sitalpati 220kV TLP: ToR approved

In addition to the above listed EIA and IEE, the ESMP of Supply and Installation of Distribution Project prepared by ESSD was cleared by the World Bank.

2. Monitoring Projects

ESSD was involved in 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 sites. ESSD prepared and submitted the quarterly and semi-annual monitoring reports to the respective projects as per the provisions made in Memorandum of Understanding (MoU). The status of different monitoring projects is as follows;

1. Upper Trishuli 3 'A' HEP (60MW): 27th Quarterly report submitted
2. Kulekhani III HEP (14MW): ESMU closed
3. Balach-Attariya 132kV TLP: ESMU closed
4. Hetauda-Dhalkebar-Duhabi 400kV TLP: 21st Quarterly report submitted
5. Hetauda-Bardghat 220kV TLP : 28th Quarterly report (Hetauda-Bharatpur section) and 20th Quarterly report (Bharatpur-Bardghat section) submitted
6. 132/220kV Chilime Substation Hub and Chilime-Trishuli 220kV TLP: 7th Quarterly Report submitted.
7. Trishuli 3B Hub substation Project: 7th Quarterly report submitted
8. SASEC Project: 5th Semi-Annual Report (Jan-June, 2019) submitted

a) Kaligandaki Corridor (Dana-Kushma) 220kV TLP

b) Marsyangdi-Kathmandu 220kV TLP

c) Kaligandaki Corridor (Kushma-New Butwal) 220kV TL Project

9. Samundratar- Trishuli 3B Hub 132kV TLP: 11th Quarterly report submitted
10. Tamakoshi-Kathmandu 400kV TLP: Semi Annual report (Jan-June, 2019) submitted.
11. Garjyang-Khimti 132kV TLP: 6th Quarterly Report submitted
12. Upper Trishuli 3A-Matatirtha 220kV TLP: 3rd Quarterly Report submitted.
13. New Modi Lekhnath 132kV TLP: 1st Quarterly Report submitted.

3. Mitigation and Enhancement Programs

Under mitigation, enhancement and community support programs, different activities were conducted in this FY 2018/19 and their status is as follows;

3.1 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 Hetauda. Under the compensatory plantation works, about 102,000 saplings have been planted in 7 districts till date.

Plumbing Training at Bardibas

Under the skill development program, ESSD has provided various skill development trainings to 204 participants of the Project affected Families (PAFs) in various fields. These include tailoring, building electrician, plumbing, driving, computer hardware, mobile repairing and others as proposed under the approved IEE and VCDP program.

A two-month Residential Training on House

Tailoring Training at Sarlahi

wiring (Building Electrician) was conducted in Lal bandhi of Sarlahi and Bardibas of Mahottari where a total of 50 (47 male and 3 female) participants were benefitted. The skill tests were also completed. In addition, one-month non-residential driving course was conducted in 7 (Hariwan, Inaruwa, Bardibas, Rupani, Rupnagar, Golbazar and Hetauda) places of 6 districts (Sarlahi, Sunsari, Mahottari, Saptari, Siraha and Makwanpur). A total of 71 (68 male and 3 female) participants were benefitted by these training.

Three different types of residential trainings (Plumbing, Computer Hardware Maintenance and Mobile Repairing), each of two-month duration, were conducted in Bardibas of Mahottari. A total of 30 participants (10 participants in each training), from project affected districts were benefitted. Out of 30 participants, 3 were female and other 47 were male participants.

Similarly, a three-month (390 hours) non-residential Tailoring trainings were conducted as 7 places (Hariwan, Dhangadhimai, Dhalkebar, Inaruwa, Kalyanpur, Bakaiya and Hetauda) of 6 districts (Sarlahi, Siraha, Dhanusha, Sunsari, Saptari and Makwanpur). A total of 53 female of the project affected households were benefitted by these training. As a part of the skill development program, distribution of 53 numbers of pedal operated sewing machines to the participants of tailoring training.

The other major trainings performed in this fiscal year were 7 days training on Off-Seasonal Vegetable farming at three places and 7 days Livestock Training at Bhokraha, Sunsari. These agriculture related trainings benefitted a total of 102 project affected people.

A one-day social awareness program was conducted in 5 places (Bakaiya, Nijgadh, Chandrapur, Harion and Bardibas) of 5 districts (Makwanpur, Bara, Rautahat, Sarlahi and Mahottari). A total of 282 affected local people and other nearby community people participated in these programs. Similarly, one-day Health and Safety program related to high voltage line was conducted in two places where a total of 149 locals participated. The ESMU also conducted one day hotspot awareness program to 15 project worker at Tapeshwori of Udayapur.

3.2 SASEC Projects

Under SASEC, currently three projects are under construction which include Kali Gandaki corridor (Dana-Kusma) 220kV TL Project, Kaligandaki Corridor (Kushma- New Butwal) 220kV TL Project and Marsyangdi-Kathmandu 220kV 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 2018/19, 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.

ESSD organized one-day training program on Occupational Health and Safety training at 5 places where a total of 119 construction workers participated. Similarly three-day NTFPs training was organized at 11 different locations which benefited 225 participants. Under the Skill Development Program, Driving Training for 25 PAFs and computer training for 16 participants were completed during this FY 2018/19.

b. Kaligandaki Corridor (Kushma-New Butwal) 220kV TL Project

ESMU has been established at Butwal of Rupandehi district for day to day Environment and Social Monitoring and the necessary key experts have been mobilized. The GRC has been formed in all project affected Wards of concerned RMs/Municipalities. Hoarding board installation at 60 different places near the project area has been completed.

c. Marsyangdi-Kathmandu 220 kV TL Project

The ESMU for the project is established at Aanbu-Khaireni, Tanahun and two safeguard officer are fully deputed at site. NTFP training was conducted at Chitwan, Gorkha and Dhading districts where a totap of 167 people participated. Similarly, seven-day seasonal and off-seasonal vegetable farming training was conducted at two places which benefitted a total of 28 local people.

Under the Skill Development Program, Beautician Training was organized for 26 female participants of Dhading, Chitwan, Gorkha and Tanahun districts.

Similarly, driving training at Tanahun for 12 project affected people and two-month computer training for 36 participants, and tailoring training for 20 female participants are on-going under the skill development program.

3.3 132/220kV Chilime Substation Hub and Chilime-Trishuli 200kV TL Project

ESMU has been established at Chilime of Rasuwa district. A one-day awareness program on health and safety was organized as different places where a total of 290 people participated. Similarly, five-day NTFP Training program was organized at two places where a total of 40 member of users group from 12 project affected community forests participated.

3.4 Trishuli 3B Hub Substation Project

ESMU is established at Betrawati of Rasuwa district. A seven-day Agricultural productivity intensification training and Assistance Program was organized at two places which benefited a total of 32 project affected people. Similarly, a five-day Livestock Farming Training and Assistance Program was organized at two places where a total of 35 project affected people participated.

3.5 Upper Trishuli 3A-Matatirtha 220kV TL Project

One-day awareness program was conducted at 17 different places. Similarly, five-day Agricultural productivity intensification training and Assistance program was conducted at two different places. In addition, five-day NTFP training was completed at two places where 50 users from different project affected community forests participated.

4. Community Support Programs

Under Community support programs of under-construction projects, different activities were completed in the FY 2018/19 which are as follows;

4.1 Hetauda-Bharatpur-Bardaghat 220 kV TL Project

Under the community support program, two Gumbas were constructed, one at Lothar of Makwanpur and other at Chitwan. Namkhai Ling Bouddha Gumba of Lothar was handed over to community.

Namkhai Ling Bouddha Gumba, Lothar, Makwanpur and Sangha Chhetra Ling Bouddha Gumba, Chitwan

Newly constructed RCC Slab Culvert at Newarpani, Hetauda, Makwanpur

Similarly, a RCC slab culvert was constructed at Newarpani of Hetauda Makwanpur under the CSP of Hetauda-Bharatpur-Bardaghat 220kV TLP.

4.2 SASEC Projects:

a. Marsyangdi-Kathmandu 220 kV TL Project

Under CSP Activities of Marsyangdi-Kathmandu 220 kV TLP, construction of women community building was done at Thakre Rural Municipality (RM) of Dhading District. Similarly, a community rest place (Chautaro) was renovated at Siddhalek RM-4.

Construction of Women Community Building at Thakre RM, Dhading District

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

The construction materials and other goods have been distributed on the basis of CSP in 7 wards (Ward 1-3 of Rahuganga RM; Ward 1,3,7 of Jaljala RM and Ward 2 of Kushma Municipality) as recommended by the GRC. Construction Materials such as Cements (PPC/OPC), TMT Rebar, Tubular Pipe, Tap, Tile, Gabion Matters, Sand and Stone, Plywood, Plain sheet, CGI Steel, HDPE Pipe, Drinking Water Supply Pipe, Mort ice lock and Handle for school and (Microscope and Table for Health Post) were distributed. Similarly, the water fall protection and park construction was completed at Histan of Annapurna RM-7 of Myagdi District under the community support program.

Water fall protection and Park Management Work at Annapurna RM-7, Myagdi

c. Marsyangdi-Kathmandu 220 kV TL Project

CSPs were implemented at Ichyakamana RM of Chitwan and Gandaki RM, Sahidlakhan RM and Gorkha Municipality of Gorkha District. Gabion box (75 nos) was also provided under CSP to Bagbachhala Women CF. Around 21 Schools were supported by providing Computers, Whiteboards, Football, Volleyball, Pencil, Duster, First Aid, Gabion Wire, Steel Cupboard, Saw Machine, Vaccine Sets, Water Tank and Pipe and Cements.

4.3 Hetauda-Dhalkebar-Duhabi 400kV TL Project

Under the community/school support program, the support was provided to 5 schools affected or located nearby the TL in Makawanpur, Sarlahi, Mahottari, Dhanusha and Sunsari districts. The support included construction of toilet and boundary wall, as well as distribution of computers, printers, play materials, water tanks, ceiling fans and others. Moreover, the support was provided for electrification of 25 dalit and janajati HHs at Srijana Tole of Belka Municipality-2, Udayapur and the gabion wall was constructed across 2 rivers (Jagannathi and Pathraha) in Tapeshwori of Udayapur.

4.4 Tamakoshi-Kathmandu 400kV TL Project

Supply, Delivery, Installation, Testing and Commissioning of Irrigation Water Pump and PPR Pipe has been completed in Indrawati RM-10 of Sindhupalchowk district under the Community Support Program. Similarly, the supply of HD pipe for irrigation purpose has been completed in Irkhu of Sindhupalchowk. Under the school support program, Namuna Sunkhani Basic School of Barhahise has been provided with Computer, Printer, play materials and others.

Handing over irrigation HD pipes at Irkhu

In addition to these activities, ESSD has published its bi-annual newsletter (ESSD-Newsletter). The newsletter covers all the activities of ESSD carried out from July 2018 to June 2019.

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 different phases of hydropower development works. It provides services like Geological Mapping, Geophysical Surveys (Resistivity and Seismic Methods), Core Drilling and Construction Material Investigations at different levels for different departments of NEA and private sectors as well. In the field of soil and rock engineering, it also provides services for carrying out in–situ tests and laboratory tests.

Followings are the major works executed by SRCL in fiscal year 2075/76

1. Geotechnical investigation works of Phukot Karnali Hydroelectric Project, Kalikot.

SRCL has been carrying out geotechnical investigation works by core drilling at damsite, inlet portal and powerhouse area. About two third of core drilling works has been completed so far. Laboratory tests on core sample of each hole are also in progress.

2. Geophysical and Geotechnical investigation works of Betan Karnali Hydroelectric Project, Surkhet/Achham

The geophysical investigation works by Electrical Resistivity Tomography (ERT) was completed at both damsite and powerhouse area of Betan Karnali HEP. Altogether 8km long ERT was carried out for this fiscal year. The geotechnical investigation works by core drilling method is in progress.

3. Geotechnical investigation works of Jagadullah Hydroelectric Project, Dolpa.

Geotechnical investigation works by core drilling has been started at powerhouse and damsite area.

More than 170m of linear depth of core drilling has been completed in this fiscal year.

4. Geological, Geophysical and Geotechnical investigation and Laboratory Tests of Sunkoshi Marin Diversion Multipurpose Project, Sindhuli.

Detail Engineering Geological mapping along the Headrace Tunnel alignment (13.1km) of this project has been completed. Columnar section and join survey analysis for each litho stratigraphic unit is also completed. 2D-ERT (3km) at different geological structures is also completed. Likewise, core samples from each rock formation along the HRT have been collected to analyze and test them in the laboratory. Laboratory tests of collected rock core sample is in progress.

5. Geological, geophysical and Geotechnical investigation works of Andhi Khola Storage HEP, Syangja.

Geotechnical investigation works in this phase includes 680m of core drilling at different hydraulic structural component which is in progress. Geological mapping of Damsite and Geophysical investigation of surge tank by ERT (1500m) will be started soon.

6. Geological and Geophysical investigation of Uttarganga Storage Hydroelectric Project, Baglung

2-D ERT Survey (9km) and Geological mapping of project area is completed in this fiscal year

7. Geotechnical investigation works of Upper Arun Access road, Sankhuwasabha.

Core Drilling works at both northern and southern portal of Access road of Upper Arun HEP is completed in this fiscal year.

8. Geotechnical investigation works of Dudhkoshi Storage Hydroelectric Project, Khotang/Okhaldhunga

Core drilling works at the left bank (100m inclined hole) of Dudhkoshi Storage HEP project is completed in this fiscal year. Remaining hole will be started just after the monsoon.

9. Geophysical and Geotechnical investigation works of Begnas Rupa Pumped Storage Project, Kaski.

2D-ERT survey of 3km and 300m of core drilling at different hydraulic structural components was completed in this fiscal year. Construction Material survey for this project is also completed.

10. Geotechnical investigation works of Tamor Storage Hydroelectric Project, Terhathum/Panchthar.

Additional geotechnical investigation works of 1200m core drilling is completed in this fiscal year.

11. Geological and Geophysical investigation works of Lower Seti hydroelectric Project, Tanahu

Geological mapping of this project is completed in this fiscal year.2-D ERT survey at damsite across the river is also completed within this fiscal year.

Construction Material Survey and Laboratory Tests

- Phukot Karnali Hydroelectric Project, Kalikot
- Betan Karnali Hydroelectric Project, Surkhet
- Lower Seti Hydroelectric Project, Tanahu
- Sunkoshi Marin Diversion Multipurpose Project, Sindhuli

Miscellaneous Laboratory Tests

- Compressive strength tests on compressed stabilized bricks of Build UP Nepal.
- Compression and various tests on core samples, ICGS Pvt Ltd.

ERT Survey at Uttaganga Storage HEP

Core Drilling works at Phukot Karnali HEP

Operation of Triaxial Rock Testing Equipment at SRCL

Phukot Karnali Dam-site

- Laboratory tests on construction material samples ,EMS Engineering
- Laboratory tests (Point load & Uniaxial compression), Bheri Babai Diversion Multipurpose Project
- Laboratory tests on sample of Sikta Irrigation Project MOWRP
- Laboratory Tests on bricks, core, cement and construction materials of different projects collected by CIAA

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. Under the engineering service It has done detailed study on Power Evacuation analysis of Rahughat Power-station project. Tamakoshi V HEP and Upper Modi HEP,. This engineering service of power evacuation study is done with collaboration of Power System Planning Department of NEA. From this fiscal year this division is involved in the feasibility study of Begnas-Rupa Pumped Storage Hydro Electric Project, it is Studying and analyzing the electro-mechanical design part. 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

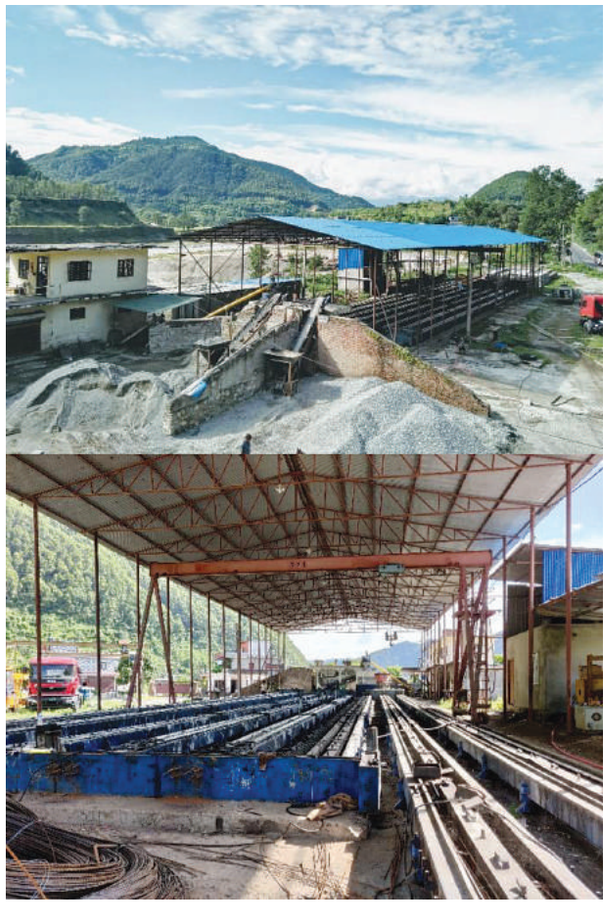
of a new concrete pole plant in Tankisinuwari, Morang. Also this Division has been monitoring the overall functioning of Central Workshop in Hetauda which is involved in maintenance and repair of transformers. Similarly it has also been monitoring the overall functioning of Kotre Pole Plant, Tanahu as 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.

Concrete Pole Plant

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. In this fiscal year gross profit of this Pole plant is around 3.5 crore. The plant is working to its best using its available manpower and resources to meet time bound production and delivery of the poles.

S.N.	Type of poles	F.Y-073/74	F.Y-074/75	F.Y-075/76
1	8 m	10150	6936	8780
2	9 m	6009	5828	7390
3	11m	1638	1806	3752
		17797	14570	19922

Kotre Pole Plant is located in Shuklagandaki Municipality, Kotre of Tanahun 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 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 and 11m respectively. After upgradation work, the capacity of plant is 60 poles per day. The Total Production of PSC Pole in Fiscal Year 2075/76 was 10956.



NEA Training Center

NEA Training Center (referred as NEA TC hereafter) is situated on Kharipati, Bhaktapur has been providing different skill enhancing trainings to the staffs as well as Nepalese citizens since 2046 B.S. It was on Ratnapark, Kathmandu from 2046 to 2057 B.S. and serving from Kharipati since 2057. During the last 30 years, NEA TC has trained 20,924 employees from the different core group of NEA and some from other organizations. With the view to expand its training programs for clients outside of NEA, upon their request, NEA TC is also conducting various programs to non NEA staffs too.

NEA TC occupies around 203 Ropanis of land with well-equipped academic as well as hostel buildings

for residential training. It has a two storey academic building having 48 halls and rooms for training purposes which includes classrooms, computer labs, electrical labs, mechanical labs and seminar halls. Most of the rooms are occupied by various project offices running under NEA. Here are 3 hostel buildings with the capacity of 130 beds and a VIP Guest House. It has one Administrative building for office use and a modern type of canteen building too.

NEA TC is conducting different types of technical as well as non-technical trainings with its sovereign identity. It has 28 (Technical 13 and Nontechnical 15) different levels approved posts under the control of Director (24 employees are working). Those staffs cover electrical, mechanical, computer, civil engineering 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.

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 aim 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 2075/76

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 the 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 2075/76 many of the trainings were conducted in its own building where as some of the trainings were at the regional level especially for the assistant level staffs from DCS. In this fiscal year total numbers of trainings conducted were 60 with 1609 trainees in number. Due to budget shortage the target was not meet in this F/Y.

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, NGOs/INGOs, 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. 75,73,536/85 (With VAT) in the fiscal year 2075/76. The Training Center has also provided space and services to various offices of NEA at its premises. A Transformer Testing Lab is being constructed in the premises of the Training Centre.

Training Program Conducted on F/Y 2075-076

S.N.	Date	Training	No. Of Participants	Level	Venue
1	2075.04.01 to 03	Induction for Level-3,4 & 5 Administration Group	42	Assistant	Kharipati
2	2075.04.01 to 03	Induction forlevel- 4 & 5 Account Group	35	Assistant	Kharipati
3	2075.04.01 to 03	Induction- Level-5 Technical Group	29	Assistant	Kharipati
4	2075.04.01 to 03	Induction- Level-4 Technical Group	54	Assistant	Kharipati
5	2075.04.01 to 03	Induction- Level-3 Technical Group	50	Assistant	Kharipati
6	2075.05.12 to 15	Electronic Government Procurement System	13	Officer	Kharipati
7	2075.05.12 to 19	Advanced Excel	18	Officer	Kharipati
8	2075.05.24 to 29	Electronic Government Procurement System	12	Officer	Kharipati
9	2075.05.24 to 29	Electronic Government Procurement System	12	Officer	Kharipati
10	2075.05.26 to 31	M-Power Billing System	17	Assistant	Bardibas
11	2075.06.02 to 07	Electronic Government Procurement System	15	Officer	Kharipati
12	2075.06.02 to 07	Electronic Government Procurement System	17	Officer	Kharipati
13	2075.06.04 to 13	Distribution Transformer Repair and Maintenance	24	Assistant	Hetauda
14	2075.06.08 to 12	Electronic Government Procurement System	16	Officer	Kharipati
15	2075.06.08 to 15	Structural Analysis Program	13	Officer	Kharipati
16	2075.06.16 to 25	Hydropower Repair and Maintenance	16	Assistant	Parbat
17	2075.06.16 to 21	Electronic Government Procurement System	18	Officer	Kharipati
18	2075.06.22 to 26	Electronic Government Procurement System	17	Officer	Butwal
19	2075.06.24 to 28	Electronic Government Procurement System	21	Officer	Biratnagar
20	2075.07.11 to 16	M-Power Billing System	25	Assistant	Kharipati
21	2075.07.12 to 17	M-Power Billing System	17	Assistant	Jhapa
22	2075.07.26 to 30	Electronic Government Procurement System	25	Officer	Pokhara
23	2075.08.03 to 12	Distribution Transformer Repair and Maintenance	18	Assistant	Kharipati/Lainchaur
24	2075.08.05 to 14	Hydropower Repair and Maintenance	16	Assistant	Parbat
25	2075.08.08 to 13	M-Power Billing System	17	Assistant	Dadeldhura
26	2075.08.11 to 16	M-Power Billing System	24	Assistant	Kharipati
27	2075.08.17 to 21	Electronic Government Procurement System	28	Officer	Hetauda
28	2075.08.26 to 09.06	Distribution Transformer Repair and Maintenance	24	Assistant	Hetauda
29	2075.09.03 to 08	M-Power Billing System	21	Assistant	Bardibas
30	2075.09.07 to 11	Electronic Government Procurement System	25	Officer	Nepalgunj
31	2075.09.17 to 22	M-Power Billing System	21	Assistant	Attariya
32	2075.09.17 to 21	Electronic Government Procurement System	23	Officer	Attariya
33	2075.09.16 to 25	Auto Cad- 2D	14	Officer	Kharipati
34	2075.10.03 to 12	Distribution Transformer Repair and Maintenance	19	Assistant	Kharipati/Lainchaur
35	2075.10.03 to 05	Induction Training for Level-7 to 10	54	Officer	Kharipati
36	2075.10.08 to 17	Distribution Transformer Repair and Maintenance	34	Assistant	Hetauda
37	2075.10.14 to 18	Electronic Government Procurement System	27	Officer	Bardibas

38	2075.10.22 to 11.02	Hydropower Repair and Maintenance	17	Assistant	Parbat
39	2075.11.05 to 14	Distribution Transformer Repair and Maintenance	38	Assistant	Hetauda
40	2075.11.06 to 15	Distribution Transformer Repair and Maintenance	24	Assistant	Kharipati/Lainchaur
41	2075.11.08 to 13	Electronic Government Procurement System	22	Officer	Kharipati
42	2075.11.15 to 19	Electronic Government Procurement System	26	Officer	Butwal
43	2075.11.22 to 24	Induction for Level-5 Administration Group	19	Assistant	Kharipati
44	2075.11.22 to 24	Induction for Level-5 Account Group	10	Assistant	Kharipati
45	2075.11.22 to 24	Induction for Level-5 Technical Group	36	Assistant	Kharipati
46	2075.11.23 to 12.02	Distribution Transformer Repair and Maintenance	42	Assistant	Hetauda
47	2076.01.23 to 27	TOD Meter Connection, data download and analysis	24	Both	Bardibas
48	2076.01.30 to 02.01	Induction for Level-4 Administration Group	47	Assistant	Kharipati
49	2076.01.30 to 02.01	Induction for Level-4 Account Group	42	Assistant	Kharipati
50	2076.01.30 to 02.01	Induction for Level-4 Technical Group	86	Assistant	Kharipati
51	2076.02.02 to 06	TOD Meter Connection, data download and analysis	32	Both	Biratnagar
52	2076.02.06 to 08	Induction for Level-3 Administration Group	30	Assistant	Kharipati
53	2076.02.06 to 08	Induction for Level-3 Technical Group	79	Assistant	Kharipati
54	2076.02.12 to 17	TOD Meter Connection, data download and analysis	22	Both	Hetauda
55	2076.02.24 to 28	TOD Meter Connection, data download and analysis	23	Both	Nepalgunj
56	2076.03.05 to 09	CAIS (Account) and Payroll Management System	22	Assistant	Kharipati
57	2076.03.12 to 16	CAIS (Account) and Payroll Management System	17	Assistant	Kharipati
58	2076.03.12 to 21	Distribution Transformer Repair and Maintenance	30	Assistant	Hetauda
59	2076.03.12 to 18	STAAD Pro	23	Officer	Kharipati
60	2076.03.19 to 22	Centralized e-Attendance System	27	Officer	Kharipati
		Total	**1609**		

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 execution of SASEC- Power System Expansion Project and PTDEEP (Power Transmission and Distribution Efficiency Enhancement Project), PMD is coordinating, monitoring and reporting the implementation 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 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 Business Operation Plan of 2019.

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 stations upcoming in the Khimti (Tamakoshi) and Barhabise area. This project includes three sub-projects viz. i) New Khimti-Barhabise 400 kV DC Transmission Line of length 46 km ii) Barhabise-Kathmandu 400 kV DC Transmission Line of length 44 km & Lapsiphedi-Duwakot 132 kV DC Transmission Line of length 14 km and iii) Barhabise GIS substation (220/132 kV, 160 MVA (3x53.33 MVA) & 132/11 kV 5 MVA). Due to inadequate fund in ETESIP, one of the subprojects "220 kV GIS Substation Construction in Barhabise" has been financed through Loan No. 3542 - NEP (SF): Power Transmission and Distribution Efficiency Enhancement Project.

The contract for construction of Barhabise-Kathmandu 400kV and 132 kV Lapsiphedi-Barhabise Transmission Line has been awarded to M/s Larsen and Toubro Limited, India. Till date, tower design and testing has been completed for both 132 kV and 400 kV TL section. More than 50% of TL materials have been supplied. Out of 125 nos. of towers of 400 kV TL, 11 tower foundations have been completed and 7 are under construction. The 400 kV and 132 kV TL is scheduled to be completed by April 2020.

The contract for procurement of plant for 220 kV Barhabise GIS SS has been awarded to M/s

JV of Guangxi Transmission & Substation Construction Co. and Shenzhen Clou Electronics Co. Ltd, China. Land acquisition, compensation distribution and ownership transfer has been completed. Construction work has been initiated at the substation site. Major equipment of the SS like Transformer and GIS are in the stage of manufacturing and planned to be delivered at site before December 2019.

The project office has recently signed Contract Agreement with M/s KEC International Limited, India for construction of New Khimti- Barhabise 400kV Transmission Line after termination of contract with previous contractor due to non-performance. Previously, detail survey and tree enumeration had been completed.

B) SASEC Power System Expansion Project (SPSEP)

1) Samundratar- Trishuli 3B 132kV Transmission Line

The objective of this project is the construction of 26 km double circuit 132 kV 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 finance Loan of US$ 12.0 Million.

132/11 kV transformer installation at Samundratar site

For transmission line part, detail survey, land acquisition, tower design and tower testing of type DA, DB, DC and DD type has been completed. 49 out of 84 nos. of tower foundation has been completed till date. Similarly, for substation part, design of electrical and civil components of substation has been approved. Equipment are being delivered to the substation site. 132/33 kV transformers have been installed while civil works for other equipment's foundation, boundary wall, store building, staff quarter, control building, gantry structure, 33/11 kV transformer's foundation at the site is underway with the target to commission the transmission and substation facilities within FY 2076/77.

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. 113 km long

Double Circuit 220 kV Transmission Line from Manang (Dharapani) to Chitwan (New Bharatpur) and associated substations at Dharapani, Manang (220/132 kV, 100 MVA & 132/33 kV, 30 MVA), Khudi, Lamjung (220/132 kV, 160 MVA & 132/33 kV , 50 MVA), Udipur, Lamjung (220/132 kV, 160 MVA & 132/33 kV , 50 MVA) and New Bharatpur, Chitwan (220/132 kV 320 MVA). The length of upper section of 220 kV, double circuit transmission line from Dharapani to Udipur is 46 km. Similarly, the length of lower section of 220 kV, double circuit transmission line with twin HTLS Drake conductor from Udipur to Bharatpur is 67 km.

The contract of transmission line from Udipur to Bharatpur section has been awarded to Pinggao Group Co. Ltd, China and construction work is in progress. Tower design has been completed and testing of DB type tower has successfully completed. The tower foundation work has been started from Lamjung District.

The contract for Udipur and Bharatpur 220/132/33 kV substation was awarded to M/S Shenzen Farad Electric Co. Ltd. China. However, due to the inability of the contractor to submit performance security within given time frame, the contract has been cancelled and bids were re-invited on 15 April 2019. Technical Bids are under evaluation and contract is expected to be awarded by the end of October 2019.

Similarly, Technical Bid Evaluation Report for Dharapani (Manang) - Khudi (Lamjung) –Udipur (Lamjung) 220 kV Transmission Line and 220 kV SS at Khudi and Dharapani (Manang) has been submitted to EIB for concurrence. The contract for this package is planned to be awarded by the end of September 2019.

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 transfer power from Marsyangdi corridor to Kathmandu Valley which ultimately reinforces INPS and improves reliability of transmission system. The scope of project includes construction 82 km double circuit 220kV transmission line from Markichowk (Marsyangdi) to Kathmandu with twin “MOOSE” ACSR conductor in each phase and construction of 220/132 kV substations of capacity 160 MVA at Markichowk, Marsyangdi and 320 MVA (2x160 MVA) Matatirtha (Kathmandu). The substation in Matatirtha will be of Air Insulated (AIS) type while in Marsyangdi, the substation shall be of Gas Insulated (GIS) type. The contract agreement for transmission line was concluded on June 2016 with Tata Projects Ltd., India. Similarly, the contract agreement for substations was concluded on December 2017 with Shenzhen Farad Electric Co. Ltd., China.

Out of 231 towers, foundations of 220 towers and erection of 185 towers has been completed. Further, 42.35 km of double circuit conductor has been strung. This line is planned to be commissioned by the end of December 2019.

For substation part, almost all design and drawings of civil and electrical works has been approved. Major equipment such as power transformer, CT, PT, CVT & LA have been supplied to site at Matatirtha and Marsyangdi. Construction of boundary wall, retaining wall, gantry foundation, transformer foundation and firewall is being carried out at Matatirtha.SS. Similarly, gantry foundation, transformer foundation, firewall, quarter buildings and transit camps are ongoing at Markichowk SS.

4) Kaligandaki Corridor 220kV Transmission Line Project

The scope of the project is to construct three nos. of 220/132 kV, 100 MVA Substations at Dana (Myagdi), Kushma (Parbat) and New Butwal (Bhumahi, Nawalparasi) and their interlinking

Stringing work in progress at Dead end tower at Dana

148 km, 220 kV D/C transmission lines (Dana - Kushma - New Butwal - Bardaghat).

Dana to Kushma T/L, Dana SS and Kushma SS are being constructed by the JV Contractor M/S Tata projects Limited India and CHINT electric Co. Limited, China. Out of 110 towers, 101 tower foundations & 90 tower structure erection has been completed. Out of 39.8 km of 220 kV Double Circuit Line, 15.83 km has been strung between Dana and Kushma. Both Dana – Kushma 220 kV transmission line and 220/132 kV SS at Dana and Kushma is planned to be commissioned by December 2019.

The contract for design, supply and construction of 88 km long, 220 kV D/C Transmission line from Kushma to New Butwal has been awarded to M/S Larsen & Toubro Limited, India. Tower design, testing and detail survey has been completed. The completion of check survey and cadastral survey are in final stages. Testing of conductor and hardware fittings are at different stages. Land parceling for Palpa and Syangja district for acquisition of land for tower foundation has been submitted. 25 out of 253 nos. of tower foundation have been completed and 4 are under progress. This line is planned to be commissioned in December 2020.

The contract of 220/132 kV, 100 MVA substation construction in New Butwal (Nawalparasi) has been awarded to M/s Tata projects Limited, India. Survey and soil investigation of the substation has been completed. Electrical and civil drawing design is ongoing and is in the stage of completion. Primary equipment such as earthing materials, foundation bolts, circuit breaker, isolators are being supplied while transformer is being manufactured. Civil work such as gantry tower foundation, transformer foundation, control building, boundary wall, transit camp foundation and B, C and D type quarter building is underway. This substation is planned to be operated by December 2019.

Remaining portion of the Kaligandaki Corridor Transmission Line Project is to construct 21 km of 220 kV DC Line from New Butwal to Bardaghat. Bid evaluation is underway and scheduled to award contract by the end of October 2019. EIA of TL is in advance stage of approval.

5) Grid Substation Reinforcement and Capacity Expansion Project

The major objective of this project is to reinforce & upgrade eight 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. Reinforcement and upgradation work of all these eight grid substation was completed on December 2017 which added substation capacity by total 280 MVA. Protection upgradation and addition of Substation Automation System in Gandak SS and Baneswar SS were also concluded successfully.

Upgradation of Dhalkebar - Mujeliya 33 kV Double Circuit Line of length 23 km 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 awarded to JV Contractor M/s Mudhbary & Joshi and APAR, India on 18 June, 2018 and planned to be completed by September, 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, 266.8 MVA of 33/11 kV SS, 437 km of 33 kV line, 701 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

Lot 3 Contract package has almost been completed with the upgradation of 11 nos. of 33/11 kV substation which has added capacity of 121.8 MVA in the distribution system as well as nearly completion of 46 km of 33 kV line, 202 km of 11 kV Line and 223 km of 400 Volt Line.

Out of total 25 nos. of substations of Lot 1 and Lot 2, 8 substations have been commissioned and has contributed 59 MVA additional capacity into the system. Similarly, a total of 176 km of 33 kV line, 53 km of 11 kV line and 26 km of 400 Volts line has been completed.

33 kV UG cable connection work at Dhakdhai SS

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 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 2023 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, 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 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 solar power from eligible solar power developer. The Solar Power Developer will be encouraged by the upfront payment they would receive from NEA for power they sell up to 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.

Under this VGF scheme, five (5) solar power developers have been selected through competitive bidding process and contract has been signed with them to procure solar energy generated by installed utility scale grid tied solar power plant with total capacity 24 and will be connected at different five (5) substations of NEA (8 MW at Chanata SS, 5 MW at Gandak SS, 2 MW at Kawasoti SS, 4 MWat Lekhnath SS and 5 MW at Buluchowk SS).

C) Power Transmission and Distribution Efficiency Enhancement Project (PTDEEP)

The purpose of this project is to strengthen 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. Out of the Project cost of USD 189 Million, USD 2.0 Million has been funded as grant from JFPR and ADB has funded of USD 150 Million as a loan and the balance is being financed through GoN and NEA. Different sub-projects and their status under PTDEEP are as below:

1) Lapsephedi and Changunarayan Substation Construction Project

220/132 kV, 160 MVA and 132/11 kV, 5 MVA capacity GIS SS is being constructed at Lapsephedi and 132/11 kV, 45 MVA SS will be constructed at Changunarayan. These substations will play major role to evacuate the power generated by IPPs and Upper Tamakoshi Hydro Electric Plant through Khimti–Barhabise–Kathmandu 400/220 kV Line. The contract for this package has been awarded to Sinosteel MECC-Zhaowei J/V and design works of the substations are underway while survey and geotechnical investigations are completed. The initial project completion period was scheduled on November 2019 but due to some unavoidable reasons, completion period seems to be extended.

2) Kathmandu Valley Transmission Capacity Reinforcement Project

The primary focus of the project is to augment Grid substation capacity by adding 3 new 132/11kV substations, 2x45 MVA each at Mulpani, Futung and Chapagaon. The project will enhance transmission substation capacity and improve reliability and quality of electricity supply in Kathmandu Valley by reducing distribution system overload. The Contract of these Substations is being executed by M/s Pinggao Group Co. Limited, China. Due to the geological and social problems, contract completion period required to be extended beyond the targeted completion period.

3) Enhancement of Distribution Network in the Central and Northern Region of Kathmandu Valley

This is another sub-project under Power Transmission and Distribution Efficiency Enhancement Project (PTDEEP) which is funded by ADB under the loan no. 3542 (NEP). 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. Major work includes construction of 155 circuit km of underground 11 kV line, 210 circuit km of underground 400 volt line, 125 km of underground optical fiber laying, 40 circuit km of construction and upgrading of 11 kV overhead line by AB Cable & 140 circuit km of 400 Volt overhead line by AB Cable and 230 nos. of and RMU installation.

The contract agreement was made on 15 March, 2019 with KEI Industries Limited, India. As of now, detail survey works and design works under supervision of project is on progress and planned to be completed by November 2021.

4) Enhancement of Distribution Network in the Eastern and Southern region of Kathmandu Valley

The project intends towards the enhancement of distribution system and/or rehabilitation of 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 major work includes the construction of underground 11 kV Line: 160 circuit km & underground 400 volt Line: 195 circuit km, underground optical fiber laying: 160 km, Construction and upgrading of 11 kV overhead line by AB Cable: 40 circuit km & 400 Volt overhead line by AB Cable: 75 km and RMU installation: 140 nos.

