NEPAL ELECTRICITY AUTHORITY

A YEAR IN REVIEW-FISCAL YEAR-2019/2020

AUGUST-2020 (BHADRA-2077)

DURBAR MARG, KATHMANDU, NEPAL

Inauguration of Underground Cabling in Kathmandu Valley

Inauguration of Upper Trisuli 3A Hydroelectric Project

COMPLIMENTARY COPY

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Message from the Minister

I am pleased to extend my greetings and congratulations to the entire NEA team on completing 35 years of successful operation and for supplying continuous and reliable power to its consumers.The uninterrupted availability of electricity has improved the living standard of the people of the entire nation.

I am also grateful to NEA for whole-heartedly partaking in the Government of Nepal's vision of *"Prosperous Nepal, Happy Nepali"* and for incorporating the plans and policies of the Ministry of Energy, Water Resources and Irrigation into its central planning and operation processes. NEA's *Corporate Development Plan* 2019 has deep integration with the major milestones of the Ministry's *White Paper* (2018). With this solidarity, I express my confidence that MOEWRI, ERC, and NEA altogether will be able to increase the supply and affordability of the domestically generated electricity to power Nepali houses and businesses.

Increased use of electricity is indicative of economic and financial well-being of a country and its citizens. Extending the reach of electricity to all Nepali households either through on-grid or off-grid solutions is an essential aim of the government and a fundamental objective of NEA. I am sure, with NEA's vast experience of working in remote rural areas, the aim will be met well within the stipulated time frame.

The country was facing severe electricity shortage not too long ago. The energy crisis resulted in load shedding of up to 16 hours to households and industries. It debilitated the economy and brought about misery to everyone. The continuous supply of electricity was a result of improved transmission system, increased domestic generation, supply and demand side management, decrease in technical and commercial losses and trade. With the aim of increasing domestic generations, NEA has signed PPAs for more than 6000 MW and is ever dedicated to improve the country's transmission and distribution capacity. The commercial operation of the Upper Tamakoshi (456 MW) hydropower plant and the upgradtion of the Dhalkebar-Muzzafarpur Cross-Border Transmission Line to 400 kV will be important milestones in the power sector. It will immensely aid in improving Nepal's energy security and facilitating regional trade of this vital commodity.

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Restructuring of the electricity sector including NEA has also begun in earnest. The establishment of regional offices in line with Nepal's Provincial delineation was an important step necessary for the eventual restructuring. The establishment of the Electricity Regulatory Commission will pave the way for the determination of wholesale, retail and transmission tariff by an independent electricity sector regulator. These are necessary precondions required for restructuring of the sector, which in turn, will maximize efficiency gains.

The NEA team needs to be falicitated on the improving financial results of the past year. Due to proper technical management, sound management practices and inhanced efficiency, NEA was able to report a historic increase in operating profit without having to increase tariff charged to its customers. I feel proud to state that NEA has reduced tariff of domestic consumers for the first time in its history. The improving financial condition of the corporation will provide further impetus to transform it to a modern, efficient and profitable organization.

I would once again like to congratulate the NEA team for successfully adding another year of dedicated services to the nation and its citizens and re-affirm my confidence that we will be able to take the country to new height if all the players of the power sector work as a dedicated team.

Barsa Man Pun 'Ananta'
Minister
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Message from the Secretary

I want to congratulate NEA and its entire staff for successfully completing 35 years of service in the Nepali electricity market. The quality and reliability of supply has further improved over the past years. NEA's success in the delivery of reliable and uninterrupted power, which is indispensable to modern life, must be appreciated and felicitated.

86.4% of the population has access to on and off grid electricity. The government of Nepal is steadfast in expanding its grid and also using off grid solutions to ensure that Nepal will have electricity for all households in the near future. Further to expanding its grid to new areas, there is utmost need to enhance and expand the existing grid. A system that is currently supplying about 1332 MW will need to transmit and distribute 5000 MW within the next three years. This is an ambitious task and will require dedicated work from NEA as well as coordination and budgetary support from the government.

The transformation of NEA into an efficient entity is key to the development of the power sector. From load shedding to agreements on power export, NEA has undoubtedly played a crucial role in this incredibly quick turnaround. However, NEA still needs to push itself further to improve on multiple fronts. Some of the critical areas include further reducing losses in transmission and distribution stages, automation, upgrading its IT systems, improving contract management and ensuring timely completion of generation, transmission and distribution projects.

NEA has manifested its commitment to strengthening its services further by developing its five-year Corporate Development Plan (CDP). This strategic plan is vital to further development of the electricity sector. It is a progressive and dynamic document that looks ahead to develop NEA as a modern and smart utility with ample focus on demand-side management, supply-side grid strengthening and utmost efficiency in loss management. The targets and objectives established by the CDP build on NEA's past experiences and the future needs identified by NEA. Through this approach, NEA has aptly determined three strategic themes of i) Achieving national priorities, ii) Transformation of NEA into a capable, modern, and smart utility and iii) Improving customer services. The utility has also assessed its core strengths, challenges it faces and opportunities and threats it holds. It has also identified and categorized external risks it may face.

Trade of electricity will soon be an important component of NEA's daily operations. Nepal has progressed from a phase of only importing power to being able to export power during certain hours of the day of monsoon season. The quantum of power it generates is expected to significantly increase in the coming months and years. All regulatory processes required need to be fulfilled across the border in preparation of regional export. I would like to assure NEA of complete support from the Ministry in this aspect. Trade will not only help Nepal to develop its water resources, but also adds to system efficiency and energy efficiency.

Once again, I would like to congratulate NEA for extending exceptional services to all the consumers and thanks to all NEA members for their dedication to this service. With strong collaboration among all stakeholders, the government as well as private sector, NEA's contribution is believed to help Nepal take social and economic leaps forward. I wish NEA the very best for this.

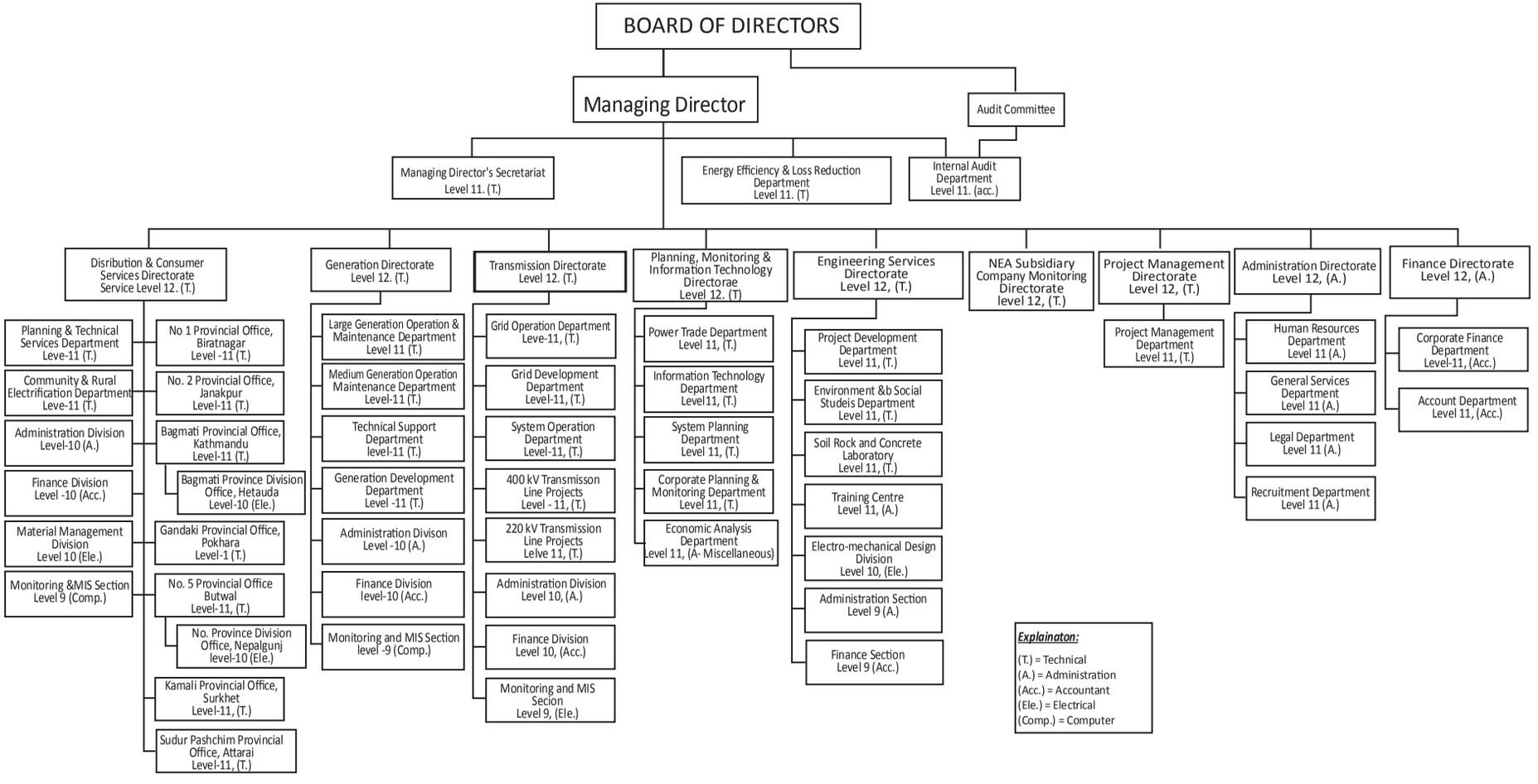
Dinesh Kumar Ghimire
Secretary
Ministry of Energy, Water Resources and Irrigation

BOARD OF DIRECTORS

1. Mr. Barsha Man Pun 'Ananta', Chairman (Hon'ble Minister, Ministry of Energy, Water Resources and Irrigation)
2. Mr. Dinesh Kumar Ghimire, Member (Secretary, Ministry of Energy, Water Resources and Irrigation)
3. Mr. Ram Sharan Pudasaini, Member (Secretary (Revenue), Ministry of Finance)
4. Mr. Chet Raj Joshi, Member (Prominent Person in Power Sector)
5. Mr. Bhakta Bahadur Pun, Member (Member from Consumers Group)
6. Mr. Vishow Prakash Gautam, Member (Prominent Person from Commerce, Industry, Financial Sector)
7. Mr. Rajendra Bahadur Chhetri 'Safal', Member (Prominent Person in Power Sector)
8. Mr. Kul Man Ghising, Member Secretary (Managing Director, NEA)

Nepal Electricity Authority

Organisation Structure



Deputy Managing Directors

Mr. Hitendra Dev Shakya
Deputy Managing Director
Nea Engineering Company

Mr. Lekha Nath Koirala
Deputy Managing Director
Finance 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
Engineering Services Directorate

Mr. Braj Bhusan Chaudhary
Deputy Managing Director
Transmission Directorate

Mr. Lokhari Luintel
Deputy Managing Director
Administration Directorate

Mr. Ramji Bhandari
Deputy Managing Director
Planning, Monitoring & It Directorate

Mr. Manoj Silwal
Deputy Managing Director
Project Management Directorate

Mr. Madan Timsina
Chief Deputy Managing Director
Generation Directorate

MANAGING DIRECTOR'S REPORT

It has been thirty five years since the formation of Nepal Electricity Authority (NEA) in 1985 with the aim of generating, transmitting and distributing electricity to its consumers. These thirty five years have not been smooth going by any means. There have been many years in its short history that NEA has had to indulge in pre-planned load shedding to manage power supply to its consumers. The last four years have been much brighter as far as the power supply management and financial health is concerned.

It is a matter of great satisfaction for every employee of NEA to bring forward this Annual Report for everyone to know and analyze its achievements in the year gone by. The past year, 2019/20 can again be considered successful as NEA has managed to supply continuous power to all its consumers and maintained sound financial health.

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 35th 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. NEA is making all efforts to ensure the supply of continuous, reliable and affordable power to its consumers. Even during lockdown enforced by the government due to COVID 19 pandemic NEA has tried its level best for a continuous supply of power its consumers. I would again like 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 more robust and significant investment is being poured into transmission and distribution system for their strengthening.

The aim of making NEA a profit making organization again, after tumultuous years of losses, was achieved in the fiscal year FY 2016/17 and this trend has become more pronounced in the successive years and the year under review (FY 2019/20) with the profit reaching a record high of NRs 11,056 million against the net profit of NRs 9,812 million in the FY 2018/19. 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 was with a deep sense of pride and satisfaction that we brought up the outstanding achievement of NEA, in the previous fiscal year, in reducing the system losses to 15.32 %, an all-time record low then. This year, even after having to deal with the Covid-19 pandemic, NEA has been able to bring it further down to 15.27%. This has, of course, contributed significantly towards maximizing NEA's profit. We are still committed to reduce it further up to the international standards with more concrete and consolidated action plans blended with technological innovations and awareness campaigns in the years ahead.

Numerous major projects of NEA that had been delayed for different reasons were completed in the past few years. Kulekhani III (14 MW), which had been stuck for many years was finally completed in the last fiscal year. Numerous Transmission and Distribution Line Projects were also completed in the year gone by.

In keeping with the changing times, NEA is in the process of benefitting from the available technological innovations taking place all over the world. Major initiatives being undertaken are implementation of Enterprise Resource Planning (ERP), Geographical Mapping (GIS Mapping), Smart Metering, Substation Automation and expansion of IT infrastructure in the years to come. IT Road map has been prepared for its systematic implementation in all its business functions. Our endeavor in this direction will lead to a "Digital NEA" which will be in line with the GoN's vision of "Digital Nepal".

All the offices under NEA will be connected within this year under the Communication Backbone establishment program. The IT department has started running various software applications for account inventory system, payroll, pension, asset management, consumption analysis system etc. NEA vacancy applications can now be easily submitted online from any location. NEA Video Conference System will be introduced very soon so that all the offices are connected through NEA's intra-net system.

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, 2019/20, 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 7.88 % from 3.91 million to 4.22 million, slightly less than the target of 4.47 million due to the Covid-19 pandemic, during FY 2019/20. The figure does not include the consumers under Community Rural Electrification, which is serving about 0.57 million consumers in rural areas. As has been in the past, the domestic consumer category with 3.93 million consumers remained the largest category with 93.26% share of the entire electricity consumers. Domestic and industrial consumer category contributed 39.84 % and 37.51 % to the gross electricity sales revenue respectively. The effect of the lockdown is attributable for the lesser revenue from the industrial sector. Rest of the consumer category accounted for the remaining 22.65% of the gross sales revenue. The total population with access to electricity infrastructure has reached 86% of total household in FY 2019/20.

NEA's hydropower plants including small power stations generated a total of 3021 GWh of electricity in FY 2019/20, an increase by 18.57% over the generation of 2548 GWh in FY 2018/19. The addition of two new power plants, namely Upper Trishuli 3A (60 MW) and Kulekhani III (14 MW) to the system contributed in the increased generation.

The total power purchased from Independent Power Producers (IPPs) within Nepal was 2,991 GWh, an increase by 36.57 % from the figure of 2,190.05 GWh in the FY 2018/19. The total energy imported from India was 1,729 GWh as compared to 2,813.07 GWh in FY 2018/19, a decrease by 38.55 %. Though the imports from India decreased, the total available energy in the system increased by 2.51 % to 7,741 GWh over the corresponding figure of 7,551 GWh in FY 2018/19. Out of the total available energy, NEA's own generation contributed 39.02%, whereas those imported from India and domestic IPPs accounted for 22.33 % and 38.64 % respectively.

Total energy consumption in FY 2019/20 was 6,422 GWh, a slight increase over the corresponding figure of 6,303 GWh in the FY 2018/19. The Covid-19 pandemic played a major role in limiting the consumption growth.

A nationwide drive launched a few years ago to reduce system losses continued unabated in FY 2019/20 as well, even though the pandemic had a negative effect in attaining the desired result. The system loss has come down to 15.27 % in the FY 2019/20 over the previous figures of 25.78 %, 22.90 %, 20.45 % and 15.32 in the FYs 2015/16, 2016/17, 2017/18 and 2018/19 respectively. The efforts to bring it down to the least possible figure will continue in the years ahead.

Metering, Billing, Revenue collection and Loss reduction activities were seriously affected due to Covid 19 pandemic during the fourth quarter of the fiscal year 2019/20. There were several cases of under-billing and over-billing as the average bill issued without meter reading for the month of Chaitra, Baishakh and Jeshtha could not reflect the real consumption of the consumers. However, the adjustment has been made for most of the consumers in the month of Asad after real meter reading was restarted. The loss target of 14.5% could not be met because of the restriction in mobility of staffs in the loss prone areas and also due to complete shutdown of Industries resulting in decrease of Industrial consumption.

FINANCIAL PERFORMANCE

The net profit of NEA before tax in the FY 2019/20 is NRs 11,056 million, an increase by 12.67 % over corresponding figure of NRs 9,812 million in FY 2018/19. NEA has been successful in converting the accumulated losses of NRs 12,234 million in FY 2018/19 to an accumulated profit of NRs 4,866 million in FY 2019/20.

The gross revenue generated from energy sales and other income in the FY 2019/20 reached NRs 77,800 million, with an increase of 2.09 % over the figure of NRs 76,207 million in the FY 2018/19. The continued growth in energy sales and subsequent increase in revenue is the result of the continuous power supply to the consumers, even though the Covid-19 pandemic and the subsequent lockdown hampered in its regular growth. 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 stood at NRs 58,069 million, a decrease by 1.95% from NRs 59,222 million of the previous year, whereas that for power purchase alone was NRs 38,896 million in FY 2018/19. This has decreased to NRs 35,197 million in FY 2019/20.

In FY 2019/20, total revised revenue of NEA including other incomes (excluding finance income) stood at NRs 73,760 million as against the operational expenses of NRs 58,069 million resulting in an operational surplus of NRs 15,691 million, an increase by 30.21% over the figure of NRs 12,051 million in the FY 2018/19.

Energy purchase amounted to 60.97% of the total available energy and NEA paid 51.35% of the net electricity sales revenue of NRs 68,534 million for this purpose. The total cost of purchased power decreased by 9.51% in the FY 2019/20 as compared to the figure of FY 2018/19 due to the decrease in the volume of import.

Other operating expenses for generation, royalty, transmission and distribution in the FY 2019/20 amounted to NRs 2,114 million, NRs 1,571 million, NRs 2,156 million, and NRs 9,252 million respectively.

Interest cost on long term borrowing increased by NRs. 752 Million during FY 2019/20. The interest expenses in FY 2019/20 has been calculated as NRs 4,738 million as against NRs 3,985 million in the previous year. Similarly depreciation expenses amounted to NRs 5,000 million, an increase of 3.05% from NRs 4,852 million. Foreign Exchange losses totaled NRs 436 million against NRs 9 million in the previous year. Accumulated investment in capital works in progress reached to NRs. 124,474 Million with net addition of NRs. 54,633 Million for the year 2019/20.

NEA estimated a provision of NRs 3,500 million towards the long-term employee liabilities in respect of gratuity, pension, medical facilities and accumulated leave facilities under employees' benefit plan scheme.

ADMINISTRATIVE PERFORMANCE

NEA Employee By-laws, 2075 was amended. Centralized e-attendance was successfully tested and started in the corporate offices. It is planned for implementation in all offices within this year. Organization and Management (O & M) study report has been submitted to NEA management for approval.

NEA recruited 114 new staff of various levels in FY 2019/20 and 1,093 are in the process of selection. Similarly 470 employees of different levels were promoted to higher posts. A total of 449 employees retired in the year under review.

ONGOING PROJECTS

The devastating earthquake of 2015, its aftershocks and the subsequent Terai Bandh delayed the completion date of all under-construction projects. Upper Trishuli 3A (60 MW) was inaugurated by the Prime Minister on 18th November, 2019. Similarly Kulekhani III (14 MW) started full generation from 11th October, 2019.

There are several hydropower projects at various stages of development under the Engineering Services Directorate. Some of these projects are Dudhkoshi Storage Hydroelectric Project, Upper Arun Hydroelectric Project, Upper Modi Hydroelectric Project and Uttarganga Storage Hydroelectric Project.

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 constructed under Transmission Directorate in FY 2019/20 is 169.5 circuit kilometer (ckt.km). Similarly, a total of 364.4 MVA substation capacity, including up gradation of existing substations has been added to the system. The total lengths of under-construction transmission lines at 132 kV, 220 kV and 400 kV levels are 1,322 ckt. km, 1,272 ckt. km and 756 ckt. km respectively, with the total of 3,350 ckt. km. Similarly, the total capacity of substations under construction is 9,866 MVA. A total of

110.22 ckt. km of 220 kV transmission lines were constructed under Project Management Directorate (PMD).

NEA managed to fully electrify 15 districts. This number could have been more if not for the pandemic in the final months of the fiscal year. NEA commissioned 9 new and upgraded 17 distributions substation of 33/11 kV corresponding to the capacity of 401 MVA in the FY 2019/20 to bring the total number to 151 corresponding to the total capacity of 1,701.5 MVA as of FY 2019/20. Likewise, the total line lengths corresponding to 33 kV, 11 kV and 0.4/0.23 kV voltage levels completed as of FY 2019/20 were 5,310 ckt. km, 38,723 ckt. km and 120,365 ckt. km respectively, whereas the line lengths commissioned in FY 2019/20 alone were 402.84 ckt. km, 2,996.52 ckt. km and 11,888.85 ckt. km corresponding to 33 kV, 11 kV and 0.4/0.23 kV voltage levels respectively. A total of 35,537 distribution transformers with the capacity of 3,285 MVA have been installed in the system up to the fiscal year under review. A total of 13 numbers of 33/11 kV substations with capacity of 64 MVA were commissioned in FY 2019/20 under PMD. Similarly total lengths corresponding to 33 kV, 11 kV and 400 V voltage levels completed under PMD in FY 2019/20 are 202 km, 330 km and 470 km respectively.

Following Government of Nepal's electricity roadmap, NEA's commitment to light up every household of Nepal by the year 2023 through adequate network expansion plans all over the country, still remained at top priority. Enhancement of system reliability through network strengthening will continue unabated. Similarly, for safety, reliability as well as from the aesthetic point of view, underground cable laying works to upgrade the distribution system has been initiated in Kathmandu under the scheme of underground cable laying in the Ratnapark and Maharajgunj distribution centre areas within this FY 2020/21. Similarly underground cable laying will be started in the areas under Balaju, Kirtipur, Kuleshwor, Baneshwor and Jorpati distribution centers within FY 2020/21. Contracts will also be signed within FY 2020/21 for underground cable laying work to start in Lalitpur and Bhaktapur.

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. Smart Meter installation within Ratnapark and Maharajgunj distribution centers will be accomplished in FY 2020/21. Contracts will be signed within FY 2020/21 for the supply and installation of smart meters for the remaining consumers within the valley.

The online centralized bill payment system is now striving towards enhancing the revenue collection. M-Power Billing System Software has already been implemented by 175 of the total 181 revenue collection centers. NEA has already initiated the use of Smart meters, Enterprise Resource Planning (ERP) and Substation Automation System. Proper implementation of the above will require a Distribution Command and Control Center and Data Centre. These will be constructed at Suichatar and the tendering process and contract signing are planned to be accomplished within FY 2020/21.

Automation of Grid substations will ensure controlled and systematic operation of the Grid system. This will ultimately lead to reliable power supply and remarkable savings in the operation of the Grid substations. Contracts have been signed and work started for installation of Substation Automation System in 13 Grid Substation within the valley. Contracts will be signed for the automation of

additional 40 Grid Substations in the country within FY 2020/21.

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. Capacitor Bank installation project for different substations and distribution transformers, which has helped improve voltage fluctuation and reduce technical loss of the system, will be implemented in all Grid and Distribution Substations. Consumer awareness campaign for use of efficient appliances will be conducted effectively all over Nepal.

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 2020/21. These projects have been included in GoN's programme, "Nepal ko Pani Janata ko Lagani: Harek Nepali Bidyut ko Share Dhani". Madhya Bhotekoshi which was progressing satisfactorily met with heavy flooding on 8th July, 2020, causing heavy damage and losses resulting in delay in completion date.

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 pride project, Upper Tamakoshi HEP (456 MW), has been undergoing construction in the company mode under UTKHPL utilizing domestic financial resources. After facing many hindrances, water impounding the reservoir and simultaneous wet test of Dam and Intake were successfully accomplished in March 2020. The Lower (367 m) and Upper (305 m) Vertical Shafts, considered the most challenging works of the project, were completed on 2nd July, 2020. Power generation from the first unit is targeted for November 2020 and from all six units by February 2021.

UTKHPL is presently evaluating the tender applications for the construction of Rolwaling Khola HEP (22 MW) under EPC mode.

Tanahu Hydropower Limited: Tanahu Hydropower Limited (THL), established as a Subsidiary Company of NEA has been implementing the storage type Tanahu Hydropower Project (140 MW) under the co-financing from ADB, JICA and EIB. The major works under both Package 2 (Powerhouse, Waterway and Related Equipment) and Package 3 (220 kV Transmission Line) Contracts have been initiated. However, the procurement of Package 1 (Headworks) Contract has been significantly delayed due to the unavoidable termination of the Contract with CMC de Ravenna, Italy and the rejection of all bids of the subsequent re-bidding process. Following

the initiation of Re-bid II, all efforts are being made to conclude the contract agreement of Package 1 by the end of October, 2020.

For future development, THL has assigned the JV of WAPCOS Limited, India and Nippon Koei Co. Ltd, Japan for conducting Detail Engineering Design of Lower Seti Hydropower Project (104 MW) under the grant assistance of ADB. The Consultant is expected to submit the draft Detail Engineering Design Report of the project by the end of the 2020.

Trishuli Jal Vidhyut Company Limited (TJVCL): This Company was established with NEA and Nepal Doorsanchar Company Limited as promoters, 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. The construction started with the intention of commissioning in March 2021. The present Covid-19 pandemic is bound to hamper in achieving this target.

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 (NTP) was issued on 24th May, 2018. Similarly, after approval from EXIM Bank of India, NTP was issued for Electro-mechanical works to Bharat Heavy Electrical Limited, India under PDB mode on 4th December, 2019. Both Contractors have started their works. The Project is planned 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 (1,060 MW) and Ikhuwa Khola Hydroelectric Project (30 MW). The Consultant CSPDR for Detailed Engineering Design and Preparation of Bidding Document of UAHEP and IKHPP submitted the Updated Feasibility Study (UFS) Report in November 2019. 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. Additional geotechnical investigation recommended was assigned to SRCL, draft report of the same was submitted in June 2020 for review. EIA study for the Project is being carried out in parallel with the Detailed Engineering Design. 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. Tractable Engineering GmbH submitted the Detailed Design Report and Tender Documents in August 2019. EOI documents for construction supervision and Prequalification (PQ) for Contract 1 (Civil and Hydromechanical Works) were issued and their evaluation is in its final stage. Preparatory works for preparing PQ documents for Contract 2 has been initiated. Bids submitted for the construction of permanent camp facilities are presently being evaluated. As requested by the company, Ministry of Energy, Water resources and Irrigation has made a formal request to

the Ministry of Finance in managing Project Financing with Asian Infrastructure Investment Bank (AIIB) as the lead agency. AIIB has shown a keen interest in the project.

Dudhkoshi Jalvidyut Company Limited: This Company, as a subsidiary of NEA, has been established for the implementation of Dudhkoshi Storage HEP. The Feasibility Study has recommended 635 MW to be financially viable one. The Consultant is preparing the final detailed design report incorporating comments from the Client. The Asian Development Bank (ADB) has committed to lead the financing for this Project with other co-partners from multi-lateral financial institutions. GoN has already requested ADB, European Investment Bank (EIB), Asian Infrastructure Investment Bank (AIIB) and Korean Exim Bank for financing tis project. GoN and NEA have taken up this Project as the priority project for development in the coming years.

NEA Engineering Company Limited (NEC): NEA formed the NEC to provide complete engineering solutions in the development of the energy sector. NEA holds majority ownership (51), with remaining 49 % held by other companies. The company intends to build national engineering capability for large hydro-projects, extra high voltage engineering and smart economic distribution and services. NEC has completed eight design and engineering contracts while two dozen are ongoing.

MoUs have been signed with the Nepalese Technical Diaspora in Australia and the UK as well as international consulting companies in Canada, USA, China and India bears evidence of its widening reach and ambitions. The MoUs of understanding signed with the two flagship universities, Tribhuvan and Kathmandu exemplifies one of its core values of research and innovation.

Nepal Power Trading Company Limited (NPTC): NPTC has been established with the objective of carrying out power trading function within and outside the country. Business Plan for its operation has been approved by the Company's Board and license issue pertaining to power trading is under consideration at the MOEWRI. A request in this line has already been made as an interim solution until the New Electricity Act comes into effect. .

Power Transmission Company Nepal Limited (PTCN): This is a subsidiary company of NEA, established with the objective of developing high voltage transmission interconnection system between Nepal and India for mutual benefit. The Nepal portion of the 400 kV double circuit line between Dhalkebar and Muzaffarpur was implemented by PTCN.

PRIVATE SECTOR PARTICIPATION

NEA has been facilitating the participation of the private sector through Power Purchase Agreements (PPA) to ensure meeting the energy demand of the country. 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).

Grid Impact Study (GIS), necessary prior to PPAs, were conducted for 26 hydropower projects to be developed by IPPs with a total installed capacity of 978.673 MW in FY 2019/20. Similarly GIS of a total 99.1 MVA capacities of 9 bulk load industries to be connected to the INPS were also conducted.

A total of 15 new projects developed by the Independent Power Producers (IPPs) with a combined installed capacity of 135.39 MW were commissioned in the FY 2019/20. This

has increased the total number of IPP-owned projects in operation to 98 with a combined installed capacity of 696.17 MW. A total of 131 projects to be developed by IPPs, with a combined installed capacity of 3,157.19 MW are under construction after financial closure. Similarly, 112 IPP-owned projects with a combined installed capacity of 2,124.77 MW are at various stages of development.

During the FY 2019/20, a total of 2 new PPAs were signed with a combined installed capacity of 9 MW with solar power projects based on tariff-based competitive bidding and Viability Gap Funding (VGF). This has increased the total number of PPAs signed with the various IPPs to 341 with the combined installed capacity of 5,978.13 MW as of FY 2019/20.

NEA has been very supportive to develop a conducive environment for the private sector to invest in hydropower projects and policy decisions in this regard was taken by increasing the capacity limits for ROR, PROR and storage/ pumped storage projects so that PPAs can be signed on take-or-pay basis. The take-or-pay limits of ROR, PROR and storage hydropower projects is still at 5,250 MW, 4,500 MW and 5,250 MW respectively. It created a positive environment to encourage the financial institutions to finance in the hydropower sector of Nepal. Likewise, NEA considers PROR projects on priority basis for signing PPAs.

CROSS BORDER POWER TRADING

Cross Border Power trading with India 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 in August, 2018. The installation of 400/220 kV, 3 x 315 MVA transformers will be completed by the end of August 2020.

The modality for the implementation of the second cross border transmission line from New Butwal to Gorakhpur was finalized in the 7th Joint Working Committee (JWG)/ Joint Steering Committee (JSC) meeting in Bangalore, India on 14-15 October, 2019. The Shareholders' Agreement (SHA) for the implementation of this line is about to be signed between Power Grid Corporation of India Ltd. (PGCIL) and NEA very soon. The draft has already been negotiated between the parties. Further, NEA has been playing a crucial role through representation in the Joint Technical Team (JTT) and the Joint Operation Committee (JOC) 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 and finalizing Grid Synchronization study respectively.

Government of Nepal has recently decided to give prior approval to NEA for all types of cross-border power trading including Day Ahead Market (DAM), Term Ahead Market (TAM) and long term, medium term and short term power trading. This will enable NEA to operationalize the agreement signed with NVVN earlier for power trading through the power exchange markets of India after the Conduct of Business Rules (CBR/Procedure) is approved by the concerned ministry of Government of India. In addition to power exchanges, NEA has also commenced the commercial preparations by signing a composite agreement with NVVN for transactions involving both purchase and sale of electrical energy. According to the agreement, NEA is required to sign separate agreements for each transaction with NVVN in future for selling Nepal's surplus energy. This will herald a new era of cross border power trading between Nepal and India with a myriad of implications on profit earning, transmission

capacity utilization, technology transfer and system stability along with other mutually shared benefits.

Likewise, replacing the 50 MVA, 220/132 kV power transformer at Tanakpur substation of India with a 100 MVA transformer has enhanced the power trading capacity along this route. A tri-partite agreement, in this regard, between NEA, POWERGRID and National Hydropower Corporation (NHPC) is going to be signed very soon as per the mandate of the 7th JWG/ JSC committee meeting.

The experience of power trading with India in the FY 2019/20 was extremely encouraging with a remarkable reduction in power import. This obviously reflects the sign of the country's readiness for a spectacular transformation from the age of a devastating power deficit to an economy-stimulating power surplus. A number of evidences like Government of Nepal's prior approval to NEA to go for all sorts of power trading and the appointment of NEA as the nodal agency for dealing with the Indian counterpart agency are such examples.

A total of 1,729 GWh of electricity was imported through various transmission links including Dhalkebar-Mujaffarpur line in FY 2019/20, whereas Nepal has also been able to export 107 GWh of electricity to India, an increase of 18.6% through power exchange mechanism.

Though new avenues for cooperation in power sector have been discussed with Bangladesh in developing a new hydropower project in Nepal and power trading, the furtherance of the same could not be attained in the FY 2019/20 due to the COVID-19 pandemic threatening the entire world.

Likewise the Nepal-China cooperation in power sector is in its study stage and GoN has allocated funds in the current fiscal year for carrying out the Feasibility and Environmental Studies of the Ratmate-Rasuwagadhi-Kerung 400 kV transmission line as per the plan and policy of the Government.

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 development. The end to load shedding through integrated resource planning including domestic generation, imports and efficient demand-side management has culminated in people's trust and optimism in our endeavors towards achieving the long-standing goal of becoming self-sufficient in electricity generation and supply. The ongoing uncertainties due to the COVID 19 pandemic has affected, to a large extent, on the daily functioning of NEA as an organization and at the same time hampered the progress of the various projects under construction.

Organizational Restructuring of NEA, which has been a long discussed agenda, shall be our top priority to be addressed in the days to come and it shall be accomplished with the adoption of an agreeable modality by allowing amendment to the NEA Act 2041. The initial framework for restructuring is formulated in Corporate Development Plan 2019, approved by the NEA Board. All stakeholders including employees will be engaged in consultation meetings so that restructuring and its ultimate results is owned by employees who are obviously more concerned with their service and benefit guarantees along with their post retirement pensions.

We emphasize the fast deployment of automation and digitization in our businesses. The use of automation system to monitor, control and manage the power system from

generation to distribution network shall be our priority at the door step for facilitating the reduction of operational cost and providing better services to our valued customers. Likewise digitization of paper-based processes shall be our initial step towards digitalization, which is an essential element of digital transformation of NEA for its future. We strongly feel that some policy measures are to be introduced on an urgent basis in this regard so that our journey from digitization to digitalization would prove beneficial in several ways including saving through operational efficiency and transparency across the value chain to all players in the power ecosystem.

Since a large number of Hydro Projects including Upper Tamakoshi HEP (456 MW), with which NEA has signed power purchase agreements are at advanced level of construction with more than 1,000 MW of generation to be commissioned in the FY 2020/21 alone, sale of this energy is going to pose a serious challenge to NEA in this and subsequent years, for which marketing arrangements need to be indispensably explored for NEA's overall financial performance. Both domestic and cross-border power markets shall be explored in possible dimensions to cope with the emerging situation of high domestic generation. We are continuously accelerating every avenue in this regard to enhance domestic power demand in the country and all tools and mechanisms for cross-border markets shall be deployed at best for realizing seamless power trading in the near future.

Further, NEA will be focusing on increasing domestic demand through the promotion of electric vehicles by building charging station infrastructures, increasing lift irrigation facilities and replacing cooking gas with electricity. For supplying increased demand in industrial and urban areas, the strengthening and expansion of transmission and distribution infrastructures will be continuously carried out on a high priority basis.

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. The modality for the second 400 kV cross border link with India from New Butwal (Nepal) to Gorakhpur (India) has been finalized and the formation of a JV Company between NEA and PGCIL for the implementation of this line is likely to be signed within this fiscal year to sell the surplus power in the cross border market. The Share Holders Agreement and Implementation & Transmission Services Agreement (ITSA) will also be signed soon.

The national power grids of Nepal and India are on the verge of synchronization after the installation of Special Protection System (SPS) and communication system which are in progress with the target for commissioning by October 2020.

The completion of the Feasibility Report of the 400 kV transmission line from Ratamate (Nepal) to Kerung (China) will trigger Nepal-China power trading in the years to come. We look forward for 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.

The Corporate Development Plan (CDP) of NEA which has been formulated for improving the overall performance of the organization in terms of its businesses shall be considered as a dynamic document to ameliorate it continuously as per the need of time

pursuant to the requirement of reforms. The implementation of this plan shall be assigned a high priority from the ongoing fiscal year itself.

NEA will continue its efforts in developing all types of power plants on its own and with joint venture partners, through subsidiary companies 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 more flexible and reliable meeting the varying demands of a single day as well as of the entire season. The development of reservoir and PROR types of hydropower projects such as Dudhkoshi storage (635 MW) and Upper Arun HEP (1060 MW) will help meet the long term power demand of the country.

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. Training program 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 associated with 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, including World Bank, ADB, JICA, EIB, AIIB, KfW, NORAD, Exim Bank of China, Exim Bank of India, Exim bank of Korea, 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 even in difficult situations like the Covid 19 pandemic. Finally, I would like to express my sincere thanks and appreciation to our valued customers and different professional organizations for bearing with us at times of extreme difficulties and boosting our morale by recognizing our untiring efforts. I would like to assure our valued customers that every possible step will be taken to maintain a continuous, reliable and safe power supply in the coming days.

Thank You.

Kul Man Ghising
Managing Director

GENERATION DIRECTORATE

Generation directorate, headed by Deputy Managing Director is responsible for the construction of the new power generation projects together with optimum operation and maintenance of the hydropower stations owned by Nepal Electricity Authority (NEA). Currently there are twenty (20) generating hydropower stations and two (2) thermal power plants under this directorate and no any new under construction hydropower projects directly under this directorate. Generation of energy by optimally utilizing the resources available while undertaking periodic overhauling, major maintenance works and rehabilitation projects of the generating stations; approximately describes the mission of the Generation Directorate.

The directorate is supported by four departments, namely Large Generation Operation and Maintenance Department (LGO & MD), Medium Generation Operation and Maintenance Department (MGO & MD), Generation Development Department (GDD) and Technical Support Department (TSD) each headed by a Director. Further, there are three divisions/sections namely, Finance, Administration and Monitoring & IT.

Major Achievements

In this Fiscal year, the directorate successfully added power from two ongoing hydropower projects; Upper Trisuli 3A Hydroelectric Project (60 MW) and Kulekhani III Hydroelectric Project (14 MW). Upper Trisuli 3A Hydroelectric Project has already been transformed as hydropower station while Kulekhani III is still in test operation.

Operation of Upper Trishuli 3A hydroelectric Project was officially inaugurated by Rt. Hon'ble Prime Minister, K.P. Sharma Oli on 18th November, 2019 (B.S. 2076/08/02) after completion of trial operation period starting from May 16 for one unit and from August 2 for other one.

Similarly, Kulekhani III Hydroelectric project started generation as test operation from 15th Ashoj 2017 and 24 Ashoj 2076 from its Unit-1 and Unit-2, respectively.

Heavy rainfall and high flood occurred on second week of July, 2020 forced few power stations for shutdown. Kaligandaki and Marsyangdi river observed highest flood level since last few years. Despite generation of 264.826 GWhr energy (total generation of all

three plants of Kulekhani), Kulekhani reservoir water level raised from 1503.96 masl (on 2077/03/01) to 1510.5 masl (on 2077/03/31) during 31 days.

In this FY, total generation from all power plants under this directorate is 3011.431 GWhr whereas in the FY 2018/19, the generation was 2541.116 GWhr. Hence, increment in 18.5% of annual energy generation from last year was achieved. The hydropower stations in total have achieved 90.7 % and 96.1 % of design and target energy value respectively.

Large Generation Operation and Maintenance Department

The operation and maintenance of seven (7) hydropower plants and one (1) Multi-fuel power plant (with installed capacity 30 MW and above) fall under the jurisdiction of this department. The total installed capacity of these plants is 504 MW. Total generation from the power plants under this department in the fiscal year 2076/77 is 2574.82 GWh, with an increment of 20.77 % as compared to that of last fiscal year's generation. The increment in generation is mainly due to operation of new plant Upper Trishuli 3A hydropower station.

All the hydropower stations under this department are continuously-operating type throughout the year. Except Kulekhani HEP, which is seasonal-storage type, all the remaining power stations are daily peaking ROR type plants. Hence, both scheduled/ preventive and corrective maintenance as well as special maintenance are required. General regular maintenance works are such works which can be done without plant shutdown or within few hours of plant shut down. Special maintenances are those which requires multiple days of plant shutdown. Overhauling of generating units, upgradation of control and protection system, installation of SCADA, maintenance works in headwork site are the special maintenance works. As such works require multiple days of plant shutdown, it is the normal practice as far as possible to carry out such works in the lean/dry 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.

Kulekhani I, being the reservoir type plant, water is collected throughout the year, in which monsoon rainfall contributes the most for the collection, and plant is generally operated to aid peaking load demand.

Kaligandaki 'A' Hydropower Station

Kaligandaki 'A' Hydropower Station, located at Beltari, Syangja is the largest installed power station in Nepal with capacity of 144 MW with 3 units each having capacity of 48 MW. It is a six-hour daily 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 2019/20 has reached 13,790.321 GWh from the first run. The plant generated 871.466 GWh of energy this year which is 103.50 % of the annual design generation and 98.71% of annual generation target.

Repair and Maintenance Activities

Turbine Maintenance works

The following works has been carried out;

Repairing of Stay vanes

- Overhauling of Unit 1 Turbine Main Inlet Valve (MIV)
- Overhauling of turbine Unit No. 1 and 3
- Inspection of turbine parts of unit no. 2

Headworks Maintenance works

The following works were carried out;

- Repair and maintenance of diversion dam, bascule gate
- Repair and maintenance of three (3) Diversion radial gates
- Replacement of rubber seal of five (5) de-sander flushing radial gates.
- Repair and maintenance of under sluice gates.
- Repair and maintenance of travelling, hydraulic and hoisting system of Old Trash Rack Cleaner Machine
- Repairing and maintenance of twin chamber desander basin
- Repair and maintenance of diversion spillway surface with wear resistant epoxy compound
- Installation of the floating boom in front of intake
- An independent study of left bank slope protection works at left river bank at the confluence of Kaligandaki and Aandhi Khola river was carried out by a private French company and they have recommended an effective way to handle such type of problem.

Plant Control System Upgradation Works

Completion of major portion of "Plant Control System (SCADA) Upgradation Work" became the highlight of this year.

Control Room Furnished with SCADA

Completion of major portion of "Plant Control System (SCADA) Upgradation Work" became the highlight of this year. Local Control Units (LCUs) for controlling all three Units, 132 kV GIS, Common auxiliaries, 12 kV Feeders, Surge Tank Wheel Gate and Damsite Gates along with Governor Panel, Generator Protection Panel and Static Excitation Panel of all three Units have been replaced. Also, Network panel and Server panel has been installed for establishing Supervisory Control and Data

Acquisition from Power House Control Room and Damsite Control Room. Server Panel is facilitated with HMI Server, Historian and Reporting Server, Network Attached Storage, Engineer Server, Simulator Server and Dispatch Communication Server. Similarly, Network panel is equipped with Light Interface Unit, Network Switches, GPS Time synchronizer and GPS Signal Conditioner. Two sets of Operator Consoles are installed at Control Room and one set of Engineering Console and Simulator Console is installed at Engineer's Room. In addition to this, one set of Intake Operator Console is installed at Damsite for controlling Damsite Gates and acquisition of data from Powerhouse to Damsite and vice-versa.

Before execution of this work, operators were bound to run the machine and operate all the equipment manually from Local Control Panel itself as there wasn't any provision of Control and acquisition of data from Control Room. After execution of upgradation works of Control and SCADA system, operators are now able to monitor all the parameters and also control all the electrical and mechanical equipment (Circuit breakers, Isolators, Drives, Pumps etc.) remotely from Control Room. Furthermore, all the information of Numerical relay has been integrated to SCADA system via IEC 61850 communication and all the metering data are integrated to SCADA via modbus over TCP/IP. In addition to this, complete redundancy has been maintained for all the major components like Controllers, DC-DC converters, Network Switches, Fiber Optics Cable, HMI Server, Historian & Reporting Server, Network Attached Storage, Excitation Bridge and Numerical Relays in order to increase the reliability of Plant. More than 90% of the work has already been completed by Contractor 'ABB India Limited' and remaining work is expected to be completed within December 2020.

Despite the adverse conditions arise due to outbreak of pandemic of COVID-19 and successive lockdowns and time constraint, more than 90% of works under the scope of this Project has been successfully completed and hence the progress so far can be justified commendable.

Middle Marsyangdi Hydropower Station

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 of Gandaki Province, MMHPS has an installed capacity of 70 MW and a design annual generation of 398 GWhr.

MMHPS is a peaking run-off-the-river (PRoR) plant with daily peaking capacity of 5 hrs at minimum discharge. The plant was commissioned in December, 2008 and commercial generation was started one month later. The cumulative generation of the station has reached 4,926.55 GWh until the end of FY 2019/20. The total generation during this FY is 446.62 GWh, which is 112.22 % of the annual design generation.

Repair and Maintenance Activities

Apart from regular preventive maintenances, following major maintenance works were done in the FY 2019/20;

- Overhauling of unit no. 2 turbine
- Repairing of all 3 Spillway Radial Gates and flushing gates of all 3 de-sanding units, Intake and Spillway radial Gate Stop Logs, Installation of 4 new sets of Bulkhead Gates for De-sander outlets, repairing of raking/travel mechanism for Trash Rack cleaning machine at Dam Site
- Replacement of Heat Exchanger plates of cooling water system of both units

- Replacement of broken spring-loaded studs of generator brake of Unit-1

Overhauling of unit no. 2

- Inspection, insulation as well as BDV testing of power transformers of Unit # 2
- All interconnection facilities for transmission line coming from Dordi Corridor connected in MMHPS Switchyard and incorporated in SCADA system
- Replacement of PLC cards for Unit # 2 Governor and Intake Gate # 2
- Replacement of motor in close circuit cooling water system of Unit # 1
- Replacement of cable head for power cable of power transformer L1of Unit # 1
- Maintenance of Gabion Structures at Left and Right banks of Spillway at Downstream end of Dam Site
- Sediment sampling works at Intake, De-sander Outlet and Draft tube of Power House for measurement of sediment concentration
- Application of High-performance Abrasion Resistant Epoxy Compounds at Spillway Chutes
- Regular maintenance works of Water Supply, Sewerage and Sanitation system
- Contract Award for major Rehabilitation Works of dam Spillway no. 3

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. The cumulative generation of the station has reached 12,851.205 GWh until the end of FY 2019/20. In FY 2019/20, it generated 443.852 GWh of energy which is 95.97 % of annual design generation.

Repair and Maintenance Activities

Other than regular maintenance works,

- Overhauling work of unit 3 turbine and insulation testing of its generator
- Repair and maintenance of Diversion Radial Gates 2 and 3

Replacement of sill plate of gate no. 3 of diversion weir

- Replacement of shaft seal, and heat exchangers of all the units changed as per necessity
- Gravity Tank cleaning done multiple times as per requirement during plant shutdown taken for flushing of desanding basin.
- Overhauling of all weir site gates (Diversion) control panels, Overhauling of Unit 3 power transformers, Generators, Circuit Breakers, & Various feeders

and emergency gate of Surge Tank rectification.

- Removal of deposited sediments/Debris from the under-sluice tunnel gallery at weir site.
- Up-gradation and maintenance works of dam site water supply system intake to distribution point, high
- Application of high strength epoxy on 2 gates and U/S damaged weir surface.

Upper Trishuli 3A Hydropower Station

Upper Trishuli 3A (UT3A) Hydro Power Station is a 60 MW Run of River type power plant located in Rasuwa and Nuwakot districts. The annual design generation of the Power Station is 489.76 GWh, with design discharge of 70% PoE (the highest among other power plants) which resulted second highest annual generation in Nepal after Kaligandaki 'A' Hydropower Station. The construction of this power plant was initiated in June 2011. The power plant is being financed by a soft loan from China Exim Bank. The estimated cost of the project is 125.775 Million US$ and the loan from China Exim Bank is expected to cover the cost of the major project works including Civil, Electro-Mechanical, Hydromechanical and Transmission Line works. Since the handover of UT3A project, by CGGC to NEA, and the beginning of Defect Liability Period (DLP) from 1st August, 2019, the Power Station has facilitated CGGC in works appended in the Punch List in and other works appearing during the operation of the Power Station. The Project contract cost for civil. EM, HM works is USD 100.771 million (2010) and T/L is USD 17.371 million and NRs 611.266 million (2011) including VAT in EPC model.

On May 16, 2019 and July 30, 2019, 72 hours generation test of Unit 1 and Unit 2 was completed, respectively by synchronizing with the national grid. In this Fiscal Year 2019/20, the Power Station generated 407.551 GWh, which is 83.21 % of the annual design generation. While the cumulative generation of the station till F/Y 2019/20 has reached 423.736 GWh from the first run.

Repair and Maintenance Activities

- Repair and maintenance of Hydraulic Mechanism, other vertical sliding gates, draft tube maintenance gates of both Units;
- Repair and maintenance of governor system and its solenoid operating valves.
- Repair and maintenance works of Upper Guide Bearing Pads of Unit-2, Butterfly Valve Expansion Joint, Pressure Reducing Valve (PRV) of Unit-1, Four Way Globe Valve of Unit-2 Cooling Water System

Excitation Floor

- Repair of the broken optical fiber from GIS to headworks
- Replacement of LV winding thermometer and sensor of 36 MVA power transformer and oil level sensor of upper guide bearing of Unit 1
- Repair of Unit 1 MIV pressure balance sensor
- Installation of CCTV monitoring system at both headworks and underground powerhouse
- Construction of new Control room
- Construction of Plumb Concrete wall for protection of river embankment at downstream of head works.

- Installation of warning boards for the local people at probable entry of the river to reduce the chances of accident due to variation in river flow.
- Construction of room for the safety of motor and cables hoist at surge shaft.

Kulekhani I Hydropower Station

Kulekhani –I, located at Dhorsing, Makwanpur is the only reservoir (seasonal 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. Its 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 as well as a backup when ROR types plants face some problems for operation. The Power Station is designed to generate 165 GWh as primary energy and 46 GWh as Secondary energy.

The cumulative generation of Kulekhani-I HPS has reached 5015.996 GWh. The plant generated 162.97 GWh of energy in FY 2019/20. The maximum water level was recorded as 1527.7 masl on 2076/06/25, whereas the minimum as 1503.96 masl on 2077/03/01, which raised up to 1510.5 masl on 2077/03/31.

Repair and Maintenance Activities

- Repair and maintenance of Radial Spillway Gate, Sim Khola Intake Gate and Chakhel Khola Intake Gate.
- Replacement of Cooling Water Pump
- Repair and maintenance of Jet Brake of Unit No 2.
- Repair and maintenance of the Powerhouse Chiller Plant, Generator and Turbine Oil Coolers, Cooling Water Pump, Compressor and Diesel Generator
- Installation, testing and commissioning of new 66 kV synchronizing SF6 circuit breaker for Unit no 1 and Unit no 2 and Automatic Synchronizing Panel
- Maintenance of 11 kV Bus bar and Vacuum Circuit Breakers.
- Installation, testing and commissioning of new control and relay panel for operation of butterfly valve of valve house from control house (remote)

Maintenance of Jet Brake

- Clearance of Chakhel Intake and Waterway Tunnel to regulate flow which was fully blocked by debris
- Construction of different retaining/ supporting structure at different access roads, security areas on rock fill dam area to protect additional damage.
- Removal of debris from energy dissipation pond below spillway.
- Maintenance of Valve House road.

Kulekhani II Hydropower Station

Kulekhani-II Hydropower Station, located at Bhimphedi Rural Municipality-4, Nibuwatar, Makwanpur is a cascade of Kulekhani-I HPS with installed capacity of 32 MW and annual design generation of 104.6 GWh. It was commissioned in 1986 AD.

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

The cumulative generation of Kulekhani-II HPS has reached 2064.583 GWh till F/Y 2019/20. The Plant has Generated 81.483 GWh in F/Y 2019/20 which is 77.9% of design generation. 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.

Generator Floor

Repair and Maintenance Activities

Major works carried out on this period are;

- Repairing of Control Valve for operating downstream seat ring.
- SF6 Gas filling of breaker at power house switchyard.
- Corrosion Resistant Coating on 132 KV live lines switchyard Gantry Structures.
- Transformer and pumps maintenance at Rapti intake.
- Surge Tank Protection works (Backfilling work & Retaining Wall) at Surge Tank Area.
- Mandu Dam Protection & Check Wall Maintenance Works.
- Construction of Temporary Reservoir on Rapti Intake which played the major role in increment of the generation.

Chameliya Hydropower Station

Chameliya Hydropower Station (CHPS), a daily peaking run-off-river (PROR) scheme with an installed capacity of 30 MW designed annual generation of 184.21 GWhr is located 950 km west of Kathmandu on Chameliya river, a tributary of Mahakali river, in Shailya-Shikhar Municipality-1, Balanch, Darchula. Generation, operation and maintenance works are underway since establishment of station after successful inauguration of Chameliya Hydroelectric Project (CHEP) on 10 February, 2018.

The cumulative generation has reached 374.666 GWh till the end of FY 2019/20. The total generation during this FY year is 160.811 GWh which is 87.30% of annual design generation.

Repair and Maintenance Activities

On Baishak 26, 2077 the unexpected transmission line trip (over voltage) resulted in failure of DC system leading the machine to

run-away speed due to which the unit could not be put into operation without further repair. Therefore, the excitation housing was dismantled and upper and lower guide bearing were inspected; bearing adjustment were done. The unit was reassembled, tested and put into operation on Jestha 01, 2077, successfully.

Meanwhile, due to further frequent transmission line failure, Unit no. 1 got subjected to further jerks causing abnormal vibration of the unit. So, Unit 1 was put to halt, for thorough inspection and repair works. Repair work included replacement of Turbine Guide Bearing (TBN BRG), adjustment of lower and upper guide bearing along with aligning the shaft. The repair work comprised with repeated manual operation and adjustment of guide bearing.

Mostly during rainy season high concentration of sediment, debris, leaves, jute pieces, etc. in the water causes choking of filter element, which needs to be cleaned on daily basis filters, valves and pipes etc.

The major maintenance works completed this year include

- Repairing of 11 kV dedicated line from powerhouse to dam damaged due to landslide, maintenance of 132 kV transmission line damaged due to heavy snowfall in Dadeldhura District and repairing of 132 kV Circuit Breaker.
- Upgrading works of Gokuleshwor-Balanch access road by CHEP.

Multi- Fuel Power Plant

Multifuel power plant is the largest thermal power plant in Nepal. It is located in Bansbari Morang, Biratnagar, which happens to be one of the largest industrial areas in Nepal. In the first phase, 4 units each of 6.5 MW were installed with financial assistance from Finland Government in FY 1990/91. Later, 2 more units of same capacity were installed in FY 1997/98 to complement the energy deficit during winter and evening peak.

The cumulative generation of Multifuel Power Plant has now reached 593.97 GWh from its first run. The energy generation in this year is 2.52 MWhr. Recently, the Condition Evaluation and Assessment work of all the six units (Generator, Engine and their auxiliary equipment) was concluded by M/s Wartsila India Pvt. Ltd.,India in FY 2018/19.

Repair and Maintenance Activities

- Installation, testing and commissioning of two sets of 33 kV Outdoor Vacuum circuit breakers, 33 kV current transformers and existing 30 kV lightning arrestors at switchyard.
- Upgradation of 33kV/11KV, 6/8 MVA Power transformer by replacing with 33kV/11KV, 24 MVA Power transformers
- Repair and maintenance of 11 kV circuit breakers, 11 kV SF6 circuit breakers and 33 kV Outdoor circuit breakers
- Repair & maintenance of main control panel, synchronizing panel and lube oil separator/heating unit of diesel unit no. 5.
- Installation, testing & commissioning of new 11 kV breakers- 5 nos. in newly constructed Breaker switching & control room for industrial as well as domestic power consumption is being 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 thirteen (13) hydropower stations and one (1) diesel power plants with individual installed capacity below 30MW owned by NEA. It has always strived to

uphold economy, operational efficiency and an acceptable level of reliability in its drive for improvement. The installed capacity of 13 hydropower stations and 1 diesel power plant with installed capacity below 30 MW is 122.7 MW. The actual generation from the hydropower generating stations under this department on FY 2019/20 is 436.668 GWh and has achieved an increment of 6.69 % generation as compared to previous fiscal year. Rehabilitation project ongoing under this department is Trishuli, Sundarijal and Tinau with GON funding and loan assistance from the Asian Development Bank (ADB) under Energy Access and Efficiency Improvement Project (EAEIP).

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

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 MWh and annual design generation of 163 GWh. The cumulative generation of THPS since its first run has reached 5,435.631 GWh of which 128.973 GWh has been generated in FY 2019/20. The energy generation in this year is 79.12 % of design generation.

The Electro-Mechanical Renovation and Modernization works of Trishuli Hydropower Station is in progress. Recently, the contract has been awarded at price in Euro. 3,367,424.46 and NRs. 9,63,26,000.00 on 26th May, 2020 AD (BS 2077/02/13) and contract effective date started from 26th June,2020 AD with 30 months of completion period.

Repair and Maintenance Activities

- Overhauling of Unit no. 1 turbine along its MIV,
- Overhauling of MIV of unit no.6
- Repair and maintenance at dam site
- Installation of new transformer at desander,
- Repair and maintenance of 3 distribution transformers, Trishuli-Chilime Breaker, Chilime Line CT and powerhouse CT and PT
- Replacement of TOD Meters and installation of AMR/AMI system,
- Installation of CCTV cameras at desander and forebay
- Powerhouse access road maintenance and partial cleaning of reservoir

Penstock

Devighat Hydropower Station

Devighat Hydropower Plant is a cascade development of Trishuli Hydropower Plant with installed capacity of 14.1 MW and annual design generation of 114 GWh. It is located at Devighat, Nuwakot and was commissioned in 1984 AD. The capacity of the units was improved and upgraded to 15MW. The cumulative generation since its first run has reached 3060.175 GWh in FY 2019/20. The actual generation of year 2019/20 is 92.053 GWh which is 80.75 % of annual design generation.

The contract, "Supply and delivery of Electro-Mechanical Spare parts for 3x5 MW Devighat HPP", for the Power station has been awarded to Bharat Heavy Electricals Limited (BHEL) on 30th January, 2020 (2077/10/16) amounting to INR.40,297,339.00.

Repair and Maintenance Activities

- Overhauling of unit no. 3 turbine
- Replacement of bypass valve,
- Installation of Slurry pump at the forebay,

Welding of Francis Runner

- Installation of new 66 kV SF6 breaker for 66 kV bus coupler, 33kV out door VCB breaker and 33kV current transformer for Dhading feeder
- Replacement of damaged 66kV lightening arrestor at 66kV bus coupler.
- Upgradation of overhead crane from hardwire manual operation to wireless remote operation
- Water diversion work at Samari Khola to increase discharge and generation,
- Repair and maintenance of Protection wall.

Gandak Hydropower Station

Gandak Hydro Power Station is located at Pratappur Gaunpalika ward no.-7, Nawalparasi, Nepal about 235 kms from Kathmandu and about 5 kms North from Indian boarder point called Jhulenipur, Mahrajgunj, Uttar Pradesh. The power house is a part of irrigation cum power generation scheme on Gandak River. A barrage has been constructed on the river Narayani at Bhainsalotan (Balmikinager, Bihar) on Indo-Nepal boarder. From the barrage, two canals take off namely Gandak Main Eastern Canal (MEC) and Gandak Main Western Canal (MWC). 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 by Water Resource Department Balmikinagar, Bihar, India

The plant has three Horizontal mounted tubular bulb turbines; low head high discharge Kaplan Turbo-Generators of 5 MW each with aggregate capacity of 15 MW and annual design generation of 106.38 GWh. The project was built in1979 AD in assistance with the Government of India and Government of Nepal with the total cost of NRs. 170 million. It was handed over to NEA on 31 St, Aug 1981.

The actual generation of this year is 10.33 GWh which is 55.48% of its target generation 18.63 GWh whereas the cumulative generation has reached 1036.96 GWh at the end of the year. The decrease in power generation is mainly due to frequent & long canal shutdown (i.e. approx. five months) of Main Western Canal for inspection, maintenance by Irrigation Department, Bihar, India & sometimes due to local issues causing disturbance in canal. The frequent system changing, high water level in tailrace maintained by Irrigation Dept. UP, high deposition of sediment & choking of trash rack also disrupted power generation.

High sand deposition at Intake

Repair and Maintenance Activities

- Repair and maintenance of guide vane servomotor and governor of unit no. 2
- Replacement of carbon seal (shaft seal), damaged and leaking guide vane bush and seals and oil coolers of unit no. 2
- Repair of damaged portion of upstream gate in unit no. 3,
- Repair and maintenance of high-pressure compressor used in oil pressure unit, electrical components of old 15 Ton gantry crane
- Installation of new excitation system, temperature sensor & meter with alarm system of unit no. 2
- Repair and maintenance of slip ring, carbon holder etc. of generator,
- Replacing of control panel sets for cooling water system.
- Cleaning and boulder filling work at 132 kV switchyard

Modi Khola Hydropower Station

Modikhola Hydropower Station is located at Dimuwa in Parbat district about 46 km towards west from Pokhara City. It 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. The cumulative generation of this plant since its first run has reached 1076.70 GWhr. It has generated 66.913 GWh in the fiscal year 2019/20 which is 72.34 % of design capacity.

Repair and Maintenance Activities

- Overhauling of Unit-2 turbine and generator
- Replacement of drain valve of penstock at turbine floor.
- Repair & maintenance of Lathe machine & drilling machine
- Replacement of CTs at 33 KV substation, Lightning arrestor at 132 KV Substation of Pokhara feeder
- Replacement of speed and temperature sensors, position indicators and mini MCR.

Installation of Rotor Shaft during overhauling

- Construction of new control room by Middle Modi hydropower project at intake areas because the old control room need to be demolished for the construction of tailrace of Middle Modi hydropower project.
- Construction of cable trench from the LT bushing of 132 KV transformer to the 33 KV substation.

Sunkoshi Hydropower Station

Introduction

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

The cumulative generation of the station has reached 2440.348 GWh in 2019/20 from the first run. It has generated 62.245 GWh in FY 2019/20 which is 88.92% of design capacity.

Repair and Maintenance Activities

- Complete overhauling of unit no. 1 and 2 turbines,
- Repair & maintenance of monorail hoist of maintenance gate of dam site
- Maintenance of gates of peak load pondage
- Replacement of Excitation System, bus bar by insulated conductor of all the units
- Maintenance of Breaker of 6.3 MVA, 6.3/66 kV
- Maintenance of SCADA system of dam site and changing the Limit Switch of SCADA system.
- River training works with Gabion
- Debris removal works at Dam site's upstream and downstream area.
- Black Topping work of access road

Overhauling of Machine

Illam (Puwa Khola) Hydropower Station

Puwakhola hydropower station is a run-off river type plant operating with the water of the Puwakhola River, a river in the Far East Nepal has installed capacity of 6.2 MW and annual design generation of 48 GWH.

The plant was commissioned and constructed with the in-house management of the Nepal Electricity Authority and the source of fund was the Government of Nepal and Nepal Electricity Authority which was commissioned in 1999AD with a cost of US$15.7million dollars.

It has two identical units of 3.1 MW each and has generated 34.914 GWh energy in this fiscal year and till date generation of the plant is 624.73 GWh.

Repair and Maintenance Activities

Major maintenance works that have been carried this fiscal year are; replacement of 8 MVA Power Transformer, 33 kV lightning Arrestor, 33 kV PT, addition of Lightning Arrestor at both end of Power Transformer at switchyard, replacement of Penstock Drain Valve of both Unit, replacement of Spherical Valve (MIV), Brake-Jet valve, By-Pass valve of Unit No.2, replacement of 6.6 kV Switch Gear & Protection Panels, replacement of Digital Excitation System of both Unit, replacement of Unit control, Digital Governor & OPU system in Unit No. 2 and operating the unit in manual mode, etc.

New Control Room

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.

A single unit of the plant is in operation since the FY 2018/19 after the complete plant shutdown for five years. The total energy generation of the plant this FY is 1822 MWh and cumulative generation till now is 55,529 MWh. 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 generating unit was facing frequent tripping and shutdowns because of voltage fluctuations in the 33 kV Dharan Chatara Line. This problem has been sorted out by the installation of new 3.5 MVA 33/11 kV OLTC Power Transformer at the switchyard.

Power Transformer in the Switchyard

Panauti Hydropower Station

Panauti Hydropower Station is third oldest Hydropower Station of Nepal. It is run of river scheme hydropower plant with intake on right bank of Roshi Khola and Power House is located at Khopasi, Kavre, nearly 35 km east of Kathmandu.

The plant is with install capacity of 2.4 MW and annual design generation of 6.97 GWh. It was commissioned in 1965 A.D. and developed jointly by Soviet Union Government and GON at a cost of NRs. 27 million. The station was developed with joint purpose of hydropower generation and irrigation. However, the water in the canal has also been used for drinking purposes as well.

The water of the river now mainly used for drinking purpose. The water users along the canal are having the same irrigation facilities as earlier days. Recently the power station control, monitoring, substation and protection system has been upgraded.

The cumulative generation of the station has reached 138.066 GWh till F.Y. 2019/20 from its first run. The station has generated 2.886 GWh in FY 2019/20.

