NEPAL ELECTRICITY AUTHORITY

AUGUST 2017 (BHADRA 2074)
DURBAR MARG, KATHMANDU, NEPAL

Managing Director of NEA receiving the trendsetter of Public Service Sector award from the Former PM Pushpa Kamal Dahal.

Procession on Electrical Safety Day 2017.

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COMPLIMENTARY COPY

Front cover photo: Newly constructed Chapali Substation

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Message from the Minister for Energy

It is a matter of great pleasure for me to express my thoughts as Minister for Energy, Government of Nepal (GoN) on the occasion of Nepal Electricity Authority's (NEA) thirty-second anniversary. As a predominant player in the country's power sector, NEA has an important role to play to provide electricity that is sufficient, reliable and of acceptable quality to the consumer.

With the enactment of Electricity Act – 1992, the doors for private sector participation in the country's electricity generation were opened and since then NEA has lost its monopolistic legacy in the country's power sector. Nevertheless, NEA still maintains its role as the key player in the nation's power sector – a sector that has been identified by GoN as a determining economic force in the country's development.

The shape of the power sector that GoN intends to create is evident in the Hydropower Development Policy – 2001. The Policy was adopted to make hydropower development simple, clear, investment friendly and transparent. The policy sees an environment that is conducive for the healthy development of increased private sector investment in the country's power sector. The path that NEA must adopt to remain as the national utility can be inferred from this document. Legal instrument in conformity with the Hydropower Development Policy – 2001 namely: the proposed Nepal Electricity Regulatory Commission Act has been tabled for deliberation in the Legislative Parliament.

Reforms in Nepal's power sector are continuing. Institutional reform of Nepal Electricity Authority is also high in the Government of Nepal's agenda.

Despite all possible measures taken, demand for electricity could not be met and NEA had no other option but to resort to curtailment of load since last decade. From last year the situation however drastically improved with load curtailment restricted only to the industrial consumers that too at the time of system peak during the evening hours. This can be attributed to commissioning of number of IPP projects, increased import from India, reduction in losses and demand side management. The commissioning of long awaited Khimti – Dhalkebar transmission line also played a crucial role. Through this line it became possible to transmit the imported power to Kathmandu on a continuous basis thereby making possible to manage our power system in a more efficient way. I must congratulate NEA and its leadership for better managing our power system for restricting the load shedding hours to the bare minimal.

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NEA now needs to improve its functioning by adopting more result oriented responsible and efficient methods. In order to do this, it needs to adopt new technologies including smart grid/smart meter, online payment system, grid automation and underground cabling technology.

In the next couple of months Chameliya (30 MW) and by the end of current fiscal year Kulekhani – III (14 MW) are expected to be commissioned. Next year generation from Upper Tamakoshi (456 MW) is expected. In addition, significant chunk of generating capacity from private hydropower projects is also forthcoming. So, the present supply-demand imbalance would be offset to a considerable extent.

With the commissioning of number of hydropower projects in the next few years, substantial surplus energy would be generated in the NEA power system during the wet months. It is therefore a challenge for NEA to manage this surplus energy. NEA should explore all possibilities to consume the power including option for exporting this seasonal surplus energy to India through the 400 kV Dhalkebar – Muzzarfarpur cross border transmission line. This cross border transmission line would also help in importing bulk power to meet any eventual deficit during the dry season. Importing power at the time of deficit during the dry season and exporting power at the time of surplus during the wet season would eventually cut down the cost of supply of NEA.

To conclude, I thank the entire NEA staff for the valuable services they have rendered.

(Mahendra Bahadur Shahi"Prajjwal")
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Message from the Chairman

This year has indeed been a very successful year for Nepal Electricity Authority. It has been successful in doing away with load shedding in Kathmandu and in many other parts of the country. Apart from some industrial corridors, load shedding has become a thing of the past. I would like to congratulate NEA on achieving this gigantic task and would also like to offer my best wishes to NEA to maintain this situation from now on. I personally believe that achieving this mission in itself has taken NEA a step further towards being a profit making organization. And, I also believe that, this in turn has not only contributed in accelerating the economic growth of the Nation but also changed positively the perception of the consumers towards NEA.