The contract agreement was made on the 15 March, 2019 with KEI Industries Limited, India. Detail survey and design works under the supervision of project is on progress and planned to be completed by November 2021.

5) Kathmandu Valley Smart Metering Project

Kathmandu Valley Smart Metering Project is one of the sub-project of PTDEEP which will modernize the distribution business and improve financial health of NEA with reduction of distribution losses and increment of overall efficiency of distribution system operation. NEA intends to introduce smart meters and deploy 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 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, immediate benefits such as reduced meter reading costs, access to time of use-based tariffs and 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 distribution sector.

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 90,000 metering nodes in areas of Kathmandu central region and Kathmandu northern region (Maharajung and Ratnapark) with an approx. area of 60 sq. miles. AMI system includes communications links provided by Network provider, which is the backbone of 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.

The 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 entire network, increase operational efficiency and to establish network platform that can support 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 canopyistobeestablishedusingRFcommunication 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 RF communication technology is not feasible at specific consumer/metering location, the bidder shall provide GPRS/GSM based network connectivity for metering point.

The contract has been awarded to M/s Pinggao-WISDOM JV and planned to be completed by December 2020.

6) Kathmandu Valley Substation Automation Project

PMD has strongly felt the need of automation of existing grid SS to have efficient, reliable and automatic operation of 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 thirteen (13) NEA grid SS within Kathmandu Grid Division will be fully automated and be operated remotely from Control Centre located at Baneshwor S/S. This project is very important for NEA in the sense of reduction of ongoing operational cost, improvement of grid reliability, lengthening the life of equipment and improvement of organizational effectiveness. The Bid for this project is under evaluation and the Contract is expected to be awarded by the end of September 2019.

D) SASEC Power Transmission and Distribution System Strengthening Project (PTDSSP)

This project is the continuation of the PTDEEP to some extent and is already in 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 the existing system with the adoption of new technology. Proposed sub projects under this project are:

1) Hetauda-Parwanipur 132 kV DC Line Upgradation and Construction of 132 kV Parwanipur-Pokhariya TL and 132 kV Substation at Pokhariya

This project basically consists of Parwanipur-Pokhariya 132 kV Transmission Line along with the 132 kV substation Pokhariya (Parsa district) to meet the present demand of industrial growth. In future, construction of Nijgadh-Pokhariya 400 kV Transmission Line along with the concomitant substations in Nijgadh and Pokhariya has also been planned.

Proposed 132 kV Transmission line from Parwanipur to Pokhariya will be of 20 km in length and 132 kV Double circuit line will be constructed using HTLS conductor. The study of the line is being carried out by Engineering Directorate of NEA and supposed to be completed by the end of August 2019. Bids for construction of 132 kV line and 132 kV Substations at Pokahariya is planned to be invited by the end of 2019.

Likewise, considering the potentiality of cross-border line, Nijgadh-Pokhariya approximately 75 km 400 kV transmission line has been included in the Program of GoN for this fiscal year. The detailed survey and corresponding IEE are expected to be completed within the end of this fiscal year.

2) Construction of 132/11 kV substation at Thimi and Koteshwor

The main objective of this project is to reduce burden on existing Bhaktapur-Baneshwor-Patan single circuit 66 kV transmission line. The scope includes construction of a 132 kV double

circuit underground cable transmission line approximately 12 km in length from existing Bhaktapur substation to newly proposed 132 kV, 90 MVA and 132/66kV, 100MVA GIS substaion at Koteshwor via newly proposed Thimi 132/11kV, 90 MVA GIS substaion. This project also includes approximately 2 km 66 kV double circuit underground cable transmission line from newly proposed Koteshwor substation to existing Baneshwor substation.

Survey of the TL has been completed and Bidding Document preparation is underway.

3) Upgrading of Khimti-1, Barhabise and Lapsiphedi SS to 400 kV

The scope of the project is to upgrade (i) New Khimti SS (ii) Barhabise SS and (iii) Lapsifedi SS to 400 kV as New Khimti – Barhabise – Lapsifedi 220 kV TL is required to be charged on 400 kV in near future. With the concurrence of ADB for advance contracting, notice for IFB has been published on 21 May 2019. Capacity of New Khimti SS, Barhabise SS and Lapsifedi SS will be 630MVA (2x3x105 MVA), 320 MVA (2x3x53.33 MVA) and 315 MVS (3x105 MVA) respectively.

4) Kathmandu Valley West Distribution System Enhancement Project

The project is a sub-project under PTDSSP which 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 Kirtipur, Kuleshwor, Baneshwor, Balaju and Jorparti Distribution Center of the Kathmandu Valley.

The scope of the project includes design, supply, installation and commissioning of underground distribution network using trenchless boring methodology under five distribution Center including reinforcement and automation.

With the ADB concurrence on advance procurement, the notice for IFB was published on 21 May 2019. Technical bids were opened on 25 July 2019 and evaluation is underway.

The major work includes construction of underground 11 kV Line: 225 circuit km & underground 400 volt Line: circuit 239 km, underground optical fiber laying: 225 km, Construction and upgrading of 11 kV overhead line by AB Cable: 165 circuit km & 400 Volt overhead line by AB Cable: 240 km, RMU installation: 360 nos. and OPGW stringing: 165 km

5) Rural Electrification and Distribution Network Reinforcements in Province 2

In order to achieve the goal of sustainable energy access and grid access to all, Government of Nepal and Nepal Electricity Authority have emphasized on improving the electricity quality through construction of new substations and augmentation of the existing substations and transmission lines with distribution network reinforcement.

The scope of works under this proposal include construction of new 33/11 kV substations, 33 kV lines, 11 kV lines and low voltage distribution lines and reinforcement and rehabilitation of existing distribution networks. It is proposed to construct 8 new 33/11kV substations, 300 km of 33 kV lines, 750 km of 11kV lines, 970 km of 400 Volts distribution lines and addition of 300 nos. of distribution transformers.

The project is expected to be started by late 2019 and be completed by fiscal year 2024/25. The project shall be implemented through turnkey contracts in three packages. Adequate attentions will be paid for project preparation to ensure smooth project implementations and timely completion. Required Land acquisition and social & environmental study and bidding document preparation has already been initiated.

E) Engineering and Environmental study of Transmission Lines and associated Substations under ADB Grant no. 0361 (Project Preparatory Facility for Energy (PPEE))

The prime objective of the services under PPFE is to procure a project preparation support consulting service from consulting firms. The consulting firm is to prepare Detail Project Report including detail transmission and substation design with tower spotting and demarcation in site, safeguard studies, preparation of cost estimate and preparation of bidding documents in detail enough to provide adequate information & data to ensure that the project will be ready for procurement and construction immediately after the completion of intended project preparation support consulting service. Engineering and Environmental study of following transmission line and the associated substaion are underway.

1) New Butwal Kohalpur, Surkhet and Upper Karnali 400 kV Transmission Line project

As a part of 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 detail engineering and complete design of 400 kV TL and associated substations along the route. As of now, the consultant has presented inception report. The detail study on due diligence related activities and engineering design is targeted to be completed by October 2019. The proposed Transmission route and Substation under the scope of detail study and engineering design are as follows:

Transmission Lines:

- New Butwal - Lamahi 400 kV DC Transmission Line (150 km);
- Lamahi – New Kohalpur 400 kV DC Transmission Line (90 km);
- New Kohalpur – Dododhara (New Lumki) 400kV DC Transmission Line (95 km)
- Chhinchu - Surkhet 132kV DC Transmission Line (25 km);
- Dododhara (New Lumki) – New Attariya 400 kV DC Transmission Line (90 km)

Substations

- New Butwal 400kV Substation;
- Lamahi 400kV Substation;
- Dododhara (New Lumki) 400kV Substation;
- Surkhet 132kV Substation;
- New Attariya 400kV Substation;
- New Kohalpur 400kV Substation.

2) Other Transmission Line and associated Substations

NEA has initiated the detail engineering design and environmental study of three (3) different 400 kV transmission lines and two (2) 132 kV transmission lines and associated substations. Consultant recruitment are under process, and are being done in three (3) separate packages, CP-1, CP-2 and CP-3. For all three packages shortlisting of consulting firm has been concluded and RFP evaluation is underway. The details of Line and substation under each consulting packaes are as follow:

Consulting Package (CP-1)

(i) Tingla Hub - Likhu Hub - New Khimti 400kV Double Circuit Transmission Line (approximately 55 km) and associated substation at Likhu Hub and bay expansion works at Tingla Hub Substation and New Khimti Substation.

(ii) New Khimti -Tamakoshi 3 - Sunkoshi

Hub - Dhalkebar 400kV Double Circuit Transmission Line (approximately 110 km) and associated substation at Sunkoshi Hub and bay expansion at Dhalkebar Substation.

Consulting Package (CP-2)

(i) The 400 kV Double circuit Budhigandaki Corridor (Philim-Gumda-Ratamate) (approximately 95 km) transmission line and associated 400 kV substations at Philim/ Gumda (Gorkha District) and Ratamate (Nuwakot District).

(ii) 132 kV Double circuit Dailekh - Kalikot – Jumla (approx. 80 km) and associated substations at Jumla and Kalikot and bay extension work at Dailekh substation

(iii) 132 kV Double circuit Lamoshangu – Kavre/ Ramechap (approx. 40 km) transmission line and associated Substations at the bordering area of Kavre/Ramechhap and associated bay extension work at Lamosanghu Substation.

Consulting Package (CP-3)

(i) 400 kV Double circuit Damauli - Kusma - Burtibang - Bafikot (approximately 200 km) transmission line and associated 400 kV substations at Kusma, Burtibang and Bafikot and bay extension at Damauli Hub substation

The study of all the above transmission and Substation is planned to be completed within 12 months.

F) Rural Electrification and Distribution Network Improvement of Tanahu District

This project intends to electrify and improve the networks of the nearby villages which will be affected by the Tanahu Hydropower Project and is financed by ADB through Loan No.2990/2991-NEP (SF): Tanahu Hydropower Project. The scope of this project consists of construction of two 33/11 kV, 6/8 MVA SS at Saranghat and Ghiring, 40 km of 33 kV sub-transmission line, 218 km of 11 kV line, 345 km of 400/230 V line and installation of seventy (70) nos. distribution transformers (11/0.4 kV). The contract was awarded to M/s JV of East India Udhyog and Waiba Infratech on 29 November 2018. Till date, design of major equipment like pole, conductor, stay wire, distribution transformer has been approved and survey for 33, 11 and 0.4 kV line has been completed. The project is expected to complete by the middle of 2020.

G) Kathmandu Valley 220 kV Ring Main Project

This project has been formulated to meet the demand of Kathmandu valley. 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. This project is required to implement along with the outer ring road project of the GoN and the GoN is reviewing the DPR. As soon as the DPR of outer ring road finalizes, the procurement of proposed 220 kV Ring main Project required to be initiated.

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
12. Uttarganga Power 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

13. DudhKoshi Jalavidhyut Company Limited
14. Upper Arun Hydropower Company Limited
15. Modi Jalavidhyut Company Limited
16. Aandhikhola 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 (NEC) 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 Vidhyut Utpadan Company Limited (VUCL) 17%, Rastriya Prasaran 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 130 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 NEC 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 NEC 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.

Comparative Study Of Sunkoshi-Marin Study Ofsunkoshi- Marin And Sunkoshi-Kamala Diversion Multipurpose

PROJECTS

The Contract agreement was signed on December 2018 between NEC and Ministry of Energy, Water Resources and Irrigation, Sunkoshi-Marin Diversion Multipurpose Project. The study was completed on March, 2019 within 3 months. The main scope of the study was to rank these two projects for implementation, one of the two irrigation projects based on the major milestones including review and analysis of the completed studies and potential alternatives.

Consultancy Services On Upgradation Design Of Existing 66kv Transmission Line For Htls Conductor

The Contract agreement was signed on October 2018 between NEC and Nepal Electricity Authority, Transmission Directorate, Bhaktapur – Baneshwor - Patan 66 kV Transmission Line Upgradation Project .The study was completed on July, 2019. The main scope of study is to prepare the details report regarding study of existing 66 kV Line Route, existing Sag, Tower Condition, Right

of Way and different available HTLS conductors followed by their Technical Evaluation and Selection of Conductor along with BOQ and Cost Estimate.

Projects being currently executed by NEA Engineering Company

1. Phukot Karnali Peaking Ror Hydroelectric Project (Pkhep) (426 Mw)

The Contract agreement was signed on 10th October 2017 between NEC 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. Feasibility Level Study is completed, and FS Report has been submitted, and Interim Design Report is completed and now it is in the final stage of Detailed Engineering Design and Tender Document preparation.

2. Betan Karnali Hydroelectric Project (Bkhep) (688 Mw)

A Contract between Betan Karnali Sanchayakarta Hydropower Company Limited (BKSHCL) and NEC) was signed on November 23rd, 2017 for the Detailed Feasibility / Engineering Study of Betan Karnali PROR 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. The main objective of the assignment is to carry out Detailed Feasibility/ Engineering Study of BKHEP including technical, financial assessment and prepare Tender document. Interim Design Report is completed, and Detailed Engineering Design is undergoing while Tender Document preparation and vetting by International consultants is slated to begin shortly.

Aerial view from Drone Survey of BKHEP

3. Jagadulla Storage Hydroelectric Project (Jshep) (307 Mw).

The Contract agreement was signed on December 6, 2017 between NEC 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 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 JSHEP including technical, financial assessment and prepare Tender document. Feasibility Study is completed, and Interim Design Report is submitted, while Detailed Engineering Design ongoing.

4. Kimathanka Arun Hydroelectric Project (Kahep) (450 Mw)

The Contract was made on 6th December 2017 between NEC and VUCL to perform detailed feasibility engineering study of KAHEP.

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 KAHEP including technical, financial assessment and prepare Tender document.

Some drilling work has been delayed by onset of monsoon and difficulty of terrain. Feasibility Study will be completed shortly and Detailed Engineering Design as well as Tender Document preparation will go on simultaneously.

5. Rolwaling Khola Hydroelectric Project (22 Mw)

The Contract agreement was signed on March 29, 2018 between NEC 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.

All field investigations and design works are completed at Drat Report level. Draft Report will be submitted shortly and following the investigations inside the Test Adit in the Power house, further design modifications will be done later.

6. Mugu Karnali Hydroelectric Storage Project (Mkhep) (1,902 Mw)

The Contract agreement was signed on February, 2019 between NEC and VUCL to conduct the detailed feasibility / engineering study report of MKHEP incorporating the technical, financial and relevant aspects of the project development based on detailed survey and investigations including preparation of bidding document of MKHEP.

MKHEP is located in Mugu,Humla,Bajura District. MKHEP is a storage type with a capacity of 1,902 MW.

The main objective of the assignment is to carry out Detailed Feasibility/Engineering Study of JSHEP including technical, financial assessment and prepare Tender document. Inception report has been submitted and field investigations including hydrological and sediment and survey and geological study is ongoing. This Financial Year, all the investigations of First stage will be completed. The total work is scheduled to be completed in 36 months.

7. Environmental Impact Assessment Of Phukot Karnali Peaking Ror Hydroelectric Project (Pkhep), Kimathanka Arun Hydroelectric Project (Kahep), Betan Karnali Hudroelectric Project (Bkhep)And Jagadulla Storage Hydroelectric Project (Jshep)

NEC has signed the Contract agreement with VUCL to carry out the detailed Environmental Impact Assessment of Phukot Karnali HEP, Kimathanka Arun HEP, Betan Karnali HEP and Jagadulla HEP. 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. EIA study has been affected by the Renewal and / or Update of Survey License of the individual projects. The EIA study is expected to be completed in the coming fiscal Year for those projects whose license is already renewed or updated provided that there are no procedural delays in the governmental agencies.

8. Design Check And Construction Supervision Of 400 Kv Dhalkebar Substation

The Contract agreement was signed on February 28, 2018 between NEC 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. The Work has been carried out to the satisfaction of NEA and further extension has been given for construction supervision, which is scheduled to complete in next quarter of the Fiscal Year.

9. Design Check And Construction Supervision Consultancy Services For 400kv Hetauda And Inaruwa Substations

The Contract agreement was signed on February 8, 2019 between NEC and Nepal Electricity Authority, Hetauda- Dhalkebar -Inaruwa 400KV Substation Expansion Project as a consulting service contract to conduct design check and supervision of 400KV Hetauda and Inaruwa substation. The prime objective of consultant is to review the designs submitted by the Contractor SIEMENS, India, supervise the construction for smooth operation of construction activities.

The progress of the supervision work is going as per schedule and NEC has provided all necessary expertise required by NEA.

10. Detailed Engineering And Environmental Study Of Kimathanka Arun-Arun Hub 400kv Double Circuit Transmission Line Project

The Contract agreement was signed on December 16, 2018 between NEC and Rastriya Prasaran Grid Company Ltd. (RPGCL) as a consulting service contract to prepare detailed project design covering route alignment survey, transmission lines and substations design including tower spotting, ROW plan, environmental studies, cost estimates, land demarcation and identification, preparation of contract packages and bidding documents. Transmission line Route alignment study of all alternatives are based on optimum routing using GIS Intelligence.

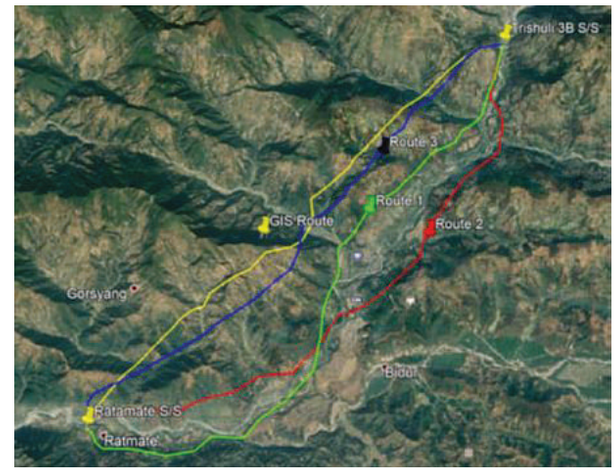
The GIS-based intelligent routing and detailed survey of the route based on the alignment selection has been completed. The Scoping and TOR will be submitted and EIA to be complete in next fiscal year.

11. Consulting Services Of Design Estimate Of Transformer Workshop At Kharipati, Bhaktapur

The Contract agreement was signed on May 6, 2019, between NEC and Nepal Electricity Authority, Distribution and Consumer Services Directorate, Transformer Workshop Branch, Lainchaur, Kathmandu as a consulting service contract to prepare Architectural Planning, structural design and drawing of proposed store building and office building, preparation of contract packages and bidding documents

12. Detail Feasibility Study Of Trishuli 3b-Ratmate 220kv Transmission Line Project

The Contract agreement was signed on November 18, 2018 between NEC and Nepal Electricity Authority, Transmission Directorate, Trishuli 3B-



Transmission line Route alignment study of alternatives using GIS Intelligence

Ratmate 220KV Transmission Line Project. The scope of the services under this contract is to prepare detailed project design covering route alignment survey, transmission lines and substations design including tower spotting, ROW plan, establish Bill of Quantity and cost estimate. Transmission line Route alignment study of all alternatives are based on optimum routing using GIS Intelligence. The work has been complete upto the Draft report level and shall be complete in next quarter.

13. Consulting Services Of Tender Document Review And Recommendations, Assistance In Tender Evaluation, Design Review And Erection And Commission Supervision Under Rehabilitation And Modernization Of Trishuli Hep.

The Contract agreement was signed on October 2018 between NEC and Nepal Electricity Authority, Generation Directorate, Medium Generation Operation and Maintenance Department to review the designs, drawings submitted by the main contractor, supervise the erection and commission of rehabilitation works

14. 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 as a strategy for increasing clean energy consumptions. At the same time, it has adopted the EV only principle for mobility within the valley by procuring the first EV from BYD China, and from KIA as well as two electric cars from Mahindra Reva. It has also procured Electric Scooter from NIU, China. The purpose of this EV fleet is to generate confidence in public towards the EV and at the same time to gain experience and insight into different EV that are is available so as to provide expertise services to Government and NEA on EV in future.

The Company is also carrying its research and indigenous design of floating solar plants that can be used in lakes and reservoirs.

15. MOU of Cooperation

In order to promote research and study activities the Company has entered into a MOU with School of Engineering, Kathmandu University as well as Institute of Engineering, Tribhuvan University, Pulchowk Campus.

In order to obtain international expertise and exposure, the Company has approved a similar MOU on cooperation and exchange of expertise with Chinese Company, Power China Guiyang Engineering Corporation Ltd (PGEC China) and a nonprofit organization of Australia, Engineer's Solidarity for Nepal Development Inc. (ESFNDI Australia)

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. Further, the remaining 25% of the shares have been issued to General Public (15%) and Residents of Dolakha district (10%) in Fiscal Year 2018/19.

Project Features

UTKHEP, one of the national pride projects of Nepal, is located in Bigu Rural Municipality, ward No.1 of Dolakha district in State No 3 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.

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 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. Similarly, GoN has allocated additional loan of NRs 1 Billion for current FY.

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 99.0% by the end of the fiscal year 2075/76 (2018/19). 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	100%
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. Excavation of Headrace tunnel was completed with successful breakthrough on 19 November 2017. Concrete lining works on Headrace Tunnel is almost in final stage of completion. Grouting works in Headrace Tunnel is ongoing in full swing. The concrete lining in Surge System (which includes Surge Shaft, Surge Tunnel, and Ventilation Tunnel) is ongoing after completion of all excavation works.

Lot 2 Contractor substantially completed the installation of all dam radial gates and the installation work of hydraulic system for the same is ongoing. Transportation of steel penstocks for lower shaft has already been completed. Installations on both Lowe and Upper Penstock Shafts have been started from June 2019 by Assignee Andritz Hydro and Texmaco respectively in accordance with Tripartite Assignment Agreement signed on 07 January 2019.

Lot 3 Contractor has completed the installation of all six units in Powerhouse. All 19 Power

Transformers along with their accessories are placed in the Transformer Cavern. Installation of Main Inlet Valves (MIVs) and digital governors for all units have been completed. Installation of 220 kV Gas Insulated Switchgear (GIS) is also completed. In the main control room, installation of Control Panels, DC supply unit and other required works are also completed. Dry Testing of all six units have been completed.

Lot 4 Contractor has completed the foundations and erection works of all 127 towers. Stringing of 40.81 km ACSR BISON conductor out of 47 km has been completed. Civil works of GIS building and Control building is ongoing. Major construction of the GIS building including roof slab has been completed. All four transformers (including one spare transformer) have already been placed in the position. Remaining civil works for 220 kV take off gantry and 132 kV AIS bays for line in line out is ongoing. Electrical installation works in substation will start once the civil works complete.

Project Cost & Schedule

The initial approved cost estimate of the project for financial closure and power purchase agreement (PPA) was NRs. 35,290 Million (US$ 441 Million with average exchange rate of NRs 80/USD) excluding Interest during Construction (IDC). Considering the effects of earthquake of 25 April 2015, boarder blockade thereafter and some additional works due to design modifications a new Integrated Time Schedule comprising water-on in Headrace Tunnel by early February 2020 and following start of first unit commissioning within March 2020. Similarly, all remaining units will be commissioned by May 2020. 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. 17,942 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 and consequence of border blockade thereafter, some other design changes in the project components, poor work performance of Lot 2 Contractor 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 2019/20.

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 will 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 final DPR and tender documents will be finalized by September/October 2019. Similarly, UTKHPL and ESSD (Environmental and Social Studies Department) of NEA has had MoU to carry out EIA Study of RKHEP and it is expected to complete the EIA study by Fiscal Year 2019/20. In order to expedite critical part of the headrace tunnel, UTKHPL has initiated to start exploratory tunnel excavation within headrace and associated access road construction. The major construction of this project will likely to be started just after final commissioning of UTKHEP.

TANAHU HYDROPOWER LIMITED

Tanahu Hydropower Limited (THL) was established as a subsidiary company of Nepal Electricity Authority (NEA) on 25 March 2012 to develop 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 Secretary

Background of Project

Following the identification of the project during the Screening and Ranking of Storage Hydropower Projects in Nepal, NEA conducted the feasibility study in 2001. The Japan Electric Power Company Limited (J-Power) carried out the upgraded Feasibility Study in 2007 under the technical assistance from the Japan International Cooperation Agency (JICA) and further completed the Detail Engineering Design in 2015 under the grant assistance from the Asian Development Bank (ADB).

THL has concluded a contract agreement with the Project Supervision Consultant (PSC), namely, M/S Lahmeyer International GmbH, Germany in association with Manitoba Hydro International, Canada on June 29, 2015. The first phase of the services including preparation of the Inception Report after review of the detail design, finalization of the bidding documents and supporting THL for bid evaluation of major construction packages has been completed. As an addendum to the Contract, PSC also completed the rock mechanical tests inside the powerhouse cavern, seismic hazard assessment of the project site and 3D- dynamic structural analysis of dam.

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 MW with estimated average annual energy generation of 502.6 GWh. The Project is designed for minimum six hours of peaking operation even during the driest month of the year. The main components of the Project are as follows:

Dam and Powerhouse Site of Tanahu Hydropower Project

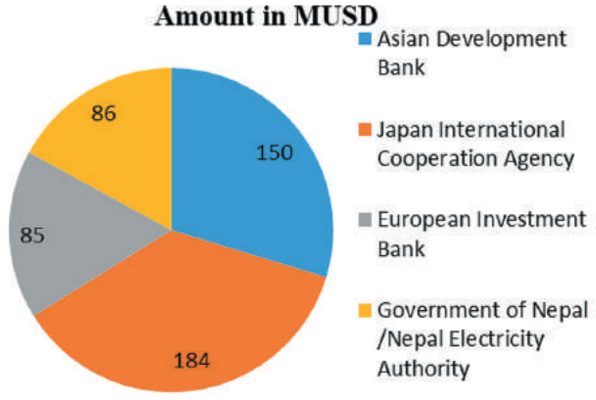
- A 140 m high concrete gravity dam with a crest length of 215 m creating a reservoir with a total surface area of 7.26 km2 at FSL of 415 masl;
- A headrace tunnel of internal diameter 7.4 m and length of 1,162 m;
- A restricted orifice type surge shaft of internal diameter 28m and height of 61.5 m;
- An underground powerhouse of dimensions 89m (L) x 22 (W) x 44m (H);
- A tailrace tunnel of length 243 m long 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 line of length 34 km to evacuate the generated power to the New Bharatpur Sub-station.

In addition, the project includes the Rural Electrification (RE) component to electrify the remote villages of the district with construction of two new 33/11 kV sub-stations, which is being implemented by the Project Management Directorate (PMD) of NEA.

Financial 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 finding 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 of each co-financier to NEA.

Further pursuant to the subsidiary financing agreements between NEA and THL, NEA will relend part of the loan proceeds to THL and contribute the remainder to THL's equity in accordance with the debt: equity (70:30) arrangements.

Project Status and Progress

Pre-Construction Activities

All pre-construction works including the access road and a bridge across Seti River, the camp facilities and the 33/11 construction power sub-station of capacity 8 MVA have been completed.

THL Camp Facilities at Jhaputar

Access Road to Powerhouse Site

Land Acquisition & Compensation

THL has distributed USD 10.98 Million to 501 affected HHs out of identified 547 affected HHs (compensation success rate of 91.6%) toward land acquisition and resettlement costs within the camp site, access road and reservoir area. A local concerned committee under the name of "Collective Rights Protection Committee to Directly Drown Affected People", Tanahu has filed a case of complain to the ADB Accountability Mechanism and THL with the facilitation of the ADB is making efforts to resolve the issue. The compensation distribution to the remaining HHs will be continued during the current FY 2019/20.

Major Construction Packages

THL concluded the contract agreements with M/S

Contractor's Camp Facilities

Cooperativa Muratori and Cementisti, Italy on 01 October, 2018 for Package 1 (Headworks and River Diversion). However, as the Contractor failed to commence the Works within the prescribed schedule, the Contract was terminated on 19 February 2019. Subsequently after concurrence from the ADB, THL published a notice of the invitation of Bids for re-bidding of Package on 25 April, 2019. Four international bidders have submitted their bids by the bid submission deadline of 07 July 2019 and the evaluation of the Technical Bids are being carried out by THL with supports from the PSC.

Main Access Tunnel Portal Excavation

THL also concluded the contract agreements with M/S Sinohydro Corporation Limited, China on 01 October, 2018 for Package 2 (Waterway, Powerhouse and Related Equipment). After mobilization to the Site on 18 January 2019, the Contractor is being engaged with the construction of site establishment area including camp facilities, initial excavation of the access road to tailrace outlet/surge tank and portal of the Main Access Tunnel (MAT) to the powerhouse in addition to the survey and design Works under the Contract.

Likewise, THL and KEC International Limited, India signed the Contract Agreement for Package 3 (220 kV Transmission Line) on 25 December 2018. After mobilization to the Site, the Contractor has already commenced the detail survey and geotechnical investigation of the transmission line route alignment.

Power Purchase Agreement/ Licenses & Clearances

As a first PPA for the storage type hydropower projects, NEA and THL concluded the Power Purchase Agreement (PPA) for Tanahu Hydropower Project on 29 June 2018. As per the agreement, NEA will purchase the energy generated from the project at the rate of NRs. 12.40 NRs. 6.08 during the dry and wet season of the year respectively at the Commercial Operation Date with an annual escalation of 3% for eight years.

Signing of PPA with NEA

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. Likewise, the DoED has issued the Construction License for Damauli-Bharatpur 220 kV 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. 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

Following the no objection from the ADB and subsequent approval of the negotiated contract from the THL Board, the Contract for Environmental and Social Management Service Provider (ESMSP) was signed with the selected firm M/S ELC, (Italy) in association with GEOCE consultant Ltd., Nepal on 20 May 2019. The Consultant has commenced the services from 01 July 2019. Apart from the daily monitoring of environmental and social safeguard activities with close collaboration with the ESMU of THL, ESMSP will focus on finalization of Environmental Management Plan covering fish management plan, water release and dam safety plan, wild life management plan and forestry management plan.

As provisioned in the PAM, the Contracts for 3 Panel of Exerts (POE) namely Social Expert, Environment Expert and Dam Safety Expert were concluded on 17 December 2018. The Panel submitted the report after conducting the first mission from 17-24 December 2019.

Community Development, Livelihood Restoration and GESI Action Plan

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 registration of grievances and dissemination of project related information to APs. THL is regularly engaged in consultation with Local Authorities like District Administration Office, Land Revenue Office, District Survey Office, District Forest Office etc. to address the grievances from the APs.

Under the community development program, THL has provided financial assistance for the implementation of Jhaputar Water Supply Project, which has directly benefitted 300 affected families of Jhaputar. In addition, THL has recently concluded an agreement with Janajyoti Multiple Campus, Bhimad to provide financial assistance of NRs. 2.0 million for completion of under construction campus building. For the livelihood restoration program, THL has requested Rural Training Center, Bhimad-a training wing of CTEVT to submit the proposal for second phase of vocational training with special focus on women after successful conduction of the first phase of the vocational training to sixty affected people in the building electrician and junior plumbing. 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.

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 with utilization of the flows of Madi Khola 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. Under the Grant-0361-NEP, Project Preparation Facility for Energy of the ADB, THL has concluded the contract with JV of WAPCOS Limited, India and Nippon Koei Co. Ltd, Japan on 12 April 2019 for detailed engineering design of the project. After commencement of the Services and subsequent site visits from the experts, the Consultant has submitted the Inception Report and the hydro-sedimentology investigation is being carried out at the dam site of the project.

RAGHUGANGA HYDROPOWER LIMITED

Raghuganga Hydropower Limited (RGHPL) was formed as a subsidiary company of Nepal Electricity Authority (NEA) on 7th March, 2017 (24th Falgun, 2073) with the primary objective of developing and managing 40 MW Rahughat Hydroelectric Project (RGHEP). 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. Power Purchase Agreement (PPA) was signed on 1st April 2019 (2075 Chaitra, 18) with NEA for the sale of energy generated by the project.

Rahughat Hydroelectric Project is located in Raghuganga Rural Municipality of Myagdi District in Gandaki Province of Nepal 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 250.617 GWh of energy annually.

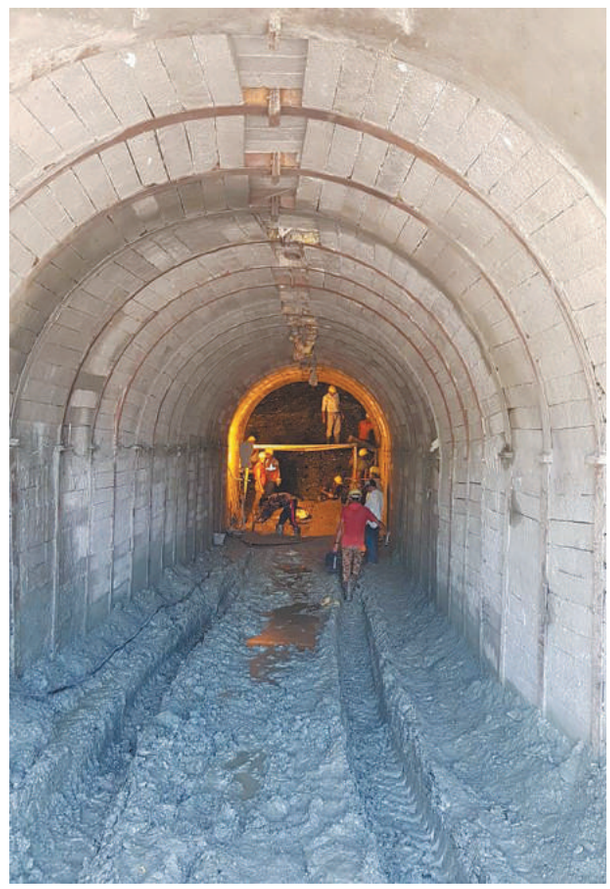
Key Features of the Project

Project Location	Gandaki Province
River Name	Raghuganga
Type of Scheme	Peaking Run of River
Turbine	Pelton, Vertical
Installed Capacity	2 X 20 MW
Gross Head	292.83 m
Net Head	281.56
Design Discharge (at 40% PoE)	16.67 m^3/sec
Headrace Tunnel	Concrete lined HRT, 3.30 m Finished internal diameter, 6.270 km Length
Power House	Surface

The major components of the Project lie at the left bank of Raghuganga Khola. It is one of the major tributaries of Kaligandaki River that flows from west to east to meet Kaligandaki River at Galeshwor. Raghuganga Khola will be diverted through the headworks to 6.270 km headrace tunnel to generate 40 MW of power in the surface powerhouse where it is turbined through 2-vertical axis Pelton turbines before release into the Kaligandaki River. The generated 40MW power will be evacuated from the switchyard to 220kV Dana - Kusuma Transmission line through about 600m long with LILO arrangement single circuit. 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 consultancy services for construction management and construction supervision of main Civil Works & for EM, HM, TL works is under the responsibility of WAPCOS Limited, India.

Lot–1: Civil and Hydro-Mechanical Works on Engineering, Procurement and Construction (EPC) mode have been awarded to M/s Jai Prakash Associates Limited. Contract Agreement for the construction of the Civil Works and Hydro-Mechanical works was signed on 21st November, 2017 with Jaiprakash Associates Limited, India.



Work in Progress in Adit III

Powerhouse Site of RGHEP

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.

Access road works started on 1st July, 2018. Track Opening of access road completed. Protection work for access road started at different chainage.

At Powerhouse, bench excavation at El 878.00 m up to A-Line has been completed and excavation from top hill along pressure shaft portal area up to El 889.25 m has been completed and further work is in progress.

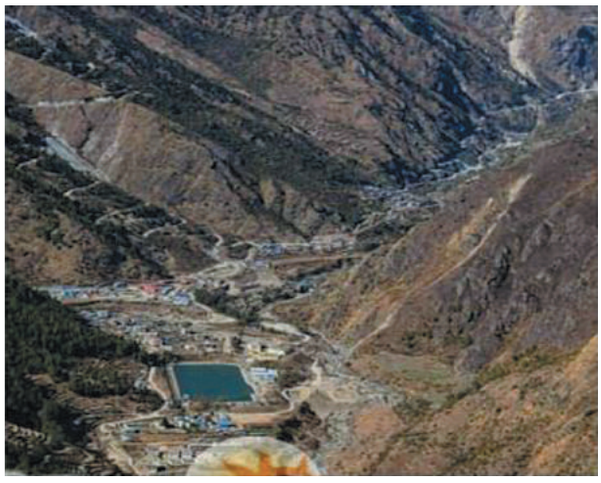
Out of total length 396.75m, excavation of 19.5m length of Adit III completed and further remaining 377.25 m are in progress. Out of total length 183.59m, excavation of 19m length of Adit II completed and work is in progress.

Surface excavation for Surge Shaft is started up to level 1195 m. Slope protection work of adjacent slope is in progress.

Bid for Lot – 2: Electro-mechanical Works for PLANT and Design-Build Contract (PDB) has been called for Tender on 8th July, 2018 and opened on 23rd November, 2018. Technical proposal & Price Bid was evaluated and sent to Exim Bank of India for concurrence/approval and the concurrence for Price Bid was also received from EXIM Bank of India on 10th July, 2019.

CHILIME JALAVIDHYUT COMPANY LIMITED

Chilime Jalavidhyut Company Limited (CJCL), a subsidiary of Nepal Electricity Authority (NEA) was established in 1996 for the development of Chilime Hydroelectric Project of capacity 20MW. As per the financial structure of the Company, the equity share has divided as 51% promoter share and the 49% general share. The 51% promoter share of the Company owned by NEA and the 49% general share has distributed as 25% to the employees of NEA and CJCL, 10% to the local people of Rasuwa district and the remaining 14% share to the general public.



The Company has developed the Chilime Hydroelectric Project located in Rasuwa district which is being operated since B.S. 2060/05/08. The Chilime Hydropower Plant has been operating in the maximum capacity of 22.10 MW and generating total annual energy of 153.75GWh including excess energy of 20.95 GWh. The generated energy from this Chilime Plant is being transmitted into the National Grid of NEA at Nuwakot district through a 38 km long 66 KV transmission line between Rasuwa-Trishuli.