Turbine Overhauling of unit no. 3

Repair and Maintenance Activities

- Construction of new overhead 33kV transmission line at IT Park, Banepa.
- Installation and Commissioning of 3MVA Power Transformer, control and relay panel at Bhaktapur sub-station.
- Repair and maintenance of Francis Runner and its components of unit 3.
- Repair and maintenance of Intake Gates.
- Bearing Housing and Bearing replacement work of unit no 1.
- Bearing replacement and Repair of Bypass valve of unit no 2.
- Replacement of Bushing, Copper Studs, Lighting arrester, OTI and complete Oil of Power Transformers of Power House.
- Upgrading distribution lines of Office and Forebay Areas.
- Restoration of control and AVR system of Unit no. 2.
- Repair and maintenance of headrace canal.

Fewa Hydropower Station

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

The cumulative generation of the station has reached 97.677 GWh till 2076/77 from its first run. The station has generated 2.126 GWh in FY 2076/77 which is 78.77 % of target generation of this year.

Unit#2 of Fewa HPS was in shutdown condition for previous 7 years period, this year the unit has been restored in operation condition after installing new Generator Circuit breaker, repairing of synchronizing circuit, excitation circuit with DC Excitor.

Repair and Maintenance Activities

- Electro-mechanical Overhauling of Unit-2.
- Laying 11kV XLPE Cable from Power Transformers to Oil Circuit Breaker.
- Replacement of Bushing, Copper Studs, OTI and complete Oil of Power Transformers of Power House
- Repairing of AC and DC distribution system.
- Condition monitoring of penstock pipes.

Turbine Floor

The Electromechanical rehabilitation and modernization of Phewa hydropower station is in progress by assigning a consultant. Now, the technical specification, estimate and bid document for the rehabilitation is finalized by the consultant and the bid will be published in next fiscal year.

Seti Hydropower Station

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

The cumulative generation of Seti HPS has reached 336.814 GWh till FY 2019/20 from its first run. The station has generated 11.158 GWh in FY 2019/20 which is 113.86 % of design generation.

Repair and Maintenance Activities

- Electro-mechanical Overhauling of Unit-1 along with Main seal replacement of MIV.
- Replacement of Oil Coolers of Unit 1 & 2, Generator Guide Bearing of Unit-2.
- Repair & maintenance of Desander Gates, Penstock inlet gates, Copper Studs, OTI and Oil of Power Transformers of Power House,
- Replacement of Bushing, servicing of 10 Ton EOT crane inside power house.
- Installation and Commissioning of 630 kVA, 6.3/11kV Transformer for Unit-3.

Insulation Testing of Generator of Unit-1.

Overhauling of Unit no.1

Sundarijal Hydropower Station

Sundarijal Hydropower Station is located at Sundarijal, 15 km northeast of Kathmandu and serves twin purpose of water supply and energy.

The tail-water discharge is utilized for water supply system to Kathmandu Valley. It has two turbo-generator sets with total installed capacity of 640 kW & annual generation 4.77 GWh. This Plant was erected under Colombo Plan scheme whereby the main equipment'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 2.814 GWh and cumulative generation till now is 131.679 GWhr.

Major maintenance works carried out in this year for the plant are repair and maintenance of main gate valve, needle opening and closing system of unit 1 and completion of repair and maintenance of intake downstream flushing gate.

The rehabilitation of this power station is underway under the joint assistance from ADB, 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. 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.

The rehabilitation works largely consists of electro-mechanical rehabilitation work with modernization of Plant Control System and civil improvement work at intake and head pond. 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 been rebuilt with upgradation for easy transportation of heavy equipment, which was stored in NEA's Training Centre, Kharipati. Headpond of the Sundarijal hydropower plant has been rehabilitated with construction of gabion structure weir with RCC structure supported metallic trash rack. Out of the two Generator-Turbine units each 320 kW, one unit (Unit no. 2) has been completely rehabilitated with upgradation of power to 485 kW. Unit no. 1 could not be continued for rehabilitation work as prevailed lockdown-imposed situation due to Covid-19 pandemic situation.

After successful testing and commissioning of unit no. 2, it is running in regular operation now, fully automated with SCADA system. For the rehabilitation of Unit no. 1 its Turbine-Generator soon will be dismantled and replaced by new Turbine-Generator, However, till now the Unit no. 1 is also running with previously existed system whenever is required for additional drinking water supply, upon request from Kathmandu Upatyaka Khanepani Limited (KUKL).

Pharping Hydropower Station

Pharping Hydropower Station is the first Power Station 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).

Pharping Reservoir

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

Hetauda Diesel Powerhouse

Hetauda Diesel Power Plant, with installed capacity of 14.41 MW is located at Hetauda, Makawanpur. The first phase with three sets of English Units was commissioned in 1963 and the second phase with four sets of Russian Units was commissioned in 1980 in assistance from British Government and Government of Nepal.

Machine Hall

The plant operates during peak; however, the soaring fuel price has made its operation costlier compared to that of hydropower stations. Presently, the plant has been operating at capacity of 10 MW in need of system peak load and for regular testing purposes.

The cumulative generation of the plant has now reached 155.45 GWh from its first run. The station has generated 113 MWh in FY 2018/19 and 57 MWh in FY 2019/20.

Repair and Maintenance Activities

- Repair, maintenance of Air compressor no.2, engine no.7 exhaust pipeline, and engine no.5 exhaust pipeline eroded along with top cover cap.
- Servicing of all the engines and Cleaning of Air filters.
- Repair & maintenance work of engine no.6 exhaust pipeline.
- Repair & maintenance of Pump motor.

Generation Development Department

Generation Development Department (GDD) performs the regular monitoring, inspection and resource management of under-construction projects of Generation Directorate. This year, department has completed the construction of Upper Trishuli 3A hydroelectric project and 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. Presently, Upper Trishuli hydroelectric project has been taken over by NEA whereas Kulekhani III is still under test operation from Asoj, 2076.

Upper Trishuli 3A Hydroelectric Project

Project Description

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 Million US$ which is being funded by concessional loan from China Exim Bank. Contract for the major construction work (Civil, Electro-mechanical & Hydro-mechanical works) was signed with China Gezhouba Group Company Ltd., China (CGGC) at 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 of 3.932 Million US$ excluding VAT. Contract for the Transmission line work was awarded to China International Water & Electric Corporation (CWE) at a contract price of 22.6 million US$ excluding VAT.

Main Plant Project Works

To date main Contractor CGGC has almost completed the 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. From May 16, 2019 and from July 31, 2019 the 72-hour generation test of Unit 1 (30 MW) and Unit 2 (30 MW) have been started synchronizing with the national grid. After the successful generation tests, both Units are in continuous operation and supplying the electricity to Matatirtha Substation charged with 132kV. The Taking Over Certificate for the main plant works has been issued effective from August 30, 2019 and the Defect Liability Period is running at present. However, some remaining and defect removing works have been seriously affected due to the pandemic outbreak of Covid-19.

The Plant Project has been handed over to Trishuli 3A Hydropower Station under Large Generation Operation and Maintenance Department, Generation Directorate effective from December 01, 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 to Trishuli-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 from Badbhanjyang to Matatirtha, Kathmandu. In addition, about 1.35 km length of 220 kV four circuit underground cable route leading to the Matatirtha Substation is also constructed.

Till date, all works of Transmission line have been completed with 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 of the Trishuli Basin (220 kV Double circuit) and from Badbhanjyang(220kV Four Circuit) it will also carry the power from Marsyangdi corridor to Matatirtha Substation.

The Operation of Transmission Line has been handed over to Kathmandu Grid Division under Transmission Directorate effective from August 05, 2019.

Matatirtha terminal

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 completed.

The construction works after the Gorkha Earthquake has been resumed from October 2017 and the remaining works were being undertaken at a rapid pace and TOC was issued effective from August 30, 2019. However, due to the pandemic outbreak of Covid-19 the defect removal works and construction of some outstanding works is affected. So, hoping for favorable conditions, it is planned to complete the main plant project works by the end of 2020.

Kulekhani III Hydroelectric Project

Project Description

Kulekhani III Hydroelectric Project (14MW) is the cascade project of Kulekhani II hydroelectric plant which utilizes the regulated flow of Kulekhani reservoir. Additional water from Khani Khola is also utilized for the Project. The Project is located southwest of Kathmandu in Makawanpur district, Narayani zone, Bagmati 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.

The headworks site is located on the left bank of Khani Khola at Bhainse, about 11 km north of Hetauda. The Powerhouse is located about 5 km north of Hetauda at Sanutar village adjacent to the Tribhuwan Highway. The Civil construction works have been completed by M/S Sinohydro Corporation, China while the contractor for the Electromechanical, Hydromechanical & Transmission Line works is M/S Zhejiang Jinlun Electromechanic Co. Ltd., China. The Consultant is M/S WAPCOS Ltd., India.

Project Status as of 2076/077 (2019/20)

The project was initiated in 2008 April with the contract award to the civil contractor while the contract for Electromechanical, Hydromechanical and Transmission Line works 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 was exerted to resolve the issues, overcome the problems and complete the project as early as possible. As a result, first generating unit started test operation from 15 Ashoj 2076 (2 October 2019) and the second from 24 Ashoj 2076 (11 October 2019). As of Jestha 2077, a total of 16,992 MWh of electrical energy has been generated by the plant.

It was planned to take over the plant from the electro-mechanical contractor in March 2020 (Falgun 2076) after completing all the remaining peripheral works. However, that could not be materialized owing to the effect of global Covid-19 pandemic. The project will be taken over as soon as possible the situation improves. In spite of contractual handover/ takeover process, the plant is in generating mode and supplying power to the INPS.

Headpond Water Filling

Technical Support Department

Technical Support Department, headed by Director, provides expert advice for the under-construction projects and existing generating power plants. Deputy Managing Director (directorate chief) co-ordinates between the Technical Support Department and Projects/ Operation and Maintenance Department. This year, the department was engaged in the review of the report submitted by project development department for the rehabilitation of the civil structures of existing Trishuli hydropower station for generation improvement which is being obstructed with various waterways and sediment problems.

Nepal Electricity Authority

Generation Directoratge

Generation Related Statistics and Performance Factors of FY 2076/77 (FY 2019/020)

S. No.	Power Stations	Total Installed Capacity	Design Generation (MWh)	Actual Generation (MWh)			Max. generation in a year till date (MWh)	Generation Target in FY 2076/77 (MWh)	Backfeed (MWh)	Power Station Available Energy (MWh)	Energy Transmission to Grid (MWh)	Net Energy Transmission to Grid (MWh)	Local Distribution (MWh)	Station/ Internal Consumption (MWh)	Total Power Utilization (MWh)	Energy Loss (MWh)	Power Station Loss (%)	Loss/ Energy generation	Plant Factor (%)	Actual Generation/ Design Generation ratio (%)
				FY 2074/75	FY 2075/76	FY 2076/77														
		P	a			A		b	B	C=A+B	D	D-B	E	F	G=D+E+F	L=C-G	(C-G)/C	L/A*100	A/(Installed capacity *365*24) *100	(A/a)*100
1	Kaligandaki 'A'	144	842,000.00	865,075.00	871,914.00	871,466.00	929,983.00 (2071/72)	882,860.66	296,306.56	1,167,772.56	1,162,899.55	866,592.99	886.69	1,810.66	1,165,596.90	2,175.66	0.19	0.25	68.64	103.50
2	Mid-Marsyangdi	70	398,000.00	437,286.87	471,322.51	446,624.75	471,322.51 (2075/76)	463,473.21	366,134.54	812,759.29	794,945.65	428,811.11	107.06	1,191.28	796,243.99	16,515.30	2.03	3.70	72.37	112.22
3	Marsyandi	69	462,500.00	447,490.30	475,176.00	443,852.10	483,928.20 (2052/53)	477,698.55	484,458.00	928,310.10	906,033.40	421,575.40	0.00	4,420.87	910,454.27	17,855.83	1.92	4.02	73.13	95.97
4	Upper Trishuli 3A	60	489,760.00	-	16,185.60	407,551.15	407,551(2076/77)	489,760.00	7.20	407,558.35	402,815.82	402,808.62	0.00	821.80	403,637.62	3,920.73	0.96	0.96	77.79	83.21
5	Kulekhani I	60	211,000.00	62,131.00	91,184.00	162,972.00	249,680.00 (2056/57)	103,926.41	119,866.42	282,838.42	272,926.23	153,059.81	8,319.42	512.15	281,757.80	1,080.62	0.38	0.66	30.74	77.24
6	Kulekhani II	32	104,600.00	31,754.10	44,676.70	81,483.40	122,757.00 (2056/57)	86,864.07	238.77	81,722.17	80,989.34	80,750.57	0.00	201.35	81,190.69	531.48	0.65	0.65	28.82	77.90
7	Chameliya	30	184,200.00	52,459.58	161,395.54	160,811.64	161395.54(2075/76)	181,437.65	63,402.29	224,213.93	221,101.90	157,699.61	1,011.23	260.16	222,373.29	1,840.64	0.82	1.14	60.82	87.30
8	Trishuli	24	163,000.00	121,316.50	123,741.10	128,973.11	154,423.75 (2053/54)	138,964.17	175,331.17	304,304.28	277,191.47	101,860.30	16,416.14	261.88	293,869.49	10,434.79	3.43	8.09	61.35	79.12
9	Gandak	15	106,380.00	17,495.80	11,950.80	10,337.60	52,272.70 (2043/44)	18,631.25	96,038.43	106,376.03	-	-	91,487.56	701.93	107,275.13	-	-	-	7.90	9.72
10	Modi	14.8	92,500.00	66,422.70	69,400.50	66,913.20	69,556.40 (2073/74)	73,253.95	113,761.58	180,674.78	177,204.87	63,443.29	2,381.25	613.93	180,200.05	474.73	0.26	0.71	51.25	72.34
11	Devighat	15	114,000.00	86,238.79	86,851.14	92,053.14	106,277.70 (2056/57)	97,749.31	58,063.60	150,116.74	114,509.50	56,445.90	34,984.93	169.50	149,663.93	452.81	0.30	0.49	70.14	80.75
12	Kulekhani III	14	40,850.00	0.00	0.00	20,365.20	20365.2		0.00	20,365.20	20,109.60	20,109.60	0.00	215.99	20,325.59	39.61	0.19	0.19	16.66	49.85
13	Sunkoshi	10.05	70,000.00	55,050.50	62,156.70	62,245.94	66,383.10 (2068/69)	60,523.27	194.50	62,440.44	59,850.48	59,655.98	2,058.97	305.47	62,214.92	225.51	0.36	0.36	70.52	88.92
14	Puwa	6.2	48,000.00	35,790.53	34,192.81	34,914.55	36,414.24 (2073/74)	34,642.57	6.50	34,921.05	34,864.37	34,857.87	0.00	50.18	34,914.55	6.50	0.02	0.02	64.05	72.74
15	Chatara	3.2	6,000.00	22.25	2,698.25	1,822.00	5,219.75 (2063/64)	4,166.00	807.85	2,629.85	1,112.08	304.23	1,488.89	12.05	2,613.02	16.84	0.64	0.92	6.40	30.37
16	Panauti	2.4	6,970.00	1,112.34	3,005.84	2,886.76	4,654.80 (2058/59)	3,616.31	4.60	2,891.36	2,834.49	2,829.89	0.00	14.27	2,848.76	42.59	1.47	1.48	13.74	41.42
17	Seti	1.5	9,800.00	10,186.74	10,030.00	11,158.29	11,616.19 (2067/68)	10,478.86	3.03	11,161.32	10,369.31	10,366.28	0.00	42.96	10,412.27	749.05	6.71	6.71	85.15	113.86
18	Fewa	1	6,500.00	1,911.68	1,531.68	2,126.54	3,919.47 (2034/35)	2,699.58	-	2,126.54	-	-	--	10.65	-	-	-	-	24.60	32.72
19	Sundarijal	0.64	4,770.00	4,332.29	3,587.30	2,814.76	4,530.26 (2071/72)	2,921.47	0.00	2,814.76	2,808.10	2,808.10	0.00	6.66	2,814.76	0.00	0.00	0.00	49.88	59.01
20	Pharping	0.5	-	-	-	-	48.65(2064/65)			-	-	-	-	-	-	-	-	-	-	-
	Total (Hydro)	573.29	3,360,830.00	2,296,076.97	2,541,000.47	3,011,372.13	-	3,133,667.29	1,774,625.03	4,785,997.16	4,542,566.16	2,863,979.56	159,142.14	11,623.74	4,728,407.04	57,590.13	1.20	1.91	59.96	89.60
21	Multifuel	39	-	15.78	-	2.52	86,215.07 (2055/56)	-	-	2.52	-	-	-	-	-	-	-	-	0.00	-
22	Hetauda Diesel	14.41	-	127.19	115.74	57.09	24,203.64 (2055/56)	-	-	57.09	47.23	47.23	-	9.87	57.10	-	-	-	1.03	-
	Total (Thermal)	53.41	-	142.97	115.74	59.61	-	-	0.00	59.61	47.23	47.23	0.00	9.87	57.10	2.51	4.21	4.21	0.00	-
	Grand Total	626.7	3,360,830.00	2,296,219.94	2,541,116.21	3,011,431.74	-	-	1,774,625.03	4,786,056.77	4,542,613.39	2,864,026.78	159,142.14	11,633.61	4,728,464.14	57,592.63	1.20	1.91	0.56	89.60

Total system energy	7874.85	GWh
Total Loss in Powerhouse	GWh	GWh
System Loss percentage	0.73	%

Nepal Electricity Authority

Generation Directoratge

Actual Generation for the FY 2076/77 (FY 2019/20 A.D.)

S.No.	Power Stations	Shrawan	Bhadra	Ashwin	Kartik	Mangsir	Poush	Magh	Falgun	Chaitra	Baisakh	Jestha	Ashar	Total
1	Kaligandaki 'A'	98,957.00	95,071.00	83,278.00	80,846.00	66,111.00	49,345.00	43,666.00	38,692.00	53,715.00	72,132.00	97,224.00	92,429.00	871,466.00
2	Mid-Marsyangdi	51,511.75	50,778.80	38,733.70	40,775.75	35,598.75	26,420.50	23,203.10	22,192.40	24,296.50	35,495.50	48,963.80	48,654.20	446,624.75
3	Marsyandi	44,759.80	44,295.50	35,862.00	40,075.60	40,354.90	30,027.40	26,595.00	25,269.00	26,125.10	38,577.50	46,652.60	45,257.70	443,852.10
4	Upper Trishuli 3A	10,424.40	27,443.00	34,801.00	39,713.00	41,909.75	38,417.50	33,052.50	30,482.50	31,237.50	40,357.50	44,590.00	35,122.50	407,551.15
5	Kulekhani I	34,087.00	10,136.00	6,239.00	11,710.00	17,176.00	13,628.00	10,978.00	5,655.00	7,788.00	8,934.00	18,230.00	18,411.00	162,972.00
6	Kulekhani II	16,499.14	5,437.33	3,140.70	5,772.90	8,401.25	6,891.44	5,588.30	2,878.64	3,964.25	4,519.90	9,122.45	9,267.10	81,483.40
7	Chameliya	16,466.11	19,959.74	17,791.00	14,665.78	11,345.54	8,026.22	8,033.88	8,465.86	9,991.30	13,566.42	18,667.42	13,832.37	160,811.64
8	Trishuli	11,785.40	10,143.00	11,120.72	11,804.85	11,817.37	10,895.38	9,975.67	9,352.41	9,202.63	10,723.94	11,515.92	10,635.82	128,973.11
9	Gandak	1,603.30	977.00	1,447.20	559.10	0.00	736.00	1,680.50	1,438.80	726.30	0.00	228.60	940.80	10,337.60
10	Modi	7,841.60	6,114.80	5,364.30	7,505.40	5,941.40	3,650.30	3,012.40	3,268.30	3,445.80	5,813.60	8,392.20	6,563.10	66,913.20
11	Devighat	8,420.09	7,303.76	7,907.87	8,631.96	8,863.56	8,058.64	7,359.52	6,832.15	6,809.92	6,916.73	7,333.49	7,615.45	92,053.14
12	Kulekhani III	0.00	0.00	262.20	1,800.60	3,092.40	2,465.40	1,996.80	1,037.40	1,410.00	1,626.60	3,301.20	3,372.60	20,365.20
13	Sunkoshi	6,086.10	5,578.10	6,856.30	6,849.80	5,906.40	4,252.82	3,563.31	3,405.93	3,468.87	4,850.88	6,372.66	5,054.78	62,245.94
14	Puwa	4,510.63	4,504.98	4,330.12	3,378.76	2,946.42	2,289.15	1,855.95	1,581.43	1,598.11	1,976.67	2,046.75	3,895.58	34,914.55
15	Chatara	323.50	118.00	0.00	0.00	0.00	0.00	26.50	268.00	360.00	305.50	173.75	246.75	1,822.00
16	Panauti	336.48	361.41	336.08	357.32	317.80	251.50	197.90	134.26	71.87	209.28	144.38	168.49	2,886.76
17	Seti	641.79	940.05	876.96	920.79	995.04	972.18	937.71	1,005.12	1,011.15	1,026.54	872.37	958.59	11,158.29
18	Fewa	142.60	231.90	186.14	157.25	231.96	353.00	326.46	208.67	29.19	138.76	4.64	115.97	2,126.54
19	Sundarijal	256.00	248.00	239.33	214.00	99.99	134.33	139.67	190.33	297.84	308.36	330.57	356.35	2,814.76
20	Pharping													0.00
	Total (Hydro)	314,652.68	289,642.36	258,772.62	275,738.86	261,109.53	206,814.76	182,189.16	162,358.20	185,549.33	247,479.68	324,166.79	302,898.15	3,011,372.13
21	Multifuel	0.00	0.60	0.00	0.34	0.18	0.00	0.00	0.70	0.00	0.00	0.00	0.70	2.52
22	Hetauda Diesel	3.35	3.02	4.81	6.07	4.41	8.88	6.82	4.07	4.14	2.11	4.81	4.60	57.09
	Total (Thermal)	3.35	3.62	4.81	6.41	4.59	8.88	6.82	4.77	4.14	2.11	4.81	5.30	59.61
	Grand Total	314,656.03	289,645.98	258,777.43	275,745.27	261,114.12	206,823.64	182,195.98	162,362.97	185,553.46	247,481.79	324,171.60	302,903.46	3,011,431.74

- Indicates metering problem or data unavailability

TRANSMISSION DIRECTORATE

Transmission Directorate is one amongst the nine directorates in the overall organizational structure of NEA, headed presently by a Deputy Managing Director Mr. Braj Bhushan Chaudhary. The directorate is entrusted upon the responsibility to plan, develop, implement, construct, operate, maintains and monitor high-voltage transmission lines and substations from 66 kV to 400 kV voltage level.

The transmission system provides an important link between the power generated from various power plants being owned by NEA, IPPs. and distribution networks ensuring the reliable and quality power to be supplied to the consumers. This directorate undertakes develop and construct not only the new transmission lines and associated substations but also the work of reinforcement/upgradations of existing transmission lines and substations.

There are four departments, namely; Grid Operation Department (GOD), System Operation Department (SOD), Grid Development Department (GDD), and Major 220 kV Transmission Line Department under an umbrella of this directorate each of which is headed by a Director. Further, the major 400 kV Transmission Line Projects is also under this directorate.

The main objectives of the directorate are

- To ensure the development and construction of an efficient, coordinated, and economical system of transmission lines from 66 kV to 400 kV voltage level for smooth flow of electricity from generating stations to the load centers.
- Efficient operation, monitoring, and maintenance of Transmission system (66 kV to 400 kV voltage level)
- To guarantee the continuity and quality of the power supply to consumers by uninterrupted operation and supervision of INPS.
- To envisage, formulate, and implement a short term, medium-term and long term development plans of transmission system network of 66 kV and above voltage levels to evacuate the power generated as per the GoN strategy (15,000 MW in 10 years) as well as to cater the rapidly growing demand of the country.
- To undertake a reinforcement/ the up-gradation projects of existing transmission lines and substations.

Till now, INPS system has been energized up to maximum voltage level of 220 kV. The Dhalkebar 400/220 kV substation is in the verge of completion. With this NEA is all geared up for charging the substation at 400 kV and thus upgrading INPS to 400 kV level. This will be great milestone in the INPS. Now and on all the newly constructed 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 to different control centers. Additional, this directorate has responsibility to operate INPS in synchronous mode with Indian Grid to make the system reliable, secured, and robust in the future.

Moreover, this directorate is also responsible for power exchange across border countries through cross-border transmission lines. The first-ever 400 kV Dhalkebar-Muzzaffapur cross-border transmission line was charged successfully at 220 kV voltage level on 16th of August 2018. This cross-border line has played a central role in the strengthening of the transmission network of INPS. Also, preparation of financial and implementation modality for the construction of the Butwal-Gorakhpur 400 kV cross-border transmission line is in the final stage. Similarly, the preparation of the comprehensive design of 400 kV Inaruwa-Purniya and New Lumki (Dododhara) - Bareli cross border transmission lines are in progress.

Recently Completed Projects

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

Objective of this project was to supply adequate power to western sector of 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, 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 132/33 kV substations at Pahalmanpur and Bhurigaon. Substation upgradation to double bus system and 132 kV bay extension works at Kohalpur, Attariya, Lamki and Lalpur substations have been completed.

Transmission line construction work was completed on Falgun 2073 (February 2017) and substations on Shrawan 2074 (July 2017). Lamki-Pahalmanpur (29.394 km), Pahalmanpur-Attariya (35.384km), Attariya – Lalpur (36.657km) sections were charged on Falgun 2, 2075 (14th February 2019), Jesth 3, 2076 (17th May 2019), Chaitra 23, 2075 (16th April 2019) respectively. Permanent households under RoW were demolished in this FY 2076/77 and consequently remaining Bhurigaun-Lamki (33.373km) and Kohalpur-Bhurigaun (55.004km) sections were charged on Kartik 7, 2076 (24th October 2019) and Asar 8, 2077 (22nd June 2020) respectively.

2. Kabeli Corridor 132 kV Transmission Line

Objective of this project was to evacuate power generated from Kabeli, Hewa, Mai and other river basin HEPs of eastern region. Construction of transmission line from Damak to Kabeli and associated substations has helped to cater the increasing electricity demand of Damak area, relieve Anarmani substation and improve quality of power supply situation in the eastern part of the country. Cost of the project was approximately US$ 31 Million and funded by WB, GoN, and NEA.

The first Damak-Godak section comprising of 35 km transmission line and associated substations at Damak and Godak was commissioned on 9th Ashoj, 2072 and has been used to evacuate power from Sanima Mai Khola (22 MW), Mai Cascade (8.0 MW) and more projects to INPS.

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

The third section comprising of 13.33 km of transmission line from Phidim to Amarpur (Kabeli) has been commissioned on 6th August 2019.

3. Tingla 132/33 kV Substation

This substation (132/33 kV, 30 MVA) being a part of Solu Corridor 132 kV transmission line project has been commissioned on Bhadra 07, 2076. The 132 kV transmission line from Mirchaiya to Tingla (90 km double circuit with ACSR Cardinal Conductor) is under construction and is expected to complete in few months. After completion of the transmission line, power from IPP's projects of Solu river basin connecting at Tingla substation will be evacuated to INPS at 132 kV voltage level.

After commissioning of this substation, presently contingency arrangement has been made to evacuate power from Upper Solu Hydropower Project (23 MW) via 33 kV sub transmission line since Falgun 20, 2076. This substation is also feeding power to Solukhumbu district via 33/11 kV, 8 MVA power transformer.

132/33/11 kV Tingla Substation

4. Purbi Chitwan 132 kV substation

At present, eastern part of Chitwan area is getting electrical power from Parsa (Chitwan) 33/11 kV substation which is connected to 132/33 kV Bharatpur substation via approximately 21 km 33 kV single circuit line. Because of long length of 33 kV line and increased power demand, voltage profile at distribution end is poor and line loss is higher. To provide adequate, quality and reliable power to eastern Chitwan area (Ratnanagar, Khairahani, Rapti and Kalika Municipality), 132/33/11kV substation at Hardi-6, Chitwan is proposed.

The scope of works under this project includes construction of 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. Cost of this project is estimated to be US$ 5.4 Million and funded by GoN.

The project is initiated on FY 2072/073 (2015/016) and this substation has been charged in the month of July 2020. However, construction of 33 kV double circuit sub transmission line has not yet been started because of the RoW problem.

Purbi Chitwan 132 kV substation

Comparison of Transmission Line Length in last Six Fiscal Years

S.N.	FY	Circuit km				Total	Total Increment (ckt. km)
		66 kV	132 kV	220 kV	400 kV		
1	2071/072	494	2130	-	-	2624	-
2	2072/073	494	2417	-	-	2911	287
3	2073/074	494	2596	75	78	3243	332
4	2074/075	514	2717	75	78	3384	141
5	2075/076	514	3142.5	255	78	3990	606
6	2076/077	514	3240	437	78	4269.7	279

Comparison of Substation Capacity in last Six Fiscal Years

S.N.	FY	Total Capacity (MVA)	Total Increment (MVA)
1	2071/072	2132	-
2	2072/073	2223	92
3	2073/074	2618	394
4	2074/075	3198	580
5	2075/076	3935	738
6	2076/077	4299.7	364.4

The details of existing, under construction, plan and proposed high voltage transmission lines and substations that are being executed by different Departments under this Directorate are presented in Annexure.

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 the projects being executed by this department 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 power quality, reliability and reduce line loss through completion of 132 kV ring main in Kathmandu Valley. The initial project cost estimate was US$ 23 million and project was jointly financed by loan assistance of ADB and OPEC, GoN and NEA. 6 km transmission line in Kathmandu district and 4 km transmission line in Bhaktapur district have been completed. Construction of remaining 18 km transmission line in Lalitpur district was stopped due to protest by local people demanding 100% RoW compensation or complete shift of transmission line and consequently previous contract was terminated. NEA is taking initiations and conduct dialogs with concerned people and authorities to complete the remaining works.

Further, to meet the increasing demand in that part of Kathmandu and Lalitpur district, NEA is planning to construct 132/11 kV substation at Chobhar in Dry Port Premises.

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 Kartik 2077 (October 2020).

The scope of project includes construction of 40 km double circuit Singati-Lamosangu 132 kV transmission line with ACSR Bear conductor, 132/33kV, 30 MVA substation at Singati and 132 kV bay extension works at Lamosangu substation.

As of July 2020, out of 125 tower, 118 foundations, 112 erection works and 34 km stringing works have been completed. Foundation works at 6 different locations in Dolakha district could not be started since many years because of obstructions from local people demanding shifting of tower. In the previous month, with the support from District

and Local administration, foundation works at few remaining locations have been started. The tower erection and conductor stringing works are in progress.

Conductor Stringing in one circuit in 132 kV Tower

3. Kusma-Lower Modi 132 kV Transmission Line

Objective of this project is to evacuate power from IPP projects and provide N-1 contingency to power the plants in Modi river basin. The project started in FY 2070/071 (2013/014) and expected to be completed in 2020/21. 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 works at Lower Modi.

Construction of transmission line is completed. However, testing and commissioning work is to be completed.

4. Hetauda-Birgunj 66 kV Transmission Line Upgradation

Presently Hetauda-Birgunj 66 kV double circuit transmission line with ACSR Wolf conductor is supplying power to small and medium scaled 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 by these industries and associated substations is increasing day by day. Because of low current carrying capacity of existing ACSR Wolf conductor, these industries are not getting abundant, quality, reliable and uninterrupted power supply. To address these problems, this project was initiated with the objective of replacing existing Wolf conductor with High Temperature Low Sag (HTLS) INVAR conductor in order to increase the power transmission capacity. Estimated project cost is US$ 3 Million and funded by GoN. Project started in FY 2072/073 (2015/016) and as per revised schedule its expected completion date is September 2020.

Project scope includes replacing of 20.20 km Wolf conductor with HTLS conductor and associated hardware from Simara tower no 276 to Birgunj substation via Parwanipur substation.

As of July 2020, detail survey of the existing 66 kV transmission line from Simara (tower no 276) to Birgunj substation (tower no 353) has been completed. It is estimated that 43 tower insertions are required to achieve minimum ground clearance at maximum operating temperature of HTLS conductor. Recently, foundation works for Insertion towers have been started and foundation at 4 locations have been completed. Stub and tower materials for 20 Insertion towers have already reached at site.

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 132/33 kV, 30 MVA and New Khimti substation. For 132 kV transmission line, Garjyang 30 MVA substation and bay extension in New Khimti substation, contract was signed in February 2017 and is scheduled to be completed in September 2020.

As of July 2020, 93 tower foundations and 47 tower erection out of 105 have been completed, transmission line materials (conductors, insulators, tower parts) have reached at site, civil construction works such as control building, transformer foundation, gantries foundation etc. have been completed at Garjyang substation. Power transformers have already reached at site.

Under construction Garjyang substation

In New Khimti substation, Upper Tamakoshi Hydropower Project has been installing 220/132kV, 100 MVA power transformer to evacuate power from IIP's of Likhu Corridor. However, its capacity is found insufficient to evacuate the power from IPPs of Likhu and Garjyang corridor, so NEA decided to install additional 220/132 kV, 200 MVA power transformer at New Khimiti. For this work, contract has been signed in March 2020 and Contractor has mobilized to site. The expected completion date is October 2021.

For whole the works mentioned above, the estimated cost is about US$ 20 Million and funded by GoN.

6. New Modi-Lekhnath 132 kV Transmission Line

Objective of this project is to improve power supply situation in Dhaulagiri zone and to evacuate power from hydropower projects in Modi river basin of Parbat and Seti-Mardi-Sardi river of Kaski District. Cost of the project is about 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 works will be completed on

132 kV Transmission Tower

November 2020 and transmission line works will be completed on March 2021.

Scope of project includes construction of 42.2 km 132 kV double circuit transmission line with ACSR Bear conductor which shall connect existing Modi HEP with Lekhnath substation via proposed New Modi & Lahachowk substations. It will also construct 132 kV Switching substation at Korunga (New Modi) and132/33kV, 30MVA substation at Lahachowk.

As of July 2020, regarding substation construction, land acquisition at Korunga

(Parbat) and Lahchowk (Kaski) is completed, 90% of control buildings construction works on both substation, switchyard foundation works on both have been completed, almost 95% of supplies of equipment (major items like CTs, PTs, LA, Circuit Breakers, Isolators, CRP SAS panels, Power Transformers, Distribution transformers, DC batteries etc.) has been delivered to site stores. Staff Quarter at Lahachowk has been completed whereas in New Modi, it is in final stage.

Lahachowk substation

New Modi substation

Regarding transmission line, check survey of 42.5 km line, land profiling and tower schedule have been completed. Other lot items like tree numeration, land parcel data, soil investigation etc. work has been almost completed. Also the cadastral land survey has been carried out and land compensation notice has been published for Parbat section, Kaski's Annapurna & Machapurchhe Gaunpalika. 42 nos of stub foundation out of total 138 towers works has been completed and stub foundation works are ongoing in 7 nos of location. 34 nos of towers have been erected and 2.716 km of line stringing 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 is initiated in FY 2067/068 (2010/11) and expected to be completed by December 2020.

Scope of this project includes 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 2020, all the works at 132/33/11 kV Tingla substation has been completed and substation is charged. 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 302 towers, 269 towers foundation work and 204 tower erection works have been completed and 44 km line has been completed.

Project has suffered severe delay in the construction works due to various reasons such as prolonged delay in approval of forest clearance, demand and strong protest for rerouting of transmission line at Maruwa, Katari municipality, RoW issues at various locations etc. Moreover, difficult terrains and extreme climatic conditions have also contributed in the delay of construction works.

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

distribution system and decrease the technical loss. It will also provide the electrical network for power evacuation of proposed hydroelectric projects in this region. The estimated cost of the project is around US$ 30 Million and funded by GoN. This project was initiated in FY 2065/066 (2008/09) and is expected to be completed by 2021/22.

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).

NEA has signed contract agreement for all the works and for all contracts, Contractor has mobilized to the site. As of July 2020, civil construction works of office building, control building, guard house and store building in Motipur & Sandhikharka substation has been completed. Construction works of Tamghas, Paudi-amarai, Burtibang substation have been started. Regarding Motipur-Sandhikharka 132 kV transmission line 59 tower foundation works out of 114 have been completed and for Sandhikharka-Tamghas-Paudi-amarai-Burtibang 132 kV transmission line, check survey has been completed, tree counting is about to start.

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 October 2020.

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 132/11 kV, 10 MVA substation at Kirtipur.

As of July 2020, all equipments of Kirtipur 132/11kV substation has been delivered at site and major civil works have been completed. The steel structures in substation switchyard has been erected whereas equipment installation work is in progress. Regarding Kirtipur-Udipur 132kV transmission line, 23 tower foundation out of 35 has been completed, conductor is delivered to site and tower parts, insulator, line hardware and OPGW have been dispatched from the factory and is expected to reach site in few days. The construction works at both substation and transmission sites have been affected by more than 3 months due to Covid-19 and local people obstructing workers to carry out works during lock down period.

Kirtipur 132 kV substation

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 as well as 33/11 kV Rani and Tankisinwari substations because of increasing power demand by domestic, commercial and Industrial consumers. 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 February 2021.

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 new Biratnagar 132/33kV, 2X63 MVA substation with two 33kV capacitor banks 30 MVAr for reactive power compensation.

For the substation works and 33 kV lines, contract was signed on November 22, 2017. As of July 2020, civil construction works of control building, office building, store, guard house are in final stage, power transformer foundation works are completed, and foundation of other major substation equipment have been started. Construction of 33 kV line has been delayed because of RoW problem in some of the places nearby road. NEA is taking initiatives to resolve the RoW issues.

For 132 kV transmission line, contract agreement has recently been signed in July 2020. Contractor is about to start the Check survey works.

11. Butwal-Lumbini 132 kV Transmission Line

The objective of this project is to enhance transmission capacity, improve power quality, reliability and reduce 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 October 2020.

The scope of project includes 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, 16 MVA power transformers.

As of July 2020, in substation all the civil construction works including staff quarter, control building, equipment foundation and erection of steel structures have been completed. All major substation equipment excluding Power Transformers have been delivered to site. Regarding transmission line, land acquisition process for tower pad has been completed, construction of 30 out of 57 tower foundation works have been completed, RoW compensation finalization is in progress. XLPE cable and terminating equipment for underground cable has been delivered at site and other equipments are in the process of manufacturing.

12. 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 December 2020.

As of July 2020, 124.5 km of stringing works has been completed. For bay extension, equipment foundation works at Chameliya and Attariya substation are completed and at Syaule substation, equipment foundation construction work is in progress. All major substation equipment for bay extension works has been delivered at site except the steel lattice structure.

Local residents nearby tower no. 13 to tower no. 17 of Darchula district have forced to stop conductor stringing work demanding insertion of additional towers. Further, local

residents nearby tower no. 194 to tower no. 212 at Dadeldhura district have created obstruction for conductor stringing demanding for compensation for household structures under RoW which was constructed after the completion of first circuit.

13. Bardghat - Sardi 132 kV Transmission Line

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 October 2020.

As of July 2020, 60 out of 67 tower foundation and 30 out of 67 tower erection works have been completed, land acquisition process for tower pad has been completed, RoW compensation work is in progress and major equipments including tower materials, conductor, Insulators and hardware & fittings have been delivered to site. OPGW is dispatched from the factory and is expected to reach site soon.

132 kV Tower Erection at Sardi

14. Kushaha- Kataiya 132 kV Second circuit Transmission Line

Considering high generation & surplus power in Nepal and high demand in India during wet season and reverse scenario of power generation/demand in dry season, Nepal and India government have agreed to construct cross border transmission line for import/export of power. Kushaha-Kataiya 132 kV second circuit transmission line project is proposed for further 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 2020, Contract agreement has been signed on September 2019. Civil and electrical design drawings and equipment drawings are under review and few of them have been approved. Transformer Foundation and switchyard construction work at Kushaha substation have been started and conductor stringing works are also under progress. The project is expected to be completed by May 2021.

15. Nawalpur 132/33 kV Substation

Objective of this project is to enhance the capacity of power supply system and to cater load of Sarlahi district. The estimated cost of the project is US$ 6.9 Million and funded by GoN. The project is initiated in FY 2074/75 (2017/18) and expected to be completed by January 2021.

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

As of July 2020, construction of boundary wall and store cum guard house have almost been completed. Construction of control building, switchyard foundation and staff quarter are in progress. Approval of design drawings of major electrical equipments have almost been done. Major equipments like Power Transformer, 132 kV Circuit Breaker, 132 kV and 33 kV Disconnecting Switches, 132 kV CVT are delivered at site. Communication equipment and equipment support structure and gantry structure shall be delivered to site very soon as they are in the custom. Other equipments such as 132 and 33 kV Instrument Transformers, CRP and SAS are ready for dispatch from manufacturer premises.

Nawalpur 132 kV SS

16. Sunwal 132 kV Substation

The objective of this project is to provide power supply to Palpa Cement Industry as well as to other existing industries in the Sunwal area and reinforce the 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 contract agreement has been signed on September 2019 and the project is expected to be completed by August 2021.

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

As of July 2020, layout design and single line diagram of substation, geo-investigation works have been approved and detail drawing designs of civil works has been partially approved and others are in approval process.

17. Balefi-Barhabise Corridor 132 kV Transmission Line

Objective of this project is to evacuate power from different IPP projects at Balefi Corridor. Project will construct Pangtang-Bahrabise 20 km 132 kV double circuit transmission line with ACSR Cardinal Conductor and 132/33 kV, 63 MVA substation at Pangtang and necessary bay extension works at Barhabise substation. Initial cost estimate of the project is US$ 7.5 Million and funded by GoN. The contract agreement has been signed on May 2020 and the project is expected to be completed by July 2022.

As of July 2020, the land acquisition for the Pantang (Balefi) substation has been accomplished. Construction of approach road, compound wall fencing and protection works has been completed at substation site.

18. Kohalpur-Surkhet-Dailekh 132 kV Transmission Line

Objective of this project is to meet the increasing power demand of Surkhet and Dailekh districts, improve quality and reliability of power supply and facilitate power evacuation from hydropower projects in Bheri, Babai and Karnali river basins of Karnali Province. Scope of project includes construction of 52 km Kohalpur-

Surkhet 132 kV double circuit transmission line with ACSR Bear conductor, 31 km Surkhet-Dailekh 132 kV double circuit transmission line with ACSR Bear conductor, 132 kV bay extension works at Kohalpur and 132/33 kV substation at Dailekh. Estimated project cost is US$ 23 Million and is funded by GoN.

As of July 2020, Contract agreement has been signed for Kohalpur-Surkhet 132 kV transmission line in the month of July 2020 and this section is expected to be completed within 24 months from the contract effective date. Contractor is about to start the Check survey works. Similarly, detail survey for second section i.e. Surkhet-Dailekh 132 kV transmission line has been completed. IEE for second section and Land acquisition for Dailekh substation are in process.

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

Objective of this project is to reinforce existing power supply system of Lalitpur and Kathmandu districts by upgrading the conductor of existing 66 kV transmission lines in Kathmandu Valley. It also helps to supply quality, reliable and uninterrupted power supply in Kathmandu Valley.The scope of project includes replacement of 20 km existing ACSR LGJ 120 sq. mm Chinese conductor and ACSR Wolf conductor from Bhaktapur to Suichatar substation via Baneshwor and Patan substations and 5 km existing ACSR Dog conductor between Chapali and Chabahil substations with High Temperature Low Sag (HTLS) conductor. Estimated cost of the project is US$ 2.5 Million and funded by GoN. This project is initiated on FY 2074/075 (2017/18) and expected to be completed by 2020/21.

As of July 2020, contract has been signed on May 2020 for replacement of conductor from Bhaktapur to Siuchatar within one year period. Detail survey works by the Contractor is being carried out. Similarly, bid evaluation is completed for conductor up-gradation works of Chapali- Chabahil and LOI has been issued.

Detail Survey of Patan Suichatar 66 kV Transmission Line, Houses constructed in RoW

20. Mainahiya - Sampatiya 132 kV Transmission Line

Objective of this project is to facilitate cross-border power trade between Nepal and India. The Joint Steering Committee (JSC) on Nepal - India cooperation in power sector held on 24th January 2019 at Pokhara has agreed to proceed for the implementation of 132 kV cross border transmission line which interconnects Mainahiya substation (Nepal) and Sampatiya substation (India). The cost estimate of the project in Nepal side is about USD 8 Million.

Scope of the project includes construction of 28 km double circuit transmission line with ACSR Bear conductor in Nepal side from 132/33/11 kV Mainahiya substation to Marchawar (Shree Rampur) border point at Rupandehi district, Nepal.

Contract has been signed on June 2020 and the expected completion date is 18 months from contract effective date. Contractor is about to start the survey and other works.

21. Lamahi Ghorahi 132 kV Substation Expansion

Objective of this project is to provide adequate power supply to east and mid region of Dang

Valley. With completion of this project, it will be possible to meet present and future load demand in this region within permissible voltage profile. Estimated cost of the project is US$ 2.8 Million. This project is initiated in FY 2076/77 (2019/20) and expected to be completed on September 2021.

Scope of the project comprises of construction of new 132/33 kV, 63 MVA substation with two numbers of capacitor banks of 12.5 MVAR and 20 MVAr at existing Ghorahi substation and Bay expansion works at Lamahi.

Contract agreement has been signed on June 2020. Design works have been initiated.

22. Dhalkebar- Loharpatti 132 kV Transmission Line

Objective of this project is to reinforce the power supply system, cater increasing power demand, enhance quality and reliability of power supply of Mahottari and Dhanusha districts. The project will construct 20 km long 132 kV double circuit transmission line with ACSR Cardinal Conductor from existing Dhalkebar substation to Loharpatti with 132/33 kV, 2*30 MVA and 132/11 kV, 22.5 MVA substation at Loharpatti. Cost of the project is estimated to be US$ 11.3 Million and is funded by GoN.

As of July 2020, IEE, land acquisition for Loharpatti substation and land for bay extension at Dhalkebar substation have been completed. Tender has been floated for construction of 132 kV transmission line from Dhalkebar to Loharpatti and Loharpatti 132/33/11 kV substation in a single package. Technical Evaluation of the bidder's proposal is in final stage.

23. Dadakhet Rahughat 132 kV Transmission Line

Objective of this project is to improve power supply situation in Dhaulagiri zone and evacuate power from hydropower plants of Myadgi river and Kaligandaki river basins of Myadgi district. Project will construct 25 km, 132 kV double circuit transmission line with Cardinal conductor and also 132/33 kV, 30 MVA substation at Dadakhet and 220/132 kV, 100 MVA substation at Rahughat (Rakhupiple) through LILO arrangement of 220 kV Kaligandaki corridor transmission line. Estimated cost of the project is US$ 28 Million. This project is initiated in FY 2073/74 (2016/17).

As of July 2020, land acquisition of Dadakhet and Rahughat (Rakhupiple) substation is completed. Construction of boundary walls, staff quarter & guard house at Dadakhet substation is in final stage. The land profile survey has been completed. Construction of Boundary Wall, Drainage, Road and Landscape Planning works at Rahughat substation has been awarded on Falgun 2076. Preparation of bidding document for transmission line and substation is in progress.

24. Keraun 132/33kV Substation

Keraun substation is located at Keraun, Kanepokhri rural municipality ward no-2 of Morang district. Objective of this project is to reduce overloading capacity of Duhabi 132/33kV substation, meet increasing power demand, reduce frequent tripping & outage and cater the 33 kV load of different 33 kV substation of Morang district.

The project scope of works include construction of LILO (Line In-Line Out) arrangement of existing Duhabi-Anarmani 132 kV transmission line and 132/33 kV, 2x63 MVA and 132/11kV, 22.5 MVA substation. It will also construct Keraun- Rangeli 15 km & Keraun-Birtachok 25 km 33 kV double circuit sub transmission line to existing 33/11 kV substation to supply the reliable power in that area. This projected is initiated in FY 2075/076 (2018/19).

The construction of civil part i.e. Boundary wall, Staff quarter and Guard house has been started. Preparation of bidding document for transmission line and substation is in progress.

Projects under Planned and Proposed

Ghorahi-Madichaur 132 kV Transmission Line

Sunwal (Bhumahi) – Hakui 132 kV Transmission Line

1. Raxaul Parwanipur 132 kV Second Circuit Transmission Line
2. Kaligandaki-Ridi 132 kV Transmission Line
3. Amarpur-Dhungesaghu 132 kV Transmission Line
4. Lalbandi-Salimpur 132 kV Transmission Line
5. Dhalkebar – Balganga 132 kV Transmission Line
6. Godak – New Anarmani Transmission Line
7. Kohalpur – Nepalgunj Transmission Line
8. Pathlaiya – Harniya Transmission Line
9. Sunkoshi 132 kV Substation
10. Bafikot-Khungri 132 kV Transmission Line
11. New Pokhara 132 kV Substation
12. Godak-Soyak 132 kV Transmission Line
13. Lahan - Sukhipur 132 kV Transmission Line
14. Rupani – Bode Barsain 132 kV Transmission Line
17. Chandrapur - Sukhdevchauk 132 kV Transmission Line
18. Dhaubadi 132 kV Transmission Line
19. Jhurjhure 132 kV Transmission Line

II. Major 220 kV Transmission Line Department

Projects under Construction

1. Khimti – Dhalkebar 220 kV Second Circuit Transmission Line

The Khimti-Dhalkebar 220 kV transmission line is instrumental for evacuating the power generated from the Upper Tamakoshi Hydropower Project. It also helps to evacuate power generated from IPPs of Likhu corridor. This line directly links the northern Tamakoshi region to southern load centre of Nepal. This line helps to enhance the transmission capacity, improve supply reliability, reduce loss and improve voltage profile in the national grid.

The project scope of works include construction of 75 km long double circuit transmission line with twin Bison conductor. The construction of all the double circuit towers along with the first line stringing had already completed and charged (initially at 132 kV) back on January 17, 2017. The project was jointly funded by World Bank, GoN, and NEA. The estimated cost was US$ 22 Million.

The stringing of second circuit was started in year 2013 with the estimated cost of 2.5 MUSD. As of now stringing of 68 km out of 75 km line has already been completed. The second circuit is expected to be completed and charged by September 2020.

2. Chilime-Trishuli 220 kV Transmission Line

The objective of this project is to facilitate evacuation of power generated from hydropower projects in Upper Trishuli Valley being constructed by Chilime Hydropower Company Limited notably Upper Sanjen, Sanjen and Rasuwagadhi and other Independent Power Producers (IPPs).

The scope of the project includes construction of 28 km long 220 kV double circuit transmission line from Chilime Hub to Trishuli Hub substation and construction of 220/132/33 kV, 370 MVA (7x53.3 MVA, 220/132 kV+ 1x50 MVA, 132/33 kV) substation at Thambuchet, Rasuwa .The line has two sections. One section (Chilime Hub substation to Mailung) is 20 km line of double circuit twin Bison ACSR conductor and the other section (Mailung to Trishuli 3B Hub) is 8 km line of four circuit twin Bison ACSR conductor.

Contract has been awarded to Pinggao Group Co.Ltd., China on December, 2017. Similarly, The power Grid corporation of India has been awarded the consultancy service contract for the project supervision. The project cost is estimated at US$ 39 Million and is jointly funded by Government of Nepal, Germany (KfW) & European Investment Bank (EIB).

Chillime Hub substation site, various construction activities are ongoing.

The site office has been established at Thambuchet, and Danda gau, Rasuwa for the close monitoring of construction activities. As of July 2020, the overall physical progress of the project is 65%. The various construction activities in Chilime Hub station like boundary wall and retaining wall, foundations of transformers and gantry structures control-room building and constructions of transit camp and staff quarters etc are ongoing. Most of General Arrangement Drawing, drawings of most of civil and electrical components of the substation have been finalized and have dispatched major equipment (Transformers, Communication equipment, 245 kV GIS).

Also, check survey, detail survey and soil investigation along with measurement of earth resistivity of transmission line are completed. Land acquisition process for tower pad was completed and almost all the respective land owners received the compensation. But few tower locations have to be shifted to new locations triggered by the landslide in some of the location and change in design according to the site conditions. The land acquisition process for shifted locations is ongoing. Tree-cutting of 9 community forest out of 14 is completed.

Proto-testing of DD, DB, MB & MD tower is successfully completed. Stubs for DB, DD, MB & MD tower have been manufactured and delivered at the site. The conductors have also been dispatched. .Construction of foundation of 11 tower locations out of 79 locations has been completed. Excavation works for tower foundation on 28 locations are ongoing.

The significant time consumed in the forest clearance as well as strong objection from the community forest user group have contributed the delay in the project progress. Besides, the extreme geological conditions and inaccessible tower locations have also made construction of transmission line even difficult and challenging. The covid-19 effect and subsequent travel and work restrictions from the government has further propelled the delay in progress. The expected completion date is December 2020.

3. Koshi Corridor 220 kV Transmission Line

The objective of this project is to evacuate power from various Hydro Power Projects in Arun and Tamor River basin especially in Sankhawasabha, Taplejung, Terhathum and Panchthar district. The project area covers the five districts viz. Taplejung, Sankhuwasabha, Terhathum, Dhankuta and Sunsari. The power will be pooled at under construction 400/220/132 kV Inaruwa substation.

The project is jointly financed by GoN and Government of India supported Line of Credit from Exim Bank of India. US$ 90 Million has been earmarked for the construction of the project out of basket of US$ 250 Million line of credit to the government of Nepal.

The scope of the project covers design, supply and construction of 141 km double circuit transmission line and five 220 kV Air Insulated Substations (AIS) at Tumlingtar (Sankhuwasabha district), Baneshwor (Sankhuwasabha district), Basantapur (Terhathum district), Dhungesangu (Taplejung district) and Inaruwa (Sunsari district). The whole project has been split into three packages viz, Package- KC1, Package-KC2, and Package- KC3 as described below.

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 106 km long 220 kV level double circuit transmission line from Inaruwa-Basantapur-Baneshwor-Tumlingtar. This 106 km long line can be further segmented into two sections: the 30 km long twin section from Tumlingtar to Basantapur via Baneshwor, and the 76 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.

Construction of Package-KC1 started simultaneously from three different sections and as of July 2020, 309 tower foundations and 277 tower erections out of 326 towers have been completed. Stringing of a 71 km stretch has also been completed. Similarly, other constructional activities including tower earthing, OPGW stringing and construction of revetment wall are also under progress.

The construction progress of this transmission line has been marred with many social issues in connection with compensation of land under Right of Way, dissatisfaction on the land rate acquired for the tower footing in certain area of Dhankuta district, compensation of untitled land and administrative hurdles/ issues in clearing the forest in the Right of Way etc. The issue of line diversion in the Vishnu Paduka area of Sunsari district that has been persisting for more than one year has now been partially cleared with the collaborated effort of NEA and the state government of Province No.1. The pace of the construction also suffered the major setback due to effect of Covid-19 and associated lockdown enforced by the government.

The expected completion date for this package is December 2020.

Ongoing Stringing work at Dhankuta Section

Stringing work under progress at Chitre, Dhankuta District.

Package-KC2, signed with M/s Larsen and Toubro Limited, India on October 2018, with the contract value of US$ 25.3 Million, covers the construction of AIS substations at Tumlingtar (220/132 kV, 7X33.33 MVA single phase Bank with one transformer as spare and 132/33kV, 2 X 25/30 MVA three phase), Baneshwor (220/33 kV, 2X25/30 MVA three phase) and Basantapur (220/132kV, 7X33.33 MVA single phase bank with one transformer as spare and 132/33kV, 1 X 25/30 MVA three phase) and 2 numbers of 220 kV bay extensions at Inaruwa substation.

Construction of all four substations is under progress. Manufacturing of the most of the electrical equipments including power transformers has been completed and majority of them have been transported to the site. The civil and electrical construction of Tumlingtar and Baneshwor substation is in advance phase of construction. The construction of the Basantapur substation is also in progress.

The Covid-19 and associated lockdown enforced by the government has significantly hindered the pace of the progress of construction. The miserable road conditions and under capacity bridges in the Piluwa and Sabhakhola river en-route to Baneshwor and Tumlingtar has posed the serious limitation to transport the heavy electrical equipments especially the power transformers during the monsoon season. The expected completion date for this package is December 2020.

Constructional activities at Tumlingtar Substation

Package-KC3, signed with M/s KEC International Limited, India, on June 2018 with the contract value of US$ 21 Million, covers the construction of 132/33 kV AIS substation (132/33 kV, 7x5 MVA single phase bank with one transformer as spare) at Dhungesangu, Taplejung and a 35 km long 220 kV double circuit transmission line

from Dhungesangu 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.

Under Package KC3, the land for tower footing as well as for the Dhungesangu substations has been acquired and construction activities have been started. 51 tower foundations and 13 tower erections out of 132 towers have been completed. Tower earthing and protection activities for foundations is progressing in parallel. Site development works and foundation activities for gantry towers and electrical equipments are in progress at Dhungesanghu substation.

The construction of this transmission line has also been affected due to tree cutting issues in various community forests of Terhathum and Sankhuwasabha district. The other issues that are causing hindrance in construction include mainly the unavailability of construction materials like sand and gravel, difficult mountainous terrain, extreme weather conditions and right of issues in certain patches of transmission line. The pace of the construction experiences the set-back due to shortage of labour due to effect of Covid-19 and associated lockdown enforced by the government. The expected completion date for this package is July 2021.

Foundation of Control Room Building under progress at Dhungesanghu Substation

Tower Erection under progress in Basantapur-Dhungesanghu section

4. Lekhnath-Damauli 220kV Transmission Line

Objective of this project is to augment power transfer capacity of the Integrated National Power System from the western region of Nepal with the construction of 220 kV, 45 km long double circuit transmission line with ACSR Moose 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 is funded by the Government of Nepal and Germany (KfW). The project is expected to be completed on June 2023.

As of July 2020, detailed survey, feasibility study, Initial Environmental Examination (IEE), baseline Survey for Avian species, procurement of the Project Implementation Consultant (PIC) and the Environment and Social (E&S) Consultant have been completed. Crop compensation for the effected land owners is being determined during the Land acquisition for Damauli substation.

Field Visit and consultation with the land owners of the Damauli substation

5. Trishuli 3B 220 kV HUB Substation

There are numerous projects currently being constructed and in advanced phase of construction in the Trishuli basin, namely: Upper Trishuli 3A, Upper Trishuli-1, Upper Trishuli 3B, Sanjen, Rasuwagadhi and other IPPs. The objective of this Trishuli 3B 220 kV Hub substation is to accumulate about 600 MW of power and evacuate those power via Trishuli-Matatirtha transmission line to INPS.

The scope of the project includes construction of 2x160 MVA 220/132 kV plus 1x50 MVA 132/33 kV substation at Manakamana VDC of Nuwakot district. The 220/132 kV transformer includes two Banks of 160 MVA Auto transformers formed with 7 numbers of 220/132 kV, 53.33MVA Single phase auto transformers and 132/33 kV transformer includes 50 MVA, 132/33 kV, 3 Phase Power Transformer. The 220 kV bays will be of Hybrid GIS type.

The project cost is estimated to be US$ 16 Million with the joint funding of Government of Nepal, 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 became effective from December 20, 2017.

Since this is a very urgent project to evacuate the power from various IPPs, the project is given a high priority. As of July 2020, the project has achieved overall physical progress of about 82%. The progress on design/drawing approval is about 95%, site leveling (95%) and rivulet protection (72%). Preliminary works like quarter building and boundary walls were completed in last 2 years. 7 (seven) numbers of foundation works with fire walls for, 53.33MVA, single phase auto transformers are almost completed. Major foundations of gantry structures are completed and foundations for equipment like CB, CVT, and Isolator etc. are under progress. Control room building, Switchyard Panel Room and Transit Camp are under progress. Terrace separation works for the switchyard of different voltages (220kV, 132kV and 33kV) are almost completed. Major supplies like power transformers and communication equipment have been dispatched and will reach the site very soon. Other equipment like HGIS, CB, Instrument Transformers etc. are under dispatch stages.

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

The major challenges included the site levelling work and Trishuli river protection works. It took significant time not only to finalize the design of the river protection but also in construction.

Due to COVID-19 Pandemic, project is impacted and is re-scheduled to be completed by October 2020.

Under-constructing Trishuli 3B Hub Substation

Projects under Planned and Proposed

1. Tumlingtar-Sitalpati 220 kV Transmission Line
2. Borang-Ratmate 220 kV Transmission Line
3. Trishuli 3B- Ratmate 220kV Transmission Line
4. Dharan 220/33 kV Substation

III. Major 400 kV Transmission Line Project

Projects under Construction

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

Objective of this project is to serve as a backbone transmission line system in the national grid of Nepal. The Dhalkebar 400 kV GIS substation will offer as a major hub by connecting not only the Muzaffarpur (India) substation via. Dhalkebar- Muzaffarpur 400 kV cross border transmission line but also connecting Hetauda and Inaruwa via Hetauda-Dhalkebar-Inaruwa 400kV transmission line. The Dhalkebar- Muzzaffarpur cross-border link will be instrumental for exporting/importing the electricity between Nepal and India.

The scope of this project includes the construction of 400/220 kV, one and half breaker scheme Gas Insulated Substations (GIS) at Hetauda, Dhalkebar and Inaruwa, the first of its kind in Nepal. This project was started in the fiscal year 2073/74. The estimated project cost is around US$ 60 Million and is funded by Government of Nepal and Nepal Electricity Authority.

The scope of Hetauda substation includes 400/220 kV, 4X167 MVA autotransformers, 400 kV, 50 MVAr Bus Shunt Reactor and 400 kV line bays for the termination of 400 kV double circuit lines from Dhalkebar and Ratmate.

The scope of Dhalkebar substation includes 400/220 kV, 3X315 MVA autotransformers, 400 kV, 80 MVAr Bus Shunt Reactor and 400 kV line bays for the termination of 400 kV double circuit lines from Hetauda, Inaruwa and Muzaffarpur (India).

Similarly, the scope of Inaruwa substation includes 400/220 kV, 3X315 MVA autotransformers, 400 kV, 50 MVAr Bus Shunt Reactor and 400 kV line bays for the termination of 400 kV double circuit lines from Dhalkebar.

All the 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.

NEA Engineering Company has been appointed construction supervision consultant for this project. The scope of the consultant also includes the vetting of the design and drawings submitted by the contractor.

For the construction of 400 kV GIS substation at Dhalkebar, Contract has been awarded to ABB India Limited on December 2017 with the construction period of two years. However project could not be completed on the scheduled time due to various reasons beyond the control of the project/NEA including but not limited to the effect of COVID-19 pandemic which has caused the delay in the installation and testing of GIS equipments owing to delay arrival of testing and commissioning engineer from China and India. As of now, all the equipments are installed and final testing and commissioning works of the substation are in progress. The project is likely to be commissioned in August 2020.

Similarly, for the construction of 400 kV GIS substation at Hetauda and Inaruwa, Contract has been awarded to Siemens Limited, India on December 2018 with the scheduled date of completion being on end of September 2020. As of now, the majority of engineering & design works has been completed. Majority of equipments including 400 kV GIS, 400/220 kV outdoor equipments, reactors, transformers for Hetauda substation etc. have been dispatched. Civil foundation works for transformers, reactors, towers, equipments structures and buildings works are in progress at both sites. These substations are likely to be completed and commissioned by the end of July 2021.

400 kV GIS Hall at Dhalkebar
400 kV Transformerl at Dhalkebar

2. Bheri Corridor 400 kV Transmission Line

Objective of this project is to evacuate power from Uttarganga as well as from other IPP's projects upcoming in the Sani Bheri river basin and its tributaries. The project started in the year 2015. This project was initiated by GoN funding.

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. The scope also includes the construction of one 400/132 kV, 200 MVA Uttarganga substation hub at Bafikot, Rukum (West).

As of July 2020, the land acquisition for the Uttarganga substation hub at Bafikot, Rukum (West) has been completed after long detainment of around 3 years due to numerous reasons. Tendering for Civil works at substation land has been completed recently. Detail field survey of Substation areas, line route, Initial environmental examination (IEE) works along with preparation of office estimate works is aimed to be started simultaneously by F/Y 2077/78.

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 is being funded by GoN.

Scope of the project includes 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 power exchange purpose between two countries.

As of July 2020, the detail survey works for this project is being carried out and final report Phase-I (Transmission line) and draft report Phase-II (Substation) have been prepared. The project has obtained permission from Department of National Parks and Wildlife Conservation, GoN to carry out feasibility study/ environmental study as the northern portion of the proposed route alignment passes through Lamtang National Park and also obtained permission from Ministry of Forest and Environment for the Environmental Impact Assessment (EIA) of the entire route alignment. EIA study is under progress.

Joint Technical Group (JTG) meeting between NEA and SGCC at NEA Head office

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 Hetauda, Bharatpur and Bardaghat is being executed. 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.

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 was started in the year 2012. The estimated project cost is around US$ 150 Million and is jointly funded by World Bank and GoN. 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.

The scope of the project includes followings:

- Design, supply and construction of approximately 288 km of Hetauda-Dhalkebar-Inaruwa 400 kV, double circuit Quad Moose ACSR conductor transmission line.
- Design, supply and construction of Hetauda substation: 220/132 kV, 2X160 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.
- Design, supply and construction of Dhalkebar substation: 220/132 kV, 2X160 MVA Transformers and its associated bays, and 220 kV line bays for the termination of 220 kV double circuit lines from Khimti.
- Design, supply and construction of Inaruwa substation: 220/132 kV, 2X160 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 (Koshi Corridor transmission line) 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.

As of July 2020, out of 792 tower pads, 609 foundations have been completed and 575 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.

220 kV Substation at Dhalkebar

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, power in the tune of 260 MW power is being imported during peak hours through Dhalkebar-Muzzaffaur 400 kV transmission line charged at 220 kV level.

In addition, the 220/132 kV Hetauda and Inaruwa substation balance works has been awarded to Consortium of Siemens Limited and Telmos Electronics on December 20, 2018. As of now, for Hetauda and Inaruwa Substations majority of the engineering design drawings has been approved. Equipments like control & relay panel, tower/beams/equipment structures etc. are under manufacturing stage. At Hetauda site, the site erection activities of gantry towers/beams/equipment structures, equipment and tower, equipment, water tank raft foundation works are in progress whereas, at Inaruwa, 220kV, 132kV & 33kV tower, water tank, firefighting building and control building foundations are in progress. The project is expected to be completed by the year 2021.