With the demand side management, NEA has also been able to increase its generation. This transpires into the fact that NEA's revenue has also increased in the past year. Along with the increase in the generation and the increase in the tariff, NEA has certainly come a long way since its days of deficit. I must also congratulate NEA in being able to substantially reduce the loss in the system. The Fiscal Year 2016/2017, has therefore certainly been a productive year for NEA

It certainly gives me great pleasure to be a part of the team in achieving this situation. However, I must say that NEA still needs to achieve a lot. NEA now needs to mainly focus on strengthening its transmission and distribution facilities, increase its internal generation drastically with a major focus on storage projects, reducing its growing dependence on imports from India and concentrate in improving its organizational capacity and management.

Completion of the Dhalkebar Mujafurpur 400 kV Substation is one of the important tasks NEA should take up with utmost priority in order to realize the 1st Cross border line to its fullest. Likewise, completion of ongoing projects, namely, Chameliya HEP, Kulekhani III HEP, Upper Trishuli 3 A HEP and Rahughat HEP which have been under construction for a very long time should also be attended with top ungency. The delay and the cost overrun in these projects have certainly taken its toll. I am quite happy to learn that Chameliya HEP is nearing completion. I am pleased to learn that NEA is initiating the implementation of Upper Arun, Upper Modi and Modi A, Tamakoshi V, Uttar Ganga, Tamor and AndhiKhola Hydropower Projects through the subsidiary companies. Imports from India increased quite substantially during the last fiscal year. Although, the imports has contributed significantly in reducing load

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shedding, it has also increased NEA's cost of generation, especially with imports through the mechanism of Power Exchange Committee established between Nepal and India. Independent Power Producers have also started showing a strong presence in the overall hydropower development of Nepal and it is my opinion that NEA and IPPs should go hand in hand and support each other in achieving the generation targets of Nepal.

With the suitable policy intervention from the Government, NEA has been successful in solving many of the chronic problems that had been plaguing and undermining it's performance. Everybody understands that growth in the generation of energy is one of the major input for economic development of a nation and therefore NEA has a very important role to play in the overall economic development of Nepal.

I would finally like to thank all the staff of NEA for their valuable, committed and diligent efforts in bringing about this change for the betterment of the organization as well as for the betterment of the Nepal.

Anup Kumar Upadhyay
Secretary
Misnistry of Energy
&
Chairman, Nepal Electricity Authority