The Company has promoted three hydropower development companies and one Engineering Consulting Services Company for the development of hydroelectric Projects as follows:

1. Rasuwagadi Hydropower Company Limited

Rasuwagadhi Hydropower Company Limited is promoted by CJCL and NEA with their promoter share of 32.79% and 18% respectively. The Company is developing Rasuwagadhi Hydroelectric Project in Thuman and Timure Village, Gosainkunda Rural Municipality of Rasuwa district. The project is a run-of-river type having capacity of 111MW. The headwork site of the project is about 400m downstream from the confluence of Kerung and Lende khola which are the boundary rivers between Nepal and China border.

2. Sanjen Jalavidhyut Company Limited

Sanjen Jalavidhyut Company Limited is promoted by CJCL and NEA with their promoter share of 39.36% and 10.36% respectively. The Company is developing Sanjen and Upper Sanjen Hydroelectric Projects in Chilime Village, Aama Chhodingmo Rural Municipality of Rasuwa district. These Sanjen and Upper Sanjen hydroelectric projects are peaking run-of-river type and developing in cascade system with capacity of 14.80 MW and 42.50 MW respectively.

3. Madhya Bhotekoshi Jalavidyut Company Limited

Madhya Bhotekoshi Jalavidyut Company Limited is promoted by CJCL and NEA with their promoter share of 37% and 10% respectively. The Company is developing Madhya Bhotekoshi Hydroelectric Project in Gati/Marming village, Bhotekoshi Rural Municipality and Barabise Municipality of Sindhupalchowk district. The project is a run-of-river type having capacity of 102 MW.

4. Chilime Engineering and Services Company Limited (ChesCo)

Chilime Engineering and Services Company Limited is promoted by CJCL with its 100% ownership to provide complete engineering and consulting services for the development of hydropower project in Nepal. Chesco's main objective is to develop the skilled local manpower in engineering field and provide complete consulting services for the sustainable hydropower development in Nepal. Now the Chesco is providing engineering and consulting services for the design & construction supervision of Sanjen and Upper Sanjen Hydroelectric Project, detail feasibility study of Budhi Gandaki Prok, Seti Nadi-3 and Chumchet Syar Khola Hydroelectric Project.

The brief description of under study projects of Chilime Jalabidhyut Company Limited are as follows:

a. Budhi Gandaki Prok Hydroelectric Project

Chilime Jalavidhyut Company Limited (CJCL) has obtained the Electricity Generation Survey License for the Budhi Gandaki Prok Hydroelectric Project (420 MW) on B.S 2074/06/01 from Department of Electricity Development, Nepal. The detail feasibility study of the project is being carried out by the Chilime Engineering and Services Company Ltd. (ChesCo). The study is scheduled to be completed by the end of FY 2076/077.

Surveying work

ChesCo is carrying out different option studies considering maximum utilization of power with minimum socio-environmental impact. Once all the options are clearly defined by the consultant, the optimized installed capacity of the project will be finalized. During its study, consultant has almost completed its topographical surveying works. Similarly the hydrological, sedimentology, geological studies are also under progress. In project site there are 3 Staff Gauges placed at different location to study actual water level at various time period. In the meantime ChesCo has also started ERT study required for geo-technical investigation works. Apart from field work, design teams are equally concentrating in design of different hydraulic structure.

Preparation for Discharge Measurement

b. Seti Nadi-3 Hydroelectric Project

Chilime Jalavidhyut Company Limited (CJCL) has obtained the Electricity Generation Survey License for the Seti Nadi-3 Hydroelectric Project (165 MW) on B.S. 2074/06/01 from Department of Electricity Development, Nepal. The detail feasibility study of the project is being carried out by the Chilime Engineering and Services Company Ltd. (ChesCo). The study is scheduled to be completed by the mid of FY 2076/077.

During project study ChesCo is doing different option studies considering optimized power generation with minimum socio-environmental impact. Once all the options are clearly shape out by the consultant, optimized installed capacity of the project will be finalized.

Preparation for ERT works

In this project consultant has substantially completed its topographical survey works of the project area. Similarly the hydrological and geological studies are also under progress. In project site, 3 staff gauges including automatic gauging station has already been placed at different river stretch between headwork to powerhouse. With the help of automatic gauging station we can observe actual river water level at every fifteen minutes interval directly from Kathmandu head office. Similarly the consultant has also carried out ERT study necessary for geo-technical investigation works. Hydraulic structure design works, reports and drawing preparations works are also in progress.

c. Chumchet SyarKhola Hydroelectric Project

Chilime Jalavidhyut Company Limited (CJCL) has obtained the Electricity Generation Survey License for the Chumchet Syar Khola Hydroelectric Project (60 MW) on B.S. 2074/12/27 from Department of Electricity Development, Nepal. The detail feasibility study of the project is being carried out by the Chilime Engineering and Services Company Ltd. (ChesCo). The study is scheduled to be completed by the end of FY 2076/077.

ChesCo has already prepared the project inception

Automatic Gauging Station

report and started their work with topographical survey, geological and hydrological studies. One automatic gauging station was placed to measure river hydrology continuously. Furthermore ChesCo is doing different option studies for power optimization.

Chilime Jalavidhyut Company Limited (CJCL) has planned to construct the Chilime corporate building of the company in its own premises at Dhumbarahi, Kathmandu. The detail design and drawing has completed and submitted to the Kathmandu Metropolitan City Office for the approval process and still waiting to proceed forward.

TRISHULI JAL VIDHYUT COMPANY LIMITED

Introduction

Trishuli Jal Vidhyut Company Limited (TJVCL), a joint venture company of Nepal Electricity Authority (NEA) and Nepal Doorsanchar Company Limited , was established in 2011 with the main objective to develop the Upper Trishuli 3B Hydroelectric Project (37 MW) in Nuwakot and Rasuwa districts. NEA and NDCL have equal (30% each) equity shareholding in the Company. Rest of the equity share has been allocated to the general public, natives of Nuwakot and Rasuwa districts, local governments of Nuwakot and Rasuwa districts, employees of NEA and NDCL among others.

Upper Trishuli 3B Hydroelectric Project

Upper Trishuli 3B Hydroelectric Project (UT3BHEP) is a Run of the River type cascade development Project. The Project will utilize the water coming out of the tailrace tunnel of the upstream UT3A Hydroelectric Project. A headpond will be constructed at the outlet of the upstream Project to divert the water towards the Headrace Tunnel of the UT3BHEP. Construction of the UT3BHEP started on 14 March 2018 and is scheduled to be completed on 13 March 2021. Shuifa ANHE Group Co. Ltd. (previously known as Sichuan ANHE Hydraulic and Hydroelectric Engineering Co. Ltd.) of China is the EPC Contractor for all three components of the Project i.e. Civil, Hydro-mechanical and Electro-mechanical. The power produced by the Project will be evacuated to the under construction Trishuli 3B Hub Sub-station through 3 km long 132kV transmission line. The transmission line is being built by Nepal Electricity Authority under a separate agreement with TJVCL.

Some of the major features of the Project are highlighted in the table below:

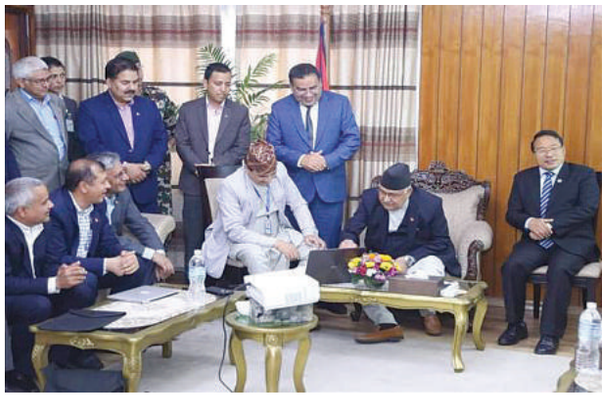
Project Location	
Districts	Nuwakot & Rasuwa
Headrace Tunnel	
Total Length	3805.48 m
Surge Tank	
Diameter	15 m
Height	39.3 m
Vertical penstock shaft	
Diameter	4.2 m (circular)
Length	72 m
Powerhouse	
Type/ Length x width x height	Surface/ 40.42m×19.30m ×33.81
Turbine	
Turbine Type/number	Francis (vertical axis)/2
Length of Transmission line (132 kV)	3 km
Generator	
Rating/ No. of units	22.7045 MVA/ 2
Power and Energy	
Maximum Goss Head	90 m
Installed capacity	37 MW
Average annual energy	292.58 GWh

Following are the highlights of the Project activities of fiscal year 2075/76:

- Upper Trishuli 3B Hydroelectric Project has been selected by Government of Nepal as the first Project under the "Janata ko Jalvidhyut" programme. Accordingly, Trishuli Jal Vidhyut Company Limited issued Initial Public Offering (IPO) of its shares to the general public in March 2019. Right Honorable Prime Minister Mr. K.P. Sharma Oli was the first applicant of this IPO
- Honorable Minister for Energy, Water Resources and Irrigation Mr. Barsha Man Pun "Ananta" laid the foundation stone of the Project on 10 Feb 2019
- Loan agreement with the consortium of Nepalese Banks led by Nabil Bank Ltd. and co-led by Jalvidhyut Lagani Tatha Bikas Company Ltd. as part of financial closure for the debt portion required for the Project was signed on 20 August 2018.
- Acquisition of forest land and tree cutting has been completed.
- Temporary road construction to Surge Tank and Adit 2 has been completed.
- Excavation of about 675 m of Headrace Tunnel has been completed
- Excavation of about 115 m of Adit 2 has been completed.
- Detail Design of permanent support in Rock Class II and III of Headrace Tunnel has been approved.
- Detail Design of Surge Tank, penstock, powerhouse 1st stage excavation, Headpond, Approach Pressure Conduit have been approved.
- Honorable Minister for Energy, Water Resources and Irrigation Mr. Barsha Man Pun "Ananta" laying the foundation stone of the Project

Inlet portal of Headrace Tunnel

Signing ceremony of Credit Facility Agreement



Right Honourable Prime Minster, Mr. K.P. Sharma Oli applying for the share of Trishuli Jal Vidhyut Company under the "Janta ko Jalvidhyut" programme.

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)

400 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 Venture Company 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

400 kV Tower of Dhalkebar- Muzzafarpur Transmission Line

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.

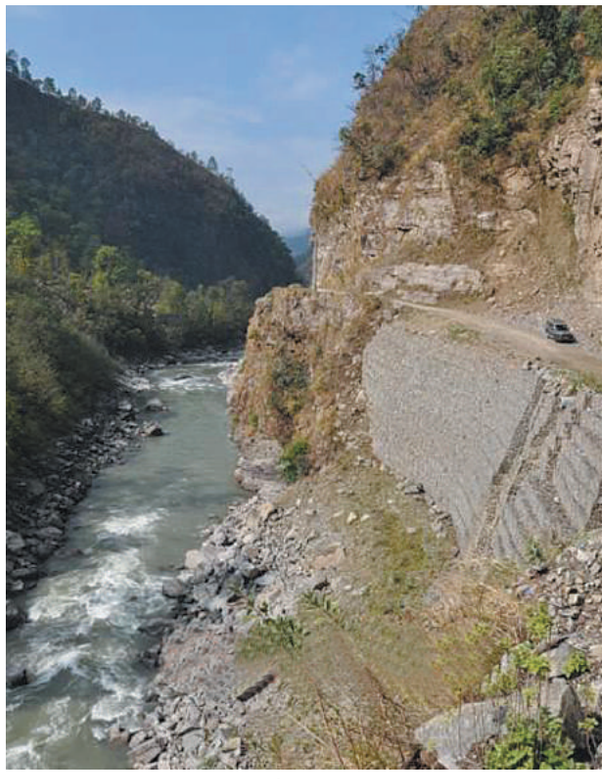
NEA is presently drawing up to 145 MW of power from India through this line. Import of power through this cross border Transmission line has been major backbone in eradicating the load shedding in Nepal. Upon the completion of the 220 kV substation at Dhalkebar, this line is expected to be charged at 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 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 Kathmandu and 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 inter connection arrangement and conveys to headrace tunnel of this Project. An underground powerhouse is proposed at Suri Dovan.

The design discharge of the project is 66 m3/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 94.8 MW. An additional 5 MW equipment is installed to utilize minimum flows coming from Upper Tamakoshi powerhouse during the off-peak operation hours. Hence, the 5 MW turbine will be operational for about 18 hours a day only the dry seasons when Upper Tamakoshi will be storing water for peak operations.

Test Adit Construction



Project Area

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. Discharge from the tailrace

Test Adit Construction

of Upper Tamakoshi HEP is diverted through an interconnection system and conveyed to the 8.1 Km long concrete lined headrace tunnel, a 138.93 m high drop shaft, 404.36 m long horizontal Penstock pipe, underground powerhouse with four Francis turbines (three vertical shaft and one horizontal shaft), from where the discharge is released into the Tamakoshi river at about 0.7 km downstream from the confluence of Tamakoshi River and Khari Khola at Suri Dovan.

Generation license of the project was obtained from Department of Electricity Department (DOED) 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 has been transferred from NEA to Tamakoshi Jalvidyut Company Limited on 2074/09/05.

For the speedy implementation of Tamakoshi V, NEA has already initiated the construction of Interconnection system between Upper Tamakoshi Hydroelectric Project (UTHEP) tailrace tunnel and headrace tunnel of Tamakoshi V through UTHEP using the Contractor working for the UTHEP. Construction of Interconnection Tunnel, Chamber, Gate Shaft and Adit Tunnel has been completed whereas the installation of gates at the interconnection will be completed soon.

Detailed Engineering Design and Tender Document Preparation work for the project was contracted to Lahmeyer International GmbH. As a part of the geotechnical investigation in detailed engineering design besides the surface geological investigation and bore hole drilling, a test adit of 175 m was constructed upto the crown of an underground powerhouse. All necessary laboratory tests and in-site rock mechanics test were carried out inside the test adit.

The increment in license area resulting in the increment of installed capacity from 87 MW to 99.8 MW come up with the requirement of Supplementary Environmental Impact Assessment Study (SEIA). SEIA process has been initiated. Public hearing for SEIA was held at project area (Jamune) on 8th June, 2019 and Draft SEIA report was submitted to Department of Electricity Development (DOED) on 20th June, 2019 followed by presentation on 12th July 2019. Final SEIA report incorporating all the comments from DoED has been submitted for its approval.

Land required for the powerhouse and interconnection area has been identified. Land acquisition process at Suritar (Power House Area) through District Administration Office, Dolkha has been completed. Similarly land required for the permanent camps of client and engineers has been identified and land acquisition process through District Administration Office, Dolkha has been initiated. Total amount required for the land acquisition has been transferred to the District Administration Office for distribution to the land owners. Beside this, preparatory works for Construction supervision and project construction of Tamakoshi V Hydroelectric project; "Expression of interest (EOI) for Construction Supervision" and "Prequalification (PQ) of Bidder for civil and hydro mechanical works [Contract 1-Civil and Hydro-mechanical works]" have already been issued. Evaluation for EOI for construction supervision and PQ for Contract -1 are currently ongoing. Preparatory works for Prequalification of Bidder documents for remaining construction packages [Contract-2 Electro-mechanical works

and Contract-3 Construction of Permanent Camps] has been initiated.

With regards to financial arrangement of the project, Nepal Electricity Authority (NEA) has requested Ministry of Energy (MOE) to request Ministry of Finance for necessary arrangements for financing the project through Asian Infrastructure Investment Bank (AIIB) through letter dated 17th May 2018. The same request letter was sent to Ministry of Finance (MOF) by Ministry of Energy (MOE) through letter dated 1st June 2018.Pre-concept approval for the project has been issued by AIIB on November, 2018. For project preparatory works of Tamakoshi V HEP, a Grant Agreement has been signed by Ministry of Finance, Government of Nepal and AIIB on 25th February, 2019.

The grant agreement has been signed for the following additional studies:

1. Biodiversity Action Plan (BAP)
2. Supplemental Environmental and Social Documentation (SESD),
3. Panel of Technical Expert (PTE)
4. FPICon Process- Study on Indigenous people

Expression of Interest (EoI) and RFP evaluation for BAP and SESD has been completed. Notice for opening of the financial proposal for the consulting firm obtaining highest mark in technical evaluation for BAP and SESD has been issued. Expression of interest (EoI) evaluation for FPICon and PTE has been completed and final negotiation with selected experts is ongoing.

Nepal Government has included Tamakoshi-V Hydropower Project into a program called Nepal Ko Pani Janatako Lagaani (People's Investment for Nepal's Hydro) launched by Ministry of Energy to encourage general public investment in Hydropower development . Necessary activities are being carried out to fulfill the prerequisites for the program.

UTTARGANGA POWER COMPANY LIMITED

Uttarganga Power Company Limited was established on the 30th day of March, 2017 as a subsidiary company of Nepal Electricity Authority. Since its establishment through registration in Company Registration Office it has undertaken the study and development of Uttarganga Storage Hydroelectric Project. Survey License of Uttarganga storage hydroelectric project for 828 MW was transferred from NEA to Uttarganga Power Company Limited on 2074/04/02. The following paragraphs describe in detail the Uttarganga Storage Hydroelectric Project.

Uttar Ganga Storage Hydroelectric Project

Uttar Ganga Storage Hydroelectric Project with an installed capacity of 828 MW is a storage project identified by NEA during "Identification and Feasibility Study of Storage Projects". After being selected 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. As the project is located within the Dhorpatan Hunting Reserve, pre-approval is required from Ministry of Forest and Environment for conducting the feasibility study. However, 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 (EIA)

Dhorpatan Valley (Proposed Reservoir Area)

at the earliest. 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.

The project site is located about 398 km west of Kathmandu in Baglung district of Gandaki Province. The dam site is located at Gaba village 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 (Pushpalal Lokmarg) between Burtibang and Rukum. The dam site is accessible through a 48 km fair weather road from Burtibang bazar. However upgrading and realignment of certain parts is required for proper utilization of the road for project construction.

Major components of the project are 200 m high rockfill dam, sloping type intake, 8.51 km long headrace tunnel, circular restricted orifice type surge shaft, 5.2 m diameter penstock pipe, etc. The tailrace cum construction adit of powerhouse-1 has a length of 408 m, whereas powerhouse-2 tailrace has a length of 2334 m. Both powerhouses 1 and 2 are underground consisting of four units of vertical shaft Pelton turbines each of 104.25 MW installed capacity in each powerhouse. Tandem control arrangement is conceptualized between powerhouses 1 and 2 during its operation. A 65 km long 400 kV double circuit transmission line is proposed to evacuate the power to the proposed Uttarganga Hub in Rukum.

During the fiscal year 2075/76 Scoping and ToR for Environment Impact Assessment (EIA) of the project was approved by the Ministry of Forest and Environment on 2075/05/17. The Public Hearing Programs at Dhorpatan and Nishi Khola were successfully organized on 2076/03/18 and 2075/03/20 respectively. Final EIA Report was submitted to Department of Electricity Development on 2076/03/26. Similarly Feasibility Study of the project was completed during this fiscal year. Detailed topographical survey of dam site, intake site, surge tank area, powerhouse area, tail race area and Employer's camp area near powerhouse site was completed. River cross sections at about 200m interval were taken for the three kilometer stretch between dam site and intake site. Similarly 100 numbers of river cross sections along Nishi Khola between tail race and confluence of Nishi Khola and Badigad River near Burtibang was taken to study adequacy of river banks to accommodate 78.06 m3/s of design discharge. Geological mapping, ERT study of major project component areas and construction material survey was also carried out. Spot discharge measurements were carried out during site visits by engineers from UGSHEP. Regular gauge reading and sediment sample collection is being carried out. EOI for short listing of international consultants for Review of Feasibility Study Report, Preparation of Detailed Engineering Design and Bidding Documents were published as part of consultant selection.

Application for Generation License was submitted to DoED on 2076/03/12 along with copies of Draft Feasibility Study Report, Draft EIA Report, Survey Report and Geotechnical Study Report.

The distinct features of the project are as follows:

- Availability of very high gross head of about 1355m 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 about 12.59% and B/C of 1.28.

RASUWAGADHI HYDROPOWER COMPANY LIMITED

Rasuwagadhi Hydropower Company Limited (RGHPCL), promoted by Chilime Hydropower Company Limited (CHPCL) and Nepal Electricity Authority (NEA), was established on Shrawan 17, 2068. The company is constructing the 111 MW Rasuwagadhi Hydroelectric Project (RGHEP) in Rasuwa district. The project lies some 65 km north of Kathmandu and can be accessed via Trishuli. The project is planned to start generation by the end of the current fiscal year, i.e. July 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 forms the Boundary between Nepal and China. This is a run-of-river type project with an annual generation of approximately 613 GWh.

Key Features of the Project

Type of Project	Run-of-River(ROR)
Design Discharge (Q_{40}):	80.00m^3/s
Geology:	Quartzite, Magnetite and Gneiss Rock
Gross Head:	167.9 m
Headwork:	Overflow Diversion Weir with Undersluice gates and Side Intake
Desander, Type, Size and Flushing System :	Underground, 3 nos -125mx15mx23m with S4 Flushing System
Headrace Tunnel length and size:	4185m, dia. - 6m~7m
Penstock Vertical Shaft:	133.4m (including elbow section)
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

The project is being constructed under three different contracts; Lot 1, Lot 2 and Lot 3.

Lot 1: Civil and Hydro-Mechanical Works under Engineering, Procurement and Construction (EPC) contract model. The contract was signed with M/S China International Water and Electric Corp. (CWE) on 5th January, 2014.

Lot 2: Electromechanical Works, the contract was signed with M/S VOITH Hydro Pvt. Ltd, India on 31st July, 2014.

Lot 3: Transmission Line works which includes construction of about 10 km long 132 kV double circuit transmission line, the contract agreement has been signed with M/S Mudbhary and Joshi Construction Pvt. Ltd., Kathmandu on 15th June, 2017.

The contract with the project Consultant M/S SMEC International Pty. Ltd., Australia was signed on 3rd December, 2017. It has been continuously supervising the Lot 1 & Lot 2 construction works as well as reviewing and approving the design and drawings submitted by the contractors. The coordination between the two contractors for smooth operation of construction work activities is also under the scope of the Consultant.

Present Status of the Project

The progress summary of the major construction activities are as follows:

Temporary Camps

Infrastructure works

The devastating Earthquake of 2072 heavily damaged the under construction camp facilities. The work there has still not taken off. As an alternative, Employer's temporary camp facilities (pre-fab buildings) was built in the Timure/ Thuman area and the project team has been using this facility for residence as well as office work till date.

Lot 1: Civil and Hydro-Mechanical Works

The concrete works for the Under sluice and Intake structure has been completed with gate installation. Left bank slope protection works is in progress and overflow weir construction work is also ongoing. The third layer excavation with primary support for desander caverns 1, 2 and 3 have been completed and the forth layer excavation is in progress.

Headworks undersluice gates

The major part of the civil works for the underground powerhouse has been completed. The internal frame structure, control room, lift, staircase and assembly bay are completed. In the Transformer cavern, rail installation and second stage concreting has been completed for Block 3. As for Block 1 and 2, slab concreting has been completed.

The excavation and primary rock support of Headrace Tunnel of length 4185m is complete. Concrete/ Shotcrete Lining and invert concreting works are going on. Steel Lining with backfill concreting for the Penstock Vertical Shaft (PVS) is in progress with 34 m, including bend, still to be completed. 87m of the Tailrace Tunnel excavation in soft ground remains to be completed. TRT outlet structure is almost complete.

Transformer Cavern

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. Most of

the equipment components have already been delivered and is in the process of being installed. Installation of Powerhouse EOT Crane and Pit Liners, Spiral Casing of all the units are complete. Pressure Test of Unit # 3 and Unit # 2 Spiral Casing has been completed and already concreted up to the Machine floor level whereas the installation of Stator Frame of Unit # 3 is ongoing. The installation of Cable Tray in the Switchgear room of the control bay is completed.

Powerhouse

Lot 3: Transmission Line Works

The construction of132 KV double circuit Transmission Line Works is in progress. The Contractor has completed the detail survey and design work. The private land acquisition required for the Tower foundation has been completed and the land acquisition for Right of Way (ROW) is in the final stage. Tower foundation excavation is in progress.

The combined overall progress achieved till date is approximately 70%. Because of various unforeseen events, April, 2015 earthquake, Nepal-India border blockade and its aftermath as well as the regular landslides, dry and wet have regularly blocked roads as well as site access. At the same time it has also increased the volume of protection works that have been carried out and are still required to be carried out to ensure safer working environment. The present monsoon is also causing massive slides blocking roads and making work site inaccessible temporarily.

Financial Arrangement

The financial requirement for the construction of the project has been managed on a 50:50 Debt: Equity ratio. The debt portion is being managed by the Employees Provident Fund (EPF) under the long term loan agreement signed on 22nd Mangshir, 2068. The equity portion has been divided into 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 the 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 51 % of equity investment has already been paid up by the Promoter groups as per their commitments. 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. Similarly 15 % of general public shares and the Employees of the Company have also been issued. Necessary preparation for issuing the remaining 10 % shares to the locals of Rasuwa district is in progress.

MIDDLE BHOTEKOSHI HYDROELECTRIC PROJECT (MBKHEP-102MW)

Madhya Bhotekoshi Jalavidyut Company Ltd. (MBJCL), a subsidiary company of Chilime Jalavidyut Company Limited, is constructing Middle Bhotekoshi Hydroelectric Project (102 MW) in Sindhupalchowk District of Province no. 3 of Nepal.

I. Capital Structure

The Company managed its 50% debt part from EPF and 50% equity parts 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. Sindhu Bhotekoshi 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%

All the above mentioned shares has been issued except number 4 and 5 (25%), which is in the process of issuance.

II. 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

III. Key Construction Activities

The Construction works are divided into following packages:

1. Infrastructure Development
2. Civil and Hydro-mechanical works(Lot-1)
3. Electromechanical works (Lot-2)
4. Construction of Transmission line

Excavation at Headworks

Concreting in Power House

Breakthrough of vertical Penstock shaft

Infrastructure Development

Construction of camp Buildings for the accommodation of employer and consultant staffs are completed and in operation. Some prefabricated buildings are in use for security personnel's. A 250m long Adit1 tunnel and 350m

long diversion tunnel were constructed before the mobilization of main contractor to expedite the work.

Civil and hydro-mechanical works (Lot-1): China Energy Engineering Group, Guangxi Hydroelectric Construction Bureau is the contractor of Civil and Hydro-mechanical work. Excavation and slope protection by soil nailing is almost complete in headworks area. Excavation in spillway and desander part is also complete upto the foundation level. Approximately 50% of bore piles have been completed as cut off structure. 75.4% of tunnel excavation, i.e. 5924 meter out of 7855 meter including 730m long penstock tunnel has been completed. Powerhouse excavation has been completed and concreting works in powerhouse is being continued. It is planned to complete the project at the end of December 2020.

Electromechanical Works (Lot-2): Andritz Hydro Private Limited, India is the contractor for Electromechanical works. The company manufactured and supplied about 60% of the equipment and stored at site store. Installation of draft tube, second stage concreting is being planned in coordination with the consultant Tractebel Engineering GmbH, Germany. The project is planned to generate energy at the end of December 2020.

Transmission Line works: The contractor, Urja-Ac JV for the construction of 4 Km 220 kV transmission line has completed the check survey and submitted the tower design, which is under approval process. Initial Environmental Examination (IEE) for Transmission Line has been completed. Construction license for 4 km long 220KV transmission line is in the process.

Restoration of Araniko Highway above HRT Inlet

Bore Piling at Headworks Area

CENTRAL ACTIVITIES

INTERNAL AUDIT DEPARTMENT

The Internal Audit Department is an independent organizational unit that is accountable for its work directly to the NEA Board and is functionally and organizationally distinct from NEA's other units. It has a role to provide independent assurance that organization's risk management, governance and internal control processes are operating effectively. The purpose, authority and responsibility of the internal audit activity is formally defined by the NEA's Financial Administrative Bye laws, 2073 and Internal Audit Guidelines. Guided by the Audit Committee and headed Director, the department is responsible for planning, executing, monitoring & evaluation of audit as per the organizational guidelines as well as Nepal Auditing Standards.

ROLE OF THE INTERNAL AUDIT

Internal auditing is an impartial assurance and advisory activity designed to add value and improve the organization's performance.

It helps the organization to achieve its goals by systematically and methodically assessing and improving the performance of risk management, control procedures and organizational management.

INTERNAL AUDIT COMPONENTS

Audit Committee:

NEA has formed a three member - Audit Committee, headed by a member of the NEA Board and two experts each from Finance and Energy sector. The roles, composition and necessary powers and responsibilities of the audit committee are set out by the Board in NEA's Financial Administrative Byelaws. The roles of the audit committee are:

- Facilitating communication between the Board of directors and the internal and external auditors;
- Facilitating the maintenance of the independence of the external auditor;
- Providing a structured reporting line for internal audit and facilitating the independence of the internal auditor.
- Monitoring the financial reporting process and effectiveness of the company's system of internal check, internal audit and risk management.

Divisions within the Internal Audit Department

Financial Audit	• Verification ofthe effectiveness and efficiency of internal control over the financial reporting process. • Review of the internal processess, compliance with applicable law, accounting standards, rules and regulations, organizational policies, propriety audit.
Technical Audit	• Audit of technical norms and standard, energy balance, preventive as well as breakdown maintenance, condition monitoring and electricity loss as per the guidelines available.
Management Audit	• Review of implementation of managerial plans, policies, procedures, and targets, procurement management, organizational structure, job analysis program, accountability and monitoring & evaluation.

The department performs the aforesaid audits on quarterly basis and reports to the Audit Committee and Managing Director of NEA. The audit committee holds regular meeting and interactions with the department for providing directions on matters related to audit.

Progress Observed

Audit Coverage (No of budget centers audited)

Offices	Financial Audit		Technical Audit		Management Audit	
	F/Y 2074/75	F/Y 2075/76 Half yearly	F/Y 2074/75	F/Y 2075/76 Half yearly	F/Y 2074/75	F/Y 2075/76 Half yearly
Central Office	1	4				
DCS	108	124	50	49	35	81
Transmission Directorate	10	8	1	6	6	3
Generation Directorate	17	3			2	1
Engineering Service Directorate	8	6			2	2
Project Management Directorate	1	1				
Projects	85	91		7		17
Total	230	237	51	62	45	104

Capacity Building & Resource Strengthening

- Recruitment of 3 Chartered Accountants (On Contract basis) was made by creating new positions in the year for enhancing quality of audit, professional ethics and standards among the auditors.
- Training was conducted on First time adoption of NFRS in Malaysia where 2 representatives from the department participated.
- Similarly training cum workshop on "Audit Scope, Methodology, and Processes" was conducted for all the internal audit department members to increase their performance.

Way Forward

Apart from the existing roles, the department has planned to bring innovative efforts to revamp the internal audit function to contribute within and outside the department.

- Periodic certification of Financial Statements and Financial Indicators for publication/ report to Stakeholders.
- Increase number of trained and capable resources through continuous training and development activities.
- Maintain a system of stepwise review of Audit Documentation and Report of each and every audit team. Report will be forwarded only if the audit documentation and report thereon is within the Standard set.
- Conduct special assignment to resolve long pending issues and risky areas identified

Major Improvement Required

The department is continuously making efforts in enhancing the level of economy, efficiency and effectiveness of the audit work performed. However, following are the major improvements required in Internal Audit Department:

- The department should be provided with adequate skilled and competent manpower.

- Adequate training programs should be conducted to refine the knowledge of the auditors.
- The organization should introduce system of providing incentive, as a motivational factor, to attract and retain good auditors thereby increasing the effectiveness of internal audit of NEA.

NEA BOARD MATTERS

The Minister Mr. Barsha Man Pun 'Ananta' of Ministry of Energy, Water Resources and Irrigation has been chairing the NEA Board Meetings since 25th Mangsir, 2075. Earlier, Mr Anup Kumar Upadhyay, Secretary at the Ministry of Energy, was the Chairman of NEA Board of Directors from 28th Bhadra, 2073.

The Secretary at the Ministry of Energy, Water Resources and Irrigation is also a nominated Board of director and Mr. Dinesh Kumar Ghimire, Secretary (Energy) at the Ministry of Energy, Water Resources and Irrigation was nominated as the Board of Director of NEA from 18th Poush, 2075.

The Secretary at the Ministry of Finance is also a nominated Board of Director of NEA. The Ministry of Finance has nominated Mr. Lal Shanker Ghimire, Secretary (Revenue) as the Board of Director of NEA from 11th Poush, 2075. Mr. Shishir Kumar Dhungana, Secretary (Revenue) was the Board of Director of NEA from 32nd Ashad, 2075 to 4th Poush, 2075 (782th Board Meeting).

Mr. Chandra Tandon was the Board of Director till 10th Ashoj, 2075. Mr. Bishwo Prakash Gautam was nominated as the Board of Director from the decision of 18 Ashoj, 2075. The rest of the Board of Directors have remained unchanged; 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 28 Board Meetings (774th to 802nd) were held in the last fiscal year, 2075/076. Important decisions relating to and for the benefit of NEA were taken. Some of the more significant decisions taken and under review are;

- Net Metering modification is under review.
- Approval of www.nea.org.np/eboard for board meeting process.
- The Financial Bylaws (Modification 2068) is under review.
- Approval of The Employees Services Bylaws, 2075.

ENERGY EFFICIENCY AND LOSS REDUCTION DEPARTMENT

Energy Efficiency and Loss Reduction Department aims to carry out various activities in order to enhance the supply side and demand side efficiency of electricity distribution system. The department also performs various activities for data collection, analysis and reduction of technical and non-technical losses. The department performs its activities through two divisions.

A. Energy Efficiency Division

Capacitor Bank Installation

For reactive compensation in distribution system and power factor improvement using shunt capacitors, the department has awarded a contract for 325 nos of Automatic Power Factor Correction (APFC) Panel Boards. Distribution transformers of 200 kVA and higher ratings with low power factor shall be selected throughout the country for installation of APFC. The microprocessor based pf controller technology used in this APFC project enables sensing the existing power factor and automatic switching of capacitor units to meet the target power factor thereby preventing the leading pf status. Technical data like transformer loading in kVA, reactive power in kVAR, power factor, and information about the number of steps of switched capacitors will be reported in real time to a central

server using 3G/4G network. Status of power factor improvement in all the installed locations can be viewed in real time from anywhere using IoT technology. To mitigate the effect of dominant 3rd harmonics, 14% detuned reactors have also been used in series with the capacitors to build a compact modular APFC for easy installation by the side of distribution transformers.

The department has also planned to install 11 kV APFC at 33/11 kV Distribution Substations for reactive power compensation and power factor improvement in the FY 2076/77.

Smart Street Light

Upon the request of Lalitpur Metropolitan City (LMC) the department conducted a joint survey for installing Smart Street Lights in the prime areas of Lalitpur. Being completely funded by LMC, NEA has awarded a contract for installation of around 650 nos of smart LED street lights using existing poles and new poles in half proportion each. Smart technology used in this project enables facilities listed herein but not limited to automatic switch-on of lights after sunset, auto switch-off after sun-rise, full intensity of light at peak hours, dimming as required of individual luminaires at night, software billing of individual lights, data storing and controlling from central server. The project is expected to complete by the end of FY 2076/77.

Electric Vehicle (EV) Charging Station

To cope up with the increasing demand of Electric Vehicles (EV) and to support government's policy to promote EVs and build charging infrastructure, the department has made a rigorous study on the types of EVs imported in Nepal, their charging protocols, worldwide trend of charging protocols etc. To enable EV charging based on all three modes of charging viz CHAdeMO, CCS and GB/T using DC boost charge technology, the department is continuously working to build charging stations in all seven provinces so as to facilitate public charging of EVs, both small vehicles and large buses.

Nepal Energy Efficiency Program (NEEP-III)

Nepal Energy Efficiency Programme (NEEP) is being implemented to promote and realize energy efficiency in Nepal since 2010. NEEP is implemented by the Ministry of Energy, Government of Nepal with technical assistance provided by GIZ, acting on behalf of the German Federal Ministry for Economic Cooperation and Development (BMZ). Third phase of Nepal Energy Efficiency Program is in effect since December 2018. The programme is focused on the market based energy efficiency services for the private and public sector. NEA is the major partner organization to implement the NEEP III program. Energy Efficiency and Loss Reduction Department in cooperation with GIZ Nepal is continuously working for enhancing the supply side and demand side efficiency of distribution system under NEEP III.

The scope of works under NEEP III includes various pilot projects to be conducted at Nagarkot feeder of Bhaktapur Substation for system reinforcement and DSM activities such as GIS mapping, HVDS implementation, Network AMR metering, Customer smart metering, real time feeder power monitoring, feeder energy accounting / audit, technical/commercial feeder loss assessment, consumer service management etc. The program also includes capacity development of NEA employees, public campaign for creating awareness about energy efficiency and loss reduction among NEA consumers and general public.

Grid Tied Energy Efficient Solar Water Pumping and Irrigation

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.

The department has successfully installed three numbers of grid tied solar water pumping system with net metering facility (2 nos in Chitwan and 1 in Udaypur).

Central Data Storage and Online Monitoring System

The department has initiated the development of central storage of substation technical data and online data monitoring system. Actually, it is the web based data storage, processing and presenting tool which is aimed to replace the traditional practice of manual data keeping at substations by digital data system. The web based program can analyze and present these data by means of user friendly tools like graph, chart etc. These real time data continuously updated by substation personnel will save in central server of NEA. It will be useful for having an idea of power inflow and outflow, power loss, peak load of the feeders, substations etc. It will also help for future planning of distribution system expansion.

The department has successfully completed the server installation at IT department, software installation and testing of online data keeping and operation of data monitoring system at K2 substation, Ratnapark. The department is planning to extend the system to other substations in the FY 2076/77.

Awareness Campaigning

The department has conducted several campaigns to create public awareness on energy efficiency and loss reduction.

A team of artists including folk singers, dancers and musicians was mobilized in some districts of Terai region (Dhanusha, Mahottari, Bara, Parsa, Rautahat) with the objective of creating nation-wide public awareness on demand side management and energy efficiency through media campaign on local level along with the broadcast of relevant information materials on national level television. Six video clips with interaction/training conducted with local people were recorded and broadcasted in national television.