2. Hetauda – Bharatpur - Bardaghat 220kV Transmission Line

This World Bank funded project was 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 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

The scope of this project is to construct 74 km long, 220 kV double circuit transmission line with Twin Bison 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 was awarded to M/s Hengton-Optics Electric Company, China on August 6, 2018 with the contract value of US$ 5.5 Million.

As of July 2020, out of 246 tower pads, 222 tower foundations and 212 tower erections have been completed. 100% of the site is cleared and 70% of Project Affected Families (PAFs) are compensated for their loss of properties. The line is expected to be completed by December 2020.

2.2 Hetauda-Bharatpur 220 kV Transmission Line

The scope of this project is to construct 74 km long, 220 kV double circuit transmission line with twin Bison 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 but was terminated on 29th April, 2019 due to contractor's non performance. After the termination of contract, new contract for the balanced work was awarded to M/s KEC International Ltd., India on 5th June, 2020 with the contract value of US$ 5.4 Million plus NPR 368.8 Million.

As of July 2020, out of 226 tower pads, 173 tower foundations have been completed, 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 new contract for balanced work with KEC International Ltd. Covers all remaining activities of the project and is expected to be completed within 15 months from the effective date of the Contract.

The scope of project 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 July 2020, the overall progress of the construction of substation is about 94%. Almost all the equipment have been supplied and the installation works is about to complete.

Projects under Planned and Proposed

1. Arun-Inaruwa-Tingla-Mirchaiya 400 kV Transmission Line

As a part of project preparation studies, under the Power Sector Reforms and Sustainable Hydropower Development Project funded by the World Bank, NEA has undertaken the feasibility study and detail design of three transmission lines and concomitant substations namely (i) about 100 km long Inaruwa-New Anarmani 400 kV Transmission Line and substations (ii) about 130 km long Inaruwa-Arun 400 kV Transmission Line and associated Substations (iii) about 115 km Long Arun-Dudhkoshi-Tingla 400 kV Transmission Line and associated substations. The consultant has been selected for Feasibility studies and detail design for priority transmission lines and studies are underway. Whereas the consulting process for environmental and social studies has been initiated and is at RFP evaluation stage. The study is expected to be completed by April 2022. After the completion of the study, the construction of transmission line and associated substation will be taken up by arranging the necessary funding for the same.

IV. System Operation Department

The Load Dispatch Centre (LDC) centrally located at Siuchatar, Kathmandu under the System Operation Department (SOD), Transmission Directorate is the core center for operation, monitoring, and control of integrated Nepal power system (INPS) to ensure continuity and quality power supply to consumers. The SCADA (Supervisory Control and Data acquisition system) set up in LDC expedites collecting system data of power system elements like transmission lines, power transformers, generators, feeders, etc. of the interconnected system thus contributing considerably for monitoring and supervision of the system for competent system operation. The major highlights of this fiscal year are presented below.

1	Annual Peak Demand	1407.94 MW	2076-05-23
2	Annual Energy Demand	7894.47 GWh	
3	Annual Load Factor	64 %	
4	Total export	101 GWh	
5	The maximum Energy demand of the Day	28.84 GWh	2076-05-24
6	The maximum energy exported in a month	29.575 GWh	Ashwin, 2076

*based on LDC data

II. The key accomplishments of LDC in this Fiscal Year

Frequency and voltage control:

Frequency and voltage are the crucial parameters of the power system as it determines the quality of power supply to costumers. In this FY, most of time the system frequency is maintained at 50 Hz. The maximum frequency of 50.85Hz (instantaneous) and minimum frequency of 48.89(instantaneous) Hz are recorded in this year. In this fiscal year, the voltage achieved in most of the load centers' substations is in the range of permissible limit of +/- 10% limit at 132 and 66 kV as per NEA Grid Code. However, in mid-western region system voltage was recorded as low as 110 kV in Kohalpur 132 kV substation. Despite the effort of LDC to control the voltage, voltage could not be maintained at the desired level due to absence of adequate number of capacitor banks in the system.

Dispatching and scheduling:

Effective short term forecasting, daily energy scheduling of INPS, and proficient dispatching of IPPs generation have made it possible to optimize available generation and import of power from India. This has enabled LDC to comprehend the economic dispatch of power with keeping voltage and frequency of the system within a standard limit. This fiscal year generation of Kulekhani 1 and Kulekhani 2 storage plant has increased by 78.69% and 83.98 % respectively as compared to last year. Despite the Kulekhani water being best exploited in this fiscal year, the tactical planning of Kulekhani water level by LDC aided to maintain the respectable level of reservoir at present also. Similarly, the generation of other NEA ROR and PROR plants has also increased considerably due to the well-organized operation of the system.

Shutdown coordination:

In this FY some major shutdown of generating stations and transmission lines were completed on the coordination of LDC. Major power plant Kaligandaki-A, Marsyangdi, Middle Marsyangdi took shutdown for overhauling of their unit (machine) in the dry season. Likewise, different grid divisions also took a scheduled shutdown of major transmission lines for maintenance and emergency shutdown during a breakdown. Similarly, the approved shutdown schedule and emergency shutdown plan of IPPs were implemented successfully. The skillful handling of system by the operator during the shutdown period has made it possible to supply power with minimum interruption.

Drop-in partial system tripping:

The persistent monitoring of the system and the prompt decision of the operator during abnormal situations has helped significantly to control the partial tripping of the system. In this fiscal year the number of total partial system tripping has dropped down to 41 (total of 7:26 hours) as compared to 43 (total of 7:38) last year. This has contributed a positive impact on the financial shape of the NEA.

Maintenance of SCADA and communication facilities:

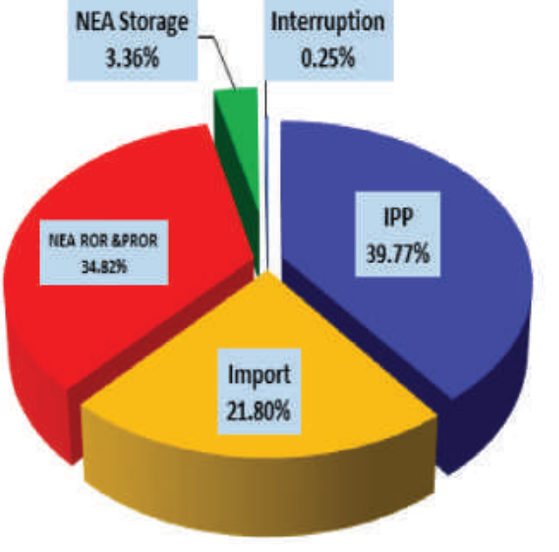
For the continued smooth functioning of the INPS, the data acquisition from the power stations and substations must be updated according to the latest changes/modifications in the respective stations. The trained manpower in the LDC has been able to keep the data up-to-date in the SCADA software in the LDC, through the regular maintenance works of three primary component of SCADA: RTU, Communication equipment and optical fibers, master stations. A significant amount of revenue is being received annually by leasing (to Nepal Telecom and other private companies) optical fiber cable.

Newly Installed Video projection system in LDC

Status of Supply and Demand:

In this fiscal year, generation of Upper Trisuli 3A (60 MW), KL III (14 MW) and a total of 131.6 MW from IPPs were added to the INPS which helped to fulfill the increasing demand of the system and also helped to minimize power import. The quantum of imported power has declined by 41.35 % as compared to last year whereas the generation of IPPs and NEA has been increased by 33.19 % and 18.54 % respectively. The quantum of exported energy has been increased by 135% as compared to the last year.

The contribution of different sources to meet the total energy demand of the INPS for the fiscal year 2076/77 is given below.



Total Energy Contribution
F.Y. 2019/20 (2076/77 BS)

III. Challenges

- The major challenge in the operation of the system during last FY was met after the enforcement of lockdown due to the outbreak of the corona pandemic. The demand crashed heavily thus to match demand with available supply was very challenging. The energy demand and peak demand recorded were very low compared to the pre lockdown period. Further to make a matter worse, unfavorable weather in between made the operation of the system demanding. In Baishakh 2077, the energy demand and peak demand decreased by 32% and 21% respectively as compared to last year the same month and by 5% and 15% as compared to the preceding month. The peak demand met on Baishakh 11, 2077 was 815.48 MW only which is lowest of this fiscal year.
- Because of an increment in the available generation, the existing ageing transmission structures are inadequate to transmit power to load centers. Depending on the system scenarios, the transmission line Hetauda-Bharatpur 132 kV, Damauli-Bharatpur 132kV, Bharatpur-Kawasoti-Bardghat 132 kV were being operated almost in full capacity continuously which might have instigated the power cut in some areas.
- In this fiscal year, the voltage drop problem was observed due to nonexistence of capacitor banks and reactors in INPS especially in far west and far east region.

IV. Future Plan

NEA is planning to synchronize the Indian system with INPS. The objective of this arrangement includes the installation of SPS (Special protection scheme), Communication and SCADA system within the Nepalese power system. LDC has been given responsibility to implement the project. For the same, the contractor had been already selected for the execution of works to install the SPS system at existing Dhalkebar, Chandranigahapur, Kamane, Bharatpur, Butwal, Hetauda, Bhaktapur and Lamahi substations. The strengthening of the protection system and the communication system of present INPS are also on the contractor's scope of the work. Synchronization of two grids will increase the reliability and security of the INPS system as well as creates an opportunity for power exchange between two countries through market transactions. The details of the System Load Curve (dry and wet peak), capacity balance, energy balance and energy export to India are presented in Annexure A. The load curve of the year and peak load curve of Baishakh 2077 which is the worst hit by lockdown are presented in Annexure A.

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 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.

The scope of rehabilitation of existing LDC at Siuchatar includes a complete new version of SCADA system 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.

Emergency Control Center (ECC) Building at Hetauda

All prerequisite hardware and software had been supplied and installed in the main LDC. The major components of the project which were installed in LDC include Video projection system, different kind of servers with software, PABX, and UPS. The Site Acceptance Test (SAT) and another testing of this hardware and software was completed. Most of the stations are now switched to new SCADA software SPECTRUM_7 with energy management system facilities which is now being used as the main tool for the operation of the system. The construction work of the emergency control center building which acts as a backup for main LDC had already been completed in premises of New Hetauda substation. The installation of supplied hardware and software had been completed except for a few minor things. Though all major activities have been completed, still fine-tuning of different software is going on to achieve the best.

The upgraded LDC at siuchatar, Kathmandu, was jointly inaugurated by Honorable Science and Technology minister Mr. Giriraj Mani Pokhrel and German parliamentary state minister Mr. Norbert Barthle on October 4th, 2019 in presence of a high level official from government and NEA as well as high level foreign delegates.

During inauguration of main LDC

This project was funded by grant assistance to the Nepal government by KfW, the German Bank, and a loan from Nepal Government. The cost of the project is Euro 1,972,239 (without Tax and Vat) and Nepalese portion NPR 237,595.3 (without Tax and VAT). The consultant cost for the tendering phase is Euro 129,170.06 and the supervision of the project is 532,178.50 (without Tax and Vat). The project was started on January 31, 2018 and completed on March 31, 2020.

IV. Grid Operation Department

Grid Operation Department (GOD) is the department within Transmission Directorate, responsible for transmitting reliable and quality power from distant generators to various load centers in reliable manner. The department also looks after connection facilities to IPPs and Bulk Consumers at different voltage levels by performing Connection Agreement as per NEA Grid Code. The major responsibility of this department is to oversee the operation of 66kV & higher voltage Substations and Transmission Lines along with preventive and breakdown maintenance works. The up-gradation, extension, replacement works, reactive compensation, rehabilitation works etc of substations are also done by this department. GOD is also looking after the operation and maintenance of Nepal portion of

400kV Dhalkebar - Muzzaffurpur Transmission line currently charged at 220 kV Voltage level, which is owned by Power Transmission Company of Nepal (PTCN). Three division offices in Kathmandu, Hetauda, Butwal and four branch offices in Duhabi, Pokhara, Attaria & Dhalkebar are directly supervised by GOD to carryout the resposibility of this department.

A. Major reinforcement/ upgradation works performed

This department has executed numbers of transformer reinforcement/upgrading works at various substations. Up-gradation, reactive power compensation and rehabilitation of power system equipments are being carried out to meet increasing power demand and reduce voltage drop problem. The replaced transformers are reused at other substations after necessary overhauling and maintenance works. Reallocations of such power transformers are cost effective and immediate solution for load management.

Various works executed by this department have supported to reduce power interruption due to inadequate substation capacity. The department has carried out and completed various up-gradation and reinforcement works in FY 2076/77 (2019/20) which are attached in Annexure.

B. Major reinforcement/upgradation works in progress

The major up-gradation & reinforcement works for various substations have been initiated and these works are under progress as attached in Annexure.

C. Grid Connection Agreement

The Department has successfully accomplished the Grid Connection Agreement with 25 IPPs (Independent Power Producers) for 667.84MW capacity to meet future load demand.

D. Major Maintenance works

The following major maintenance works have been completed in FY 2076/77.

a. Fabrication & Installation of Broken Cross-arm of Tower No. 51 of Hetauda-Pathlaiya 132 kV transmission line.

b. Construction of 4 nos. of Pile Foundation of 16 meter depth in Lohendra Khola bank for protection work of Tower no. 37 & 38 of 132 kV transmission line of Duhabi- Damak Section.

c. Total of 354 relays were tested at various substations.

d. Total of 126 energy meters (52 Meters from NEA and 74 Meters from IPP & others) were tested.

Tree Falling in Dhalkebar Pathalaiya 132 kV Section

Cross Arm Maintenance works

Repairing work of broken strands of conductor near Simara

Landslide near Tower no.31 in Kaligandaki Syangja 132 kV section

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%
7	2076/77	7,149,391.47	6,826,833.47	322558.00	4.51%

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 necessary for immediate replacement. The project was started in F/Y 2073/074 with the estimated cost of US$ 8.4 Million by GoN funding.

The main scope of the project includes replacement of 132 kV, 66 kV & 33 kV old circuit breakers with new one, installation of 33/11 kV, 16.6 MVA power transformer replacing existing 7.5 MVA at Yadukuwa substation, supply and delivery of spare power transformers, installation of 132/11 kV, 22.5 MVA new power transformer bay at Bhaktapur substation and installation of 220/132 kV, 2x315 MVA auto transformer at Dhalkebar substation.

Under this project total 18 nos. of 132 kV, 2 nos. of 66 kV and 11 nos. of 33 kV circuit breakers were procured out of which, 16 nos. of 132 kV, 1 no. of 66 kV and 11 nos. of 33 kV circuit breakers were replaced and remaining were kept as spare.

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

Total 6 nos. of spare power transformers (132/33 kV, 2x63 MVA; 132/11 kV, 2x30 MVA and 33/11 kV, 2x16.6 MVA) were procured, out of which, 1 no. of 132/33 kV, 63 MVA power transformer was installed at Kohalpur substation, 2 nos. of 132/11 kV, 30MVA were installed at Bharatpur substation and 1 no. of 33/11 kV, 16.6 MVA power transformer was installed at Anarmani substation and another 33/11 kV,16.6MVA was installed at Dhakdahi substation, 1 no. of 132/33 kV, 63 MVA power transformer is going to be installed at Kamane substation.

Similarly, the new 132/11 kV, 22.5 MVA transformer bay has been commissioned at Bhaktapur substation increasing the overall capacity of the substation from 45 MVA to 67.5 MVA.

Two nos. of 220/132 kV, 315 MVA auto transformer are to be installed at Dhalkebar substation. This will help in bulk power import / export to India. The necessary civil foundation works and construction of 220/132kV transformer bays are completed. The installation and commissioning of these transformers is expected to be completed by August 2020.

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 include planning, expansion, operation, maintenance & up-gradation 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 seven provincial & two divisional offices, headed by the provincial/division 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. Based on approved positions, approximately 74.38% of the total staff 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 (DC) spread all over the country.

Performance Highlights

In FY 2019/20, total number of consumers under DCSD reached 42,17,710 an increase of 7.88% over the last fiscal year's figure.

Consumer Category	No of consumer (% of total consumers)	Sales %	Revenue %
Domestic	93.24%	44.34%	35.27%
Non-Commercial	0.62%	2.97%	3.95%
Commercial	0.70%	7.59%	9.32%
Industrial	1.33%	35.83%	45.31%
Others	4.11%	9.27%	6.15%

Similarly, in FY 2019/20, a total of 6,420.762 GWh of energy was sold earning gross revenue of Rs. 74,309.877 Million. Industrial and Commercial consumer categories combined

together represent only 2.03% of the total number of consumers but shared 43.42% of total sales. Similarly, the domestic consumer category represents 93.24% of total consumers and contributed 44.34% 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 2019/20 to expand and improve the service delivery. These programs and activities are executed by the Departments at Central and Provincial/ Division 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 Equipment:

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 level.

Awareness program to school students organized by Taulihawa Distribution Center

NEA marks Chaitra 26 as "Electrical Safety Day" and organizes safety awareness programs in collaboration with Society of Electrical Engineers (SEEN) and other stake holders at the central, provincial/divisional and district level. Due to Covid 19 pandemic induced nationwide lockdown, DCSD could not organize safety day programs this year. However, a brief event on safety awareness was organized at the central level in collaboration with Women Network for Energy and Environment (WoNEE) on December 26, 2019 and an audio of safety awareness song was released by the NEA Managing Director.

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 2019/20, 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. provincial/divisional offices were assigned loss targets to achieve within the prescribed time frame. This was also linked with the performance evaluation 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 digital meters and replacement of unmatched current transformers to eliminate possible errors in multiplying factors.
- Various public awareness campaigns were organized in the central as well as provincial/divisional level through various media promoting extensive use of energy efficient appliances/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. 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.
- Addition of new feeders and transformers in loss prone areas were also carried out to curb line loss.
- Electromechanical meters of the consumers of capacity 25-50 kVA range continued to be replaced with electronic (TOD) meters.
- Existing electromechanical meters are being replaced by three phase smart meters. Similarly, new three phase connections for lesser load are being done through smart meters only.

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 10.28% in this Fiscal Year, decrease of 1.00% than previous year.

Similarly, global Covid 19 pandemic took its toll on overall operation of DCSD including loss & theft control activities also.

Demand Side Management

The electricity supply-demand gap in the country is still significant. For the sake of meaningful & efficient use of electricity, people are consistently advised to use efficient LED lights instead of conventional, energy-intensive incandescent, CFL lamps and other efficient appliances. DCSD undertook media campaign in this regard also.

Besides, the electricity supply scenario is expected to improve significantly once the Upper Tamakoshi and other NEA/Chilime subsidiary projects are brought into operation shortly. 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.

Oil Filtration for installation of 33/11 kV, 20/24 Power Transformer at Rani S/S, Biratnagar

Future Plans and Programs

NEA with cooperation from consumers brought down the load shedding crippling the nation for a decade to an end. Now, NEA has shifted its dedication to supply safe, reliable and quality electricity to its consumers. NEA's future programs are thus focused to meet peoples' aspirations through improved supply quality and customer care services.

- NEA is executing distribution system expansion plan to avail electricity for all within next 2 years and upgrade its networks so as to enhance per capita consumption to 700 units by F/Y 2022/23
- Out of 40 planned, NEA has fully electrified 16 districts: Sunsari and Dhankuta in Province No. 1; Bara, Parsa, Dhanusha, Mahottari and Siraha,in Province No. 2; Kathmandu, Lalitpur, Bhaktapur and Nuwakot in Bagmati Province; Parwat and Syangja in Gandaki Province; and Bardia, Gulmi and Kapilbastu in Province No. 5 this year despite Covid 19 pandemic.

Free Meter Distribution Program for under-privileged groups at local level

- 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.

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

- DCSD has implemented 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 centers and has plan to expand it.
- 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.
- NEA has been implementing online payment through internet based payment system for consumers. High value consumers are also planned to provide with such facility in coming year.

Queue management System using token at Surkhet Distribution Centre

- DCSD has started self-meter reading system for its consumers to cope with the meter reading challenges during Covid 19 lockdown.
- 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.
- 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 grid connected smart street light as a pilot project in Bharatpur and 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 equipment.
- Monitoring and evaluation of region wise monthly distribution system losses. Assist to identify and implement programs for loss reduction in distribution systems.
- Implementation of modern technology in the field of meter reading, billing and revenue collection.
- Execution of distribution planning, demand side management and loss reduction.
- Preparation and review construction standards and guidelines for electrical installations and construction activities up to Voltage level 33 kV.
- Testing and locating faults of underground cables of 11 kV & 33 kV feeders throughout the country with the help of cable testing equipment along with technical support.

175 collection centers out of 181 have computerized billing system. It is planned to extend the system to all centers in coming year. The Computerized Billing Division under PTSD has successfully implemented 'Any Branch Payment System' in all distribution centers in Kathmandu valley. This system will be extended to the whole country in coming years.

Arrear billing of Rs 19,91,18,869.12 from 187 consumers was done in this year as it was left out during initial billing by distribution centers.

Energy Monitoring and Metering Enhancements

Under this program, static meters installed in community consumers of different provincial/ divisional offices 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.

A. Computerized Billing and Networking Division

Computerized Billing and Network Division has always been striving towards enhancing the revenue collections of NEA. Our M-Power Billing System Software, being a very competent billing system, has provided NEA with several features and modules for monitoring the entire process and transparency of the revenue system.

M-Power has already been implemented in 175 revenue collection centers out of 181 revenue collection centers. This Division has targeted the data migration/implementation of M-power Billing System in all the remaining revenue collection centers of NEA within this Fiscal Year. Currently M-Power Billing System covers more than 99% of the total consumer count and also covers more than 99.5% of the total NEA revenue.

Handheld Meter Reading Device (HHD) is currently operating in more than 115 locations. HHD has helped in reducing human errors during meter reading and improving the energy sales. With the innovation in new technology, the division has implemented Online Meter Reading Handheld Device (SBM-Spot Billing Machine) with GPRS functions in 40 revenue collection centers. The meter reader directly uploads the meter reading data to the concerned branch server, collecting the data from the consumer premises which results in efficient meter reading.

Web Based Services has been provided to the consumer that helps to view the bills, where the consumers can have their query regarding bills through NEA website. The Consumer Management Information System (LAGAT) has been implemented in various revenue collection centers which will help to keep the consumer database up to date.

Online Payment Collection system was introduced from Bhadra, 2074 and has been successfully implemented in 170 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 for waiting 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) has been implemented inside Kathmandu valley, helping the consumers to pay their bill in any locations within Kathmandu valley with ease. It has facilitated 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.

Computerized Billing and Network Division along with IT department has enhanced existing DCS Activities to get a Real time Revenue Management Information which will help MIS for Data Analysis and evaluate NEA's financial health.

During lockdown, meter reading has been halted for Chaitra 2076, Baisakh 2077 and Jestha 2077 before introduction of online-self meter reading system. As per NEA Board

Decision, for domestic consumers, billing for Chaitra 2076 and Baisakh 2077 has been done based on billing of Falgun 2076. However, billing for Jestha 2077 has been done based on billing of the same month of previous year.

Furthermore, with the concept of automation, globalization and moving towards consumer's easiness, Online Self Meter Reading System has been introduced from Jestha, 2077 which has been successfully implemented in more than 100 revenue collection centers. This system has focused all the groups of consumers where the consumers can effortlessly enter their present meter reading, through online web application as well as mobile application. Online Self Meter Reading System has eased the consumers to read and enter their meter reading details.

B. Smart Metering Smart Grid Project

The scope of the project includes:

Phase 1: This phase includes implementation of Automatic Meter Reading (AMR) System with implementing Advanced Metering Infrastructure in TOD meters like EDMI, Bluestar, Actarius, Wasion, Risesun. For this purpose, 10,000 Intelligent GPRS/GSM Modem has been procured. Out of the procured modems, 8198 modems have been installed in consumer sites. This phase work had been completed. The information like 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: This phase includes implementation of Smart Three phase energy meter to replace three phase whole current electromechanical meter. The programming of these smart meters can be executed remotely and supply can be controlled remotely in case of due payment. Out of 60,000 Three Phase Smart Meter, 30,000 meters have been delivered to NEA. Out of 30,000, around 9,000 old electro- mechanical meters are replaced with the new Smart Meter and about 8,000 meters are installed in new connections. Out of 9,000 smart meters installed, 469 consumers' demand was found increased and 200 defaulter's lines were disconnected. About 50 lakhs amount was collected from those consumers within a month. The billing of consumer reading is integrated with M-power Billing System. The system is two way allowing AMI system to read and write as per requirement. The mode of communication between meter and system is GPRS.

Installation and configuration of AMR modem in TOD Meter

C. 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, 2021.

Installation of hardware for poles at Solukhumbu District

Preconstruction survey works have been completed and PCS report approved. Similarly, design & drawing approval of line materials completed. 5,000 steel tubular poles and accessories, 200 km of ACSR Conductor, 40 km of ABC cable & cable hardware, insulators & hardware have been delivered to the site store. Polling works are under way despite Covid 19 pandemic. The project is scheduled to be completed by January 24, 2021.

D. Reconstruction and Improvement of Electricity Distribution System (KfW funding)

The scope of this project is to improve the access to electricity in Nuwakot and Rasuwa 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 long term electrification measures as well as other social issues identified after earthquake.

The envisaged scope of the project consists of Social Development (civil work and supply of ambulance) and Electrical Components. The electrification measures will comprise the construction and reconstruction of several medium and low voltage distribution lines, construction of small substations, installation of distribution transformers and other related project measures.

The contract for Design, Supply and Installation of Electrification Component consisting of 33/11kV New Substations and associated 33kV, 11kV & 0.4kV Lines in Earthquake Affected Districts of Rasuwa and Nuwakot. Preliminary survey work for layout design in Dhunce, Kalikasthan and Ratamate is completed.

The contract for Construction of Social Infrastructure works such like as School, Community Building, Health post, Cultural Heritage, Vegetable Collection Centre and Supply and Delivery of 4WD Ambulance under Social Component is in final stage.

The project under Reconstruction and Improvement of Electricity in Earthquake Affected Districts of Rasuwa and Nuwakot is schedule to be completed by December 2022.

E. Rasuwa – Nuwakot Reconstruction & Distribution System Improvement Project (KfW funding)

The project includes the construction of the 220 kV Chilime-Trishuli Transmission System (Portion I) and a Neighborhood Electrification Component (NEC) (Portion II). The purpose of the Project is to expand and improve the grid infrastructure for 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 through the Trishuli- Chilime transmission line and upstream hydropower projects to new consumers in some specific locations in the vicinity of the transmission line.

The NEC, Portion II, is related to the neighborhood electrification in Salme, Bhalche and Kaule VDC and also in the vicinity of the transmission line benefitting local people. The project includes consulting services during project implementation for design, procurement and supervision. It also 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 completed. Construction of switchyard and equipment installation work is completed. Retaining wall and boundary wall construction work is already completed. Due to COVID-19, the construction work is hampered and expected to be completed by the end of December 2020.

Panoramic view of 33/11 kV, 6/8 MVA Bhalche Substation, Rasuwa

F. Reconstruction and Improvement of Electricity Distribution System (KfW funding)

The scope of this project is to improve the access to electricity in Nuwakot and Rasuwa 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 long term electrification measures as well as other social issues identified after earthquake.

The envisaged scope of the project consists of Social Development (civil work and supply of ambulance) and Electrical Components. The electrification measures will comprise the construction and reconstruction of several medium and low voltage distribution lines, construction of small substations, installation of distribution transformers and other related project measures.

11 kV outgoing feeder from Bhalche Substation to neighborhood areas

The contract for Design, Supply and Installation of Electrification Component consisting of 33/11kV New Substations and associated 33kV, 11kV & 0.4kV Lines in Earthquake Affected Districts of Rasuwa and Nuwakot. Preliminary survey work for layout design in Dhunce, Kalikasthan and Ratamate is completed.

The contract for Construction of Social Infrastructure works such like as School, Community Building, Health post, Cultural Heritage, Vegetable Collection Centre and Supply and Delivery of 4WD Ambulance under Social Component is in final stage.

The project under Reconstruction and Improvement of Electricity in Earthquake Affected Districts of Rasuwa and Nuwakot is schedule to be completed by December 2022.

G. Khokana - Nijgadh 33/11kV Substation Project

The project is funded by Government of Nepal and primarily aims to meet the electricity demand of Kathmandu - Nijgadh Fast Track Road. It also aims to meet growing demand of electricity in Thingan, Len Danda, Dhedhre Simpani areas of Makanwanpur District. The scope of this project includes the construction of 33kV Sub-Transmission Line and 33/11kV, 16.6 MVA Substation. Field survey work for 33KV Sub-Transmission Line is completed and final cost estimate is under progress. The land acquisition for substation area is under process. The Project is scheduled to be completed by F/Y 2021/22.

H. 33 kV Line Expansion and Rehabilitation Project

The project is funded by GoN and aims to meet the growing demand of electricity in various parts of country by rehabilitation / capacity upgradation / new construction of 33 kV lines. The scope of this project includes construction of Bhurigaun-Gulariya (Bardia) 72 km of 33 kV line and construction of Yadukuha-Dhanushadham 15 km of 33 kV line. The contract has been signed. Polling and stringing works are under progress.

I. Rasuwaghat-Khotang S/S and RE Project

The scope of this project includes the construction of 14 km of 33kV line, 33/11kV, 3 MVA capacity substation at Bagedhunga and 90 km of 11 kV & LV line in Khotang and Udaypur districts. Out of above, 10 km of 33kV line, 37.2 km of 11kV line, 33 km of LV line and 12 nos. of distribution transformers have been installed and commissioned. Store building has been constructed in Bagedhunga. 33kV Bay extension at Jaljale substation has been completed & is in operation. 3 MVA Bagedhunga (Khotang) Substation was completed and tested/commissioned on 2075/12/30 B.S. Capitalization of this project is under progress.

J. Madankudari-Makaibari-Singati 33 kV line Project

The project funded by Government of Nepal aims to meet the growing demand of electricity in Madankudari – Majhifeda area of Kavre District and its vicinity area. The scope of the project includes the construction of 33/11 kV, 6/8 MVA Substation at Majhifeda, Kavre district with interconnection facilities. Power generation from IPP will be connected to this substation and part of this power will be consumed locally and remaining power will be evacuated at Mude-Lamosanghu, Sindhupalchok district. The land acquisition process has been completed. Sixty percent works of 33 kV Substation and 33 kV Transmission line have been completed. The supply and installation/construction works are in progress. The Project is scheduled to be completed by FY 2020/21.

K. Transformer Testing Lab Construction Project

This project is funded by Government of Nepal. The scope of the project includes construction of Transformer Testing Lab at Biratnagar, Butwal and Nepalgunj. The facilities provided from this project will be beneficial to NEA branches as well as medium and large private consumers of the areas nearby. This will help to reduce loss by connecting quality and low loss type of transformer in NEA Power System. The construction works of transformer workshop building has been completed at all the three places and Transformer testing equipments have been installed in these labs, too. Regarding other Civil works boundary wall, road works, painting works and miscellaneous works are on progress. These labs will be come into operation sooner.

Transformer Testing Lab at Kohlapur, Banke

L. Matatirtha Naubise 33 kV Transmission Line Project

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 17 km 33 kV double circuit line. Construction of the transmission line & substation at Naubise is completed. Naubise substation is charged from Matatirtha Substation through Matatirtha - Naubise 33 kV double circuit transmission line.

M. 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 losses 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 and the substation is in operation, charged with Khanikhola hydropower feeder. Construction of 33 kV line from Matatirtha to Malta is in progress. Line construction work has been obstructed at different locations by locals. Number of trees in the Right of Way of 33 kV line has increased than those approved in IEE report, so the project is in process of preparing updated IEE report which is in final stage of approval. Almost 70% of the transmission line construction work is completed and remaining work is scheduled to be completed within FY 2077/78.

N. 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 to construct 33/11 kV, 6/8 MVA substation at Markhu with single circuit 15 km Transmission line from Matatirtha to Markhu. Construction of substation, with 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 completed. Testing and commissioning of Markhu substation is on process. Transmission line construction work is in progress. The project is expected to be completed in FY 2077/78.

O. 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 inter-connection facilities. The construction of 33 kV line from Lamosanghu to Chautara has been completed. Civil works for control building, guard house and wall construction have been completed. Substation equipments have been delivered to the site and installation and testing works is on progress. The project is scheduled to be completed by FY 2020/21.

P. Distribution System Rehabilitation Project

Capacity Upgradation & Rehabilitation of 33/11kV Sub-stations (Nepalgunj Old, Tulsipur, Shitalnagar/Butwal, Milanchowk/Myagdhi, Balardaha/Saptari, Dhankuta, Malangawa, Devight and Arghakhanchi has been completed last year. Rehabilitation of other 33 kV Line & 33/11 kV Substation with proper estimation and procurement across the country is under process.

Q. 33/11 KV Substation Rehabilitation Project

This project aims to improve the reliability of the distribution system by upgrading more than 36 Substations under different distribution centers across the country. This project is funded by Govt. of Nepal (GON) and NEA.

The main purpose of the Project is to rehabilitate substations and strengthen the distribution system by F/Y 2077/078 under 5 different Packages.

The scope and progress under this project for different packages is briefly described as follows.

- 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. All substations have been charged successfully and are running under Defect Liability Period.
- Package 2: Rehabilitation of 33/11 KV Substation in Pokharia, Harsa, Simrangaud with 33/11 kV Power Transformers of 20/24 MVA capacity. All substations have been charged successfully and are running under Defect Liability Period.
- Package 3: Rehabilitation of 33/11 KV Substation in Mukundapur, Kawasoti, Kalaiya with 33/11 kV Power Transformers of 20/24 MVA capacity. Power Transformers have been delivered to respective sites and supply of other electrical equipments is under process due to effect of lockdown, caused by COVID-19 virus.

Substation Upgradation at Mahendranagar DC, Kanchanpur

- 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. All substations have been charged successfully and are running under Defect Liability Period.

- 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. All substations have been charged successfully and are running under Defect Liability Period.

R. GIS Smart Grid Project

This project is funded by the Government of Nepal (GoN). NEA has planned to develop GIS (Geographical Information System) software to manage DCS asset inventories like substation, feeder, transformer, poles & meters along with its position on earth. It will help to identify the actual information about s/s, feeder, and poles, transformers, and consumers' capacity and also to balance the transformer's load as per connection to the consumer. It also helps to facilitate the consumer service faster & reliable against any fault in distribution system. Additional benefit of this smart distribution system will aid for outage management, no light management, optimal connection path for new consumer can be built. GIS based Data Survey work for certain 30 branches across the country will be conducted in F/Y 2077/78.

S. Grid Solar Energy and Energy Efficiency Project

The Government of Nepal (GoN) has received a credit from the World Bank (WB) towards the cost of Grid Solar Energy and Energy Efficiency Project (GSEEP) under IDA Credit No. 5566-NP (Project ID P146344) for an amount of USD 130 million under a counter financing of USD 8 million by the GoN. The financial agreement between GoN and the WB was concluded on February 20, 2015. The GSEEP Project comprises of following two components.

i. **Component 1: Grid–connected Solar PV Farms Development** with an estimated cost of 46 million USD which deals with the Design, Planning, Engineering, Procurement (Manufacturing/Supply) Construction/ Erection, Testing, Commissioning and Five Years of Operation & Maintenance of 25 MWp Utility Scale Grid Tied Solar Farms. Among seven different locations selected for solar plant installation 1.25 MWp has been connected to national grid and additional 15 MWp will be connected within September 2020. Initial Environmental Examination (IEE) is being carried out for other locations.

Solar Farm under construction at Devighat

ii. Component 2: Distribution System Planning and Loss Reduction with an estimated cost of 80 million USD dealing with the Rural Electrification in seven (7) packages along with Distribution Business Management and Implementation of Loss Reduction and Distribution System Rehabilitation. Under this component, following Projects are in process:

   a. Design, planning, engineering, procurement, installation, testing and commissioning of 8 New 33/11kV substations and 33kV lines in the development of the NEA grid. (Kapilbastu, Arghakhachi, Sindhuli, Ramechap & Gulmi.)

   b. Design, Supply, Installation/Erection, Testing and Commissioning of 11/0.4 kV Distribution System (Dolakha, Sindhuli & Ramechap).

c. Design, Supply, Installation/Erection, Testing and Commissioning of 11/0.4 kV Distribution System (Gulmi, Arghakachi & Kapilbastu).

d. Design, Supply, Installation/Erection, Testing and Commissioning of 11/0.4 kV Distribution System (Taplejung, Panchthar & Illam).

e. Preparation Of Distribution Loss Reduction Master Plan Along With Design, Supervision And Monitoring Of Loss Reduction Activities.

f. Design, Supply and Installation of Substations and 33kV Lines in Bharatpur, Dhading, Hetauda, Kavre, Lagankhel, Nuwakot, Palung, Ramechhap, Dolakha and Sindhupalchok districts.

g. Design, Supply and Installation/ Erection, Testing and Commissioning of of 11/0.4 kV Distribution System in Kavre, Dhading and Nuwakot districts.

h. Design, Supply and Installation/ Erection, Testing and Commissioning of Distribution System in Melamchi, Dolakha, Ramechhap, Rasuwa, Palung, Bharatpur and Sindhuli districts.

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 17 years, CREP has achieved major success making electricity access to more than 5,65,000 households of 53 districts through 516 nos. of different CREEs (300 CBOs and 216 Entities of Kailali Kanchanpur ***Gramin Bidhyut Chhata Sansthan and*** Rural Municipalities/ Municipalities).

CRED is facing some technical and administrative issues despite which the performance of CRED of FY 2019/20 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:

- Forty Nine (49) Rural Electrification projects, initiated in this year and previous years with a total of 260 km of HT line, 853 km of LT Line and 120 Distribution Transformer Installations have been completed and capitalized in this Review Period.
- The works related to replacement of 9,955 wooden poles by Steel tubular poles have been completed and capitalized in this Review Period.

- 33/11 kV Substations in the rural areas of Sindhuli, Panchthar, Taplejung and Lamjung along with 33 kV line extensions are being constructed.

The details of projects of CRED in different stages of execution from FY 2013/014 to FY 2019/020 are as follows.

- Total number of projects: 178
  - ✓ Electrification, System Improvement and Rehabilitation Projects : 169
  - ✓ 33/11 kV, 6/8 MVA Substation Projects with 33kV line Construction : 5 (Lamjung, Baglung, Sindhuli, Taplejung, Panchthar)
  - ✓ 33kV Line Construction: 1 (Palpa)
  - ✓ Building (Division Office) Construction Project: 1 (Pokhara)
  - ✓ Material Procurement Projects : 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.

Province No. 1 Provincial Office, Biratnagar

Operational Highlights

There are 24 Distribution Centers under Province No. 1 Provincial Office spread over 14 districts. The distribution loss is 11.19%. Sales contribution to NEA system of this office is 16.22%. The performance highlights of this provincial office during review period are as under.

Energy sales (MWH) – 1,041,635

Revenue (million) – Rs.10, 871.385

Numbers of consumers – 793,781

Project Highlights

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

- Letang Rajarani 33 kV Transmission Line & Sub-station Project
- Biratchowk (Keraun) – Letang 33 kV Transmission Line & Sub-station Project
- Harinagara 33 kV Transmission Line & 10/16 MVA Sub-station Project.
- Pakhribas (Hiley) Transmission Line & 6/8 MVA Sub-station Project
- Majhkharka (Udaypur) 33 kV Transmission Line & Sub-station Project
- Ohaldhunga-Koshbhanjyang 33 kV Transmission line & Sub-station Project
- Sanghutaar Ghurmi 33 kV Transmission line & Sub-station Project
- Chainpur Sitalpati (Tumlingtaar) Sankhuwasabha 33 kV Transmission line & 3 MVA Sub-station Project
- Tingla – Dudhkoshi 33 kV Transmission line & Sub-station Project

Photo: 33/11 kV, 6/8 MVA Substation at Taplejung

Province No. 2 Provincial Office, Janakpur

Operational Highlights

There are 23 Distribution Centers under Province No. 2 Provincial Office spread over 8 districts. The distribution loss is 15.60%. Sales contribution to NEA system from this office is 19.53%. The performance highlights of this provincial office during review period are as under.
Energy sales (MWH) – 1,254,188
Revenue (million) – Rs. 16,069.556
Numbers of consumers – 878,582

Project Highlights

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

- Okhaldhunga-Salleri 33 KV Transmission line Project
- Gadahia-Dumaria 33/11 kV S/S Construction Project.
- Haripurwa-Basantpur 33 kV Transmission Line & Sub-station Construction project.
- Bhagwanpur 33/11 kV S/S Construction project.
- Lohana Janakpur 33/11 kV S/S Construction project.
- HT/LT Line Construction at Singhdevi Raniban, Okhaldhunga Districts
- HT/LT Line Construction at Nirmalidada, Khotang District
- Nijgadh Kolhvi 33/11 kV S/S Construction project.

Performance Agreement between DC Chiefs with DCSD Deputy Managing Director in presence of Provincial Chief

Bagmati Provincial Office, Kathmandu Operational Highlights

There are 20 Distribution Centers under Bagmati Provincial Office spread over 10 districts. The distribution loss is 5.38%. Sales contribution to NEA system from this office is 25.70%. The performance highlights of this provincial office during review period are as under.

Energy sales (MWH) – 1,650,037

Revenue (million) – Rs 19,597.186

Numbers of consumers – 766,605

Project Highlights

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

- Khurkot Nepalthok (Rakathum) 33/11 KV Transmission Line and Substation Project
- Electrical Line Shifting for Road Expansion Project

Inauguration of Billing Counter at Dhunkharka by Bagmati Provisional Director

33/11 kV, 3 MVA Jhakale Substation at Achham

Bush Cutting activities under Kuleshor Distribution Center

Agreement between Panchkhal Mayor and DCS Chief regarding Wooden Pole replacement, discouraging electricity theft and helping DCS for revenue collection

Maintenance of burnt transformers at Transformer Workshop at Pokhara

Electricity Bill Payment by Karjanha Municipality against domestic consumer of its municipal residents for Chaitra 2076 and Baisakh 2077 at Mirchaiya DC

Replacement of non-standard and damaged wooden poles from 11 kV Line within Panchkhal DCS

Bagmati Division Office, Hetauda

Operational Highlights

There are 6 Distribution Centers under Bagmati Division Office spread over 3 districts. The distribution loss is 8.08%. Sales contribution to NEA system from this office is 7.21%. The performance highlights of this divisional office during review period are as under.

Energy sales (MWH) – 463,178

Revenue (million) – Rs. 5,339.214

Numbers of consumers – 262,601

Project Highlights

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

- Chanauli-Madi 33 KV underground Sub-Transmission Line Project
- Kamanae-Riddhi Siddhi Cement 33kV Sub-Transmission Line Project

Tower Erection for 33 kV Line from Kamane to Riddhi Siddhi Cement Industry

Gandaki Provincial Office, Pokhara

Operational Highlights

There are 13 Distribution Centers under Gandaki Provincial Office spread over 11 districts. The distribution loss is 8.72%. Sales contribution to NEA system from this office is 6.67%. The performance highlights of this provincial office during review period are as under.

Energy sales (MWH) – 428,554

Revenue (million) – Rs 4,391.188

Numbers of consumers – 380,579

Project Highlights

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

- Lekhnath-Sindhabesi 33 kV Transmission Line and Substation Projec
- Galkot 33 kV Transmission Line and Substation Project
- Damauli-Khairenitar 33 kV Transmission Line and Substation Project
- Damauli-Bhorletar 33 kV Transmission Line and Substation Project
- Righa-Kharbang 33 kV Transmission Line and Substation Project
- Syarkhu-Thanchowk-Manang 33 kV Transmission Line and Substation Project
- Gorkha-Siranchowk Chipleti 33 kV Transmission Line and Substation Project
- Gharap-Chhusang Mustang 33 kV Transmission Line and Substation Project

Tatopani Feeder maintenance work after Burnt Suska Cable at Pokhara DC

Province No. 5 Provincial Office, Butwal

Operational Highlights

There are 11 Distribution Centers under Province No. 5 Provincial Office spread over 6 districts. The distribution loss is 10.18%. Sales contribution to NEA system from this office is 14.49%. The performance highlights of this provincial office during review period are as under.

Energy sales (MWH) – 930,445
Revenue (million) – Rs 11,108.818
Numbers of consumers – 457,992

Project Highlights

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

- Jeetpur-Thada 33 kV Substation Project
- Gulmi Shantipur33 kV Transmission line and Substation Project.
- Jitpur Saljandi 33 kV Transmission line and Substation Project.
- Saljhandi – Majganwa (Marchawar) 33 kV Transmission line and Substation Project.
- Distribution Line Reinforcement at Arghakhachi
- Distribution Line Reinforcement at Palpa

Construction of Cable Trench for cabling works during substation construction

Province No. 5 Division Office, Nepalgunj

Operational Highlights

There are 10 Distribution Centers under Province No. 5 Division Office spread over 6 districts. The distribution loss is 12.17%. Sales contribution to NEA system from this office is 5.78%. The performance highlights of this divisional office during review period are as under.

Energy sales (MWH) – 370,897

Revenue (million) – Rs 4,354.862

Numbers of consumers – 325,451

Project Highlights

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

- Dang Bhalubang 33 kV Transmission Line Project:
- Kapurkot-Koilachaur 33 kV Transmission Line Project
- Pyuthan Substation Project
- Koholpur- Dhampur 33 KV Transmission Line Project
- Khawang 33 kV Transmission Line and Substation Project:
- Rajwada 33 kV Transmission Line and Substation Project:
- Rukumkot 33 kV Transmission Line and Substation Project

Inauguration Ceremony of 33/11 kV, 6/8 MVA Dhampur Substation, Banke

Karnali Provincial Office, Surkhet

Operational Highlights

There are 10 Distribution Centers under Karnali Provincial Office spread over 10 districts. The distribution loss is 15.66%. Sales contribution to NEA system from this office is 0.72%. The performance highlights of this provincial office during review period are as under.

Energy sales (MWH) – 46,525
Revenue (million) – Rs 480.555

Numbers of consumers – 94,662

Project Highlights

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

- Chhinchu-Rakam-Jajarkot 33 kV Transmission Line Project
- Sitalpati-Musikot 33 kV Transmission Line and Substation Project
- Dailekh Substation and Rural Electrification Project
- Surkhet Bijaura 33 kV Substation Project
- Ramghat Surkhet 33 kV Transmission Line Project
- Surkhet Gangate Matela Project 33 kV Transmission Line Project
- Dailekh Chilkha Jumla 33 kV Transmission Line and Substation Project
- Kudu - Chaukha Bajar - Jajarkot 33 kV Transmission Line and Substation Project
- Chaukha Bajar – Jajarkot - Dolpa 33 kV Transmission Line and Substation Project
- Nagma – Mugu (Gamgadi) 33 kV Transmission Line and Substation Project
- Dullu – Kalikot 33 kV Transmission Line and Substation Project
- Surkhet Chingad Electricity Extension Project
- Seri Dailekh Electricity Extension Project
- Kalikot Small Hydropower Rehab Project
- Heldung Small Hydropower Rehab Project

Sudurpaschim Provincial Office, Attariya

Operational Highlights

There are 12 Distribution Centers under Attariya Provincial Office spread over 9 districts. The distribution loss of ARO is 12.05%. Sales contribution to NEA system from this office is 3.66%. The performance highlights of this provincial office during review period are as under.

Energy sales (MWH) – 235,303
Revenue (million) – Rs. 2,097.112
Numbers of consumers – 257,457

Project Highlights

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

- Budar-Jogbuda, Bagarkot (Dadeldhura) 33 kV Transmission Line and Substation Project
- Khodpe (Baitadi)-Chainpur (Bajhang) 33 kV Transmission line and Substation Project
- Balanch (Gokuleshwor) - Khalnga (Darchula) 33 kV Transmission Line and Substation Project
- Sanfebagar-Chamara-Chautara 33 kV Transmission Line and Substation Project
- Sanfe-Manma-Jumla 33 kV Transmission Line & Substation Project
- Attariya-Punarbas 33 kV Transmission Line and Substation Project
- Sanfebagar - Achham – Martadi 33 kV Transmission Line & Substation Project
- Sakayal (Dadeldhura) 33 kV Transmission Line & Substation Project

33/11 kV, 3 MVA Substation at Thaligaadh, Darchula

No. of Consumers for F/Y 2076/077

S.No.	Category	Province 1 PO	Province 2 PO	Bagmati PO	Bagmati DO	Gandaki PO	Province 5 PO	Province 5 DO	Karnali PO	Sudurpaschim PO	Total
1	Domestic	719975	801495	736042	240374	363721	436716	301245	90915	242259	**3,932,742**
2	Non-Commercial	4537	3611	4332	1337	2858	3207	2403	1300	2426	**26,011**
3	Commercial	4812	3430	8459	1943	3278	3220	2099	645	1636	**29,522**
4	Industrial	9170	12904	10753	3913	5371	6404	3804	1089	2480	**55,888**
5	Water Supply	307	212	785	298	545	511	175	35	92	**2,960**
6	Irrigation	51301	54633	1615	13877	2779	5576	14666	494	7544	**152,485**
7	Street Light	1222	733	843	156	226	363	145	7	31	**3,726**
8	Temporary Supply	70	146	923	72	86	114	96	11	59	**1,577**
9	Transport	0	0	40	1	2	0	0	0	0	**43**
10	Temple	1441	798	835	425	910	1120	518	112	452	**6,611**
11	Community Sales	348	147	151	27	399	243	171	12	384	**1,882**
12	Non-Domestic	363	334	1639	106	300	409	79	10	20	**3,260**
13	Entertainment	51	24	24	13	28	13	11	1	5	**170**
14	Internal Consumption	184	115	164	59	76	95	39	31	69	**832**
15	Export to India	0	0	0	0	0	1	0	0	0	**1**
Total		793781	878582	766605	262601	380579	457992	325451	94662	257457	4217710

Sales Unit (MWh) for F/Y 2076/077											
S.No.	**Category**	**Province 1 PO**	**Province 2 PO**	**Bagmati PO**	**Bagmati DO**	**Gandaki PO**	**Province 5 PO**	**Province 5 DO**	**Karnali PO**	**Sudurpaschim PO**	**Total**
1	Domestic	429818	431805	925593	181391	235035	318223	166867	31506	126915	**2,847,154**
2	Non-Commercial	23488	15796	91583	12637	14638	12223	8697	3426	7909	**190,397**
3	Commercial	53921	39719	230033	33733	49145	37272	21097	4671	17552	**487,144**
4	Industrial	444333	684321	225149	197432	68378	509946	136621	3960	30550	**2,300,690**
5	Water Supply	23821	7127	25940	12380	11968	15297	5707	785	3398	**106,422**
6	Irrigation	21957	23374	1558	11133	1885	5587	7237	403	3599	**76,732**
7	Street Light	10760	29851	24161	5700	2901	4907	2374	949	1916	**83,520**
8	Temporary Supply	92	278	2062	72	155	416	107	18	46	**3,247**
9	Transport	0	0	2484	532	26	0	0	0	0	**3,042**
10	Temple	1373	838	2208	450	740	1375	570	35	258	**7,848**
11	Community Sales	19485	15669	8425	2963	35832	10635	14653	613	42547	**150,822**
12	Non-Domestic	9509	4309	107652	4081	7360	11594	6442	26	266	**151,239**
13	Entertainment	2242	335	1334	465	244	118	242	26	115	**5,120**
14	Internal Consumption	835	765	1855	209	248	404	282	106	232	**4,937**
15	Bulk Supply	0	0	0	0	0	2448	0	0	0	**2,448**
	Total	1041635	1254188	1650037	463178	428554	930445	370897	46525	235303	6420762

REVENUE(NRs.in Thousands) for F/Y 2076/077

S.No.	Category	Province 1 PO	Province 2 PO	Bagmati PO	Bagmati DO	Gandaki PO	Province 5 PO	Province 5 DO	Karnali PO	Sudurpaschim PO	Total
1	Domestic	3849984	3696872	9734472	1665453	2212648	2922259	1550828	275656	1088662	**26,996,835**
2	Non-Commercial	332307	229627	1502251	184660	216081	179710	133236	51735	113562	**2,943,170**
3	Commercial	796839	590099	3413443	523057	728838	543606	313234	79583	268421	**7,257,120**
4	Industrial	5235120	10978397	2708468	2662452	771591	6946406	2055221	51917	337181	**31,746,753**
5	Water Supply	156255	57910	212217	91281	95687	123301	43138	6858	27790	**814,436**
6	Irrigation	99244	95552	7665	50950	8509	45766	33669	2358	16944	**360,658**
7	Street Light	93350	254911	231073	56680	28157	56099	20172	6560	19614	**766,616**
8	Temporary Supply	1795	5564	42046	2463	3006	6734	2256	364	930	**65,157**
9	Transport	0	0	18517	5819	351	0	0	0	0	**24,687**
10	Temple	8491	5078	14833	2785	4519	10885	3505	214	1560	**51,870**
11	Community Sales	99323	71797	41074	16448	170455	51381	74341	2874	211821	**739,514**
12	Non-Domestic	149350	69941	1625564	66150	142604	188769	114666	527	4415	**2,361,986**
13	Entertainment	38626	6255	23895	8318	5167	2472	6801	419	2627	**94,580**
14	Internal Consumption	10699	7555	21668	2698	3574	5324	3796	1489	3586	**60,389**
15	Bulk Supply	0	0	0	0	0	26106	0	0	0	**26,106**
	Total	10871385	16069556	19597186	5339214	4391188	11108818	4354862	480555	2097112	74309877

LOSS PERCENTAGE

S.No.	Category	Province 1 PO	Province 2 PO	Bagmati PO	Bagmati DO	Gandaki PO	Province 5 PO	Province 5 DO	Karnali PO	Sudurpaschim PO	Total
1	Received Energy, KWh	1203708115	1488484562	1741902552	505872357	500041313	1026536824	422508510	51253763	268439335	7,208,747,331
2	Sales Energy, KWh	1069067030	1256327335	1648170128	465010127	456445272	922019458	371098876	43229234	236104780	6,467,472,239
3	Loss Unit, KWh	134641085	232157227	93732425	40862230	43596041	104517366	51409634	8024529	32334555	741,275,092
	Loss percentage (2019/020)	11.19%	15.60%	5.38%	8.08%	8.72%	10.18%	12.17%	15.66%	12.05%	**10.28%**
4	Loss percentage (2018/019)	12.15%	23.36%	7.40%	8.39%	9.79%	12.39%	11.57%		14.39%	**11.28%**
5	Loss percentage (2017/018)	15.08%	31.30%	8.47%	13.37%	11.50%	15.55%	16.81%		17.72%	**14.82%**
*PO=Provincial Office, DO=Division Office											

Distribution System Data for F/Y 2076/077

S.No.	Provincial 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	Province 1 PO	32	429.05	1,006	7,760	20,806	6,217	606.10
2	Province 2 PO	24	364.10	784	6,654	19,240	6,546	638.17
3	Bagmati PO	17	139.20	515	8,697	29,876	8,660	844.26
4	Gandaki PO	20	146.50	545	4,393	12,082	4,307	419.89
5	Province 5 PO	28	403.65	1,632	6,652	21,838	6,174	601.90
6	Karnali PO	9	43.50	203	1,309	2,866	750	73.12
7	Sudurpaschim PO	21	175.50	625	3,258	13,657	2,883	281.06
	TOTAL	**151**	**1,701.50**	**5,310**	**38,723**	**120,365**	**35,537**	**3,464.50**

Electrification Status of Local Levels

Description	Status	Province 1 PO	Province 2 PO	Bagmati PO	Gandaki PO	Province 5 PO	Karnali PO	Sudurpaschim PO	Total
Metropolitan	Fully Electrified	1	1	3	1	0	0	0	**6**
	Partially Electrified	0	0	0	0	0	0	0	**0**
Sub-Metropolitan	Fully Electrified	2	3	1		4		1	**11**
	Partially Electrified	0	0	0	0	0	0	0	**0**
Municipalities	Fully Electrified	28	73	34	21	29	0	13	**198**
	Partially Electrified	18	0	7	5	3	21	13	**67**
	Non-Electrified	0	0	0	0	0	4	7	**11**
Rural Municipalities	Fully Electrified	22	59	44	32	46	0	6	**209**
	Partially Electrified	51	0	25	21	22	22	27	**168**
	Non-Electrified	15	0	5	5	5	32	21	**83**
No. of Distribution Centers		**24**	**23**	**26**	**13**	**21**	**10**	**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 Corporate Development Plan of NEA to achieve NEA vision of becoming "an efficient modern utility that provides clean, reliable, quality and affordable electricity of global standards while being responsible to Government imperatives and creating value for its shareholders."

The department carried out the network analysis study conducted by Joint Technical Team (JTT) of India and Nepal.

The department associated in the power grid interconnection study conducted by Joint Technical Group (JTG) of State Group Corporation of China (SGCC) and Nepal Electricity Authority (NEA).

In FY 2019/20, 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. Load Forecast Study 2020.
iii. Load flow Study of:
    a. Trishuli 3 B- Ratmate 220kV transmission line.
    b. Ratmate-Rasuwagadhi- Kerung 400kV transmission line.
iv. Power Evacuation Report and Load flow study of:
    a. Begnas Rupa Pumped Storage Hydropower Project (153 MW)
v. Reactive compensation analysis at 132kV Ghingni substation.
vi. System Fault Level calculation at:
    a. Hetauda 400kV substation.
    b. Inaruwa 400kV substation.
vii. Grid Impact Study of total 978.673 MW capacity of 26 hydropower projects to be developed by IPP'S.
viii. Contingency connection Grid Impact Study of total 82 MW capacity of 3 hydropower projects to be developed by IPP'S.
ix. Grid Impact Study of total 99.1 MVA capacities of 9 bulk load industries to be connected to the INPS.

List of GIS condUCTED PROJECTS OF HYDROPOWER PROJECTS IN FY 2019/20

S. No.	Project	Capacity (MW)
1	Chomrong Khola	4.89
2	Lower Tara Khola	3.5
3	Upper Piluwa Khola	7.7
4	Super Tamor	166
5	Kaligandaki Gorge	164
6	Jhyaku Khola	5.243
7	Kasuwa Khola	45
8	Upper Balephi	46
9	Khorunga Tangmaya	2
10	Upper Trishuli-1 Cascade	24.6
11	Lower Isuwa Cascade	37.7
12	Upper Sankhuwa Khola	40
13	Lower Mid Rawa	4
14	Dar Khola	6.5
15	Gandigad	1
16	Upper Pikhuwa	4.99
17	Super Bagmati	41.31

18	Dana Khola	34.8
19	Syalque Khola	4.8
20	Dudhkoshi-2 Jaleshower	70
21	Sani Bheri	46.72
22	Kaligandaki Upper	65
23	Upper Chirkhuwa	4.7
24	Lower Chirkhuwa	4.06
25	Bhim Khola	4.96
26	Lower Manang Marsyangdi	139.2
	Total	978.673

List of Contingency Connection GIS conducted projects in FY 2019/20

S.No	Project	Capacity (MW)
1	Nyadi HPP	30
2	Upper Dordi A	25
3	Dordi Khola	27
	Total	82

List of GIS conducted projects of Bulk Load Consumer in FY 2019/20

S.No	Load	Capacity (MVA)
1	Huaxin Cement	25
2	Jagadamba Wires	5
3	Sourya Cement	20
4	Goyal Spat	5
5	Ghorahi Cement	2.5
6	Samrat Cement	24
7	Pokhara International Airport	3.6
8	Maruti Cement	10
9	Swastik Rolling Mills	4
	Total	**99.1**

INFORMATION TECHNOLOGY DEPARTMENT

IT Department is responsible for providing the infrastructure for automation. It implements the governance for the use of network and operating systems, and it assists the operational units by providing them the functionality they need.

Especially in NEA, under Planning, Monitoring and Information Technology Directorate, IT Department plays a vital role 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 training to all NEA offices round the clock.

Information Technology Audit has been conducted (assessment of internal controls within its information system environment to assure validity, reliability and security of information and information systems) After the assessment of the audit, the department has upgraded the necessary Computer Hardware (Server) requirements, network security equipment's and software requirements.

Communication Backbone establishment (intranet connectivity) is being carried out throughout the nation. IT Department has started connecting all the NEA offices and has plans to connect all the offices within this Fiscal Year.

This Department is running the various software applications such as CAIS (Customized Account & Inventory System), Payroll, Pension, Asset Management, DCS-Activity's Information System, Consumption Analysis System, etc. Payroll information system has been upgraded in such a way that employee can view the salary and tax sheet.

NEA vacancy application process was introduced from an Online Recruitment System. Applicants could easily submit the forms online from any location within any convenient time.

Centralized E-attendance System has been introduced where all the attendance activities can be accessed centrally. Employee Self portal of the system will be introduced where the employee can view the attendance report.

IT department has introduced NEA mobile app where consumers can insert self-meter reading. Further, Customer Relation Management System will be introduced where Consumer can post a complain through mobile app and NEA portal. Other features will also be added for the ease of the consumer.

Personal Information System (PIS) and Darbandi Management System (DMS) will be upgraded from the old system. IT Department will centralize the Asset Management System and NEA Inventory System. NEA Video Conference System will be introduced where all the offices can be connected using NEA's Intranet/secure connection.

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 established, primarily to assist the NEA management in devising, plan for corporate development and monitoring of the same. Responsibility of appropriation of the received ceiling of annual budget from GON and mobilization of internal resources to ensure the realization of targets set forth is undoubtedly a complex job, wherein tradeoff between competing activities have to be assessed. The whole process involves repeated discussion on various level within NEA's set up.

Monitoring of status of to-be-implemented and ongoing plans, projects and activities on continuous basis and reporting is another vital responsibility of the department. In addition to need-based reporting, periodic reporting is also carried out on month, trimester and annual basis. These reports indicate the status of various activities with reference to pre-set targets such as generation in MW, transmission line length in circuit km, upgraded and new substation capacity in MVA, number of added new consumers, percentage loss reduction etc.

Development of suitable monitoring and evaluation directives, assisting National Planning Commission, Ministry of Energy, Water Resources and Irrigation and Ministry of Finance in functions related to NEA, entry of annual budget in the Line Ministry Budget Information System (LMBIS) software are additional works to be carried out by the department.

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. Development and periodic revision of Corporate Development Plan is an equally important responsibility of the department. The department also plays the coordinating role in the development of hydropower projects under different financing mode.

Following list incorporates the number of projects whose progress was evaluated on periodic basis under the reviewed year.

Feasibility study of storage and large/medium hydropower projects: 11
Hydropower projects under construction: 6
Rehabilitation and maintenance of hydropower

stations : 15
Transmission line projects: 89
Distribution system expansion and rural electrification projects: 97
Totaling to 218.

POWER TRADE DEPARTMENT

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

i. PPA processing and signing:
   It covers PPA processing activities up to and including its signing.
ii. PPA implementation and monitoring
   It includes PPA administration after its execution till commercial operation.
iii. Operational Administration and monitoring of PPAs
   It includes PPA administration after commercial operation.

The department has 3 Divisions to carry out these functions. Various reform measures have been introduced in the Fiscal Year under review so as to make the processing of the PPA applications systematic and transparent. The applications are put on a processing sequence based on pre-established criteria and published in its notice board. The different stages involved are document study and investigation, technical review, grid connection agreement followed by Grid Impact Study and PPA draft preparation and negotiation.

A total of 15 new projects developed by the Independent Power Producers (IPPs) with their combined capacity of 135.39 MW were commissioned in FY 2076/77. Projects that were commissioned are: Tallo Hewa Khola (22.1 MW), Lower Chhote Khola (0.997 MW), Upper Mardi (7 MW), Iwa Khola (9.9 MW), Upper Naugad Gad (8 MW), Kabeli B-1 (25 MW), Jeuligad (0.996 MW), Padam Khola (4.8 MW), Rudi Khola B (6.6 MW), Ghalemdi Khola (5 MW), Upper Khorunga (7.5 MW), Jhankre Khola (0.6 MW), Solu Khola (23.5 MW), Super Mai 'A' (9.6 MW), and Super Mai Cascade (3.8 MW). With these 15 projects, the total number of IPP-owned projects that are in operation has reached 98 with their combined installed capacity of 696.17 MW. Similarly, 131 projects of IPPs with their combined capacity of 3157.19 MW are under construction. Likewise, 112 projects of IPPs with their combined capacity of 2124.77 MW are in other stages of development. During FY 2076/77, 2 new PPAs were concluded for solar projects with their combined capacity of 9 MW. Similarly, 1 project, namely, Trishuli Galchi Hydropower Project (75 MW) was terminated in FY 2076/77.

With this, total number of PPAs concluded till the end of FY 2076/77 has reached 341 with their combined capacity of 5978.134 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:

- Formulate criteria for economic and financial analysis of NEA's projects.
- 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.
- Study on Financial Resource Requirement.

- Focal unit for tariff petition to be submitted to ERC.
- Financial/ Economic, commercial and market analysis of NEA.
- 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.
- 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 for retail tariff. It also contributes 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 department 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. In addition, Corporate Development Plan (CDP) and Financial Viability Action Plan (FVAP) are assumed to be the pillars for sustainable path of the NEA. EAD has been advising financial and market analysis for NEA. The department takes initiation and plays vital role by establishing coordination among various department while doing these activities.

Main activities conducted by the Department in the FY 2019/20

- **Review of electricity tariff -** EAD team successfully filed the tariff petition to ERC via authorization of NEA Board abiding by the regulation of ERC. It mainly constitute the sequence of activities including: i**) Data acquisition and Database preparation**, ii) **Defense of the filed tariff and relevance of proposed tariff**, iii) **Public hearing**- after submission of tariff petition to ERC and strong defense, it went for public hearing where queries have been answered., iv) **Analysis of data**- the impact of finalized tariff on financials and overall activities of NEA has been conducted and it is ongoing. v) **Facilitation in implementing new tariff 2020/21.**

Retail Tariff Module Development- It has been developed to outline the average tariff requirement for different customer categories. International Standard has been considered while modeling but the ground reality has also not been ignored. The cost of service for various consumer categories has been calculated and neutral tariff for each category has been prepared. It forms the basis for scientific allocation of cost into different categories. While operationalizing the module, various sheets has been interlinked namely Cost Data, Revenue Data, Costumer Data, Losses Data, Energy Allocation Factors, Demand Allocation factors, Customer allocation factors, Functionalize Asset Base, Functionalize Cost Data, Assets base Classification, Cost Classification, Cost allocated to Consumers, Revenue to Cost Comparisons, Combined Categories, Target Revenues, Marginal Cost of Supply, Energy Charges on Dry, Energy Charges on Wet, Fixed Charges, and Summary of Calculated Data Sheets **.** While developing module, care has been given to represent the actual scenario. However, there are some cases like hybrid assets and costs, demand allocation factors, and energy allocation factors, in which best estimate has been made on the basis of some assumptions.