Board of Directors

Mr. Anup Kumar Upadhyay
Secretary
Ministry of Energy, Chairman

Dr. Shanta Raj Subedi
Secretary
Ministry of Finance, Member

Mr. Chandra Tandon
Member

Mr. Umesh Prasad Thani
Member

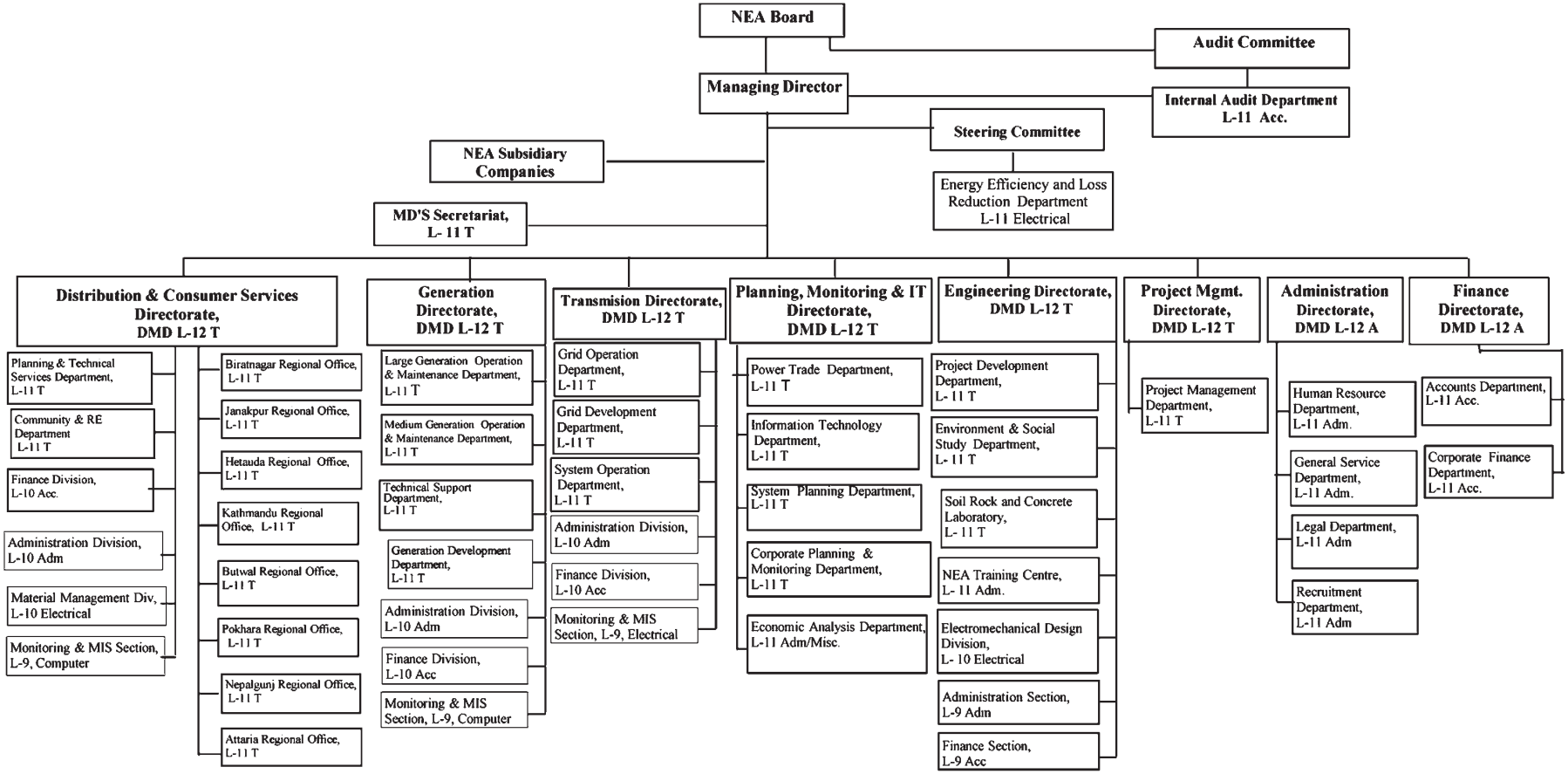
Mr. Bhakta Bahadur Pun
Member

Mr. Chet Raj Joshi
Member

Mr. Kul Man Ghising
Managing Director, NEA
Member Secretary

NEPAL ELECTRICITY AUTHORITY

Organization Structure



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

Deputy Managing Directors

Mr. Sunil Kumar Dhungel
Deputy Managing Director
Distribution & Consumer Services Directorate

Mr. Rajeev Sharma
Deputy Managing Director
Transmission Directorate

Mr. Lekha Nath Koirala
Acting Deputy Managing Director
Finance Directorate

Ms. Shanti Laxmi Shakya
Acting Deputy Managing Director
Administration Directorate

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

Mr. Mohan Ratna Shakya
Off. Deputy Managing Director
Engineering Services Directorate

Mr. Hara Raj Neupane
Off. Deputy Managing Director
Generation Directorate

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

MANAGING DIRECTOR'S REPORT

It gives me immense pleasure to state that Nepal Electricity Authority (NEA) has successfully completed thirty-two years of glorious journey in Power sector. The 32nd Anniversary is an opportune event to share our performance and achievements during last year and reaffirm our commitment to lead the organization ahead with excellent results by building upon its strengths and turning challenges into opportunities.

Under the "Ujjyalo Nepal Abhiyaan" initiative load shedding mitigation and various other activities were introduced. As a result, the year 2016/17 was historic one in terms of load shedding management, loss reduction and financial performance. It was our great satisfaction to supply 24 hours of continuous power to our esteemed consumers, except industrial consumers, even in the driest months. The capital city-Kathmandu and city of tourist-Pokhara were made load shedding free for entire period and remaining areas of the country also felt minimum power cuts during dry season. The industries' supply was curtailed during peak hours only. This became possible due to effective and efficient demand and supply side management with augmentation of transmission and distribution facilities.