Two Television commercials of 1 minute duration were prepared using animated characters for creating public awareness on use of efficient appliances and electricity theft/loss control, which were broadcasted 10 times per day before news on Nepal Television.

Two Television commercials of 30 second duration were prepared casting the popular celebrities for creating public awareness on use of efficient appliances and electricity theft/loss control, which were broadcasted 10 times per day before news on Nepal Television.

B. Electricity Loss Reduction Division

I. Loss and Leakage Control Activities

The Electricity Loss Reduction Division is under Energy Efficiency and Loss Reduction Department, is led by Manager and entrusted with the responsibility to control the electricity theft, energy leakage and electricity 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, wrong connection etc. Division had 11 number of employees working during fiscal year 2075/076 including Technical, Administration & Driver. There was one dedicated pick up for the field visit.

II. Target of Loss Reduction Division of FY 2075-076

In the fiscal year 2075/076, Division had set target to inspect 400 consumers with TOD meter installed and 800 consumers with whole current meter installed under different Regional offices. The focus has been given to Industrial Consumers. Division has also set target for monitoring, inspection and data download of rural community

Three phase hooking arrangement found in Gaur Distribution Centre

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.

III. Major Activities and Achievements of FY 2075/076:

(a) TOD meter Inspection

This year Division has performed its monitoring and inspection activities to the consumers of 52 different Distribution Centers of Distribution and Consumer Services Directorate of NEA. This year around 597 TOD meters have been inspected, out of which 14.90% were found with remarks. The major Remarks found during inspection were Un-programmed meter, Stock Units left by the reader, Reverse unit, C.T./P.T. outage, wrong MF calculation, Display outage of meter and Pilferage of energy meter. In few consumers, demand leakage, burnt meter, un-metered, and direct tapping in community consumers were also observed. Among the TOD meters inspected,26 were found with either CT/ PT outage or CT / PT wrong connection, 2 meters had display outage, 4 had without meter, 7 consumers were observed having billed with incorrect multiplying factor.

(b) Whole Current Meter Inspection

A total of 894 Whole current meters were

Community Consumer served without Energy meter under Parbat Distribution Centre

inspected this year, 8.94% of which were found with remarks. The major remarks found among the inspected meters were demand leakage due to oversized fuse/ MCB/ MCCBs/ No MCB/MCCBs installed at all, Pilferage of meter, stock units, clogged/stopped meter, meter burnt etc. In this year the Division has recovered 1,77,833 units from pilferage amounting Rs.26,45,510.00, From demand leakage Rs. 53,446.00 and stock units 46,870. This year following units are recommended for billing by the Division to concerned Regional Offices and Distribution Centres.

IV. Monitoring and data collection

The loss reduction division is also regularly monitor the loss reduction activities and revenue collection activities of distribution centers and regional offices. This division is collecting the activity data weekly and monthly basis and suggests as and when required to get their target figure regarding the loss. While being on field, the representatives of this division try to correct poor workmanship work with prudent practice.

Table 1 : Work Progress of this division (Comparision w.r.to last fiscal year)

S.No.	Activities	F.Y. 2074/075	F.Y. 2075/076	Increase /Decrease (%)
1	Distribution Centre Visited	42	52	23.81
2	TOD meter inspected	470	597	27.02
3	Problem found in TOD meter	61	89	45.90
4	Hydro power station visited	0	5	-
5	Grid Substations visited	0	8	-
6	Whole Current meter Inspected	1058	894	-15.50
7	Total units recovered(kWH)	1,896,020.00	3,732,534.75	96.86
8	Total Amount Billed (NRs.)	19,038,805.00	30,974,706.92	62.69

Table 2: Region wise Progress report of field visit

S.N.	Regional office	Meter Inspected		Electro Mechanical			Remarks found in TOD meter					Collection	
		Electro Mechanical	TOD	Theft found	Hooking	Stock	Reverse	Stock	CT/PT out & Wrong connection	Display out	Others	Unit	Amount
1	Kathmandu	128	113	32	12	0	6	2	6	2	0	155,357.00	1,849,815.13
2	Biratnagar	69	100	4	1	0	12	0	7	0	1	601,782.00	4,852,421.46
3	Janakpur	393	200	18	1	16	5	2	7	0	1	210,547.00	1,000,152.00
4	Hetauda	189	27	8	5	0	0	0	0	0	0	56,358.00	1,123,971.93
5	Butwal	0	15	0	0	0	3	0	1	0	0	2,208,774.00	18,962,555.56
6	Pokhara	84	57	0	0	0	7	2	4	0	4	121,712.00	580,258.97
7	Nepalgung	26	79	1	0	0	14	0	1	0	2	375,514.75	2,508,420.87
8	Attarai	5	6	1	0	0	0	0	0	0	0	2,490.00	97,111.00
Total		**894**	**597**	**64**	**19**	**16**	**47**	**6**	**26**	**2**	**8**	**3,732,534.75**	**30,974,706.92**
Additional Work:													

Additional Work:

1. **Hydro power Stations Visited:** Marshyangdi Hydro power Station, Seti Fewa Hydro power Station, Middle Marshyangdi Hydro power Station, Modi Khola Hydro power Station & Kali Gandaki Hydro power Station.
2. **Substations Visited:** Godak substation, Anarmani substation, Damak substation, Duhabi substation, Lahan substation, Mirchiya substation, Duhabi substation & Laalbandi substation.

ADMINISTRATION DIRECTORATE

Administration Directorate is accountable for overall planning, organizing, directing, implementing & monitoring of polices related to human resource management, recruitment management, general administration and legal management. This directorate is also responsible for circulating and reviewing of the decision of NEA board and Managing Director as well as coordination of different directorate activities. It also co-ordinate to the oversight agencies and other government agencies in relation to administrative activities of NEA. This directorate is supported by four departments namely Human Resource Department, Legal Department, Recruitment Department and General Services 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.

"Nepal Electricity Authority, Employee Term and Condition Bylaws 2075" has promulgated since 31 Jestha 2076.

"Centralized e-Attendance" has successfully tested and deployed from corporate office. Gradually, it will be implemented in provincial offices within this year.

Organization and Management Study (O&M) committee has successfully completed the Study and submitted the report to the NEA management for necessary approval.

A separate web based Darbandi Management System (DMS) and Human Resource Information System (HRIS) is to be implemented for the automation of approved and existing employee position, transfer and other HR processes.

Service Contract Document of meter reading work has been revised and circulated and ready for implementation. It will resolve existing meter reading problem throughout the Distribution & Consumer Service Directorate.

Light vehicle Service Contract documents have been prepared and ready for circulation. This document has been prepared on the basis of complete supply of specific condition light vehicle including driver and fuel completely. This will resolve the vehicle scarcity as well as reduce the cost of vehicle expenses throughout the NEA.

During the year under review different department, division and section have accomplished the following major activities:

1. Human Resource Division

Employees Status FY 2018/2019

The statistics of employed human resource till the end of fiscal year 2018/19 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	1145	0	0	1145
	Non-tech	582	23	605	547	0	0	547
	Total	1830	136	1966	1692	0	0	1692
Assistant Level (Level 1-5)	Technical	5883	0	5883	4568	22	47	4637
	Non-tech	3284	0	3284	2732	12	21	2765
	Total	9167	0	9167	7300	34	68	7402
Grand Total		**11006**	**136**	**11142**	**9001**	**34**	**68**	**9103**

The total numbers of approved position in NEA stands at 11,142 whereas working staff by the end of FY 2018/19 remained 9001. Remaining vacant positions are in the process of recruitment. During the year under review, 389 employees got retirement, this retirement comprises of compulsory retirement of 298, voluntary retirements of 36, resignation of 29 and 24 employees have decease during their service period.

During the year under review, the following activities were performed under disciplinary action.

Activities	No. of Employee
Edification	3
Warned	3
Force dismissal	1
Dismissal from Service	3
Termination by Service	6
Grade Decreased	2
Resume from Suspend	1

Similarly, complaints from government agencies like Criminal Investigation Abuse of Authority (CIAA), National Vigilance Center and Ministry of Energy, Water Resources and Irrigation were received actions as following;

S.N.	Agencies	Total Complaints	Reported	in process
1.	Complains received via CIAA	137	100	37
2.	National Vigilance Center	24	20	4
3	Ministry of Energy, Water Resources and Irrigation	17	15	2

2. Employee Welfare Division

Employee welfare division under Human Resource Department has provided following facilities in Employee in accordance to NEA rules and regulations.

S.N.	Descriptions	Types	Nos.	Amount (Rs.)	Total Amount (Rs.)
1	Grant	Grant	2	40000.00	3620000.00
		Kaj Kiriya	347	3580000.00	
2	Medical Insurance	Accidental	5	1850000.00	45005175.00
		Medical Treatment	1189	43155175.00	
3	Endowment Life Insurance	Payment received from Beema Corporation	406	47327316.23	294433400.01
		Additional Payment by NEA		247106083.23	
5	Soft Loan	Medical Treatment Loan	209	2090000.00	721508000.00
		Social Loan	219	4380000.00	
		House Maintenance Loan	216	10800000.00	
		Natural Disasters Loan	0	-	
		House/Land Purchase Loan	1568	704238000.00	

3. Human Resource Planning and Development Section

Under the Human Resource Department, HR Planning, development Section has accomplished the given significant works:

S.N.	Actions	Descriptions	Remarks
1.	2nd Organizations and Management review (O&M) report prepared and submitted to management for necessary approval.	Restructured of Entire NEA offices with new administrative division.	
2.	O&M survey has Completed the newly established branches during FY 2018/19	10 Distribution Centers & 1 Hydropower Stations	
3	Nomination for post graduates study by NEA expenses	Electrical Engineering - 3 Civil Engineering - 1 Computer Engineering -1 EMBA-1 LLM-1	7 personnel
4	Pre-approval for self-financing study	PhD -1 Post Graduates - 1 Bachelor - 3	5 personnel
5	Leave granted for study purpose in self-finance	Phd- 1 Bachelor - 3	4 personnel
6	Nomination for study in Nepal Government's quota	Post Graduates-1	1 personnel
7	Nomination for Factory Acceptance Test, Inspection, Trainings, Conference in abroad	121 programs	258 personnel
8	Nomination in national level workshops, Trainings, Conference	39 programs	262 personnel
9	Reviewed of temporary position for Projects	66 projects	
10	Nomination for Intern students from various academic institutions.	13 academic institutions	199 students
11	Nominations for Intern to individuals as per the recommendations of their academic institutions.	26 academic institutions	108 students

GENERAL SERVICE DEPARTMENT

General Service Department (GSD) is responsible for vehicle management, logistic support and security management activities. Record keeping, safeguarding of related documents and provides necessary support to concerned offices. It also manages the land of NEA against encroachment and misuse. The department is also responsible for events management, publishing regular magazine "Vidyut", public relation and public grievance handing. In the year under review, 2587 grievances were lodged through toll free number and resolved all the grievances. About 339 complaints were received via social media (Facebook, Twitter) SMS and other channels, out of those, 267 complaints were settled and rest are sent to concerned for resolved. NEA has 33,398-1-3-0 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/hellobidhut 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 and final result will be prepared and declared by by recruitment department. Similarly, it performs staff promotion as per the prevailing employees' terms and condition bylaws. During the year in review period, 420 deserving candidates for different level has recommended for permanent services after completing the selection procedure, 655 candidates are on the process of selection. Likewise, 670 employees of different levels were recommended for promotion to higher level.

LEGAL DEPARTMENT

Legal Department is responsible for legal matters of NEA. It defends all legal cases of NEA in different courts throughout the country and abroad too. It provides legal advice/suggestion to the concern offices of NEA. The department has started a separate software for archiving the corresponding legal documents as well cases related to NEA in the form of digital system.

The legal department also involves in arbitration, legal drafting, bid evaluation, investigation, case study and negotiations. During the year in Review, the department provided 124 numbers of legal advices to the NEA offices. During the year, 151 number of cases were registered in different courts for and against of NEA. The different courts have finalized 46 number of cases, out of them, 27 verdicts were in favor of NEA and 16 cases were against the NEA, 3 cases are in adjourn and 105 cases are under consideration for courts judgment. Likewise, out of 6 cases registered in arbitration tribunal, 2 verdicts were in favor of NEA, one case was against NEA and 3 cases are under consideration for tribunal judgment.

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. Two separate projects namely Institutional Strengthening Project and Physical Verification and Valuation of assets have been formed. Institutional Strengthening Project, has been placed in operation to implement ERP based Integrated Financial Management Information System (IFMIS) and Revenue Management System (RMS) whereas Physical Verification and Valuation of Assets Project performs verification and valuation of inventories & property, plant and equipment and develop IT based asset register.

This FY remained another successful year for Nepal Electricity Authority (NEA) in terms of operational and financial performance improvement. This was made possible by efficient management of power including demand side management, commissioning of new power plantsby Independent Power Producers (IPPs), commissioning of long awaited Trishuli3A Hydropower Project (60 MW) has started operationsand increase in the quantum of import from 400 KV and 132 KV cross boarder transmission link with India under commercial arrangement. By adopting the measures for reducing the losses in distribution network strengthening, upgrading the capacity of transformers, bringing new substations into operations, load balancing and by organizing programs as loss reduction activities, actions against hooking and awareness against electricity theft. The loss reduction activities, carried out through out the year, reduced loss remarkably from 20.45% to 15.32% during the year under review. In addition to above all, the average selling rate of electricity has been instantly increased to NRs. 10.48 per kWh from NRs. 10.10 per kWh. This is due to continious supply to industrial consumers even in peak hours, increase in consumption level of high end domestic, commercial and dedicated consumers. With the implementation of budget locking system in Centralization of Customized Accounting System and bringing this into operation has resulted in the reduction in operations and maintenance costs all over the

offices as financial discipline was enforced. With the All these elements contributed to increase in the gross revenue from NRs. 62,788.62million in FY 2017/018 to NRs74,341.01million before deduction of rebate in 2018/19 and this resulted in operating surplus of NRs. 15,420.38 million in FY 2018/19.

NEA maintained reasonably progressive year in terms of electricity sales, power supply and financial performance. Energy generation from NEA's hydro power plants recorded 2,547.99 GWh as compared to actual generation of 2,308.24 GWh in previous year 2017/18. 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 2,190.05 GWh which is higher by 22.29 GW has compared to previous year 2017/18. Similarly, NEA increased power import from India in order to meet the electricity demand in the country. Total import from India constituted 2,813.07 GWh which is higher by 8.96% import against the previous year's import of 2,581.80 GWh. NEA succeeded in increasing the total available energy in the distribution system to 7,551.23 GWh by adding its own new power plants, generating more than the target from exising power plants and purchasing additional energy from IPPs and India.

NEA's contribution to the total availability of power is increased to 33.75% as compared to 32.71% in the previous year. Energy supplied by IPPs and import from India constitutes 29.00% and 37.25% respectively. Out of the total available energy, NEA recorded 6,394.38 GWh energy as energy consumed by the consumers including internal consumption and rest of the units contribute to system losses. During the review period, NEA initiated substantial efforts to minimize leakage by implementing, monitoring and conducting awareness programs and strengthening augmentation of distribution lines, transmission networks and substations. This resulted in a loss reduction to 15.32% in this FY from 20.45% in last FY 2017/18 which is great achievement in the loss reduction (by 25.09%).

Domestic consumers continued to be the largest consumer category with 93.56% share of entire consumer base. However, contribution to the gross revenue by domestic consumers stands only 37.69 %. On the other side, Industrial consumer category holds only 1.35% of entire consumer volume but contributes 39.95% to the total gross revenue. During the year, NEA's total consumers increased from 3.57 million to 3.91 million including community and bulk buyer.

NEA achieved attractive growth in total sales of electricity figuring to 6,381.21 GWh in FY 2018/19 from 5,560.24 GWh in FY 2017/18. The factors behind this are higher energy availability in the system and reduction in system losses. Overall growth in gross sales revenue measured 18.97% higher as compared to the previous year sales revenue and individual growth in domestic and industrial consumer category noted 10.15% and 27.78% respectively. Out of the total gross revenue, NEA allowed NRs. 880.63 million as rebate in order to motivate consumers to pay their electricity bills earlier than given credit period. Additionally, NEA earned NRs. 7,509.12 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. 3,025.58 million as interest income on bank deposits, loans and as dividend income from investment in subsidiaries. NEA's gross income including income from non-core business activities reached to NRs. 74,341.01 million as compared to NRs. 62,295.61 million in the earlier fiscal year 2018/19. The growth in the overall income reached to 18.40% in comparison to the last FY.

NEA's total operating expenses increased from NRs. 53,019.39 million to NRs. 58,040.01

million for the year 2018/19. 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. 37, 161.40 million for power purchase and is 8.88% higher than the previous year. Similarly, transmission cost increased to NRs. 1,996.62 million from NRs. 1,883.09 million in the previous year with a growth of 6.03%. This includes wheeling charge for power import through Cross Boarder Transmission Line which is NRs 1,040.00 million. NEA increased investment for strengthening distribution system through out the country that resulted into increase in distribution costs from NRs. 7,645.02 million to NRs. 8,691.45 million. Other operating expenses included generation costs, royalty and administrative expenses that accounted to NRs. 1,852.01 million, NRs. 1,437.55 million and NRs. 2,190.72 million respectively.

Interest cost on long term borrowing increased by NRs. 1,328.22 million during this year. Interest expense in this FY 2018/19 has been calculated to NRs. 4,550.00 million as compared to NRs. 3,221.78 million in corresponding FY 2017/18. Likewise, depreciation expenses on property, plant and equipment resulted into NRs. 4,710.28 million in FY 2018/19 against NRs. 4,210.28 million in FY 2017/18. NEA recorded foreign exchange translation loss of NRs. 165.71 million in FY 2018/19 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. 3,500.00 million in FY 2018/19 towards long term employee liabilities with respect to gratuity, pension, medical facilities and accumulated leave facilities under employees' benefit plan scheme which is 40% higher than FY 2017/18.

NEA experienced continuously remarkable improvement in its operating performance as compared to last financial year. Net profit for the year 2018/19 sharply increased by 148.69% to reach at NRs. 7,204.67 million from NRs. 2,897.08 million in FY 2017/18. Reduction in system losses, increase supply to supply to industrial consumers, operating cost control, increase in generation of its own power plants and continuous supply of power and efficient management of funds all contributed to achieve net profits for the year under review. During the year NEA received NRs. 3,263.75 million as power import loss from India upto 2015/16 as per decision of Council of Ministers, GoN, under Financial Restructuring Plan-II, which was directly adjusted with accumulated losses. NEA has been successful in reducing accumulated losses to NRs. 15,220.12 million in FY 2018/19 from the corresponding figure of NRs. 34,608.7 million in FY 2015/16.

As per decision of Council of Ministers, GoN, under Financial Restructuring Plan- II of NEA, dues of GoN offices and street lights till the end of financial year 2016/17 were partially settled in coordination with concerned line ministry and through verifying due amount. Accordingly, Government of Nepal directly paid dues of street lights from local bodies to NEA amounting to NRs. 3,341.39 million in FY 2018/19. As a result of which the total trade receivables consumers including dues from government offices and local bodies stood to NRs.15,985.95 million at the end of FY 2018/19.

Property, plant and equipment (PPE) constitute the largest component of NEA's return generating assets. Net carrying amount of PPE reached to NRs. 120,303.35 million at the end of the FY 2018/19. During the year, NEA completed various distribution system reinforcement, rural electrification projects, sub-stations and distribution line projects which contributed an additional net capitalization of NRs. 12,029.08 million in property, plant, and equipment.

During the review period, NEA invested significant amount of resources in various

projects under generation, transmission and distribution. Accumulated investment in capital works in progress reached to NRs. 110,065.19 million with net addition of NRs. 32,458.19 million for the year 2018/19. The sources of investment included government equity and loan, foreign loan and grants and NEA's internal cash generation. However, financial returns from investments 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. 34,591.55 million in the year 2018/19. During the year, NEA increased its investment in subsidiaries and other companies by NRs. 4,650.00 million. NEA holds 51% of equity investment at a cost of NRs. 489.60 million in Chilime Hydropower Co. 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%.Till the end of FY 2018/19, total equity investments in Middle Bhotekoshi Hydropower Co. Limited, Sanjen Hydropower Co. Limited and Rasuwagadi Hydropower Co. Limited reached to NRs. 600.00 million, NRs. 378.14 million and NRs. 1,231.58 million respectively, NRs. 589.00 million in Trishuli Hydro Power Co. Ltd., NRs. 1,999.88 million in Tanahu Hydropower Company Ltd., and NRs. 78.21million in Cross Border Power Transmission Company Ltd. respectively. NEA holds 41% share in equity share capital in Upper Tamakoshi Hydropower Co. Ltd. At the end of the FY 2017/18, total investment in Upper Tamakoshi Hydropower Co. Limited reached NRs. 4,341.90 million as equity and NRs. 16,535.70 million as long-term loan.

NEA invested in newly formed companies, NRs. 330.00 million in Electricity Generation Co. Ltd., NRs. 70.00 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. 161.70 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. 41.00 million in Uttar Ganga Power Co. Ltd., NRs. 20.00 million in National Transmission Grid Co. Ltd and NRs. 424.00 million in Raghuganga Hydropower Co. Ltd., NRs. 7.65 million in Nepal Power Trading Company Ltd., NRs. 11.00 million in Tower and Pole Utpadan Company Ltd. respectively.

Further, NEA maintained share investment of NRs. 225.00 million including bonus share and loan investment of NRs. 973.11 million in Power Transmission Company Nepal Ltd. at the end of FY 2018/19 in the capacity of joint venture and holds rest of the investments in various subsidiaries and associate companies.

During the year, NEA received net cash dividends amounting to NRs. 101.11 million, NRs. 3.40 million and NRs. 38.48 million from Chilime Hydropower Co. Ltd., Butwal Power Co. Ltd., and Power Transmission Co. Nepal Ltd. respectively.

At the end of the financial year, total long-term borrowings from GoN, the main source of project financing, reached to NRs.140,245.85 million in FY 2018/19 from NRs. 120,261.15 million in FY 2017/18. NEA received NRs. 2,319.00 million as long-term loan from GoN internal source to invest in different projects relating to generation. In the similar manner, donor agencies provided around NRs. 18,500.00 million as long-term loans through direct payment to the consultants and contractors in the FY 2018/19. In addition to this, GoN also provided NRs. 22,786.27 million as equity investment in NEA.

NEA repaid NRs. 1,000.00 million against long term loan to the GoN. During the year, NEA contributed NRs. 1,500.62 million towards royalties and paid NRs. 13,155.14 million as arrears of interest on long term loan. Total contribution from NEA to GoN treasury reached to NRs. 15,655.76 million in the FY 2018/19.

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). NEA met all these covenants in this FY.

Office of the Auditor General has re-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 2018/19. The auditors have commenced their audit procedures by attending physical verification and submitting audit-planning memorandum. The statutory audit for the year 2017/18 was completed within a period of nine months from the end of fiscal year and the audit report was issued by the Office of the Auditor General in April 11, 2019.

Large Tax Payer's Office has concluded final income tax assessment up to the FY 2014/15. NEA has deposited Rs. 1,909.20 million till the end of FY 2017/18 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 1.05 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.

Implementation of Nepal Financial Reporting Standards (NFRS) was a mandatory obligation from fiscal year 2016/17 for public sector entities. However, due to delay in preparatory works, NEA could not comply from the year but it has initiated conversance since then. During the year 2018/19, SAR Associates, Chartered Accountants firm was selected as NFRS consultant through national competitive bidding process and NEA has entered into a contract with that firm for technical support in implementation of NFRS in NEA. NEA expects to prepare NFRS complied financial statements with effective from FY 2018/19 for the first time. For this NEA is in the process of reviewing and approving its accounting policies to make the same in line with NFRS. To facilitate the smooth implementation of NFRS, a facilitation committee at central level under the Finance Directorate was restructured, capacity building programmes were conducted in all the 8 regions of NEA including a top level management training and a training at Malaysia for 30 senior level officials with the involvement of NFRS consultant.

NEA is in a process of strengthening financial accounting and management decision support system. Centralization of computerized accounting & inventory system (CAIS) , Payroll system and Assets Management System has been completed. During the year a central level budget locking system was implemented in CAIS system to maintain and control the budgetary discipline in the organization.

Institutional Strengthening Project (ISP) is functioning under the Finance Directorate. This is a world Bank funded project and the project has published the Invitation for Bids for the Selection of System Integrator to implement Integrated Financial Management Information System (IFMIS) and Revenue Management System (RMS) at Nepal Electricity Authority. Through this bidding, we are procuring an ERP based system with two major blocks: IFMIS consisting of Financial Management, Material Management, Fixed Assets, Payroll, Project

Accounting and Human Resource Management Information System modules and RMS consisting of Meter Management for traditional meters, Consumer Management, Billing and Collection and Energy Audit modules. This procurement is being done to Reform Accounting Framework and strengthen operations in the Organization.

This project will be implemented in 2 phases: Phase-I will be for 3 years and include design, customization, testing and pilot to be completed in year 1, rollout in all offices in year 2 and post go-live operation and maintenance support in year 3. Phase-2 will be extension of Phase-I for next 5 years. Phase-2 will include AMC for hardware and software (including ATS of Software licenses), fixing of bugs in application, integration of solution with forthcoming software applications and onsite support for project. Phase - 2 may be awarded after successful completion of Phase - I on sole discretion of NEA.

The key components of this project implementation include: Component 1: Supply and Installation of Hardware at NEA Data Center, Component 2: Supply and Installation of Software, Component 3: Implementation Services for IFMIS and RMS, Component 4: Capacity Building and Change Management and Component 5: Post Operational Acceptance/ Go-Live, Operation and Maintenance. Through this implementation of the ERP based system the benefits to NEA customers are: i) Services Anywhere, Anytime and with fixed timelines, ii) Ease of payment of fees for the services received and iii) Effective Grievance Redressal Mechanism and Transparency. The benefits to NEA employees are: i) Uniform, well-defined work procedures with clear accountability, ii) Trainings for skill enhancement and iii) Real-time status tracking. The benefits to NEA are: i) Financial modules reports from ERP will comply with NFRS, ii) Standardized practices and procedures across all offices, iii) Capability to handle increased demand and iv) Centralized payment of Tax, CIT, PF and retirement funds.

The project is also working to initiate the local procurement of a System Integrator to set up infrastructure facilities for a full-fledged Data Center at NEA central office premises and Near Line Data Center at Load Dispatch Center office at Syuchetar to ensure the efficient operations of ERP and Smart Meter project procurements and have an adequate backup of these systems.

Asset Verification and Valuation in Nepal Electricity Authority (AVNEA), another Project is functioning under Finance Directorate. This is a World Bank funded project and the scope of this project is to conduct Physical Verification of Asset & Inventories, develop Database/ Register, carry out valuation, recommend adjustments based on valuation and develop standard operating procedures/ manuals for PPE & Inventories as per NFRS including capacity building. The project is in the process of procurement of consulting services through international competitive bidding (ICB) for the technical assistance. The estimated duration of this consulting service is eighteen (18) months.

To further strengthen and restructuring the NEA, Board of Directors had approved the third NEA Financial Restructuring Proposal (FRP-III) and submitted to Government of Nepal for cabinet decision which is under consideration of GoN.

Nepal Electricity Authority

Highlights of FY 2018/19

Description	FY 2019*	FY 2018	Increase/(Decrease)	
			Amount	%
Revenue				
Net Sales Revenue of Electricity (M.NRs.)	65,951.27	55,358.22	10,593.05	19.14
Income from other Services (M.NRs.)	7,509.12	6,615.52	893.60	13.51
Total Revenue (M. NRs.)	**73,460.39**	**61,973.74**	11,486.65	18.53
Operating Expenses				
Generation Expenses (M. NRs.)	1,852.01	1,678.52	173.49	10.34
Power Purchase (M. NRs.)	37,161.40	34,130.74	3,030.66	8.88
Royalty (M. NRs.)	1,437.55	1,428.79	8.76	0.61
Transmission Expenses (M. NRs.)	1,996.62	1,883.09	113.53	6.03
Distribution Expenses (M. NRs.)	8,691.45	7,645.02	1,046.42	13.69
Administration Expenses (M. NRs.)	2,190.72	2,042.95	147.77	7.23
Depreciation Expenses (M. NRs.)	4,710.28	4,210.28	500.00	11.88
Total Operating Expenses (M. NRs.)	**58,040.01**	**53,019.39**	5,020.62	9.47
Operating Surplus (M. NRs.)	**15,420.38**	**8,954.34**	6,466.04	72.21
Interest on Long-Term Loans (M. NRs.)	4,550.00	3,221.78	1,328.22	41.23
Foreign exchange translation losses/(Gain) (M. NRs.)	165.71	277.54	(111.83)	(40.29)
Provision for Employee benefits (M. NRs.)	3,500.00	2,500.00	1,000.00	40.00
Provisions for Employees' Bonus (M. NRs.)	-	57.94	(57.94)	(100.00)
Net Profit/(Loss) (M. NRs.)	**7,204.67**	**2,897.08**	4,307.59	148.69
Long-Term Loans (M. NRs.)	140,245.85	120,261.15	19,984.71	16.62
Net Property, Plant & Equipment (M. NRs.)	120,303.35	112,984.54	7,318.81	6.48
Number of Consumers	**3,909,641**	**3,574,226**	335,415	9.38
Total Sales of Electricity (GWh)	**6,381.21**	**5,560.24**	820.97	14.76
Internal Sold/Utilized (GWh)	6,346.47	5,557.30	789.17	14.20
Annual Average Consumer's Consumption (kWh)**	1,632.17	1,555.65	76.52	4.92
Average Price of Electricity (NRs./kWh)	10.48	10.10	0.38	3.74
Peak Load Interconnected System (GWh)	1,320.28	1,508.16	(187.88)	(12.46)
Total Available Energy (GWh)	**7,551.23**	**7,057.93**	**493.30**	**6.99**
NEA Hydro Generation (GWh)	2,547.99	2,308.24	239.75	10.39
Thermal Generation (GWh)	0.12	0.13	(0.01)	(10.77)
Purchased Energy (GWh) - India	2,813.07	2,581.80	231.27	8.96
- Nepal (Internal)	2,190.05	2,167.76	22.29	1.03
Average Power Purchase Rate (NRs./kWh)***	7.43	7.19	0.24	3.36
Exported Energy (GWh)	34.74	2.94	31.80	1,081.63
Self Consumption (GWh)	13.17	54.35	(41.18)	(75.77)
Net System Losses (Percentage)	15.32	20.45	(5.13)	(25.09)

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

Nepal Electricity Authority

Statement of Financial Position as at July 16, 2019

(NRs. in million)

Particulars	2019*	2018	2017	2016	2015	2014	2013	2012	2011	2010
Assets										
Non Current Assets										
Property, Plant & Equipment	120,303.35	112,984.54	90,341.20	88,521.09	86,439.05	84,238.72	83,873.47	85,460.71	84,725.47	83,105.63
Capital Work in Progress	110,065.19	77,607.00	80,272.33	66,684.09	58,052.39	46,993.93	39,843.17	29,905.45	22,832.03	17,040.47
Investments	34,591.55	29,941.55	25,845.37	21,755.05	17,550.91	12,288.26	6,807.56	5,049.17	4,855.07	3,445.74
Total Non-Current Assets	**264,960.09**	**220,533.09**	**196,458.89**	**176,960.24**	**162,042.34**	**143,520.91**	**130,524.20**	**120,415.33**	**112,412.57**	**103,591.84**
Current Assets										
Inventories	9,562.67	7,543.72	4,217.99	3,376.41	3,169.78	2,859.44	3,043.02	3,033.83	2,502.93	2,431.99
Trade and other Receivables	15,985.95	15,546.99	13,585.86	11,186.84	9,927.45	9,015.61	7,930.03	6,693.17	6,871.19	6,097.74
Cash and Cash Equivalents	31,144.99	34,494.63	24,823.79	15,361.60	10,621.60	6,121.57	4,714.98	2,697.48	2,016.58	1,244.65
Prepaid, Loans & Advances and Deposits	7,855.42	6,453.63	5,875.85	3,804.28	3,782.99	3,644.70	3,300.57	4,222.65	2,976.82	4,585.60
Total Current Assets	**64,549.03**	**64,038.96**	**48,503.49**	**33,729.14**	**27,501.82**	**21,641.33**	**18,988.60**	**16,647.13**	**14,367.52**	**14,359.98**
Total Assets	**329,509.12**	**284,572.05**	**244,962.38**	**210,689.37**	**189,544.17**	**165,162.24**	**149,512.80**	**137,062.46**	**126,780.09**	**117,951.82**
Equity and Liabilities										
Capital and Reserves										
Share Capital	125,223.90	102,437.63	82,411.25	58,527.86	49,275.07	44,510.75	37,364.90	31,422.44	25,694.81	38,651.77
Reserves and Accumulated Profits										
Reserve	2,090.61	1,988.71	1,833.28	2,089.24	2,021.87	1,908.53	1,721.41	1,706.03	1,677.55	1,631.30
Accumulated Profits (Loss)	(15,220.12)	(25,586.64)	(28,168.13)	(34,608.47)	(25,751.42)	(20,238.58)	(13,238.16)	(9,866.97)	0.00	(21,022.36)
Total Reserve Accumulated Profits	**(13,129.51)**	**(23,597.93)**	**(26,334.85)**	**(32,519.23)**	**(23,729.55)**	**(18,330.06)**	**(11,516.75)**	**(8,160.94)**	**1,677.55**	**(19,391.06)**
Total Equity	**112,094.39**	**78,839.70**	56,076.41	26,008.62	25,545.52	26,180.69	25,848.15	23,261.50	27,372.36	19,260.71
Non-Current Liabilities										
Borrowings	140,245.85	120,261.15	110,681.69	111,303.64	98,253.08	82,691.67	75,034.89	68,909.20	62,631.85	58,231.66
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	**140,939.06**	**120,954.35**	111,374.89	111,996.85	98,946.28	83,384.87	75,728.09	69,602.40	63,325.05	58,924.86
Current Liabilities										
Borrowings	-	-	-	-	-	700.00	1,200.00	3,500.00	790.00	1,280.00
Sundry Creditors and Other Payables	47,030.94	58,833.27	54,085.28	51,324.45	45,742.90	37,637.22	33,019.22	29,137.09	27,825.95	32,909.45
Provisions	**29,444.73**	**25,944.73**	**23,425.81**	**21,359.45**	**19,309.45**	**17,259.45**	**13,717.34**	**11,561.47**	**7,466.73**	**5,576.80**
Total Current Liabilities	**76,475.67**	**84,778.00**	**77,511.09**	**72,683.90**	**65,052.36**	**55,596.67**	**47,936.56**	**44,198.56**	**36,082.68**	**39,766.25**
Total Liabilities	**217,414.73**	**205,732.35**	**188,885.98**	**184,680.75**	**163,998.64**	**138,981.55**	**123,664.65**	**113,800.96**	**99,407.73**	**98,691.11**
Total Equity and Liabilities	**329,509.12**	**284,572.05**	**244,962.38**	**210,689.37**	**189,544.17**	**165,162.24**	**149,512.80**	**137,062.46**	**126,780.09**	**117,951.82**

Note:- *Provisional figures

Nepal Electricity Authority

Income Statement for the year ended July 16, 2019

(NRs. in million)

Particulars	2019*	2018	2017	2016	2015	2014	2013	2012	2011	2010
Net Sale Revenue	65,951.27	55,358.22	**46,795.78**	**31,824.21**	**30,168.77**	**28,205.70**	**25,354.62**	**20,088.64**	**17,946.82**	**17,164.60**
Cost of Sales										
Generation	1,852.01	1,678.52	1,463.94	1,333.13	1,383.95	1,886.51	1,604.31	1,147.69	929.56	1,541.27
Power Purchase	37,161.40	34,130.74	28,332.84	22,332.39	19,210.19	17,041.53	13,572.46	11,948.41	10,493.74	9,746.57
Royalty	1,437.55	1,428.79	967.37	883.13	892.46	888.67	890.49	941.60	854.76	849.77
Transmission	1,996.62	1,883.09	1,822.83	1,094.58	579.63	519.45	416.74	421.38	345.96	337.73
Gross profit	**23,503.70**	**16,237.08**	**14,208.80**	**6,180.97**	**8,102.54**	**7,869.54**	**8,870.62**	**5,629.56**	**5,322.80**	**4,689.26**
Other Income	7,509.12	6,615.52	4,907.33	3,249.33	3,116.26	2,156.90	1,868.37	1,695.42	1,382.94	1,188.27
Distribution Expenses	8,691.45	7,645.02	7,041.57	5,671.35	5,341.48	4,575.15	4,087.97	3,685.15	3,004.18	3,091.21
Administrative Expenses	2,190.72	2,042.95	1,601.57	1,218.58	1,339.02	1,239.19	1,327.50	973.38	866.74	789.52
Interest Expenses	4,550.00	3,221.78	3,546.15	5,079.73	4,670.21	4,234.51	4,039.65	3,885.49	3,594.01	3,668.65
Depreciation	4,710.28	4,210.28	3,755.22	3,554.36	3,471.02	3,296.62	3,228.68	3,175.80	3,031.33	2,902.92
Loss/(Gain) on Foreign Exchange	165.71	277.54	(410.70)	746.48	(523.17)	(52.77)	(652.14)	896.57	85.01	28.67
Provisions & write offs	-	-	-	-	-	-	-	549.79	323.68	112.36
Provision under Employees' Benefits Plan	3,500.00	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
Provisions for Employees' Bonus	**-**	**57.94**	**30.05**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Net Profit/(Loss) before Tax	7,204.67	2,897.08	1,502.28	(8,890.19)	(5,129.76)	(6,808.36)	(3,405.41)	(9,947.88)	(6,089.22)	(6,961.82)
Provision for Income Tax**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Total Profit Available for Appropriation	7,204.67	2,897.08	1,502.28	(8,890.19)	(5,129.76)	(6,808.36)	(3,405.41)	(9,947.88)	(6,089.22)	(6,961.82)
Appropriation for Corporate Social Responsibility Fund	70.63	28.97	15.02	-	-	-	-	-	-	-
Appropriation for Insurance Fund	**20.00**	**20.00**	**20.00**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Profit/(Loss) Transferred to Statement of Financial Position	**7,114.04**	**2,848.11**	**1,467.25**	**(8,890.19)**	**(5,129.76)**	**(6,808.36)**	**(3,405.41)**	**(9,947.88)**	**(6,089.22)**	**(6,961.82)**

Note:- *Provisional figures
** No tax provision has been made due to unrelieved accumulated losses.