- **Regulatory Compliance -** All the work of regulatory compliance for NEA has been reported.
- **Study of Consumption Pattern** – consumption behavior of various consumer categories has been studied, analyzed and used as base for projection of demand and growth pattern of various categories of consumers.
- **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. The department has taken the initiation to develop and finalize the CDP that visualize the unbundling of NEA via restructuring it.
- **NEA Financial Viability Action Plan (FVAP) Updated** - 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 2019. 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 focusses on the: i) Study of Cost of Service, ii) Study on financial Resource Requirement, & iii) Tariff Adjustment. It could be the basis for tariff requirement under different scenarios. It also estimates the Financial Viability Gap Funding (FVGF) as a grant of GoN, in case the tariff not able to meet the resource requirement of NEA, which could be the basis for the prosperous future of NEA and overall electricity sector in the nation. Special team for updating the module has been formed and it has prepared the draft report regarding this and it will be conducted as a regular job of the Department.
- **Financial analysis** - EAD has done economic and financial analysis for NEA. Various financial parameters have been considered and best analysis has been made in co-ordination and collaboration with various departments and related agencies.
- **Capacity Building –** EAD in collaboration of concerned agencies/ organizations has trained its staff internally and externally wherever necessary. It is expected that capacity building via skill enhancement programs will be an asset not only for the department but also for the entire institution as well. We are grateful to the organizations who assist us for training and skill enhancement program. The staffs were given opportunity to learn off-site and on-site scenario regarding power trade, energy exchange, tariff petition, and handling computerized activities among other.
- **Covid-19 impact analysis** – Unusual scenario has been created by corona virus in overall economy. NEA cannot be exception of this. Significant generation capacity has been added to the national grid in the year 2019/20. But the consumption pattern did not realize as expected. It forces us to re-estimate and modify the electricity demand. It-certainly – has adverse impact on the financials of NEA. The detailed study has been conducted and the department has crucial role in that matter. It is significant particularly to revise tariff via tariff petition to ERC.

ENGINEERING SERVICES DIRECTORATE

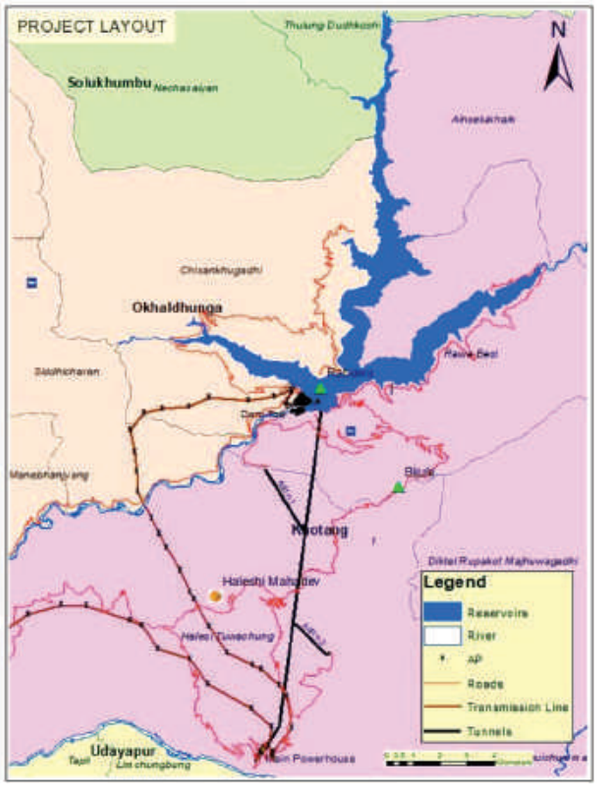
Engineering Services Directorate is entrusted with the responsibility to carry out engineering studies beginning from the identification to feasibility study, detailed engineering design, environmental studies, geological and geotechnical studies. It is headed by a Deputy Managing Director. The Directorate renders its services to NEA and private sector particularly for the study of hydropower and transmission line projects. The Project Development Department, Soil Rock and Concrete Laboratory, Environmental and Social Studies Department, Training Center and Electromechanical Division to provide technical services and support to various departments within NEA and to the private parties. The brief description of the Project studies and other activities being carried out under this directorate is outlined as follows:

Dudhkoshi Storage Hydroelectric Project (DKSHEP)

Dudhkoshi Storage Hydroelectric Project (DKSHEP) is a storage type hydropower project with total installed capacity of 635 MW capable of addressing prevailing power and energy deficit during dry season. The project is proposed to be built in the Dudhkoshi River originating from Solukhumbu district and bordering Khotang and Okhaldhunga districts in Province no. 1 of Nepal. The proposed dam is located close to the village called 'Rabuwa' on the left bank of the Dudhkoshi River, which is about 140 km (Aerial distance) east from Kathmandu, approximately 1.5 km northwest from Lamidanda airport at Khotang

At present, with the support from Asian Development Bank (ADB) under grant 0361-NEP: PPFE, NEA is conducting the updated feasibility study and detailed design of this project. A contract agreement was made between NEA and ELC Electroconsult S.p.A. (Italy) in association with NEWJEC Inc. (Japan) on 30 May, 2016 to perform related investigations, Feasibility Study, Environmental and Social Impact Study, Detailed Engineering Design and Preparation of Bidding Documents. The Consultant has submitted Updated Feasibility Study Report, Pre-qualification Document, Detailed Design Report, Environmental Impact Assessment Report for Hydropower Component and Bidding Documents for Civil Works and Hydro Steel Structures (HSS) & Access Roads contract, Plant contract and 400 KV Transmission Lines contract.

Project area of Dudhkoshi Storage Hydroelectric Project



General Layout of the Project

The Upgraded Feasibility Study prepared by the consultant envisages two alternatives. First alternative is with total installed capacity 835 MW comprising an underground powerhouse with installed capacity of 600 MW located near Sunkoshi River with a 13.3 km long headrace tunnel and an underground powerhouse with an installed capacity of 235 MW located in the right abutment immediately downstream of the dam site including a hydro unit of 35 MW to generate energy from the downstream release of the environmental flow. Second alternative is with total installed capacity 635 MW comprising a powerhouse with installed capacity of 600 MW located near Sunkoshi river with a 13.3 km long headrace tunnel and a surface powerhouse of capacity 35 MW located in the right abutment at dam toe to generate energy from the downstream release of the environmental flow.

For the first alternative, 835 MW, the study report shows that 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 the second alternative, Layout 635 MW, the study report shows that 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 alternatives, the debt-service indicators as well as the Project Financial Internal Rate of Return are higher than the reference figures for similar cases. Nevertheless, the second alternative, 635 MW is the best option from the economic and financial point of view and detailed design has been carried out for 635 MW by the consultant.

The Draft Detailed Design Report was submitted in June 2019 and an International Panel of Experts and ADB experts have reviewed the reports submitted by the Consultant and provided comments / suggestions on it. The Consultant has submitted the Final Detailed Design report in January 2020.

The project layout in the Detailed Design Report includes: 220 m high Concrete Face Rockfill Dam (CFRD) with a 630 m long crest at elevation 648m.a.s.l,, with Full Supply Level at 640 m.a.s.l. located on Dudhkoshi River in a gorge nearly one kilometer downstream of the confluence between Dudhkoshi River and

Thotne Khola (a tributary); an underground powerhouse with the installed capacity of 600 MW located near Sunkoshi river with a 13.3 km long headrace tunnel; a surface powerhouse with an installed capacity of 35 MW located in the right abutment immediately downstream of the dam site to generate energy from the downstream release of the environmental flow; a combined spillway (gated and labyrinth overflow) located in the left abutment. Even in case all radial gates are out of operation, an emergency spillway (fuse gates) at the left side of the main spillway approach canal has been proposed to ensure the safety of the dam. The total storage capacity of the reservoir is 1,581 Mm3 out of which the live storage capacity is 1,342 Mm3 and the dam body volume is about 26.7 million m^3.

The annual energy production is 3,443GWh per year, with an average energy production of 1,358 GWh in Dry season and 2,084GWh in Wet season. The power generated from the project is planned to be evacuated by double circuit 400 KV Transmission Line connecting to Dhalekbar. The Consultant has also conducted the survey for Transmission Line. The base cost of the Project at present day price levels is estimated to be 1531 MUSD.

An International Panel of Experts and ADB experts have reviewed the final submitted by the consultant reports and provided comments / suggestions on it. There were some gaps in the Reports and the Consultant has been requested to fulfill the gaps and address the provided comments/suggestions.

The Scoping and Terms of Reference (ToR) report for EIA has been approved by Ministry of Environment and Forests, Government of Nepal (GoN). The Consultant has also carried out public hearings to finalize the EIA report and submitted the final EIA report for approval to Department of Electricity Development (DoED) which is in the process of approval. The Terms of Reference (ToR) for IEE of Transmission Line has been submitted and Panel of Experts and ADB experts have provided comments/ suggestions and the Consultant is finalizing the document. In comparison to similar projects, Dudhkoshi Storage Hydroelectric Project can produce the more energy in terms of cost and installed capacity with minimal social impact (less than 200 severely displaced household) and is financially more viable.

Public Hearing of EIA Report at Rabuwa
Construction of track road for powerhouse site

Regarding Geotechnical Investigations, 1500 m of Core Drilling works and 750 m of Construction of Test Adit has been completed by separate contractor in close co-ordination and assistance from the Consultant. Inclined Core drilling is being carried out by Soil, Rock and Concrete Laboratory (SRCL), Nepal Electricity Authority. SRCL has completed Drilling at right bank and a total of 100 m out of 200 m of core drilling has been completed as of 5 July 2020. The Project is also carrying out suspended sediment sampling from suspension bridge over Dudhkoshi River at Rabuwa Bazar.

The project has also started the process for land acquisition. The identification of land (land parcel) for the Employer's camp facilities at Power house and Quarry Site at Majhi Gaun has been completed and identification of land for reservoir, other structure and Employer's camp facilities at dam site is ongoing.

The project has also started the construction of access road. The Memorandum of Understanding (MoU) was made between NEA and Halesi Tuwachung Municipality to open about 2 Km track road from Dhitung to Main Powerhouse. The road construction work has already started through consumer committee.

Honorable Minister for Energy, Water Resources and Irrigation Mr. Barshaman Pun visited the project site last January along with member of House of Representatives and Provincial Assembly of Khotang, Okhaldhunga, and Solukhumbhu and the Managing Director of Nepal Electricity Authority. Honorable Minister Mr. Barshaman Pun said that the ministry is planning to initiate the development process by declaring the storage scheme a priority project after a detailed final design is completed.

Honorable Minister for Energy, Water Resources and Irrigation Mr. Barshaman Pun and MD of NEA during the site visit of the project.

Government of Nepal has initiated communication with development partners to raise investment for the project. A meeting was held between the authorities of the Ministry of Finance, Ministry of Energy, Water Resources and Irrigation and Nepal Electricity Authority (NEA) with representatives of Asian Development Bank (ADB), European Investment Bank (EIB), Asian Infrastructure Investment Bank (AIIB) and Korean Exim Bank regarding the investment for the project and request has been sent to the above development partners to invest in the construction of this project.

As presently conceived, the project can be implemented and fully commissioned in 7 years period. The Detailed Design of Project including Tender Document preparation is expected to complete by end of 2020. However, the ongoing lockdown due to pandemic Corona may affect the finalization of the document as well as completion of other project activities including land acquisition within target date. The financial arrangement for the project is expected to complete by the mid of 2021. The land acquisition for the project is planned to be complete by the end of 2021 and the construction of the project is expected to commence from the start of 2022 and complete by the end of 2028.

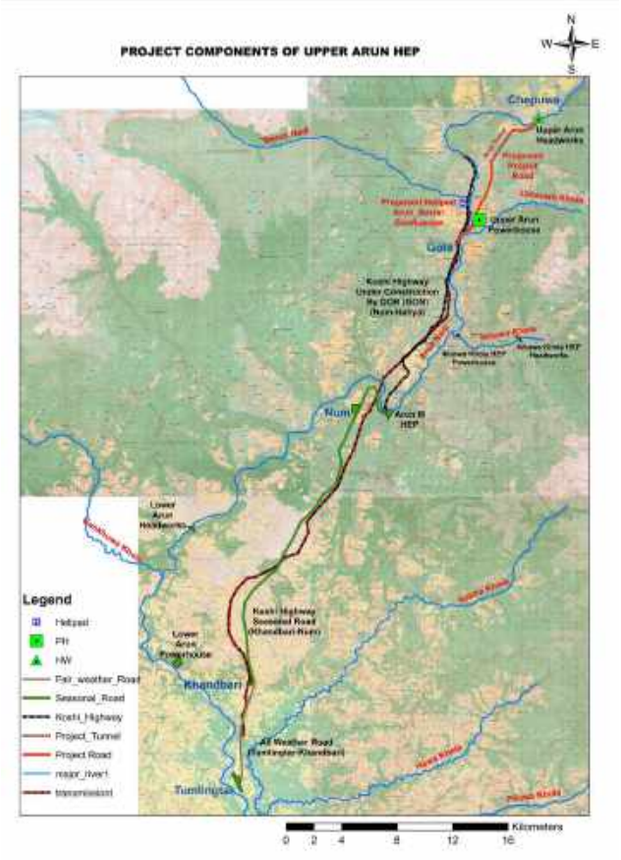
Upper Arun Hydroelectric Project (UAHEP)

The UAHEP, which lies on the upper reach of the Arun River, is one of the most attractive projects in the Province No. 1, Sankhuwasabha District of Nepal. It is located in about 700 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 stretch of Arun River in the project area is the boundary of the buffer zone of Makalu

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

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



Project Location

As preparation of the projects for implementation, the study of UAHEP & IKHPP (Ikhuwakhola Hydropower Project) (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. NEA Board decided to develop both projects under the Public Company for which Upper Arun Hydroelectric Limited (UAHEL) has been formed. The license for study of IKHPP and Upper Arun has already been granted to UAHEL.

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

- The Consultant [CSPDR (China)-Sinotech (Taiwan) JV] for Detailed Engineering Design and Preparation of Bidding Document of UAHEP and IKHPP has submitted the Updated Feasibility Study (UFS) Report on November 2019. The project was optimized for 1040 MW capacity with 6 hours peaking. The investigation works; hydrology, topographic survey and drilling bore hole for UFS have been completed while test adit excavation is ongoing and completed 852 m out of 1290 m. POE (Panel of Expert) has recommended additional investigation work for Detailed Design. The MOU (Memorandum of Understanding) is already undertaken and signed between Project and SRCL (Soil, Rock, Concrete Lab).
- For Environmental study of the Project, three consultants namely, Environment and *Social Studies Department (ESSD) of NEA*, *Environmental Resources Management (ERM, USA and NEFIN (Nepal Federation of Indigenous Nationalities)* are involved. ESSD is responsible for the IEE of Camp Facility, Fishery Baseline Study (FBS) and EIA of Access road. The IEE and FBS were completed while field work of EIA is on-going. ERM was assigned the ESIA, CIA and SPS work of Hydropower component. The Scoping document/ ToR of UAHEP had been submitted to MoF (Ministry of

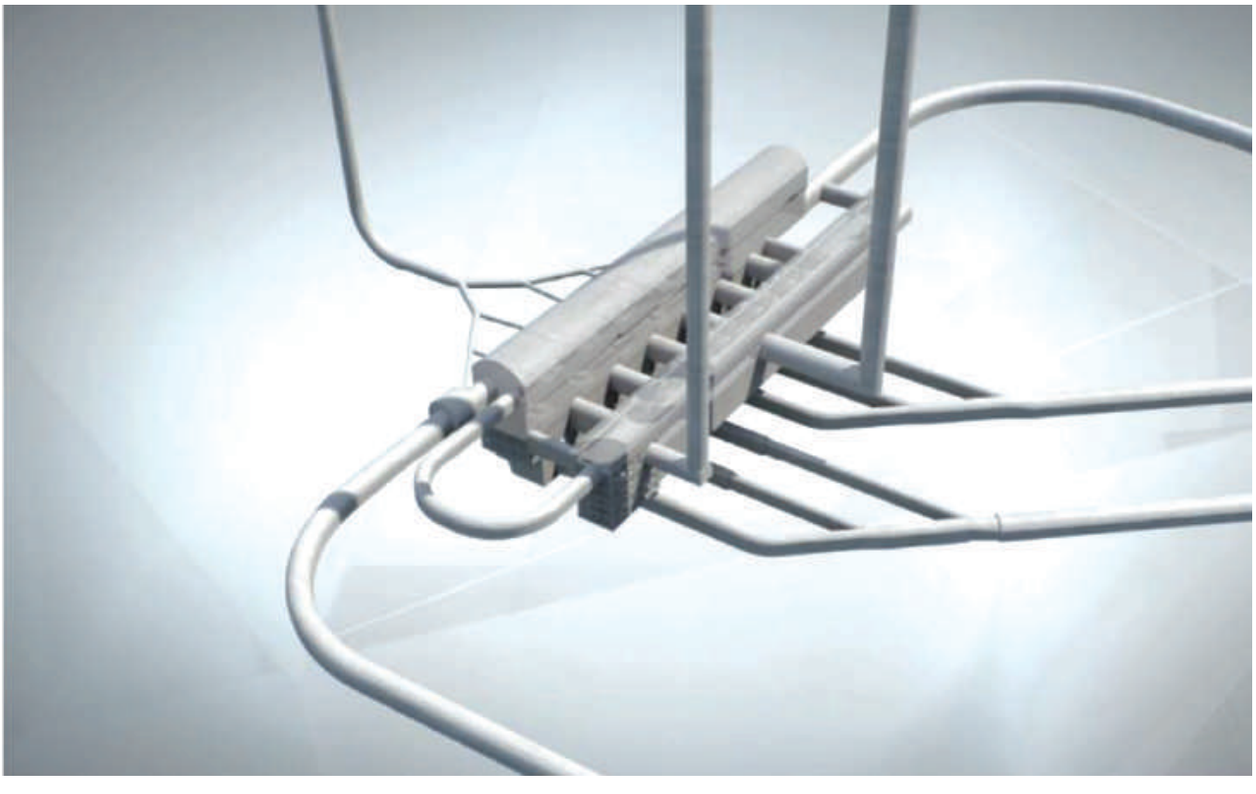
Forest) for approval while other parallel works, preparation of stakeholder engagement plan, draft RAP (Resettlement Action Plan) and physical & biological baseline plan have been completed. The contract period of ERM has been expired on Feb, 2020. The consultant has asked for time extension with revised schedule to complete the work by Dec 2020. A separate contract was signed to NEFIN on 13th Feb, 2020 for Free Prior Informed Consent (FPIC). NEFIN has submitted the Scoping Document and was finalized by ESPOE (Environmental and Social Panel of Expert) and WorldBank.

- The Consultant, JV KYONG DONG Engineering Co. Ltd., Korea & Nepal consult (P) Ltd. in association Total Management Services Pvt. Ltd. for assignment of "Detailed Engineering Design, Tender Document Preparation and Construction Supervision and Contract Management of Access Road Construction for UAHEP has submitted the Draft Design Report and Bidding Document. An additional geotechnical investigation for alternative analysis of road tunnel portal with SRT, drilling and MASW had been assigned to SRCL. The SRCL has provided the draft report on June 2020. The Consultant is now carrying out the alternative analysis and redesign (if required) the road tunnel portals as per the final geological investigation report submitted by the SRCL.
- The UAHEP is planned to start the construction work of project from September – 2023.

Test Adit at Proposed Headworks Site

Some 3D model snaps are below:

Proposed Headworks



Proposed Underground Powerhouse 3D Model

UPPER MODI HYDROELECTRIC PROJECT

Upper Modi Hydroelectric Project comprises two run of river projects, Upper Modi 'A' (42 MW) and Upper Modi (18.2 MW) respectively. This project is located approximately 250 km west of Kathmandu in Annapurna Rural Municipality of Kaski District in the Gandaki Province of Nepal.

The Upper Modi 'A' Hydroelectric Project consists mainly of a concrete weir and under sluice to be constructed on the Modi River. Headworks components will include a weir, power intake structure; gravel trap, desanding basins, and a Head pond. A low-pressure horizontal tunnel, surge shaft, vertical shafts and the powerhouse also lie in the right bank of Modi River. The total annual average energy generation for UMAHEP is estimated to be 209.87GWh out of which 27.14 GWh dry and 182.73GWh wet season energy. Similarly, the Upper Modi Hydroelectric Project is a cascade project of UMHEP and consists of interconnection structure, covered box culvert, low pressure tunnel, surge shaft, vertical and horizontal penstock and powerhouse structures. The average annual generation for UMHEP is estimated to be 94.46 GWh out of which the total dry season energy is estimated to be 10.76 GWh and the total wet season energy is 83.7 GWh. The inlet portal is located in the vicinity of Syauli Bazar. Powerhouse of UMHEP is located at Birethanti Village. A seasonal serviceable road to both headworks and powerhouse site is available from Pokhara Baglung Highway at Nayapul. The Gandaki Province has started the upgrading of access road of 10 km from Nayapul to Ghandruk.

The updated feasibility study reports have been completed. Final energy production from both projects has been revised after detailed investigation of hydrological and metrological study. Similarly, detailed topographical survey works, geological and geotechnical study of both projects have been completed. The construction of project is planned to be carried out under an EPC contract model. An international Consultant has submitted detailed engineering design reports, pre-bid document, bidding documents of civil, hydro-mechanical, electromechanical and transmission line works for both projects. The consultant's submittals are being reviewed by Project and shall be finalized at the earliest.

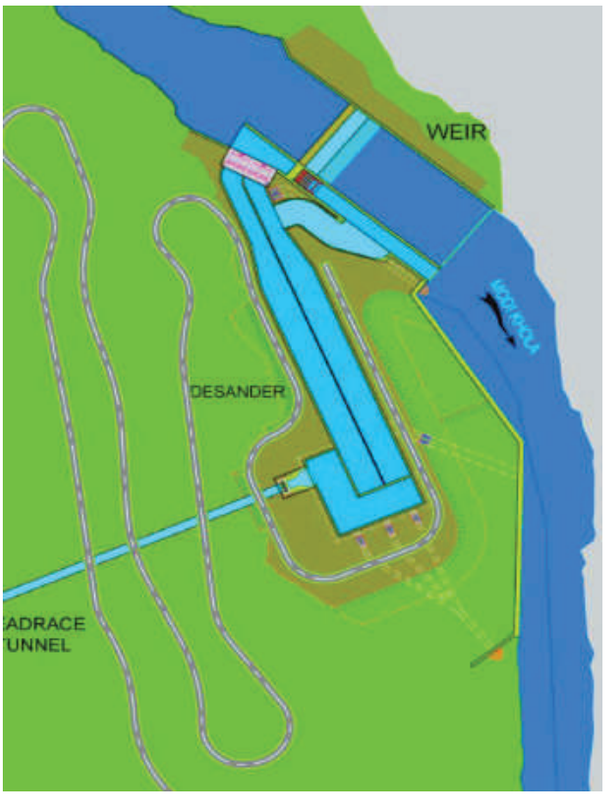
The selection of Owner's Engineer for the review of design and supervision of the project will be initiated from this fiscal year. Financial closure for the projects shall be finalized in this fiscal year and pre-qualification of contractor for construction of project works shall be performed.

About 168 Ropani private land acquisition for powerhouse area, camp area and access road area of UMHEP has already been completed. In this Fiscal Year 2076/77, acquisition of about 10 Ropani of private land has been accomplished in order to provide access to camp area. Furthermore, remaining 86 Ropani private lands required for construction of both projects have been verified from survey and land revenue office, Kaski is also in the final stage. Likewise, other land including government land, forest etc. will be preceded for the permission from government of Nepal for entitlement of Project Construction and operation phase

Tender for construction of pre-construction activities; camp facilities and access road to camp, has been published for prospective bidder and nine bidders have submitted their offer. Evaluation of technical bid of bidders is ongoing and expected to be completed within one Month. The bidding process is expected to be completed within next two months.

Both of these projects are proposed to be developed in company Model. For this purpose, NEA subsidiary Modi Jalabidhut Company has been registered as a public company. Board members and Managing Director has been appointed in this fiscal year. All project activities shall be carried out from Modi Jalvidyut Company from this fiscal year.

Proposed Camp Layout



Layout of Proposed Headwork of Upper Modi A

Andhikhola Storage Hydroelectric Project

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

The crest level of dam has been proposed at 710 masl so that Galyang Bazar on the highway will be protected. After the site visit by JICA/NEWJEC experts in November, 2017, an alternative dam site has been proposed for further study which is located at about 1.2 km upstream from the previously proposed dam site. The newly proposed rock fill dam will be 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, Surge shaft, 227.5 m high Drop shaft and 1.277 km long Pressure tunnel to the powerhouse. A semi surface powerhouse with three turbine-generator units and ancillary facilities has been proposed on the left bank of Kaligandaki River instead of the underground powerhouse proposed in earlier study.

Field investigation works including Geological drilling, Geological mapping, ERT survey, Topo Survey has been carried out. Sediment sampling & Discharge measurement work of the river is being carried out. The EIA study of this project is conducted by Environment and Social Studies Department, NEA. Scoping document and ToR has already been submitted to Department of Electricity Development,

MoE for approval. This project can generate about 674.45 GWh of total energy with 8.25 hour peak in dry season which is very much needed in the Power system. Estimated cost of the project is about US$ 559 Million.

Major Environmental impact comprises of acquisition of about 712 households and 9.4 MW Andhikhola run of river hydropower project owned by BPC. Based on the interaction made at Galyang Bazar with the local stakeholders in April 2018, the local people are positive for the implementation of this project

Due to easy access for construction, favorable location and moderate environmental impact, this storage project could be promising scheme for implementation in near term. Andhikhola Power Company Ltd. has been established as a subsidiary company of NEA to execute this project. In the fiscal year 2077/078 NEA Village and access road survey, design and tendering work will be carried out. Furthermore, Expression of Interest and Request for Proposal will be called from International Consultant for Detail engineering design and Tender document preparation of this project.

Proposed New Dam Site

Sediment sampling at Andhikhola River

Proposed Intake Location

Drill Hole Location at Powerhouse Site

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 a prime location along with other infrastructures.

Corporate Office Building at Durbarmarg

NEA planned to establish a corporate office, commercial multiplex at 26 ropanis lands at Durbarmarg, Kathmandu. A master plan was developed in 1989. But due to rapid change in building technology, evolution in the latest office design concept and changed scenario in commercial building requirements, NEA modified the existing master plan. NEA had 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 the earthquake of 2015 as "बस्ती विकास, सहरी योजना तथा भवन निर्माण सम्बन्धि आधारभूत निर्माण मापदण्ड, २०७२", demanding setback of one-fourth of the building height in all sides of the building, the above design could not meet the requirement of the new by-laws. But the Kathmandu Valley Development Authority (KVDA), one of the executive body under MoUD, had allowed a planning permit to execute the construction as per building by-laws "काठमाडौँ उपत्यका भित्रका नगरपालिका, नगरोन्मुख गा. वि. स. हरुमा गरिने निर्माण सम्बन्धि 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 महानगरपालिका भवन निर्माण मापदण्ड २०७५", demanding setback of 5 m in all sides of the building, conflicting with the by-laws of MoUD. MoUD is insisting to follow his by-laws for approval of the Initial Environmental Examination (IEE). Therefore, the difference in by-laws between MoUD and KMC, has created a delay in the construction of the corporate building. Currently, BPICP is revising the architectural drawing to meet the by-laws of MOUD by changing storey height and limiting the total height of the building to 30 m. With this arrangement, the setback required by the by-laws of the MOUD will be fulfilled. BPICP will commence the construction of the Corporate Building from F/Y 2077/078.

West Elevation of Proposed Corporate Office Building at Durbarmarga

The building consists of an approximately rectangular in shape of plinth area 807.38 m^2. It has eight-storey and double basement. The exterior finishing is of ACP (Aluminum Composite panel) and Windows are double glazed. The building is disabled friendly and consists of two lifts. The total floor area is 6274 sqm. The height of the building is 30 m.

New Office Building at Lainchaur

The existing office space in NEA head office complex at Durbarmarg is not adequate to accommodate all the central offices due to haphazard space planning and layout of existing old buildings. Nepal Electricity Authority has planned to construct the office building at Lainchaur to accommodate some of the directorate office and its departments.

NEA has 5-13-0-0 land area at Lainchaur. The land is located at prime location. BPICP had selected A. Not Architecture N Architects (P.) Ltd for detail design of New Office Building at Lainchaur. The Contract Agreement was done on 6th Jan 2020. The Consultant has proposed the eight storied building with one basement. The built-up area is approximately 5150 sqm.

Proposed office building at Lainchaur

Proposed Office Building at Bhagwanpau

Office Building for SRCL

Soil, Rock and Concrete Laboratory (SRCL) is located at Bhagwanpau, Swayambhu Kathmandu. It is scattered on about 6 Ropani 12.5 Aana of land. The land is located at the toe of Swoyambhu, a world heritage site. NEA has planned to construct an office building at Bhagwanpau to accommodate some of the directorate office and its departments.

BPICP had selected A. Not Architecture N Architects (P.) Ltd for detail design of Office Building for SRCL at Bhagwanpau. The Contract Agreement was done on 6th Jan 2020. As this site is located at the buffer zone of the monumental zone, the Consultant has proposed a five-storied slope roof styled building fulfilling the by-laws of Department of Archeology. The proposed built-up area is approximately 5341 sqm.

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 projects. 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 and detail design works of other projects. Brief descriptions of the projects being carried out from this department is outlined in following sections.

Chainpur Seti Hydroelectric Project (210MW)

Chainpur Seti Hydroelectric Project (CSHEP) is Peaking Run off River type Hydropower project being developed in Seti River that is located in Saipal, Talkot and Mastha Rural-Municipality in the Bajhang District of Sudurpaschim Province. The project features includes 40 m high concrete gravity dam with four number of radial gates, 3 nos of intake gate of width 8 m and 3.5 m high;3 nos of underground desanding basin of length 100 m each and width of 15 m;12492.20 m long headrace tunnel of 5.4 diameter;87.3 m high surge shaft with 14 m internal diameter ; 1575 m of 3.5 m diameter and 161.30 of 2 m diameter of steel lined pressure shaft; semi surface powerhouse with 3 units of pelton turbine each of rated capacity of 70 MW 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. The ongoing study shows that the project will have a nominal installed capacity of 210 MW generating annual energy about 1133.72 GWh with 6 hours daily peaking during dry period with dry peak energy generation of 200.56 GWh. The power generated from the project shall be connected to proposed 400/132 KV Bajhang Substation via 0.5 km long Transmission Line.

Powerhouse Area of Chainpur Seti Hydroelectric Project

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.

A review of feasibility study and Preparation of Engineering Procurement and Construction (EPC) tender document of the project is being carried out by Chilime Engineering Services Company Limited (ChesCo) and is at final stage. Design of access road to powerhouse and design of camp facility near powerhouse have been completed. The Scoping Document and Terms of Reference for the environmental impact assessment of the project have been approved by Ministry of Forest and Environment (MoFE) on 2076/11/30.

Begnas Rupa Pump Storage Hydroelectric Project (150MW)

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.

Begnas Rupa Pump Storage Hydroelectric Project Area

Prithivi Highway, which connects Kathmandu with Pokhara, runs near site and thus is the access to the Project. Lekhnath-Sundari Danda feeder road joins the Project Area with the Prithvi Highway.

During the fiscal year 2076/77, the environmental impact assessment studies of the project area have been initiated for which the Scoping Document and TOR document, prepared by the Environment and Social Studies Department of Nepal Electricity Authority, have been dispatched to the Ministry of Environment and Forest for its approval for the EIA. The sediment analysis studies on the both Begnas and Rupa Lake are carried out by the Innovative Engineering Services Pvt. Ltd.

The alignment survey of the 9.73 km long 220 KV transmission line is completed. The preliminary alignment for the access road to the project components have been identified during the reconnaissance survey. The Numerical Analysis of the Rockfill Dam and design of the spillway in the outlet of Rupa Lake is designed in coordination with the Rupa Lake Conservation Integrated Development Project (RLCIDP).

Most of the project major components are in the process of finalization and auxiliary components like camp facility, access road, muck disposal area, quarry sites, etc. are under process of designing. Still, some of the major components like surge tank and headrace tunnel needs the modification as per the review made by JICA Expert, Mr. Yukiyoshi Ozaki for NEA.

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 2076/77 following survey works have been accomplished by survey division of PDD.

Transmission line Works Carried out by Survey Division, F.Y. 2076/77

S. N.	Transmission Line Projects	Districts	Length(km)	Status
1	Amarpur-Dhangesagu 132 kV T/L Survey and Feasibility Study	Panchthar and Taplejung	20.00	Completed
2	Dhalkebar-Balganga 132 kV T/L Survey and Feasibility Study	Dhanusa		Completed
3	Kaligandaki-Ridi 132 kV T/L Survey and Feasibility Study	Palpa and Syanjga	26.00	Completed
4	Lalbandi Salimpur 132 kV T/L Survey and Feasibility Study	Siraha	20.00	Completed
5	Surkhet- Dailekh 132 kV T/L Survey and Feasibility Study	Surkhet and Dailekh	36.00	Completed
6	Dhalkebar-Bardibas 33 kV T/L Survey and Feasibility Study	Dhanusa and Mahottari	15.00	Completed
7	Khungri-Bhedakhet 132 kV T/L Survey and Tower Spotting	Rolpa and Rukum	75.00	Survey Running
8	Bhumahi-Hakui 132 kV T/L Survey and Feasibility Study	Nawalparasi	18.00	Draft Report Completed
9	Godak- Anarmani 132 kV T/L Survey and Feasibility Study	Ilam and Jhapa	35.00	Draft Report Completed
10	Inaruwa-Dharan 132 kV T/L Survey and Feasibility Study	Sunsari	30.00	Draft Report Completed
11	Kohalpur-Nepaljung 132 kV T/L Survey and Feasibility Study	Banke	20.00	Draft Report Completed
12	Hetauda-Parawanipur-Pathlaiya 132 kV TL Survey and Feasibility Study	Parsa and Bara	20.00	Completed.
13	Pathlaiya-Harnaiya 132 kV T/L Survey and Feasibility Study	Bara	27.00	Draft Report Completed.
14	Lahan-Sukhipur 132 kV T/L Survey and Feasibility Study	Siraha	18.00	Draft Report Completed
15	Rupani-Bordebarsnain 132 kV T/L Survey and Feasibility Study	Saptari	21.00	Draft Report Completed
16	Nijgadh-Pokhariya 400 kV T/L Survey and Feasibility Study	Bara and Parsa	75.00	Project running
17	Godak-Soyak 132 kV TL Survey and Feasibility Study	Ilam	8.00	Draft Report Completed

Topographical Survey Works Carried out by Survey Division, F.Y. 2076/77

S. N.	Projects	Districts	Status
1	Modi HEP(Topographical & Road Survey)	Kaski	Completed.
2	Begnas-Rupa Pumped Storage HEP	Kaski	Completed
3	Andhi Khola HEP (Topographical & ERT Survey)	Syangja	Completed

Other Activities

In addition to regular work consisting of carrying out studies at different levels for different projects, PDD has been carrying out various activities which have been instrumental in developing the institutional strength of Nepal Electricity Authority in the field of consulting services.

Study of New Hydroelectric Projects

Government of Nepal has allocated the budget for the study and identification of new hydropower projects in the FY 2076/77. The activities conducted for the study and identification of new hydropower projects in the FY 2076/77 are presented below:

- **Suligad ROR Hydroelectric Project (22 MW)**

"Suligad Hydroelectric Project" is studied as RoR project. This project is proposed on Suligad River at Dolpa District of Karnali Province. The study shows the installed capacity of 22 MW. The project features includes diversion weir / dam, sluice structure, intake structure, headrace tunnel, surge tank, spillway, penstock pipe, powerhouse and tailrace canal including approach road. A 7m height diversion weir is proposed to divert 11.10 m3/s of water through approx. 7.4Km headrace tunnel and canal to generate 128.40 GWh energy annually. The power generated will be connected to the nearest national grid.

- **Marsyangdi 3 Hydroelectric Project (36 MW)**

"Marsyangdi 3 Hydroelectric Project" is proposed as cascade development of the existing Middle Masyangdi Hydroelectric Project at Lamjung District of Gandaki Province. Being the cascade development, the project is peaking RoR type. The installed capacity of the project is 36 MW. Design Discharge of the project is 80.0 m^3/s and the energy generation of 218.90 GWh annually.

- **Chera 1 Storage Hydroelectric Project (135 MW)**

"Chera 1 Storage Hydroelectric Project" is proposed on Chera River at Jajarkot district of Karnali Province. Chera 1 Storage project has installed capacity of 135 MW. The project features includes Dam, headrace tunnel, steel lined pressure shaft, powerhouse and tailrace structures. A 170m height rock fill dam is proposed to divert 80.5 m3/s of water through approx. 4.25 Km headrace tunnel to generate 396.49GWhr energy annually. Net head is of 200m.

- **Dadagaun Khalanga Bheri Storage Hydroelectric Project (133 MW)**

"Dadagaun Khalanga Bheri Storage Hydroelectric Project" is proposed on Bheri River atRukum district of Karnali Province. This project has installed capacity of 133 MW. The project features includes Dam, headworks, headrace tunnel, powerhouse and tailrace structures. A 105 m height rock fill dam is proposed to divert 125.00 m3/s of water through approx. 3.5 Km headrace tunnel to generate 853.02 GWh energy annually. The detailed desk study report has been prepared and applied for the Survey license to Department of Electricity Department.

- **Kaligandaki 2 Storage Hydroelectric Project (310 MW)**

"Kaligandaki 2 Storage Hydroelectric Project" is proposed on Kaligandaki River at Nawalparasi East, Syanga and Tanahu districts of Gandaki Province and Palpa district of Province No 3. It has the installed capacity of 310 MW. Being the toe development project, the main components includes rock fill dam and powerhouse. A 120m height rock fill dam is proposed to divert 333.35 m3/s of water to generate 2012.48 GWh energy annually. The detailed desk study report has been prepared and applied for the Survey license to Department of Electricity Department.

- **Saptagandaki Storage HEP (146.27MW to 283.44 MW)**

"Saptagandaki Storage Hydroelectric Project" is proposed on Saptagandaki River at Tanahun, and Nawalpur district of Gandaki Province and Chitwan district of Bagmati Province. The bed level of the proposed dam site is at elevation about 178 m below the confluence of Kaligandaki and Narayani River. Various options have been studied at different FSL level viz. FSL 215, 220 and 230m. The maximum installed capacity of the Saptagandaki Storage project is 283.44 MW.

Environment and Social Studies Department

Realizing the need of addressing environmental and social issues associated with hydropower related development, Environment and Social Studies Department (ESSD) was established in 2000 under the Engineering Service Directorate of NEA. In due course of time, due to 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 2076/077, ESSD was actively engaged in environment and social studies, monitoring and protection of the environment. However, the performance of the department was affected by two factors; i) change in legal regime governing the study projects and ii) the global pandemic COVID-19. This year, ESSD witnessed the change in the legal regime, where the initial Environment Protection Act of 1997 (2053) and Environment Protection Rules of 1997 (2054) were replaced by Environment Protection Act, 2019 (2076) and Environment Protection Rules, 2020 (2077) respectively. Similarly, all the field study and field based activities were postponed due to the global pandemic of COVID-19 and the lockdown. Probably, ESSD was the first to be indirectly affected by COVID-19 in Nepal, as the office building of the department based in Kharipati, Bhaktapur was used by the Government of Nepal to establish the first quarantine. With this, the office of the department was shifted to the Head office of NEA for immediate functioning. However, due to limited space available in the head office premises, ESSD shifted its office to Lazimpat, Kathmandu.

Despite all these unfavorable circumstances in this fiscal year, the department has successfully completed and got clearance from concerned ministries for EIA of two TL Projects and IEE/ Updated IEE of five projects. In addition, Scoping document (SD) and Terms of Reference (ToR) for EIA of four projects and ToR for IEE of six TL projects were also approved by the concerned ministries. The following sections provides a brief of different tasks carried out by ESSD in the FY 2076/077.

1. Study Projects

a. Projects Requiring EIA

The whole process of EIA in Nepal is primarily guided by Environment Protection Act (EPA), 2076 and Environment Protection Rules (EPR), 2077. All the documents subject to EIA including the SD; ToR and main EIA document are subjected to approval by the Ministry of Forests and Environment (MoFE). In the fiscal year 2076/077, ESSD was involved in the EIA of following 10 projects, out of which EIA of two projects have been approved by the ministry and the EIA/S-EIA of four projects have been submitted for approval.

1. Kohalpur-Surkhet 132kV TLP: **EIA report approved by MoFE on Jan. 21, 2020**
2. Kaligandaki Corridor(New Butwal-Bardghat) 220kV TLP:**EIA report approved on March 5, 2020**
3. Upper Modi HEP (18.02MW): S-EIA report submitted to MoFE for approval
4. Uttarganga Storage HEP (828MW): EIA report submitted to DoED
5. Andhikhola Storage HEP (180MW): EIA report Submitted to DoED
6. Ghorahi-Madichaur 132kV TLP: **SD/ToR approved by MoFE**, EIA submitted to DoED
7. Access Road of Upper Arun HEP: **SD/ToR approved by MoFE**, Draft EIA submitted to Project
8. Chainpur Seti HEP (210MW): **SD/ToR approved by MoFE**
9. Rolwaling Khola HEP (22MW): SD/ToR submitted to MoFE for approval.
10. Begnas-Rupa Pump Storage HEP (150MW): **SD/ToR approved by MoFE**

Public hearing for EIA of Andhikhola Storage HEP at Galang, Syangja

Public hearing of Ghorahi Madichaur 132kV TLP at Ghorahi, Dang

b. Projects Requiring IEE

The documents, ToR and IEE are subject to approval from the concerned ministry as per EPR, 2077. In the FY 2076/077, ESSD was engaged in IEE of 17 projects and was able to get approval for IEE of five projects from Ministry of Energy, Water Resources and Irrigation. Similarly, ToR for IEE of five projects were also approved by the Ministry. The status of projects requiring IEE is presented as follows;

1. Balefi Corridor 132kV TL Project:**IEE approved on September 2, 2019**
2. Dadakhet-Rahughat 132kV TL Project:**IEE approved on September 30, 2019**

3. Lekhnath-Damauli 220kV TLProject:**U-IEE approved on February 12, 2020**
4. Trishuli 3B Hub-Bhalche 33kV TLProject:**IEE approved on March 4, 2020**
5. Kusaha-Biratnagar 132kV TL Project: **U-IEE approved on July 7, 2020**
6. Borang-Ratmate 220kV TLProject: IEE report submitted to DoED for approval
7. Tumlingtar-Sitalpati 220kV TLProject: **ToR approved,** IEE report submitted to DoED
8. Mainaihaya-Sampattiya 132kV TLProject**: ToR approved,** Draft IEE prepared
9. Amarpur-Dhungesanghu 132kV TLProject**: ToR approved**
10. Lalbandhi-Salempur 132kV TLProject**: ToR approved,** Draft IEE prepared
11. Trishuli 3B-Ratmate 220kV TLProject**: ToR approved**
12. Dhalkebar-Balganga 132kV TLProject**:** ToR submitted to DoED
13. Kaligandaki-Ridi 132kV TLProject**:** ToR submitted to DoED for approval
14. Baneshwor-Bhaktapur 132kV Underground TL Project: MoU signed, ToR under preparation
15. Grid Tied Solar Power Project Block No.5 (6.5MW): MoU signed, ToR submitted to DoED
16. Parwanipur-Pokhariya 132kV TL Project: MoU signed, ToR under preparation
17. Surkhet-Dailekh 132kV TL Project: MoU signed

2. Monitoring Projects

ESSD was involved in environmental monitoring and mitigation works of 11 different projects by establishing Environmental and Social Management Unit (ESMU) at project sites. The department prepared and submitted 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. UpperTrishuli 3 'A' HEP (60MW): Monitoring works completed
2. Nepal India Electricity Transmission and Trade Project; Hetauda-Dhalkebar-Duhabi 400kV TL :24th Quarterly Monitoring Report (Up to March 2020) submitted
3. Nepal India Electricity Transmission and Trade Project Hetauda-Bharatpur-Bardghat 220kV TL:24th Quarterly Monitoring Report (Up to May 2020) submitted
4. SASEC Project: Quarterly Monitoring Report (up to March, 2020) and monthly (up to June) submitted

a. Kaligandaki Corridor (Dana-Kushma) 220kV TLProject

b. Marsyangdi-Kathmandu 220kV TLProject

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

d. Marsyangdi Corridor (Udipur-Markichowk-Bharatpur) 220kV TL Project

5. Tamakoshi-Kathmandu 400kV TLProject: Semi Annual report (Jan-June, 2020) and Quarterly Monitoring Report (up to June) submitted.
6. 132/220kV Chilime Substation Hub and Chilime-Trishuli 220kV TLProject: 11th Quarterly Monitoring Report (up to March 2020) submitted
7. Trishuli 3B Hub substation Project: 11th Quarterly Monitoring Report (up to March 2020) submitted
8. Samundratar- Trishuli 3B Hub 132kV TLProject:17th Quarterly Monitoring Report(up to March 2020) submitted
9. Upper Trishuli 3A-Matatirtha 220kV TL Project: Environment and Social Management Completion Report submitted.
10. Garjyang-Khimti 132kV TLProject: 9th Quarterly Report(up to March 2020) submitted

11. New Modi Lekhnath 132kV TLProject: 4th Quarterly Environment and Social Management Report (up to April 2020) submitted.

3. Mitigation and Enhancement Programs

The mitigation works as per the Vulnerable Community Development Plan prepared for the Hetauda-Dhalkebar-Duhabi transmission line has been completed. The brief of mitigation measures implementation in different project in FY 2076/077is presented below;

3.1 Nepal India Electricity Transmission and Trade Project; Hetauda-Dhalkebar-Duhabi 400kV TL

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 mitigation program, by the end of FY 2019/20, a total of 275,000 seedlings of various species have been planted in about 172 ha forest area of 10 project affected districts and the plantation area is being managed. Out of that, about 182,600 seedlings have been planted in about 114ha of forest land in 9 project affected districts in this fiscal year. Similarly, a one-day health and safety including hotspot awareness program was conducted at 2 places for project workers, each at Rautahat and Saptari.

Plantation in Sunsari

On-site Awareness Training at Rautahat

3.2 SASEC Projects:

Under SASEC, currently four projects are under construction which include Kali Gandaki corridor (Dana-Kusma) 220kV TL Project, Kaligandaki Corridor (Kushma-New Butwal) 220kV TL Project,Marsyangdi-Kathmandu 220kV TL Project and Marsyangdi Corridor (Udipur-Markichowk-Bharatpur) 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 2019/20, 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 Beni of Myagdi. Two full time safeguard (environmental and social) officers are deployed for day-to-day monitoring. Most of the safeguard related training has been completed whereas the monitoring is ongoing.

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

ESMU has been established at Butwal of Rupandehi and Waling of Syangja for day to day Environment and Social Monitoring and the necessary key experts have been mobilized. A one-day social/community awareness program was conducted in 5 places of 3 project affected districts (Palpa, Syangja and Rupandehi) where a total of 177 locals participated.

c. Marsyangdi-Kathmandu 220 kV TL Project

The ESMU for the project is established at Aanbu-Khaireni, Tanahun and Dharke of Dhading. Two safeguard officer are fully deputed at site.A seven-day agricultural productivity intensification training was conducted which benefitted a total of 28 local people. Similarly, under the skill development program, 60-days tailoring training for 32 female participants and 30 days driving training for 17 participants were completed. Basic computer training for 8 participants was also completed in this fiscal year. These participants were from the project affected families.

Participants of Tailoring Training

d. Marsyangdi Corridor (Udipur-Markichowk-Bharatpur) 220kV TL Project

Environment and Social Management Unit has been established at Baradi of Tanahun district for day to day Environment and Social Monitoring and the necessary key experts have been mobilized. The formation of GRC in the concerned project affected RMs/Municipalities has been initiated.

3. 3132/220kV Chilime Substation Hub and Chilime-Trishuli 200kV TL Project

ESMU has been established at Chilime of Rasuwa district. A five-day agriculture intensification training program focusing on vegetable farming was organized at two different places. Similarly, a three-day livestock training to 30 project affected people was conducted at Sano Haku and goat was distributed to the participants. Likewise light vehicle driving training was given to 25 project affected people at Underprivileged Children's Educational Program (UCP) Institute, Bhaktapur.

Participants of Five Days Agriculture Training at Rasuwa

Certificate distribution for Driving Training Participants

3.4 Trishuli 3B Hub Substation Project

ESMU is established at Betrawati of Rasuwa district. A one-month light vehicle driving training was conducted for 10 project affected people. Similarly, a 390 hours house wiring training was provided to 10 people affected by the project.

Participants of Driving Training and House Wiring Training

3.5 Samundratar- Trishuli 3B Hub 132kV TL Project

A five-day Non-timber forest product (NTFP) management training was organized in Bidur of Nuwakot, where a total of 16 participants from 8 different community forest users groups (CFUGs) participated. As a part of the training, 8,000 saplings (of mango, lemon and bamboo) were distributed to concerned CFUGs

3.6 Upper Trishuli 3A-Matatirtha 220kV TL Project

Hoarding boards containing informative and warning signs were placed at 15 different locations in project affected area. Light vehicle driving training (one-month) to 65 participants and 390hrs building electrician training to 40 participants were completed in this fiscal year.

3.7 Garjyang-Khimti 132kV TL Project

Agriculture training was conducted at five different locations for 60 local people in project area.

3.8 New Modi-Lekhnath 132kV TL Project

ESMU is established at Patichaur of Modi Rural Municipality, Parbat. Eleven hoarding boards including project information, safety and environmental messages were placed in areas near to project site.

Hoarding Board Installation at Bhalamchaur, Pokhara Metropolitan City

4. Community Support Programs

Under Community support programs of under-construction projects, different activities were completed in the FY 2019/20 which are as follows;

4.1 Nepal India Electricity Transmission and Trade Project; Hetauda-Dhalkebar-Duhabi 400kV TL

Support was provided to 3 schools affected or located nearby the TL in Bara, Sarlahi and Dhanusha districts which included construction of boundary wall and class rooms as well as provision of construction materials. Moreover, the support was provided for the placement of about 190 meter 6 inch Ductile Iron (DI) drinking water pipelines of Bardibas Small Town Water Supply and Sanitation Users Organization at Bardibas, Mahottari.

Under construction School Office Room in Nijgadh, Bara

4.2 Nepal India Electricity Transmission and Trade Project; Hetauda-Bharatpur-Bardaghat 220 kV TL

Under the community support program, construction material was provided to Hasaura Chilla Drinking water Consumers Committee at Kawasoti-3 and Lohaseshwor Baba Dham Temple of Madhyabindu Municipality-8 ,Nawalpur district. Similarly river bank protection work at Mukundasen Basic School of Gaidakot Municipality-12 and construction of Canal (Near Tower no 203) at Bineyee Trivani Rural Municipality-2, were completed in this fiscal year.

River bank protection at Gaidakot, Nawalpur

Construction Material Supply at Kawasoti

4.3 SASEC Projects:

a. Marsyangdi-Kathmandu 220 kV TL Project

Under CSP activities, construction materials such as cements (PPC/OPC), TMT rebar, tubular pipe, tile, sand and stone, bricks and CGI steel were provided to Nama Buddha Committee located at Dharke of Dhading district for the construction of cremation sites of Tamang community.

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

The construction materials (cement) and Irrigation Pipe (HDPE) have been distributed to Jaljala Rural Municipality Ward No. 8 of Parbat district under the CSP.

c. Marsyangdi Corridor (Udipur-Markichowk-Bharatpur) 220 kV TL Project

A Shade was constructed at Fulbari Ghat of Sundarbazar, Lamajung district for the rest of people coming in nearby cremation areas.

Construction of Shade at Phulbari Ghat, Sundarbazar, Lamjung

4.4 Tamakoshi-Kathmandu 220/400kV TL Project

ESMU has been established at Charikot Dolakha for Khimti-Barhabise section and Khandichour for Barhabise-Kathmandu section. Under the Community Support Program,construction of Seti Devi Temple and stairs to the temple at Chautra Shangachowkgadi Municipality Ward No 8, Irkhu in Sindhupalchowk was completed. Similarly, in Barhabise, construction of resting place at four places, restoration work of Bhimsen Temple and Kriyapputri Bhawan as well as compound wall construction of Buddha Stupa was completed. Under the school support program, playground extension,

fencing and improvement of road to Seti Devi Basic Schoollocated at Irkhu of Sindhupalchowk was completed.

4.5 Trishuli 3B Hub Substation Project

Construction of crematorium (Maranpati) was completed at Kispang Rural Municipality-5 near the bank of Trishuli River. The construction was completed with active participation and support of Sukare Maranpati Construction User Groups.

4.6 Samundratar-Trishuli 3B Hub 132kV TL Project

Distribution of Construction materials to the project affected communities in Nuwakot for local development works was done under the community support program**.** Under this program, 270 bags OPC cement was provided to Kalika Devi and Bhumeshwor Mahadev Temple Consumers Committee of Naubise, Samundratar. Similarly, 500 bags OPC cement, 300 bags PPC cement, 1600 kg TMT Iron bar was provided to Ward Committee of Ward No. 3 of Tadi RM at Kharanitar and 100 bags OPC cement and 1500 meter HD pipe (25 mm diameter) to Paharebhal Danda Community Forest Users' Group.

4.7 New Modi-Lekhnath 132kV TL Project

Under the school support program, one set of computer and projector was provided to Aadarsha Primary School of Modi RM of Parbat.

Handing over computer and projector to Aadarsha Primary School, Parbat

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, Construction Material Investigations and laboratory testing of soil, rocks and concrete at different levels for different departments of NEA and private sectors as well.

Followings are the major works executed by SRCL in fiscal year 2076/77

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

SRCL has completed the assigned investigation works for Phukot Karnali HEP located at Kalikot district. 1570m of core drilling works along with geological mapping, geophysical investigation by ERT and construction material survey have been accomplished so far. Additional 300m of core drilling works as assigned by the Client is 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 dam site and powerhouse area of Betan Karnali HEP in the previous fiscal year. SRCL has completed 722m of core drilling works as assigned by the Client.

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

All the investigation works for this project has been completed except the additional core drilling works for the bridge located at Triveni, Dolpa. 458m linear depth of core drilling works at headworks, powerhouse and a bridge near Ila village has already been completed. In addition, construction material survey for this project has also been completed.

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 was completed. Based on the geological mapping and laboratory testing of collected core samples, Geotechnical Baseline Report (GBR) was prepared and submitted to the Client.

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

Geotechnical investigation works for phase III of this project includes 770m core drilling works along with 2.3km long ERT surveys and Geological mapping of damsite. In total, 525m of core drilling works has been completed so far which is 68% of the total assigned works. ERT survey for intake, surge shaft and along the penstock pipe alignment has been completed. Additional ERT at Galyang saddle is remaining. Because of the COVID-19 pandemic, remaining works will be completed in the next fiscal year only.

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

SRCL has mobilized a team for the arrangement of core drilling works at powerhouse site of this project. The core drilling works (330m) at powerhouse will starts in the next fiscal year only.

7. Geotechnical investigation works of Upper Arun HEP Access Road Tunnel, Sankhuwasabha.

SRCL has completed the additional investigation works for northern and southern portal of access road tunnel of Upper Arun HEP located at Sankhuwasabha. Additional 213m core drilling works along with 7.3km Seismic Refraction Survey and 12 MASW survey were completed in this phase.

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

Installation of drill rig for core drilling works at the left bank (100m inclined hole) of Dudhkoshi Storage HEP project has been done and the core drilling works will start soon.

9. Geological investigation works of Lower Seti hydroelectric Project, Tanahu

SRCL completed 215m of core drilling works for this project this year. Core drilling works for surge shaft has been stopped due to COVID-19 pandemic and will be resumed soon after the cessation of Corona virus.

Construction Material Survey and Laboratory Tests

- Jagadullah Hydroelectric Project, Dolpa
- Uttarganga storage Hydroelectric Project, Baglung.
- Seti-Nadi Hydropower Project, Bajhang (Laboratory tests only)

Miscellaneous Laboratory Tests:

- Compressive strength tests on compressed stabilized bricks produced by different industries, Build UP Nepal.
- Compression and various tests on core samples, Treacebale Measurement Pvt Ltd.
- Compressive strength tests on core samples provided by Sakhuwa engineering Consultancy Pvt. Ltd.

Core Drilling Works at Dudhkoshi SHEP.

Seismic Refraction survey at Upper Arun HEP

Sample of core recovered

Laboratory tests on core sample

Laboratory tests on soil samples provided by Rupa Taal Irrigation Project, Kaski. Electromechanical Design Division

EMD is 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 Upper Modi HEP, and Upper Arun HEP power evacuation study is going on. This engineering services of power evacuation study is done with collaboration of Power System Planning Department of NEA. Feasibility study of Begnas-Rupa Pumped Storage Hydro Electric Project, studying and analyzing the electro-mechanical design part was initiated from previous fiscal year, this study will be continued. Apart from it, the Division is also involved in procurement and maintenance of vehicles under Engineering Services Directorate. From three 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 2076/077, 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.

Amlekhgunj 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 3.1 crore. The plant is working to its best using its available manpower and resources to meet time bound production and delivery of the poles.

SN	Types of Pole	F.Y. 074/075	F.Y. 075/076	F.Y. 076/077
1	8m	6936	8780	6186
2	9m	5828	7390	6030
3	11m	1806	3752	3008
	Total	**14570**	**19922**	**15224**

Kotre Concrete Pole Plant

Kotre Pole Plant is located in Shuklagandaki Municipality, Ward No. 2, 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). Now it has been working to implement concrete pole production and sales of different sizes poles to DCS, NEA. Currently the plant is producing 8.0m, 9.0m and 11m sizes pole of standard sizes as per design norms. From this fiscal year, 8 Nos. of 8m Pole, 24 Nos. of 9m Pole and 24 Nos. of 11m Pole are produced in this plant on daily basis. In F/Y 2076/77, 3880 nos. of 8m Pole, 5184 nos. of 9m Pole and 3120 nos. of 11m pole have been produced in this plant despite lockdown due to COVID-19.

Concrete Pole Plant, Tankisinuwari & Lamki

Concrete Pole Plant, Tankisinuwari & Lamki is working under Electromechanical Division, Engineering Service Directorate, Durbarmarg, Kathmandu. During this Fiscal Year, 2076/077, the Plant has completed construction of Office Building, Store Buildings, Installation of Concrete Mixture, Boiler, Cranes at Tankisinuwari, Morang. The tensioning Post installation work is near about completion in Tankisinuwari. 95 percentage of concrete pole plant construction works have been completed in Tankisinuwari. The pole plant has capacity of production as below: 14 nos. of 8m pole, 48 nos. of 9m Pole and 30 nos. of 11m pole having total of 92 poles per day. The production will start from this fiscal year 2077/078, which will fulfil the demand of PSC Poles in eastern part of Nepal.

In case of Concrete pole plant in Lamki, Plant has started to construct Office building, Store Buildings, Installation of PSC Pole Moulds. In addition to this, the plant has started to prepare tensioning posts, Cranes, Boiler and Concrete Mixture in the factory. The construction work of this pole plant will be completed in fiscal year 2077/78. This pole plant has a production

capacity as below: 14 nos. of 8m pole, 48 nos. of 9m Pole and 20 nos. of 11m pole having total of 82 poles per day. The production is planned to commence from coming fiscal year 2078/079, which will fulfil the demand of PSC Poles in western part of Nepal.

Central Workshop

Located at Bhairav Road, Hetauda-5, Makawanpur and established in 2055 BS, the Central Workshop has been contributing to Nepal Electricity Authority being an entity under Engineering Service Directorate with its purpose of repairing Distribution and Power transformer of Regional Offices of NEA, Power transformers of various Hydroelectric Centers, testing of transformers and providing the available heavy equipment on rent. Considering the increasing demand of electricity in Nepal and contributing to maintain best quality of supply, transformer itself being a major component of power system, the workshop has been striving to its best, using its available resources to meet time bound repair and testing services.

Maintenance of Distribution Transformer

Inside Transformer Workshop

Winding of Power Transformer

Tanking Power Transformer

The achievement of the workshop in the last five fiscal years is tabulated below:

SN	Description	F.Y. 2072/073	F.Y. 2073/074	F.Y. 2074/075	F.Y. 2075/076	F.Y. 2076/077
1	Distribution Transformer Repair	433	636	805	807	850
2	Power Transformer Repair	10	13	8	13	9
3	Transformer Testing	2448	4041	2362	8476	8250

Major Accomplishment of FY 2076/077

- Repaired highest number of distribution transformer (850 numbers) till FY 2076/077.
- Number of transformer tested is 8250.
- Repair and maintenance of 18 MVA, 33/11 kV power transformer of Kathmandu Grid, NEA.
- Facilitated the conduction of 10 days Distribution Transformer Training to NEA staffs up to Supervisor level from all regional offices in collaboration with Training Center, NEA, Kharipati.
- Construction of Power Transformer Repair Workshop Building has been going on with the completion of second beam level.

NEA Training Center

NEA Training Center (referred as NEA, TC) is located at Kharipati, Bhaktapur has been providing different skill enhancing trainings to the employees of NEA as well as other organizations since 2046 B.S. It was at Ratnapark, Kathmandu from 2046 to 2057 B.S. and serving from Kharipati since 2057. During the last 31 years, NEA, TC has trained 21,421 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 hall 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. There 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 (23 employees are working). Those staffs cover electrical, mechanical, 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.

Objectives

- Provide Knowledge, Skill and Attitude enhancing tips.
- Supply need based trainings to NEA employees for enhancing their work efficiency and enabling them for serving the customers effectively.
- Train the employees enabling them to plan, implement, maintain and operate NEA's system today and in the future.
- Promote knowledge and skill of the employees to interface them to the changing environment and technology.
- Conduct problem oriented interactions, research and development and seminars relating to service business.
- Design training packages and implement.

Vision

NEA, TC is to be strengthened day by day to be a sovereign academic institution capable to cope with the training requirements of power

sector of the country. Finally NEA, TC 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 2076/77

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 2076/77 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 23 with 507 trainees in number. Due to the corona pandemic, the target did 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 are using the facilities available in the NEA, TC for various purposes. The total income generated from these services amounted to Rs.27,04,463/70 (With VAT) in the fiscal year 2076/77. 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. During the corona pandemic, Nepal government has made the quarantine in the hostel premises for the Nepali people rescued from China and other countries.

Training Program Conducted on F/Y 2076-077					
S.N.	**Date**	**Training**	**No. of Participants**	**Level**	**Venue**
1	2076.05.23 to 25	Induction for Level-2/1 Technical Group	70	Assistant	Kharipati
2	2076.05.23 to 25	Induction for level- 1 Admin Group	30	Assistant	Kharipati
3	2076.05.24 to 29	Central e-Attendance System	19	Assistant	Kharipati
4	2076.05.29 to 31	GIS Mapping System	10	Officer	Kharipati
5	2076.06.05 to 09	Central e-Attendance System	25	Officer & Assistant	Hetauda
6	2076.06.30 to 07.03	Central e-Attendance System	16	Officer & Assistance	Kharipati
7	2076.07.18 to 22	Central e-attendance System	16	Officer & Assistant	Kharipati
8	2076.07.25 to 29	Central e-Attendance System	19	Officer	Kharipati
9	2076.08.02 to 06	M-Power Billing System	19	Assistant	Janakpur
10	2076.08.08 to 16	Distribution Transformer Repair & Maintenance	27	Assistant	Kathmandu
11	2076.08.09 to 13	Central e-Attendance System	20	Officer & Assistant	Kharipati
12	2076.08.22 to 26	CAIS Account & Payroll System	18	Assistant	Kharipati
13	2076.09.13 to 17	CAIS Account & Payroll System	18	Assistant	Hetauda
14	2076.09.21 to 25	Central e-Attendance System	20	Officer & assistant	Butwal
15	2076.09.23 to 29	M-Power Billing System	17	Assistant	Kharipati
16	2076.10.01 to 03	CAIS Inventory Management System	17	Assistant	Kharipati
17	2076.10.05 to 14	Auto CAD	20	Officer	Kharipati
18	2076.10.12 to 16	Central e-Attendance System	20	Officer & Assistant	Kharipati
19	2076.10.20 to 26	M-Power Billing System	19	Assistant	Nepalgunj
20	2076.10.22 to 28	M-Power Billing System	18	Assistant	Kharipati
21	2076.11.05 to 19	Central e-Attendance System	20	Officer & Assistant	Janakpur
22	2076.11.16 to 25	Distribution Transformer Repair & Maintenance	30	Assistant	Hetauda
23	2076.11.20 to 24	Central e-Attendance System	19	Assistant	Janakpur
Total			507		

PROJECT MANAGEMENT DIRECTORATE

Project Management Directorate (PMD) in the Nepal Electricity Authority's organogram has a role to execute and facilitate the projects funded by Asian Development Bank (ADB) and European Investment Bank (EIB). PMD is responsible for project preparation, procurement and implementation of all new and existing projects that is or will be funded by ADB. At present, PMD is executing diverse projects in energy sector including transmission line, substation, distribution system, distribution system modernization, smart meters and automation under ADB financed (i) SASEC – Power System Expansion Project (SPSEP) (ii) Electricity Transmission Expansion and Supply Improvement Project (ETESIP) (iii) Power Transmission and Distribution Efficiency Enhancement Project (PTDEEP) (iv) SASEC Power Transmission and Distribution System Strengthening Projects (SASEC PTDSSP) and (v) Electricity Grid Modernization Project (EGMP). PMD is also leading environmental and engineering study of different transmission lines up to 400 kV voltage level with length of more than 1000 km and substations associated with it under ADB Grant No. 0361: Project Preparatory Facility for Energy (PPFE). The current portfolio of Project Management Directorate exceeds USD 1.3 Billion together with financing from Asian Development Bank, Government of Nepal, Government of Norway and European Investment Bank.