We feel great pride to state that we have been successful in completing many substations and transmission lines including Khimti-Dhalkebar 220 kV Transmission Line, which is the first in its voltage level playing pivotal role in eradicating load shedding in Kathmandu. All generation projects have resumed their construction works in full swing. Chamelia Hydroelectric Project is at the final stage of completion and will be completed within next couple of months.

The financial performance of the year under review recorded positive operating surplus and net loss stood below one billion. We are now confident enough on our endeavor to make NEA as a profit earning organization by next year.

It is a matter of great honor for us to receive overwhelming support and recognition from public and institutions for our deeds. It has boosted the morale and confidence of our team and has helped a lot in creating amenable working environment for growth and transformation of the Organization.

At this annual day, I would also like to pay my sincere tribute to all individuals and employees who lost their lives due to electric hazards and shocks in pursuing their duty.

With these notes, I now present the highlights of the performance and achievements made by the organization during FY 2016/17.

Operational Performance

The total number of consumers increased from 2.97 million to 3.26 million including community and bulk buyers during the year. As in the previous year, the domestic consumer category with 3.06 million consumers remained the largest consumer category with 93.96 % share of the entire consumers. Domestic and Industrial consumer category contributed 41.85 % and 35.61 % to the gross revenue from electricity sales respectively. Rest of the consumer Category accounted for the remaining 22.54 % of the gross sales revenue. Only 65% of the population has access to grid electricity.

NEA's hydropower plants including small power stations generated a total of 2,305.17 GWh, an increase of 8.06% from previous year's figure of 2,133.14 GWh. The total energy imported from India has reached 2,175.04 GWh, an increase of 22.35% from previous year's figure of 1,777.68 GWh. Kaligandaki, Marshyangdi and Middle Marshyangdi power plants were run for peaking operation during the dry season to meet the peak demand of the system, which has supported a lot to minimize the load shedding at the peak time. The average power import for the last year was about 250 MW through various transmission lines including Dhalkebar-Muzaffarpur transmission line. The total power purchased from Independent Power Producers (IPPs) within Nepal was 1777.24 GWh, an increase of 52.39% from previous year's figure of 1,166.24 GWh. The total energy available in NEA's system increased by 23.25 % to 6,257.73 GWh over the previous year's figure of 5,077.14 GWh. Out of the total available energy, NEA's own generation contributed 36.84 % whereas those imported from India and local IPPs accounted for 34.76 % and 28.40 % respectively.

A nationwide drive launched to reduce system losses showed positive results reducing the system losses from 25.78 % in the previous year to 22.90% in the year under review. The amount of loss that still persists is not to the acceptable standard and continued drive to minimize it is underway nationwide.

Financial Performance

After many years, NEA has managed to generate operational profit in the fiscal year 2016/17. The total revenue generated from energy sales and other income reached NRs 50,229.48 million as compared to NRs 35,073.54 million in the previous year. This is an increase of 43.21 % from previous year's figure. NEA's overall operating expenses including power purchase increased from NRs 36,087.53 million in the FY 2015/16 to NRs 45,572.09 million in the FY 2016/17, an increase of 26.28 %. This is mainly due to increase in power purchase cost and staff salary. NEA achieved an operational profit, after many years, amounting to NRs 2,407.38 million as against the operational loss of NRs 3,063.98 million in previous year. However, NEA incurred Net Loss in the FY 2016/17 amounted to NRs 978.92 million whereas the same for the previous year was NRs 8,890.19 million. Reduction in system losses, reduction in average rate of power import, increment in retail tariff, continuous supply of power in major cities and partial endorsement of financial restructuring all contributed to decrease financial losses for the year under review.

The cost for purchasing power has again been the largest component in the total operating expenses in the year under review. NEA spent NRs 28,457.34 million in purchasing power from the various Independent Power Producers (IPPs) and import from India.

Energy from purchased power amounted to 63.16 % of the total available energy and NEA paid 61.67% of the net electricity sales revenue for this purpose. The total cost of purchased power increased by 27.43 % in the FY 2016/17 due to the increase in the volume of import and domestic purchase and to some extent because of normal price escalation for power purchase from IPPs.

Other operating expenses for generation, transmission, distribution and administration in the last year amounted to NRs. 1,823.98 million, NRs 1,907.15 million, NRs. 7,457.82 million and NRs 1,306.72 million respectively.