Significant Accounting Policies and Explanatory Notes

For the year ended Ashad 31, 2076 (July 16, 2019)

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

The financial statements of the NEA, which comprises Statement of Financial Position, Statement of Profit or Loss & Other Comprehensive Income, Statement of Cash Flows and Statement of Changes in Equity have been prepared in accordance with Nepal Financial Reporting Standards ("NFRS") issued by the Accounting Standards Board Nepal, which are materially in conformity with International Financial Reporting Standards ("IFRS") issued by the International Accounting Standards Board (IASB).

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

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

c. The financial statements are prepared, generally, on accrual basis. However, some items are accounted on a cash basis, for practical reasons. Management has adopted such practice due to impracticability for recognising those items on accrual basis and the impact of those items are not material.

d. Management has applied estimation while preparing and presenting financial statements. Such specific estimates are disclosed in individual section wherever they have been applied.

e. The NEA's management has made an assessment of NEA's ability to continue as a going concern and is satisfied that NEA has the resources to continue in business for the foreseeable future. Furthermore, the management is not aware of any material uncertainties that may cast significant doubt upon the NEA's ability to continue as a going concern.

2.2 Functional and Presentation Currency

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

2.3 Property, Plant and Equipment

Recognition

Property, plant and equipment are tangible items that are held for use in the production or supply of services, for rental to others or for administrative purposes and are expected to be used during more than one period. Property, plant and equipment

are recognized if it is probable that future economic benefits associated with the asset will flow to the entity and the cost of the asset can be measured reliably. NEA applies the requirements of the Nepal Accounting Standard - NAS 16 (Property, Plant and Equipment) in accounting for these assets.

Initial Measurement

An item of property, plant and equipment that qualifies for recognition as an asset is initially measured at its cost. Cost includes expenditure that is directly attributable to the acquisition of the asset and cost incurred subsequently to add and replace part of an item of property, plant & equipment. The cost of self-constructed assets includes the cost of materials and direct labour, any other costs directly attributable to bringing the asset in working condition for its intended use and the costs of dismantling and removing the items and restoring the site on which they are located. Purchased software that is integral to the functionality of the related equipment is capitalized as part of such equipment. When parts of an item of property or equipment have different useful lives, they are accounted for as separate items (major components) of property, plant and equipment.

Subsequent Measurement

Cost Model

Property, Plant and equipment are stated at cost less accumulated depreciation and accumulated impairment in value. Such cost includes, cost of replacing part of the equipment when that cost is incurred, if the recognition criteria are met.

Revaluation Model

Revaluation model is applied for class of assets instead of particular assets. On revaluation of an asset, any increase in the carrying amount is recognized in 'Other Comprehensive Income' and accumulated in equity, under capital reserve or used to reverse a previous revaluation decrease relating to the same class asset, which was charged to the Statement of Profit or Loss. Any decrease in the carrying amount is recognized as an expense in the Statement of Profit or Loss or debited to the Other Comprehensive income to the extent of any credit balance existing in the capital reserve in respect of that class of asset. In the case of reversal, the increased amount is recognized as income to the extent of previous written down value.

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 Equipment are as follows:

Assets Category		Depreciation Rate (per annum)
(a)	Land	-
(b)	Buildings	2%
(c)	Hydro Electric Structures	2%-3%
(d)	Hydro Electric Plant & Machinery	3%
(e)	Internal Combustion on plant & machinery	2.5%
(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

Carrying amount of property, plant and equipment is kept at minimum value of 1 Rupee and is not depreciated further.

2.5 Capital Work in Progress (CWIP)

All expenditures in developing property, plant and equipment not yet completed or not ready to

use are categorised as CWIP. The value of capital works-in-progress includes stock of materials, 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 and Other Financial assets

Classification

NEA classifies its financial assets in the following measurement categories:

- Fair value through Profit or loss(FVTPL)
- Fair value through other comprehensive income (FVTOCI).
- Amortised Cost

The classification depends on the entity's business model for managing the financial assets and contractual terms of the cash flows.

For assets measured at fair value, gains and losses will either be recorded in statement of profit or loss or other comprehensive income. For investment in debt instruments, this will depend on the business model in which investment is held.

Measurement

At initial recognition, NEA measures financial assets at fair value, which are classified as FVTOCI and Amortised cost. Transaction costs of financial assets carried at FVTPL are expensed in the statement of profit or loss.

Debt Instrument

Subsequent measurement of debt instrument depends on the NEA's business model for managing the asset and the cash flow characteristics of the asset.

Equity Investment

NEA subsequently measures all equity investments in subsidiaries at fair value. NEA's management has elected to present fair value gains and losses on equity. Equity investment may be classified as per business model of NEA in either FVTPL if such equities are Held for Trading or In FVTOCI if such assets are classified as Available for Sales. Changes in the fair value of financial assets at FVTPL are recognised in the statement of profit or loss whereas changes in fair value of any equity investments measured at FVTOCI are adjusted through fair value reserve.

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 for impairment testing and provided as impairment allowance in case of need of impairment.

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 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).Amount reflected under share allotment suspense is also categorized as Issued and Paid up share capital. Related share issue expenses incurred, if any, are deducted from Share Capital.

2.11 Reserves

Non-revenue nature incomes are presented under reserves and surplus which includes capital reserve, general reserve, insurance fund, corporate social responsibility fund and accumulated profit or losses balance. 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 Responsibility 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 for 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 Borrowings

Borrowings are subsequently carried at amortised cost and any difference between the proceeds (net of Transaction costs) & the redemption value is recognised in the statement of profit or loss over the period of the borrowings using the effective interest rate method.

Further, 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.

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 rate. The gain / losses arising there from such transactions are recognised in Statement of Profit or Loss.

2.17 Sundry Creditors 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 the end of each reporting date and are adjusted accordingly to reflect the current best estimate.

2.19 Employee Benefits

Short-term obligations

Liabilities for wages and salaries, including non-

monetary benefits that are expected to be settled wholly within 12 months after the end of the period in which the employees render the related service are recognised in respect of employees' services up to the end of the reporting period and are measured at the amounts expected to be paid when the liabilities are settled. The liabilities are presented as current employee benefit obligations in the Statement of Financial Position.

Other long- term employee benefit obligations

The liabilities for earned leave and sick leave are not expected to be settled wholly within 12 months after the end of the period in which the employees render the related service. They are therefore measured as the present value of expected future payments to be made in respect of services provided by employees up to the end of the reporting period using the projected unit credit method. The benefits are discounted using the market yields at the end of the reporting period that have terms approximating to the terms of the related obligation. Re-measurements as a result of experience adjustments and changes in actuarial assumptions are recognised in statement of profit or loss.

The obligations are presented as current liabilities in the Statement of Financial Position if the entity does not have an unconditional right to defer settlement for at least twelve months after the end of reporting period, regardless of when the actual settlement is expected to occur.

Post employment obligations

NEA operates the following post-employment schemes:

- Defined benefit plans such as gratuity, pension, insurance, leave, medical facilities etc.
- Defined contribution plans such as provident fund, retirement fund etc.

Defined Benefit Plan Obligation

The liability or asset recognised in the Statement of Financial Position in respect of defined benefit plans are the present value of the defined benefit obligation at the end of the reporting period less the fair value of plan assets. The defined benefit obligation is calculated annually by actuaries using the projected unit credit method.

Re-measurement gains and losses arising from experience adjustments and changes in actuarial assumptions are recognised in the period in which they occur, directly in other comprehensive income. They are included in retained earnings in the consolidated statement of changes in equity and in the Statement of Financial Position.

Defined contribution Plan

NEA pays defined contributions to publicly administered provident funds established as per prevailing laws in force. In addition to contribution to provident fund, for staff joining NEA from Shrawan 1st 2063 B.S., NEA has established equal contributory based approved retirement fund.

NEA has no further payment obligations once the contributions have been paid. The contributions are accounted for as defined contribution plans and the contributions are recognised as employee benefit expense when they are due.

2.20 Grant–in-Aid and 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.

A contingent asset is disclosed, where an inflow of economic benefit is probable.

2.22 Revenue from Sale of Electricity

Revenue from sale of electricity is recognised at the time of raising bills to the customers as per the billing cycle on accrual basis. Revenue from the billing cycle date up to Ashad End (Mid-July) has been recognised and is shown at gross amount.

2.23 Rebate

NEA allows rebate in order to motivate consumers to pay their electricity bills earlier than given credit period and accounted for on cash basis.

2.24 Other Income

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 for 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.

e. Surcharge on delayed payment etc. are accounted for on cash basis.

2.25 Cost of Sales

Cost of Sales includes cost of generation, power purchase, royalties to Government of Nepal, transmission and transmission service charges. Cost of generation includes cost directly attributable to generation of electricity of NEA's power plants including distribution expenses. 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 transmission service charge involves costs that are directly attributable to transmission of power within NEA transmission networks and transmission service charges for cross boarder power transmission.

2.26 Distribution Expenses

Distribution expenses includes cost that are directly attributable to distribution of power &expenses relating consumer services and expenses of community rural electrification expenses. Distribution expenses also includes maintenance of low voltage transmission lines and system operation costs also.

2.27 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 assets 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.

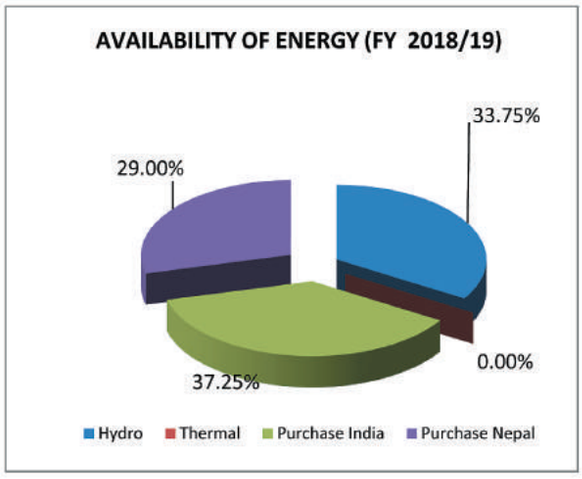
2.28 Finance Cost

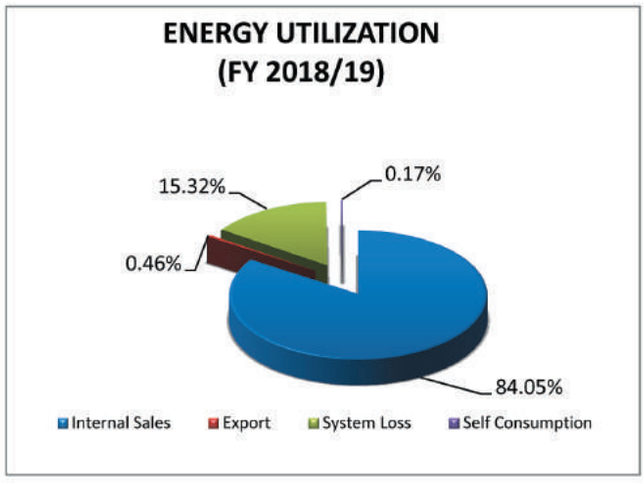
Finance costs includes borrowing cost and other interest expenses & charges on borrowings. Borrowing costs that are directly attributable to the construction of a qualifying asset are included in the cost of that asset. Other interest & charges on borrowing are treated as an expense in the period in which it occurs.

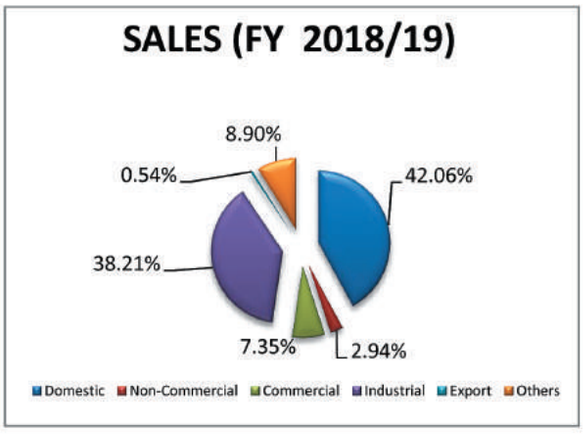
2.29 Foreign Currency Transactions

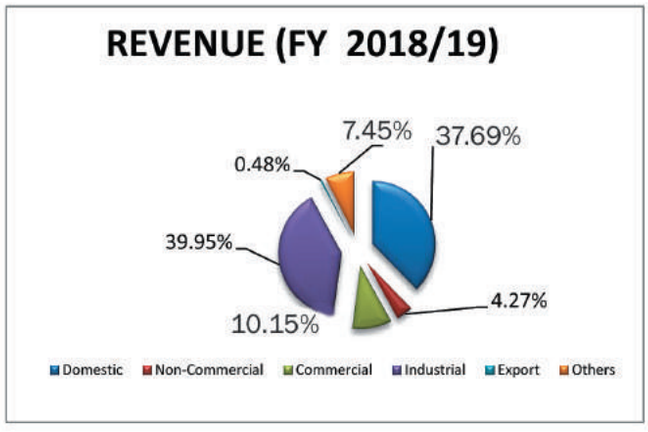
The transactions in foreign currency are recognised at the prevailing rate on transaction date. The balances of monetary assets and liabilities in foreign currencies are translated at closing rate. The resulting gain or loss due to the translation is taken to Statement of Profit or Loss.

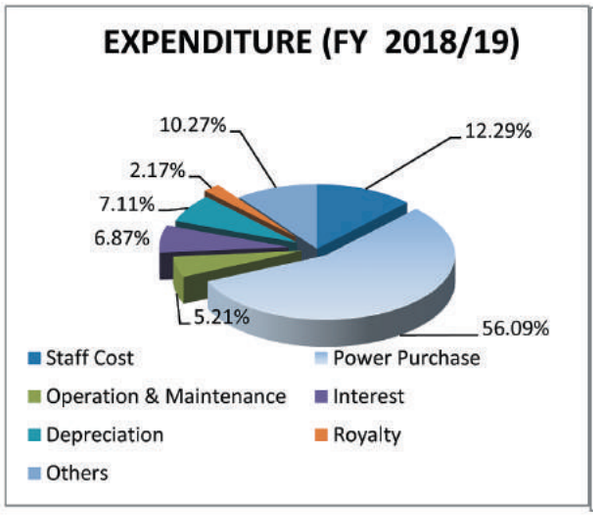
Statistics & Schematics

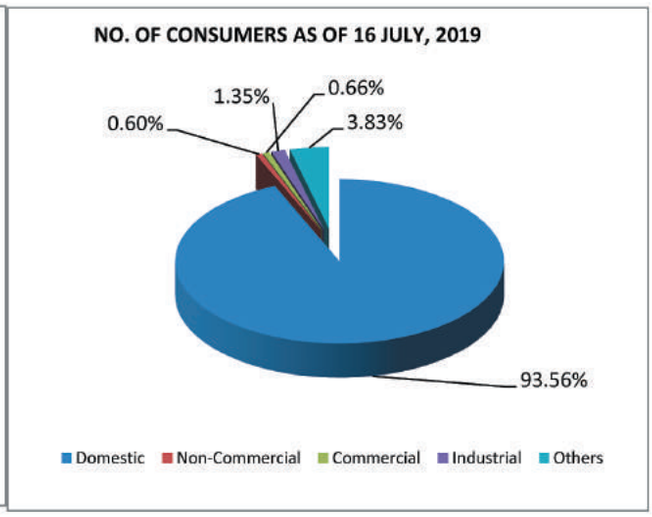


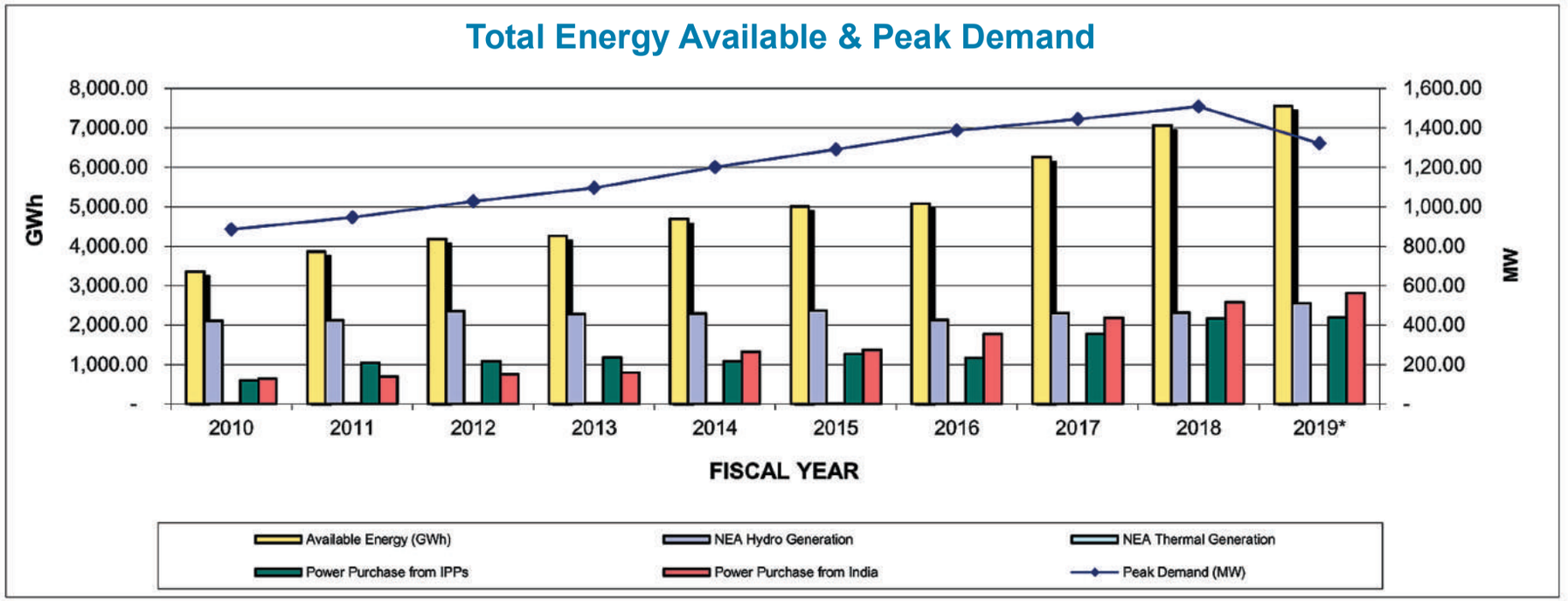








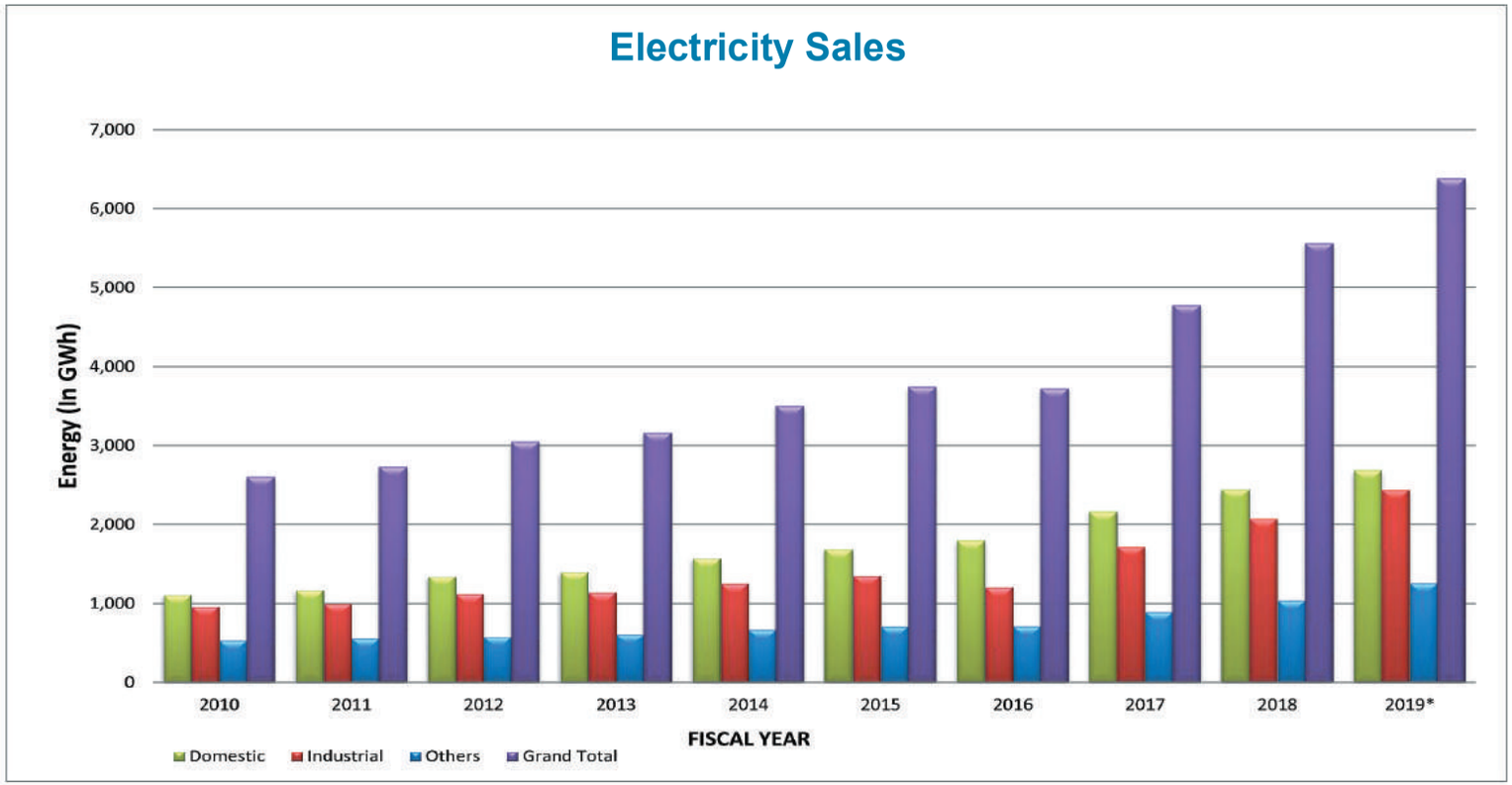




Particulars	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019*
Peak Demand (MW)	885.28	946.10	1,026.65	1,094.62	1,200.98	1,291.10	1,385.30	1,444.10	1,508.16	1,320.28
NEA Hydro Generation	2,108.65	2,122.08	2,357.43	2,273.11	2,288.23	2,366.88	2,133.14	2,305.17	2,308.24	2,547.99
NEA Thermal Generation	13.01	3.40	1.56	18.85	9.65	1.24	0.08	0.28	0.13	0.12
NEA Generation Total (GWh)	**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**	**2,548.11**
Power Purchase from India	638.68	694.05	746.07	790.14	1,318.75	1,369.89	1,777.68	2,175.04	2,581.80	2,813.07
Power Purchase from IPPs	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	2,190.05
Power Purchase Total (GWh)	**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**	**5,003.12**
Available Energy (GWh)	**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**	**7,551.23**

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

* Provisional figures

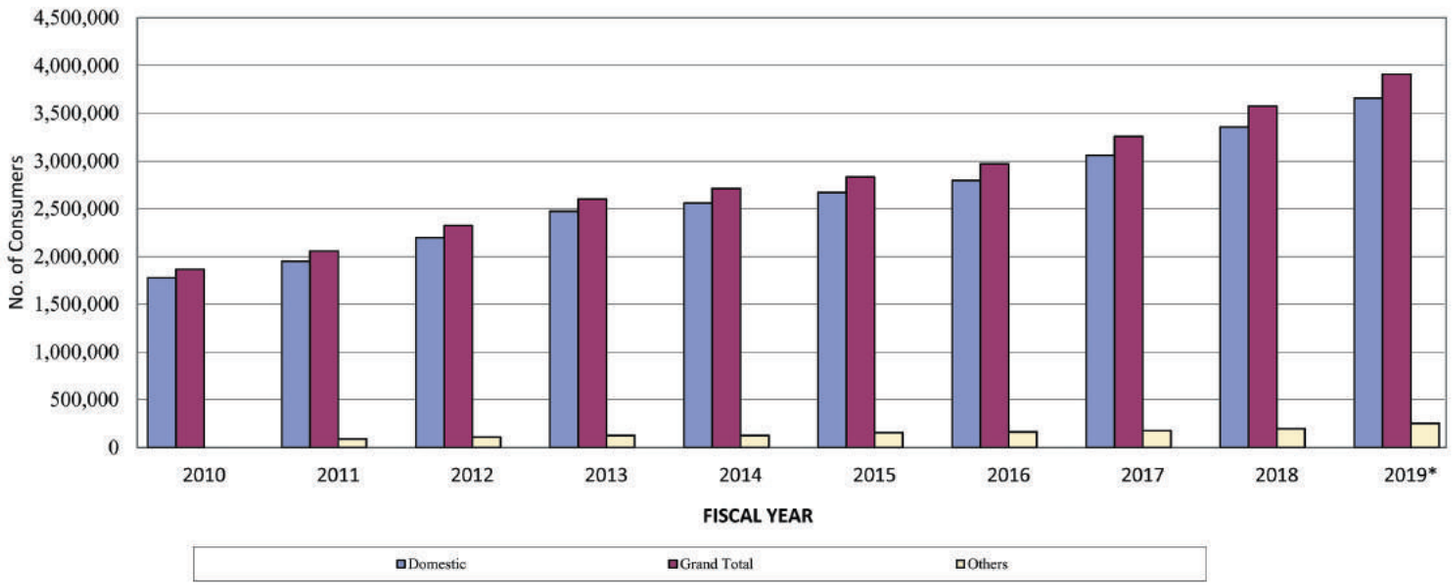


(in GWh)

Particulars	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019*
Domestic	1,108.87	1,169.31	1,342.67	1,401.64	1,571.39	1,679.35	1,796.78	2,163.51	2,441.67	2,683.97
Non-Commercial	103.47	109.49	115.68	115.21	126.64	130.53	134.37	160.79	171.93	187.43
Commercial	187.12	204.03	240.74	256.82	285.42	300.25	286.48	350.58	407.59	468.89
Industrial	960.43	1,001.73	1,123.94	1,141.07	1,251.69	1,352.15	1,205.69	1,719.26	2,074.17	2,438.06
Water Supply & Irrigation	55.98	82.80	64.59	72.55	82.52	86.56	100.42	115.93	137.89	177.31
Street Light	65.58	67.21	72.06	76.24	76.44	76.48	73.88	76.12	77.36	79.40
Temporary Supply	1.00	1.00	1.20	1.47	1.34	1.52	2.10	3.03	3.08	3.51
Transport	5.42	5.54	6.72	6.26	6.22	6.24	6.09	6.33	5.30	4.61
Temple	3.64	3.46	3.95	4.11	5.18	4.85	5.53	7.10	7.77	7.90
Non- Domestic	-	-	-	-	-	-	-	53.74	103.15	149.20
Entertainment	-	-	-	-	-	-	-	1.21	2.71	5.66
Community Sales	34.95	51.95	69.02	77.04	86.08	102.62	104.48	116.24	124.68	140.53
Total (Internal Sales)	**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**	**6,346.47**
Bulk Supply (India)	75.07	31.10	4.12	3.60	3.40	3.17	3.15	2.69	2.94	34.74
Grand Total	**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**	**6,381.21**

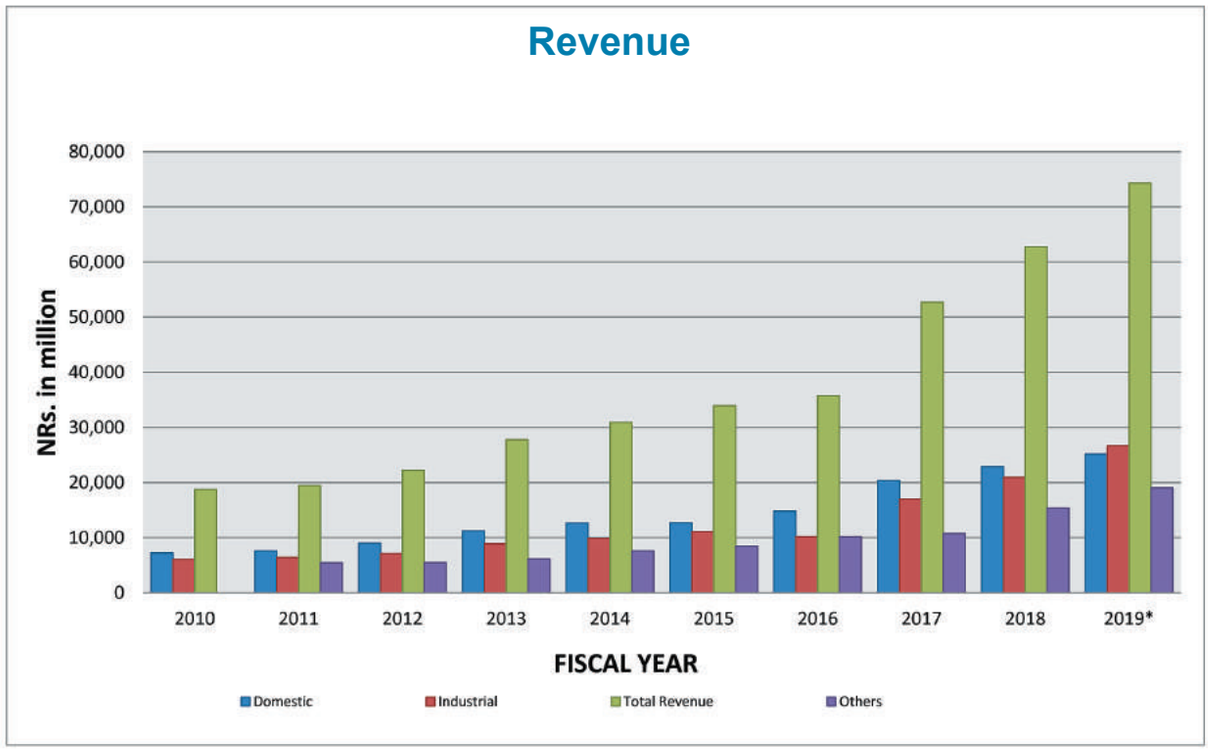
Note:- *Provisional figures

Growth of Consumers



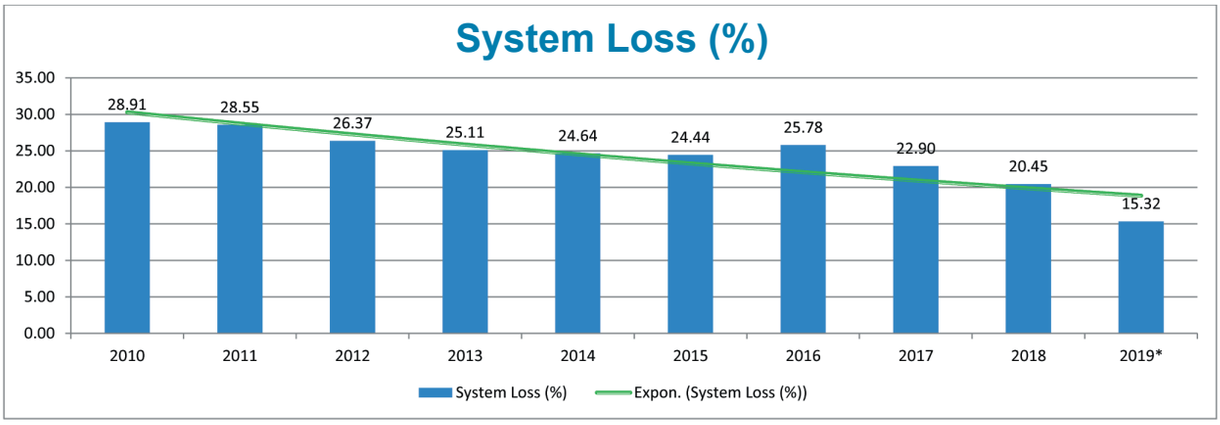
Particulars	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019*
Domestic	1,775,571	1,949,530	2,198,680	2,472,264	2,558,726	2,671,039	2,796,621	3,061,709	3,355,830	3,657,887
Non-Commercial	10,952	12,520	14,055	15,179	16,155	16,717	17,732	19,257	21,094	23,493
Commercial	8,919	10,802	13,297	13,096	14,955	15,899	17,191	18,860	21,716	25,746
Industrial	29,410	33,030	36,409	37,498	40,265	41,825	43,639	46,345	48,800	52,697
Water Supply	609	688	860	834	1,141	1,266	1,426	1,675	2,063	2,460
Irrigation	32,089	42,494	53,165	51,520	71,845	77,066	83,283	98,626	111,493	131,935
Street Light	2,214	2,374	2,590	2,878	2,774	2,813	2,829	2,935	3,010	3,266
Temporary Supply	522	634	619	768	726	733	883	1,070	1,520	1,682
Transport	41	42	44	51	1	44	43	44	44	40
Temple	2,941	3,181	3,529	3,857	4,048	4,181	4,391	4,673	5,182	5,890
Non- Domestic	-	-	-	-	-	-	-	977	1,735	2,735
Entertainment	-	-	-	-	-	-	-	45	107	150
Community Sales	795	995	1,161	1,207	1,377	1,459	1,537	1,597	1,631	1,659
Total (Internal Sales)	**1,864,063**	**2,056,290**	**2,324,409**	**2,599,152**	**2,712,055**	**2,833,042**	**2,969,575**	**3,257,813**	**3,574,225**	**3,909,640**
Bulk Supply (India)	4	2	5	4	2	1	1	1	1	1
Grand Total	**1,864,067**	**2,056,292**	**2,324,414**	**2,599,156**	**2,712,057**	**2,833,043**	**2,969,576**	**3,257,814**	**3,574,226**	**3,909,641**

Note:- *Provisional figures
** Total number of consumers including consumers of the community 531,232 reached to 44,40,873 at the end of FY 2018/19.