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 undertaken and being executed by PMD under Loan No. 2808 - NEP: Electricity Transmission Expansion and System Improvement Project (ETESIP). This project will play an important role to evacuate power from upcoming generating stations in 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 (PTDEEP).

The contract for construction of New Khimti – Bahrabise 400 kV Transmission Line is signed with M/S KEC International Limited, India on 20 May, 2020. Survey and land parceling are on the verge of completion while design, testing and material supply is going on. Design-drawings for different components of transmission line has already been approved. Further, tree cutting is approved from the ministry cabinet and the contract with Forest and Soil Conservation Department is completed. This transmission line is planned to be commissioned by October 2021.

400 kV Bahrabise-Kathmandu Transmission Line Tower

The contract for construction of Barhabise-Kathmandu 400kV and 132 kV Lapsiphedi-Changunarayan 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 90% of TL materials have been supplied. Out of 123 nos. of towers of 400 kV TL, 50 tower foundations have been completed and 6 are under construction. The 400 kV and 132 kV TL is scheduled to be completed by April 2021, however with the effects of COVID-19 pandemic, completion time is likely to be extended.

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, ownership transfer and 80 % of the design works have been completed. Construction work at site is going on. Power and Station Transformers are ready for shipment and GIS equipment are in advance stage of manufacturing completion.

B) SASEC Power System Expansion Project (SASEC PSEP)

1) Samundratar- Trishuli 3B 132kV Transmission Line

The scope of this project is to construct of 26 km double circuit 132 kV transmission line (including 3 km of four circuits) from Samundratar to Trishuli 3B Hub and 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 equivalent USD 120 Million for this project and Marsyangdi Corridor 220 kV Transmission Line Project.

Samundratar 132/33 kV Substation

For transmission line part, detail survey, land acquisition, tower design and tower testing of type DA, DB, DC and DD type has been completed. 77 nos. of tower foundation construction and 63 tower erection out of 84 nos. of has been completed till date. Similarly, for substation part, design of electrical and civil components of substation has been approved. All equipment have been delivered to the site except a few which are under inspection. Almost 50% of 132 kV equipment installations and all 33 kV equipment have been installed. The transmission line and substation facilities are targeted to be commissioned by December 2020.

2) Marsyangdi Corridor 220 kV Transmission Line Project

Marsyangdi Corridor 220 kV Transmission Line Project once completed will evacuate approximately 1600 MW of power generated by various hydropower stations under constructions in the Marsyangdi river basin/ corridor. The Project comprises of construction of approx. 113 km long double circuit 220 kV transmission line from Manang (Dharapani Substation) to Chitwan (New Bharatpur Substation) via Khudi substation, Udipur Substation and Markichowk substation and construction of 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 which constitutes 18 km double circuit transmission line from Udipur to Khudi with twin ACCC Drake conductor. The remaining 28 km section from Khudi to Udipur will be constructed using ACSR Moose conductor. The lower 67 km section of 220 kV double circuit line extends from Udipur to Bharatpur and will be of twin ACCC Drake conductor.

The contract of transmission line from Udipur to Bharatpur section has been awarded to Pinggao Group Co. Ltd, China and construction works are in progress. All types of tower design work has been completed. Testing of DB, DC and DD type tower has been completed. Around 10% of tower foundation work in Lamjung district has been completed.

Tower Foundation work in progress: Udipur-Bharatpur 220 kV Transmission Line

The contract for Udipur and Bharatpur 220/132/33 kV substation has been awarded to M/S Larsen and Toubro Limited, India, and the contract has become effective from July 2020.

Similarly, the contract for Dharapani (Manang) - Khudi (Lamjung) –Udipur (Lamjung) 220 kV Transmission Line and 220 kV SS at Khudi and Dharapani (Manang) has been awarded to M/S TBEA Co. Ltd., China and the contract has become effective from June 2020.

Both sections of transmission lines and associated substations of the project are expected to be commissioned by end of FY 2078/079 (2020/021). The overall progress of the project till date is 16.14%.

3) Marsyangdi – Kathmandu 220 kV Transmission Line Project

This project was conceptualized to transfer power from Marsyangdi corridor to Kathmandu Valley which ultimately reinforces INPS and improve reliability of transmission system. The scope of this project includes construction of 82 km double circuit 220 kV transmission line from Markichowk, Tanahun to Matatirtha, Kathmandu with twin "MOOSE" ACSR conductor and construction of 220/132 kV substations of capacity 320 MVA at Markichowk, Tanahun and 320 MVA (2x160 MVA) Matatirtha, Kathmandu. The substation in Matatirtha will be air insulated type while in Markichowk, the substation shall be of gas insulated type. The contract agreement for transmission line was concluded on June 2016 with Tata Projects Ltd., India.

Marsyangdi- Kathmandu 220 kV Transmission Line

Similarly, the contract agreement for substations was concluded on December 2017 with Shenzhen Farad Electric Co. Ltd., China. However, the contract with Shenzhen Farad Electric Co. Ltd., China has been terminated due to non-performance of the contractor on 17 February 2020 and bid has already been invited to complete remaining works of both substations. Before contract termination, almost all design and drawings of civil and electrical works had been prepared by the Contractor and had been approved. Major equipment such as power transformer, circuit breaker, CT, PT, CVT & LA have already been delivered to site at Matatirtha and Markichowk.

In transmission line, out of 231 towers, foundations of 227 towers and erection of 226 towers has been completed. Further, 78.3 km of double circuit conductor has been strung. This line is planned to be commissioned by the end of October 2020.

4) Kaligandaki Corridor 220 kV Transmission Line Project

The scope of the project includes construction of 220/132 kV, 100 MVA & 132/33 kV, 25 MVA Substation at Dana (Myagdi), 220/132 kV, 100 MVA Substations at Kushma (Parbat) and 127.57 km of 220 kV D/C transmission line (Dana- Kushma- New Butwal).

Dana Kushma 220 kV Transmission Line

Dana to Kushma TL, 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 114 towers of Dana-Kushma section, 110 tower foundations & 108 tower structure erection has been completed. Out of 39.57 km of 220 kV Double Circuit Line, 36.37 km conductor 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 September 2020.

220 kV Kushma Substation

The contract for design, supply and construction of 88 km, 220 kV D/C transmission line from Kushma to New Butwal has been awarded to M/S Larsen & Toubro Limited, India. Design of tower and all other equipment has been completed. Check survey and cadastral survey are in final stages of completion. Land parceling for Palpa and Syangja district for acquisition of land for tower foundation has been submitted. 92 out of 225 nos. of tower foundation have been completed, 5 are under progress while 22 tower structures have been erected till date. This line is planned to be commissioned in December 2020, however with the effects of COVID-19 pandemic, completion time is likely to be extended.

5) New Butwal – Bardaghat 220 kV Transmission line and Substation Project

The major objective of this project is to construct 21 km of 220 kV transmission line from New-Butwal to Bardaghat and 220/132 kV, 100 MVA substation in New Butwal, Nawalparasi.

The contract for construction of 220/132 kV, 100 MVA Substation in New Butwal (Nawalparasi) has been awarded to M/S Tata projects Limited, India. The substation is in advance stage of completion and planned to be commissioned by December 2020.

Switchyard of 220 kV New Butwal Substation

The contract of design, supply, installation and commissioning of 21 km of 220 kV transmission line from New Butwal to Bardaghat has been undertaken by M/S Powerchina Sepco1Electric Power Construction Co. Ltd. Though the contract was awarded in December 2019 but due to delay in EIA approval and COVID-19 pandemic, the contract has lately been effective on June 2020.

6) Grid Substation Reinforcement and Capacity Expansion Project

The idea of this project was drafted 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. 280 MVA capacity was added in the grid when reinforcement and upgradation work of all these eight grid

substation was concluded on December 2017. Protection upgradation and addition of Substation Automation System in Gandak SS and Baneswar SS were also completed successfully.

As an additional scope to this project, upgradation of first circuit of Dhalkebar- Mujeliya 33 kV Double Circuit Line of length 23 km has been successfully completed by replacing the existing 0.10 sq. Inch ACSR conductor with ACCC "Silvassa" Conductor. Upgradation of second circuit of 33 kV Dhalkebar - Mujeliya line and addition of 33 kV 2x10 MVar capacitor banks at Mujeliya substations is in progress. The upgradation work is expected to be completed by September 2020. After completion of the upgradation work, power supply quality and reliability in Janakpur area will be improved with enhanced distribution capacity.

ACSR Conductor Replacing by ACCC conductor in Dhalkebar Mujeliya 33 kV Line

7) Distribution System Augmentation and Expansion Project

This project was initiated to augment and expand the distribution system all over Nepal to improve reliability of distribution system, enhance quality of electricity supply and reduce distribution system losses. The project is being executed in following 3 Lots of contracts:

Lot 1: This lot of contract intends to expand distribution network in the eastern region of Nepal. The scope of this contract consists of construction of 13 numbers of 33/11 kV new substations, 167 km of 33 kV line, 197 km of 11 kV line, 165 km of 400/230 V line and installation of 150 numbers of 11/0.4 kV distribution transformers. The contract was awarded to M/S A2Z Infra Engineering Limited, India on 15 June, 2016. Out of total 13 numbers of substations, 5 substations have been commissioned & charged and has contributed to 40 MVA additional capacity into the system. Similarly, a total of 128 km of 33 kV line, 69 km of 11 kV line and 34 km of 400/230 V line has been completed and 29 number of distribution transformers have been installed till date. The contract is expected to be completed by the end of 2020.

Lot 2: This lot of contract intends to expand distribution network in the western region of Nepal. The scope of this contract consists of construction of 12 numbers of 33/11 kV new substations, 181 km of 33 kV line, 147

Butwal-Dhakdahi 33 kV line

km of 11 kV line, 140 km of 400/230 V line and installation of 182 numbers of 11/0.4 kV distribution transformers. The contract was awarded to M/S A2Z Infra Engineering Limited, India on 15 July, 2016. Out of total 12 numbers of substations, 6 substations have been commissioned & charged and has contributed to 43 MVA additional capacity into the system. Similarly, a total of 125 km of 33 kV line, 44 km of 11 kV line, 25 km of 400/230 V line has been completed and 25 number of distribution transformers have been installed till date. The contract is expected to be completed by the end of 2020.

Khairenitar 33/11 kV Substation

Lot 3: This contract lot intends to improve distribution network all over the country. The scope of this contract consists of upgradation of 11 numbers of 33/11 kV existing substations and construction of 87 km of 33 kV line, 342 km of 11 kV line, 365 km of 400/230 V line and installation of 262 numbers of 11/0.4 kV distribution transformers. The contract was awarded to M/S East India Udhyog Limited, India on 22 February, 2016. This contract has almost been completed and handover of the completed facility is underway.

8) Distribution System Master Plan Project

This project was designed 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 with the objective of betterment 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 and optimized access in on-grid areas by 2035. The master plan will also include policy recommendations, comprehensive electrification and distribution augmentation program and detailed case studies. The Project is funded by Norwegian Grant, administered by ADB. The final report has been submitted by the consultant, which includes Seven (7) provincials Distribution System / Rural Electrification Master Plan and a consolidated National Master Plan report for Nepal and other relevant reports such as socio-economic survey report, environmental and social safeguard report.

9) 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 MW. These solar power plants will be connected at different five (5) substations of NEA (8 MW at Chanauta SS, 5 MW at Gandak SS, 2 MW at Kawasoti SS, 4 MW at Lekhnath SS and 5 MW at Buluchowk SS). Power Purchase Agreement (PPA) has been concluded with two (2) developers and is in process for remaining three (3) developers.

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 safe and 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, ADB has funded USD 150 Million as a loan and the balance is being financed through GoN and NEA. Additional USD 2.0 Million has been funded as a grant from Government of Japan from Japanese Fund for Poverty Reduction which is being utilized (i) to strengthen the capacity of energy sector in mainstreaming Gender Equality and Social Inclusion in energy programs and projects (ii) productive use of clean energy technologies and services by poor and vulnerable households and (iii) capacity development of NEA staff for new technology of energy.

Different sub-projects and their status under PTDEEP are as below:

1) Lapsiphedi and Changunarayan Substation Construction Project

The main objective of this project is to construct 220/132 kV, 160 MVA & 132/11 kV, 22.5 MVA capacity GIS substation at Lapsiphedi and 132/11 kV, 45 MVA SS 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, which will be initially charged at 220 kV. The addition of these substations will also help reinforce transmission network of Kathmandu valley and increasing the reliability of transmission network feeding power to Kathmandu valley. Further, since the areas around these substations are supplied from substations far from load center, addition of these substations aids to improvement of power quality in these areas.

The contract for this package was awarded to Sinosteel MECC-Zhaowei J/V, but terminated due to non-performance of the contractor in February 2020. Prior to termination, design works of the substations were underway while survey and geotechnical investigations had been completed. For the selection of new contractor, technical bid evaluation is underway. In the new tender, additional scope of work for upgradation of existing 66/11 kV Teku substation to 132/66/11 kV voltage level and construction of new double circuit 132 kV line bays at existing Suichatar 132 kV substation for charging existing Suichatar – Teku 66 kV transmission line on 132 kV has been added which will be helpful to strengthen the distribution capacity of Kathmandu valley.

2) Kathmandu Valley Transmission Capacity Reinforcement Project

As an essential project to cope growing demand in the outskirts of the Kathmandu valley and to reduce burden on the existing substations, this project will augment grid substation capacity by adding 3 new 132/11kV substations, 2x45 MVA each at Mulpani, Futung and Chapagaon. These substations will not just increase the reliability of distribution network but also serve to supply qualitative electricity to the consumers. The Contract of these Substations is being executed by M/S Pinggao Group Co. Limited, China.

Manufacturing of major equipment such as power transformer and GIS has already been completed and design/drawings of most of other electrical equipment has also been concluded. Approval for designs and drawings related to civil works such as superstructure has been obtained from the Contractor and is being reviewed by the Consultant. Due to geological and social problems, civil works at the sites are delayed thus extending contract completion period up to 25th January 2021. Alternative construction sites at Thimi switching station and Chobhar have been provided to the contractor due to unavailability and unsuitability of land in Chapagaun and Mulpani respectively. Ongoing COVID-19 pandemic has affected project severely as it has hampered both manufacturing and site works.

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

This project intends the enhancement of distribution system and/or rehabilitation of the distribution system (11kV and 0.4kV) with the provision of automation for the areas under Maharajgunj Distribution Center in the Northern region of the Kathmandu Valley.

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

Horizontal drilling for Distribution system undergrounding in Maharajgunj area

The contract agreement was made on 15 March, 2019 with KEI Industries Limited, India. As of now, route survey for 280 km of HT feeder and 467 km of LT line covering 317 distribution transformers has been completed. Pipe laying and foundation for panels/RMU is in progress. Due to effect of Covid-19 pandemic, this project is expected to be completed by middle of 2022.

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

The project intends 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. Till date, 229 survey works of all 229 km HT feeders and 428 km of LT line covering 474 distribution transformers has been concluded. Due to effect of Covid-19 pandemic, the project is expected to be completed by middle of 2022.

Cable laying works at Chabahil

5) Kathmandu Valley Smart Metering Project

This is first smart metering project of NEA which covers all classes of consumer be equipped with smart meter and a milestone to modernize the distribution business eventually improving 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).

Data Centre construction at IT Department premises

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. Nepal Electricity Authority (NEA) plans to implement Advance Metering Infrastructure to bring about reform in distribution sector.

This contract is undertaken by M/S Pinggao-WISDOM JV which was awarded in March

2019. The first lot of supply of single phase and three phase meters, RF modules and AMI IT has been delivered. The testing of all these equipment delivered in first lot has been completed at meter testing laboratory. The contractor is constructing Data Centre at the premises of IT Department and is in advance stage of completion. Smart Meter installation is planned to start by August 2020 and the Project is expected to be completed by first quarter of 2021.

6) Kathmandu Valley Substation Automation Project

NEA 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 digitization of NEA grid system. 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 contract has been awarded to M/S GE T&D India Limited on 5 January, 2020 and expected to be completed within March 2022.

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

This project continues some of the activities of the ongoing project PTDEEP to some extent. The project is focused on reinforcement and modernization of power supply system, improvement energy access with the adoption of new technologies. This project also has initiated strengthening of distribution systems outside Kathmandu valley in a systematic and phase-wise manner starting from Pokhara and Bharatpur. The sub projects under this project are:

1) Kathmandu Valley Transmission Capacity Reinforcement Project (Phase II)

This project is the continuation to Kathmandu Valley Transmission Capacity Reinforcement Project and serves the same objective of augmentation of grid substation capacity of Kathmandu valley. The primary focus 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 132/11 kV, 2x45 MVA and 132/66kV, 2x63 MVA GIS substation at Koteshwor via newly proposed Thimi 132/11kV, 90 MVA GIS substation. This project also includes approximately 2 km of 66 kV double circuit underground transmission line from newly proposed Koteshwor substation to existing Baneshwor substation and necessary bay extension works at both ends of the transmission line.

Survey license for the transmission line has already been acquired and ESSD, NEA is conducting IEE study for the line. Due to unavailability of land in targeted area of Koteshwor/Tinkune area, project is assessing other alternatives for the construction site of Koteshwor substation. Preliminary survey has been completed and Bidding Document preparation is underway.

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

To evacuate power generated by IPPs including Tamakoshi and Middle Bhotekoshi, the Khimti – Bahrabise – Lapsiphedi transmission line have to operate at 400 kV and accordingly the

substations at Khimti, Bahrabise and Lapsiphedi need to upgrade to 400 kV voltage level. To meet these power evacuation requirements, Khimti-Bahrabise-Lapsiphedi 400 kV substation project was intiated in FY 2074/75 and scheduled to be completed by FY 2078/79.

The scope of the project is to construct (i) New Khimti SS (ii) Barhabise SS and (iii) Lapsifedi SS at 400 kV and of Capacity of New Khimti SS, Barhabise SS and Lapsifedi SS will be 630MVA (2x3x105 MVA), 320 MVA (2x3x53.33 MVA) and 315 MVA (3x105 MVA) respectively. The cost of this project is estimated to be USD 63 million. The project is now on advance stage of contract award and letter of intent has been issued to the substantially responsive lowest evaluated bidder M/S Grid Solutions SAS, France.

3) Kathmandu Valley West Distribution System Enhancement Project

This project intends the enhancement of distribution system and/or rehabilitation of the distribution system (11kV and 0.4kV) along with the provision of automation in distribution 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 (5) distribution center including reinforcement and automation. Major work in this project includes construction of 225 circuit km underground 11 kV line & 239 circuit km underground 400 volt line, 225 km underground optical fiber laying, 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.

The contract has been awarded to M/S Larsen and Toubro Limited, India on 24 June, 2020. The project is expected to complete by end of 2023.

4) Lalitpur and Bhaktapur Urban Distribution Network Reinforcement

The project intends the enhancement of distribution system and/or rehabilitation of distribution system (11kV and 0.4kV) with the provision of automation for the areas under Lagankhel, Pulchowk, Bhaktapur and Thimi Distribution Center. The scope of the project includes design, supply, installation and commissioning of underground distribution network using trenchless boring methodology in the distribution areas under Lagankhel, Pulchowk, Bhaktapur and Thimi Distribution Center including reinforcement and automation. The major work includes the construction of underground 11 kV Line: 120 circuit km & underground 400 Volt Line: 100 circuit km, underground optical fiber laying: 120 km, Construction and upgrading of 11 kV overhead line by AB Cable: 100 circuit km & 400 Volt overhead line by AB Cable: 120 km and RMU installation: 200 nos. Bid has been invited for selection of the contractor to execute the project.

5) Distribution System Reinforcement and Modernization of Bharatpur and Pokhara

The project intends the enhancement of distribution system and/or rehabilitation of distribution system (11kV and 0.4kV) with the provision of automation in Bharatpur and Pokhara.

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. Major work in this project includes construction of 120 circuit km underground 11 kV line & 155 circuit km

underground 400 volt line, 120 km underground optical fiber laying, Construction and upgrading of 11 kV overhead line by AB Cable: 50 circuit km & 400 Volt overhead line by AB Cable: 60 km, RMU installation: 100 nos. Bid document required for this project is being prepared.

6) 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 quality of electricity supply through construction of more distribution system infrastructures including the reinforcement of existing distribution networks.

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. The project area includes 8 districts of Province 2 viz. Siraha, Saptari, Dhanusa, Mahottari, Sarlahi, Rautahat, Bara and Parsa. It is proposed to construct 10 nos. of new 33/11kV substations, 323 km of 33 kV lines, 950 km of 11kV lines and 1000 km of 400 Volts distribution lines including distribution network reinforcement of existing 11 kV and low voltage lines.

Stakeholder consultation for Province 2 Electrification

The procurement has been divided into five different packages viz. Lot 1, Lot 2, Lot 3, Lot 4 and Lot 5. Estimated total cost for this project is USD 45 Million. Bids received from the bidders are under evaluation. This project is expected to complete by the end of 2024/25.

7) 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 construction of Parwanipur-Pokhariya 132 kV Transmission Line along with the 132 kV substation at Pokhariya (Parsa district) to meet the current demand of industrial growth. Nijgadh-Pokhariya 400 kV Transmission Line along with the concomitant substations in Nijgadh and Pokhariya has been planned for future electricity demand of industries.

Proposed 132 kV double circuit transmission line from Parwanipur to Pokhariya of 21 km in length will be constructed using HTLS conductor. The survey of the line is already completed, which was carried out by Engineering Directorate of NEA. The IEE study of the line has been assigned to Environment and Social Studies Division (ESSD) and is about to complete. Bids for construction of 132 kV line and 132 kV Substations at Pokahariya is planned to be invited by the end of 2020.

Likewise, study of the 400 kV Nijgadh-Pokhariya transmission line of approximately length of 75 km has also been initiated. The detailed survey is being carried out by Engineering Directorate of NEA and expected to be completed by October 2020. Further, corresponding IEE of the line are expected to be completed within the end of this fiscal year.

8) Electric Vehicle Charging Station Construction Project

This project supports government's vision of sustainable environmental friendly transportation system in Nepal which ultimately increases the consumption of electricity and reduces the import of fossil fuels. Under this project, fifty (50) numbers of DC fast chargers, especially in the major highways and cities of Nepal will be installed. The single 142 kW charger will consist of two nos. of 60 kW DC gun and one 22 kW AC gun which would be suitable for most of the available electric vehicles in the market. The charging station supports all types of charging protocols (CCS, CHAdeMo, GB/T and AC). Bids for design, engineering manufacturing, supply, erection, testing and commissioning of EV Charging stations has already been invited with the deadline of submission on 31 July 2020. The scope of the bid also includes operation and a comprehensive on-site maintenance of the entire EV Charging system for five (5) years from the date of commissioning of these charging stations.

E) Electricity Grid Modernization Project (EGMP)

ADB is going to provide financial assistance as a loan of amount USD 156 Million for upcoming Electricity Grid Modernization Project (EGMP) where GoN and NEA contribution will be of USD 39 Million. The EGMP aims to (i) strengthen the transmission system capacity and modernize the grid substations (ii) modernize electricity distribution system and (iii) to strengthen the capacity of NEA and Electricity users.

All the bids for the procurement of sub-projects under EGMP will have been invited by the end of 2020 and the projects will be completed latest by year 2025/26. Required land acquisition, social and environmental study and bidding document preparation for most of the packages of this project are underway. The EGMP constitutes the following sub-projects.

1) Construction of Distribution Command and Control Centre (DCC)

In order to comply with NEA's objective of digitization and modernization of its service delivery, NEA is establishing a Distribution Command and Control Centre as a modern facility to control NEA's distribution system in Kathmandu valley which will provide common platform of a Data Centre for data acquisition from the different ongoing facilities like smart meters and ERP. The proposed Distribution Control Centre would provide full time control and operation of medium voltage and low voltage distribution system in Kathmandu valley, thereby improving reliability and quality of supply to the end consumers. Coupled with the rollout of smart metering and ERP, it would be helpful to enhance the operational efficiency of NEA.

The Distribution Command and Control Centre combined with Data Centre will be built using state of the art container system to facilitate fast completion of project within a period of 15 months. The bidding document for its procurement has been prepared and is under review in ADB.

2) Smart Metering Project (Phase II)

With an aim to modernize distribution system throughout Kathmandu valley, EGMP is introducing Smart Metering Phase II project, supplementing Smart Metering Phase I project being implemented under PTDEEP. Through this project, NEA intends to replace all 350,000 electromechanical meters of the consumers of remaining nine distribution centres (Thimi, Pulchowk, Bhaktapur, Kirtipur, Kuleshwor, Lagankhel, Baneswor, Jorpati and

Balaju) in Kathmandu valley by smart meters. The bidding documents for this project has also been prepared and submitted to ADB for review.

3) Grid Substation Automation Project (Phase II)

This project is the continuation of Grid Substation Automation of thirteen (13) nos. of grid substations being carried out at Kathmandu valley. The project will completely automate the remaining forty (40) grid substations outside Kathmandu valley with the facility of data acquisition, monitoring and control at MV distribution level to the overall electrical transmission system network including auxiliary system of the grid substations built over a strong and vibrant communication backbone. The project shall also provide tools for complete operation, monitoring and control of distribution network, operation analysis, optimization and improvement, maintenance and long term development together with technical database. The project shall strengthen the electricity network enabling to integrate and accommodate future network addition and upgradation works in the country. After completion of automation of these 40 (forty) Grid Substations, all the grid substations will be unmanned and will be controlled from a master control center to be built at each of the Grid Division Office.

PMD has planned to invite Bids for this project latest by end of 2020 and the project completion by middle of 2023.

4) Construction of 132 kV Pangtang Substation

The purpose of this project is to evacuate power from different IPPs of Balefi Corridor in Sindhupalchowk. This project will include construction of a 132/33 kV, 30 MVA & 33/11 kV, 8 MVA substation at Pangtang and necessary bay extension works at Barhabise substation. Till date, land acquisition for the Pantang (Balefi) substation has been accomplished. Construction of approach road, compound wall fencing and protection works has been completed at substation site. Bidding Document preparation is underway and have plan to invite Bids by end of 2020.

5) Construction of 132 kV Surkhet Substation

In order to meet the increasing electricity demand of Surkhet and surrounding districts and to enhance quality, reliability of power supply and facilitate power evacuation from hydropower projects in Bheri, Babai and Karnali river basins of Karnali Province, 132/33/11 kV Surkhet substation has been planned and designed. The scope of this project includes installation of 132/33 kV, 2x65 MVA &33/11 kV, 16.6 MVA transformers and necessary facilities of the substation in Surkhet. A 52 km Kohalpur-Surkhet 132 kV transmission line with ACSR Bear conductor and 32 km Surkhet-Dailekh 132 kV transmission line with ACSR Bear conductor is being constructed by Transmission Directorate of NEA. The land acquisition for the substation has already been completed; bidding document is being prepared and has planned to invite Bids by next two (2) months.

6) 132/66 kV Transmission Line Upgradation Project

Transmission network in Kathmandu valley currently comprises of ACSR Bear, Panther, Wolf and Dog conductor. Most of these lines are overloaded and can't handle contingency conditions. In few instances, even the normal loading creates system instability. In order to mitigate these problems and abnormalities, 7 km Suichatar-Matatirtha 132 kV TL, 5 km Suichatar-Balaju 132 kV TL, 13 km 132 kV Suichatar-Patan TL and 8.5 km Suichatar-Teku 66 kV TL within Kathmandu valley has

been planned to upgrade by replacing existing conductor with HTLS conductor.

In addition to transmission line in Kathmandu valley, 120 km of Patlaiya-Dhalkebar 132 kV DC transmission line built with ACSR Bear conductor is another important transmission line section as the supply can be routed from either Hetauda to Dhalkebar or Dhalkebar to Pawanipur substation. Currently, the major Power source is Dhalkebar SS and the power some time need to supply upto Butwal through the Dhalkebar - Patlaiya line.This is also the major line to supply Birgunj area where numbers of industries are facing power shortages and this Dhalkebar - Patlaiya line tends to operate in overloading. Thus, to avoid overloading and outages during contingency and normal loading condition, this line has also been planned to upgrade using HTLS conductor. Further, another transmission line planned for upgradation is 30 km of Kushaha-Duhabi 132 kV TL section constructed with ACSR Bear conductor. It becomes imperative to upgrade this transmission line section as this line is the main export / import point for power trade with India and connected with Kataiya substation in India. This line also acts a major power carrier for the substations supplying Duhabi and Biratnagar area.

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

The main objective is to prepare projects to the high level of readiness for procurement and execution. High leveled readiness project is easy to implement, cost effective and ensure timely completion of the project with adequate quality. PMD has been engaged for the project preparation of many strategically important Transmission Line and Substations where the Consulting firm has been appointed for detail engineering and environmental study of the proposed Transmission Line and associated Substations with the grant aid of ADB (Grant No. 0361: Project Preparatory Facility for Energy). Under the detail engineering and environmental study, the consulting firm will prepare Detail Project Report including detail transmission & substation design with tower spotting and demarcation in site, soil tests, all necessary civil and electromechanical design, safeguard studies, preparation of cost estimate, preparation of bidding documents and necessary activities in detail enough to provide adequate information & data to ensure high readiness of the project for procurement so that construction can be commenced smoothly immediately after the contract award. Engineering and environmental study of following transmission line and the associated substation are underway.

1) New Butwal – Lamahi – Kohalpur – New Attariya 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 transmission 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 completed the detail survey of Chhinchu - Surkhet 132 kV DC Transmission Line, New Butwal - Lamahi 400 kV and Transmission Line and Lamahi – New Kohalpur 400 kV DC Transmission Line. In substation part, consultant has submitted the substation design of Dododhara (New Lumki) 400 kV Substation and Surkhet 132kV Substation. Furthermore,

consultant has also submitted review report of tower design. The detailed study on due diligence related activities and engineering design on the remaining transmission line and substation design is targeted to be completed by this fiscal year. 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 other three (3) different 400 kV transmission lines and two (2) 132 kV transmission lines and associated substations. Consultant recruitment has been done in three (3) separate packages, CP-1, CP-2 and CP-3. The details of line and substation under each consulting packages 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.

Contract for all three consulting packages has been signed with Power Grid Corporation of India Limited, India in association with Jade Consult Pvt. Ltd., Nepal on November 2019.

3) Power Transmission System Planning for Major Cities of Nepal

The existing capacity of transmission lines and substations in the city areas will be insufficient to meet the growing energy demand as well as peak demand. Therefore, there is no alternative to upgrading the capacity of existing transmission lines and substations as well as construction of new transmission lines and substations. The power transmission infrastructures requires a lot of land and right of way along the line. It is very hard to find the land and RoW in the cities to construct transmission infrastructures which will be an evident problem in the future. Hence, NEA has decided to plan the transmission infrastructure considering the future demand of electricity till 2050 AD and develop infrastructure accordingly phase wise. Similarly, it has become essential to find some alternatives to avoid land and RoW problems in transmission infrastructure by adopting modern practices like underground transmission line, compact substation, transmission system using monopoles, etc.

This project will prepare a power transmission system plan of major cities and associated industrial areas of Kathmandu valley, Banepa, Pokhara, Biratnagar, Itahari, Dharan, Biratchowk and adjacent cities, Janakpur, Bardibas, Hetauda, Simara, Parwanipur, Birgunj, Butwal, Bhairahawa, Nepalgunj and Kohalpur, taking into account the future load growth till 2050 AD including feasibility study and project preparation.

G) 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, 222 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, major items have been supplied and survey of line has been completed. Civil construction works at substations as well as construction of line has already started. The project is expected to complete by middle of 2021.

NEA'S SUBSIDIARY & ASSOCIATE COMPANIES

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 coordination 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. Nepal Power Trading Company Limited
18. Transformer Utpadan Company Limited
19. 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 hydropowers and infrastructures. NEC services include feasibility study, 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, transmission and distribution system design operation/maintenance, rehabilitation and specialized services, project management and construction services.

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.

Establishment and Business :

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 200 million rupees.

Initially operating from a single room in the Head Office of NEA three years ago, it is now established in Trade Tower, Thapathali in the second floor and a second office in Imadol, Nepal Telecom Building. The Company strength has now grown to be 140 plus staffs, the majority of whom are highly skilled and qualified engineers and specialists.

The Turnover of the company has increased from NRs 290 million in FY.2075/76 to more than NRs 308 million in FY 2076/77 and projected to turn a healthy profit of NRs.18 million this year. The total business at hand is more than NRs 2 billion .

NEA ENGINEERING COMPANY LTD.

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

NEC completed 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 in September, 2017 for National Planning Commission. This was its first project, and completed within time & budget.

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 project was completed on March, 2019.

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 project was completed on July, 2019.

CONSULTING SERVICES OF DESIGN ESTIMATE OF TRANSFORMER WORKSHOP AT KHARIPATI, BHAKTAPUR

The Contract Agreement was signed on May, 2019, between NEC and Nepal Electricity Authority, Distribution and Consumer Services Directorate, Transformer Workshop Branch, Lainchaur, Kathmandu . The project was completed on February, 2020.

DETAIL FEASIBILITY STUDY OF TRISHULI 3B-RATMATE 220KV TRANSMISSION LINE PROJECT

The Contract Agreement was signed on November ,2018 between NEC and Nepal Electricity Authority, Transmission Directorate, Trishuli 3B- Ratmate 220KV Transmission Line Project. The study project was completed on July, 2019.

DETAIL FEASIBILITY STUDY OF KUSAWA-BIRATNAGAR 132KV TRANSMISSION LINE PROJECT

The Contract Agreement was signed on September ,2019 between NEC and Nepal Electricity Authority, Transmission Directorate, Kusawa-Biratnagar 132KV Transmission Line Project. The study project based on drone survey was completed on March, 2020.

CONSULTING SERVICES LUM SUM FOR DESIGN OF TOWER FOR 400KV TRANSMISSION LINE PROJECT

The Contract Agreement was signed on November ,2019 between NEC and Rastriya Prasaran Grid Company Ltd. (RPGCL). The scope of services under this contract was to prepare complete design of tower type DB and DD using tower design software PLS-TOWER, loading tree diagrams / design calculation for different conditions (Normal, Reliability and Safety condition). The whole work was completed in February, 2020.

Projects being currently executed by NEA Engineering Company:

HYDROPOWER PROJECTS

1. PHUKOT KARNALI PEAKING RoR HYDROELECTRIC PROJECT (PKHEP) (480 MW)

The Contract Agreement was signed on 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 480 MW and annual energy generation of 2510.02 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. Detailed Feasibility Engineering Report was completed and now it is in the final stage of Tender Document preparation. The Project work is scheduled to complete on September 2020.

2. BETAN KARNALI HYDROELECTRIC PROJECT (BKHEP) (688 MW)

A Contract between Betan Karnali Sanchayakarta Hydropower Company Limited (BKSHCL) and NEC) was signed on November , 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. The project is in the final stage of Detailed Engineering Design and Tender Document preparation. The Project work is scheduled to complete on September 2020.

3. JAGADULLA STORAGE HYDROELECTRIC PROJECT (JSHEP) (109.74 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 109.74 MW and the annual energy generation of around 669.41 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. Detail Design Study Report was completed, and now it is in the final stage of preparing Detailed Engineering Design and Tender document. The Project work is scheduled to complete on September 2020.

Drilling work at JSHEP

4. KIMATHANKA ARUN HYDROELECTRIC PROJECT (KAHEP) (450 MW)

The Contract was made on 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.

Detail Design Study report will be completed shortly and Detailed Engineering Design as well as Tender Document preparation will go on simultaneously.

5. ROLWALING KHOLA HYDROELECTRIC PROJECT (20.2 MW)

The Contract Agreement was signed on March , 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 20.2 MW 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. Detailed Feasibility Engineering Report was completed and now it is in the final stage of Tender Document preparation. The Project work is scheduled to complete on September 2020.

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. REVIEW OF UPDATED FEASIBILITY REPORT (UFSR) AND DETAILED DESIGN REPORT (DDR) OF NALGAD HYDROPOWER PROJECT

The Contract Agreement was signed on February,2020 between NEC and Nalgad Hydropower Company Ltd. (NHCL) .The scope of the services under this contract is to review and comments on the feasibility level reports prepared by the Main Consultant of the NHCL. The main objective of the task is to review of the main report, field investigation report, design criteria and layout, draft detailed design report and draft tender document. The project is completed recently in this Fiscal Year.

8. DETAILED ENGINEERING DESIGN OF HEADWORKS, INTAKE, APPROACH CANAL, DESANDER,POWERHOUSE,HYDRO-MECHANICAL,ELECTRO-MECHANICAL WORKS, AND ASSOCIATED STRUCTURES-SUNKOSHI MARIN DIVERSION MULTIPURPOSE PROJECT

The Contract Agreement was signed on February,2020 between NEC and Ministry of Energy, Water Resources and Irrigation, Sunkoshi-Marin Diversion Multipurpose Project . The scope of the Consulting services is to evaluate existing feasibility study reports and carry out final Detailed Engineering Design of the Headworks(Barrage), intake, Approach Canal, Desander, Powerhouse, Hydro-mechanical and Electro-Mechanical works and associated structures including finalize the construction drawings, cost estimate and technical specifications of the construction works.

9. CONSULTING SERVICES OF TECHNICAL COMPLIANCE MONITORING OF ARUN-III HYDROELECTRIC PROJECT

The Contract Agreement was signed on November,2019 between NEC and Investment Board Nepal (IBN) to provide technical support to Project Management Unit (PMU) to ensure the technical compliances of Project development Agreement (PDA)

The main objective of task force is to assist the PMU to monitor and evaluate on technical matters such as dam safety, geotechnical, hydrological and construction of civil, mechanical and electromechanical works. The work has been completed in Asar 2077 (July 2020).

ENVIRONMENTAL IMPACT STUDIES

10. 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.

11. EIA STUDY OF RATMATE-RASUWAGADHI -KERUNG 400KV TRANSMISSION LINE PROJECT

The Contract Agreement was signed on June,2020 between NEC and Nepal Electricity Authority, Ratmate- Rasuwagadi-Kerung 400KV Transmission Line Project. The scope of the services under this contract is to carry out the EIA study as required by the prevailing Acts and Regulations of the Government

12. INITIAL ENVIRONMENTAL EXAMINATION STUDY OF MEWA-CHANGE 132KV TRANSMISSION LINE PROJECT

The Contract Agreement was signed on November ,2019 between NEC and Rastriya Prasaran Grid Company Ltd. (RPGCL), Mewa-Change 132KV Transmission Line Project. The prime objective of consulting services under this contract is to conduct Initial Environmental Examination Study of 132KV Mewa Change Transmission Line Project .

13. ENVIRONMENTAL AND SOCIAL STUDIES OF DISTRIBUTION SYSTEM AND EXPANSION PROJECT (DSUEP)

The Contract Agreement was signed on June,2020 between NEC and Nepal Electricity Authority, Distribution and Consumer Service Directorate. The scope of the services under this contract is to conduct IEE or appropriate Environmental Assessment as required by the prevailing Acts and Regulations of the Government and AIIB's and EIB's Environmental screening criteria.

TRANSMISSION LINE AND SUBSTATIONS PROJECTS

14. DESIGN CHECK AND CONSTRUCTION SUPERVISION OF 400 KV DHALKEBAR SUBSTATION

The Contract Agreement was signed on February, 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.

15. DESIGN CHECK AND CONSTRUCTION SUPERVISION CONSULTANCY SERVICES FOR 400KV HETAUDA AND INARUWA SUBSTATIONS

The Contract Agreement was signed on February , 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.

16. DETAILED ENGINEERING AND ENVIRONMENTAL STUDY OF KIMATHANKA ARUN-ARUN HUB 400KV DOUBLE CIRCUIT TRANSMISSION LINE PROJECT

The Contract Agreement was signed on December ,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 and detail design as well as tower design has been completed. The Scoping and TOR will be submitted and EIA to be complete in this fiscal year.

17. DETAIL FEASIBILITY STUDY OF CHANDRAPUR-SUKDEV CHOWK 132KV TRANSMISSION LINE PROJECT

The Contract Agreement was signed on September,2019 between NEC and Nepal Electricity Authority, Transmission Directorate, Chandrapur-Sukdev Chowk 132KV 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, establish Bill of Quantity and cost estimate. Transmission line Route alignment study of all alternatives are based on optimum routing using GIS Intelligence.

18. STUDY OF KUSAWA-BIRATNAGAR 132KV TRANSMISSION LINE PROJECT, VERIFICATION OF LINE ROUTE SURVEY AND TOWER DESIGN REVIEW OF 33KV DOUBLE CIRCUIT (D/C) TRANSMISSION LINE

The Contract Agreement was signed on September,2019 between NEC and Nepal Electricity Authority, Transmission Directorate, Kusawa Biratnagar 132KV Transmission Line Project. The scope of the services under this contract is to review the survey reports and design check for two sections (Rani and Tankisinwari Substation) as submitted by the Contractors.

SOLAR POWER PROJECT

19. CONSTRUCTION SUPERVISION OF 25MWp GRID TIED SOLAR FARMS

The Contract Agreement was signed on October, 2019, between NEC and Nepal Electricity Authority, Distribution and Consumer Services Directorate, 25MWp Grid Tied Solar Project. The main objective of the consulting service is to carry out Design and Documents review, supporting contract management and Construction Supervision.

ROAD AND INFRACTURE PROJECT:

20. KATHMANDU TERAI/MADESH FASTRACK EXPRESSWAY PROJECT

The Contract Agreement was signed on March,2020 between NEC and Nepal Army, The Kathmandu-Terai/ Madesh Fast Track (Express way) Road Project as a consulting service contract to conduct design ,drawing of River Training works under 12 different Chainage. The prime objective of consultant is to prepare design, drawing including cost estimation. NEC has provided all necessary expertise required by project for some section of the road in river training and protecting and modelling.

POWER PLANT REHABILITATION PROJECTS

21. 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

22. DETAILED FEASIBILITY STUDY OF UPGRADATION/ REHABILITATION OF TINAU HYDROPOWER PLANT

The Contract Agreement was signed on December ,2019 between NEC and Nepal Electricity Authority, Generation Directorate, Medium Generation Operation and Maintenance Department to conduct the rehabilitation/ upgradation feasibility study of Tinau hydropower project. The main tasks under this project

includes mainly review of previous studies field visits, topographical survey, geological and geotechnical investigation, review and update of hydrological and sedimentological studies, power evacuation study, detailed engineering design, cost estimate, preparation of tender documents and financial analysis.

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 and continues to do so. 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 available so as to provide expertise services to Government and NEA on EV in future.

The Company had also carried its research and indigenous design of floating solar plants that can be used in lakes and reservoirs.

NEC is presently carrying out research on H2H (Hydrogen to Hydrogen) and particularly Hydrogen generation and using Hydrogen for Electricity generation and urea production . It is also continuing research on 132KV monople design and application in the context of Nepal .

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 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 and the remaining 25% of equity capital have been allocated 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 Bagmati Province 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 m^3/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 8.0km; penstock of length 1,165m (dia. 1.47 to 3.6 m); 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.

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 99.5% by the end of the fiscal year 2076/77 (2019/20). The status of the Works are summarized as below:

Impounding of Reservoir

After the completions of Civil and Hydro-mechanical Works of Dam and Intake, water impounding in the reservoir and simultaneous Wet Test of Dam and Intake were successfully accomplished in March 2020. The overall conclusion of the Wet Test on the dam foundation is that the Dam and Intake sections seem to be behaving very well with small seepage and very small deformations due to the filling of the reservoir. A somewhat higher seepage may be expected during large floods, but there are no signs of any erosion or malfunction of the cut-off wall.

Completion of Two Vertical Penstock Shafts

Installations of steel penstock pipes and simultaneous backfill concreting in Lower and Upper Vertical shafts (heights of vertical portions are 305 m and 367 m respectively) have been successfully completed in 25 May and 02 July 2020 respectively. These works were the most risky and challenging works of the Project.

Other Works

Lot 1 Contract: Only 24 m out of 1,165 m concrete lining stretch on Headrace Tunnel is remaining. The concrete lining in Surge System has been completed. Major grouting works (backfill, contact, consolidation works etc.) in Headrace Tunnel have been completed, except chemical grouting works in different 5 critical locations. These chemical grouting works are being affected due to unavailability of foreign grouting experts/specialists whose travels are currently being restricted because of pandemic and international lockdown. Necessary steps have been carried out to bring those experts at the earliest.

Lot 2 Contract: Substantially completed the installation of all dam radial gates and its hydraulic system. As stated above, steel penstock pipes in both the vertical shafts have been successfully installed. Installations of lower horizontal pipes in Powerhouse Cavern area is in the final stage of completion. Penstock installation in middle horizontal portion is also ongoing. Manufacturing of some important equipment, accessories, tools, spare parts have been delayed due to lockdown in the Contractor's factory.

Lot 3 Contract: Installation of all six units in Powerhouse have been completed. All 19 Power Transformers along with their accessories are installed in the Transformer Cavern. Installation of Main Inlet Valves (MIVs) and digital governors for all units have been completed. Installation of Gas Insulated Switchgear (GIS) for all units is also completed. In the main control room, installation of Control Panels, DC supply unit and other required works are also completed.

Lot 4 Contract: The Contractor has completed erection works of all 128 towers by the end of Fiscal Year 2075/76. Stringing of all 47 km conductor has also been completed. Two Multi-Circuit Towers are being installed near new Khimti Sub-Station. Major civil works of GIS building and Control building of new Khimti Sub-Station have been completed. Remaining minor works like construction of cable trenches and some finishing works are ongoing. All three transformers has already been installed in the position. Electrical

installation works in substation will start once the civil works completed. However, it is also being very difficult to mobilize skilled labors and technicians necessary for electrical installations and Multi-Circuit Tower erection works due to lockdowns, which will impact on the completion of Sub-Station and Multi-Circuit Towers.

Project Cost & Schedule

The approved cost estimate of the project prior to bidding of different construction lots and consultancy services in different stages was USD 456 Million excluding Interest during Construction (IDC). The project cost has been revised as USD 559 Million excluding IDC as of December 2017 because of multiple reasons such as design modifications of Headrace Tunnel and Surge System, upgrading and rehabilitation of project access roads, time delays and additional scope of works due to the great earthquake of April 2015, some other design changes in the project components, poor work performance of Lot 2 Contractor, etc.

Construction Schedule of the Project has been revised and updated in July 2020 considering effects of the ongoing COVID-19 pandemic and subsequent international lockdowns in the constructions, installations, manufacturing of some remaining items and transportation, etc. In the revised Schedule, it is targeted that water filling in Headrace Tunnel and Penstock will be accomplished in month of October 2020 after the Pressure Test to be carried out in Lower Horizontal Penstock (LHP). Similarly, start of power generation from 1st Unit and all 6 units have been targeted in November 2020 and February 2021 respectively in the revised Schedule.

Rolwaling Khola Hydroelectric Project (RKHEP)

As the second stage development of UTKHEP, Upper Tamakoshi Hydropower Limited (UTKHPL) intends to implement Rolwaling Khola Hydroelectric Project (RKHEP) having installed capacity of 22 MW. The Company has obtained Survey License of Rolwaling Khola Hydroelectric Project from Department of Electricity Development on 6 September 2017. Apart from 98 GWh of annual energy generated from this power plant itself, additional 221 GWh of annual energy will be generated from Upper Tamakoshi Hydropower Plant. This project will enhance dry season energy of UTKEHP by 142 GWh and peaking hours from 4 hours to 6 hours even in the driest months. The present status of this project is as below:

- A Contract was signed between UTKHPL and NEA Engineering Company Limited on 13 March 2018 for the Contract for Detailed Engineering Design and Preparation of EPC Bidding Documents and the Consultant has submitted the Draft Final Report.
- The Contract for the Construction of Exploratory Tunnels and Connecting Road has already been awarded on 14 November 2019 and the related works are being executed.
- Contract has been awarded 16 June 2020 for construction of Mule Track from lower Lamabagar to Rikhu village as an access to the Headwork's Site.
- The Re-invitation for Prequalification of Bidders for EPC Construction of Rolwaling Khola Hydroelectric Project was made on 26 April 2020 and the evaluation of the Applicants are underway.
- Contract was signed between UTKHPL and Environmental and Social Studies Department of NEA on 14 February 2018 to carry out Environmental Impact Assessment (EIA) study of RKHEP. The ToR and Scoping documents have already been submitted to the Ministry of Forests and Environment for approval and it is in the final stage of approval.

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 company also envisages to develop Lower Seti (Tanahu) Hydropower Project at the lower reaches of Seti River. The overall management of THL is entrusted to the Board of Directors, headed by the Managing Director of NEA.

Tanahu Hydropower Project

Tanahu Hydropower Project is located on the right bank of Seti River, about 150 km West of Kathmandu near Damauli, the district headquarters of Tanahu District. The storage type project is envisaged to have an installed capacity of 140 MW with an estimated annual energy generation of 590 GWh. The Project is designed for at least six hours of peaking operation during the driest month of the year. The key features of the project are as follows;

Dam	Concrete Gravity; 140 m high and 210 m Crest Length
Headrace Tunnel	1,162 m long; 7.4 Internal Diameter
Surge Shaft	61 m high; 28 m internal Diameter
Underground Powerhouse	89m x 22m x 44m
Tailrace Tunnel	243 m
HM Equipment	Four Spillway Gates (12.8m x 18.7m) Two Water Lowering Gates (3.8m x 3,8m) Two Flushing Gates (5m x 5m)
EM Equipment	Two Units of Francis Turbines with maximum outputs of 71. MW each coupled with 3 phase synchronous generator with maximum output of 82.3 MVA
Transmission Line	220 kV DC of length 34 km to New Bharatpur Sub-station

As per the Project Administration Manual (PAM), the total financial cost of the project was estimated to be 505 MUSD as of January 2013 for which the funding arrangements have been made after signing the respective loan agreements with ADB, JICA and EIB. THL has also concluded the Power Purchase Agreement (PPA) with NEA on 29 June 2018 as a maiden PPA for storage type hydropower projects.

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 under the National Competition Bidding. The company has distributed 10.98 MUSD to 501 affected HHs out of total 547 affected HHs (compensation success rate of 91.6%) as compensation payments for the acquisition of land and structures including livelihood support allowances. The compensation distribution to the remaining HHs shall be continued during the current FY 2020/21.

Major Construction Packages

Package 1: The procurement of Package 1 (Headworks) has been significantly delayed due to unavoidable termination of the Contract with CMC di Ravenna, Italy and the rejection of all bids received for the re-bidding, being substantially non-responsive to the requirements of bidding documents. After the re-invitation of Re-bid II on 28 February 2020 and the opening of bids on 06 July 2020, the evaluation of technical bids is underway with the supports from the Project Supervision Consultant (PSC).

Package 2: The contract agreement of the Package 2 (Waterway, Powerhouse and Related Equipment) was signed on 01 October 2018 with M/S Sinohydro Corporation Limited, China. After mobilization to the site and the completion of site establishment works including camp facilities, batching

and crushing plants etc., the Contractor has initiated the major construction works under the Contract.

Camp Facilities of Package2 Contractor

The Contractor is currently being engaged in protection of slopes along with the construction of side drains on the access road to the surge tank. About 128 m out of 188 m of the cable tunnel has been excavated with the temporary support works, whereas the excavation of Main Access Tunnel (MAT) has been initiated with the installation of necessary supports at the tunnel portal.

Portal Area of Cable Tunnel & Main Access

Tunnel The Contractor is also carrying out the excavation works at tailrace outlet with the necessary slope protection works.

Package 3: THL and KEC International Limited, India signed the Contract Agreement for Package 3 (220 kV Transmission Line) on 25 December 2018. The Contractor completed the detail and check survey along the TL alignment and the geological investigation at the tower locations. Upon successful testing of DB/DC Type Towers at the Contractor's testing laboratory, the design of DB Type tower has been approved by the PSC. The Contractor has started delivering the Tower Stubs, ACSR Conductor, Earthwire and Insulators to the site.

Tower Testing at the Contractor's Laboratory

The tree enumeration works for Tanahu district has been completed, whereas the District Administration Office of Tanahu, following the decision of the Compensation Determination Committee, has published a notice for land acquisition as required for tower foundation works within the district.

Major Consulting Contracts

THL concluded Consulting Services Contract with M/S Tractebel Engineering GmbH (then Lahmeyer International GmbH) Germany in association with Manitoba Hydro International, Canada on 29 June, 2015. After completion of the activities under the Phase 1, the Consultant has been carrying out the review and approval of designs/drawings submitted by the Contractors as well as the construction supervision and contract administration of both major Contracts under the Phase 2 of the Contract. The Project Supervision Consultant (PSC) has also been supporting THL on the procurement process of Package 1.

A Consulting Contract Agreement was signed with M/S Electro-consult, Italy in association with GEOCE Consultant (P) Limited, Nepal on 20 May 2019 for management of environmental and social safeguard activities. After commencement of the services from 01 July 2019, the Consultant as the Environmental & Social Management Service Provider (ESMSP) has been engaged on finalization of the Environmental Management Plan covering Fish Management Plan, Water Release and Dam Safety Plan, Wild Life Management Plan and Forestry Management Plan in addition to the daily monitoring of environment and social safeguard activities of the project.

As provisioned in the Project Administration Manual, THL has signed Contracts with three individual experts namely Dam Safety Expert, Environment Expert and Social Safeguard Expert, as Panel of Experts (POE) on 17 December 2018. The Dam Safety Expert conducted the second mission from 14-17 January 2020 in relation to the assessment of PGA values as determined in the Seismic

Meeting with Dam Safety Expert at Project Site Office

THL has also appointed External Environment Monitor and External Social Monitor to carry out periodic and independent review of the implementation of Environment Management Plan (EMP) and RIPP.

Impact of COVID-19

Following the imposition of national lockdown to prevent the spreading of pandemic COVID-19 by the Government of Nepal on 24 March 2020, the Package 2 Contractor, after notification of the Force Majeure event, suspended all site activities except for the submission of the design/drawing documents of the Works under the Contract. The Package 3 Contractor also, after notification of the Force Majeure event, stopped the survey and tree enumeration works but continued submission of the design documents to the Engineer for review and approval.

After the GON's decision on 02 April 2020 in relation to resumption of the construction works of national priority projects maintaining the required health and safety regulation at work places, THL organized a co-ordination meeting with representatives from the district administration office, the district police office and the local authorities on 08 April 2020. The meeting chaired by the Chief District Officer (CDO) of Tanahu District agreed to carry out the construction activities of the project with the use of workers residing inside the camp. Accordingly, the Package 2 Contractor resumed the limited site activities maintaining the health and safety protocols of the GON, whereas the Package 3 Contractor resumed tree enumeration works in Tanahu district.

Livelihood Restoration & Community Development

THL has established four Local Consultative Forums (LCFs) in addition to one Public Information Centers (PIC) for the registration of grievances and dissemination of project related information. THL is being regularly engaged in consultation with Local Administration and Authorities to address the grievances of the APs to the extent possible. The first broad-based participatory and socially inclusive

consultations on GESI's goals, objectives, and status in each Rural/Municipality as defined in the project area will be carried out along with the surveys for the Livelihood Restoration Plan.

For the implementation of livelihood support program, the ESMSP, after conducting a need based assessment of vocational training, submitted two training proposals on beautician and tailoring with a target of 40 women participants from affected HH. Under the domain of community development strategy, THL has provided financial assistance of NRs. 2.0 Million for the completion of campus building of Janajyoti Multiple Campus, at Bhimad.

Lower Seti (Tanahu) Hydropower Project

THL has envisaged to develop Lower Seti (Tanahu) Hydropower Project located about 18 km downstream of the tailrace of Tanahu Hydropower Project. The peaking type ROR project with an installed capacity of 126 MW will have an estimated annual energy generation of 520 GWh with utilization of the flows of Madi River in addition to the regulated discharge of Seti River from the tailrace of Tanahu Hydropower Project. At the request of THL, the DoED has extended the Survey License of Generation until 28 October 2020.

Under the Grant-0361-NEP, Project Preparation Facility for Energy of the ADB, THL signed a Contract Agreement with JV of WAPCOS Limited, India and Nippon Koei Co. Ltd, Japan on 12 April 2019 for the Detail Engineering Design and Preparation of Bidding Documents of the project. After completion of the field investigation works, the Consultant has submitted the reports on the project layout and power potential optimization, whereas the detail design of various components and the preparation of bidding documents are underway. The Consultant is expected to submit the draft report of the study by the end of December, 2020. As per the agreed plan with the ADB, THL has also initiated the process for the engagement of Panel of Experts (POE) for review of the Detail Design Report to be submitted by the Consultant.

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 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 M/S WAPCOS Limited, India.

Lot–1: Civil and Hydro-Mechanical Works: Contract Agreement for the construction of the Civil and Hydro- Mechanical works was signed with M/S Jai Prakash Associates Limited, India under Engineering, Procurement and Construction (EPC) mode on 21st November, 2017 and notice to proceed was issued on 24th May 2018.

The Contractor is executing works from all fronts (Project Road, Permanent Bridge, Headworks, Adit-1, Adit-2, Adit-3, Adit-4, HRT, Surge Shaft, Pressure Shaft, Power House Complex).

- Track opening of Project road has been completed and Construction of Steel Permanent Bridge is in final stage.
- Construction of Adit-2 and Adit-3 has been completed and HRT works has been started form these adits.
- 45% (25m out of 55m) work of Construction of Surge Shaft has been completed.
- Power House Excavation is in progress and Slope Protection of Power House Complex is in final stage.
- Physical Modelling test of Head works including Desander has been completed IRI Roorkee, India.

Site Visit by NEA MD Kulman Ghising on 9th March 2020

Work in Progress in Power House

Work in Progress in Adit-3

Work in Progress in Surge Shaft

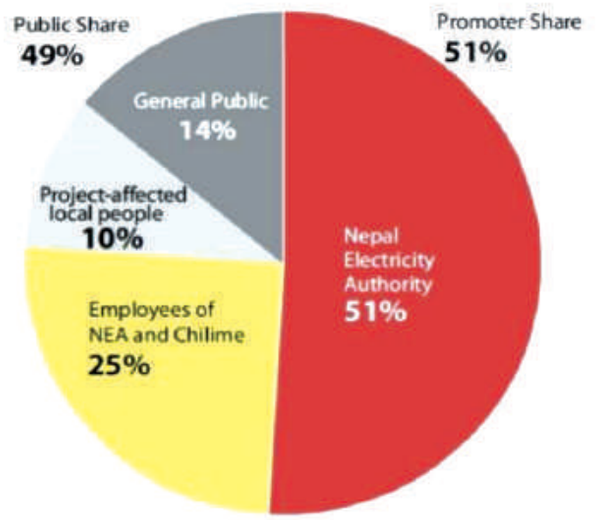
Work in Progress in Permanent Bridge

Lot–2: Electromechanical Works: Contract Agreement for the construction of the Electro-Mechanical works was signed with M/S Bharat Heavy Electrical Limited, India under Plant, Design and Built (PDB) mode on 15th October, 2019 and notice to proceed was issued on 04th December 2019. The Contractor has completed model test of turbine and is executing design works of all electro-mechanical components of the project.

Signing ceremony of Contract Agreement for Lot-2: EM Works on 15th October, 2019

CHILIME HYDROPOWER COMPANY LIMITED

Chilime Hydropower Company Limited (CHPCL), a subsidiary of Nepal Electricity Authority (NEA) was established in 1996 with the main objective of developing hydroelectric power projects in the country by Public Private Participation (PPP) model. NEA is owned 51% of the Company's share and the rest is owned by the public



Chilime Hydroelectric Plant

The Company commissioned Chilime Hydroelectric Project in 2060/05/08 (24 August 2003) which is locatevd in Rasuwa district. Installed capacity of the power plant is 22.10 MW and total average Annual energy generation is 150 GWh including excess energy. The generated energy is transmitted into the NEA grid located at Nuwakot district through a 38 km long 66 kV transmission line.

During the FY 2076/77, it was planned to update the plant by replacing the existing central control system, excitation system, protection system, and other electrical system with the modern ones. All the equipment has site delivered but due to the situation of worldwide Covid-19 pandemic, the installation works could not take place. Dismantling of old components and installation & commissioning of new system will be carried out in the forthcoming dry season.

Hydropower development through Chilime Subsidiaries

With the objectives of further development of hydropower project, the company has invested in other four under construction hydroelectric projects with the total installed capacity of 270.30 MW through three subsidiary companies ie; Rasuwagadhi Hydropower Company Limited, Madhya Bhotekoshi Jalavidyut Company Limited and Sanjen Jalavidyut Company Limited. The company has also established Chilime Engineering & Services Co. Ltd (CHEsco) as a consulting company which is studying three hydroelectric projects under this company recognized as a "JANATA KO JALAVIDHYUT" of Nepal Government with the proposed capacity of 425 MW.

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 developing Rasuwagadhi Hydroelectric Project (RGHEP) of 111 MW capacity in Rasuwa district

❖ Rasuwagadhi Hydroelectric Project

The project is located in Thuman and Timure village (ward no. 1 and 2 of Gosaikunda Gaupalika) of Rasuwa district. The project can be accessed by the Kathmandu-Trisuli-Rasuwagadhi road which is about 150 km North from Kathmandu. The headwork site is about 400m downstream from the confluence of Kerung and Lende khola which is the Boundary Rivers between Nepal and China.

Key Features of the Project:

Type of Project:	Run-of-River
Design Discharge (Q_{40}):	80.00m^3/s
Gross Head:	167.9 m
Headwork:	Diversion Weir with Undersluice and Side Intake
Desander, Type and Size:	Underground, 3-125mx15mx23m
Headrace Tunnel length and size:	4185m, dia.- 6m~7m
Powerhouse type and size:	Underground, 76.3m x 15.0m, 35.0m
Turbine, Type & No:	Francis, Vertical Axis & 3 Nos.
Turbine Unit Capacity	38.50 MW each
Generator, Capacity & No.:	3 Phase Synchronous AC, 3x43.75 MVA
Installed Capacity:	111.0 MW
Annual Energy Generation	613.87GWh
Dry Months Energy	84.32GWh
Wet Months Energy	529.55GWh
T/L length, Voltage	10km, 132kV Double Circuit up to Chilime Hub

The construction of the project is categorized into three different Lots. For Lot 1: Civil and Hydro-Mechanical Works, M/S China International Water and Electric Corp. (CWE) is the contractor under Engineering, Procurement and Construction (EPC) contract model. Similarly, M/S VOITH Hydro Pvt. Ltd, India is the contractor for Lot 2: Electromechanical Works under P & DB contract model. M/S Mudbhary and Joshi Construction Pvt. Ltd. is the contractor for Lot 3: Transmission Line works which includes construction of about 10 km long 132 kV double circuit transmission line. The project Consultant M/S SMEC International Pty. Ltd., Australia has been continuously supervising the Lot 1 & Lot 2 construction works, reviewing and approving the designs submitted by the contractors and coordinating with the contractors for smooth operation of construction work activities.

❖ Present Status of the Project

The progress summary of the major construction activities are as follows:

Infrastructure works

Due to the effect of Earthquake 2015 and the subsequent rock fall, under construction permanent camp facilities at Ghatte Khola was heavily damaged and work stopped. Now, Tendering process for the re-construction and maintenance of the camp office building has been started. As an alternative, Employer's temporary camp facilities (Pre-fab buildings) which includes both the project office and residence on the Timure/Thuman area has been used and the whole project team has been working from the site office.

Lot 1: Civil and Hydro-Mechanical Works

The concrete works at Undersluice & Intake with Gate Installation has been completed. The 2nd stage river diversion work Completed on 2076/9/17 and the weir construction work has been started. Excavation of 3 number of Underground Desanding Basin (UDB) has been completed & concrete work at UDB #1 has completed and at UDB#2 & 3 is ongoing. In addition, the concrete works at RCC Pressure conduit and Diversion Weir & Stilling Basin is ongoing.

After completing the excavation of 4185m long Headrace Tunnel, final support works (Invert concrete, grouting and full section concrete lining) is on the verge of completion. Surge Shaft full section excavation has been started & Steel lining with backfill concreting of penstock Vertical Shaft Completed. The excavation & support works of Underground Powerhouse & Transformer Cavern is completed. 90% Excavation of Tailrace Tunnel with primary support has been completed. Remaining excavation and weak-zone treatment is still ongoing with full section lining.

Lot 2: Electro-Mechanical Works

Lot 2: Electromechanical Works Contractor M/S VOITH Hydro Pvt. Ltd, India has completed the detail design and manufacturing of the electromechanical equipment. Most of the equipment have already been delivered to the site and is in process of installation. Due to Covid-19 Pandemic, they have demobilized from site on 21 March 2020 and still have not fully mobilised.

Lot 3: Transmission Line Works

For the construction of Lot 3: 132 KV double circuit Transmission Line Works, the Contractor has completed the detail survey and the detail design work. Acquisition of private land has been completed and subsequently the concreting of tower foundation work has been continued.

The overall progress of the project construction work is around 75%. Because of various unforeseeable events i.e. April, 2015 earthquake followed by Nepal-India boarder blockade and massive landslides in the public road as well as the project work fronts due to heavy rainfall during the monsoon season, frequent flash flood and adverse geological condition in Tailrace Tunnel, the project completion schedule has been extended. After going through many hindrances, full efforts are being put to complete the project by the end of this fiscal year

❖ Financial Arrangement

The company has planned to manage the capital requirement for the construction of the project from debt and equity provision in the ratio of 50:50. The debt requirement has been managed from Employees Provident Fund (EPF), under the long term loan agreement signed on 22nd Marg, 2068. The equity portion has the investment proportion

of 51% promoter share and 49% public share. The promoter share comprises of 32.79% from Chilime Hydropower Company Ltd., 18% from Nepal Electricity Authority and 0.21% from local level (District Coordination Committee and Gaupalika) of Rasuwa district. Similarly, the public share comprises of 19.50% from Depositors of EPF, 4.5% from Employees of Promoter & Investor Institutions, 15% from General Public and Employees of the Company and 10% from the Locals of Rasuwa district.