Reduction in long term borrowing interest rate from 8% to 5% for the GoN funded loans and conversion of some loan into equity shares has reduced interest amount by about NRs. 1,200 million. Interest expense for this year is calculated as NRs. 3879.39 million as compared to NRs. 5,079.73 million in the previous year 2015/16.

The growth in the revenue from energy sales should also be attributed to the decrease in the prevalent load shedding. The main load centers,

the urban areas, have been gradually made 'load shedding free", hence the increase in the energy sales. At the same time it has also helped a great deal in saving valuable foreign exchange revenue of the country that was being used to import additional petrol/ diesel for the generators used to counter the darkness during load shedding hours.

NEA estimated a provision of NRs 2,250 million towards the long term employee liabilities in respect of gratuity, pension, medical facilities and accumulated leave facilities under employees' benefit plan scheme.

Ongoing Projects

After the delays caused by the massive earthquake of April, 2015, its aftershocks and the subsequent Terai Bandh, NEA's ongoing project construction suffered delays that led to the postponement of their completion date. It can be taken as a positive sign that the construction of these projects have resumed.

Chamelia HEP (30 MW) had been stuck because of the variation disputes of the tunnel squeezing works. An understanding on this issue was reached on 22nd September, 2016. The progress thereafter was satisfactory and the tunnel work has been completed. The overall progress of the project stands at 99.19 %. The major remaining work on the civil side is plugging of the audits and minor finishing works in the powerhouse. The dry test has already been completed. This project is scheduled for commissioning by December, 2017.

Kulekhani III (14 MW) had been staying idle with most of the civil construction completed and most of the equipment already at site. As of July 2017, approximately 80 % of the works have been completed. This accounts for 98 % of civil works and 75 % of EM works. The remaining works are expected to be completed by December, 2017.

After the re-opening of the access road, in March 2016, from the Powerhouse to the Headworks site that was made inaccessible by the April 2015 earthquake; both the Contractors CGGC and CWE have resumed their respective works at site for Upper Trishuli 3A (60 MW) after a gap of nearly two years. The access road was opened by the Nepal Army as per the decision of the cabinet. The commissioning date of this project has been postponed to April 2019. Overall progress is about 60% till July 2017.

The various major transmission lines that were completed in the last FY 073/74 are Khimti-Dhalkebar 220 kV, Hetauda - Kulekhani II - Siuchatar 132 kV, Bhulbhule - Middle Marsyangdi 132 kV, Grid Substation upgrading (Hetauda, Parwanipur, Birgunj transformer capacity addition), Chapali 132/66 kV Substation/ Expansion, Mirchaiya 132/33 kV Substation, Kushaha - Kataiya 132 kV, Raxaul - Parwanipur 132 kV and Kushum - Hapure 132 kV lines. There are numerous transmission line projects which are under different phases of construction. The line length of under construction transmission lines under 132 kV, 220 kV and 400 kV level are 1010 Ckt Km, 659 Ckt Km, and 648 Ckt Km respectively. Similarly, capacity of substation under construction under 132 kV and 220 kV level are 506.5 MVA and 726 MVA respectively.

NEA Subsidiary Companies

After the successful completion of Chilime Hydropower as a subsidiary of NEA, NEA has taken the initiative to develop more projects under the company mode to ensure early decision making as well as proper public participation which should help in the timely completion of the projects. The projects transferred or in the process of being transferred to company mode and the progresses achieved are as follows;

Upper Tamakoshi Hydroelectric Project (456 MW): Upper Tamakoshi HEP being built under Upper Tamakoshi Hydropower Limited (UTKHPL) utilizing domestic financial resources is the biggest project till date being constructed in the company mode. The project has been delayed by almost one year

due to the April, 2015 earthquake and blockade in the India-Nepal border thereafter. As per new Integrated Time Schedule the project is scheduled to start generation from all units by December 2018.

Tanahu Hydropower Limited (THL): It is a Subsidiary Company of NEA established to promote storage type Tanahu Hydropower Project (140 MW). It aims to initiate the major construction activities by the end of December 2017. The submitted bids for both Package 1 (Headworks and River Diversion) and Package 2 (Water Conveyance, Powerhouse and related Equipment) from the prequalified bidders are being evaluated by the Project Supervision Consultant and the Bid Evaluation Committee of THL. The pre-construction activities are in the final stage of completion.