(NRs. in million)

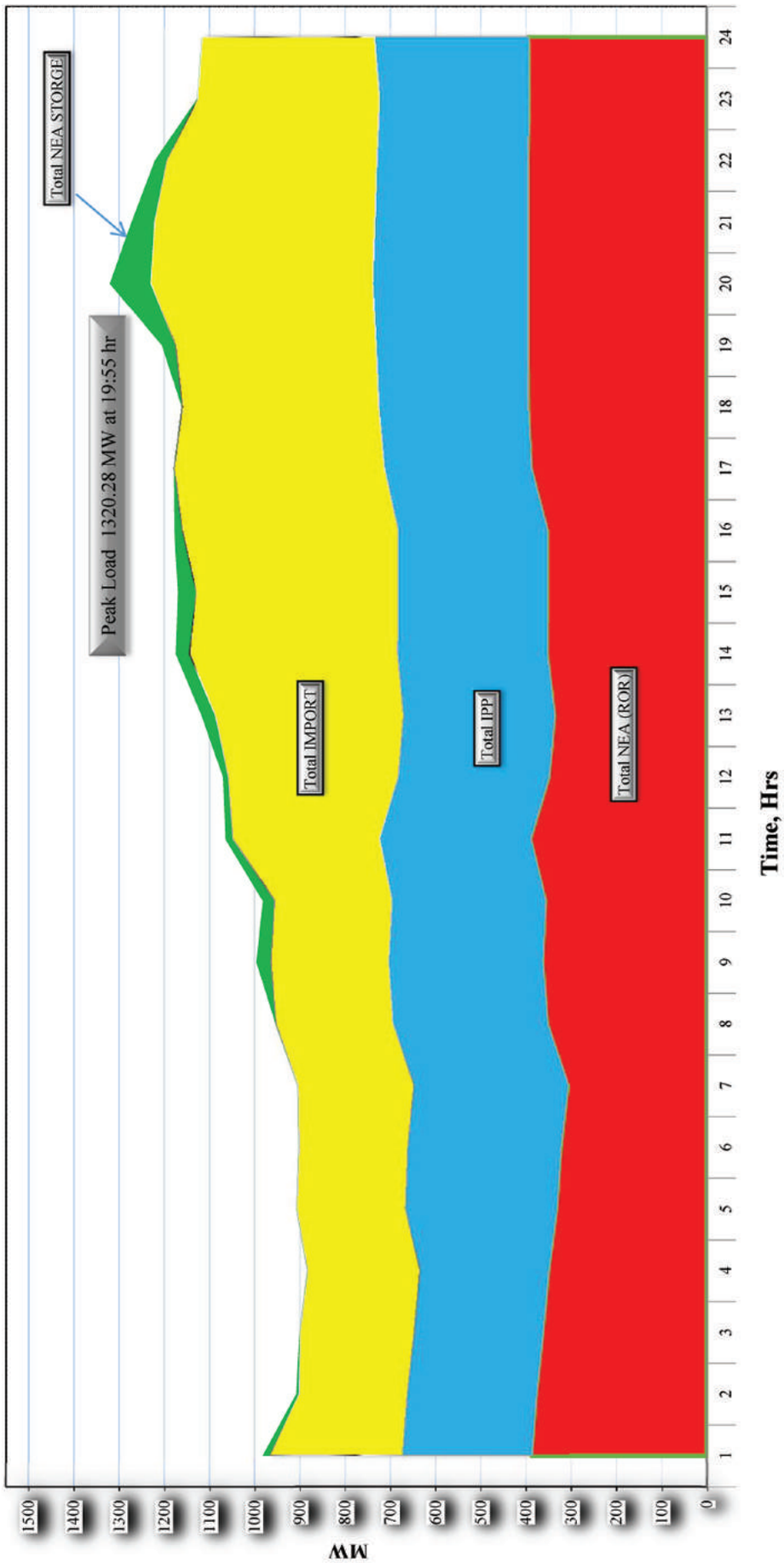
Particulars	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019*
Domestic	7,252.06	7,602.34	8,967.77	11,247.77	12,622.11	12,706.55	14,833.65	20,329.92	22,867.62	25,190.88
Non-Commercial	983.63	1,020.51	1,091.52	1,355.17	1,486.63	1,644.45	1,995.10	2,479.08	2,593.74	2,857.06
Commercial	1,719.35	1,910.28	2,259.50	2,994.00	3,359.69	3,735.00	3,788.76	5,114.29	5,883.48	6,782.06
Industrial	6,060.20	6,378.25	7,102.37	8,885.21	9,844.18	11,064.84	10,182.32	16,977.17	20,896.55	26,702.45
Water Supply & Irrigation	353.14	250.60	294.82	389.34	418.20	480.71	525.30	727.54	865.44	1,094.84
Street Light	333.90	433.42	464.22	582.69	601.84	629.65	602.37	665.62	702.35	700.60
Temporary Supply	13.58	13.98	16.18	24.48	23.07	27.39	29.25	53.35	61.48	64.62
Transport	27.58	27.78	31.70	39.53	39.32	41.44	39.74	43.87	37.60	34.51
Temple	28.16	26.51	21.38	23.66	26.34	29.17	33.92	39.10	51.10	52.31
Non- Domestic	-	-	-	-	-	-	-	654.53	1,418.60	2,241.96
Entertainment	-	-	-	-	-	-	-	16.97	49.80	96.08
Community Sales	170.90	189.28	244.97	301.38	334.94	400.12	411.50	630.66	716.26	696.32
Total (Internal Sales)	**16,942.50**	**17,852.95**	**20,494.43**	**25,843.23**	**28,756.31**	**30,759.31**	**32,441.91**	**47,732.10**	**56,144.02**	**66,513.68**
Bulk Supply (India)	604.85	215.42	23.97	32.22	30.90	39.36	32.07	45.75	29.07	318.22
Gross Revenue	**17,547.35**	**18,068.37**	**20,518.40**	**25,875.45**	**28,787.21**	**30,798.67**	**32,473.98**	**47,777.85**	**56,173.10**	**66,831.90**
Income from Other Services	1,188.27	1,382.94	1,695.42	1,868.37	2,156.90	3,116.26	3,249.33	4,907.33	6,615.52	7,509.12
Total Revenue	**18,735.62**	**19,451.31**	**22,213.82**	**27,743.82**	**30,944.11**	**33,914.93**	**35,723.31**	**52,685.18**	**62,788.62**	**74,341.01**



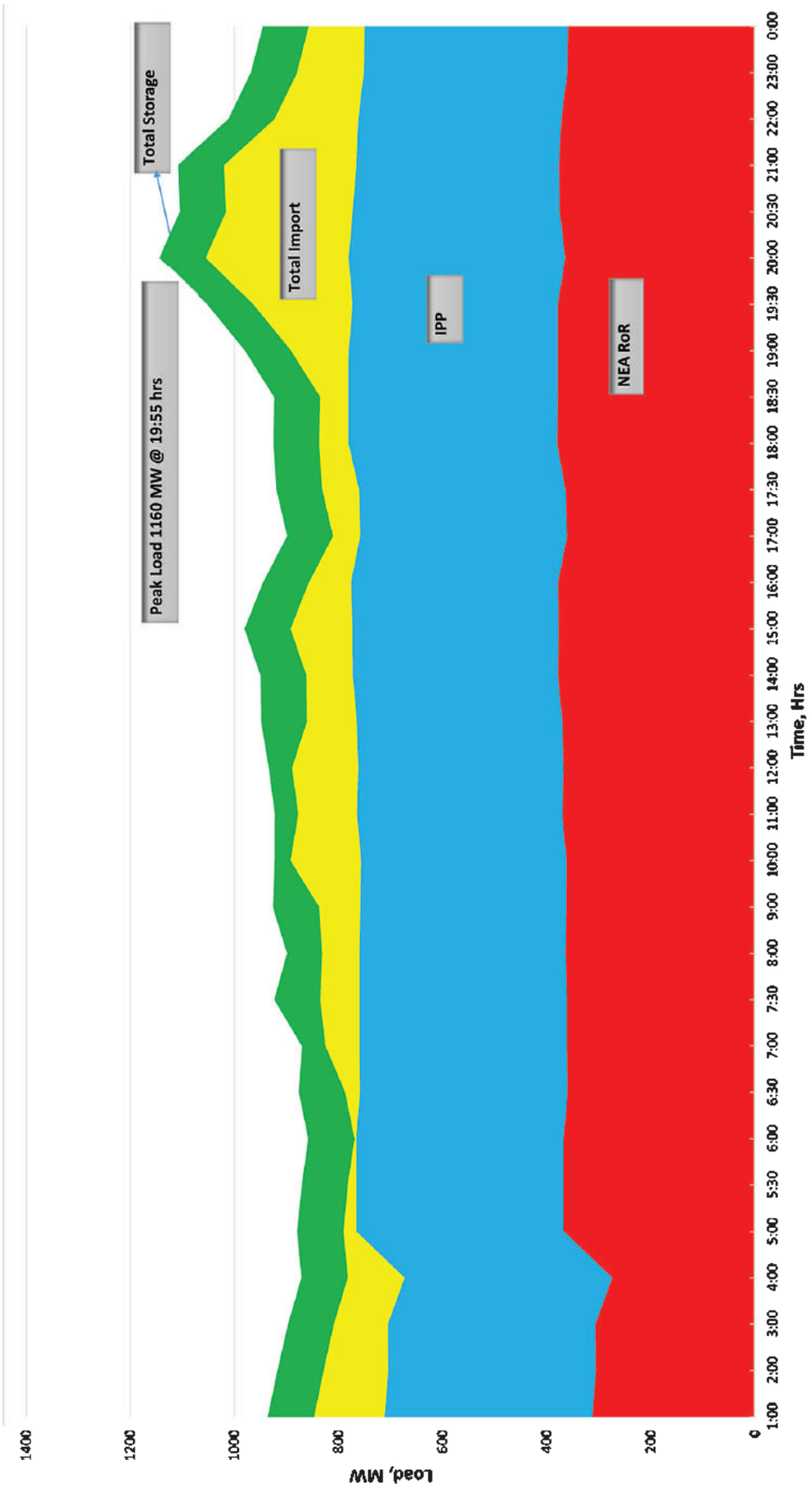
Fiscal Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019*
System Loss (%)	28.91	28.55	26.37	25.11	24.64	24.44	25.78	22.90	20.45	15.32

Note:- *Provisional figures

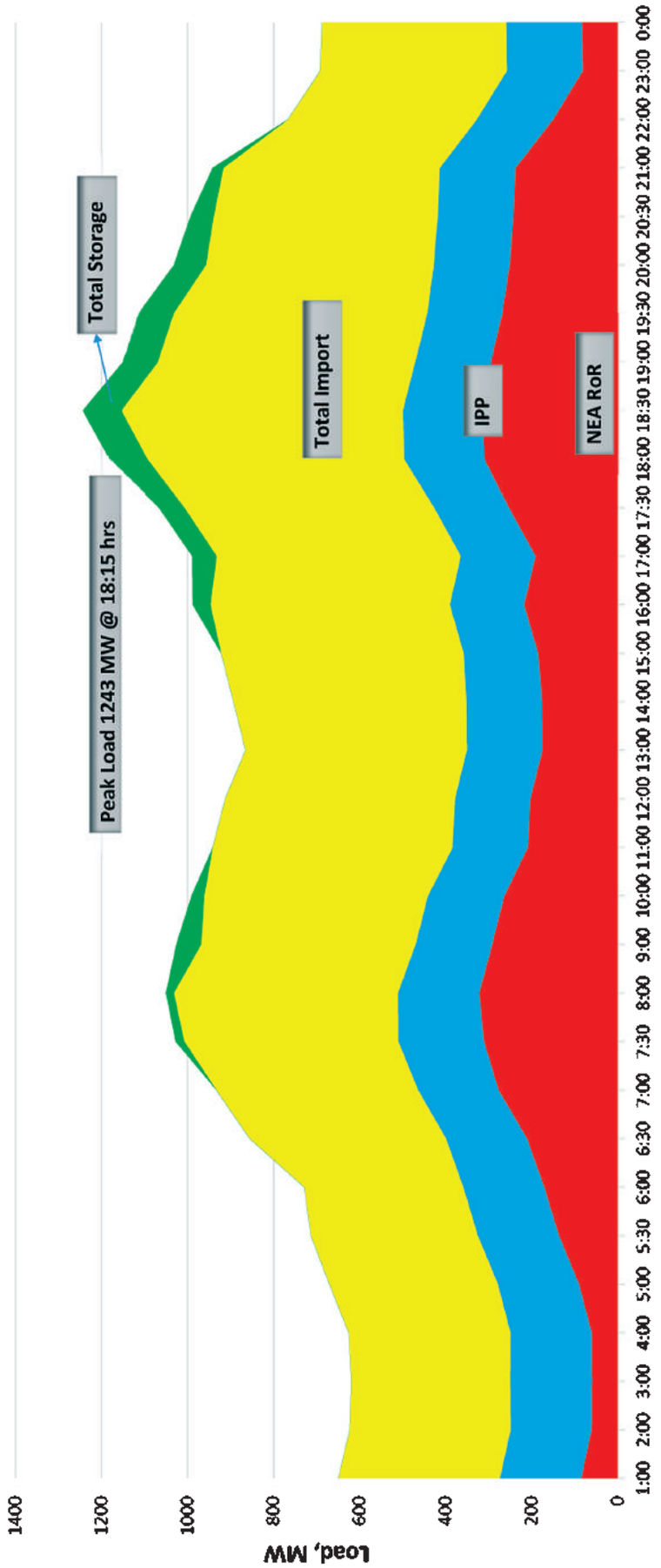
System Load Curve, Asar 15, 2076 (June 30, 2019) - Wet Season



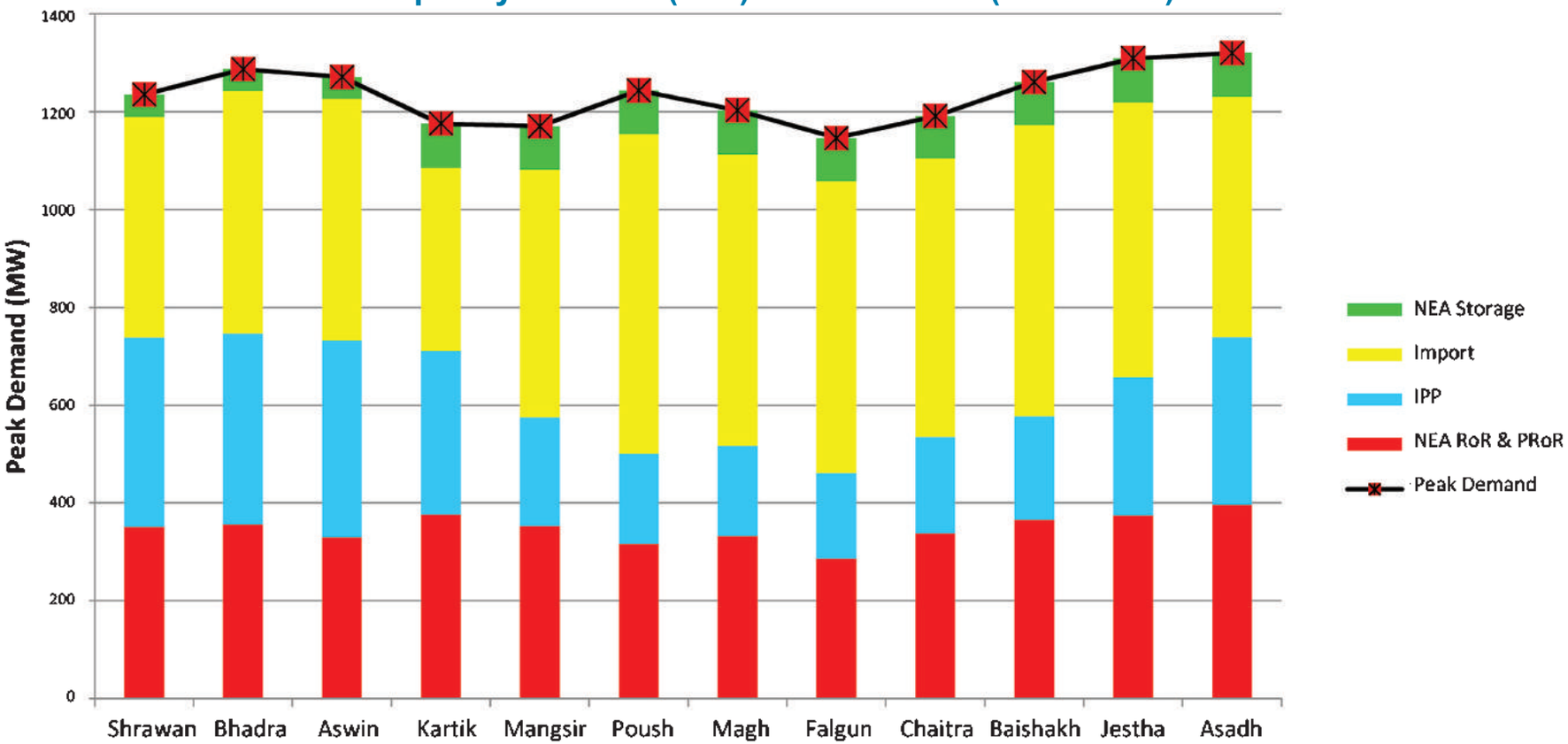
System Load Curve, Shrawan 4, 2076 (July 20, 2019) - Wet Season



System Load Curve Poush 26, 2075 (January 10, 2019) -Dry Season



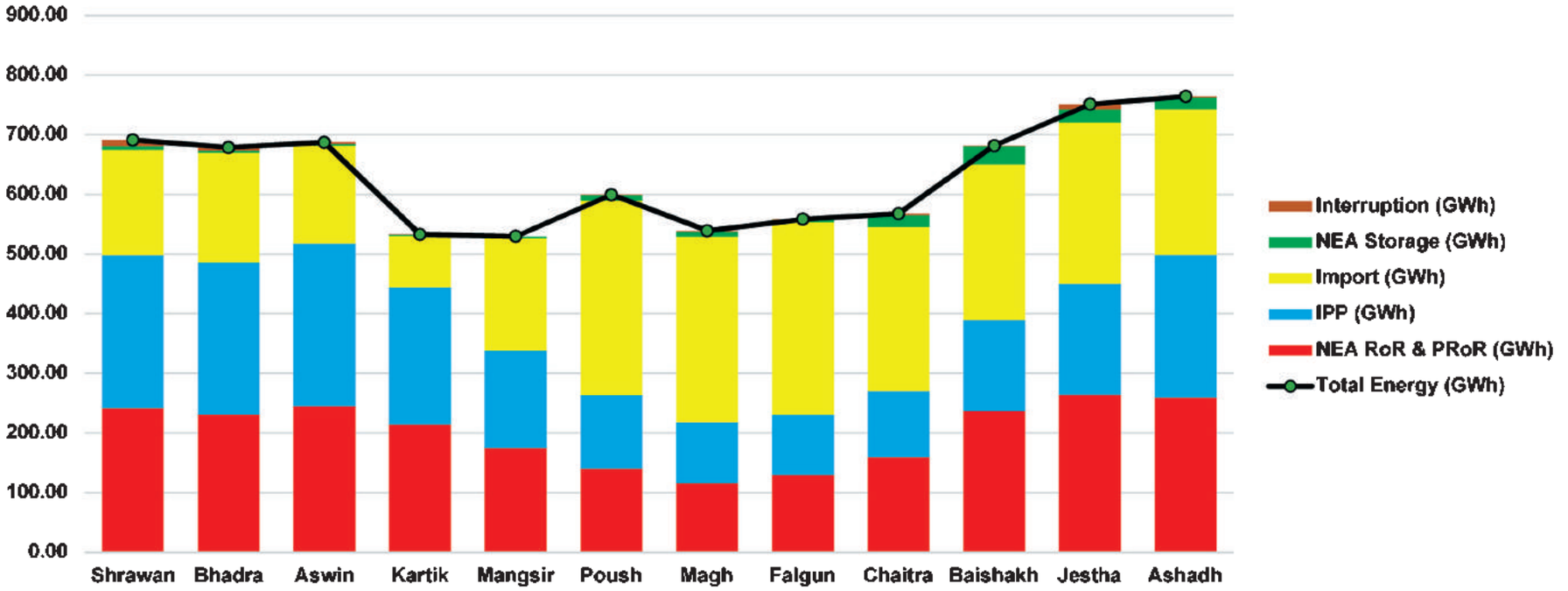
Capacity Balance (MW) in FY 2075/76 (2018/2019)



Monthly Peak Demand (MW)

Month	Shrawan	Bhadra	Aswin	Kartik	Mangsir	Poush	Magh	Falgun	Chaitra	Baishakh	Jestha	Asadh
Import (MW)	450.86	494.91	493.2	374.77	506.05	653.47	596.39	596.06	570.3	596.1	562.45	491.12
IPP (MW)	388.01	391.81	403.2	334.85	222.24	184.4	184.46	174.32	196.08	211.27	282.96	343.46
NEA RoR & PRoR (MW)	350.89	355.44	329.74	375.75	353.3	316.3	332.35	286.9	338.2	365.95	374.1	396.4
NEA Storage (MW)	45.5	45	45.1	90.4	89	89.4	89.6	89	86.7	87.7	90	89.3
Peak Demand (MW)	1235.26	1287.16	1271.24	1175.77	1170.59	1243.57	1202.8	1146.28	1191.28	1261.02	1309.51	1320.28

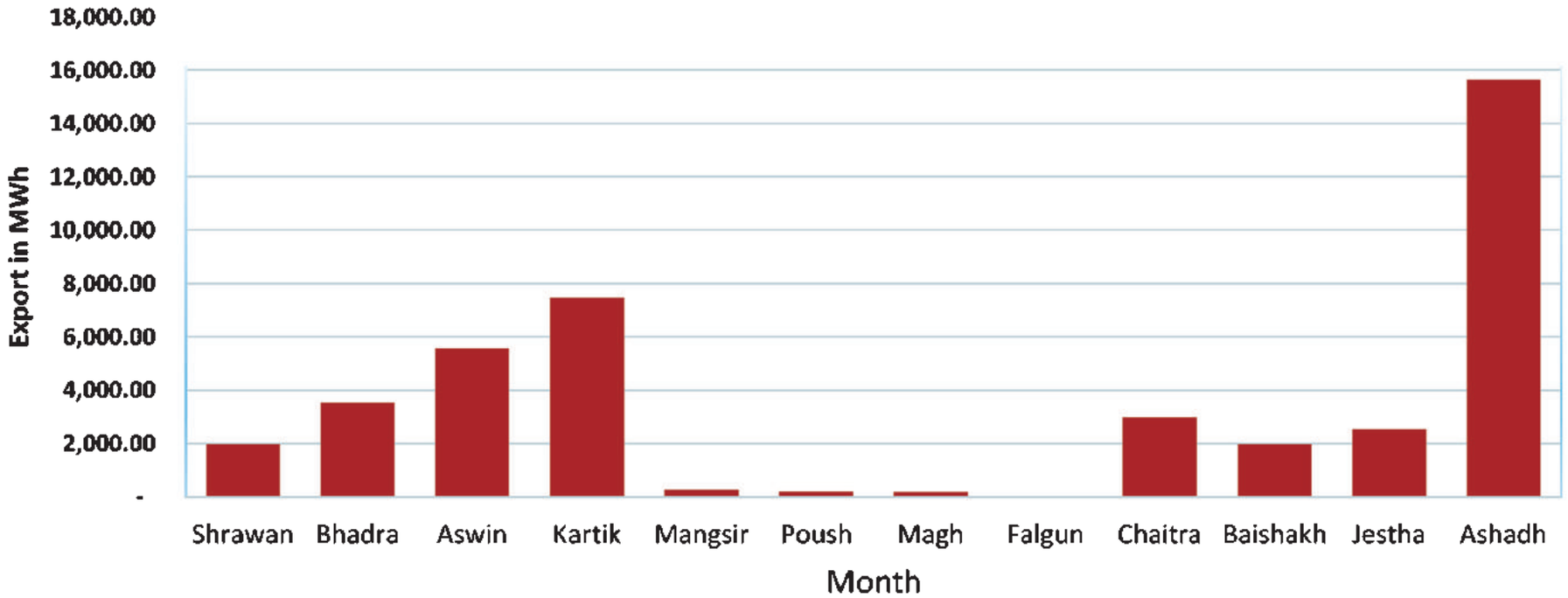
Energy Balance (GWh) in FY 2075/76 (2018/2019)



Monthly Energy Balance (GWh) in FY 2075/76 (2018/2019)

Month	Shrawan	Bhadra	Aswin	Kartik	Mangsir	Poush	Magh	Falgun	Chaitra	Baishakh	Jestha	Ashadh	Total
NEA RoR & PRoR (GWh)	241.84	230.64	245.16	214.49	175.24	140.31	115.49	130.14	160.14	237.33	264.59	259.27	2414.63
IPP (GWh)	256.63	255.33	272.43	229.31	163.31	123.47	102.46	99.78	109.79	152.15	185.95	239.50	2190.05
Import (GWh)	176.49	183.86	164.29	87.05	187.90	326.58	311.75	323.97	275.55	260.82	270.38	244.44	2813.07
NEA Storage (GWh)	6.57	4.26	3.26	2.06	3.41	8.94	8.14	4.07	19.95	30.97	22.21	19.62	133.47
Interruption (GWh)	9.94	4.85	2.26	0.23	0.00	0.30	1.41	0.68	2.59	0.70	8.06	1.69	32.70
Total Energy (GWh)	**691.47**	**678.93**	**687.39**	**533.14**	**529.84**	**599.59**	**539.25**	**558.64**	**568.01**	**681.98**	**751.19**	**764.50**	**7583.92**

Energy Export to India (MWh) in FY 2075/76 (2018/2019)



Monthly Energy Export to India (MWh) in FY 2075/76 (2018/2019

Month	Shrawan	Bhadra	Aswin	Kartik	Mangsir	Poush	Magh	Falgun	Chaitra	Baishakh	Jestha	Ashadh
Kataiya I (MWh)	2005.92	3541	5564.16	7467.84	290.88	214.56	184.32	40.32	1164.96	852.48	601.92	8493.12
Kataiya II (MWh)	0	0	0	0	0	0	0	0	0	0	0	3050
Ramnagar (MWh)				2.4	2.4	0	0	0	1824	1149.6	1946.4	3240
Raxaul (MWh)												861.68
Total (MWh)	2,005.92	3,541.00	5,564.16	7,470.24	293.28	214.56	184.32	40.32	2,988.96	2,002.08	2,548.32	15,644.80

ANNEX-1

ELECTRICITY TARIFF

TARIFF RATES

1. Domestic Consumers

(a) Minimum and Energy Charge (Single Phase)

kWh (Monthly) Units	5 Ampere		15 Ampere		30 Ampere		60 Ampere	
	Minimum Charge	Energy Charge	Minimum Charge	Energy Charge	Minimum Charge	Energy Charge	Minimum 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) Minimum and Energy Charge (Three Phase)

Low Voltage (230/400 V)

kWh	Up to 10 KVA		Above 10 KVA	
	Minimum Charge	Energy Charge	Minimum Charge	Energy Charge
Up to 400	1100.00	12.50	1800.00	12.50
Above 400		13.50		13.50

(c) Minimum and Energy Charge: Three Phase

Medium Voltage (33/11 KV)

kWh	Up to 10 KVA	
	Minimum Charge	Energy Charge
Up to 1000	10000.00	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	Peak Time (17.00-23.00)	Off Peak 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	Peak 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 Marsyandi	70,000
3	Marsyandi	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
13	Upper Trishuli 3A HEP	60,000
	Sub Total	549,150
Small Hydropower Plants		
1	Sundarijal	640
2	Panauti	2,400
3	Fewa	1,000
4	Seti (Pokhara)	1,500
5	Tatopani	2,000
6	Chatara	3,200
7	Tinau	1,024
8	Pharping***	500
9	Jomsom**	240
10	Baglung***	200
11	Khandbari**	250
12	Phidim**	240
13	Surnaiyagad	200
14	Doti***	200
15	Ramechhap	150
16	Terhathum**	100
17	Gamgad	400
	Sub Total	**14,244**
	Total	**563,394**
Small Hydropower 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**
S.No.	**Solar Power Plants**	**Capacity(KW)**
1	Simikot	50
2	Gamgadhi	50
	Total	**100**
Total Major Hydro(NEA)-Grid Connected		**563,394**
Total Small Hydro(NEA)-Isolated		4,536
Total Hydro(NEA)		567,930
Total Hydro(IPP)		560,775.40
Total Hydro(Nepal)		1,128,705
Total Thermal(NEA)		53,410
Total Solar(NEA)		100
Total Installed Capacity(NEA & IPP)-Grid		**1,177,679.40**
Total Installed Capacity		**1,182,215**
Under Construction		**Capacity(KW)**
1	Upper Tamakoshi Hydropower Project	456,000
2	Tanahu Hydropower Project	140,000
3	Kulekhani III HEP	14,000
4	Rahuganga HEP	40,000
5	Upper Sanjen	14,600
6	Sanjen	42,500
7	Rasuwagadi	111,000
8	Madhya Bhotekoshi	102,000
9	Upper Trishuli 3B	37,000
	Total	**957,100**
	Planned and Proposed	**Capacity(KW)**
1	Upper Arun HEP	10,61,000
2	Upper Modi A HEP	42,000
3	Upper Modi HEP	18,200
4	Dudhkoshi Storage HEP	6,35,000
5	Tamor Storage HEP	762,000
6	Uttar Ganga Storage HEP	828,000
7	Tamakoshi V HEP	95,000
8	Aandhikhola Storage HEP	180,000
9	Chainpur Seti HEP	210,000
10	Begnas Rupa Pump Storage HEP	150,000
	Total	**2,285,200**

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

Existing High Voltage Transmission Lines

SN	Description	Type of Ckts	Length Circuit km	Conductor Type	Nominal Aluminium Cross Section Area (Sq.mm)
A	**132 kV Transmission Line**				
1	Anarmani-Duhabi	Single	75.76	BEAR	250
2	Kushaha (Nepal)-Kataiya(India)	Single	15.00	BEAR	250
3	Duhabi-Lahan-Chandranigahapur-Pathalaiya-Parwanipur/ Pathalaiya- Hetauda	Double	608.00	BEAR	250
4	Hetauda-KL2 P/S	Double	16.00	BEAR	250
5	Bharatpur-Marsyangdi P/S	Single	25.00	DUCK	300
6	Hetauda-Bharatpur	Single	70.00	PANTHER	200
7	Marsyangdi P/S-Suichatar	Single	84.00	DUCK	300
8	Suichatar-Matatirtha- KL2 P/S	Double	72.00	BEAR	250
9	Suichatar-Balaju	Single	5.00	BEAR	250
10	Balaju-Chapali-New Bhaktapur	Double	36.00	BEAR	250
11	New Bhaktapur-Lamosangu	Double	96.00	BEAR	250
12	Lamosangu-Khimti P/S	Single	46.00	BEAR	250
13	Lamosangu-Bhotekoshi P/S	Single	31.00	BEAR	250
14	Bharatpur-Damauli	Single	39.00	WOLF	150
15	Bharatpur-Kawasoti-Bardghat	Single	70.00	PANTHER	200
16	Bardghat-Gandak P/S	Double	28.00	PANTHER	200
17	Bardghat-Butwal	Double	86.00	BEAR	250
18	Butwal-KGA P/S	Double	116.00	DUCK	300
19	KGA P/S-Lekhnath	Double	96.00	DUCK	300
20	Lekhnath-Damauli	Single	45.00	WOLF	150
21	Lekhnath-Pokhara	Single	7.00	DOG	100
22	Pokhara-Modikhola P/S	Single	37.00	BEAR	250
23	Butwal-Shivapur-Lamahi-Kohalpur	Double	430.00	BEAR	250
24	Lamahi-Jhimruk P/S	Single	50.00	DOG	100
25	Kohalpur-Bhurigaun-Lumki	Single	88.33	BEAR	250
26	Lamki-Pahalwanpur-Attariya-Mahendranagar (Lalpur)	Double	203.12	BEAR	250
27	Mahendranagar-Gaddachauki	Single	12.00	BEAR	250
28	Marsyangdi -M. Marsyangdi	Double	80.00	CARDINAL	420
29	Damak-Godak	Double	70.00	BEAR	250
30	Kusum-Hapure	Single	22.00	BEAR	250
31	Bhulbhule- Middle Marsyangdi P/S	Single	22.00	BEAR	250
32	Chameliya-Attaria	Double	236.00	BEAR	250
33	Raxual-Parwanipur (Cross Border-Nepal Portion)	Single	16.00	BEAR	250
34	Kusaha-Kataiya (Cross Border-Nepal Portion)	Single	13.00	BEAR	250
35	Dumre Damauli	Double	46.00	BEAR	250
36	Lamahi Ghorahi	Double	25.00	BEAR	250
37	Kushma -Lower Modi	Single	6.20	BEAR	250
38	Godak- Phidim-Amarpur (Kabeli II & III)	Double	113.13	BEAR	250
39	Trishuli 3A-Trishuli 3B Hub	Double	6.00	BISON	350
Total			**3142.54**		

B	**400/220 kV Transmission Line**				
1	Dhalkebar-Muzzaffarpur 400 kV Cross Border Line	Double	78.00	MOOSE	500
2	Khimti- Dhalkebar 220 kV Transmission Line	Double	142.00	BISON	350
3	Trishuli 3B Hub-Matatirtha	Double	98.00	BISON	350
4	Matatirtha- Matatirtha Substation	Double Ckt, Underground	2.50	1C, XLPE Cu Cable	1200
		Double Ckt, Underground	2.50	1C, XLPE Cu Cable	1600
5	Hetauda- Bharatpur	Double	10.00	BISON	350
Total			**333.00**		
C	**66 kV Transmission Line**				
1	Chilime P/S-Trishuli P/S	Single	39.00	WOLF	150
2	Trisuli P/S-Balaju	Double	58.00	DOG	100
3	Trisuli P/S-Devighat P/S	Single	4.56	WOLF	150
4	Devighat P/S-Okhaltar	Double	53.00	DOG	100
5	Okhaltar-Chapali	Double	5.60	XLPE Cable	500
6	Chapali-New Chabel	Double	10.00	DOG	100
7	New Chabel-Lainchaur	Single	7.00	XLPE Cable	500
8	Balaju-Lainchor	Single	2.00	PANTHER	200
9	Balaju-Siuchatar-KL1 P/S	Double	72.00	WOLF	150
10	KL 1 P/S-Hetauda-Birgunj	Double	144.00	WOLF	150
11	Suichatar-Teku	Double	8.20	BEAR	250
12	Suichatar-New Patan	Double	13.00	WOLF	150
13	Teku-K3 (underground)	Double, Single Core	5.60	XLPE Cable	400/500
14	Bhaktapur- Baneshwor-Patan	Single	16.50	LGJ 120 / WOLF	120/150
15	Bhaktapur-Banepa-Panchkhal-Sunkoshi P/S	Single	48.00	LGJ 120	120
16	Indrawati- Panchkhal	Single	28.00	PANTHER	200
Total			**514.46**		

Under Construction High Voltage Transmission Lines

S.N.	132 kV Transmission Line	Type of Ckts	"Length Circuit km"	Conductor Type	Nominal Aluminium Cross Section Area (Sq. mm)	"Expected Completion Year (FY)"
I	**Transmission Directorate**					
A	**132 kV Transmission Line**					
1	Singati-Lamosangu	Double	80	BEAR	250	2019/20
2	Solu Corridor	Double	180	CARDINAL	420	2019/20
3	Ramechap-Garjyang-Khimti	Double	62	BEAR	250	2019/20
4	Dordi Corridor	Double	20	BEAR	250	2019/20
5	Bardaghat-Sardi	Double	40	BEAR	250	2019/20
6	Raxual-Parwanipur 2nd Ckt Line (Cross Border-Nepal Portion)	Single	16	BEAR	250	2019/20
7	Kusaha-Kataiya 2nd Ckt Line (Cross Border-Nepal Portion)	Single	13	BEAR	250	2019/20
8	Butwal-Lumbini	Double	40	BEAR	250	2020/21
9	Burtibang-Paudi Amarai-Tamghas-Sandhikharka-Gorunsinghe	Double	168	BEAR	250	2020/21
10	Kushaha- Biratnagar	Double	46	BEAR	250	2020/21
11	Thankot-Chapagaon	Double	56	BEAR	250	
12	New Modi-Lekhnath	Double	84	BEAR	250	2021/22
	Total		**805.0**			
B	**220 kV Transmission Line**					
1	Chilime-Trishuli	Double	54	BISON	350	2019/20
2	Hetauda-Bharatpur	Double	148	BISON	350	2020/21
3	Bharatpur-Bardghat	Double	148	BISON	350	2020/21
4	Koshi Corridor (Inaruwa-Basantapur-Baneshwor-Tumlingtar)	Double	210	MOOSE	500	2020/21
5	Koshi Corridor (Basantapur-Dhungesangu)	Double	70	MOOSE	500	2021/22
	Total		**630**			
C	**400 kV Transmission Line**					
1	Hetauda-Dhalkebar-Inaruwa	Double	576	MOOSE	500	2020/21
	Total		**576**			
II	**Project Managment Directorate**					
A	**132 kV Transmission Line**					
1	Samundratar - Trishuli	Double	52	AAAC Upas	300	2019/20
2	Lapsifedi - Changunarayan - Duwakot	Double	28	BEAR	250	2019/20
3	Parwanipur - Pokhariya **	Double	40	ACCC Amsterdam	376	2021/22
4	Bhaktapur - Thimi - Koteswar**	Double	24	Single Core XLPE	500 sq. MM Cu	2021/22
	Total		**144**			
	(Note : ** - In the process of Procurement)					
B	**220 kV Transmission Line**					
1	Marsyangdi - Kathmandu	Double	164	Twin Moose	500	2019/20
2	Dana - Kushma	Double	79.6	Moose	500	2019/20
3	Kushma - New Butwal	Double	176	ACCC Drake	519.7	2020/21
4	New Butwal - Bardaghat	Double	42	BISON	350	2021/22
5	Udipur - Bharatpur	Double	134	ACCC Drake	519.7	2020/21
6	Udipur - Khudi	Double	36	ACCC Drake	519.7	2021/22
7	Khudi - Manang	Double	56	Moose	500	2021/22
	Total		**688**			
C	**400 kV Transmission Line**					
1	New Khimti - Barhabise	Double	92	MOOSE	500	2020/21
2	Barhabise - Kathmandu	Double	88	MOOSE	500	2021/22
	Total		**180**			

Planned and Proposed High Voltage Transmission Lines

S.N.	Description	Type of Ckts	Length Circuit km	Conductor Type	Nominal Aluminium Cross Section Area (Sq.mm)
I	**Transmission Directorate**				
A	**400 kV Transmission Line**				
1	Kerung-Chilime Hub-Ratmate	Double	140.00	MOOSE	500
2	Bheri Corridor	Double	50.00	MOOSE	500
3	Arun Inaruwa Anarmani	Double	460.00	MOOSE	500
4	Arun-Dudhkoshi-Tingla	Double	230.00	MOOSE	500
5	Dudhkoshi-Dhalkebar	Double	170.00	MOOSE	500
6	New Butwal Gorakhpur	Double	80.00	MOOSE	500
	Total		**1130.00**		
B	**220 kV Transmission Line**				
1	Lapan - Ratomate	Double	52.00	MOOSE	500
2	Tumlingtal Sitalpati	Double	30.00	MOOSE	500
3	Trishuli 3B - Ratomate	Double	48.00	MOOSE	500
4	Lekhnath-Damauli	Double	90.00	MOOSE	500
	Total		**220.00**		
C	**132 kV Transmission Line**				
1	Dhalkebar-Loharpatti	Double	40.00	BEAR	250
2	Dhalkebar- Balganga	Double	48.00	BEAR	250
3	Dadakhet- Rahughat	Double	50.00	BEAR	250
4	Ghorahi-Madichaur	Double	72.00	BEAR	250
5	Borang-Lapan	Double	46.00	BEAR	250
6	Nawalpur (Lalbandi) Salimpur	Double	40.00	BEAR	250
7	Pathlaiya Harniya	Double	54.00	BEAR	250
8	Bhumahi-Hakui	Double	32.00	BEAR	250
9	Bajhang-Deepayal-Attariya	Double	260.00	BEAR	250
10	Madichaur Bafikot	Double	150.00	BEAR	250
11	Kohalpur-Surkhet-Dailekh	Double	168.00	BEAR	250
12	Kaligandaki- Ridi	Double	44.00	BEAR	250
13	Balefi Corridor	Double	40.00	BEAR	250
14	Kohalpur- Nepalgunjg	Double	40.00	BEAR	250
15	Godak -Anarmani	Double	70.00	BEAR	250
16	Kabeli (Amarpur) Dhungesangu	Double	40.00	BEAR	250
17	Inaruwa Dharan	Double	50.00	BEAR	250
18	Godak Soyak	Double	16.00	BEAR	250
19	Barhabise Lamosaghu (Sunkoshi 132 kV SS)	Double	24.00	BEAR	250
20	Mainahiya Sampatiya	Double	56.00	BEAR	250
	Total		**1340.00**		
II	**Project Management Directorate**				
A	**400 kV Transmission Line**				
1	Nijgadh - Hetaunda TL	Double	150.00	MOOSE	500
2	New Butwal-Lamahi TL	Double	300.00	MOOSE	500
3	Lamahi-New Kohalpur TL	Double	180.00	MOOSE	500
4	New Kohalpur-Dododhara TL	Double	190.00	MOOSE	500
5	Dododhara(New Lamki)-New Attariya (Daiji) TL	Double	180.00	MOOSE	500
6	Tingla Hub-Likhu Hub- New Khimti TL	Double	110.00	MOOSE	500
7	New Khimti-Tamakoshi 3-Sunkoshi Hub-Dhalkebar TL	Double	220.00	MOOSE	500
8	Budhigandaki Corridor (Philim-Gumda-Ratamate) TL	Double	190.00	MOOSE	500
9	Damauli-Kusma-Burtibang-Bafikot	Double	400.00	MOOSE	500
	Total		**1920.00**		
B	**220 kV Transmission Line**				
1	Kathmandy valley Ring Main	Double	150.00	MOOSE	500
	Total		**150.00**		
C	**132 kV Transmission Line**				
1	Chhinchu - Surkhet	Double	50.00	BEAR	250
2	Dailekh - Kalikot - Jumla	Double	160.00	BEAR	250
3	Lamosangu - Kavre/Ramechhap	Double	80.00	BEAR	250
	Total		**290.00**		