The equity investment has already been paid up by the Promoter group as per their commitment. Among the public investment, 24% Public Shares, that include 19.50% to the Depositors of EPF, 3.5% to the Employees of Promoter Institutions & 1% to the Employees of Investor Institution have already been issued in the first lot. Out of remaining 25% Public Share, 15% to the General Public and Employees of the Company have also been issued in the second lot. Now the necessary preparation for the issuance of the remaining 10% to the Locals of Rasuwa district is going on.

SANJEN JALAVIDHYUT COMPANY LIMITED (SJCL)

Sanjen (Upper) 14.8 MW and Sanjen (42.50MW) Hydroelectric Projects

Sanjen Jalavidhyut Company Limited (SJCL), is a subsidiary of Nepal Electricity Authority (NEA) and Chilime Hydropower Company Limited (CHPCL) with their promoter share of 10.36% and 39.36% respectively. SJCL is developing two hydroelectric projects, namely, Sanjen (Upper) Hydroelectric Project (SUHEP) (14.8 MW) and Sanjen Hydroelectric Project (SHEP) (42.5 MW) in cascade and in under construction stage with the financing arrangement of 50:50 debt equity ratio. All the debt portion (50%of total) has been arranged from Employer's Provident Fund (EPF) of Nepal.

The equity shares from promotors and also shares from depositors of EPF, Employee of EPF, staffs of promotors and General Public have been already paid up and only the remaining equity portion only 10 % of Project Affected Local People of Rasuwa district is planned to be concluded within the fiscal year 2077/078.

Sanjen (Upper) Hydroelectric Project (SUHEP) - 14.8 MW

SUHEP Headworks & Powerhouse

The project is located in Chilime (now Amachhodingmo Rural Municipality), Rasuwa. The headworks of this project is in Tiloche and powerhouse is in Simbu Village. The project has approx. 161 m gross head and design discharge of 11.07 m3/s. Total annual saleable energy is 82.44 GWh.

The overall progress of SUHEP is approx. 87%. The Civil Works (Lot 2), is approx. 93% % completed. Penstock installation is almost completed and Hydro-mechanical Works has been completed approx. 89%. Electromechanical Works particularly EM installation works is yet to be started and this

works has been severely impacted due to COVID 19 as the delivery of equipment and deployment of manpower from China is halted due to lockdown and border sealed in both side. The civil works in powerhouse is almost completed and waiting for EM installation works. The project is targeted to completed and commissioned within this fiscal year.

Sanjen Hydroelectric Project (SHEP) - 42.5 MW

This project is cascade project of SUHEP and has gross head 442 m. Additional 0.5 m3/s discharge from Chhupchung Khola is to total design discharge 11.57 m3/s. This project will produce total 251.94 GWh with total annual salable energy is 241.86 GWh. The overall progress of the project is approx. 78%.

In Civil Works, headrace tunnel excavation is completed, Chhupchung headworks, balancing pond, syphon pipes, inlet slopes is almost completed. Most critical part of this works of Penstock shaft excavation accomplished and penstock installation and backfilling is about to start. Superstructure concreting of powerhouse is almost finished and waiting for EM installation however EM Works (Lot-3) is severely impacted by COVID 19 for delivery of some of the equipment and deployment of technical manpower for installation from contractor home country China.

HEP Headworks & Powerhouse

Consulting Services for the Projects

Chilime Engineering and Services Company Ltd. (Chesco) has been engaged in Detailed Engineering Design & Construction Supervision of both projects after SMEC International Pty. Ltd., Australia left the major consulting service.

Transmission Line Works

Mudbhary and Joshi Construction Pvt. Ltd. is carrying out the construction of approx. 6 km 132 kV transmission line works. Almost all foundation works has been completed and tower element manufacturing is ongoing. The forest clearance and land compensation in ROW is 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 have been issued except number 4 and 5 (25%), which is in the process of issuance.

II. Key features of the Project

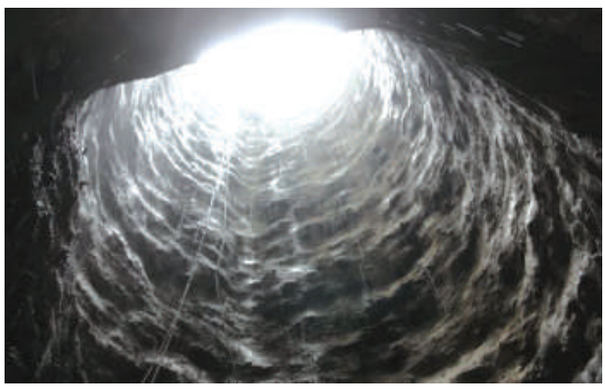
Type of Project:	Run-of-River (ROR)
Design flow:	50.8 m3/sec
Gross Head:	235 m
Headworks:	Gated Weir Type with Undersluice and Side Intake
Desanding Basin Type & Size:	Surface, 100 m(l) x 13 m(w) x 8.5 m(h)
Tunnel Length & Size:	7124 m x 5.7 m(w) x 5.7 m(h)
Powerhouse Type & Size:	Surface Powerhouse, 52 m(l) x 15 m(b) x 25.5 m(h)
Turbine:	Francis, Vertical Axis & 3 Nos. each of 34 MW
Generator Unit Capacity & Nos.:	40 MVA & 3 Nos.
Installed Capacity:	102 MW (3 x 34 MW)
Annual Salable Energy:	542.2 GWh
Dry Energy:	83.7 GWh
Wet Energy:	458.5GWh
Transmission Line Length/ Voltage:	4 km/220 kV
Project Cost	NRs 15.03 billion

III. Key Construction Activities

The Main Construction works are divided into following packages:

1. Civil and Hydro-mechanical work(Lot-1)
2. Electromechanical works (Lot-2)
3. Construction of Transmission line

Construction of Dam in progress



Excavation and Support of Surge Tank

Civil and Hydro-mechanical works (Lot-1):

China Energy Engineering Group, Guangxi Hydroelectric Construction Bureau(CEEC GHCB) is the Contractor of Civil and Hydro-mechanical work. Concreting in Spillway is completed upto the level of 1149m. 168nos of bore piles have been completed as cut off structure. 93 % of Headrace tunnel excavation i.e. 6628 meter out of 7116 meter has been completed. Surge tank and penstock tunnel as well as shaft excavation and support work has been completed. Concreting works in powerhouse is being continued.

Reinforcement placement in Powerhouse

Electromechanical Works (Lot-2):

Andritz Hydro Private Limited(AHPL), 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 has been completed.

Transmission Line works:-

The Contractor, Urja-Ac JV for the construction of 4 Km 220 kV transmission line has completed and manufacturing of tower is being carried out stubs are being imported for the foundation construction.

Impact of Flood on 24th Ashad 2077 (8th July 2020):-

Storage yard for Electro Mechanical equipment partly damaged by flood. Losses are yet to be estimated by surveyor of concerned insurance company.

Flood impact on Storage yard of Lot-2 (Electromechanical works)

Under construction powerhouse filled with the water and debris during the flood.

No any noticeable impact on constructed Structures during the flood in headworks, area.

Severe damages observed in Araniko Highway (Access to the Project Site) during the flood.

CHILIME ENGINEERING AND SERVICES COMPANY LIMITED (CHESCO):

Chilime Engineering and Services Company Limited is promoted by Chilime Jalavidhyut Comapany Limited with its 100% ownership to provide complete engineering and consulting services for the development of hydropower projects and other infrastructure works. ChesCo aims to be a major contributor to a sustainable development of the projects in Nepal as well as other parts of the world. Through the following simple distinct ways, we will achieve our goals:

- Development of employees' abilities and performance vide' emerging technologies;
- Achieve mutual goals with Clients through the best practices; and
- Strengthen our compliance with corporate values with ethical practices.

Since the establishment in 2016 AD, ChesCo is progressing towards the core vision in the field of engineering and services. A brief description of the services and under study projects are as follows:

1. Feasibility Study Projects:

a) Budhi Gandaki Prok Hydroelectric Project : ChesCo is undertaking the Feasibility Study of the project owned by Chilime Jalavidhyut Company Ltd. CJCL has obtained the Survey License for electricity generation of Budhi Gandaki Prok Hydroelectric Project (420 MW) in Gorkha District of Nepal. The Consultant has completed its topographical surveying works, ERT and Gauge installations. Likewise, hydrological, sedimentology, geological studies and field investigations related works are also in progress. The design team is engaged in optimization, layout and design works.

b) Seti Nadi-3 Hydroelectric Project: ChesCo is undertaking the Feasibility Study of the project owned by Chilime Jalavidhyut Company Ltd. CJCL has obtained the Survey License for electricity generation of Seti Nadi-3 HEP (65MW) in Bajhang District of Nepal. The Consultant has completed its topographical surveying works, Gauge installations, ERT, surface geological mapping. The optimization and hydraulic design, electromechanical and hydro-mechanical design, structural stability analysis and design works has been completed. Core Drilling works, rate analysis, project costing, planning and scheduling and financial analysis is ongoing.

c) Chumchet Syar Khola Hydroelectric Project: ChesCo is undertaking the Feasibility Study of the project owned by Chilime Jalavidhyut Company Ltd. CJCL has obtained the Survey License for electricity generation of Chutmchet Syar Khole HEP (60MW) in Gorkha District of Nepal. The topographical survey works has been completed. Automatic Gauge has been installed. Other field and design works are in progress.

2. Detailed Project Report:

a) Chainpur Seti Hydroelectric Project: Review and Update of the Feasibility Study Report of Chainpur Seti Hydroelectric Project (210MW) located in Bajhang District of Nepal which is owned and prepared by Nepal Electricity Authority has been completed. Likewise, an updated report in the form of a Detailed Project Report has been submitted to the Client.

3. Project Management and Construction Supervision:

ChesCo also provides services Project Management and Construction Supervision works. At present, ChesCo is engaged in services for design and supervision of Sanjen (Upper) HEP (14.8MW) and Sanjen Hydroelectric Project (42.5MW) which lies in Rasuwa District of Nepal. The Client is Sanjen Jalavidyut Company Limited. The construction works is being executed under FIDIC Red Book and FIDIC Yellow Book.

4. Modernization and Rehabilitation:

a) Phewa Hydropower Station: Nepal Electricity Authority, Generation Directorate awarded contract to ChesCo on September 12, 2019 for the Consulting Services to prepare EPC Tender Documents (Phase 1) and Supervision Works (Phase 2) for the Rehabilitation and Modernization of the Plant on September 12, 2019. The Station was commissioned on) June 12, 1969 by Nepal Electricity Authority with assistance from the Government of India. The Station has been in partial operation for many years and has now sought Rehabilitation and Modernization with updated technology for operation in

full load in safe and efficient manner. The Consultant conducted the Plant diagnosis, prepared a rehabilitation plan, financial viability assessment of the Rehabilitation and Modernization scheme, and prepared EPC tender documents. The Consultant has submitted the Final Report and Tender Documents marking the completion Phase 1 on February 2020.

b) Rehabilitation of Chilime Hydropower Plant: ChesCo is awarded the contract on November 19, 2020 to provide services to Chilime Jalavidhyut Company Ltd. for the design review and supervision works during installation for the rehabilitation of plant works. The design review works and FAT is completed.

5. Plant Operation and Maintenance:

Given the criticality of hydropower in the Nepal power sector and the Nepal economy, the existing O&M challenges pertaining to the hydropower generation in the country need to be addressed in order to achieve the Maximization of plant availability through reduction of forced outages; Fullest utilization of the hydro-generation assets; Most optimum, efficient and sustainable generation of hydro-electricity; and Sustainable revenue from the sale of hydro-electricity generated. Given the current level of O&M challenges faced by the Nepal hydropower plants and the vast upcoming hydropower capacity (around 5 GW) in the coming years, there will be a huge requirement of skill base pertaining to the O&M activities. ChesCo is planning to have a specialized team in future.

6. Tender Documents Preparation:

ChesCo has been providing services for the preparation of tender documents including technical specifications, drawings and cost estimate for civil, hydromechanical and electromechanical works. Assistance is also provided during the tender evaluation stage. At present, a complete set of EPC/Turnkey Tender Documents has been prepared and submitted to NEA based on FIDIC Silver Book and Yellow Book 2017 edition.

7. Geological and Geotechnical Investigation Works:

ChesCo also carries a detailed geological and geotechnical field exploration and testing of the laboratory samples, and has carried out ERT, SRT and MASW. ChesCo is equipped with WD240 and WD320 drilling machines required for the geotechnical investigation works. Drilling works at weir, intake, desander locations of SN3HEP are completed. At present, the drilling works is being carried out at Surge Tank area.

8. Environmental Impact Assessment:

ChesCo is carrying out the Environmental Impact Assessment (EIA) for the following projects:

a) Budhigandaki Prok Hydroelectric Project

b) Seti Nadi-3 Hydroelectric Project

c) Chumchet Syar Khola Hydrolectric Project

TRISHULI JAL VIDHYUT COMPANY LIMITED

Introduction

Trishuli Jal Vidhyut Company Limited (TJVCL), was established in 2011 with the main objective of developing the Upper Trishuli 3B Hydroelectric Project (37 MW) in Nuwakot and Rasuwa districts. Nepal Electricity Authority (NEA) and Nepal Doorsanchar Company Limited (NDCL) are the promoters of TJVCL. Both 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.

The 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. However, due to the impact of Covid-19, the Project is expected to be delayed by some time. 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**
Headpond and Approach Pressure Conduit	
Headpond: Approach Pressure Conduit:	29m (L) x 5.2 to 11.0 m (B) x 7.4 to 14.8 m (H) 243.47m (L) , 5.1m x 5.1m Box Culvert + 40m long, 5.1m dia. Steel Pipe
Headrace Tunnel	
Total Length	3805.48 m
Surge Tank	
Diameter	15 m
Height	39.3 m
Vertical penstock shaft	
Diameter Length	4.2 m (circular) 72 m
Powerhouse	
Type/ Length x width x height	Surface/ 40.42m×19.30m×33.81
Tailrace	
Length and Type	180 m, Box Culvert
Turbine	
Turbine Type/number	Francis (vertical axis)/2
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
Length of Transmission line (132 kV)	3 km
Cost and Financing	
Total Development Cost	NPR 8227 Million including Interest During Construction
Mode of Financing	30% Equity from the Promoters, 70% Debt from the Consortium of Banks led by Nabil Bank Limited

Following are the highlights of the Project activities of fiscal year 2076/77:

- Excavation for the Approach Pressure Conduit has been completed. Concreting is expected to begin after the end of current monsoon season.
- About 1175 m of Headrace Tunnel (HRT) excavation has been completed in fiscal year 2076/77. Till the end of fiscal year 2076/77, about 1800m (47%) of HRT excavation and temporary support installation has been completed.

Adit 2 Portal

- About 65% of Powerhouse excavation and slope support has been completed in the preceding fiscal year.

Powerhouse Slope Support

- Detail design of about 90% of the Hydro-mechanical equipment has been approved and manufacturing of those equipment is under way.
- Detail design of about 40% Electro-mechanical equipment have been approved. Turbine model test has been completed. Manufacturing of draft tube elbow has been completed. Manufacturing of spiral case, turbine runner is underway.

Turbine Model Test

Spread of Covid 19 in China and Nepal has seriously impacted the construction progress of the Project resulting in inability to meet the targets set for fiscal year 2076/77. Restriction of movement in China from beginning of February 2020, suspension of international flights and nationwide lockdown in Nepal from third week of March 2020 and the closure of Rasuwagadhi border continuously for six months has restricted the arrival of construction crew and construction equipment/material from China thereby making it very difficult to carry out any meaningful work. The Electro--mechanical/ Hydro-mechanical equipment design and manufacturing was also disrupted due to the closure of factories and businesses in China for about 3 months. The manufacturers have now resumed their work. It is envisaged that the work on all construction fronts of the Project will be resumed after the end of rainy season i.e. from October 2020.

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) have subscribed 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 Substation at Dhalkebar in Nepal has been implemented by 'Power Transmission Company Nepal Limited' (PTCN)- a Joint Venture Company of NEA, POWERGRID, HIDCL & IEDCL

Final executed project Cost of PTCN is NRs 1545.68 Mn. 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.

The 42.1 km long section of Dhalkebar-Mujaffarpur 400 kV double circuit

Transmission Line lying within the Nepalese territory was successfully constructed by PTCN and initially charged at 132kV voltage level under contingency arrangement in 19th Feb, 2016. Annual Turnover and Profit after Tax of PTCN during FY 2075-76 is 312.086 Mn and 126.56 Mn respectively.

NEA is presently drawing 145 MW of power from India through this line. Line has been sucessfully charged at 220 kV since 16.08.2018. Upon the completion of the 400 kV substation at Dhalkebar, this line is expected to be charged at 400kV by Aug 2020. Then after, Nepal will be able to import/export around 1000MW of power through this line from India.

(ii) India portion of Line consists of about 86 kms 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 Limited and NEA . The estimated cost of India portion is NR 3880 Mn (≈ INR 2425 Mn) and debt funding of NRs 3313 Mn (≈ INRs

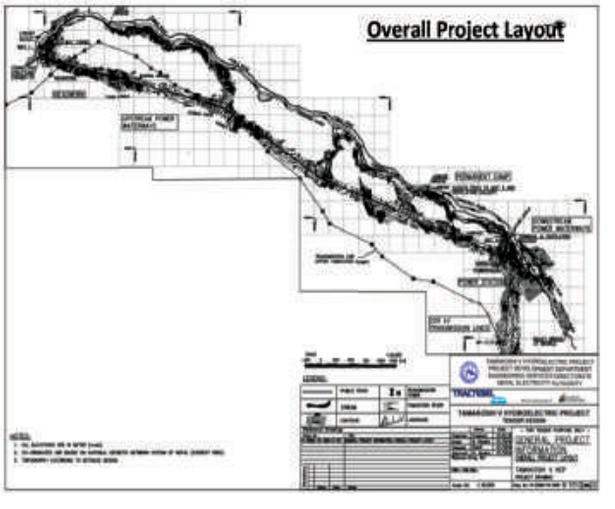
2070 Mn) is tied through Power Finance Corporation of India Ltd. Contracts for EPC for both Nepal & India Portions were awarded to M/s TATA Projects Limited and M/s KEC International Limited respectively following the International Competitive Bidding process undertaken by POWERGRID as Consultant.

TAMAKOSHI-V HYDROELECTRIC PROJECT

Tamakoshi V Hydroelectric Project is a cascade development of the Upper Tamakoshi Hydroelectric project (UTHEP) with tandem operation. The project area is located approximately 170 km north east of 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 m^3/sec and has installed capacity of 99.8 MW. Although the installed capacity of the project is 99.8 MW, maximum generating capacity of the project is 94.8 MW and the total energy generation is 543 GWh. An additional 5 MW unit is installed to obtain the minimum flow coming through the Upper Tamakoshi powerhouse during the off-peak operation hours. Hence, the 5 MW turbine will be operational for about 18 hours a day during 6 dry months.

General arrangement of the project comprises of underground interconnection system connecting headrace tunnel of the Project with tailrace tunnel of Upper Tamakoshi HEP. This 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. Water from tailrace of Upper Tamakoshi HEP is diverted through this interconnection system and conveyed to 8.13 Km long headrace tunnel, a 152.72 m (including bend) high drop shaft, underground powerhouse containing four Francis turbines, and 404.36 m long tailrace tunnel, from where it is released into the Tamakoshi river at about 0.7 km downstream from the confluence of Tamakoshi River and Khari Khola at Suri Dovan.

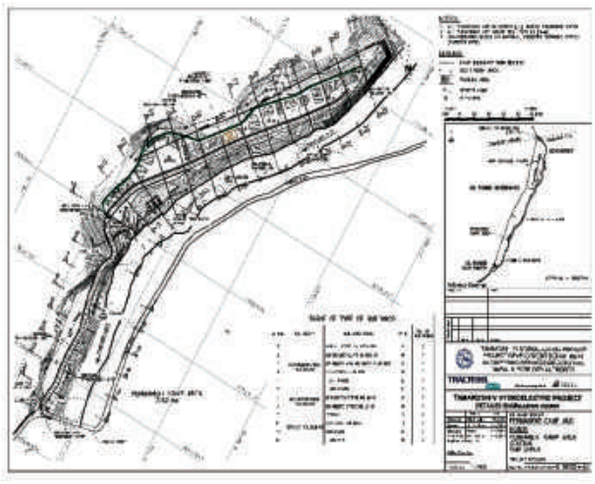
Generation license of the project was obtained from Department of Electricity Department (DOED) with revised license area on 2074/02/09.



Overall Project Layout

Tamakoshi Jalvidhyut Company Limited has been registered on 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. Supplementary Environment Impact Assessment (SEIA) of the project has

been approved by Ministry of Forest and Environment (MoFE) for increase in project capacity from 87MW to 99.8MW.



Layout of Permanent Camp

For the speedy implementation of Tamakoshi V HEP, NEA has already initiated the construction of Interconnection system between tailrace tunnel of Upper Tamakoshi HEP and headrace tunnel of Tamakoshi V using the Contractor working for the UTHEP with the arrangement of work variation of UTHEP. Construction of Interconnection Tunnel, Chamber and Gate Shaft and Adit Tunnel has been completed whereas the installation of gates at the interconnection will be completed soon.

The Detailed Engineering Design and Tender Document Preparation work for the project has been completed by consultant Tractebel Engineering GmbH (Formerly Lahmeyer International GmbH), and has submitted Final Detail Design Report and Tender Documents in August 2019. During Detailed Engineering Design and Tender Document Preparation work, apart from the other field investigation/s, as a part of Geotechnical investigation, a Test Adit was excavated with total length of 175.7m up to the whole length of powerhouse crown. The Excavated Test Adit, will later be used as cable and ventilation tunnel during operation phase of the project.

Land required for the powerhouse area and permanent camp area has been acquired. Land required to access the adit portals are under the acquisition process.

Interconnection System

The project has already initiated the process for the Construction of Permanent Camp Facility by inviting the interested bidders for the construction of the camp. Currently, evaluation of submitted bid is going on.

Beside this, preparatory works for Construction supervision and project construction of Tamakoshi-V Hydroelectric project; Expression of Interest (EOI) document along with Prequalification of Bidder documents [Contract 1-Civil and Hydro-mechanical works] has been issued and evaluation is in its final stage. Preparatory works for Prequalification of Bidder documents [Contract-2 Electro-mechanical works] has been initiated.

Nepal Electricity Authority (NEA) had requested Ministry of Energy (MOE) to request Ministry of Finance for needful doings for financing the project through AIIB as it is positive towards it. Ministry of Energy had requested the same with Ministry of Finance (MOF).

At present pre-concept approval has been issued by AIIB to this project. AIIB has provided grant of 900,000 US$ for the following additional studies:

1. Biodiversity Action Plan (BAP)
2. Supplemental Environmental and Social Documentation (SESD),
3. Panel of Technical Expert (PTE)
4. Free, Prior, Informed Consultation (FPICon) Process

Panel of Technical Expert (PTE) has reviewed the Project's Detailed Design Report and have submitted their comments/suggestions. Similarly, contract agreement was made between Tamakoshi Jalvidhyut Company Limited and the Consultant "Hagler Bailly Pakistan" for performing Biodiversity Action Plan (BAP) and Supplemental Environmental and Social Documentation (SESD). Currently, the consultant is carrying out above studies.

Consultant hiring process for FPICon study is under the evaluation of submitted EOI document. These activities are the pre-requirements of AIIB for funding the projects. Hence, these activities are being carried out in mutual coordination with AIIB.

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. Application for Generation License was submitted to DoED on 2076/03/17 and other related documents were provided to DoED on 2076/05/08 upon further query. The data of land for the Employer's Camp at Powerhouse Site is being collected from Survey Department, Ministry of Land Management, Cooperatives and Poverty Alleviation, Government of Nepal. In the fiscal year 2076/77, the evaluation of EOI for short listing of international consultants for Review of Feasibility Study Report, Preparation of Detailed Engineering Design and Bidding Documents was carried out and RFP for the same was also requested from the selected consultants and is being evaluated. The consultant will be selected and agreement signed in the first quarter of fiscal year 2077/78 and the Detailed Engineering Design of the project is expected to complete within the fiscal year 2078/79.

High level visit at the Project Site

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) 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 rock-fill 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.

(Proposed Reservoir Area)

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.

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 the 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, 2068 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.

Limitations on the assurance that internal audit can provide

Internal control systems, no matter how well designed and operated, are affected by inherent limitations. These include the possibility of poor judgment in decision-making, human error, control processes being deliberately circumvented by employees and others, management overriding controls and the occurrence of unforeseeable circumstances.

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

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.

Financial Audit	• Verification of the 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.

Progress Observed

❖ Audit Coverage (No of budget centers audited)

Offices	Financial Audit		Technical Audit		Management Audit	
	FY 2075/76	FY 2076/77 Quarterly & Half Yearly	FY 2075/76	FY 2076/77 Half yearly	FY 2075/76	FY 2076/77 Half yearly
Central Office	9	-	-	-	-	-
DCS Directorate	116	100	47	41	59	67
Transmission Directorate	45	21	8	1	4	2
Generation Directorate	26	17	5	10	11	8
Engineering Service Directorate	4	3	-	-	1	-
NEA Projects	19	1	-	-	2	-
Total	219	142	60	52	77	77

❖ Capacity Building & Resource Strengthening

- Service of 3 Chartered Accountants *(On Contract basis)* has been continued this year also for improving quality of audit, professional ethics and standards among the auditors.
- Planning for conducting training on M-Power (Revenue) software is on process for all the internal audit department members to enhance 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 Honorable Minister Mr. Barsha Man Pun 'Ananta', Ministry of Energy, Water Resources and Irrigation has been chairing the NEA Board Meetings since 25 Mangsir, 2075. The Ministry of Finance has nominated Mr. Ram Sharan Pudasaini, Secretary (Revenue) as the Board of Director of NEA from 22 Falgun 2076. Mr. Lal Shanker Ghimire and Mr. Shishir Kumar Dhungana, Secretary (Revenue) were the Board of Director earlier. Mr. Umesh Kumar Thani was appointed as the Board of Director on 30 Mangsir, 2073 and his resignation was approved by ministry on 27 Kartik, 2076. Mr. Rajendra Bahadur Chhetri was nominated as Board of Director from the decision of 28 Kartik 2076. Rest of the Board of Directors have remained unchanged; Mr. Dinesh Kumar Ghimire, Secretary, Ministry of Energy, Water Resources and Irrigation, Mr. Bhakta Bahadur Pun, Mr. Chet Raj Joshi and Mr. Bishwo Prakash Gautam are the other Board of Directors with Mr. Kul Man Ghising, MD, NEA as the Member Secretary.

A total of 35 Board Meetings were held in the last fiscal year, 2076/77. Some of the significant decisions were taken by Board are as:

- Requesting to Nepal Government through Ministry of Energy, Water Resources and Irrigation for Establishment of Nepal India 2nd Cross Border Transmission Line joint venture company between Nepal Electricity Authority and Power Grid Corporation of India.
- NEA Corporate Development Plan (2018-2023) was approved.
- NEA Employee Service by Law 1st Amendment was approved as per the consent of Public Service Commission.
- Nepal Financial Reporting Standards (NFRS) based accounting policies approved.
- Corona Insurance for NEA Employee approved.
- New Tariff Collection by Laws approved and issued as per the new tariff approved by Electricity Regulatory Commission.
- Requesting to Nepal Government through Ministry of Energy, Water Resources and Irrigation for Power Trading (Export/ Import) with India and other Neighboring countries. Now the Government has given approval as per the request of NEA.

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, 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. Installation of APFC panels at 49 nos of distribution transformers under Biratnagar Distribution Centre have already been completed and charged. APFC installation works at other distribution centers are underway. Works for Data uploading at cloud and enabling data analysis and remote monitoring are also being performed sideways.

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 2077/78.

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 9m steel tubular poles and also using the existing PSC/Steel poles wherever possible. 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 poles, cross-arms and light luminaires have already been delivered to sites, erection of poles and lights installation works are underway. Works of server installation at IT department and configuration of lighting management software are also being performed sideways.

As per the request of Bharatpur metropolitan city, a tender for 2000 nos of smart street lights and 4 nos of High Mast Lighting System had been published. The bid evaluation is underway and the contract execution is expected to begin in the first trimester of current FY.

Similarly, as per the request of other five municipalities viz Amargadhi, Belaka, Bhimeshwar, Bhimdatta and Kankai municipalities, a tender for a total of 340

nos of smart street lights and 16 nos of High Mast Lighting System had been published. The bid evaluation is underway and the contract execution is expected to begin in the first trimester of current FY.

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 program 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).

Battery Energy Storage System

The department is planning to implement Battery Energy Storage System (BESS) of 1 MW / 1 MWh capacity in the grid connected and off-grid system one each on pilot basis. Depending upon the success of the pilot project and its impact on NEA's Transmission/ Distribution system, the energy storage system shall be later replicated for extensive use in NEA's system.

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, Baneshwor substation, Bhaktapur substation, and Balaju substation. The department is planning to extend the system to other substations in the FY 2077/78.

Awareness Campaigning

The department has conducted several campaigns to create public awareness on energy efficiency and loss reduction. 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 and were broadcasted in the prime time 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 and were broadcasted in the prime time before news on Nepal Television.

B. Loss Reduction Division

Electricity Loss Reduction division which is under the Energy Efficiency and Loss Reduction Department led by manager is entrusted with the responsibility to control the electricity theft, energy leakage and loss. Division has been conducting activities that involves inspection of energy meters and responsible for conducting field raid operation when required. Division is dedicated towards supporting additional revenue generation by controlling electricity theft, pilferage, tampering, demand leakage, CT/PT outage, loss due to oversized transformers in LT consumers, wrong MF calculation and wrong connection.

Water pump operating with direct hooking found in Kalaiya DCS

Irrigation meter hanged on a wooden local pole in Lahan DCS

Target of Loss Reduction Division

In the fiscal year 2076/077, division had set target to inspect 500 consumers with TOD meters installed and 1000 consumers with whole current meters installed under different provincial offices. Focus has been given to industrial consumers. Division has also set target for monitoring inspection and data download of rural community consumers.

Besides the annual target, division also has conducted activities as directed by Managing Director, NEA as and when required. We have been progressing towards our set target but due to the COVID-19 pandemic, the division could not continue its Loss Reduction inspection process.

Meter inspection during fis. Year 2076/077 is as follows.

Out of set target, 956 whole current meters and 101 TOD meters were inspected under different provincial office. Detail field visit report and amount billed and to be billed are as follows

TOD Meter Inspection

Number of DCS visited,	No of TOD meter inspected	Reverse Energy found	CT/PT outages	Display out	MF missing	Unit recovered	Amount billed/to be billed Rs
25	101	186540	4	2	7	584454	73,36,708.43

Single phase meter bypass found in Kabhre DCS

CT operated electromechanical meter found in Janakpur DCS (PT outage)

Whole current meter Inspection

Nubmer of DCS visited	No of meter inspected	Theft case	Unit recovered	Demand leakage, stock unit and other cases	Amount billed/ to be billed Rs.
25	956	17	5929.88	208	14,97,967.39
Total unit recovered			Total amount billed/ to be billed		
5,90,383.88			Rs. 88,34,675.82		

ADMINISTRATION DIRECTORATE

Administration Directorate is responsible for overall planning, organizing, directing, implementing & monitoring of polices related to human resource management, recruitment management and general administrative and legal functions. This directorate is also accountable for circulating and implementing of the decision of NEA board and Managing Director as well as coordination of different directorate activities. It also works as a focal point to the oversight bodies 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 been amended its first edition.

"Centralized e-Attendance" has successfully tested and deployed from corporate office. Gradually, it will be implemented in regional and branch offices within this year as an integrated e-attendance system.

Organization and Management Study (O&M) committee has successfully completed the Study and submitted the report to the NEA management for necessary approval.

A complete Human Resource Information System (HRIS) is in the process of implementation. This will enhance the reliability of personnel database and other HR functions.

During the year under review different department, division and section have accomplished the following major activities:

1. Human Resource Division

Employees Status FY 2019/2020

The statistics of employed human resource till the end of fiscal year 2019/20 is given in the table.

Level	Service	Approved Position			Existing situation			
			Project	Total	Permanent	Periodical	Daily wages / contract	Total
Managing Director		1	0	1	**1**	0	0	**1**
DMD (Level-12)		9	0	9	9	0	0	9
Officer Level (Level 6-11)	Technical	1248	113	1361	1120	0	0	1120
	Non-tech	582	23	605	555	0	0	555
	Total	1830	136	1966	1675	0	0	1675
Assistant Level (Level 1-5)	Technical	5883	0	5883	4415	22	47	4484
	Non-tech	3284	0	3284	2555	13	27	2595
	Total	9167	0	9167	6970	35	74	7079
Grand Total		**11007**	**136**	**11143**	**8655**	**35**	**74**	**8764**

The total numbers of approved position in NEA stands at 11,143 whereas working staff by the end of FY 2019/20 remained 8655. Remaining vacant positions are in the process of recruitment via Public Service Commission. During the year under review, 449 employees got retirement, this retirement comprises of compulsory retirement of 308, voluntary retirements of 100, resignation of 23 and 18 employees have deceased during their service period.

During the year under review, the following activities were performed under disciplinary action.

Activities	No. of Employee	Remarks
Suspend	24	
Force dismissal	1	
Dismissal from Service	3	
Termination by Service	5	
Resume from Suspend	15	

Similarly, complaints from government agencies like Commission for the Investigation of Abuse of Authority (CIAA), National Vigilance Center and Ministry of Energy, Water Resources and Irrigation were received actions as following;

S. No.	Agencies	Total Complaint	Resolved	in process
1.	Complaint received from CIAA	119	96	23
2.	National Vigilance Center	6	3	3
3.	Ministry of Energy, Water Resources and Irrigation	11	11	0
4.	Complaint by employee	25	19	6

2. Employee Welfare Division

Employee welfare division under Human Resource Department has provided following facilities to the employees in accordance to NEA rules and regulations.

S. No.	Descriptions	Types	Nos.	Amount (Rs.)	Total Amount (Rs.)
1	Grant	Grant	1	20,000	22,55,000
		Kaj Kiriya	217	22,35,000	
2	Medical Insurance	Accidental	2	14,00,000	4,29,74,842
		Medical Treatment	1013	415,74,842	
3	Endowment Life Insurance	Payment received from Beema Corporation	378	2,39,35,292	91,88,34,533
		Additional Payment by NEA		32,79,18,761	
		Insurance Renewal	6699	56,69,80,480	
5	Soft Loan	Medical Treatment Loan	183	18,30,000	13,97,50,000
		Social Loan	195	39,00,000	
		House Maintenance Loan	205	1,02,50,000	
		Natural Disasters Loan	-	-	
		House/Land Purchase Loan	285	12,37,70,000	

3. Human Resource Planning and Development Section

Under the Human Resource Department, HR Planning's Development Section has accomplished the following works:

S. No.	Actions	Descriptions	Remarks
1.	Review report of Organization and Management Study (O&M) Report prepared and submitted to management for necessary approval	Organization Structure and positions are assigned as per Consumer, Revenue of DCS and Capacity of Substations	
2.	O & M survey has completed the newly established branches during F.Y. 2019/20	9 Distribution Centers, 1 Hydropower Station and 3 other offices	
3	Nomination for Post Graduates Study in NEA Expenses	Electrical - 4 Mechanical - 1 Civil- 2	7 Personnel
4	Pre-Approval for Self-Financing Study	Aboard-2	PhD-1 Post Graduate-1
5	Leave Granted for Study Purpose in Self Finance	Aboard-2	Post Graduate-2

6	Nomination for Factory Acceptance Test, Inspection, Pre-Dispatch Witness, Training, Conference in aboard	73 Programs	152 Personnel
7	Nomination in National Level Workshops, Trainings, Conference etc.	25 Programs	399 Personnel
8	Review of Temporary Positions for Projects	80 Projects including Hydropower, Transmission Line and substations etc.	
9	Nomination for Intern students from various academic institutions	14 Academic Institutions	206 Students
10	Nomination for Intern to individuals as per the recommendations of their academic institutions	13 Academic Institutions	19 Students

GENERAL SERVICE DEPARTMENT

General Service Department (GSD) is responsible for vehicle management, logistic support and security management activities. 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, the following grievances/complaints were lodged and resolved.

S. No.	Sources of Grievances	Total Complain	No. of Settled	Remarks
1.	Hotline Number (1150)	4095	4089	Six complaints were sent to concern office for necessary action.
2.	Hello Sarkar	76	74	Two complaints were sent to concern office for settlement.
3	Social Media (Facebook Page, Twitter)	223	220	Three were treated as non related to NEA.
4	Email	21	21	
5	Complain Box	4	0	All were sent to concern office for further enquiry.

Stakeholders can submit their complaints and give suggestions through various hotline media such as Hotline number 1150, *www.facebook.com/hellobidhut* and *www.twitter.com/hello_nea* & can get response in timely manner.

NEA has 33,608-7-3-1 Ropani land spread all over the country. Similarly, NEA has 1199 vehicles in service throughout the country of which, 1027 are in working condition.

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 is prepared and published by recruitment department. Similarly, it performs staff promotion as per the prevailing employees' service bylaws.

During the year, 114 deserving candidates for different level have been recommended for permanent service after completing the selection procedure, 1093 candidates are on the process of selection. Likewise, 470 employees of different levels were recommended for promotion to higher level.

Department has started application forms collection for open competition via web portal https://career.nea.org.np. During the year in review vacancy announcement was published on 2076/11/02 for various vacant positions and 28,982 applicants successfully applied via online system.

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 as cases related to NEA in the form of digital format.

The legal department also involves in arbitration, legal drafting, bid evaluation, investigation, case study and negotiations. In the same year, the department provided 88 numbers of legal advices to the different NEA offices. During the year, 165 number of cases were registered in different courts for and against of NEA. The different courts have finalized 67 number of cases, out of them, 63 verdicts were in favor of NEA and 3 cases were against the NEA, 1 case is in adjourn and 98 cases are under consideration for courts judgment. Most of the legal cases filed by industrial consumer related to dedicated feeder tariff has been settled by different courts in favour of NEA. Likewise, out of 4 cases registered in arbitration tribunal, 1 verdict was in favor of NEA, 3 cases were against NEA.

FINANCE DIRECTORATE

1. Introduction

The Finance Directorate, headed by 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. Two separate projects namely Institutional Strengthening Project and Physical Verification and Valuation of assets have been formed.

2. Operational Performance

Despite the impact by COVID-19, the year 2019/20 became another successful year for NEA in terms of operational and financial performance improvement. This was made possible by efficient management of energy including demand side management, Commerical operation of long awaited Trishuli HEP(60 MW) and commissioning of Kulekhani III HEP (14MW). Similarly, the private sector also commissioned about 135.39 MW new power plants and energy supplied to national grid during the year. Besides NEA adopted various rigorous measures to reduce losses by strengthening distribution network system, upgrading the capacity of transformers, bringing new substations into operations, load balancing and by organizing programs such as loss and leakage control activities, actions against hooking and awareness against electricity theft. The loss and leakage control activities carried out, reduced energy loss from 15.32% to 15.27%(provisional) even though this effort was marred by lockdown due to COVID-19 pandemic for the last 3 months. The availability of electricity for the fiscal year 2019/20 was targeted to 8,657 GWh, however the revised estimate is 7,741 GWh. Energy generation from NEA's hydro power plants recorded 3,021 GWh as compared to actual generation of 2,548 GWh in previous year 2018/19. 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 2,991 GWh which is higher by 801 GWh as compared to previous year 2018/19. Total import from India has been reduced by 39.55%

to 1,729 GWh from previous year's import of 2,813 GWh. Due to lockdown on COVID-19 pandemic, the industrial and commercial demand lessoned so that import was reduced as compared to budgeted figure. Despite the reduction of 1,084 GWh in import from India, NEA succeeded in increasing the total available energy by 189 GWh in the distribution system to 7,741 GWh.

NEA worked out its operations efficiently to increase the total availability of power from 33.74% of previous year to 39.02% this year. The percentage of energy supplied by IPPs and import from India constitutes 38.64% and 22.33% respectively. During the fiscal year 2019/20, NEA has estimated to sell 7,297 GWh internally, however due to the nationwide lockdown of COVID pandemic for 3 months (April to June 2020), offices, industries, factories, businesses were stand still and the consumption of electricity was not as per the estimation. The revised estimate till the end of this fiscal year is 6,422 GWh. However, contribution to the gross revenue by domestic consumers stands at 36.61 % only. On the other side, Industrial consumer category holds only 1.33% of entire consumer volume but contributes 42.05% to the total gross revenue Similarly, NEA had targeted to export 90 GWh of electricity to India whereas revised figure stands 107 GWh, a growth of 18.88%.

3. Number of Consumers

The consumer base at the end of the fiscal year 2019/20 was estimated to be 4.472 million revised estimates was reduced by 0.254 million resulting 4.218 million. The main reason behind is undoubtedly the months long shutdown due to COVID-19 pandemic. Though NEA sells power in bulk and provides support in operation and management to Various Community Rural Electrification Entities (CREEs) working under the Community Rural Electrification Program (CREP), the consumers of such CREEs are not included in the above figures.

In the FY 2019/20, the domestic consumer category remained the largest category with 93.26% share of the entire electricity consumers, while industrial consumers and other consumers remained at 1.33% and 5.41% respectively.

4. Revenue and Collection

The energy demand during this fiscal year was slightly less than targeted. however, NEA maintained optimum level of regular and reliable energy supply to bring about positive impact in its overall financial performance. The nationwide lockdown from April to June 2020 due to COVID pandemic seriously hampered various loss reduction activities such as timely meter reading, monitoring meter tempering and hooking wires to overhead distribution lines. The lockdown even decreased the energy demand substantially. However, the additional billing of dedicated tariff to industrial customers made during this fiscal year increased the sales revenue. The net income through sales of electricity for the fiscal year 2019/20 was estimated to be NRs. 75,966 million while the revised estimate stands at NRs. 68,534 million which is 9.78% less than the target.

The income from other services and finance income was estimated to be NRs.4,931.89 million and NRs. 3328.13 million while the revised estimate amounts to NRs. 5,361.33 million and Rs 3,904.56 million respectively in FY 2019/20. NEA had received NRs. 126 million as dividend. Out of investments in more than 25 companies, dividend has been provided by Chilime Hydropower Company Ltd, Power Transmission Company Nepal Ltd (PTCN), Cross Broder Power Transmission Ltd (CPTC) and Butwal Power Company Ltd. Other companies are under construction/ Initial

phase of operation; hence they are not able to declare dividend till date. NEA had estimated to collect NRs. 73,323 million from the sales of electricity in this fiscal year however the revised estimate is NRs. 59,540 million only. This reduction in cash collection is mainly because of not being able to collect the tariff from the domestic and other consumers in the months long nationwide lockdown and also not being able to collect the dedicated & trunk line receivables through supplementary billing in this FY. The total dues by the end of the fiscal year 2019/20 is NRs. 31,121 million. Out of this, NRs. 17,322 million is from industrial consumers including dues on dedicated & trunk line about NRs. 15,011 million, NRs. 469 million is from GoN offices and NRs. 3,544 million is from street light.

5. Supplementary Billing (Chhut Bill) to Dedicated and Trunk line customers

During the load shedding, energy consumption by industrial consumers through dedicated and trunk line was coined with premium tariff. When some consumers denied to pay the tariff, the court gave its verdict in favor of NEA. However, bearing the demands of industrialists in mind, council of ministries, GoN formed a high-level committee for fact finding. The committee has already submitted its report to the council of ministries. If the receivables from the sales of energy through dedicated and trunk line in premium tariff could not collected in time, it would certainly impact on profit/ loss.

Billed amount against dedicated and trunk line is NRs. 9,817 million in this fiscal year. A total of NRs. 6,044 million out of above NRs. 9,817 million was billed against the consumption of energy in previous year. NRs. The energy consumed in previous years but billed in this year has been shown as prior period income.

6. Cost of Sales

NEA's total cost of sales decreased from NRs. 52,134 million to NRs. 50,291 million in the year 2019/20. Cost of sales include generation cost, transmission cost, distribution cost, power purchase cost and royalty cost. Major reduction in cost of sales experienced under the head of power purchase cost. NEA recorded NRs. 38,896 million as power purchase cost in 2018/19 which has been reduced to NRs. 35,197 million in 2019/20 which was decreased due to decrease in power import from India. Generation and Transmission cost reached to NRs. 2,114 million and NRs. 2,156 million respectively. NEA increased investment for strengthening distribution system throughout the country that resulted into increase in distribution costs from NRs. 8,068 million to NRs. 9,252 million. Other cost of sales included royalty expenses that accounted to NRs.1,571 million.

7. Other Costs

Interest cost on long term borrowing increased by NRs. 752 million during this year. Interest expense in this FY 2019/20 has been calculated to NRs. 4,738 million as compared to NRs. 3,985 million in the FY 2018/19. Likewise, depreciation expenses on property, plant and equipment resulted into NRs. 5,000 million in FY 2019/20 against NRs. 4,852 million in FY 2018/19. NEA recorded foreign exchange loss of NRs. 436 million in FY 2019/20 while it was only Nrs. 9 million in FY 2018/19. The heavy loss was due to foreign currency translation loss to Japanese Yen (for the loan taken on Kulekhani Disaster Prevention Project). Foreign exchange loss was significantly increased in fiscal year 2019/20. NEA estimated provision of NRs. 3,500.00 million in FY 2019/20 towards long term employee liabilities with respect to gratuity, pension, medical facilities and accumulated leave facilities under employees'

benefit plan scheme which is 23% higher than FY 2018/19. NEA had made the provision of Nrs. 2,845 million in FY 2018/19 based on the actuarial valuation report till that date.

8. Profit & Loss

NEA experienced continuously remarkable improvement in its operating performance as compared to last financial year. Net profit before for the year 2019/20 increased by 12.36% to reach at NRs. 11,056 million (Provisional) from NRs. 9,840 million in FY 2018/19. Reduction in system losses, increase in supply to industrial consumers, efficient control and reduction in operating cost, increase in power generation from its own power plants, uninterrupted and reliable power supply and efficient management of funds all contributed to achieve net profits for the year under review. NEA has successfully reduced accumulated losses from NRs. 12,234 million to accumulated profit of NRs. 4,866 million in F/Y 2019/20. This was possible by supplementary (Chhut) billing amounting to NRs. 6,044 million and current year's profit of NRs. 11,056 million.

9. Other Non-Current Assets

Non-current assets include Property, Plant & Equipment (PPE), Capital Work in Progress (CWIP), Investments, Loan & Advances measured at amortized cost. Property, plant and equipment (PPE) constitute the largest component of NEA's return generating assets. Net carrying amount of PPE reached to NRs. 155,977 million at the end of the FY 2019/20. During the year, NEA completed various distribution system reinforcements, rural electrification projects, sub-stations and distribution line projects which contributed an additional net capitalization of NRs. 35,000 million in property, plant, and equipment. This includes capitalization newly commissioned Trishuli 3A HEP (60 MW) and Kulekhani HEP (14 MW).

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. 124,474 million with net addition of NRs. 54,633 million for the year 2019/20. 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, transmission line and substation projects of different voltage levels and rural electrifications in the various parts of the country.

Investments in subsidiaries, associates, joint ventures and others reached NRs. 47,708 million in the year 2019/20. During the year, NEA increased its investment in subsidiaries and other companies by NRs. 2,659 million. At the end of the FY 2019/20, total investment in Upper Tamakoshi Hydropower Co. Limited reached NRs. 4,341.90 million as equity and NRs. 19,554 million including interest capitalization as long-term loan. Further investment includes NRs. 2,570.36 million & NRs. 10 million respectively in Citizen Investment Trust for gratuity payment and retirement fund respectively. Fair value adjustment in investments as per NFRS of NRs. 8,986.34 million has also been included under investment of various Subsidiaries, Joint ventures & Associates.

10. Current Assets

Current Assets include Inventories, trade receivables, prepaid advances & deposits, Cash & Cash equivalents and Current tax assets. Trade receivable for this year is estimated to be NRs. 31,121 million which has been increased by 65% as compared to previous FY 2018/19.

Large trade receivable was reflected due to non-recovery from customers during lockdown and dedicated & trunk line billing. Dedicated & trunk line billing receivable amount is not recovered yet. Current assets cover 19% of total assets for this fiscal year.

11. Non-Current Liabilities

Total long- term borrowings from GoN, the main source of project financing, reached to NRS. 155,549 million in FY 2019/20 from NRs. 123,759 million in FY 2018/19. NEA received NRs. 12,371 million as long-term loan from GoN internal source to invest in different projects. In the similar manner, donor agencies provided around NRs. 18,670 million as long-term loans and grants through direct payment to the consultants and contractors as per GON budgetary program in the FY 2019/20. In addition to this, GoN also provided NRs. 6,737 million as equity investment in NEA.

12. Current Liabilities & Provisions

Current liabilities include trade & other liabilities and short-term borrowings. Loan repayment within next 12 months has been presented under short term borrowing as per the requirement of NFNRS. Since NEA's internal cash generation are used for projects constructions, all reflected short-term borrowings loans have not been paid to GON as per loan agreement. Current liabilities cover 24% of total liabilities during this fiscal year. During the year, NEA contributed NRs. 1,571 million towards royalties, NRs. 4,550 million as arrears of interest on long term loan.

13. Financial loan Covenants

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 <3 months). NEA met all these covenants except ACP in this FY.

14. Donor's Commitment

For the electrification of Province 5,6 and 7, Asian Infrastructure Investment Bank (AIIB) and European Investment Bank (EIB) committed to provide an amount equivalent to USD 112.3 million and Euro 100 Million respectively as concessional loan to NEA. The subsidiary loan agreement (SLA) with GON is under process. Similarly, Asian Development Bank (ADB) also provided its commitment to provide an amount equivalent to USD 200 Million as concessional loan for the development of power transmission and distribution system strengthening under SASEC. Under this project, Norwegian grant amount to USD 35 Million will also be received as committed by Government of Norway.

In addition to this, ADB has further committed to provide an amount equivalent to USD 156 Million for the automation and modernization of electricity grid.

15. Accounts and Audit

Accounts department is responsible to maintain accounts, prepare financial statements, conduct statutory audits, settlement of irregularities, dealing with tax authorities etc. Large Tax Payer's Office has concluded final income tax assessment up to the FY 2015/16. NEA expects to settle long pending audit qualifications worth NRs. 1.05 Million 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. Accounts department is coordinating with auditors and management to complete audit within specified period.

NEA prepared its first time adopted NFRS based financial statements for the F/Y 2018/19. The statutory audit for the year 2018/19 was completed within a period of nine months after the end of fiscal year. Office of the Auditor General has appointed Mr. Anup Kumar Shrestha, Mr. Narayan Bajaj and Mr. Prabin Dhoj Joshi, Fellow Chartered Accountants, to carry out statutory audit for the financial year 2019/20. The auditors have commenced their audit procedures by submitting audit-planning memorandum. NEA is in a process of strengthening financial accounting and management decision support system. During this year an Interunit automation system was implemented in CAIS (accounting software) system, where interunit vouchers created by one accounting unit will be automatically reconciled upon accepting/rejecting online by another accounting unit.

16. Institutional Strengthening Project (ISP)

Information Technology (IT) is evolving in every sector of businesses and Nepal Electricity Authority is too modernizing its various operational activities to enhance its efficiency. NEA is in the process of strengthening financial accounting and management decision support system. Institutional Strengthening Project (ISP), a World Bank Funded Project, is functioning under the Finance Directorate. The main objective of the project is to procure and implement ERP based system consisting of two major blocks namely a) Integrated Financial Management Information (IFMIS) and b) Revenue Management System (RMS) in NEA. IFMIS further comprises of Financial Management, Materials Management, Fixed Assets, Project Cost Accounting, Payroll & Human Resource Management Information System modules while RMS comprises of Meter Management for traditional meters, Consumer Management, Billing and Collection and Energy Audit modules.

The project had invited bid documents through global tender. Presently, the financial proposal of the technically qualified bidder is in the process of evaluation.

17. Assets Verification & Valuation Project

Asset Verification and Valuation at Nepal Electricity Authority (AVNEA) is a World Bank funded project under Power Sector Reform and Sustainable Hydropower Development Project (PSRSHDP). The main objectives include Conduction of Physical Verification of Assets & Inventories of NEA, Development of Database/ Register, Valuation, Recommendation of adjustments based on valuation and Develop standard operating procedures/ manuals for PPE& Inventories as per NFRS. The created database will be synchronized with the ERP System which is being implemented by NEA. A Contract for Consultancy Services has been signed with Deloitte Touche Tohmatsu, India LLP. This project is expected to complete on October 2021.

Nepal Electricity Authority

Highlights of FY 2019/20

Description	FY 2020*	FY 2019	Increase/(Decrease)	
			Amount	%
Revenue				
Net Sales Revenue from Electricity (M.NRs.)	68,534	66,613	1,921	2.88
Income from other Services (M.NRs.)	5,226	4,660	566	12.15
Total Revenue (M. NRs.)	73,760	71,273	2,488	3.49
Operating Expenses			-	
Generation Expenses (M. NRs.)	2,114	1,767	347	19.66
Power Purchase- IPPs (M. NRs.)	21,608	15,942	5,666	35.54
Power Purchase-India (M. NRs.)	13,589	22,954	(9,365)	(40.80)
Royalty (M. NRs.)	1,571	1,502	69	4.59
Transmission Expenses (M. NRs.)	2,156	1,901	255	13.43
Distribution Expenses (M. NRs.)	9,252	8,068	1,184	14.68
Administration Expenses (M. NRs.)	2,779	2,236	543	24.26
Depreciation & Amortization Expenses (M. NRs.)	5,000	4,852	148	3.05
Total Operating Expenses (M. NRs.)	58,069	59,222	(1,153)	(1.95)
Operating Surplus (M. NRs.)	15,691	12,051	3,640	30.21
Finance Income (M. NRs.)	(4,040)	(4,934)	894	(18.11)
Finance Cost (M. NRs.)	4,738	3,985	752	18.88
Other losses/(Gain)/Forex (M. NRs.)	436	9	427	4,626.24
Provision for Employee benefits (M. NRs.)	3,500	2,845	655	23.02
Net Profit/(Loss) (M. NRs.)	11,056	9,840	1,216	12.35
Long-Term Borrowings (M. NRs.)	155,549	123,759	31,790	25.69
Net Property, Plant & Equipment (M. NRs.)	155,977	125,977	30,000	23.81
Number of Consumers	4,217,710	3,909,641	308,069	7.88
Total Sales of Electricity (GWh)	6,529	6,338	191	3.01
Internal Sold/Utilized (GWh)	6,422	6,303	119	1.88
Annual Average Consumer's Consumption (kWh)**	1,548	1,621	(73)	(4.52)
Average sales Price of Electricity (NRs./kWh)	10.62	10.65	(0.03)	(0.26)
Peak Load Interconnected System (GWh)	1,407.94	1,320.28	87.66	6.64
Total Available Electric Energy (GWh)	7,741	7,551	189	2.51
NEA Hydro Generation (GWh)	3,021	2,548	473	18.57
Thermal Generation (GWh)	0.06	0.12	(0.06)	(50.86)
Purchased Energy (GWh)- India	1,729	2,813	(1,084)	(38.55)
- Nepal (Internal)	2,991	2,190	801	36.57
Average Power Purchase Rate-IPPs (NRs./kWh)	7.22	7.28	(0.05)	(0.75)
-India (NRs./kWh)	7.86	8.16	(0.30)	(3.66)
Exported Energy (GWh)	107	35	72	207.19
Self Consumption (GWh)	30	56	(27)	(47.11)
Net System Losses (Percentage)	15.27	15.32	(0.05)	(0.30)

Note: *Provisional figures (Subject to audit)
**On internal sales

Nepal Electricity Authority

Statement of Financial Position

Particulars	2020*	2019	2018	2017	2016	2015	2014	2013	2012	2011
Assets										
Non Current Assets										
Property, Plant and Equipment	155,977	125,977	112,985	90,341	88,521	86,439	84,239	83,873	85,461	84,725
Capital WIP	124,474	104,841	77,607	80,272	66,684	58,052	46,994	39,843	29,905	22,832
Investment in Subsidaries & Associates	47,708	45,049	37,793	33,741	21,755	17,551	12,288	6,808	5,049	4,855
Loans and Advances measured at Amortised Cost **	1,596	1,579	1,132	663	651	625	657	605	622	606
Total Non Current Assets	**329,755**	**277,446**	**229,517**	**205,018**	**177,611**	**162,667**	**144,178**	**131,129**	**121,037**	**113,019**
Current Assets										
Inventories	9,953	9,483	7,544	4,218	3,376	3,170	2,859	3,043	3,034	2,503
Trade and other receivables	31,121	18,854	15,951	13,955	11,187	9,927	9,016	7,930	6,693	6,871
Prepaid, Advances and Deposits	4,173	2,699	3,507	3,700	3,153	3,158	2,988	2,696	3,601	2,371
Cash and Cash Equivalents	27,825	38,877	34,495	24,824	15,362	10,622	6,122	4,715	2,697	2,017
Current Tax Assets	2,673	2,412	1,909	1,611	-	-	-	-	-	-
Total Current Assets	**75,745**	**72,324**	**63,405**	**48,309**	**33,078**	**26,877**	**20,984**	**18,384**	**16,025**	**13,762**
Total Assets	**405,500**	**349,770**	**292,922**	**253,326**	**210,689**	**189,544**	**165,162**	**149,513**	**137,062**	**126,780**
Liabilities										
Non Current Liabilites										
Long Term borrowings	155,549	123,759	109,550	100,063	111,304	98,253	82,692	75,035	68,909	62,632
Deferred tax Liabilities	2,244	2,244	2,040	2,598	693	693	693	693	693	693
Employees Retirement Provisions	32,302	28,802	25,945	23,426	21,359	19,309	17,259	13,717	11,561	7,467
Total Non Current Liabilites	**190,095**	**154,805**	**137,535**	**126,087**	**133,356**	**118,256**	**100,644**	**89,445**	**81,164**	**70,792**
Current Liabilties										
Trade and other liabilities	46,839	56,823	59,292	54,484	51,324	45,743	37,637	33,019	29,137	27,826
Short term Borrowings**	14,247	12,244	10,711	10,619	-	-	700	1,200	3,500	790
Total Current Liabilites	**61,086**	**69,067**	**70,003**	**65,102**	**51,324**	**45,743**	**38,337**	**34,219**	**32,637**	**28,616**
Total Liabilities	**251,181**	**223,872**	**207,538**	**191,189**	**184,681**	**163,999**	**138,982**	**123,665**	**113,801**	**99,408**
Equity										
Share Capital	139,541	128,441	102,438	82,411	58,528	49,275	44,511	37,365	31,422	25,695
Retained Earnings ***	4,866	(12,234)	(25,301)	(28,424)	(34,608)	(25,751)	(20,239)	(13,238)	(9,867)	-
Other reserves	9,911	9,691	8,247	8,150	2,089	2,022	1,909	1,721	1,706	1,678
Total equity	**154,319**	**125,898**	**85,384**	**62,137**	**26,009**	**25,546**	**26,181**	**25,848**	**23,262**	**27,372**
Total Equity and Liabilites	**405,500**	**349,770**	**292,922**	**253,326**	**210,689**	**189,544**	**165,162**	**149,513**	**137,062**	**126,780**

* Provisional Figures (Subject to audit)

**Presented as per NFRS adjustments since 2017.

*** Year 2020 Includes Trunk & Dedicated line bill amount Rs 6,044 million of previous years.

Nepal Electricity Authority

Statement of Profit or Loss

Particulars	2020*	2019	2018	2017	2016	2015	2014	2013	2012	2011
Sales Revenue	68,534	66,613	55,358	46,796	31,824	30,169	28,206	25,355	20,089	17,947
Less: Cost of Sales										
Power Purchase Cost- IPPs	(21,608)	(15,942)	(14,270)	(12,281)	(8,278)	(8,462)	(8,977)	(7,891)	(6,938)	(6,092)
Power Purchase Cost- India	(13,589)	(22,954)	(19,861)	(16,052)	(14,054)	(10,748)	(8,065)	(5,681)	(5,010)	(4,401)
Other Cost of Sales	(15,094)	(13,238)	(12,635)	(11,296)	(8,982)	(8,198)	(7,869)	(7,040)	(6,196)	(5,135)
Total Cost of Sales	**(50,291)**	**(52,134)**	**(46,766)**	**(39,629)**	**(31,314)**	**(27,408)**	**(24,911)**	**(20,612)**	**(18,144)**	**(15,628)**
Gross Profit	**18,243**	**14,479**	**8,592**	**7,167**	**510**	**2,761**	**3,294**	**4,742**	**1,944**	**2,319**
Other Income	5,226	4,660	3,186	2,471	1,792	1,995	1,610	1,539	1,373	978
Personnel Expenses Including retirement benefits	(5,899)	(4,944)	(4,215)	(3,374)	(3,039)	(3,189)	(4,579)	(3,198)	(4,890)	(2,507)
General Administration Expenses	(308)	(270)	(219)	(237)	(144)	(134)	(150)	(163)	(163)	(195)
Depreciation and Amortisation Expenses	(5,000)	(4,852)	(4,210)	(3,755)	(3,554)	(3,471)	(3,297)	(3,229)	(3,176)	(3,031)
Other Operating Expenses	(72)	(57)	(87)	(67)	(52)	(58)	(48)	(34)	(24)	(47)
Operating Profit	**12,190**	**9,016**	**3,046**	**2,205**	**(4,487)**	**(2,097)**	**(3,170)**	**(343)**	**(4,936)**	**(2,483)**
Finance Income	4,040	4,934	3,522	2,436	1,458	1,122	547	330	323	405
Finance cost	(4,738)	(3,985)	(3,283)	(3,546)	(5,080)	(4,670)	(4,235)	(4,040)	(3,885)	(3,594)
Other gains/(losses)/Forex	(436)	(9)	(278)	411	(746)	523	53	652	(897)	(85)
Impairment (Charge)/ Reversal	-	(172)	(30)	-	-	-	-	-	-	-
Other Non-operating expenses	-	(11)	(31)	(3)	(34)	(8)	(3)	(5)	(552)	(331)
Share of profit from investment in JV/Associates	-	68	29	-	-	-	-	-	-	-
Profit before income tax	**11,056**	**9,840**	**2,975**	**1,502**	**(8,890)**	**(5,130)**	**(6,808)**	**(3,405)**	**(9,948)**	**(6,089)**
Income Tax expense	-	(36)	(79)	-	-	-	-	-	-	-
Deferred Tax (Charge)/Reversal	-	9	543	-	-	-	-	-	-	-
Profit for the period	**11,056**	**9,812**	**3,439**	**1,502**	**(8,890)**	**(5,130)**	**(6,808)**	**(3,405)**	**(9,948)**	**(6,089)**

* Provisional Figures (subject to Audit)

Significant Accounting Policies and Explanatory Notes

For the year ended Ashad 31, 2077 (July 15, 2020)

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 In- come, 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 recognizing 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 labor, 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 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/Amortization

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 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.

2.5 Capital Work in Progress (CWIP)

All expenditures in developing property, plant and equipment not yet completed or not ready to use is categorized 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).
- Amortized 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 Amortized 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 recognized 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 realizable 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 capitalized 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 recognized at gross value corresponding amount is recognized 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 amortized cost and any difference between the proceeds (net of Transaction costs) & the redemption value is recognized 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 recognized 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 recognized 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 recognized 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 recognized 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 recognized 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 recognized 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 recognized 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 recognized 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 recognized 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 recognized 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 recognized 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 recognized 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 recognized only to the extent there is reasonable certainty of realization in future.

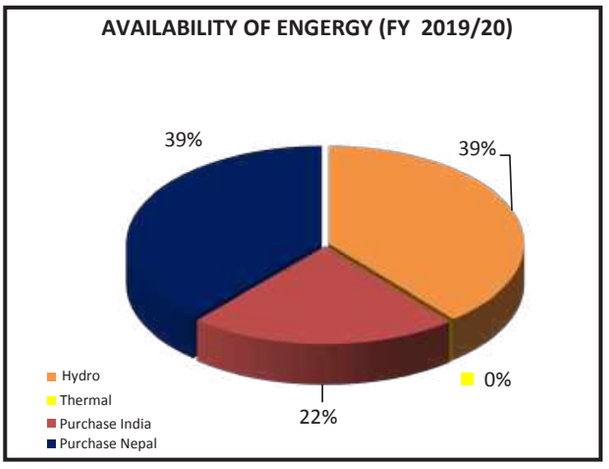
2.28 Finance Cost

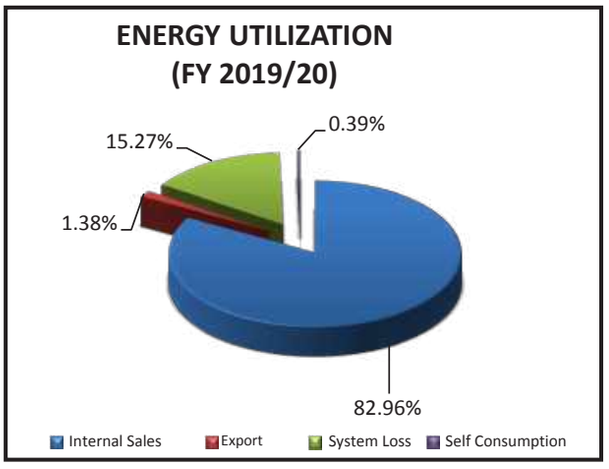
Finance costs includes borrowing cost and other interest expenses & charges on borrowings. Borrowing costs that are directly attributable to the construction of a qualifying asset are included in the cost of that asset. Other interest & charges on borrowing are treated as an expense in the period in which it occurs.