Existing High Voltage Grid Substations

S.No	Substation	Voltage Ratio	Capacity FY 074-75	Capacity FY 075-76
		kV	MVA	MVA
A	Kathmandu Grid Division			
1	Balaju	132/66	45	45
		66/11	22.5	22.5
		66/11	22.5	22.5
		66/11		22.5
2	Chapali	132/11	30	30
		132/66	49.5	49.5
		132/66	49.5	49.5
3	Siuchatar	132/66	37.8	37.8
		132/66	37.8	37.8
		132/66	37.8	37.8
		66/11	18	18
		66/11	18	18
4	New Chabel	66/11	22.5	22.5
		66/11	22.5	22.5
		66/11	22.5	22.5
5	Lainchour	66/11	22.5	22.5
		66/11	22.5	22.5
6	New Patan	66/11	18	18
		66/11	18	18
		66/11	18	18
		66/11	0	18
7	Teku	66/11	22.5	22.5
		66/11	22.5	22.5
8	K3	66/11	22.5	22.5
		66/11	22.5	22.5
9	Baneswor	66/11	18	18
		66/11	18	18
10	Bhaktapur	132/66	49.5	49.5
		132/11	22.5	22.5
		132/11	22.5	22.5
11	Banepa	66/11	22.5	22.5
		66/11	22.5	
12	Panchkhal	66/11	10	10
13	Lamosanghu	132/33	30	30
14	Matatirtha	132/33	30	30
		132/11	22.5	22.5
15	Indrawati	66/11	7.5	10
B	Hetauda Grid Division			
16	Hetauda	132/66	45	45
		132/66	45	45
		66/11	10	10
		66/11	10	10
17	Kamane	132/33	30	30
		33/11	16.6	16.6
18	Bharatpur	132/33	30	30
		132/33	30	30
		132/11	15	30
		132/11	22.5	22.5
19	Birgunj	66/33	12.5	12.5
		66/33	12.5	12.5
		66/11	30	30
		66/11	30	30

20	Parwanipur	132/11	22.5	22.5
		132/11	22.5	22.5
		132/11	22.5	22.5
		132/66	63	63
		132/66	63	63
21	Simra	66/11	15	15
		66/11	15	15
22	Amlekhgunj	66/11	7.5	7.5
23	Pathlaiya	132/11	22.5	22.5
C	Dhalkebar Grid Branch			
24	Lahan	132/33		
		132/33	63	63
		33/11	16.6	16.6
		33/11	16.6	16.6
25	Chapur	132/33	30	30
		132/33	30	30
		33/11	8	8
26	Dhalkebar	220/132		160
		220/132		160
		132/33	30	30
		132/33	63	63
		33/11	8	8
		33/11	16.6	16.6
27	Mirchaiya	132/33	30	30
		33/11	8	16.6
28	Rupani	132/33		63
D	Duhabi Grid Branch			
29	Duhabi	132/33	63	63
		132/33	63	63
		132/33	63	63
		33/11	16.6	16.6
		33/11	16.6	16.6
30	Anarmani	132/33	30	30
		132/33	30	30
		33/11	16.6	16.6
		33/11	8	16.6
31	Damak	132/33	30	30
		33/11	16.6	16.6
32	Godak	132/33	30	63
		33/11	8	8
33	Phidim	132/33		20
		33/11		3
34	Amarpur (Kabeli)	132/33		30
		33/11		3
E	Butwal Grid Division			
35	Butwal	132/33	63	63
		132/33	63	63
		132/33	63	63
		33/11	16.6	16.6
		33/11	16.6	16.6
		33/11	0.0	16.6
36	Bardghat	132/11	22.5	22.5
		132/11	7.5	7.5
37	Chanauta	132/33	30	30
		132/33	12.5	12.5
		33/11	3	8
		33/11	3	3

38	Lamahi	132/33	63	63
		132/33	30	30
		33/11	16.6	16.6
		33/11		
39	Ghorahi	132/33		30
40	Kawasoti	132/33	30	30
		33/11	16.6	16.6
F	Pokhara Grid Branch			
41	Damauli	132/33	30	30
		132/33	30	30
		33/11	16.6	16.6
		33/11	3	3
42	Pokhara	132/11	30	30
		132/11	30	30
43	Lekhnath	132/33	12.5	30
		132/11		
		132/11	22.5	22.5
44	Markichowk	132/33		30
45	Syangja	132/33	30	30
		33/11	8	8
G	Attaria Grid Branch			
46	Kusum	132/11	12.5	12.5
47	Hapure	132/33		30
		33/11		8
48	Attaria	132/33	30.0	30.0
		132/33	30.0	30.0
		33/11	16.6	16.6
49	Kohalpur	132/33	30	63
		132/33	30	30
		33/11	3	3
		33/11	16.6	16.6
50	Lamki	132/33	15	15
		132/33	15	15
		33/11	16.6	16.6
51	Mahendranagar	132/33	15	15
		132/33	10	15
		33/11	7.5	7.5
52	Bhurigaon	132/33	30	30
		33/11	8	8
53	Pahalmanpur	132/33	30	30
		33/11	8	8
54	Syaule	132/33		30
		33/11		8

S.No	Voltage Rating (kV)	No.	Total Capacity FY 74-75 (MVA)	Total Capacity FY 75-76 (MVA)	Total Increment (MVA)
1	220/132	2		320	320
2	132/66	11	522.90	522.90	0
3	132/33	46	1397.00	1718.50	321.5
4	132/11	16	350.00	365.00	15
5	66/33	2	25.00	25.00	0
6	66/11	29	553.50	574.00	20.5
7	33/11	33	349.1	409.9	60.8
	Total	137	3197.50	3935.30	737.8

Under Construction High Voltage Grid Substations

S.N.	Namae of Project	Substation	Voltage Level (Ratio)	Capacity	Total Capacity	Expected Completion Year
			kV	MVA	MVA	AD
I	**Transmission Directorate**					
1	Hetauda- Dhalkebar-Inaruwa 400 kV Substation Expansion Project	Dhalkebar	400/220	3 Ø, 3x315	945	2019/20
2	Chilime Trishuli 220 kV Transmission Line	Chilime	220/132 132/33	1 Ø, 7x53.33 Bank 3 Ø, 50	370	2019/20
3	Trishuli 3B Hub Substation	Trishuli 3 B Hub	66/11	1 Ø, 7x53.33 Bank 3 Ø, 50	370	2019/20
4	Hetauda- Bharatpur220 kV Transmission Line	New Bharatpur (Aaptari)	132/33	3 Ø, 22.5	22.5	2019/20
5	Kabeli Corridor 132 kV Transmission Line	Amarpur (Kabeli)	132/33 33/11	3 Ø, 30 3 Ø, 3	33	2019/20
6	Singati Lamosanghu 132 kV Transmission Line	Singati	132/33	3 Ø, 30	30	2019/20
7	Ramechhap Garjyang Khimti 132 kV Transmission Line	Garjyang	132/33	1 Ø, 4x10 Bank	30	2019/20
8	Kushaha Kataiya 132 kV Second Circuit Transmission Line	Kushaha	132/11	3 Ø, 22.5	22.5	2019/20
9	Solu Corridor 132 kV Transmission Line	Tingla	132/33 33/11	3 Ø, 30 3 Ø, 8	38	2019/20
10	Dordi Corridor132 kV Transmission Line	Kritipur	132/11	3 Ø, 10	10	2019/20
11	Butwal Lumbini132 kV Transmission Line	Mainahiya	132/33 33/11	3 Ø, 2x45 3 Ø, 16	106	2019/20
12	Purbi Chitwan 132 kV Substation	Hardi	132/33	3 Ø, 2x30 3 Ø, 16.6	76.6	2019/20
13	Hetauda- Dhalkebar-Inaruwa 400 kV Substation Expansion Project	Hetauda	400/220	1 Ø, 4x167 Bank	500	2020/21
		Inaruwa	400/220	3 Ø, 3x315	945	2020/21
14	Nepal India Electricity Transmission and Trade Project (Hetauda-Dhalkebar-Inaruwa 400 kV Transmission Line)	Hetauda	220/132 132/11	3 Ø, 2x100 3 Ø, 10	210	2020/21
		Inaruwa	220/132 220/33	3 Ø, 2x100 3 Ø, 2x63	326	2020/21
15	Koshi Corridor 220 kV Transmission Line	Tumlingtar	220/132 132/33	1 Ø, 7x33.33 Bank 3 Ø, 2x30	260	2020/21
		Baneshwor	220/33	3 Ø, 2x30	60	2020/21
		Basantapur	220/132 132/33	1 Ø 7x33.33 Bank 3 Ø, 30	230	2020/21
16	Ramechhap Garjyang Khimti 132 kV Transmission Line	New Khimti	220/132	1 Ø, 4x66.67 Bank	200	2020/21
17	Burtibang Paudi Amarai Tamghas Sandhikharka Gorusinghe 132 kV Transmission Line	Burtibang	132/33	3 Ø, 30	30	2020/21
		Paudi Amarai	132/33	3 Ø, 30	30	2020/21
		Tamghas	132/33	3 Ø, 30	30	2020/21
		Sandhikharka	132/33 33/11	3 Ø, 30 3 Ø, 8	38	2020/21
		Motipur	132/33 33/11	3 Ø, 30 3 Ø, 8	38	2020/21

18	Kushaha Biratnagar 132 kV Transmission Line	Biratnagar	132/33 33/11	3 Ø, 2x63 3 Ø, 16	142	2020/21
19	Nawalpur 132 kV Substation	Nawalpur	132/33 33/11	3 Ø, 63 3 Ø, 16	79	2020/21
20	Sunwal 132 kV Substation	Sunwal	132/33 132/11	3 Ø, 2x63 3 Ø, 22.5	148.5	2020/21
21	Koshi Corridor 220 kV Transmission Line	Dhungesanghu	132/33	1 Ø, 7x5 Bank	30	2021/22
22	New Modi Lekhnath132 kV Transmission Line	Lahachowk	132/33 33/11	3 Ø, 30 3 Ø, 8	38	2021/22
Total					**5,388.10**	
II	**Under Project Management Directorate**					
1	Marsyangdi - Kathmandu Transmission Line Project	Markichowk	220/132	1 Ø, 4x53.33	160	2019/20
		Matatirtha	220/132	1 Ø, 7x53.33	320	2019/20
2	Kaligandaki Corridor 220 kV TL Project	Dana	220/132 132/33	1 Ø, 4x33.33 Bank 3 Ø, 25	125	2019/20
		Kushma	220/132	1 Ø, 4x33.33	100	2019/20
		New Butwal	220/132	1 Ø, 4x33.33	100	2019/20
3	Samundratar - Trishuli 3B Hub 132 kV TL Project	Samundratar	132/33	3Ø, 2x30	76	2019/20
			33/11	3Ø, 2x8		
4	Marsyangdi Corridoor 220 kV TL Project	Bharatpur	220/132	3Ø, 2x160	320	2021/22
		Udipur	220/132	1 Ø, 4x53.33	210	2021/22
			132/33	3Ø, 1x50		
		Khudi	220/132	1 Ø, 4x53.33	210	2022/23
			132/33	3Ø, 1x50		
		Manang	132/33	1 Ø, 4x33.33	130	2022/23
			132/33	3Ø, 1x30		
5	Barhabise Substation Project	Barhabise	220/132	1 Ø, 4x53.33	165	2020/21
			132/11	3Ø, 1x5		
6	Lapsiphedi and Changunarayan SS Project	Lapsifedi	220/132	1 Ø, 4x53.33	165	2020/21
			132/11	3Ø, 1x5		
		Changunarayan	132/11	3Ø, 1x45	45	
7	Kathmandu Valley Transmission Capacity Reinforcement Project	Mulpani	132/11	3Ø, 2x45	90	2020/21
		Futung	132/11	3Ø, 2x45	90	2020/21
		Chapagaun	132/11	3Ø, 2x45	90	2020/21
8	New Khimti - Barhabise - Lapsifedi 400 kV SS Project	New Khimti	400/220	1 Ø, 7x105	630	2021/22
		Barhabise	400/220	1 Ø, 7x53.33	320	2021/22
		Lapsifedi	400/220	1 Ø, 4x105	315	2021/22
9	Parwanipur - Pokhariya 132 kv TL Project**	Pokhariya	132/33	3Ø, 2x63	171	2021/22
			132/11	3Ø, 1x45		
10	Bhaktapur - Thimi - Koteswar 132 TL Project**	Thimi	132/11	3Ø, 2x45	90	2021/22
		Koteswar	132/66	3Ø, 1x100	190	2021/22
			132/11	3Ø, 2x45		
Total					**4,112.00**	

Planned and Proposed Construction High Voltage Grid Substations

S.No.	Namae of Project	Substation	Voltage Level (Ratio)	Capacity	Total Capacity
			kV	MVA	MVA
I	**Transmission Directorate**				
1	Bheri Corridor 400 kV Transmission Line	Bafikot	400		
2	Lekhnath Damauli 220 kV Transmission Line	Lekhnath	132/33	1 Ø, 7x53.33 Bank	320
		Damauli	132/33	3 Ø, 63	63
3	Borang Ratmate 220 kV Transmission Line	Borang	132/33		
		Lapan	220/132		
4	Tumlingtar Sitalpati 220 kV Transmission Line	Sitalpati	220/132 132/33	1 Ø, 7x33.33 Bank 1 Ø, 4x8 Bank	224
5	Balefi Barhabise 132 kV Transmission Line	Pangtang (Balefi)	132/33	3 Ø, 30	30
6	Ghorahi Madichaur 132 kV Transmission Line	Madichaur	132/33	3 Ø, 45	45
7	Dhalkebar Loharpati 132 kV Transmission Line	Loharpatti	132/33 33/11	3 Ø, 2x30 3 Ø, 16	76
8	Dadakhet Rahughat132 kV Transmission Line	Dadakhet	132/33	3 Ø, 30	30
		Rahughat	220/132	1 Ø, 4x33.33 Bank	100
9	Kaligandaki Ridi132 kV Transmission Line	Ridi	132/33 33/11	3 Ø, 30 3 Ø, 8	38
10	Keraun 132 kV Substation	Keraun	132/33	3 Ø, 2x63	126
11	Lalbandi Salimpur 132 kV Transmission Line	Salimpur	132/33	3 Ø, 63	63
12	Dhalkebar Balganga 132 kV Transmission Line	Balganga	132/33	3 Ø, 2x63	126
13	Bhumahi Hakui132 kV Transmission Line	Hakui	132/33	3 Ø, 63	63
14	Godak Anarmani 132 kV Transmission Line	Anarmani	132/33	3 Ø, 63	63
15	Inaruwa Dharan 132 kV Transmission Line	Dharan	132/33	3 Ø, 63	63
16	Kohalpur Nepalgunj 132 kV Transmission Line	Nepalgunj	132/33	3 Ø, 63	63
17	Pathalaiya Harniya 132 kV Transmission Line	Harniya	132/33	3 Ø, 63	63
18	New Pokhara 132 kV Substation	Birauta	132/11	3 Ø, 30	30
19	Lamahi Ghorahi 132 kV Substation Expansion	Ghorahi	132/33	3 Ø, 30	30
	Total				**1616**
I	**Project Managment Directorate**				
1	Kathmandu valley 220 kV Ring Main Project	Kathmandu	220/132	400	490
			132/11	90	
		Bhaktapur	220/132	400	490
			132/11	90	
		Lalitpur	220/132	400	490
			132/11	90	
2	New Butwal - Lamahi - Kohalpur - New Lamki - New attariya400 kV Transmission Line Project	Lamahi SS	400/220/132	630	720
			132/11	90	
		New Kohalpur SS	400/220/132	630	720
			132/11	90	
		New Attariya SS (Daiji)	400/220/132	630	720
			132/11	90	
3	Tingla Hub-Likhu Hub- New Khimti 400 kV TL Project	Likhu Hub SS	400/220/132	630	630
4	New Khimti-Tamakoshi 3-Sunkoshi Hub-Dhalkebar 400 kV TL Project	Sunkoshi Hub SS	400/220/132	630	630
5	Budhigandaki corridor 400 kV TL Project	Philim / Gumda	400/220/132	630	
6	Dailekh - kalikot - Jumla 132 kV Project	Kalikot	132/33	63	108
			132/11	45	
		Jumla	132/33	63	108
			132/11	45	
7	Damauli - Kushma - Burtibang - Banfikot Project	Kushma	400/220/132	630	630
		Burtibang	400/220/132	630	630
		Banfikot	400/220/132	630	630
8	Lamosangu - Kavre / Ramechhap 132kV TL Project	Kavre/ Ramechhap	132/33	63	108
			132/11	45	
	Total				**7104**

Note : Above projects are in the phase of detail study and the indicated capacity of substation may change.

NEPAL ELECTRICITY AUTHORITY
POWER TRADE DEPARTMENT
IPPs' Hydro Power Projects (Operation) as of FY 2075/76

S.N.	Developer	Projects	Location	Capacity (kW)	PPA Date	Commercial Operation Date
1	Himal Power Ltd.	Khimti Khola	Dolakha	60000	2052.10.01	2057.03.27
2	Bhotekoshi Power Company Ltd.	Upper Bhotekoshi	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	Sindhupalchowk	2500	2058.07.28	2061.12.11
11	Alliance Power Nepal Pvt.Ltd.	Chaku Khola	Sindhupalchowk	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	Panchthar	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	Dolakha	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	Dolakha	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	Dailekh	3750	2069.12.30	2074.01.23
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	2075.03.24
75	Leguwa Khola Laghu Jalbidhyut Sahakari Sastha Ltd.	Leguwa Khola	Dhankuta	40	2072.11.21	2075.03.28
76	Super Mai Hydropower Pvt. Ltd.	Super Mai	Illam	7800	2073.12.06	2075.07.11
77	Chimal Gramin Bidhyut Sahakari Sanstha Ltd.	Sobuwa Khola-2 MHP	Taplejung	90	2074.11.15	2075.07.14
78	Surya Power Company Pvt. Ltd.	Bishnu Priya Solar Farm Project	Nawalparasi	960	2074.04.08	2075.08.13
79	Deurali Bahuudesiya Sahakari Sanstha Ltd.	Midim Khola	Lamjung	100	2070.02.20	2075.09.04
80	Bindhyabasini Hydropower Development Co. (P.) Ltd.	Rudi Khola A	Lamjung and Kaski	8800	2069.10.28	2075.12.04
81	Mandu Hydropower Ltd.	Bagmati KholaSmall	MakawanpurLalitpur	22000	2069.10.07	2075.12.19
82	Eastern Hydropower Pvt. Ltd.	Pikhuwa Khola	Bhojpur	5000	2066.07.24	2076.02.27
83	Salmanidevi Hydropower (P). Ltd	Kapadi Gad	Doti	3330	2069.12.11	2076.02.25
			TOTAL	**560,775.40**		

NEPAL ELECTRICITY AUTHORITY
POWER TRADE DEPARTMENT
IPPs' Hydropower Projects (Under Construction) as of FY 2075/76
(Financial Closure concluded projects)

S.N.	Developers	Projects	Location	Installed Capacity (kW)	PPA Date	Required Commercial Operation Date
1	Upper Tamakoshi Hydropower Ltd.	Upper Tamakoshi	Dolkha	456000	2067.09.14	2072.9.10 - 4 Units, 2073.3.30 - 2 Units
2	Nama Buddha Hydropower Pvt. Ltd.	Tinau Khola Small	Palpa	1665	2065.03.31	2066.11.1 (990kw) 2077.09.15 (675kw)
3	Himalayan Hydropower Pvt. Ltd.	Namarjun Madi	Kaski	11800	2066.05.30	2071.4.1
4	Jumdi Hydropower Pvt. Ltd.	Jumdi Khola	Gulmi	1750	2066.10.21	2069.10.11
5	Hira Ratna Hydropower P.ltd	Tadi Khola	Nuwakot	5000	2067.01.09	2075.10.01
6	Energy Engineering Pvt. Ltd.	Upper Mailung A	Rasuwa	6420	2067.03.25	2075.10.01
7	Shiva Shree Hydropower (P.) Ltd.	Upper Chaku A	Sindhupalchowk	22200	2067.05.22	2073.01.25
8	Greenlife Energy Pvt. Ltd.	Khani khola-1	Dolakha	40000	2067.06.24 2074.02.21	2074.12.17 (for 25MW) 2076.09.03 (for 15MW)
9	Himalaya Urja Bikas Co. Pvt. Ltd.	Upper Khimti	Ramechhap	12000	2067.10.09	2075.3.32
10	Green Ventures Pvt. Ltd.	Likhu-IV	Ramechhap	52400	2067.10.19	2077.06.30
11	Robust Energy Ltd.	Mistri Khola	Myagdi	42000	2067.10.20	2076.05.14
12	Manang Trade Link Pvt. Ltd.	Lower Modi	Parbat	20000	2068.05.20	2074.3.31
13	Mathillo Mailung Khola Jalbidhyut Ltd. (Prv. Molnia Power Ltd.)	Upper Mailun	Rasuwa	14300	2068.05.23	2075.10.01
14	Sanjen Hydropower Co.Limited	Upper Sanjen	Rasuwa	14800	2068.06.23	2075.10.01
15	Middle Bhotekoshi Jalbidhyut Company Ltd.	Middle Bhotekoshi	Sindhupalchowk	102000	2068.07.28	2076.12.28
16	Chilime Hydro Power Company Ltd.	Rasuwagadhi	Rasuwa	111000	2068.07.28	2075.10.01
17	Water and Energy Nepal Pvt. Ltd.	Badi Gad	Baglung	6600	2068.08.13	2072.2.14
18	Sanjen Hydropower Company Limited	Sanjen	Rasuwa	42500	2068.08.19	2075.10.01
19	Gelun Hydropower Co.Pvt.Ltd	Gelun	Sindhupalchowk	3200	2068.09.25	2074.06.14
20	Dariyal Small Hydropower Pvt.Ltd	Upper Belkhu	Dhading	750	2068.11.28	2071.7.16
21	Suryakunda Hydroelectric Pvt. Ltd.	Upper Tadi	Nuwakot	11000	2068.12.03	2075.10.01
22	Himalayan Power Partner Pvt. Ltd.	Dordi Khola	Lamjung	27000	2069.03.01	2076.05.14
23	Sasha Engingeering Hydropower (P). Ltd	Khani Khola(Dolakha)	Dolakha	30000	2069.03.25	2074.12.17
24	Arun Kabeli Power Ltd.	Kabeli B-1	Taplejung, Panchthar	25000	2069.03.29	2075.01.09
25	Rising Hydropower Compnay Ltd.	Selang Khola	Sindhupalchowk	990	2069.03.31	2071.6.15
26	Liberty Hydropower Pvt. Ltd.	Upper Dordi A	Lamjung	25000	2069.06.02	2076.05.14
27	Hydro Innovation Pvt. Ltd.	Tinekhu Khola	Dolakha	990	2069.06.08	2074.12.30
28	Salankhu Khola Hydropower Pvt. Ltd.	Salankhu Khola	Nuwakot	2500	2069.06.14	2071.11.30
29	Moonlight Hydropower Pvt. Ltd.	Balephi A	Sindhupalchowk	10600	2069.07.14	2076.12.28
30	Middle Modi Hydropower Ltd.	Middle Modi	Parbat	15100	2069.08.21	2077.03.31
31	Reliable Hydropower Co. Pvt. Ltd.	Khorunga Khola	Terhathum	4800	2069.08.26	2077.08.16
32	Rara Hydropower Development Co. Pvt. Ltd.	Upper Parajuli Khola	Dailekh	2150	2069.08.28	2071.12.17
33	Lohore Khola Hydropower Co. Pvt. Ltd.	Lohore Khola	Dailekh	4200	2069.09.08	2073.06.20
34	Beni Hydropower Project Pvt. Ltd.	Upper Solu	Solukhumbu	18000	2069.09.16 2073.07.25 (PPA Revived)	2074.10.01
35	Dudhkoshi Power Company Pvt. Ltd.	Rawa Khola	Khotang	6500	2069.09.26	2073.05.31
36	Universal Power Company Ltd.	Lower Khare	Dolakha	11000	2069.10.22	2074.9.16 (8.26MW) 2076.04.03 (2.74MW)
37	Madhya Midim Jalbidhyut Company P. Ltd.	Middle Midim	Lamjung	3100	2069.10.23	2072.5.1
38	Volcano Hydropower Pvt. Ltd.	Teliya Khola	Dhankuta	996	2069.10.25	2071.7.24
39	Betrawoti Hydropower Company (P).Ltd	Phalankhu Khola	Rasuwa	13700	2069.12.06	2075.10.01
40	Himalaya Urja Bikas Co. Ltd.	Upper Khimti II	Ramechhap	7000	2069.12.09	2075.12.01

41	Dovan Hydropower Company Pvt. Ltd.	Junbesi Khola	Solukhumbu	5200	2069.12.29	2076.08.30
42	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)
43	Tallo Midim Jalbidhut Company Pvt. Ltd.	Lower Midim	Lamjung	996	2070.01.19	2071.8.1
44	Rairang Hydropower Development Company Ltd.	Iwa Khola	Taplejung	9900	2070.01.29	2075.4.1
45	Tangchhar Hydro Pvt. Ltd	Tangchhahara	Mustang	2200	2070.02.20	2073.7.1
46	Abiral Hydropower Co. Pvt. Ltd.	Upper Khadam	Morang	990	2070.02.21	2071.08.01
47	Manakamana Engineering Hydropower Pvt. Ltd.	Ghatte Khola	Dolakha	5000	2070.04.28	2075.03.16
48	Essel-Clean Solu Hydropower Pvt. Ltd.	Lower Solu	Solukhumbu	82000	2070.07.15	2076.8.30
49	Consortium Power Developers Pvt. Ltd.	Khare Khola	Dolakha	24100	2070.07.15	2075.08.15
50	Upper Solu Hydroelectric Company Pvt. Ltd	Solu Khola	Solukhumbu	23500	2070.07.24	2075.4.1
51	Singati Hydro Energy Pvt. Ltd.	Singati Khola	Dolakha	25000	2070.07.27	2075.05.31 (16MW) 2077.04.01 (9MW)
52	Maya Khola Hydropower Co. Pvt. Ltd.	Maya Khola	Sankhuwasabha	14900	2070.08.30	2076.9.1
53	Idi Hydropower Co. P. Ltd.	Idi Khola	Kaski	975	2070.09.01	2074.09.16
54	Buddha Bhumi Nepal Hydro Power Co. Pvt. Ltd.	Lower Tadi	Nuwakot	4993	2070.12.10	2075.10.01
55	Mountain Hydro Nepal Pvt. Ltd.	Tallo Hewa Khola	Panchthar	22100	2071.04.09	2075.01.09
56	Bindhyabasini Hydropower Development Co. (P.) Ltd.	Rudi Khola B	Lamjung and Kaski	6600	2071.4.20	2074.04.01 2076.02.32
57	Dordi Khola Jal Bidyut Company Ltd.	Dordi-1 Khola	Lamjung	12000	2071.07.19	2076.08.16 (10.3 MW) 2077.04.02 (1.7 MW)
58	River Falls Hydropower Development Pvt. Ltd.	Down Piluwa	Sankhuwasabha	9500	2071.10.18	2076.09.01
59	Rangoon Khola Hydropower Pvt. Ltd.	Jeuligad Small Hydropower Project	Bajhang	996	2071.10.20	2073.10.03 2075.03.32
60	Peoples' Hydropower Company Pvt. Ltd.	Super Dordi 'Kha'	Lamjung	54000	2071.11.13	2077.03.29
61	Hydro Venture Private Limited	Solu Khola (Dudhkoshi)	Solukhumbu	86000	2071.11.13	2077.06.10
62	Global Hydropower Associate Pvt. Ltd.	Likhu-2	Solukhumbu/ Ramechap	33400	2071.11.19	2077.04.01
63	Paan Himalaya Energy Private Limited	Likhu-1	Solukhumbu/ Ramechap	51400	2071.11.19	2077.04.01
64	Numbur Himalaya Hydropower Pvt. Ltd.	Likhu Khola A	Solukhumbu/ Ramechap	24200	2071.11.22	2077.04.01
65	Dipsabha Hydropower Pvt. Ltd.	Sabha Khola A	Sankhuwasabha	9990	2071.12.02	2076.07.15
66	Research and Development Group Pvt. Ltd.	Rupse Khola	Myagdi	4000	2071.12.17	2076.08.02
67	Hydro Empire Pvt. Ltd.	Upper Myagdi	Myagdi	20000	2071.12.17	2077.05.30
68	Chandeshwori Mahadev Khola MH. Co. Pvt. Ltd.	Chulepu Khola	Ramechhap	8520	2071.12.23	2075.04.15
69	Nyadi Hydropower Limited	Nyadi	Lamjung	30000	2072.02.12	2077.01.06
70	Suri Khola Hydropower Pvt. Ltd.	Suri Khola	Dolakha	6400	2072.02.20	2074.12.30
71	Bungal Hydro Pvt. Ltd. (Previously Sanigad Hydro Pvt. Ltd.)	Upper Sanigad	Bajhang	10700	2072.03.15	2076.05.29
72	Kalanga Hydro Pvt. Ltd.	Kalangagad	Bajhang	15330	2072.03.15	2076.05.29
73	Sanigad Hydro Pvt. Ltd.	Upper Kalangagad	Bajhang	38460	2072.03.15	2077.04.15
74	Dhaulagiri Kalika Hydro Pvt. Ltd.	Darbang-Myagdi	Myagdi	25000	2072.04.28	2075.12.25
75	Menchhiyam Hydropower Pvt. Ltd.	Upper Piluwa Khola 2	Sankhuwasabha	4720	2072.05.11	2076.04.01
76	Kabeli Energy Limited	Kabeli-A	Panchthar and Taplejung	37600	2072.06.07	2076.11.03
77	Upper Syange Hydropower P. Ltd.	Upper Syange Khola	Lamjung	2400	2072.06.14	2075.10.01
78	Peoples Energy Ltd. (Previously Peoples Hydro Co-operative Ltd.)	Khimti-2	Dolakha and Ramechhap	48800	2072.06.14	2078.04.01
79	Chauri Hydropower (P.) Ltd.	Chauri Khola	Kavrepalanchowk, Ramechhap, Sindhupalchowk, Dolakha	6000	2072.06.14	2075.12.30 (5 MW) 2078.08.03 (1 MW)
80	Pashupati Environmental Power Co. Pvt. Ltd.	Lower Chhote Khola	Gorkha	997	2072.08.04	2076.05.15

81	Huaning Development Pvt. Ltd.	Upper Balephi A	Sindhupalchowk	36000	2072.08.29	2075.10.06
82	Upper Hewa Khola Hydropower Co. Pvt. Ltd.	Upper Hewa Khola Small	Sankhuwasabha	8500	2072.09.23	2076.03.17
83	Multi Energy Development Pvt. Ltd.	Langtang Khola	Rasuwa	20000	2072.09.29	2076.12.30 (for 10MW) 2078.04.03 (for 10MW)
84	Ankhu Hydropower (P.) Ltd.	Ankhu Khola	Dhading	34000	2073.01.30	2076.12.30
85	Myagdi Hydropower Pvt. Ltd.	Ghar Khola	Myagdi	14000	2073.02.11	2076.08.30 (8.3 MW) 2078.10.17 (5.7 MW)
86	Richet Jalbidhyut Company Pvt. Ltd.	Richet Khola	Gorkha	4980	2073.02.23	2075.07.30
87	United Idi Mardi and R.B. Hydropower Pvt. Ltd.	Upper Mardi	Kaski	7000	2073.02.25	2075.04.01
88	Rapti Hydro and General Construction Pvt. Ltd.	Rukumgad	Rukum	5000	2073.03.07	2076.09.01
89	Rawa Energy Development Pvt. Ltd.	Upper Rawa	Khotang	3000	2073.04.24	2076.03.30
90	Siddhi Hydropower Company Pvt. Ltd.	Siddhi Khola	Illam	10000	2074.05.29	2077.03.31
91	Api Power Company Pvt. Ltd.	Upper Naugad Gad	Darchula	8000	2073.07.12	2077.04.01
92	Terhathum Power Company Pvt. Ltd.	Upper Khorunga	Terhathum	7500	2073.07.29	2076.09.01
93	Nilgiri Khola Hydropower Co. Ltd.	Nilgiri Khola	Myagdi	38000	2073.11.30	2080.08.30
94	Siuri Nyadi Power Pvt. Ltd.	Super Nyadi	Lamjung	40270	2074.02.19	2079.04.01
95	Swet-Ganga Hydropower and Construction Ltd.	Lower Likhu	Ramechhap	28100	2073.09.14	2078.08.15
96	Nilgiri Khola Hydropower Co. Ltd.	Nilgiri Khola-2	Myagdi	62000	2074.03.05	2081.08.30
97	Sano Milti Khola Hydropower Ltd.	Sano Milti	Ramechhap and Dolakha	3000	2073.01.13	2075.08.01
98	Diamond Hydropower Pvt. Ltd.	Upper Daraudi-1	Gorkha	10000	2072.08.14	2075.09.17
99	Chhyangdi Hydropower Limited	Upper Chhyangdi Khola	Lamjung	4000	2074.03.22	2078.4.05
100	Taksar-Pikhuwa Hydropower Pvt. Ltd.	Taksar Pikhuwa	Bhojpur	8000	2073.09.01	2076.10.23
101	Rasuwa Hydropower Pvt. Ltd	Phalanku Khola	Rasuwa	5000	2071.08.24	2076.8.01
102	Civil Hydropower Pvt. Ltd.	Bijayapur 2 Khola Small	Kaski	4500	2072.09.12	2075.03.32
103	Makari Gad Hydropower Pvt. Ltd.	Makarigad	Darchula	10000	2072.08.29	2076.02.32
104	Super Madi Hydropower Ltd. (Previously Himal Hydro and General Construction Ltd.)	Super Madi	Kaski	44000	2073.10.27	2078.02.28
105	Mount Nilgiri Hydropower Company Pvt. Ltd.	Rurubanchu-1	Kalikot	13500	2074.05.08	2077.11.03
106	Trishuli Jal Vidhyut Company Ltd.	Upper Trishuli 3B	Rasuwa	37000	2074.05.06	2078.11.17
107	Century Energy Pvt. Ltd.	Hadi Khola Sunkoshi A	Sindhupalchowk	997	2074.05.05	2076.11.03
108	Sindhujwala Hydropower Ltd.	Upper Nyasem	Sindhupalchowk	41400	2073.07.24	2077.03.30
109	Samling Power Company Pvt. Ltd.	Mai Beni	Illam	9510	2073.07.26	2078.08.02
110	Energy Venture Pvt. Ltd.	Upper Lapche	Dolakha	52000	2073.04.20	2078.12.30
111	Orbit Energy Pvt. Ltd. (Previously Pokhari Hydropower Company Pvt. Ltd.)	Sabha Khola B	Sankhuwasabha	15100	2074.03.26	2078.2.31
112	Eco Power Development Company Pvt. Ltd	Mithila Solar PV Electric Project	Dhanusha	10000	2075.09.16	2076.01.17
113	Daram Khola Hydro Energy Ltd.	Daram Khola	Baglung and Gulmi	9600	2073.10.09	2076.09.08
114	Sagarmatha Jalabidhyut Company Pvt. Ltd.	Super Mai 'A'	Illam	9600	2074.11.14	2077.09.29
115	Sagarmatha Energy and Construction Pvt. Ltd.	Dhalkebar Solar Project	Dhanusha	3000	2075.06.24	2076.12.23
116	Gorkha Congenial Energy and Investment Pvt. Ltd.	Lamahi Solar Project	Dang	3000	2075.06.24	2076.12.23
117	Global Energy and Construction Pvt. Ltd.	Duhabi Solar Project	Sunsari	8000	2075.06.25	2076.12.24
118	Ridi Hydropower Development Co. Ltd.	Butwal Solar Project	Rupandehi	8500	2075.06.09	2076.04.08
119	Him River Power Pvt. Ltd.	Liping Khola	Sindhupalchowk	16260	2073.02.28	2077.01.22
120	Madhya Tara Khola Hydropower P. Ltd. (Prv. Pahadi Hydro Power Company (P.) Ltd.)	Madhya Tara Khola Small	Baglung	1700	2073.10.26	2075.08.29
			TOTAL	**2,613,895**		