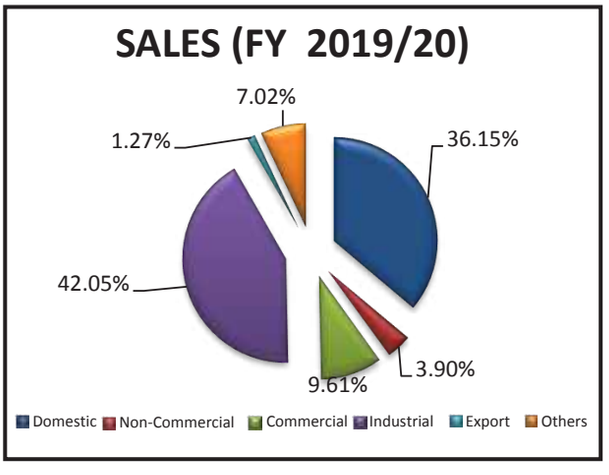
2.29 Foreign Currency Transactions

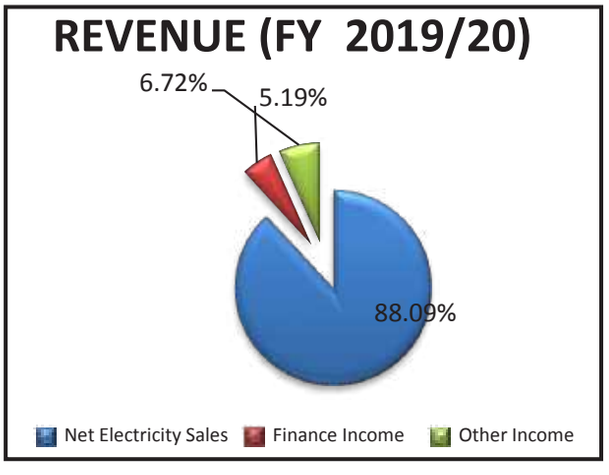
The transactions in foreign currency recognized at the prevailing rate on transaction date. The balances of monetary assets and liabilities in foreign currencies are translated at closing rate. The resulting gain or loss due to the translation is taken to Statement of Profit or Loss.

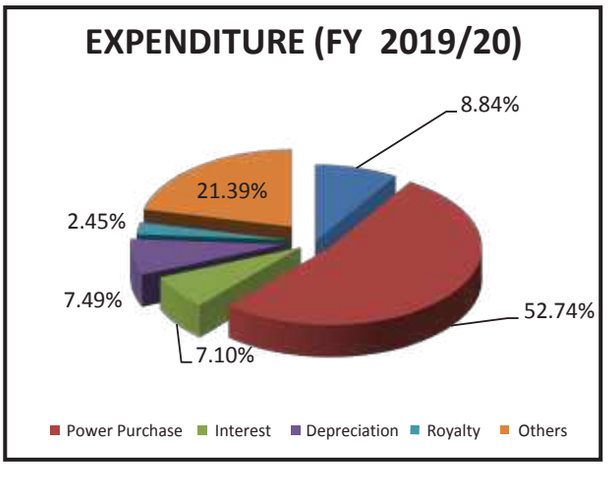
STATISTIC & SCHEMATICS

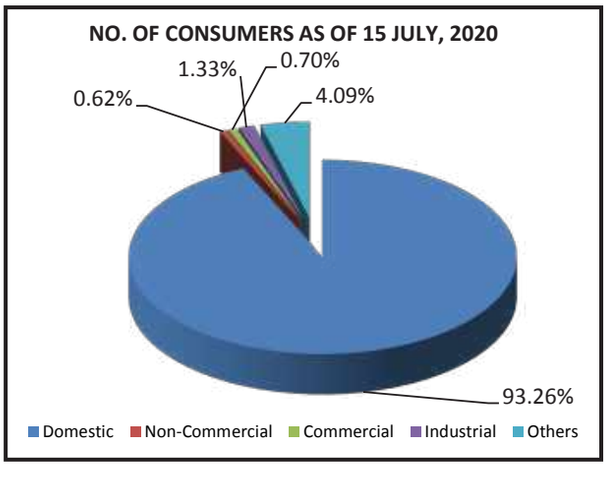






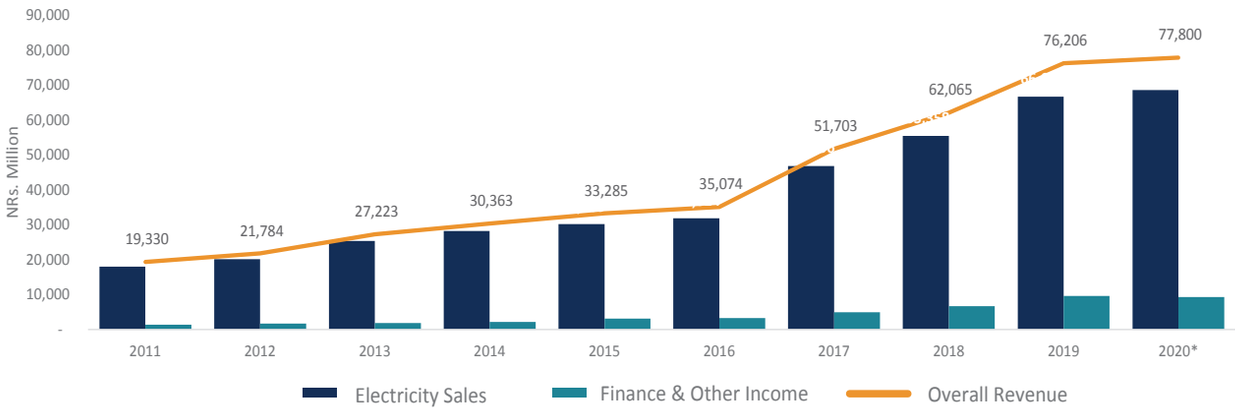




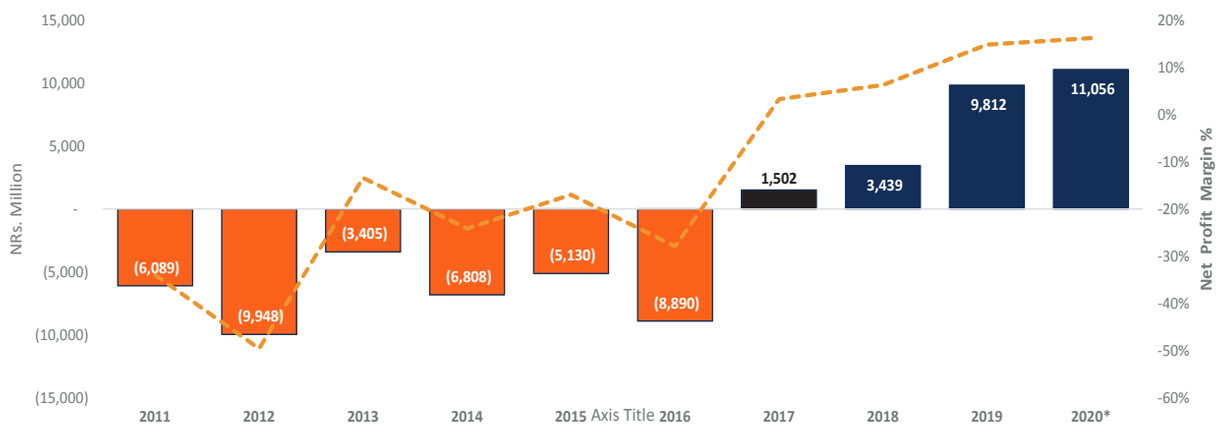


FINANCIAL DASHBOARD

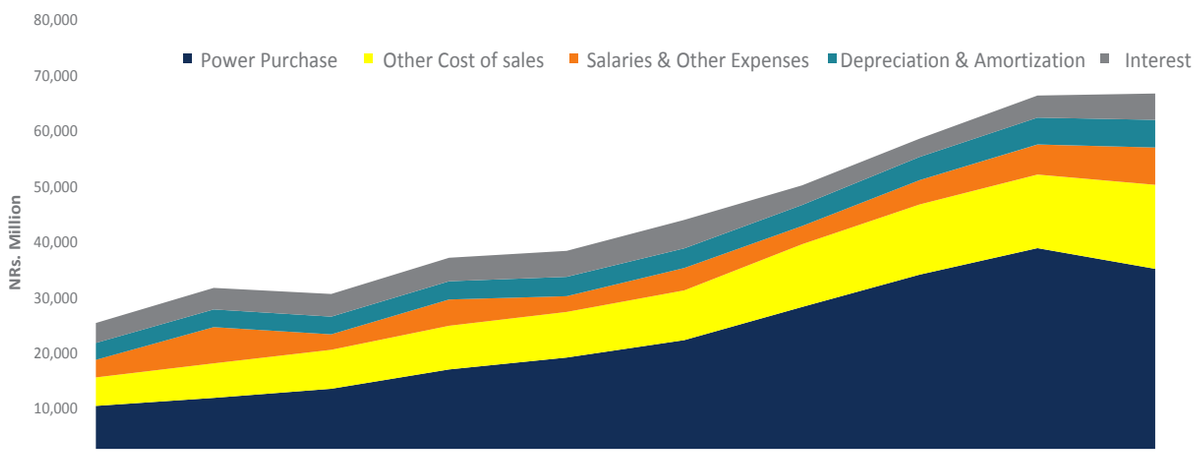
Overall Revenue including Other Income

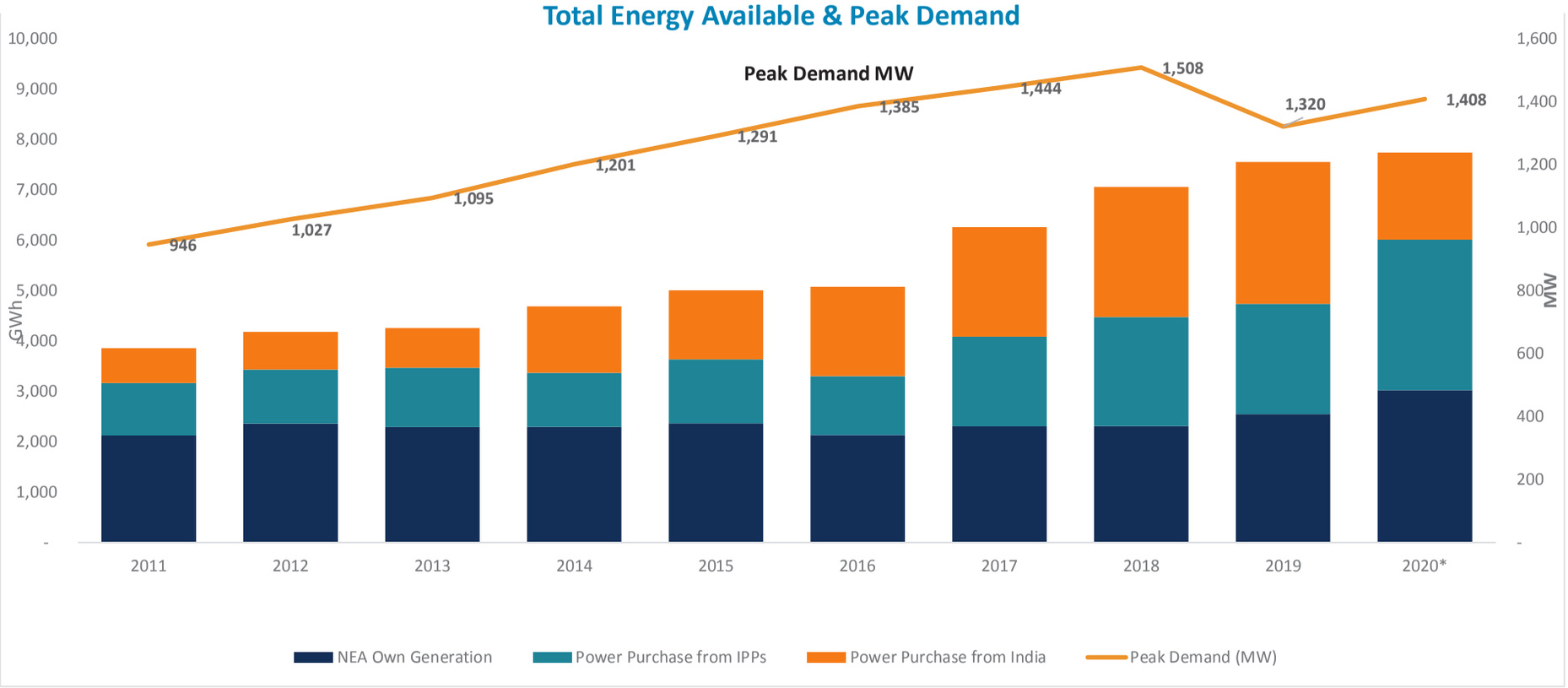


Profit & Loss & Net Profit Margin



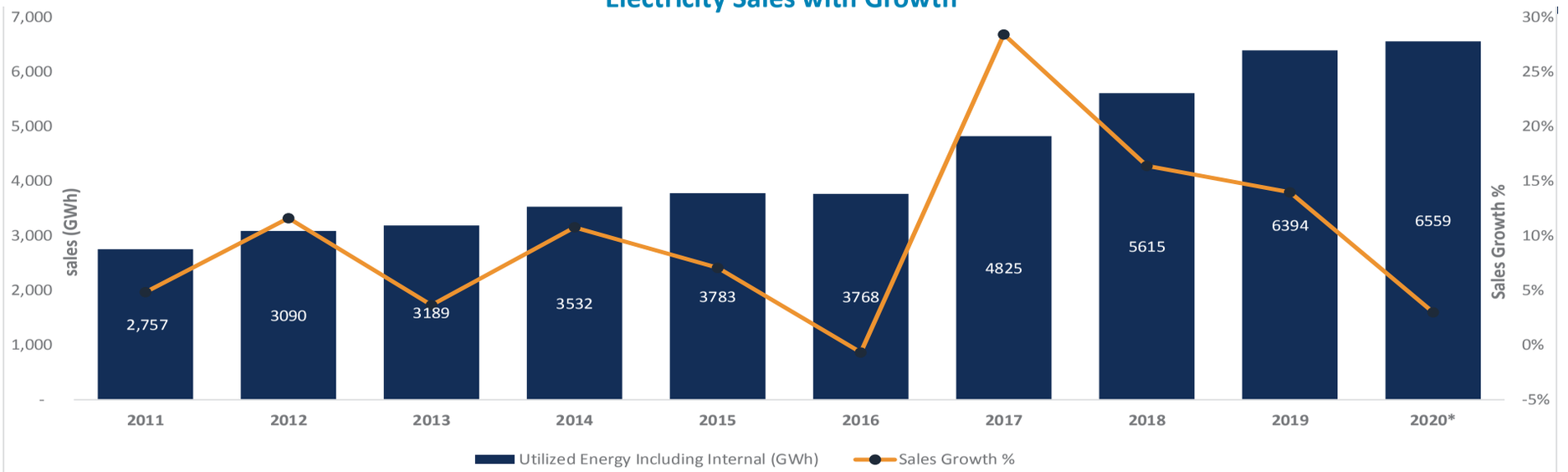
Expenses Breakup



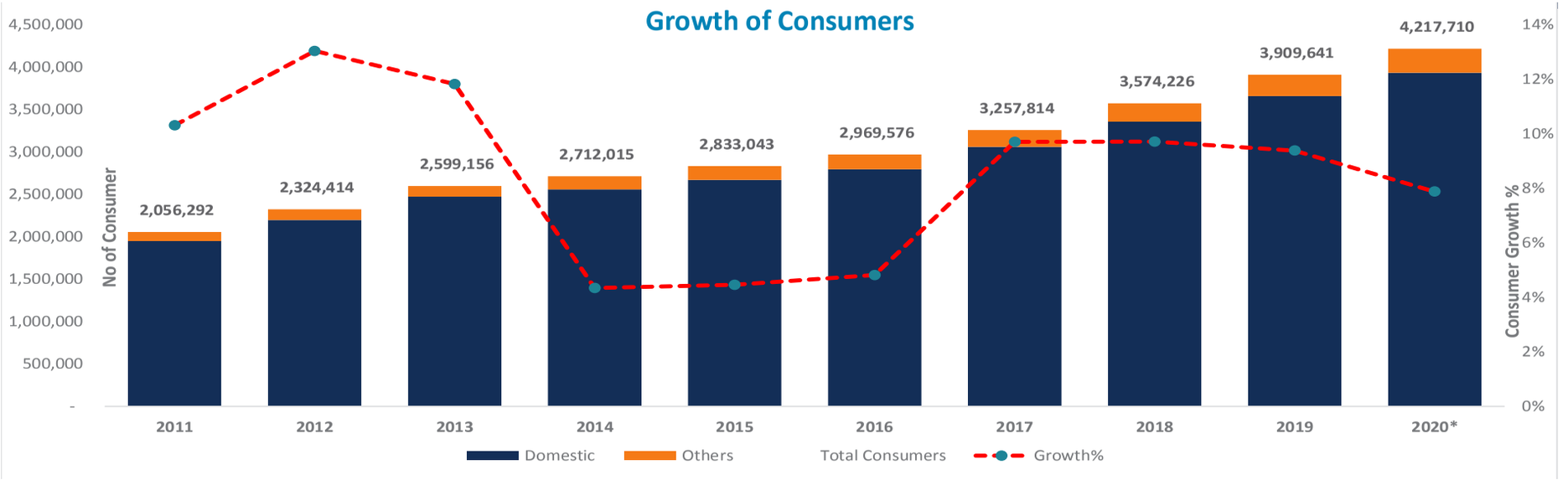


Particulars	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020*
Availability (GWh)										
NEA Own Generation	2,125	2,359	2,292	2,298	2,368	2,133	2,305	2,308	2,548	3,021
Power Purchase from IPPs	1,039	1,074	1,176	1,070	1,269	1,166	1,778	2,168	2,190	2,991
Power Purchase from India	694	746	790	1,319	1,370	1,778	2,175	2,582	2,813	1,729
Total Availability (GWh)	3,858	4,179	4,258	4,687	5,007	5,077	6,258	7,058	7,551	7,741
Peak Demand (MW)	946	1,027	1,095	1,201	1,291	1,385	1,444	1,508	1,320	1,408
* Provisional Figures (Subject to audit)										

Electricity Sales with Growth

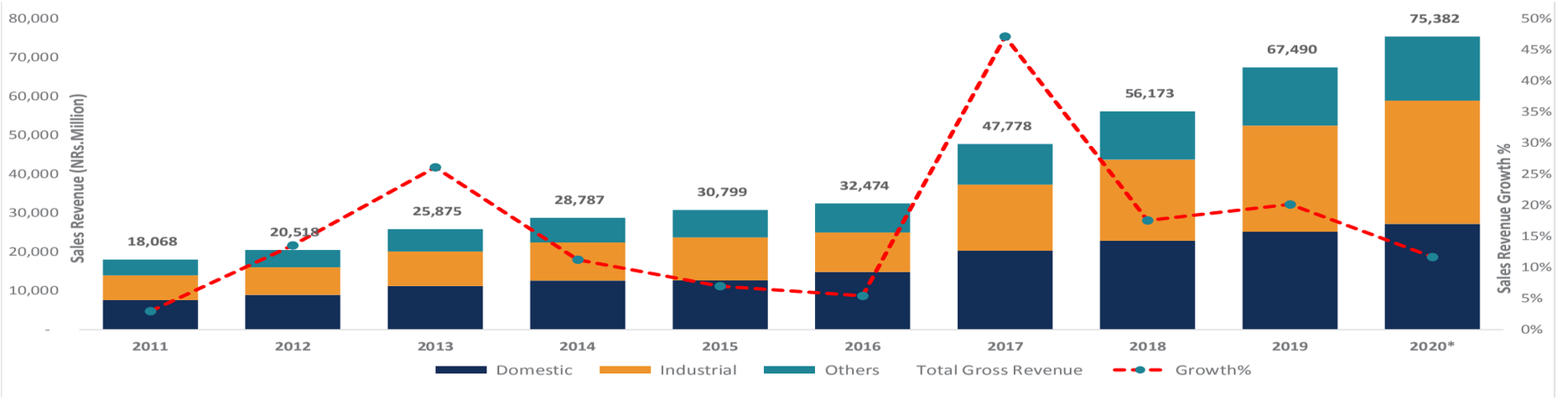


Particulars	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020*
Utilized Energy Including Internal (GWh)	2,757	3090	3189	3532	3783	3768	4825	5615	6394	6559
Sales Category (GWh)										
Domestic	1169	1343	1402	1571	1679	1797	2164	2442	2666	2867
Non Commerical	109	116	115	127	131	134	161	172	186	191
Commercial	204	241	257	285	300	286	351	408	466	488
Industrial	1002	1124	1141	1252	1352	1206	1719	2074	2422	2286
Water Supply & Irrigation	83	65	73	83	87	100	116	138	176	186
Street Light	67	72	76	76	76	74	76	77	79	82
Temporary Supply	1	1	1	1	2	2	3	3	3	3
Transport	6	7	6	6	6	6	6	5	5	3
Temple	3	4	4	5	5	6	7	8	8	8
Non Domestic	0	0	0	0	0	0	54	103	148	151
Entertainment	0	0	0	0	0	0	1	3	6	5
Community Sales	52	69	77	86	103	104	116	125	140	151
Bulk Supply to India	31	4	4	3	3	3	3	3	35	107
Total Sales (GWh)	2,728	3,045	3,156	3,496	3,744	3,719	4,777	5,560	6,338	6,529
Sales Growth %	5%	12%	4%	11%	7%	-1%	28%	16%	14%	3%
* Provisional Figures (Subject to Final Audit)										



Category	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020*
Domestic	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	3,933,574
Non Commerical	12,520	14,055	15,179	16,155	16,717	17,732	19,257	21,094	23,493	26,011
Commercial	10,802	13,297	13,096	14,955	15,899	17,191	18,860	21,716	25,746	29,522
Industrial	33,030	36,409	37,498	40,265	41,825	43,639	46,345	48,800	52,697	55,888
Water Supply	688	860	834	1,141	1,266	1,426	1,675	2,063	2,460	2,960
Irrigation	42,494	53,165	51,520	71,845	77,066	83,283	98,626	111,493	131,935	152,485
Street Light	2,374	2,590	2,878	2,774	2,813	2,829	2,935	3,010	3,266	3,726
Temporary Supply	634	619	768	726	733	883	1,070	1,520	1,682	1,577
Transport	42	44	51	1	44	43	44	44	40	43
Temple	3,181	3,529	3,857	4,048	4,181	4,391	4,673	5,182	5,890	6,611
Non Domestic	-	-	-	-	-	-	977	1,735	2,735	3,260
Entertainment	-	-	-	-	-	-	45	107	150	170
Community Sales	995	1,161	1,207	1,377	1,459	1,537	1,597	1,631	1,659	1,882
Bulk Supply to India	2	5	4	2	1	1	1	1	1	1
Total Consumers	2,056,292	2,324,414	2,599,156	2,712,015	2,833,043	2,969,576	3,257,814	3,574,226	3,909,641	4,217,710
Growth%	10%	13%	12%	4%	4%	5%	10%	10%	9%	8%

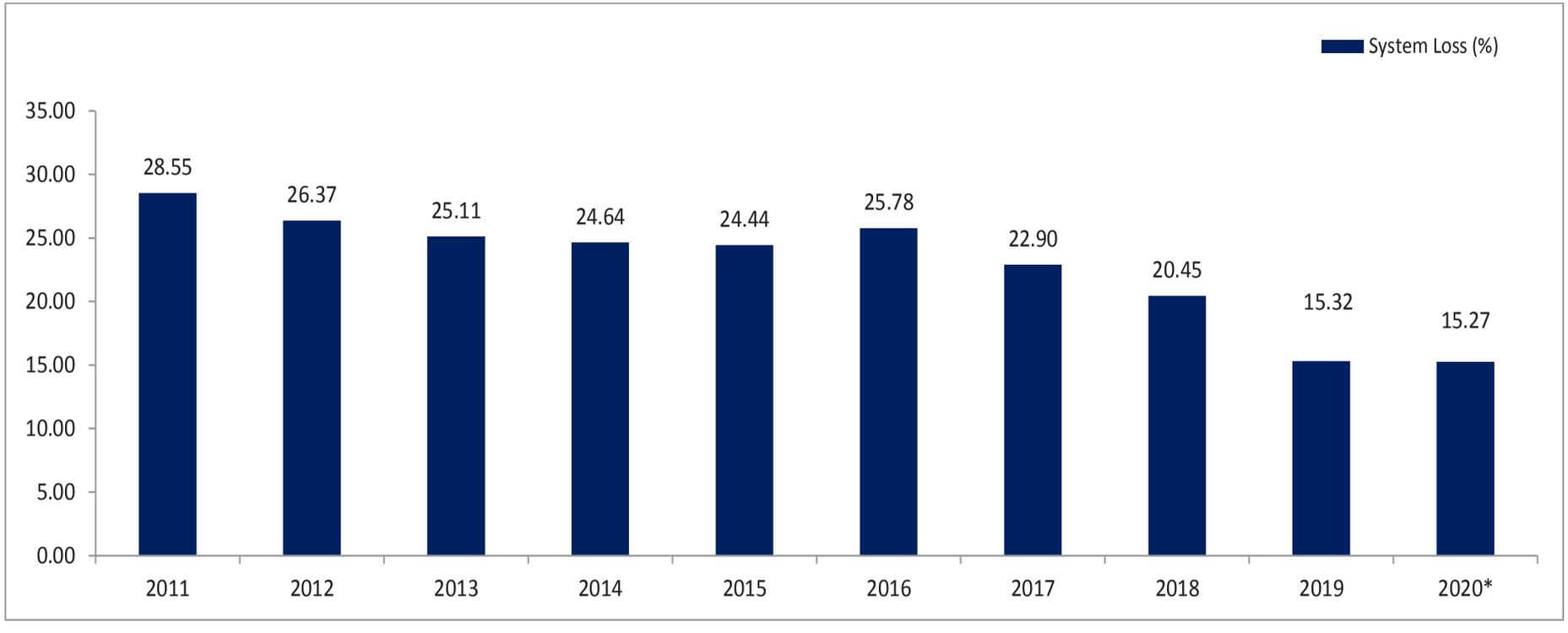
Category wise Electricity Sales Revenue



(NRs. Million)

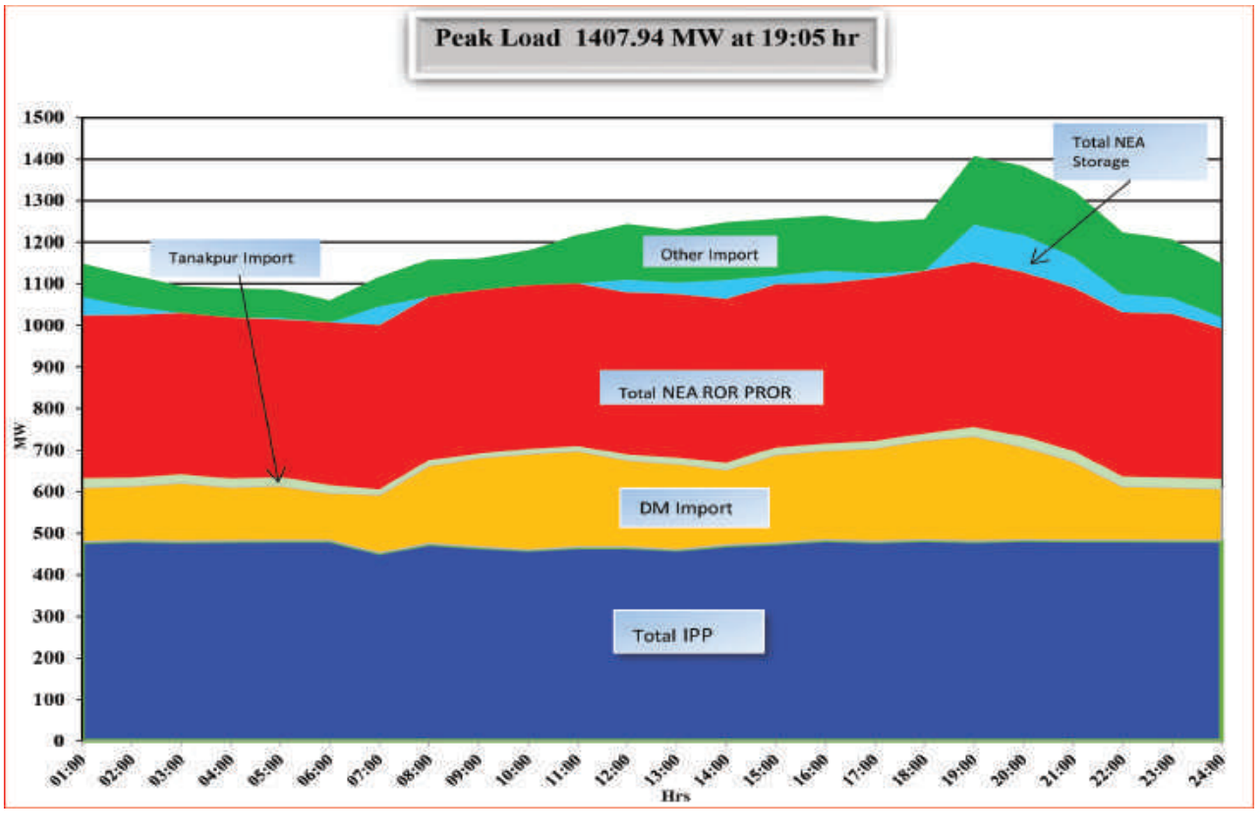
Particulars	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020*
Domestic	7,602	8,968	11,248	12,622	12,707	14,834	20,330	22,868	25,197	27,249
Non Commerical	1,021	1,092	1,355	1,487	1,644	1,995	2,479	2,594	2,831	2,939
Commercial	1,910	2,260	2,994	3,360	3,735	3,789	5,114	5,883	6,745	7,247
Industrial	6,378	7,102	8,885	9,844	11,065	10,182	16,977	20,897	27,283	31,698
Water Supply & Irrigation	251	295	389	418	481	525	728	865	1,092	1,188
Street Light	433	464	583	602	630	602	666	702	683	760
Temporary Supply	14	16	24	23	27	29	53	61	67	63
Transport	28	32	40	39	41	40	44	38	33	25
Temple	27	21	24	26	29	34	39	51	52	54
Non Domestic	-	-	-	-	-	-	655	1,419	2,278	2,367
Entertainment	-	-	-	-	-	-	17	50	84	96
Community Sales	189	245	301	335	400	412	631	716	734	740
Bulk Supply India	215	24	32	31	39	32	46	29	413	957
Total Gross Revenue	18,068	20,518	25,875	28,787	30,799	32,474	47,778	56,173	67,490	75,382
Growth%	3%	14%	26%	11%	7%	5%	47%	18%	20%	12%
* Provisional Figures (Subject to Audit)										
** ** Includes Trunk & Dedicated line bill amount Rs 6,044 million of previous years.										

SYSTEM LOSS

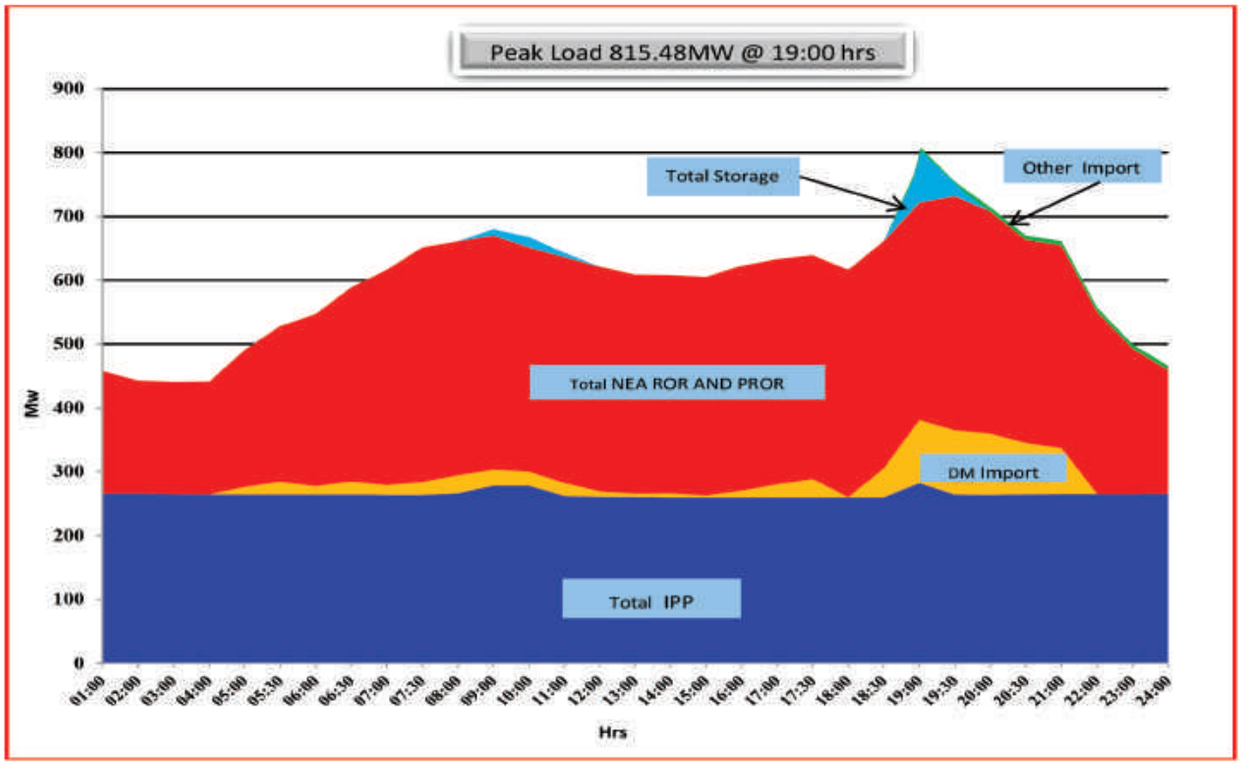


Fiscal Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020*
System Loss (%)	28.55	26.37	25.11	24.64	24.44	25.78	22.90	20.45	15.32	15.27

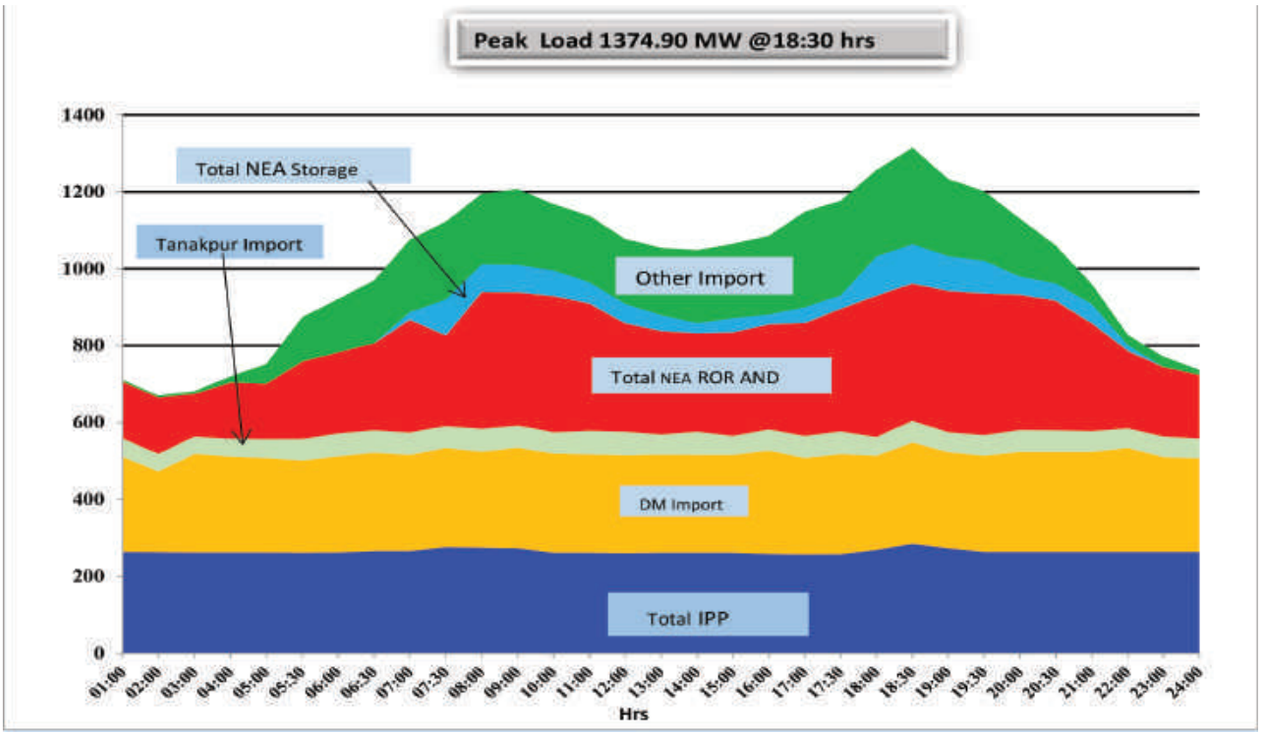
System Load Curve (Maximum Demand) Bhadra 23, 2076 (Sep 9, 2019) Monday



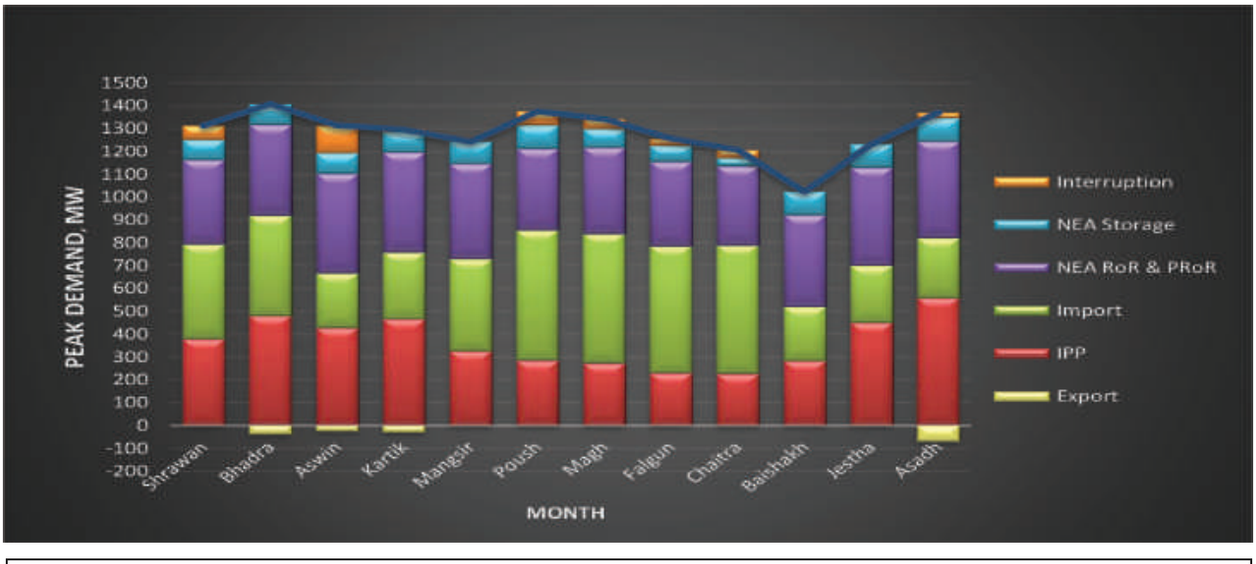
System Load Curve (Minimum Demand) Baishakh, 11, 2077 (23 APR,2020), Thursday



System Load Curve (Dry Peak Demand) Poush, 27,2076 (Jan 12,2020)

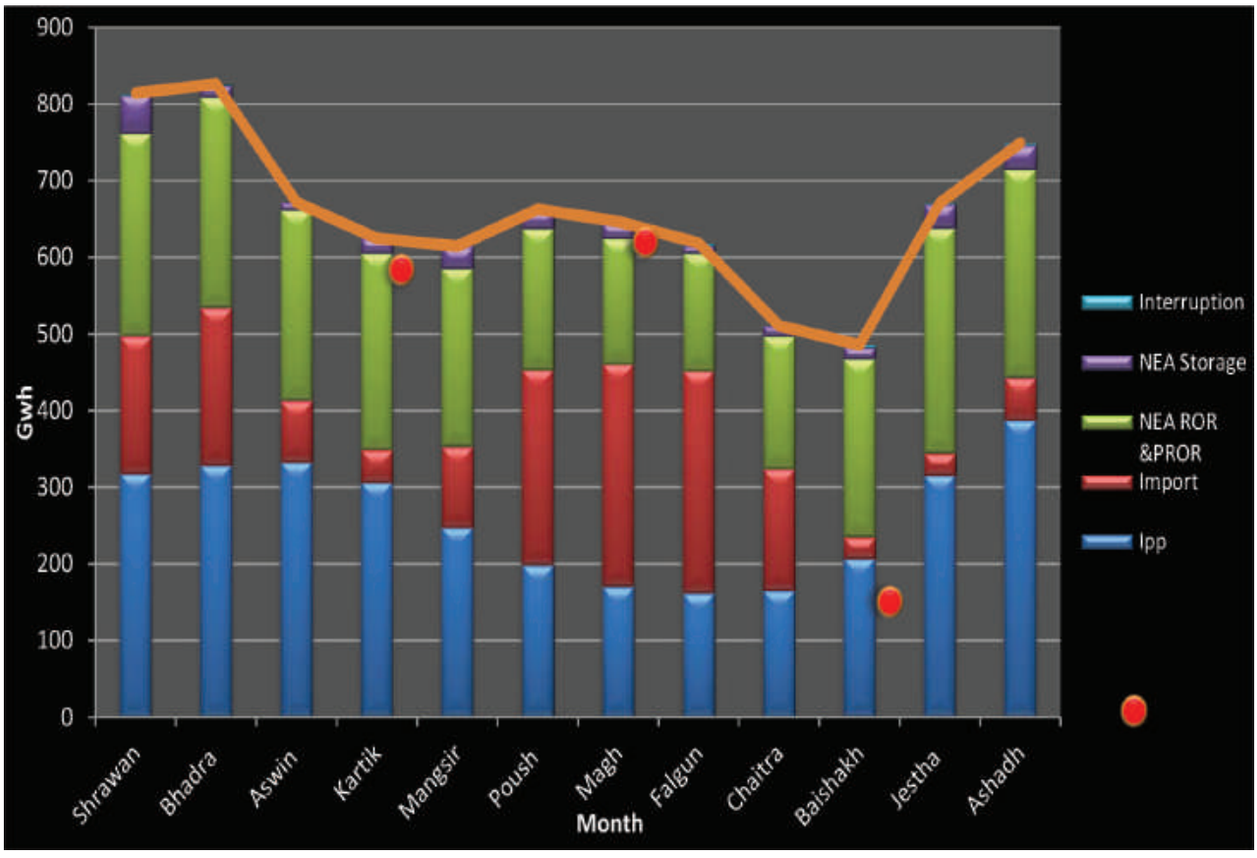


Capacity Balance (MW) in FY 2076/77 (2019/20)



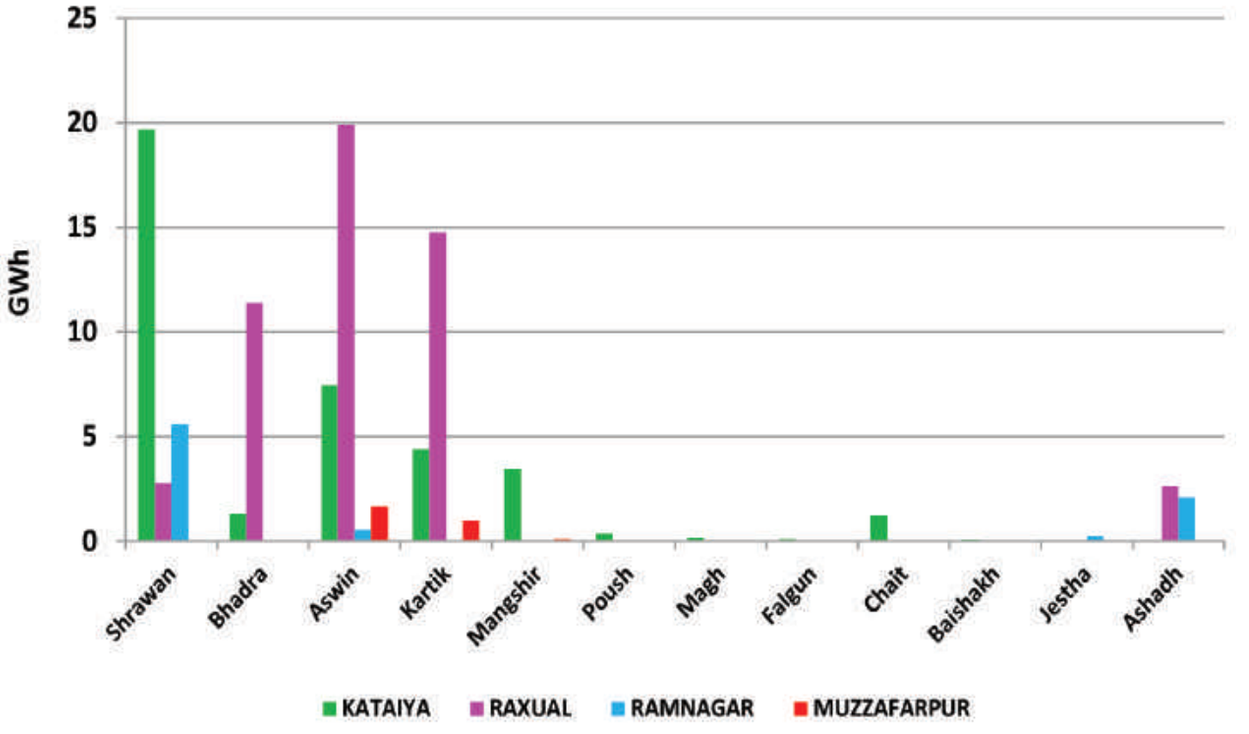
Capacity Balance (MW) of monthly Peak Demand in FY 2076/2077(2019/2020)												
Energy source /Months	Shrawan	Bhadra	Aswin	Kartik	Mangsir	Poush	Magh	Falgun	Chaitra	Baishakh	Jestha	Ashadh
IPP	379.19	481.41	428.22	466.50	326.63	284.58	273.10	229.45	225.80	283.10	451.00	558.49
Import	414.69	439.03	239.49	292.72	402.39	570.54	566.70	556.85	563.58	236.67	249.09	263.20
NEA ROR &PROR	369.50	397.50	428.90	437.00	413.58	357.28	377.65	369.41	346.22	402.16	429.75	420.62
NEA Storage	89.7	90	97	89.5	99.5	102.5	82.3	70.6	35.6	101.70	101.80	104.2
Interruption	60.00		120.00	10.00		60.00	41.00	30.00	35.00			23.00
Peak Demand	1313.08	1407.94	1313.60	1295.72	1242.10	1374.90	1340.75	1256.32	1206.20	1023.63	1231.63	1369.52
EXPORT		-37	-24	-29								-68

Energy Balance (GWh) in FY 2076/77 (2019/20)



Monthly Energy Balance (GWh) in FY 2076/2077(2019/2020)													
Energy source /Months	**Shrawan**	**Bhadra**	**Aswin**	**Kartik**	**Mangsir**	**Poush**	**Magh**	**Falgun**	**Chaitra**	**Baishakh**	**Jestha**	**Ashadh**	**Total**
IPP	318.06	328.98	333.02	306.17	247.46	198.33	170.34	162.14	165.69	206.9	315.93	387	3140.02
Import	179.5	205.67	80.16	42.43	105.66	255.22	290.66	290.17	158.81	28	28.33	55.99	1720.6
NEA ROR &PROR	264.28	274.2	248.69	256.63	232.39	184.27	164.04	152.86	172.78	232.67	294.22	271.95	2748.98
NEA Storage	50.46	15.65	9.67	19.29	28.9	22.95	18.86	9.56	13.15	15.07	30.64	31.06	265.26
Interruption	2.01	1.63	0.18	0.1	0.08	1.65	2.69	3.8	0.45	2.89	1.25	2.89	19.62
Total Energy Demand	**814.3**	**826.14**	**671.72**	**624.62**	**614.49**	**662.42**	**646.6**	**618.53**	**510.87**	**485.53**	**670.36**	748.89	7894.47

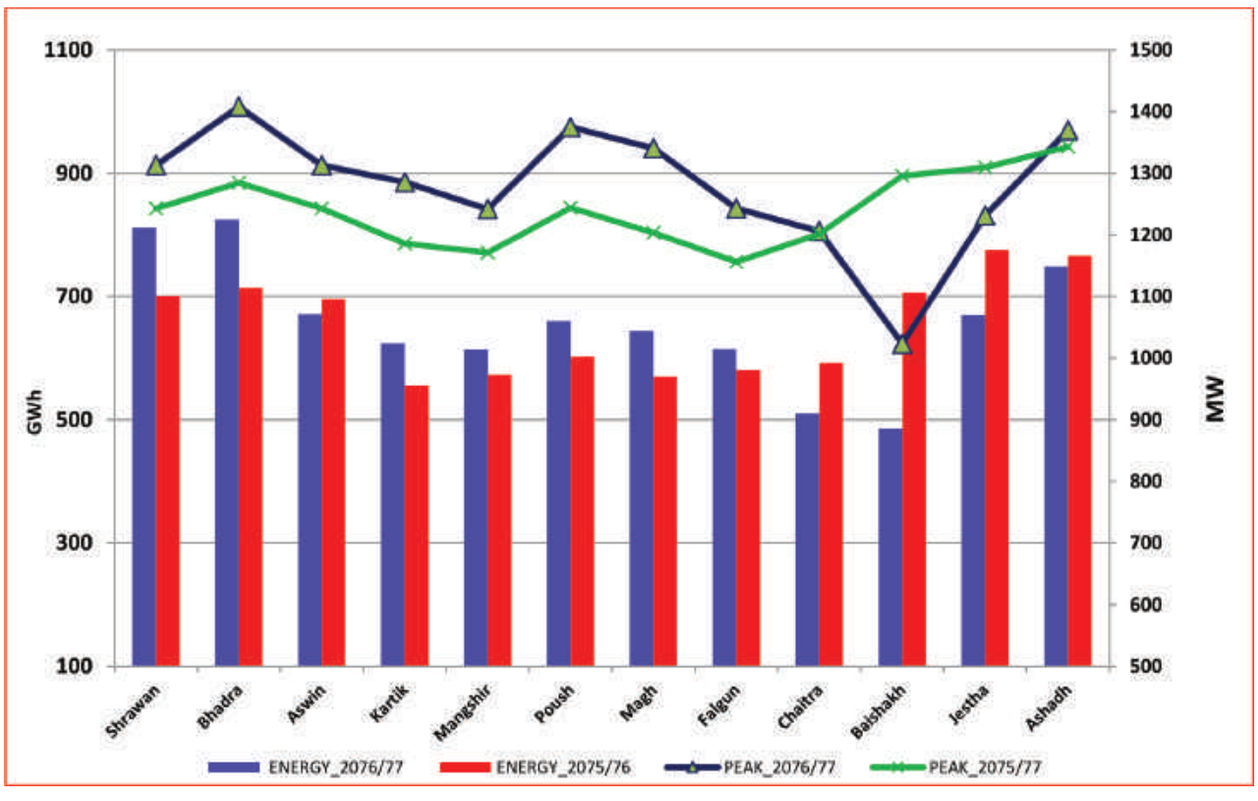
Energy Balance (GWh) in FY 2076/77 (2019/20)



Energy Export to India (GWh)

Months	KATAIYA	RAXUAL	RAMNAGAR	MUZZAFARPUR	TOTAL
Shrawan	19.69	2.78	5.58	0.00	28.05
Bhadra	1.31	11.39	0.00	0.00	12.70
Ashwin	7.45	19.90	0.55	1.66	29.57
Kartik	4.40	14.76	0.03	1.00	20.19
Mangshir	3.44	0.00	0.03	0.12	3.59
Poush	0.35	0.00	0.02	0.00	0.37
Magh	0.16	0.00	0.01	0.00	0.17
Falgun	0.11	0.00	0.00	0.00	0.11
Chait	1.21	0.00	0.00	0.00	1.21
Baishakh	0.10	0.00	0.00	0.00	0.10
Jestha	0.00	0.00	0.24	0.00	0.24
Ashadh	0.00	2.61	2.09	0.00	4.70
Total	38.23	51.44	8.55	2.78	101.00

Comparison of Monthly Energy Demand (GWh) and Peak Demand (MW) Between FY 2075/76 (2018/19) & FY 2076/77 (2019/20)



Months	GWh		MW	
	ENERGY_2076/77	ENERGY_2075/76	PEAK_2076/77	PEAK_2075/77
Shrawan	812.30	700.76	1313.08	1242.87
Bhadra	824.51	714.66	1407.94	1284.28
Aswin	671.54	695.98	1313.08	1242.87
Kartik	624.52	555.27	1285.69	1185.76
Mangshir	614.41	573.35	1242.10	1171.19
Poush	660.77	602.39	1374.90	1244.17
Magh	643.91	570.10	1340.75	1203.40
Falgun	614.73	580.92	1242.80	1156.28
Chait	510.24	591.83	1206.20	1201.44
Baishakh	485.53	706.80	1023.41	1296.02
Jestha	670.36	775.72	1231.63	1309.52
Ashadh	748.89	766.31	1369.52	1343.06

ANNEX-1

ELECTRICITY TARIFF

TARIFF RATES

1. Domestic Consumers

1.1 Single Phase Low Voltage (230 Volt)

kWh (Monthly)	5 Ampere		15 Ampere		30 Ampere		60 Ampere	
	Minimum Charge (Nrs.)	Energy Charge (Nrs/kWh)	Minimum Charge (Nrs.)	Energy Charge (Nrs/kWh)	Minimum Charge (Nrs.)	Energy Charge (Nrs/kWh)	Minimum Charge (Nrs.)	Energy Charge (Nrs/kWh)
0-10	30.00	0.00	50.00	4.00	75.00	5.00	125.00	6.00
11-20	30.00	3.00	50.00	4.00	75.00	5.00	125.00	6.00
21-30	50.00	6.50	75.00	6.50	100.00	6.50	125.00	6.50
31-50	50.00	8.00	75.00	8.00	100.00	8.00	125.00	8.00
51-100	75.00	9.50	100.00	9.50	125.00	9.50	150.00	9.50
101-150	100.00	9.50	125.00	9.50	150.00	9.50	200.00	9.50
151-250	125.00	10.00	150.00	10.00	175.00	10.00	200.00	10.00
251-400	150.00	11.00	175.00	11.00	200.00	11.00	250.00	11.00
Above 400	175.00	12.00	200.00	12.00	225.00	12.00	275.00	12.00

1.2 Three phase L ow Voltage (400 Volt)

kWh (Monthly)	Up to 10 KVA		Above 10 KVA	
	Minimum Charge (Nrs.)	Energy Charge (Nrs/kWh)	Minimum Charge (Nrs.)	Energy Charge (Nrs/kWh)
Up to 400	1100.00	11.50	1800.00	11.50
Above 400		12.00		12.00

1.3 Three phase Medium Voltage (33/11 kV)

kWh (Monthly)	Minimum Charge (Nrs.)	Energy Charge (Nrs/kWh)
Up to 1000	10,000.00	11.00
Above 1001		12.00

Billing Method (For 5 Ampere)

S. No.	kWh (Monthly)	Rate Nrs. Per Unit	Billing Method
1	Up to 10 units	0.00	Monthly Minimum Charge Rs. 30.00 for up to 10 units and Energy Charge Rs. 0.00 per unit
2	11 to 20 units	3.00	Monthly Minimum Charge Rs. 30.00 and Energy Charge Rs. 3.00 per unit for 1 unit to 20 units
3	21 to 30 units	6.50	Monthly Minimum Charge Rs. 50.00 and Energy Charge Rs. 3.00 per unit up to 20 units and Rs. 6.50 per unit for 21 units to 30 units
4	31 to 50 units	8.00	Monthly Minimum Charge Rs. 50.00 and Energy Charge Rs. 3.00 per unit up to 20 units and Rs. 6.50 per unit for 21 units to 30 units and Rs. 8.00 per unit for 31 units to 50 units
5	51 to 100 units	9.50	Monthly Minimum Charge Rs. 75.00 and Energy Charge Rs. 3.00 per unit up to 20 units and Rs. 6.50 per unit for 21 units to 30 units and Rs. 8.00 per unit for 31 units to 50 units and Rs. 9.50 per unit for 51 units to 100 units
6	101 to 150 units	9.50	Monthly Minimum Charge Rs. 100.00 and Energy Charge Rs. 3.00 per unit up to 20 units and Rs. 6.50 per unit for 21 units to 30 units and Rs. 8.00 per unit for 31 units to 50 units and Rs. 9.50 per unit for 51 units to 150 units
7	151 to 250 units	10.00	Monthly Minimum Charge Rs. 125.00 and Energy Charge Rs. 3.00 per unit up to 20 units and Rs. 6.50 per unit for 21 units to 30 units and Rs. 8.00 per unit for 31 units to 50 units and Rs. 9.50 per unit for 51 units to 150 units and Rs. 10.00 per unit for 151 units to 250 units
8	251 to 400 units	11.00	Monthly Minimum Charge Rs. 150.00 and Energy Charge Rs. 3.00 per unit up to 20 units and Rs. 6.50 per unit for 21 units to 30 units and Rs. 8.00 per unit for 31 units to 50 units and Rs. 9.50 per unit for 51 units to 150 units and Rs. 10.00 per unit for 151 units to 250 units and Rs. 11.00 per unit for 251 units to 400 units
9	Above 400	12.00	Monthly Minimum Charge Rs. 175.00 and Energy Charge Rs. 3.00 per unit up to 20 units and Rs. 6.50 per unit for 21 units to 30 units and Rs. 8.00 per unit for 31 units to 50 units and Rs. 9.50 per unit for 51 units to 150 units and Rs. 10.00 per unit for 151 units to 250 units and Rs. 11.00 per unit for 251 units to 400 units and Rs. 12.00 per unit for above 400 units

Similarly, billing will be made for 15, 30 and 60 Ampere. (Single Phase & 3 Phase Consumers)

2. Other Consumers

2.1 Low Voltage (230/400 V)

Consumer Category	Demand Charge (Nrs. per kVA/ month)	Energy Charge Nrs/kWh
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	-	4.20
b) Other Water Supply	160.00	7.20
6. Transportation		
a) Charging Station	200.00	5.75
b) Other Transportation	220.00	8.90
7. Religious place	-	6.10
8. Street Light		
a) Metered		7.30
b) Non-Metered	2475.00	-
9. Temporary Connection	-	19.80
10. Non-Domestic	350.00	13.00
11. Entertainment Business	350.00	14.00

2.2 High Voltage

Consumer Category	Demand Charge (Nrs. per kVA/ month)	Energy Charge Nrs/kWh
A. High Voltage		
1. Industrial (132 KV)	230.00	8.20
2. Industrial (66 KV)	240.00	8.30
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	-	4.80
5. Water Supply		
a) Community Water Supply	-	4.60
b) Other Water Supply	160.00	6.60
6. Transportation		
a) Charging Station	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	-	4.90
5. Water Supply		
a) Community Water Supply	-	4.80
b) Other Water Supply	150.00	6.80
6. Transportation		
a) Charging Station	230.00	5.60
b) Other Transportation	255.00	8.80
7. Religious Place	220.00	9.90
8. Temporary Connection	330.00	12.00
9. Non-Domestic	350.00	12.90
10. Entertainment Business	350.00	13.90

3. Time of Day (ToD) Tariff Rate

3.1 Tariff Rate from Baishakh to Mangsir

Consumer Category	Demand Charge Nrs. per KVA/ month	Energy Charge Nrs/kWh		
		Peak Time (17.00-23.00)	Off Peak Time (23.00-5.00)	Normal time (5.00-17.00)
A. High Voltage				
1. Industrial (132 kV)	230.00	10.00	4.65	8.20
2. Industrial (66 kV)	240.00	10.10	4.75	8.30
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	-	6.30	3.15	4.70
5. Water Supply				
a) Community Water Supply	-	6.20	3.10	4.60
b) Other Water Supply	150.00	10.20	5.25	8.40
6. Transportation				
a) Charging Station	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	-	6.40	3.50	4. 75
5. Water Supply				
a) Community Water Supply	-	6.30	3.40	4.70
b) Other Water Supply	150.00	10.50	5.40	8.50
6. Transportation				
a) Charging Station	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. Religious Place	220.00	11.30	5.15	9.10
9. Temporary Connection	330.00	14.40	6.60	11.75
D. Low Voltage (230/400V)				
1. Transportation				
a) Charging Station	200.00	7.25	4.30	5.75
b) Other Transportation	220.00	9.75	4.30	8.60

3.2 Tariff Rate from Paush to Chaitra

Consumer Category	Demand Charge Nrs. per KVA/ month	Energy Charge Nrs/kWh	
		Peak Time (17.00-23.00)	Normal Time (23.00-17.00)
A. High Voltage			
1. Industrial (132 kV)	230.00	10.00	8.20
2. Industrial (66 kV)	240.00	10.10	8.30
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	-	6.30	4.70
5. Water Supply			
a) Community Water Supply	-	6.20	4.60
b) Other Water Supply	150.00	10.20	8.40
6. Transportation			
a) Charging Station	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	-	6.40	4. 75
5. Water Supply			
a) Community Water Supply	-	6.30	4.70
b) Other Water Supply	150.00	10.50	8.50
6. Transportation			
a) Charging Station	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. Religious Place	220.00	11.30	9.10
9. Temporary Connection	330.00	14.40	11.75
D. Low Voltage (230/400V)			
1. Transportation			
a) Charging Station	200.00	7.25	5.75
b) Other Transportation	220.00	9.75	8.60

3.3. Transportation for (Automatic Swap card Users) without Demand Charge

3.3.1. Charging Station

Description	Energy Charge Nrs/kWh		
	Peak Time (17.00-23.00)	Off Peak Time (23.00-5.00)	Normal time (5.00-17.00)
Tariff Rate from Baishakh to Mangsir			
33 kV	8.40	4.45	6.60
11 kV	8.60	5.05	6.70
Low Voltage (230/400V)	8.70	5.05	6.90
Tariff Rate from Paush to Chaitra			
Description	**Peak Time (17.00-23.00)**	**Normal Time (23.00-5.00)**	
33 kV	8.40	6.60	
11 kV	8.60	6.70	
Low Voltage (230/400V)	8.70	6.90	

3.3.2 Other Transportation

Description	Energy Charge (Nrs/kWh)		
	Peak Time (17.00-23.00)	Off Peak Time (23.00-5.00)	Normal time (5.00-17.00)
Tariff Rate from Baishakh to Mangsir			
33 kV	11.20	4.45	10.10
11 kV	11.60	5.05	10.20
Low Voltage (230/400V)	11.70	5.15	10.30

Tariff Rate from Paush to Chaitra		
Description	**Peak Time (17.00-23.00)**	**Normal Time (23.00-17.00)**
33 kV	11.20	10.10
11 kV	11.60	10.20
Low Voltage (230/400V)	11.70	10.30

Note: Charging station operators will be able to get maximum 20 percent additional charge in given tarrif for providing charging service to electric vehicles.