NEPAL ELECTRICITY AUTHORITY
POWER TRADE DEPARTMENT
IPPs' Hydropower Projects in Different Stages of Development as of FY 2075/76
(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	2071.09.16 2077.06.30
2	Ingwa Hydro Power Pvt. Ltd	Upper Ingwa khola	Taplejung	9700	2068.03.10	2073.04.01
3	Yambling Hydropower Pvt. Ltd.	Yambling Khola	Sindhupalchowk	7270	2072.09.29	2077.03.17
4	United Modi Hydropwer Ltd.	Lower Modi 2	Parbat	10500	2072.11.14	2076.03.17
5	Salasungi Power Limited	Sanjen Khola	Rasuwa	78000	2072.12.02	2077.03.08
6	Siddhakali Power Limited	Trishuli Galchi	Nuwakot and Dhading	75000	2073.02.20	2077.02.01
7	Chirkhwa Hydropower Pvt. Ltd.	Upper Chirkhwa	Bhojpur	4700	2073.03.01	2077.04.01
8	Sanima Middle Tamor Hydropower Ltd. (Prv. Tamor Sanima Energy Pvt. Ltd.)	Middle Tamor	Taplejung	73000	2073.09.26	2078.05.28
9	Sisa Hydro Electric Company Pvt. Ltd.	Sisa Khola A	Solukhumbu	2800	2073.10.28	2077.12.12
10	Chirkhwa Hydropower Pvt. Ltd.	Lower Chirkhwa	Bhojpur	4060	2074.01.20	2078.04.01
11	Him Consult Pvt. Ltd.	Rele Khola	Myagdi	6000	2074.01.28	2077.02.19
12	Himali Rural Electric Co-operative Ltd.	Leguwa Khola Small	Dhankuta	640	2074.02.08	2075.12.28
13	Sabha Pokhari Hydro Power (P.) Ltd.	Lankhuwa Khola	Sankhuwasabha	5000	2074.02.21	2077.09.14
14	United Mewa Khola Hydropower Pvt. Ltd.	Mewa Khola	Taplejung	50000	2074.02.21	2078.04.01
15	Parbat Paiyun Khola Hydropower Company Pvt. Ltd.	Seti Khola	Parbat	3500	2074.02.22	2076.12.30
16	Sewa Hydro Ltd.	Lower Selang	Sindhupalchowk	1500	2074.02.22	2075.12.30
17	Gorakshya Hydropower Pvt. Ltd.	Super Ankhu Khola	Dhading	23500	2074.03.15	2080.09.15
18	Nyam Nyam Hydropower Company Pvt. Ltd.	Nyam Nyam Khola	Rasuwa	6000	2074.03.27	2077.12.31
19	Saptang Hydro Power Pvt. Ltd.	Saptang Khola	Nuwakot	2500	2074.04.08	2076.04.12
20	Jhyamolongma Hydropower Development Company Pvt. Ltd.	Karuwa Seti	Kaski	32000	2074.04.20	2079.01.12
21	People's Power Limited	Puwa - 2	Illam	4960	2074.05.05	2078.06.11
22	Bhujung Hydropower Pvt. Ltd.	Upper Midim	Lamjung	7500	2074.05.29	2078.04.01
23	Himalayan Water Resources and Energy Development Co. Pvt. Ltd.	Upper Chauri	Kavrepalanchowk	6000	2074.07.27	2078.04.04
24	Nasa Hydropower Pvt. Ltd.	Lapche Khola	Dolakha	99400	2074.07.29	2079.04.14
25	Dolti Power Company Pvt. Ltd.	Padam Khola	Dailekh	4800	2074.08.01	2077.11.08
26	IDS Energy Pvt. Ltd.	Lower Khorunga	Terhathum	5400	2074.08.24	2078.04.01
27	Langtang Bhotekoshi Hydropower Company Pvt. Ltd.	Rasuwa Bhotekoshi	Rasuwa	120000	2074.09.07	2078.09.07
28	Upper Richet Hydropower Pvt. Ltd.	Upper Richet	Gorkha	2000	2074.09.20	2077.04.01
29	Him Star Urja Co. Pvt. Ltd.	Buku Kapati	Okhaldhunga and Solukhumbu	5000	2074.10.11	2077.04.15
30	Khechereswor Jal Vidhyut Pvt. Ltd.	Jadari Gad Small	Bajhang	1000	2074.10.12	2077.07.30
31	Khechereswor Jal Vidhyut Pvt. Ltd.	Salubyani Gad Small	Bajhang	233	2074.10.12	2077.09.29
32	Nepal Water and Energy Development Company Pvt. Ltd.	Upper Trishuli - 1	Rasuwa	216000	2074.10.14	2080.12.18
33	Gaughar Ujjyalo Sana Hydropower Co. Pvt. Ltd.	Ghatte Khola Small	Sindhupalchowk	970	2074.11.11	2077.03.01
34	Unitech Hydropower Co. Pvt. Ltd.	Upper Phawa	Taplejung	5800	2074.11.11	2078.04.16
35	Seti Khola Hydropower Pvt. Ltd.	Seti Khola	Kaski	22000	2074.11.11	2079.04.15
36	Vision Energy and Power Pvt. Ltd.	Nupche Likhu	Ramechhap	57500	2074.11.28	2080.05.02
37	Omega Energy Developer Pvt. Ltd.	Sunigad	Bajhang	11050	2074.11.30	2080.02.07
38	Mai Khola Hydropower Pvt. Ltd.	Super Mai Cascade	Illam	3800	2074.12.07	2078.04.01
39	Asian Hydropower Pvt. Ltd.	Lower Jogmai	Illam	6200	2074.12.07	2078.04.01

40	Gaurishankar Power Development Pvt. Ltd.	Middle Hyongu Khola B	Solukhumbu	22900	2074.12.08	2079.04.01
41	Upper Lohore Khola Hydropower Co. Pvt. Ltd.	Upper Lohore	Dailekh	4000	2074.12.08	2077.04.11
42	Super Hewa Power Company Pvt. Ltd.	Super Hewa	Sankhuwasabha	5000	2074.12.27	2078.04.01
43	Khimti Gramin Bidhyut Sahakari Sanstha Ltd.	Jhankre Khola Small	Dolakha	600	2075.02.04	2076.05.14
44	Baraha Multipower Pvt. Ltd.	Irkhuwa Khola B	Bhojpur	15524	2075.02.14	2079.04.15
45	Aashutosh Energy Pvt. Ltd.	Chepe Khola Small	Lamjung	8630	2075.02.15	2078.11.09
46	Lower Irkhuwa Hydropower Co. Pvt. Ltd.	Lower Irkhuwa	Bhojpur	13040	2075.02.16	2079.04.03
47	Sungava Foundation Pvt. Ltd.	Thulo Khola	Myagdi	21300	2075.02.17	2079.04.15
48	Jhilimili Hydropower Co. Pvt. Ltd.	Gulangdi Khola	Gulmi	980	2075.02.24	2078.01.14
49	North Summit Hydro Pvt. Ltd.	Nyadi Phidi	Lamjung	21400	2075.02.24	2079.12.15
50	Himali Hydro Fund Pvt. Ltd.	Sona Khola	Taplejung	9000	2075.03.14	2080.07.30
51	Tanahun Hydropower Ltd.	Tanahun	Tanahun	140000	2075.03.15	2080.12.30
52	Sailung Power Company Pvt. Ltd.	Bhotekoshi-1	Sindhupalchowk	40000	2075.03.15	2079.07.01
53	Jalshakti Hydro Company Pvt. Ltd.	Ilep (Tatopani)	Dhading	23675	2075.03.25	2081.08.25
54	Three Star Hydropower Company Ltd.	Sapsup Khola	Khotang	6600	2075.03.25	2078.06.31
55	Tundi Power Pvt.Ltd	Rahughat Mangale	Myagdi	35500	2075.03.29	2079.08.29
56	Tundi Power Pvt.Ltd	Upper Rahughat	Myagdi	48500	2075.03.29	2080.08.29
57	Arati Power Company Ltd.	Upper Irkhuwa	Bhojpur	14500	2075.04.01	2079.08.01
58	Mount Everest Power Development Pvt. Ltd.	Dudhkunda Khola	Solukhumbu	12000	2075.04.01	2079.06.30
59	Shaileshwari Power Nepal Pvt. Ltd.	Upper Gaddigad	Doti	1550	2075.04.06	2077.12.19
60	Palun Khola Hydropower Pvt. Ltd.	Palun Khola	Taplejung	21000	2075.04.06	2080.06.21
61	Makar Jitumaya Hydropower Pvt. Ltd.	Upper Suri	Dolakha	7000	2075.04.10	2079.12.30
62	Him Parbat Hydropower Pvt. Ltd.	Sagu Khola-1	Dolakha	5500	2075.04.10	2079.12.30
63	Him Parbat Hydropower Pvt. Ltd.	Sagu Khola	Dolakha	20000	2075.04.10	2079.12.30
64	Annapurna Bidhyut Bikas Co. Pvt. Ltd.	Landruk Modi	Kaski	86590	2075.04.13	2081.09.15
65	Madame Khola Hydropower Pvt. Ltd.	Madame Khola	Kaski	24000	2075.04.15	2080.12.30
66	Mid Solu Hydropower Company Pvt. Ltd.	Mid Solu Khola	Solukhumbu	9500	2075.04.21	2079.05.14
67	Apolo Hydropower Pvt. Ltd.	Buku Khola	Solukhumbu	6000	2070.02.02 2075.04.22 (Revived)	2074.04.01
68	Solar Farm Pvt. Ltd.	Belchautara Solar Project	Tanahun	5000	2075.04.23	2076.04.03
69	Thulo Khola Hydropower Pvt. Ltd.	Upper thulo Khola-A	Myagdi	15000	2075.04.24	2080.06.30
70	Kalika Energy Ltd.	Bhotekoshi-5	Sindhupalchowk	62000	2075.04.25	2080.09.15
71	Api Power Company Ltd.	Chandranigahpur Solar Project	Rautahat	4000	2075.04.27	2076.02.26
72	Api Power Company Ltd.	Parwanipur Solar Project	Parsa	8000	2075.04.27	2076.02.26
73	Api Power Company Ltd.	Dhalkebar Solar Project	Dhanusha	1000	2075.05.03	2076.03.02
74	Api Power Company Ltd.	Simara Solar Project	Bara	1000	2075.05.03	2076.03.02
75	Mewa Developers Pvt. Ltd.	Middle Mewa	Taplejung	49000	2075.05.04	2080.06.06
76	Super Ghalemdi Hydropower Pvt. Ltd.	Super Ghalemdi	Myagdi	9140	2075.05.05	2080.12.12
77	Sanvi Energy Pvt. Ltd.	Jogmai Cascade	Illam	6000	2075.05.07	2078.04.07
78	Dibyajyoti Hydropower Pvt. Ltd.	Marsyangdi Besi	Lamjung	50000	2075.05.10	2079.06.06
79	Amar Jyoti Hydro Power Pvt. Ltd.	Istul Khola	Gorkha	1506	2075.05.13	2079.10.25
80	Apex Makalu Hydro Power Pvt. Ltd.	Middle Hongu Khola A	Solukhumbu	22000	2075.05.14	2079.04.01
81	Ichowk Hydropower Pvt. Ltd.	Gohare Khola	Sindhupalchowk	950	2075.05.25	2076.07.29
82	Pike Hydropower Pvt. Ltd.	Likhu Khola	Ramechhap and Okhaldhunga	30000	2075.05.26	2082.02.17
83	Sita Hydro Power Co. Pvt. Ltd.	Nyasim Khola	Sindhupalchowk	35000	2075.05.26	2080.03.15
84	Sushmit Energy Pvt. Ltd.	Kunaban Khola	Myagdi	20000	2075.05.29	2080.11.03

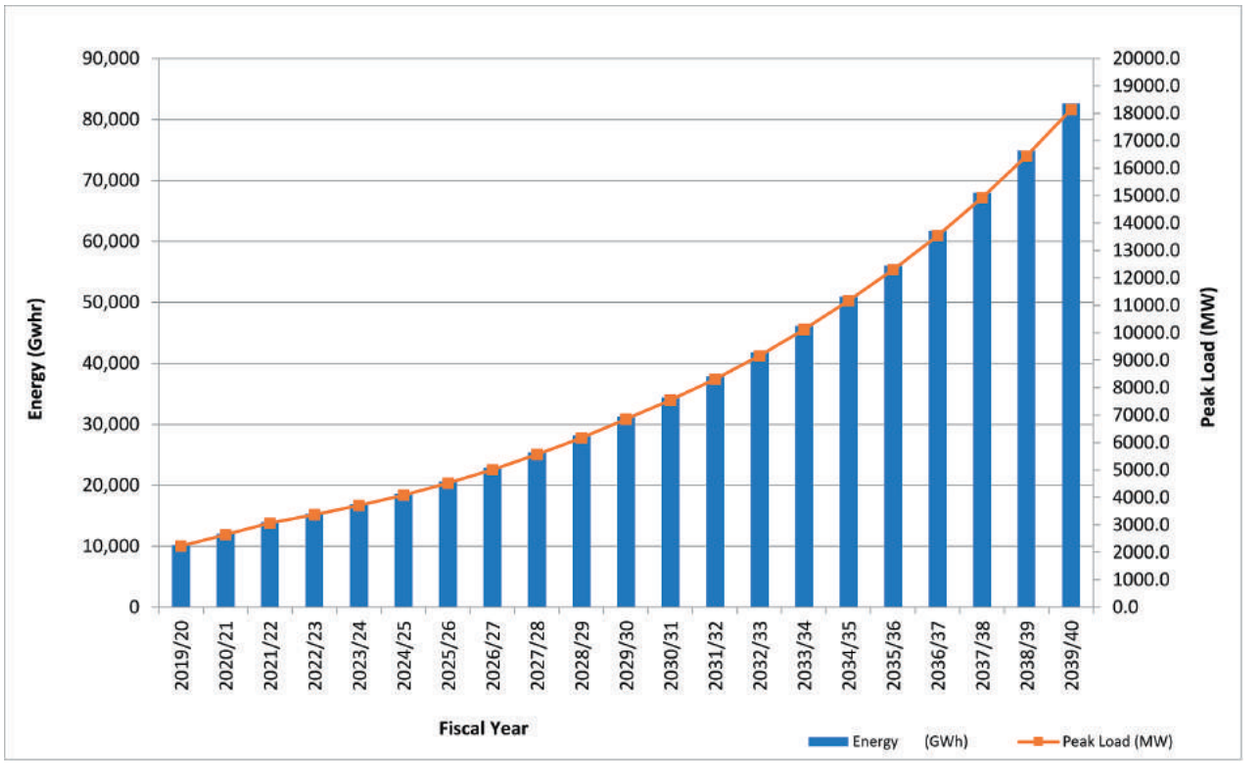
85	Masina Paryatan Sahakari Sanstha Ltd.	Masina	Kaski and Tanahu	891	2075.06.02	2076.10.29
86	Hydro Village Pvt. Ltd.	Myagdi Khola	Myagdi	57300	2075.06.04	2080.05.29
87	Shikhar Power Development Pvt. Ltd.	Bhim Khola	Baglung	4960	2075.06.10	2078.06.05
88	Indushankar Chini Udhyog Ltd.	Indushankar Chini Udhyog Ltd.	Sarlahi	3000	2075.06.10	2076.12.09
89	Dhading Ankhu Khola Hydro Pvt. Ltd.	Upper Ankhu	Dhading	38000	2075.06.14	2079.09.15
90	Everest Sugar and Chemical Industries Ltd.	Everest Sugar and Chemical Industries Ltd.	Mahottari	3000	2075.06.17	2076.12.30
91	Phedi Khola Hydropower Company Pvt. Ltd.	Phedi Khola (Thumlung)	Bhojpur	3520	2075.06.21	2079.12.01
92	Dolakha Nirman Company Pvt. Ltd.	Isuwa Khola	Sankhuwasabha	97200	2075.06.26	2080.04.01
93	Bikash Hydropower Company Pvt. Ltd.	Upper Machha Khola Small	Gorkha	4550	2075.07.11	2080.03.30
94	Sita Hydropower Co. Pvt. Ltd.	Dudh Khola	Manang	65000	2075.07.11	2080.03.15
95	Blue Energy Pvt. Ltd.	Super Trishuli	Gorkha and Chitwan	70000	2075.07.11	2080.11.17
96	Vision Lumbini Ltd.	Seti Nadi	Kaski	25000	2075.08.06	2079.04.05
97	Kalinchowk Hydropower Pvt. Ltd.	Sangu (Sorun)	Dolakha	5000	2075.08.09	2079.12.30
98	Arun Valley Hydropower Development Company Ltd.	Kabeli B-1 Cascade	Panchthar	9940	2075.08.09	2078.06.01
99	Kasuwa Khola Hydropower Ltd.	Kasuwa Khola	Sankhuwasabha	45000	2075.08.13	2082.04.06
100	Ruru Hydroelectric Company Pvt. Ltd.	Rurubanchu Khola-2	Kalikot	12000	2075.08.20	2079.05.25
101	Gumu Khola Bhyakure Hydropower Pvt. Ltd.	Gumu Khola	Dolakha	950	2075.08.21	2078.05.30
102	Alliance Energy Solutions Pvt.Ltd.	Upper Sit Khola	Argakhanchi	905	2075.08.23	2077.05.04
103	Ekikrit Byapar Company Pvt. Ltd.	Brahamayani	Sindhupalchowk	35470	2075.08.24	2080.04.13
104	Integrated Hydro Fund Nepal Pvt. Ltd.	Upper Brahamayani	Sindhupalchowk	15150	2075.08.24	2080.04.13
105	Perfect Energy Development Pvt. Ltd	Middle Trishuli Ganga	Nuwakot	19410	2075.09.03	2080.02.17
106	Kabeli Hydropower Company Pvt.Ltd.	Kabeli-3	Taplejung	21930	2075.10.03	2079.09.01
107	Union Mewa Hydro Ltd.	Mewa Khola	Taplejung	23000	2075.10.04	2080.09.15
108	North Summit Hydro Pvt. Ltd.	Hidi Khola	Lamjung	6820	2075.10.04	2080.05.15
109	Sajha Power Development Pvt. Ltd.	Lower Balephi	Sindhupalchowk	20000	2075.10.06	2080.07.18
110	Sindhujwala Hydropower Ltd.	Upper Nyasem Khola A	Sindhupalchowk	21000	2075.10.06	2079.03.30
111	Mount Rasuwa Hydropower Pvt. Ltd.	Midim 1 Khola	Lamjung	13424	2075.10.07	2080.04.04
112	Habitat Power Company Pvt. Ltd	Hewa Khola "A"	Panchthar	5000	2075.10.07	2078.04.01
113	Ruby Valley Hydropower Company Ltd	Menchet Khola	Dhading	7000	2075.10.15	2080.02.13
114	Dudhpokhari Chepe Hydropower Pvt. Ltd.	Dudhpokhari Chepe	Gorkha	8800	2075.10.15	2080.01.28
115	Maa Shakti Engineering & hydropower Pvt. Ltd.	Luja Khola	Solukhumbu	23550	2075.10.16	2080.11.14
116	Sankhuwasabha Power Development Pvt. Ltd.	Super Sabha Khola	Sankhuwasabha	4100	2075.10.23	2080.06.03
117	Hilton Hydro Energy Pvt. Ltd.	Super Kabeli	Taplejung	12000	2075.11.02	2079.10.04
118	Snow Rivers Pvt. Ltd.	Super Kabeli A	Taplejung	13500	2075.11.02	2080.01.01
119	Jal Urja Pvt. Ltd.	Nuagad	Darchula	1000	2075.11.03	2078.10.22
120	Champawati Hydropower Pvt. Ltd	Chepe khola A	Lamjung	7000	2075.11.07	2079.04.04
121	Api Power Company Ltd.	Upper Chameliya	Darchula	40000	2075.11.15	2079.11.13
122	Barpak Daruadi Hydropower Pvt. Ltd.	Middle Super Daraudi	Gorkha	10000	2075.11.23	2080.03.01
123	Helambu Construction Pvt. Ltd	Ksumti khola	Sindhupalchowk	683	2075.11.29	2078.03.04
124	River Side Hydro Energy Pvt. Ltd.	Tamor Khola-5	Taplejung	37520	2075.12.04	2080.04.10
125	Hydro Connection Pvt. Ltd.	Rauje Khola	Solukhumbu	17712	2075.12.04	2080.10.15
126	Milke Jaljale Hydropower Pvt.Ltd.	Upper Piluwa Hills	Sankhuwasabha	4990	2075.12.4	2081.04.04
127	Ambe Hydropower Pvt. Ltd.	Upper Bhurundi	Parbat	3750	2075.12.10	2079.04.16
128	Orbit Energy Pvt. Ltd.	Sabha Khola C	Sankhuwasabha	4196	2075.12.10	2079.04.02
129	Mabilung Energy (P.) Ltd	Upper Piluwa Khola -3	Sankhuwasabha	4950	2075.12.12	2078.11.16
130	Raghuganga Hydropower Ltd.	Rahughat	Myagdi	40000	2075.12.18	2079.10.17
131	Ridge Line Energy Pvt. Ltd.	Super Chepe	Gorkha and Lamjung	9050	2075.12.19	2079.05.20

132	Dhaulagiri Civil Electrical and Mechanical Engineering Pvt. Ltd.	Madhya Daram Khola A	Baglung	3000	2075.12.26	2077.12.31
133	Dhaulagiri Civil Electrical and Mechanical Engineering Pvt. Ltd.	Madhya Daram Khola B	Baglung	4500	2075.12.26	2078.02.31
134	Bhalaudi Khola Hydropower Pvt. Ltd.	Bhalaudi Khola	Kaski	2645	2076.01.06	2080.04.16
135	Kalika Construction Pvt. Ltd.	Upper Daraudi B	Gorkha	8300	2076.01.09	2080.09.15
136	Kalika Construction Pvt. Ltd.	Upper Daraudi C	Gorkha	9820	2076.01.09	2080.09.15
137	Super Khudi Hydropower Pvt. Ltd.	Upper Khudi	Lamjung	21210	2076.01.11	2080.10.09
			Total	2,869,384		

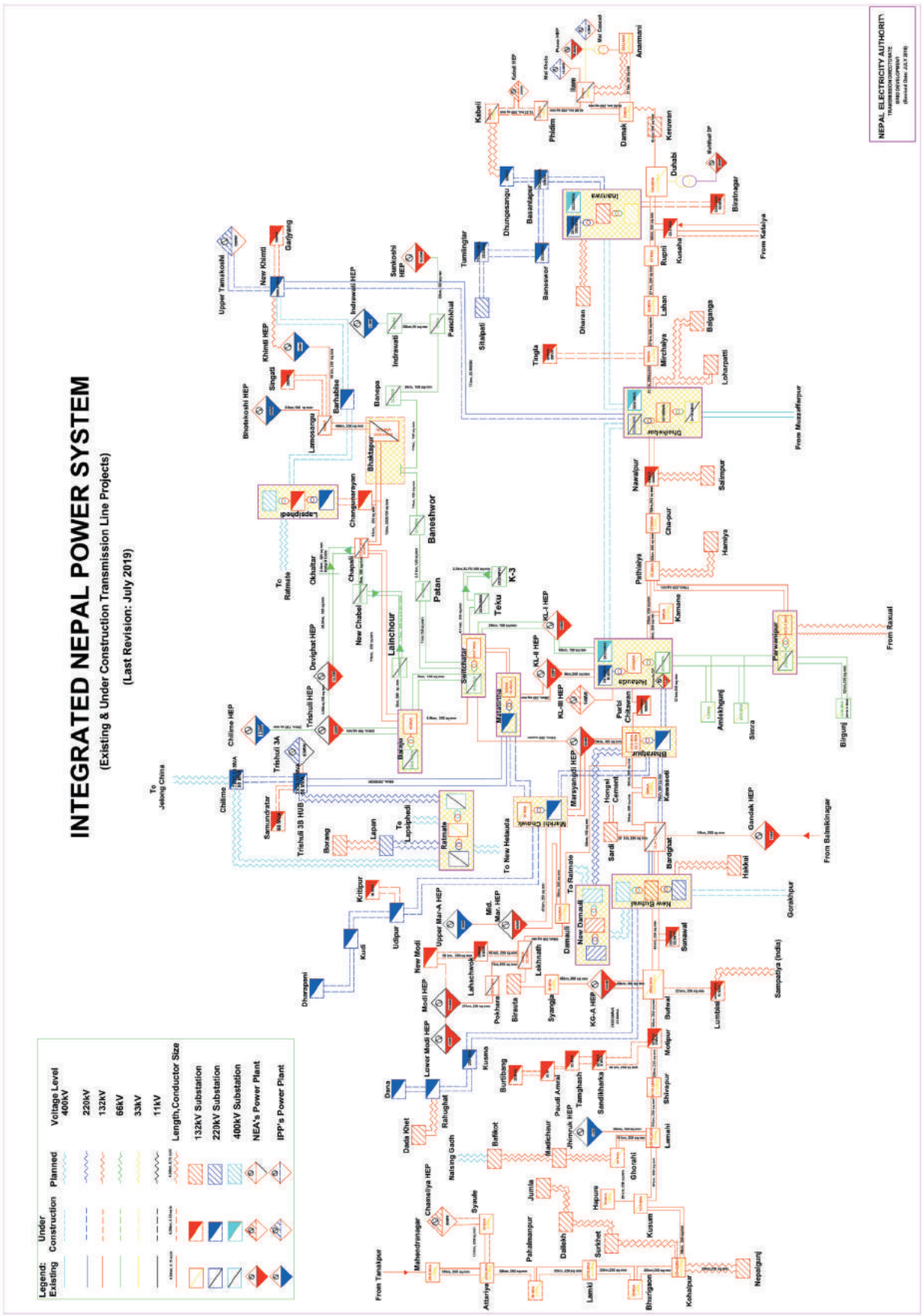
IPPs' Hydro Power Projects Terminated in FY 2075/76

S.N.	Developer	Project	Location	Capacity (kW)	Reason for Termination
1	Teleye Samyak Hydropower Company Pvt. Ltd.	Dhansi Khola	Rolpa	955	Event of Default
2	Ludee Hydropower Development Co. Pvt. Ltd.	Ludee Khola	Gorkha	750	Event of Default
			Total	**1705**	

Load Forecast



S.No.	Fiscal Years	Energy (GWh)	Peak Load (MW)
1	2019/20	10,138.28	2225.7
2	2020/21	12,017.96	2638.3
3	2021/22	13,952.00	3062.9
4	2022/23	15,332.65	3366.0
5	2023/24	16,869.13	3703.3
6	2024/25	18,579.53	4078.8
7	2025/26	20,585.22	4519.1
8	2026/27	22,826.63	5011.1
9	2027/28	25,332.50	5561.2
10	2028/29	28,111.30	6171.3
11	2029/30	31,196.38	6848.5
12	2030/31	34,355.49	7542.0
13	2031/32	37,861.08	8311.6
14	2032/33	41,754.21	9166.3
15	2033/34	46,079.83	10115.9
16	2034/35	50,887.42	11171.3
17	2035/36	56,007.87	12295.4
18	2036/37	61,677.62	13540.1
19	2037/38	67,957.59	14918.7
20	2038/39	74,913.54	16445.7
21	2039/40	82,620.73	18137.7


INTEGRATED NEPAL POWER SYSTEM
(Existing & Under Construction Transmission Line Projects)
(Last Revision: July 2019)
NEPAL ELECTRICITY AUTHORITY
Legend:
Existing
Under Construction
Planned
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
To Jiaolong China
Chilime
Trishuli 3A
Trishuli 3B HUB
Borang
Lapsiphedi
Ratmate
Matatirtha
Kritipur
Kudi
Udipur
Dhunseni
Upper Marsyangdi HEP
Mid. Mar. HEP
New Modi
Modi HEP
Lower Modi HEP
Lahachowk
Pokhara
Damauli
New Damauli
Lekhnath
Syangja
KG-A HEP
Marsyangdi HEP
Hongsi Cement
Sardi
Kawasoti
Gandak HEP
From Balmikinagar
Hakkui
Gorakhpur
Sunwal
Butwal
Lumbini
Sampatiya (India)
Motipur
Shivapur
Lamahi
Ghorahi
Tulsipur
Sandikhaska
Tamghash
Pauadi Amrai
Jhimruk HEP
Madichaur
Ridikot
Nalsing Gadh
Rahughat
Dana
Doda Khet
Kusma
Burtibang
Mahendranagar
Chameliya HEP
Syaule
Attariya
From Tanakpur
Jumla
Pahalmanpur
Dailadh
Lamki
Hapure
Surkhet
Bhurigaon
Kusum
Kohalpur
Nepalgunj
Bardaghat
New Butwal
Parwanipur
Amlekhganj
Sirsia
Birgunj
From Raxaul
Pathlaiya
Hetauda
Purbi Chitwan
Kamane
Chapur
Hamliya
Nawalpur
Salimpur
Dhalkebar
From Muzaffarpur
Lahan
Mirchaiya
Bidyanga
Loharpatti
Tingla
Dharan
Basantapur
Duhabi
Biratnagar
From Kataiya
Rupni
Kusaha
Keraun
Damak
Phidim
Anarmani
Kabeli
Kabeli HEP
Mai Khola
Mai Cascade
Ilam
Dhungesangu
Basantapur
Tumlingtar
Sankhuwa
Sankoshi HEP
Indrawati HEP
Indrawati
Panchkhal
Khimti HEP
Khimti
New Khimti
Garjyang
Upper Tamakoshi
Bhotekoshi HEP
Singati
Barhabise
Lamosangu
Sunkoshi
Banepa
Bhaktapur
Changunarayan
Lapsiphedi
To Ratmate
Okhaltar
Chapali
New Chabel
Devighat HEP
Trishuli HEP
Chilime HEP
Lainchour
Baneshwor
Patan
Teku
K-3
KL-II HEP
KL-III HEP
Matatirtha
Balaju
Siuchatar
Naxal
Bhaktapur
Banepa
Shiva Shakti
Sunkoshi
Panchkhal
Shiakpati
Tumlingtar
Basantapur
Dhungesangu
Kabeli
Phidim
Damak
Keraun
Duhabi
Biratnagar
From Kataiya
Rupni
Kusaha
Lahan
Bidyanga
Loharpatti
Mirchaiya
Tingla
Dharan
Dhalkebar
From Muzaffarpur
Nawalpur
Salimpur
Chapur
Hamliya
Pathlaiya
Kamane
Parwanipur
From Raxaul
Birgunj
Simara
Amlekhganj
Purbi Chitwan
Hetauda
Bharatpur
Marsyangdi HEP
Hongsi Cement
Kawasoti
Sardi
Bardaghat
New Butwal
Gandak HEP
From Balmikinagar
Hakkui
Gorakhpur
Sunwal
Butwal
Lumbini
Sampatiya (India)
Motipur
Shivapur
Lamahi
Ghorahi
Tulsipur
Sandikhaska
Tamghash
Pauadi Amrai
Jhimruk HEP
Madichaur
Ridikot
Nalsing Gadh
Rahughat
Dana
Doda Khet
Kusma
Burtibang
Mahendranagar
Chameliya HEP
Syaule
Attariya
From Tanakpur
Jumla
Pahalmanpur
Dailadh
Lamki
Hapure
Surkhet
Bhurigaon
Kusum
Kohalpur
Nepalgunj
Lekhnath
Damauli
New Damauli
Lahachowk
Pokhara
Birauta
Syangja
KG-A HEP
New Modi
Modi HEP
Lower Modi HEP
Upper Marsyangdi HEP
Mid. Mar. HEP
Udipur
Kritipur
Kudi
Dhunseni
Ratmate
Matatirtha
Marsyangdi HEP
Hongsi Cement
Sardi
Kawasoti
Gandak HEP
From Balmikinagar
Hakkui
Gorakhpur
Sunwal
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Lumbini
Sampatiya (India)
Motipur
Shivapur
Lamahi
Ghorahi
Tulsipur
Sandikhaska
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Pauadi Amrai
Jhimruk HEP
Madichaur
Ridikot
Nalsing Gadh
Rahughat
Dana
Doda Khet
Kusma
Burtibang
Mahendranagar
Chameliya HEP
Syaule
Attariya
From Tanakpur
Jumla
Pahalmanpur
Dailadh
Lamki
Hapure
Surkhet
Bhurigaon
Kusum
Kohalpur
Nepalgunj
Lainchour
Baneshwor
Patan
Teku
K-3
KL-II HEP
KL-III HEP
Matatirtha
Balaju
Siuchatar
Naxal
Bhaktapur
Banepa
Shiva Shakti
Sunkoshi
Panchkhal
Shiakpati
Tumlingtar
Basantapur
Dhungesangu
Kabeli
Phidim
Damak
Keraun
Duhabi
Biratnagar
From Kataiya
Rupni
Kusaha
Lahan
Bidyanga
Loharpatti
Mirchaiya
Tingla
Dharan
Dhalkebar
From Muzaffarpur
Nawalpur
Salimpur
Chapur
Hamliya
Pathlaiya
Kamane
Parwanipur
From Raxaul
Birgunj
Simara
Amlekhganj
Purbi Chitwan
Hetauda
Bharatpur
Marsyangdi HEP
Hongsi Cement
Kawasoti
Sardi
Bardaghat
New Butwal
Gandak HEP
From Balmikinagar
Hakkui
Gorakhpur
Sunwal
Butwal
Lumbini
Sampatiya (India)
Motipur
Shivapur
Lamahi
Ghorahi
Tulsipur
Sandikhaska
Tamghash
Pauadi Amrai
Jhimruk HEP
Madichaur
Ridikot
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Rahughat
Dana
Doda Khet
Kusma
Burtibang
Mahendranagar
Chameliya HEP
Syaule
Attariya
From Tanakpur
Jumla
Pahalmanpur
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Lamki
Hapure
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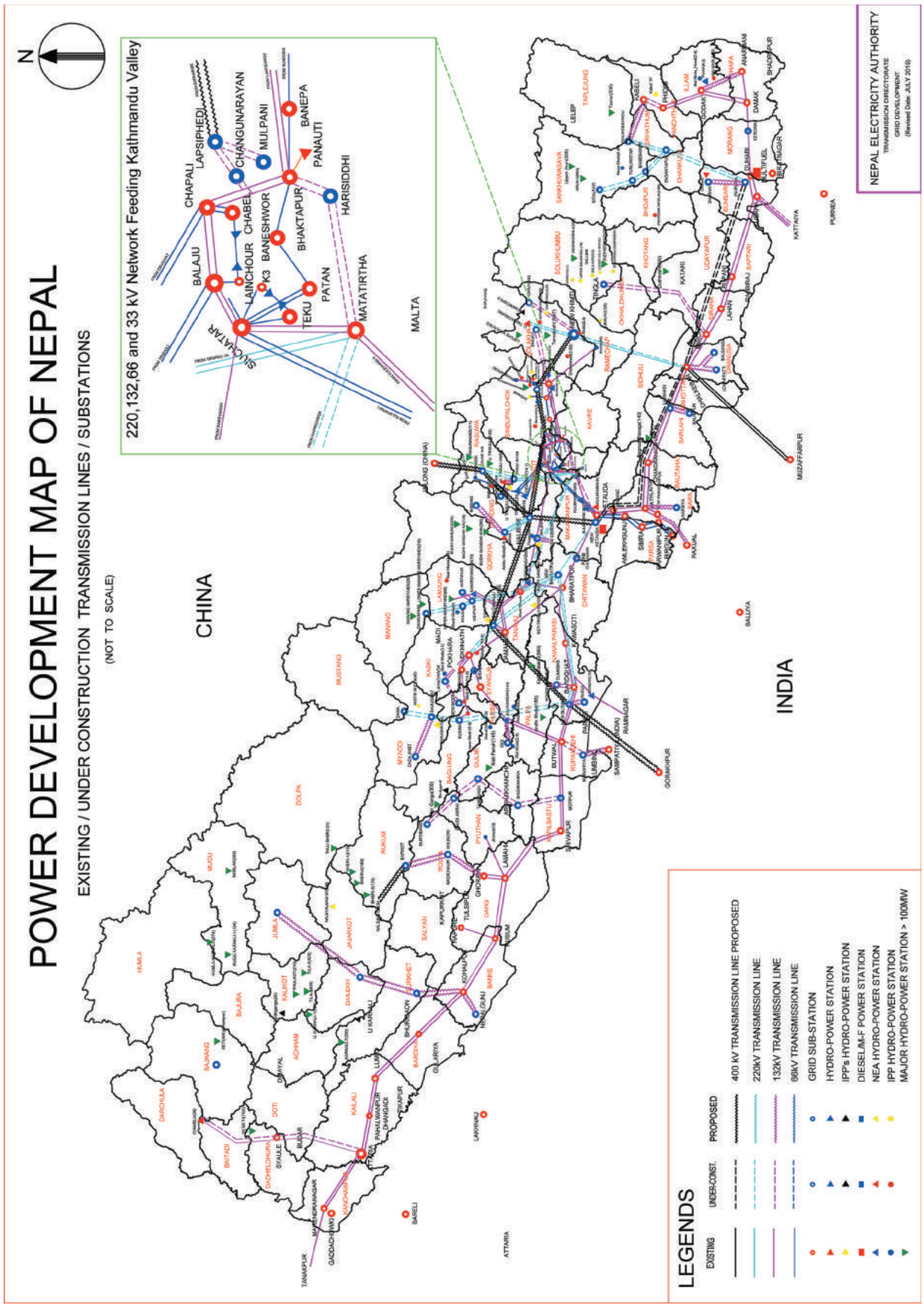
Kusum
Kohalpur
Nepalgunj


POWER DEVELOPMENT MAP OF NEPAL
EXISTING / UNDER CONSTRUCTION TRANSMISSION LINES / SUBSTATIONS
(NOT TO SCALE)
N
220,132,66 and 33 kV Network Feeding Kathmandu Valley
CHAPALI
LAPSIPHEDI
CHANGUNARAYAN
MULPANI
BANEPA
PANAUTI
BALAJU
CHABEL
BANESHWOR
BHAKTAPUR
HARISIDDHI
LAINCHOUR
K3
PATAN
TEKU
MATATIRTHA
SUNCHATAR
MALTA
CHINA
INDIA
NEPAL ELECTRICITY AUTHORITY
TRANSMISSION DIRECTORATE
GRID DEVELOPMENT
(Revised Date: JULY 2019)
LEGENDS
EXISTING
UNDER-CONST.
PROPOSED
400 kV TRANSMISSION LINE PROPOSED
220kV TRANSMISSION LINE
132kV TRANSMISSION LINE
66kV TRANSMISSION LINE
GRID SUB-STATION
HYDRO-POWER STATION
IPPs HYDRO-POWER STATION
DIESEL/M-F POWER STATION
NEA HYDRO-POWER STATION
IPP HYDRO-POWER STATION
MAJOR HYDRO-POWER STATION > 100MW

Kulekhani I Reservoir.

Koshi Corridor 220 kV Transmission Line Project.

NEPAL ELECTRICITY AUTHORITY

Head Office: Durbar Marg, Kathmandu, Nepal
Tel:+977-1-4153007/4153013, Fax:+9774153009
Email: neamd@nea.org.np, Website: www.nea.org.np

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