4. Community Wholesale Consumer:

Consumer Category	Energy Charge (Nrs/kWh)
1. Medium Voltage (11KV/33KV)	
Upto (N* x 20) units	3.00
Above (N* x 20) units	6.00
2. Lower Voltage Level (230/400 Volt)	
Upto (N* x 20) units	3.00
Above (N* x 20) units	6.25

N*= Total Number of Consumers of a Community Group

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
14	Kulekhani III HEP	14,000
Sub Total		**563,150**
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		**577,394**
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**
Thermal Power Plants		**Capacity(KW)**
1	Duhabi Multifuel	39,000
2	Hetauda Diesel	14,410
Total		**53,410**
Solar Power Plants		**Capacity(KW)**
1	Simikot	50
2	Gamgadhi	50
3	Battar (Nuwakot)	1250
Total		**1350**
Total Major Hydro(NEA)-Grid Connected		**577,394**
Total Small Hydro(NEA)-Isolated		4,536
Total Hydro(NEA)		581,930
Total Hydro(IPP)		696,168.40
Total Hydro(Nepal)		1,278,098
Total Thermal(NEA)		53,410
Total Solar(NEA)		1350
Total Installed Capacity(NEA & IPP)-Grid		**1,328,322.40**
Total Installed Capacity		**1,332,858**
Under Construction		**Capacity(KW)**
1	Upper Tamakoshi Hydropower Project	456,000
2	Tanahu Hydropower Project	140,000
3	Rahuganga HEP	40,000
4	Upper Sanjen	14,600
5	Sanjen	42,500
6	Rasuwagadi	111,000
7	Madhya Bhotekoshi	102,000
8	Upper Trishuli 3B	37,000
Total		**943,100**
Planned and Proposed		**Capacity(KW)**
1	Upper Arun HEP	1,061,000
2	Upper Modi A HEP	42,000
3	Upper Modi HEP	18,200
4	Dudhkoshi Storage HEP	635,000
5	Uttar Ganga Storage HEP	828,000
6	Tamakoshi V HEP	95,000
7	Aadhikhola Storage HEP	180,000
8	Chainpur Seti HEP	210,000
9	Begnas Rupa Pump Storage HEP	150,000
Total		**3,219,200**

** 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- Syaule- Attaria	Single	131.00	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 (132 kV)			3037.54		
B	400/220 kV Transmission Line				
1	"Dhalkebar-Muzzaffarpur 400 kV Cross Border Line (400 kV)"	Double	78.00	MOOSE	500
2	Khimti- Dhalkebar 220 kV Transmission Line	Single	75.00	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
Total (220 kV)			178.00		
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 (66 kV)			514.46		

Under Construction High Voltage Transmission Lines

S.N.	Transmission Line	Type of Ckts	Length (Circuit km)			Conductor Type	Nominal Aluminium Cross ection Area (Sq.mm)	"Expected Completion Year (FY)"
			Total	Constructed till FY 76-77	Constructed in FY 76-77 only			
I	Transmission Directorate							
A	132 kV Transmission Line							
1	Chameliya- Syaule- Attaria 2nd Circuit	Single	131	124.5	19.5	BEAR	250	2020/21
2	Singati-Lamosangu	Double	80	34	34	BEAR	250	2020/21
3	Solu Corridor	Double	180	44	44	CARDINAL	420	2020/21
4	Thankot-Chapagaon	Double	56	16		BEAR	250	
5	Ramechap-Garjyang-Khimti	Double	62			BEAR	250	2020/21
6	Dordi Corridor	Double	20			BEAR	250	2020/21
7	Bardaghat-Sardi	Double	40			BEAR	250	2020/21
8	"Raxual-Parwanipur Second Circuit (Cross Border-Nepal Portion)"	Single	16			BEAR	250	2021/22
9	"Kusaha-Kataiya Second Circuit (Cross Border-Nepal Portion)"	Single	13			BEAR	250	2020/21
10	Butwal-Lumbini	Double	40			BEAR	250	2020/21
11	Burtibang-Paudi Amarai-Tamghas-Sandhikharka-Gorunsinghe	Double	168			BEAR	250	2021/22
12	Kushaha- Biratnagar	Double	46			BEAR	250	2021/22
13	New Modi-Lekhnath	Double	84			BEAR	250	2021/22
14	Dhalkebar-Loharpatti	Double	40			CARDINAL	420	2021/22
15	Kohalpur-Surkhet	Double	104			BEAR	250	2021/22
16	Balefi Corridor	Double	40			CARDINAL	420	2021/22
17	Mainahiya Sampatiya	Double	56			BEAR	250	2021/22
Total			1,176	218.5	97.5			
B	220 kV Transmission Line							
1	Khimti- Dhalkebar 2nd Circuit	Single	75	68	1	BISON	350	2020/21
2	Koshi Corridor (Inaruwa-Basantapur-Baneshwor-Tumlingtar)	Single	106	71	71	MOOSE	500	2020/21
3	Hetauda-Bharatpur	Double	148	10		BISON	350	2020/21
4	Chilime-Trishuli	Double	72			BISON	350	2020/21
5	Bharatpur-Bardghat	Double	148			BISON	350	2020/21
6	Koshi Corridor (Basantapur-Dhungesangu)	Single	35			MOOSE	500	2021/22
Total			584	149	72			
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	2020/21
2	Lapsifedi- Changunarayan- Duwakot	Double	28			BEAR	250	2021/22
3	Parwanipur- Pokhariya **	Double	42			ACCC Amsterdam	376	2022/23

4	Bhaktapur- Thimi- Koteswar**	Double	24			Single Core XLPE	500 sq. MM Cu	2022/23
	Total:		146					
	(Note : **- In the process of Procurement)							
B	220 kV Transmission Line							
1	Marsayangdi- Kathmandu TL	Double	164	156.6	71.9	Twin Moose	500	2020/21
2	Dana- Kushma TL	Double	79.6	69.98	38.32	Moose	500	2020/21
3	Kushma- New Butwal TL	Double	176			ACCC Drake	519.7	2021/22
4	New Butwal- Bardaghat TL	Double	42			BISON	350	2021/22
5	Dharapani- Khudi TL	Double	56			Moose	500	2022/23
6	Khudi- Udipur TL	Double	36			ACCC Drake	519.7	2021/22
7	Udipur- Bharatpur TL	Double	134			ACCC Drake	519.7	2022/23
Total			688	227	110			
C	400 kV Transmission Line							
1	New Khimti- Barhabise	Double	92			MOOSE	500	2021/22
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	40.00	MOOSE	500
Total			1090.00		
B	220 kV Transmission Line				
1	Koshi Corridor (Inaruwa-Basantapur-Baneshwor-Tumlingtar) Second Circuit Stringing	Single	106	MOOSE	500
2	Koshi Corridor (Basantapur-Dhungesangu) Second Circuit Stringing	Single	35	MOOSE	500
3	Lapan- Ratomate	Double	52.00	MOOSE	500
4	Tumlingtal Sitalpati	Double	36.00	MOOSE	500

5	Trishuli 3B- Ratomate	Double	48.00	MOOSE	500
6	Lekhnath-Damauli	Double	90.00	MOOSE	500
Total			367.00		
C	132 kV Transmission Line				
1	Dhalkebar- Balganga	Double	48.00	BEAR	250
2	Dadakhet- Rahughat	Double	50.00	BEAR	250
3	Ghorahi-Madichaur	Double	72.00	BEAR	250
4	Borang-Lapan	Double	46.00	BEAR	250
5	Nawalpur (Lalbandi) Salimpur	Double	40.00	BEAR	250
6	Pathlaiya Harniya	Double	54.00	BEAR	250
7	Bhumahi-Hakui	Double	32.00	BEAR	250
8	Bajhang-Deepayal-Attariya	Double	260.00	BEAR	250
9	Bafikot-Madichaur (Khungri)	Double	150.00	BEAR	250
10	Surkhet-Dailekh	Double	64.00	BEAR	250
11	Kaligandaki- Ridi	Double	44.00	BEAR	250
12	Kohalpur- Nepalgunjg	Double	40.00	BEAR	250
13	Godak-Anarmani	Double	70.00	BEAR	250
14	Kabeli (Amarpur) Dhungesangu	Double	40.00	BEAR	250
15	Inaruwa Dharan	Double	50.00	BEAR	250
16	Godak Soyak	Double	16.00	BEAR	250
17	Rupani-Bodebarsain	Double	36.00	BEAR	250
18	Lahan Sukhipur	Double	34.00	BEAR	250
19	"Chandrapur-Sukhdevchaur (Rajpur)"	Double	70.00	BEAR	250
20	"Barhabise Lamosaghu 2nd Circuit (Sunkoshi 132 kV SS)"	Single	12.00	BEAR	250
Total			1228.00		
II	Project Management Directorate				
A	400 kV Transmission Line				
1	Nijgadh- Hetaunda	Double	150.00	MOOSE	500
2	New Butwal-Lamahi	Double	300.00	MOOSE	500
3	Lamahi-New Kohalpur	Double	180.00	MOOSE	500
4	New Kohalpur-Dododhara	Double	190.00	MOOSE	500
5	Dododhara(New Lamki)-New Attariya (Daiji)	Double	180.00	MOOSE	500
6	Tingla Hub-Likhu Hub- New Khimti	Double	110.00	MOOSE	500
7	New Khimti-Tamakoshi 3-Sunkoshi Hub-Dhalkebar	Double	220.00	MOOSE	500

8	Budhigandaki Corridor (Philim-Gumda-Ratamate)	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	Capacity FY 076-77	Total Increment
		kV	MVA	MVA	MVA	(MVA)
A	Kathmandu Grid Division					
1	Balaju	132/66	45	45	45	
		66/11	22.5	22.5	22.5	
		66/11	22.5	22.5	22.5	
		66/11		22.5	22.5	
2	Chapali	132/11	30	30	30	
		132/66	49.5	49.5	49.5	
		132/66	49.5	49.5	49.5	
3	Siuchatar	132/66	37.8	37.8	37.8	
		132/66	37.8	37.8	37.8	
		132/66	37.8	37.8	37.8	
		132/11			30	30
		66/11	18	18	18	
		66/11	18	18	18	
4	New Chabel	66/11	22.5	22.5	22.5	
		66/11	22.5	22.5	22.5	
		66/11	22.5	22.5	22.5	
5	Lainchour	66/11	22.5	22.5	22.5	
		66/11	22.5	22.5	22.5	
6	New Patan	66/11	18	18	18	
		66/11	18	18	18	
		66/11	18	18	18	
		66/11	0	18	22.5	4.5

7	Teku	66/11	22.5	22.5	22.5	
		66/11	22.5	22.5	22.5	
8	K3	66/11	22.5	22.5	22.5	
		66/11	22.5	22.5	22.5	
9	Baneswor	66/11	18	18	18	
		66/11	18	18	18	
10	Bhaktapur	132/66	49.5	49.5	49.5	
		132/11	22.5	22.5	22.5	
		132/11			22.5	22.5
		132/11	22.5	22.5	22.5	
11	Banepa	66/11	22.5	22.5	22.5	
		66/11	22.5			
12	Panchkhal	66/11	10	10	10	
13	Lamosanghu	132/33	30	30	30	
14	Matatirtha	132/33	30	30	30	
		132/11	22.5	22.5	22.5	
15	Indrawati	66/11	7.5	10	10	
16	Bagmati	66/11	0	0	6	6
B	Hetauda Grid Division					
17	Hetauda	132/66	45	45	45	
		132/66	45	45	45	
		66/11	10	10	10	
		66/11	10	10	10	
18	Kamane	132/33	30	30	30	
		33/11	16.6	16.6	16.6	
19	Bharatpur	132/33	30	30	30	
		132/33	30	30	30	
		132/11	15	30	30	
		132/11	22.5	22.5	30.0	7.5
20	Birgunj	66/33	12.5	12.5	30	17.5
		66/33	12.5	12.5	12.5	
		66/11	30	30	30	
		66/11	30	30	30	
21	Parwanipur	132/11	22.5	22.5	22.5	
		132/11	22.5	22.5	22.5	
		132/11	22.5	22.5	22.5	
		132/66	63	63	63	
		132/66	63	63	63	
22	Simra	66/11	15	15	15	
		66/11	15	15	15	
23	Amlekhgunj	66/11	7.5	7.5	7.5	

24	Pathlaiya	132/11	22.5	22.5	22.5	
25	Purbi Chitwan	132/33			30	30
		132/33			30	30
		33/11			16.6	16.6
C	Dhalkebar Grid Branch					
26	Lahan	132/33				
		132/33	63	63	63	
		33/11	16.6	16.6	16.6	
		33/11	16.6	16.6	16.6	
27	Chapur	132/33	30	30	30	
		132/33	30	30	30	
		33/11	8	8	16.6	8.6
28	Dhalkebar	220/132		160	160	
		220/132		160	160	
		132/33	30	30	30	
		132/33	63	63	63	
		33/11	8	8	16.6	8.6
		33/11	16.6	16.6	16.6	
29	Mirchaiya	132/33	30	30	30	
		33/11	8	16.6	16.6	
30	Rupani	132/33		63	63	
31	Tingla	132/33			30	30
		33/11			8	8
D	Duhabi Grid Branch					
32	Duhabi	132/33	63	63	63	
		132/33	63	63	63	
		132/33	63	63	63	
		33/11	16.6	16.6	16.6	
		33/11	16.6	16.6	16.6	
33	Anarmani	132/33	30	30	30	
		132/33	30	30	30	
		33/11	16.6	16.6	16.6	
		33/11	8	16.6	16.6	
34	Damak	132/33	30	30	63	33
		33/11	16.6	16.6	16.6	
35	Godak	132/33	30	63	63	
		33/11	8	8	8	
36	Phidim	132/33		20	20	
		33/11		3	3	
37	Amarpur (Kabeli)	132/33		30	30	
		33/11		3	3	

E	Butwal Grid Division					
38	Butwal	132/33	63	63	63	
		132/33	63	63	63	
		132/33	63	63	63	
		33/11	16.6	16.6	16.6	
		33/11	16.6	16.6	16.6	
		33/11	0.0	16.6	16.6	
39	Bardghat	132/11	22.5	22.5	22.5	
		132/11	7.5	7.5	22.5	15
40	Chanauta	132/33	30	30	30	
		132/33	12.5	12.5	30	17.5
		33/11	3	8	8	
		33/11	3	3	8	5
41	Lamahi	132/33	63	63	63	
		132/33	30	30	30	
		33/11	16.6	16.6	16.6	
		33/11			8	8
42	Ghorahi	132/33		30	30	
43	Kawasoti	132/33	30	30	30	
		33/11	16.6	16.6	16.6	
44	Gandak	132/33			30	30
F	Pokhara Grid Branch					
45	Damauli	132/33	30	30	30	
		132/33	30	30	30	
		33/11	16.6	16.6	16.6	
		33/11	3	3	3	
46	Pokhara	132/11	30	30	30	
		132/11	30	30	30	
46	Lekhnath	132/33	12.5	30	30	
		132/11			22.5	22.5
		132/11	22.5	22.5	22.5	
47	Lekhnath	132/33	12.5	30	30	
		132/11			22.5	22.5
		132/11	22.5	22.5	22.5	
48	Markichowk	132/33		30	30	
49	Syangja	132/33	30	30	30	
		33/11	8	8	8	
G	Attaria Grid Branch					
50	Kusum	132/11	12.5	12.5	12.5	
51	Hapure	132/33		30	30	
		33/11		8	8	

52	Attaria	132/33	30.0	30.0	30.0	
		132/33	30.0	30.0	30.0	
		33/11	16.6	16.6	16.6	
53	Kohalpur	132/33	30	63	63	
		132/33	30	30	30	
		33/11	3	3	16.6	13.6
		33/11	16.6	16.6	16.6	
54	Lamki	132/33	15	15	15	
		132/33	15	15	15	
		33/11	16.6	16.6	16.6	
55	Mahendranagar	132/33	15	15	15	
		132/33	10	15	15	
		33/11	7.5	7.5	7.5	
56	Bhurigaon	132/33	30	30	30	
		33/11	8	8	8	
57	Pahalmanpur	132/33	30	30	30	
		33/11	8	8	8	
58	Syaule	132/33		30	30	
		33/11		8	8	

S.No	Voltage Rating (kV)	Transformer No.	Total Capacity FY 74-75 (MVA)	Total Capacity FY 75-76 (MVA)	Total Capacity FY 76-77 (MVA)	Total Increment (MVA)
1	220/132	2		320	320	0
2	132/66	11	522.90	522.90	522.90	0
3	132/33	51	1397.00	1718.50	1889.00	170.5
4	132/11	17	350.00	365.00	462.50	97.5
5	66/33	2	25.00	25.00	42.50	17.5
6	66/11	32	553.50	574.00	584.50	10.5
7	33/11	37	349.1	409.9	478.3	68.4
	Total	152	3197.50	3935.30	4299.70	364.4

Under Construction High Voltage Grid Substations

S.No	Name 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	2020/21
2	Chilime Trishuli 220 kV Transmission Line	Chilime	"220/132 132/33"	"1 Ø, 7x53.33 Bank 3 Ø, 50"	370	2020/21

3	Trishuli 3B Hub Substation	Trishuli 3 B Hub	66/11	"1 Ø, 7x53.33 Bank 3 Ø, 50"	370	2020/21
4	Hetauda- Bharatpur220 kV Transmission Line	New Bharatpur (Aaptari)	132/33	3 Ø, 22.5	22.5	2020/21
5	Singati Lamosanghu 132 kV Transmission Line	Singati	132/33	3 Ø, 30	30	2020/21
6	Ramechhap Garjyang Khimti 132 kV Transmission Line	Garjyang	132/33	1 Ø, 4x10 Bank	30	2020/21
7	Kushaha Kataiya 132 kV Second Circuit Transmission Line	Kushaha	132/11	3 Ø, 22.5	22.5	2020/21
8	Dordi Corridor132 kV Transmission Line	Kritipur	132/11	3 Ø, 10	10	2020/21
9	Butwal Lumbini132 kV Transmission Line	Mainahiya	"132/33 33/11"	"3 Ø, 2x45 3 Ø, 16"	106	2020/21
10	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
11	Ramechhap Garjyang Khimti 132 kV Transmission Line	New Khimti	220/132	1 Ø, 4x66.67 Bank	200	2020/21
12	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
13	Kushaha Biratnagar 132 kV Transmission Line	Biratnagar	"132/33 33/11"	"3 Ø, 2x63 3 Ø, 16"	142	2020/21
14	Nawalpur 132 kV Substation	Nawalpur	"132/33 33/11"	"3 Ø, 63 3 Ø, 16"	79	2020/21
15	Sunwal 132 kV Substation	Sunwal	"132/33 132/11"	"3 Ø, 2x63 3 Ø, 22.5"	148.5	2020/21
Total (FY 2020/21)					3191.5	
16	Hetauda- Dhalkebar-Inaruwa 400 kV Substation Expansion Project	Hetauda	400/220	"1 Ø, 4x167 Bank "	500	2021/22
		Inaruwa	400/220	3 Ø, 3x315	945	2021/22
17	"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	2021/22
		Inaruwa	"220/132 220/33"	"3 Ø, 2x100 3 Ø, 2x63 "	326	2021/22
18	Koshi Corridor 220 kV Transmission Line	Dhungesanghu	132/33	"1 Ø, 7x5 Bank "	30	2021/22
19	New Modi Lekhnath132 kV Transmission Line	Lahachowk	"132/33 33/11"	"3 Ø, 30 3 Ø, 8"	38	2021/22
20	Lamahi Ghorahi 132 kV Substation Expansion	Ghorahi	132/33	"3 Ø, 63 "	63	2021/22

21	Keraun 132 kV Substation	Keraun	"132/33 132/11"	"3 Ø, 2x63 3 Ø, 22.5"	148.5	2021/22
22	Dhalkebar Loharpati 132 kV Transmission Line	Loharpatti	"132/33 132/11 33/11"	"3 Ø, 2x30 3 Ø, 22.5 3 Ø, 16"	98.5	2021/22
Total (FY 2021/22)					2359	
Total					5,550.50	
II	Under Project Management Directorate					
1	Kaligandaki Corridor 220 kV TL Project	Dana SS	"220/132 132/33"	"1 Ø, 4x33.33 Bank 3 Ø, 25"	125	2020/21
		Kushma SS	220/132	1 Ø, 4x33.33	100	2020/21
		New Butwal SS	220/132	1 Ø, 4x33.33	100	2020/21
2	Samundratar-Trishuli 3B Hub TL Project	Samundratar SS	132/33	3 Ø, 2x30	76	2020/21
			33/11	3 Ø, 2x8		
3	220 kV Bahrabise Substation	Barhabise SS	220/132	1 Ø, 4x53.33	165	2021/22
			132/11	3 Ø, 1x5		
4	Kathmandu Valley Transmission Capacity Reinforcement Project	Mulpani SS	132/11	3 Ø, 2x45	90	2021/22
		Futung SS	132/11	3 Ø, 2x45	90	2021/22
		Chapagaun SS	132/11	3 Ø, 2x45	90	2021/22
5	Marsyangdi-Kathmandu 220 kV TL Project	Markichowk SS	220/132	1 Ø, 7x53.33	320	2022/23
		Matatirtha SS	220/132	1 Ø, 7x53.33	320	2022/23
6	Marsyangdi Corridor 220 kV TL Project	Bharatpur SS	220/132	3 Ø, 2x160	320	2022/23
		Udipur SS	220/132	1 Ø, 4x53.33	210	2022/23
			132/33	3 Ø, 1x50		
		Khudi SS	220/132	1 Ø, 4x53.33	210	2022/23
			132/33	3 Ø, 1x50		
		Dharapani SS	132/33	1 Ø, 4x33.33	130	2022/23
			132/33	3 Ø, 1x30		
7	Lapsiphedi and Changunarayan SS Project	Lapsiphedi SS**	220/132	1 Ø, 4x53.33	182.5	2022/23
			132/11	3 Ø, 1x22.5		
		Changunarayan SS**	132/11	3 Ø, 1x45	45	
8	New Khimti- Barhabise - Lapsiphedi 400 kV SS Project	New Khimti SS	400/220	1 Ø, 7x105	630	2022/23
		Barhabise SS	400/220	1 Ø, 7x53.33	320	2022/23
		Lapsiphedi SS	400/220	1 Ø, 4x105	315	2022/23
9	Parwanipur- Pokhariya 132 kV TL Project **	Pokhariya SS	132/33	3 Ø, 2x63	171	2022/23
			132/11	3 Ø, 1x45		
10	Kathmandu Valley Transmission Capacity Reinforcement Project (Phase II)**	Thimi SS	132/11	3 Ø, 2x45	90	2022/23
		Koteshwor SS	132/66	3 Ø, 2x63	216	2022/23
			132/11	3 Ø, 2x45		
Total					4315.5	

** Under procurement process

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	400/132	1 Ø, 7x33.33 Bank	200
2	Lekhnath Damauli 220 kV Transmission Line (To be decided)	Lekhnath	220/132		
		Damauli	220/132		
3	Borang Ratmate 220 kV Transmission Line (To be decided)	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, 63	63
6	Ghorahi Madichaur 132 kV Transmission Line	Madichaur	132/33	3 Ø, 30	30
7	Dadakhet Rahughat132 kV Transmission Line	Dadakhet	132/33	3 Ø, 30	30
		Rahughat	220/132	1 Ø, 4x33.33 Bank	100
8	Kaligandaki Ridi132 kV Transmission Line	Ridi	"132/33 33/11"	"3 Ø, 30 3 Ø, 8"	38
9	Lalbandi Salimpur 132 kV Transmission Line	Salimpur	132/33	3 Ø, 63	63
10	Dhalkebar Balganga 132 kV Transmission Line	Balganga	132/33	3 Ø, 2x63	126
11	Bhumahi Hakui132 kV Transmission Line	Hakui	132/33	3 Ø, 63	63
12	Godak Anarmani 132 kV Transmission Line	Anarmani	132/33	3 Ø, 63	63
13	Dharan 220/33 kV substation	Dharan	"220/33 33/11"	"3 Ø, 63 3 Ø, 10"	73
14	Kohalpur Nepalgunj 132 kV Transmission Line	Nepalgunj	132/33	3 Ø, 2*63	126
15	Pathalaiya Harniya 132 kV Transmission Line	Harniya	132/33	3 Ø, 63	63
16	New Pokhara 132 kV Substation	Birauta	132/11	3 Ø, 30	30
17	Lahan - Sukhipur 132 kV Transmission Line	Sukhipur	132/33	3 Ø,2x30	60
18	Rupani - Bodebarsain 132 kV Transmission Line	Bodebarsain	132/33	3 Ø,2x30	60
19	Chandrapur - Sukhdevchaur 132 kV Transmission Line	Sukhdevchaur	132/33	"3 Ø,2x63 3 Ø,25"	151
Total					1563

I	Project Managment Directorate				
1	Kathmandu Valley 220 kV Ring Main Project	Kathmandu SS	220/132	400	490
			132/11	90	
		Bhaktapur SS	220/132	400	490
			132/11	90	
		Lalitpur SS	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	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 SS	400/220/132	630	
6	Dailekh - kalikot - Jumla 132 kV Project	Kalikot SS	132/33	63	108
			132/11	45	
		Jumla SS	132/33	63	108
			132/11	45	
7	Damauli - Kushma - Burtibang - Banfikot Project	Kushma SS	400/220/132	630	630
		Burtibang SS	400/220/132	630	630
		Banfikot SS	400/220/132	630	630
8	Lamosangu - Kavre / Ramechhap 132kV TL Project	Kavre/ Ramechhap SS	132/33	63	108
			132/11	45	
9	Construction of 132 kV Surkhet Substation	Surkhet SS	132/33	3 Ø, 2x65	130
Total					7234

NEPAL ELECTRICITY AUTHORITY
POWER TRADE DEPARTMENT
IPPs' Hydro Power Projects (Operation) as of FY 2076/77

S.N.	Developer	Projects	Capacity (kW)	PPA Date	Commercial Operation Date
1	Himal Power Ltd.	Khimti Khola	60000	2052.10.01	2057.03.27
2	Bhotekoshi Power Company Ltd.	Upper Bhotekoshi	45000	2053.04.06	2057.10.11
3	Syange Electricity Company Limited	Syange Khola	183	2058.10.03	2058.10.10
4	National Hydro Power Company Ltd.	Indrawati- III	7500	2054.09.15	2059.06.21
5	Chilime Hydro Power Company Ltd.	Chilime	22100	2054.03.11	2060.05.08
6	Butwal Power Company Ltd.	Jhimruk Khola	12000	2058.03.29	1994
7	Butwal Power Company Ltd.	Andhi Khola	9400	2058.03.29	2071.12.22
8	Arun Valley Hydropower Development Co. (P.) Ltd.	Piluwa Khola Small	3000	2056.10.09	2060.06.01
9	Rairang Hydro Power Development Co. (P) Ltd.	Rairang Khola	500	2059.08.27	2061.08.01
10	Sanima Hydropower (Pvt.) Ltd.	Sunkoshi Small	2500	2058.07.28	2061.12.11
11	Alliance Power Nepal Pvt.Ltd.	Chaku Khola	3000	2056.11.03	2062.03.01
12	Khudi Hydropower Ltd.	Khudi Khola	4000	2058.03.04	2063.09.15
13	Unique Hydel Co. Pvt.Ltd.	Baramchi Khola	4200	2058.12.14	2063.09.27
14	Thoppal Khola Hydro Power Co. Pvt. Ltd.	Thoppal Khola	1650	2059.11.23	2064.07.13
15	Gautam Buddha Hydropower (Pvt.) Ltd.	Sisne Khola Small	750	2061.04.29	2064.06.01
16	Kathmandu Small Hydropower Systems Pvt. Ltd.	Sali Nadi	250	2062.04.24	2064.08.01
17	Khoranga Khola Hydropower Dev. Co. Pvt. Ltd.	Pheme Khola	995	2057.12.31	2064.08.05
18	Unified Hydropower (P.) Ltd.	Pati Khola Small	996	2062.10.28	2065.10.27
19	Task Hydropower Company (P.) Ltd.	Seti-II	979	2063.06.08	2065.11.14
20	Ridi Hydropower Development Co. (P.) Ltd.	Ridi Khola	2400	2063.05.08	2066.07.10
21	Centre for Power Dev. And Services (P.) Ltd.	Upper Hadi Khola	991	2064.04.07	2066.07.22
22	Gandaki Hydro Power Co. Pvt. Ltd.	Mardi Khola	4800	2060.07.07	2066.10.08
23	Himal Dolkha Hydropower Company Ltd.	Mai Khola	4500	2063.11.19	2067.10.14

24	Baneswor Hydropower Pvt. Ltd.	Lower Piluwa Small	990	2064.07.21	2068.04.01
25	Barun Hydropower Development Co. (P.) Ltd.	Hewa Khola	4455	2061.04.02	2068.04.17
26	Bhagawati Hydropower Development Co. (P.) Ltd.	Bijayapur-1	4410	2066.03.30	2069.05.04
27	Kathmandu Upatyaka Khanepani bewasthapan Board	Solar	680.4	2069.06.12	2069.07.15
28	Nyadi Group (P.) Ltd.	Siuri Khola	4950	2064.04.17	2069.07.30
29	United Modi Hydropwer Pvt. Ltd.	Lower Modi 1	10000	2065.10.20	2069.08.10
30	Synergy Power Development (P.) Ltd.	Sipring Khola	9658	2065.10.20	2069.10.03
31	Laughing Buddha Power Nepal (P.) Ltd.	Middle Chaku	1800	2066.11.03	2069.11.15
32	Aadishakti Power Dev. Company (P.) Ltd.	Tadi Khola (Thaprek)	5000	2061.12.15	2069.12.14
33	Ankhu Khola Jal Bidhyut Co. (P.) Ltd.	Ankhu Khola- 1	8400	2066.02.22	2070.05.05
34	Nepal Hydro Developer Pvt. Ltd.	Charanawati Khola	3520	2067.01.13	2070.02.24
35	Laughing Buddha Power Nepal Pvt. Ltd.	Lower Chaku Khola	1800	2063.07.02	2070.04.24
36	Bhairabkunda Hydropower Pvt. Ltd.	Bhairab Kunda	3000	2065.08.02	2071.02.22
37	Radhi Bidyut Company Ltd.	Radhi Khola	4400	2066.10.18	2071.02.31
38	Pashupati Environmental Eng. Power Co. Pvt. Ltd.	Chhote Khola	993	2067.11.09	2071.03.09
39	Mailung Khola Hydro Power Company (P.) Ltd.	Mailung Khola	5000	2058.04.09	2071.03.19
40	Joshi Hydropower Development Company Limited	Upper Puwa-1	3000	2066.01.23	2071.10.01
41	Sanima Mai Hydropower Limited	Mai Khola	22000	2067.01.08	2071.10.14
42	Bojini Company Private Limited	Jiri Khola Small	2200	2065.10.23	2071.11.01
43	Ruru Hydropower Project (P) Ltd.	Upper Hugdi Khola	5000	2066.04.04	2071.12.09
44	Prime Hydropower Co. Pvt. Ltd.	Belkhu	518	2064.04.04	2071.12.30
45	Api Power Company Pvt. Ltd.	Naugadh gad Khola	8500	2067.01.19	2072.05.02
46	Kutheli Bukhari Small Hydropower (P).Ltd	Suspa Bukhari	998	2069.04.32	2072.06.03
47	Sanima Mai Hydropower Ltd.	Mai Cascade	7000	2069.10.12	2072.10.29

48	Chhyangdi Hydropower Limited	Chhandi	2000	2068.12.23	2072.12.13
49	Panchakanya Mai Hydropower Ltd. (Previously Mai Valley and prior to that East Nepal)	Upper Mai Khola	9980	2061.12.19	2073.03.09
50	Sayapatri Hydropower Private Limited	Daram Khola A	2500	2068.12.19	2073.03.12
51	Electro-com and Research Centre Pvt. Ltd.	Jhyadi Khola	2000	2067.01.30	2073.05.31
52	Khani Khola Hydropower Company Pvt. Ltd.	Tungun-Thosne	4360	2069.04.05	2073.07.09
53	Daraudi Kalika Hydro Pvt. Ltd.	Daraudi Khola A	6000	2068.05.19	2073.08.13
54	Khani Khola Hydropower Company Pvt. Ltd.	Khani Khola	2000	2069.04.05	2073.08.20
55	Sapsu Kalika Hydropower Co. Pvt. Ltd.	Miya Khola	996	2069.08.10	2073.09.03
56	Sinohydro-Sagarmatha Power Company (P) Ltd.	Upper Marsyangdi "A"	50000	2067.09.14	2073.09.17
57	Madi Power Pvt. Ltd.	Upper Madi	25000	2066.05.21	2073.09.25
58	Panchthar Power Company Pvt. Ltd.	Hewa Khola A	14900	2068.05.30	2073.10.22
59	Sanvi Energy pvt. Ltd.	Jogmai	7600	2069.08.07	2074.01.18
60	Bhugol Energy Dev Compay (P). Ltd	Dwari Khola	3750	2069.12.30	2074.01.23
61	Mai Valley Hydropower Private Limited	Upper Mai C	5100	2068.12.23	2074.04.09
62	Dronanchal Hydropower Co.Pvt.Ltd	Dhunge-Jiri	600	2068.09.25	2074.06.01
63	Dibyaswari Hydropower Limited	Sabha Khola	4000	2068.11.17	2074.06.02
64	Puwa Khola-1 Hydropower P. Ltd.	Puwa Khola-1	4000	2070.10.09	2074.06.23
65	Shibani Hydropower Co. Pvt. Ltd.	Phawa Khola	4950	2063.12.01	2074.07.14
66	Mount Kailash Energy Pvt. Ltd.	Thapa Khola	13600	2067.10.11	2074.08.22
67	Mandakini Hydropower Limited	Sardi Khola	4000	2068.11.11	2074.08.23
68	Garjang Upatyaka Hydropower (P.) Ltd.	Chake Khola	2830	2065.11.06	2074.08.28
69	Union Hydropower Pvt Ltd.	Midim Karapu	3000	2069.10.28	2074.10.15
70	Syauri Bhumey Microhydro Project	Syauri Bhumey	23	2072.11.16	2074.10.18
71	Molung Hydropower Company Pvt. Ltd.	Molung Khola	7000	2069.11.21	2074.12.12
72	Sikles Hydropower Pvt. Ltd.	Madkyu Khola	13000	2066.08.03	2074.12.19
73	Himal Dolkha Hydropower Company Ltd.	Mai sana Cascade	8000	2069.11.14	2074.12.26

74	Barahi Hydropower Pvt.ltd	Theule Khola	1500	2066.12.16	2075.03.24
75	Leguwa Khola Laghu Jalbidhyut Sahakari Sastha Ltd.	Leguwa Khola	40	2072.11.21	2075.03.28
76	Super Mai Hydropower Pvt. Ltd.	Super Mai	7800	2073.12.06	2075.07.11
77	Chimal Gramin Bidhyut Sahakari Sanstha Ltd.	Sobuwa Khola-2 MHP	90	2074.11.15	2075.07.14
78	Surya Power Company Pvt. Ltd.	Bishnu Priya Solar Farm Project	960	2074.04.08	2075.08.13
79	Deurali Bahuudesiya Sahakari Sanstha Ltd.	Midim Khola	100	2070.02.20	2075.09.04
80	Bindhyabasini Hydropower Development Co. (P.) Ltd.	Rudi Khola A	8800	2069.10.28	2075.12.04
81	Mandu Hydropower Ltd.	Bagmati Khola Small	22000	2069.10.07	2075.12.19
82	Eastern Hydropower Pvt. Ltd.	Pikhuwa Khola	5000	2066.07.24	2076.02.27
83	Salmanidevi Hydropower (P). Ltd	Kapadi Gad	3330	2069.12.11	2076.02.25
84	Mountain Hydro Nepal Pvt. Ltd.	Tallo Hewa Khola	22100	2071.04.09 2075.10.16	2076.04.21
85	Pashupati Environmental Power Co. Pvt. Ltd.	Lower Chhote Khola	997	2072.08.04	2076.05.20
86	United Idi Mardi and R.B. Hydropower Pvt. Ltd.	Upper Mardi	7000	2073.02.25	2076.06.20
87	Rairang Hydropower Development Company Ltd.	Iwa Khola	9900	2070.01.29	2076.06.20
88	Api Power Company Pvt. Ltd.	Upper Naugad Gad	8000	2073.07.12	2076.07.13
89	Arun Kabeli Power Ltd.	Kabeli B-1	25000	2069.03.29	2076.07.23
90	Rangoon Khola Hydropower Pvt. Ltd.	Jeuligad	996	2071.10.20	2076.08.27
91	Dolti Power Company Pvt. Ltd.	Padam Khola	4800	2074.08.01	2076.09.08
92	Bindhyabasini Hydropower Development Co. (P.) Ltd.	Rudi Khola B	6600	2071.4.20	2076.11.05
93	Ghalemdi Hydro Limited (Previously, Cemat Power Dev Company (P). Ltd.)	Ghalemdi Khola	5000	2069.12.30	2076.11.05
94	Terhathum Power Company Pvt. Ltd.	Upper Khorunga	7500	2073.07.29	2076.11.17
95	Khimti Gramin Bidhyut Sahakari Sanstha Ltd.	Jhankre Khola Small	600	2075.02.04	2076.11.28
96	Upper Solu Hydroelectric Company Pvt. Ltd	Solu Khola	23500	2070.07.24	2076.12.10 (Transactional Operation Date-TOD)
97	Sagarmatha Jalabidhyut Company Pvt. Ltd.	Super Mai 'A'	9600	2074.11.14	2077.02.32
98	Mai Khola Hydropower Pvt. Ltd.	Super Mai Cascade	3800	2074.12.07	2077.03.31
			696,168.40		

NEPAL ELECTRICITY AUTHORITY
POWER TRADE DEPARTMENT
IPPs' Hydropower Projects (Under Construction) as of FY 2076/77
(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 (for 990kw) 2077.09.15 (for 675kw)
3	Himalayan Hydropower Pvt. Ltd.	Namarjun Madi	Kaski	11880	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	2074.12.17 (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	2076.09.15
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	2076.09.15
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	2076.09.15
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	Rising Hydropower Compnay Ltd.	Selang Khola	Sindhupalchowk	990	2069.03.31	2071.6.15
25	Liberty Hydropower Pvt. Ltd.	Upper Dordi A	Lamjung	25000	2069.06.02	2076.05.14
26	Hydro Innovation Pvt. Ltd.	Tinekhu Khola	Dolakha	990	2069.06.08	2074.12.30
27	Salankhu Khola Hydropower Pvt. Ltd.	Salankhu Khola	Nuwakot	2500	2069.06.14	2071.11.30
28	Moonlight Hydropower Pvt. Ltd.	Balephi A	Sindhupalchowk	10600	2069.07.14	2076.12.28
29	Middle Modi Hydropower Ltd.	Middle Modi	Parbat	15100	2069.08.21	2077.03.31
30	Reliable Hydropower Co. Pvt. Ltd.	Khorunga Khola	Terhathum	4800	2069.08.26	2077.08.16
31	Rara Hydropower Development Co. Pvt. Ltd.	Upper Parajuli Khola	Dailekh	2150	2069.08.28	2071.12.17
32	Lohore Khola Hydropower Co. Pvt. Ltd.	Lohore Khola	Dailekh	4200	2069.09.08	2073.06.20
33	Beni Hydropower Project Pvt. Ltd.	Upper Solu	Solukhumbu	18000	2069.09.16 2073.07.25 (PPA Revived)	2074.10.01
34	Dudhkoshi Power Company Pvt. Ltd.	Rawa Khola	Khotang	6500	2069.09.26	2073.05.31
35	Universal Power Company Ltd.	Lower Khare	Dolakha	11000	2069.10.22	2074.9.16 (8.26MW) 2076.04.03 (2.74MW)
36	Madhya Midim Jalbidhyut Company P. Ltd.	Middle Midim	Lamjung	3100	2069.10.23	2072.5.1
37	Volcano Hydropower Pvt. Ltd.	Teliya Khola	Dhankuta	996	2069.10.25	2071.7.24
38	Betrawoti Hydropower Company (P).Ltd	Phalankhu Khola	Rasuwa	13700	2069.12.06	2075.10.01
39	Himalaya Urja Bikas Co. Ltd.	Upper Khimti II	Ramechhap	7000	2069.12.09	2075.12.01
40	Dovan Hydropower Company Pvt. Ltd.	Junbesi Khola	Solukhumbu	5200	2069.12.29	2076.08.30
41	Tallo Midim Jalbidhut Company Pvt. Ltd.	Lower Midim	Lamjung	996	2070.01.19	2071.8.1
42	Tangchhar Hydro Pvt. Ltd	Tangchhahara	Mustang	2200	2070.02.20	2073.7.1
43	Abiral Hydropower Co. Pvt. Ltd.	Upper Khadam	Morang	990	2070.02.21	2071.08.01
44	Manakamana Engineering Hydropower Pvt. Ltd.	Ghatte Khola	Dolakha	5000	2070.04.28	2075.03.16

45	Essel-Clean Solu Hydropower Pvt. Ltd.	Lower Solu	Solukhumbu	82000	2070.07.15	2076.8.30
46	Consortium Power Developers Pvt. Ltd.	Khare Khola	Dolakha	24100	2070.07.15	2075.08.15
47	Singati Hydro Energy Pvt. Ltd.	Singati Khola	Dolakha	25000	2070.07.27	2075.05.31 (16MW) 2077.04.01 (9MW)
48	Maya Khola Hydropower Co. Pvt. Ltd.	Maya Khola	Sankhuwasabha	14900	2070.08.30	2076.9.1
49	Idi Hydropower Co. P. Ltd.	Idi Khola	Kaski	975	2070.09.01	2074.09.16
50	Buddha Bhumi Nepal Hydro Power Co. Pvt. Ltd.	Lower Tadi	Nuwakot	4993	2070.12.10	2075.10.01
51	Dordi Khola Jal Bidyut Company Ltd.	Dordi-1 Khola	Lamjung	12000	2071.07.19 (10.3 MW) 2073.04.19 2075.11.21 (1.7 MW)	2076.08.16 (10.3 MW) 2077.04.02 (1.7 MW)
52	River Falls Hydropower Development Pvt. Ltd.	Down Piluwa	Sankhuwasabha	9500	2071.10.18	2076.09.01
53	Peoples' Hydropower Company Pvt. Ltd.	Super Dordi 'Kha'	Lamjung	54000	2071.11.13 2075.11.15	2077.03.29
54	Hydro Venture Private Limited	Solu Khola (Dudhkoshi)	Solukhumbu	86000	2071.11.13	2077.06.10
55	Global Hydropower Associate Pvt. Ltd.	Likhu-2	Solukhumbu/ Ramechap	33400	2071.11.19	2077.04.01
56	Paan Himalaya Energy Private Limited	Likhu-1	Solukhumbu/ Ramechap	51400	2071.11.19	2077.04.01
57	Numbur Himalaya Hydropower Pvt. Ltd.	Likhu Khola A	Solukhumbu/ Ramechap	24200	2071.11.22	2077.04.01
58	Dipsabha Hydropower Pvt. Ltd.	Sabha Khola A	Sankhuwasabha	9990	2071.12.02	2076.07.15
59	Research and Development Group Pvt. Ltd.	Rupse Khola	Myagdi	4000	2071.12.17	2076.08.02
60	Hydro Empire Pvt. Ltd.	Upper Myagdi	Myagdi	20000	2071.12.17	2077.05.30
61	Chandeshwori Mahadev Khola MH. Co. Pvt. Ltd.	Chulepu Khola	Ramechhap	8520	2071.12.23	2075.04.15
62	Nyadi Hydropower Limited	Nyadi	Lamjung	30000	2072.02.12	2077.01.06
63	Suri Khola Hydropower Pvt. Ltd.	Suri Khola	Dolakha	6400	2072.02.20	2074.12.30
64	Bungal Hydro Pvt. Ltd. (Previously Sanigad Hydro Pvt. Ltd.)	Upper Sanigad	Bajhang	10700	2072.03.15	2076.05.29
65	Kalanga Hydro Pvt. Ltd.	Kalangagad	Bajhang	15330	2072.03.15	2076.05.29
66	Sanigad Hydro Pvt. Ltd.	Upper Kalangagad	Bajhang	38460	2072.03.15	2077.04.15
67	Dhaulagiri Kalika Hydro Pvt. Ltd.	Darbang-Myagdi	Myagdi	25000	2072.04.28	2075.12.25
68	Menchhiyam Hydropower Pvt. Ltd.	Upper Piluwa Khola 2	Sankhuwasabha	4720	2072.05.11	2076.04.01
69	Kabeli Energy Limited	Kabeli-A	Panchthar and Taplejung	37600	2072.06.07	2076.11.03
70	Upper Syange Hydropower P. Ltd.	Upper Syange Khola	Lamjung	2400	2072.06.14	2075.10.01
71	Peoples Energy Ltd. (Previously Peoples Hydro Co-operative Ltd.)	Khimti-2	Dolakha and Ramechhap	48800	2072.06.14	2078.04.01
72	Chauri Hydropower (P.) Ltd.	Chauri Khola	Kavrepalanchowk, Ramechhap, Sindhupalchowk, Dolakha	6000	2072.06.14 (5 MW) 2076.01.06 (1 MW)	2075.12.30 (5 MW) 2078.08.03 (1 MW)
73	Huaning Development Pvt. Ltd.	Upper Balephi A	Sindhupalchowk	36000	2072.08.29	2075.10.06
74	Upper Hewa Khola Hydropower Co. Pvt. Ltd.	Upper Hewa Khola Small	Sankhuwasabha	8500	2072.09.23	2076.03.17
75	Multi Energy Development Pvt. Ltd.	Langtang Khola	Rasuwa	20000	2072.09.29	2076.12.30 (10MW) 2078.04.03 (10MW)
76	Ankhu Hydropower (P.) Ltd.	Ankhu Khola	Dhading	34000	2073.01.30	2076.12.30
77	Myagdi Hydropower Pvt. Ltd.	Ghar Khola	Myagdi	14000	2073.02.11	2076.08.30 (8.3 MW) 2078.10.17 (5.7 MW)
78	Richet Jalbidhyut Company Pvt. Ltd.	Richet Khola	Gorkha	4980	2073.02.23	2075.07.30
79	Rapti Hydro and General Construction Pvt. Ltd.	Rukumgad	Rukum	5000	2073.03.07	2076.09.01
80	Rawa Energy Development Pvt. Ltd.	Upper Rawa	Khotang	3000	2073.04.24	2076.03.30
81	Siddhi Hydropower Company Pvt. Ltd.	Siddhi Khola	Illam	10000	2074.05.29	2077.03.31
82	Nilgiri Khola Hydropower Co. Ltd.	Nilgiri Khola	Myagdi	38000	2073.11.30	2080.08.30
83	Siuri Nyadi Power Pvt. Ltd.	Super Nyadi	Lamjung	40270	2074.02.19	2079.04.01
84	Swet-Ganga Hydropower and Construction Ltd.	Lower Likhu	Ramechhap	28100	2073.09.14	2078.08.15

85	Nilgiri Khola Hydropower Co. Ltd.	Nilgiri Khola-2	Myagdi	62000	2074.03.05	2081.08.30
86	Sano Milti Khola Hydropower Ltd.	Sano Milti	Ramechhap and Dolakha	3000	2073.01.13	2075.08.01
87	Diamond Hydropower Pvt. Ltd.	Upper Daraudi-1	Gorkha	10000	2072.08.14	2075.09.17
88	Chhyangdi Hydropower Limited	Upper Chhyangdi Khola	Lamjung	4000	2074.03.22	2078.4.05
89	Taksar-Pikhuwa Hydropower Pvt. Ltd.	Taksar Pikhuwa	Bhojpur	8000	2073.09.01	2076.10.23
90	Rasuwa Hydropower Pvt. Ltd	Phalanku Khola	Rasuwa	5000	2071.08.24	2076.8.01
91	Civil Hydropower Pvt. Ltd.	Bijayapur 2 Khola Small	Kaski	4500	2072.09.12	2075.03.32
92	Makari Gad Hydropower Pvt. Ltd.	Makarigad	Darchula	10000	2072.08.29	2076.02.32
93	Super Madi Hydropower Ltd. (Previously Himal Hydro and General Construction Ltd.)	Super Madi	Kaski	44000	2073.10.27	2078.02.28
94	Mount Nilgiri Hydropower Company Pvt. Ltd.	Rurubanchu-1	Kalikot	13500	2074.05.08	2077.11.03
95	Trishuli Jal Vidhyut Company Ltd.	Upper Trishuli 3B	Rasuwa	37000	2074.05.06	2078.11.17
96	Century Energy Pvt. Ltd.	Hadi Khola Sunkoshi A	Sindhupalchowk	997	2074.05.05	2076.11.03
97	Sindhujwala Hydropower Ltd.	Upper Nyasem	Sindhupalchowk	41400	2073.07.24	2077.03.30
98	Samling Power Company Pvt. Ltd.	Mai Beni	Illam	9510	2073.07.26	2078.08.02
99	Energy Venture Pvt. Ltd.	Upper Lapche	Dolakha	52000	2073.04.20	2078.12.30
100	Orbit Energy Pvt. Ltd. (Previously Pokhari Hydropower Company Pvt. Ltd.)	Sabha Khola B	Sankhuwasabha	15100	2074.03.26	2078.2.31
101	Eco Power Development Company Pvt. Ltd	Mithila Solar PV Electric Project	Dhanusha	10000	2075.09.16	2076.01.17
102	Daram Khola Hydro Energy Ltd.	Daram Khola	Baglung and Gulmi	9600	2073.10.09	2076.09.08
103	Sagarmatha Energy and Construction Pvt. Ltd.	Dhalkebar Solar Project	Dhanusha	3000	2075.06.24	2076.12.23
104	Gorkha Congenial Energy and Investment Pvt. Ltd.	Lamahi Solar Project	Dang	3000	2075.06.24	2076.12.23
105	Global Energy and Construction Pvt. Ltd.	Duhabi Solar Project	Sunsari	8000	2075.06.25	2076.12.24
106	Ridi Hydropower Development Co. Ltd.	Butwal Solar Project	Rupandehi	8500	2075.06.09	2076.04.08
107	Him River Power Pvt. Ltd.	Liping Khola	Sindhupalchowk	16260	2073.02.28	2077.01.22
108	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
109	Nepal Water and Energy Development Company Pvt. Ltd.	Upper Trishuli- 1	Rasuwa	216000	2074.10.14	2080.12.18
110	Mewa Developers Pvt. Ltd.	Middle Mewa	Taplejung	49000	2075.05.04	2080.06.06
111	Solar Farm Pvt. Ltd.	Belchautara Solar Project	Tanahun	5000	2075.04.23	2076.04.03
112	Him Star Urja Co. Pvt. Ltd.	Buku Kapati	Okhaldhunga and Solukhumbu	5000	2074.10.11	2077.04.15
113	Aashutosh Energy Pvt. Ltd.	Chepe Khola Small	Lamjung	8630	2075.02.15	2078.11.09
114	Everest Sugar and Chemical Industries Ltd.	Everest Sugar and Chemical Industries Ltd.	Mahottari	3000	2075.06.17	2076.12.30
115	Indushankar Chini Udhyog Ltd.	Indushankar Chini Udhyog Ltd.	Sarlahi	3000	2075.06.10	2076.12.09
116	Sanvi Energy Pvt. Ltd.	Jogmai Cascade	Illam	6000	2075.05.07	2078.04.07
117	Jhyamolongma Hydropower Development Company Pvt. Ltd.	Karuwa Seti	Kaski	32000	2074.04.20	2079.01.12
118	Nasa Hydropower Pvt. Ltd.	Lapche Khola	Dolakha	99400	2074.07.29	2079.04.14
119	Asian Hydropower Pvt. Ltd.	Lower Jogmai	Illam	6200	2074.12.07	2078.04.01
120	Sanima Middle Tamor Hydropower Ltd. (Prv. Tamor Sanima Energy Pvt. Ltd.)	Middle Tamor	Taplejung	73000	2073.09.26	2078.05.28
121	Vision Energy and Power Pvt. Ltd.	Nupche Likhu	Ramechhap	57500	2074.11.28	2080.05.02
122	People's Power Limited	Puwa- 2	Illam	4960	2074.05.05	2078.06.11
123	Tundi Power Pvt.Ltd	Rahughat Mangale	Myagdi	35500	2075.03.29	2079.08.29
124	Him Consult Pvt. Ltd.	Rele Khola	Myagdi	6000	2074.01.28	2077.02.19

125	Parbat Paiyun Khola Hydropower Company Pvt. Ltd.	Seti Khola	Parbat	3500	2074.02.22	2076.12.30
126	Chirkhwa Hydropower Pvt. Ltd.	Upper Chirkhwa	Bhojpur	4700	2073.03.01	2077.04.01
127	Yambling Hydropower Pvt. Ltd.	Yambling Khola	Sindhupalchowk	7270	2072.09.29	2077.03.17
128	Gaurishankar Power Development Pvt. Ltd.	Middle Hyongu Khola B	Solukhumbu	22900	2074.12.08	2079.04.01
129	Upper Lohore Khola Hydropower Co. Pvt. Ltd.	Upper Lohore	Dailekh	4000	2074.12.08	2077.04.11
130	Unitech Hydropower Co. Pvt. Ltd.	Upper Phawa	Taplejung	5800	2074.11.11	2078.04.16
131	Omega Energy Developer Pvt. Ltd.	Sunigad	Bajhang	11050	2074.11.30	2080.02.07
			TOTAL	3,157,192		

IPPs' Hydropower Projects in Different Stages of Development as of FY 2076/77

(Without Financial Closure)

S.N.	Developers	Projects	Location	Installed Capacity (kW)	PPA Date	Required Commercial Operation Date
1	Balephi Jalbidhyut Co. Ltd.	Balephi	Sindhupalchowk	23520	2067.09.08	2077.06.30
2	Ingwa Hydro Power Pvt. Ltd	Upper Ingwa khola	Taplejung	9700	2068.03.10	2073.04.01
3	United Modi Hydropwer Ltd.	Lower Modi 2	Parbat	10500	2072.11.14	2076.03.17
4	Salasungi Power Limited	Sanjen Khola	Rasuwa	78000	2072.12.02	2077.03.08
5	Sisa Hydro Electric Company Pvt. Ltd.	Sisa Khola A	Solukhumbu	2800	2073.10.28	2077.12.12
6	Chirkhwa Hydropower Pvt. Ltd.	Lower Chirkhwa	Bhojpur	4060	2074.01.20	2078.04.01
7	Himali Rural Electric Co-operative Ltd.	Leguwa Khola Small	Dhankuta	640	2074.02.08	2075.12.28
8	Sabha Pokhari Hydro Power (P.) Ltd.	Lankhuwa Khola	Sankhuwasabha	5000	2074.02.21	2077.09.14
9	United Mewa Khola Hydropower Pvt. Ltd.	Mewa Khola	Taplejung	50000	2074.02.21	2078.04.01
10	Sewa Hydro Ltd.	Lower Selang	Sindhupalchowk	1500	2074.02.22	2075.12.30
11	Gorakshya Hydropower Pvt. Ltd.	Super Ankhu Khola	Dhading	23500	2074.03.15	2080.09.15
12	Nyam Nyam Hydropower Company Pvt. Ltd.	Nyam Nyam Khola	Rasuwa	6000	2074.03.27	2077.12.31
13	Saptang Hydro Power Pvt. Ltd.	Saptang Khola	Nuwakot	2500	2074.04.08	2076.04.12
14	Bhujung Hydropower Pvt. Ltd.	Upper Midim	Lamjung	7500	2074.05.29	2078.04.01
15	Himalayan Water Resources and Energy Development Co. Pvt. Ltd.	Upper Chauri	Kavrepalanchowk	6000	2074.07.27	2078.04.04
16	IDS Energy Pvt. Ltd.	Lower Khorunga	Terhathum	5400	2074.08.24	2078.04.01
17	Langtang Bhotekoshi Hydropower Company Pvt. Ltd.	Rasuwa Bhotekoshi	Rasuwa	120000	2074.09.07	2078.09.07
18	Upper Richet Hydropower Pvt. Ltd.	Upper Richet	Gorkha	2000	2074.09.20	2077.04.01
19	Khechereswor Jal Vidhyut Pvt. Ltd.	Jadari Gad Small	Bajhang	1000	2074.10.12	2077.07.30
20	Khechereswor Jal Vidhyut Pvt. Ltd.	Salubyani Gad Small	Bajhang	233	2074.10.12	2077.09.29
21	Gaughar Ujjyalo Sana Hydropower Co. Pvt. Ltd.	Ghatte Khola Small	Sindhupalchowk	970	2074.11.11	2077.03.01
22	Seti Khola Hydropower Pvt. Ltd.	Seti Khola	Kaski	22000	2074.11.11	2079.04.15
23	Super Hewa Power Company Pvt. Ltd.	Super Hewa	Sankhuwasabha	5000	2074.12.27	2078.04.01
24	Baraha Multipower Pvt. Ltd.	Irkhuwa Khola B	Bhojpur	15524	2075.02.14	2079.04.15
25	Lower Irkhuwa Hydropower Co. Pvt. Ltd.	Lower Irkhuwa	Bhojpur	13040	2075.02.16	2079.04.03
26	Sungava Foundation Pvt. Ltd.	Thulo Khola	Myagdi	21300	2075.02.17	2079.04.15
27	Jhilimili Hydropower Co. Pvt. Ltd.	Gulangdi Khola	Gulmi	980	2075.02.24	2078.01.14
28	North Summit Hydro Pvt. Ltd.	Nyadi Phidi	Lamjung	21400	2075.02.24	2079.12.15
29	Himali Hydro Fund Pvt. Ltd.	Sona Khola	Taplejung	9000	2075.03.14	2080.07.30
30	Tanahun Hydropower Ltd.	Tanahun	Tanahun	140000	2075.03.15	2080.12.30
31	Sailung Power Company Pvt. Ltd.	Bhotekoshi-1	Sindhupalchowk	40000	2075.03.15	2079.07.01
32	Jalshakti Hydro Company Pvt. Ltd.	Ilep (Tatopani)	Dhading	23675	2075.03.25	2081.08.25
33	Three Star Hydropower Company Ltd.	Sapsup Khola	Khotang	6600	2075.03.25	2078.06.31

34	Tundi Power Pvt.Ltd	Upper Rahughat	Myagdi	48500	2075.03.29	2080.08.29
35	Arati Power Company Ltd.	Upper Irkhuwa	Bhojpur	14500	2075.04.01	2079.08.01
36	Mount Everest Power Development Pvt. Ltd.	Dudhkunda Khola	Solukhumbu	12000	2075.04.01	2079.06.30
37	Shaileshwari Power Nepal Pvt. Ltd.	Upper Gaddigad	Doti	1550	2075.04.06	2077.12.19
38	Palun Khola Hydropower Pvt. Ltd.	Palun Khola	Taplejung	21000	2075.04.06	2080.06.21
39	Makar Jitumaya Hydropower Pvt. Ltd.	Upper Suri	Dolakha	7000	2075.04.10	2079.12.30
40	Him Parbat Hydropower Pvt. Ltd.	Sagu Khola-1	Dolakha	5500	2075.04.10	2079.12.30
41	Him Parbat Hydropower Pvt. Ltd.	Sagu Khola	Dolakha	20000	2075.04.10	2079.12.30
42	Annapurna Bidhyut Bikas Co. Pvt. Ltd.	Landruk Modi	Kaski	86590	2075.04.13	2081.09.15
43	Madame Khola Hydropower Pvt. Ltd.	Madame Khola	Kaski	24000	2075.04.15	2080.12.30
44	Mid Solu Hydropower Company Pvt. Ltd.	Mid Solu Khola	Solukhumbu	9500	2075.04.21	2079.05.14
45	Apolo Hydropower Pvt. Ltd.	Buku Khola	Solukhumbu	6000	2070.02.02 2075.04.22 (Revived)	2074.04.01
46	Thulo Khola Hydropower Pvt. Ltd.	Upper thulo Khola-A	Myagdi	15000	2075.04.24	2080.06.30
47	Kalika Energy Ltd.	Bhotekoshi-5	Sindhupalchowk	62000	2075.04.25	2080.09.15
48	Api Power Company Ltd.	Chandranigahpur Solar Project	Rautahat	4000	2075.04.27	2076.02.26
49	Api Power Company Ltd.	Parwanipur Solar Project	Parsa	8000	2075.04.27	2076.02.26
50	Api Power Company Ltd.	Dhalkebar Solar Project	Dhanusha	1000	2075.05.03	2076.03.02
51	Api Power Company Ltd.	Simara Solar Project	Bara	1000	2075.05.03	2076.03.02
52	Super Ghalemdi Hydropower Pvt. Ltd.	Super Ghalemdi	Myagdi	9140	2075.05.05	2080.12.12
53	Dibyajyoti Hydropower Pvt. Ltd.	Marsyangdi Besi	Lamjung	50000	2075.05.10	2079.06.06
54	Amar Jyoti Hydro Power Pvt. Ltd.	Istul Khola	Gorkha	1506	2075.05.13	2079.10.25
55	Apex Makalu Hydro Power Pvt. Ltd.	Middle Hongu Khola A	Solukhumbu	22000	2075.05.14	2079.04.01
56	Ichowk Hydropower Pvt. Ltd.	Gohare Khola	Sindhupalchowk	950	2075.05.25	2076.07.29
57	Pike Hydropower Pvt. Ltd.	Likhu Khola	Ramechhap and Okhaldhunga	30000	2075.05.26	2082.02.17
58	Sita Hydro Power Co. Pvt. Ltd.	Nyasim Khola	Sindhupalchowk	35000	2075.05.26	2080.03.15
59	Sushmit Energy Pvt. Ltd.	Kunaban Khola	Myagdi	20000	2075.05.29	2080.11.03
60	Masina Paryatan Sahakari Sanstha Ltd.	Masina	Kaski and Tanahu	891	2075.06.02	2076.10.29
61	Hydro Village Pvt. Ltd.	Myagdi Khola	Myagdi	57300	2075.06.04	2080.05.29
62	Shikhar Power Development Pvt. Ltd.	Bhim Khola	Baglung	4960	2075.06.10	2078.06.05
63	Dhading Ankhu Khola Hydro Pvt. Ltd.	Upper Ankhu	Dhading	38000	2075.06.14	2079.09.15
64	Phedi Khola Hydropower Company Pvt. Ltd.	Phedi Khola (Thumlung)	Bhojpur	3520	2075.06.21	2079.12.01
65	Dolakha Nirman Company Pvt. Ltd.	Isuwa Khola	Sankhuwasabha	97200	2075.06.26	2080.04.01
66	Bikash Hydropower Company Pvt. Ltd.	Upper Machha Khola Small	Gorkha	4550	2075.07.11	2080.03.30
67	Sita Hydropower Co. Pvt. Ltd.	Dudh Khola	Manang	65000	2075.07.11	2080.03.15
68	Blue Energy Pvt. Ltd.	Super Trishuli	Gorkha and Chitwan	70000	2075.07.11	2080.11.17
69	Vision Lumbini Ltd.	Seti Nadi	Kaski	25000	2075.08.06	2079.04.05
70	Kalinchowk Hydropower Pvt. Ltd.	Sangu (Sorun)	Dolakha	5000	2075.08.09	2079.12.30
71	Arun Valley Hydropower Development Company Ltd.	Kabeli B-1 Cascade	Panchthar	9940	2075.08.09	2078.06.01
72	Kasuwa Khola Hydropower Ltd.	Kasuwa Khola	Sankhuwasabha	45000	2075.08.13	2082.04.06
73	Ruru Hydroelectric Company Pvt. Ltd.	Rurubanchu Khola-2	Kalikot	12000	2075.08.20	2079.05.25
74	Gumu Khola Bhyakure Hydropower Pvt. Ltd.	Gumu Khola	Dolakha	950	2075.08.21	2078.05.30
75	Alliance Energy Solutions Pvt.Ltd.	Upper Sit Khola	Argakhanchi	905	2075.08.23	2077.05.04
76	Ekikrit Byapar Company Pvt. Ltd.	Brahamayani	Sindhupalchowk	35470	2075.08.24	2080.04.13
77	Integrated Hydro Fund Nepal Pvt. Ltd.	Upper Brahamayani	Sindhupalchowk	15150	2075.08.24	2080.04.13

78	Perfect Energy Development Pvt. Ltd	Middle Trishuli Ganga	Nuwakot	19410	2075.09.03	2080.02.17
79	Kabeli Hydropower Company Pvt.Ltd.	Kabeli-3	Taplejung	21930	2075.10.03	2079.09.01
80	Union Mewa Hydro Ltd.	Mewa Khola	Taplejung	23000	2075.10.04	2080.09.15
81	North Summit Hydro Pvt. Ltd.	Hidi Khola	Lamjung	6820	2075.10.04	2080.05.15
82	Sajha Power Development Pvt. Ltd.	Lower Balephi	Sindhupalchowk	20000	2075.10.06	2080.07.18
83	Sindhujwala Hydropower Ltd.	Upper Nyasem Khola A	Sindhupalchowk	21000	2075.10.06	2079.03.30
84	Mount Rasuwa Hydropower Pvt. Ltd.	Midim 1 Khola	Lamjung	13424	2075.10.07	2080.04.04
85	Habitat Power Company Pvt. Ltd	Hewa Khola "A"	Panchthar	5000	2075.10.07	2078.04.01
86	Ruby Valley Hydropower Company Ltd	Menchet Khola	Dhading	7000	2075.10.15	2080.02.13
87	Dudhpokhari Chepe Hydropower Pvt. Ltd.	Dudhpokhari Chepe	Gorkha	8800	2075.10.15	2080.01.28
88	Maa Shakti Engineering & hydropower Pvt. Ltd.	Luja Khola	Solukhumbu	23550	2075.10.16	2080.11.14
89	Sankhuwasabha Power Development Pvt. Ltd.	Super Sabha Khola	Sankhuwasabha	4100	2075.10.23	2080.06.03
90	Hilton Hydro Energy Pvt. Ltd.	Super Kabeli	Taplejung	12000	2075.11.02	2079.10.04
91	Snow Rivers Pvt. Ltd.	Super Kabeli A	Taplejung	13500	2075.11.02	2080.01.01
92	Jal Urja Pvt. Ltd.	Nuagad	Darchula	1000	2075.11.03	2078.10.22
93	Champawati Hydropower Pvt. Ltd	Chepe khola A	Lamjung	7000	2075.11.07	2079.04.04
94	Api Power Company Ltd.	Upper Chameliya	Darchula	40000	2075.11.15	2079.11.13
95	Barpak Daruadi Hydropower Pvt. Ltd.	Middle Super Daraudi	Gorkha	10000	2075.11.23	2080.03.01
96	Helambu Construction Pvt. Ltd	Ksumti khola	Sindhupalchowk	683	2075.11.29	2078.03.04
97	River Side Hydro Energy Pvt. Ltd.	Tamor Khola-5	Taplejung	37520	2075.12.04	2080.04.10
98	Hydro Connection Pvt. Ltd.	Rauje Khola	Solukhumbu	17712	2075.12.04	2080.10.15
99	Milke Jaljale Hydropower Pvt.Ltd.	Upper Piluwa Hills	Sankhuwasabha	4990	2075.12.04	2081.04.04
100	Ambe Hydropower Pvt. Ltd.	Upper Bhurundi	Parbat	3750	2075.12.10	2079.04.16
101	Orbit Energy Pvt. Ltd.	Sabha Khola C	Sankhuwasabha	4196	2075.12.10	2079.04.02
102	Mabilung Energy (P.) Ltd	Upper Piluwa Khola-3	Sankhuwasabha	4950	2075.12.12	2078.11.16
103	Raghuganga Hydropower Ltd.	Rahughat	Myagdi	40000	2075.12.18	2079.10.17
104	Ridge Line Energy Pvt. Ltd.	Super Chepe	Gorkha Lamjung	9050	2075.12.19	2079.05.20
105	Dhaulagiri Civil Electrical and Mechanical Engineering Pvt. Ltd.	Madhya Daram Khola A	Baglung	3000	2075.12.26	2077.12.31
106	Dhaulagiri Civil Electrical and Mechanical Engineering Pvt. Ltd.	Madhya Daram Khola B	Baglung	4500	2075.12.26	2078.02.31
107	Bhalaudi Khola Hydropower Pvt. Ltd.	Bhalaudi Khola	Kaski	2645	2076.01.06	2080.04.16
108	Kalika Construction Pvt. Ltd.	Upper Daraudi B	Gorkha	8300	2076.01.09	2080.09.15
109	Kalika Construction Pvt. Ltd.	Upper Daraudi C	Gorkha	9820	2076.01.09	2080.09.15
110	Super Khudi Hydropower Pvt. Ltd.	Upper Khudi	Lamjung	21210	2076.01.11	2080.10.09
111	National Solar Power Co. Pvt. Ltd.	Grid Connected Solar PV Project (VGF)	Nawalparasi	5000	2076.11.23	2077.08.22
112	Nepal Solar Farm Pvt. Ltd.	Som RadhaKrishna Solar Farm Project (VGF)	Kaski	4000	2076.11.23	2077.03.16
			Total	2,124,774		

IPPs' Hydro Power Projects Terminated in FY 2076/77

S.N.	Developers	Project	Location	Capacity (kW)	Reason for Termination
1	Siddhakali Power Limited	Trishuli Galchi	Nuwakot and Dhading	75000	Event of Default
			Total	75000	

Dhalkebar 400/220 kV Substation

Bardaghat – Sardi 132 kV Transmission Line Tower Erection

35th
2042-2077
ANNIVERSARY

NEPAL ELECTRICITY AUTHORITY

BHADRA 1, 2077

NEPAL ELECTRICITY AUTHORITY

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