Trishuli Jal Vidhut Company Limited (TJVCL): This Company was established to develop Upper Trishuli 3B HEP (37 MW) as a cascade of Upper Trishuli 3A. Bid evaluation is under process for the submitted bids under EPC mode of Contract.

Rahughat Hydroelectric Project (40 MW): After terminating the main civil contractor, the overall project parameters were reassessed and the installed capacity is increased to 40 MW. The technical bid evaluation has been completed and financial bid evaluation for Lot 1 (Civil and Hydro-mechanical works) under Engineering Procurement and Construction (EPC) mode is under process.

Upper Arun Hydroelectric Project (335-700 MW): Tender Evaluation process for the selection of the Consultant for the Detailed Engineering Design and Tender Document Preparation for the Construction is under process along with Ikhuwa Khola Hydroelectric Project (30 MW). Similarly Tender evaluation for the Detail Design, Tender Document Preparation and Construction Supervision for the Access Road is also in its final stage. The selection of Consultant for both works will be undertaken under the financing agreement between GoN and World Bank for Power Sector Reform and Sustainable Hydropower Development Program (PSRSHDP).

Dudhkoshi Storage Hydroelectric Project (300/900MW): The Updated Feasibility and Detail Design are being carried out by ELC Electroconsult S.p.A. (Italy) in association with NEWJEC Inc. (Japan) with the grant assistance of Asian Development Bank under Project Preparatory Facility for Energy (PPFE) for the early implementation of the Project. Core Drilling work and Construction of Test Audit is being carried out under a separate contract agreement.

Tamakoshi V Hydroelectric Project (95 MW): This is a cascade development of the under construction Upper Tamakoshi HEP. Lahmeyer International GmbH is presently engaged in the Detailed Engineering Design and Tender Document preparation. The interconnection system with Upper Tamakoshi tailrace is already under construction.

Upper Modi A (60 MW): The submitted bids for the Request for Proposal (RFP) for the selection of Consultants for the Detailed Engineering Design and Tender Document preparation in EPC mode of Contract are under evaluation.

Utter Ganga Storage Hydroelectric Project (300/600 MW): The feasibility study report is being prepared. The preparation of EOI and RFP documents for the selection of Consultant for the Detailed Engineering Design is under way.

Tamor Storage Hydroelectric Project (762 MW): Project Development Department (PDD) carried out optimization study which shows the project to be more attractive at higher FSL even with inundation of the proposed Kabeli -A (37.6 MW) and Lower Hewa (21.6 MW). On this basis, PDD is conducting feasibility study on TSHEP at installed capacity of 762 MW and FSL of 550 masl. In addition, PDD is preparing documents for the selection of Consultant for Updated Feasibility Study, Detail Engineering Design and preparation of Tender Documents.

Andhi Khola Storage Hydroelectric Project (180 MW): PDD is currently carrying out the feasibility study and field investigation works such as Survey work, Geological drilling, ERT survey and EIA study have been completed. Similarly, the Surge Shaft, Semi-surface Power House and Sloping Intake design has been reviewed. EOI will be requested from International Consultants for Detailed Engineering Design in the coming year.

Chainpur Seti Hydroelectric (210 MW): It is a RoR scheme, identified by PDD in 2015. Topographic survey, Geological mapping and investigation (Phase-I), project optimization studies and alternative layout studies were completed in the year under review. The feasibility study of the project is planned to be completed in the coming fiscal year 2017/18.

Private Sector Participation

NEA is continuously pursuing the efforts to promote the Private Sector participation to fulfill the energy demand and has eased the procedure for Power Purchase Agreements (PPA). NEA has open rates for energy purchase from 3 categories of Hydro Power Projects i.e. Run off River (RoR), Peaking Run off River (PRoR) and Storage type. Further, guidelines for dollar-denominated PPAs has been issued, which may create conducive environment for attracting FDI in hydropower sector of Nepal.

Ten new projects developed by the Independent Power Producers (IPPs) with a combined capacity of 116.61 MW were commissioned in the FY 2016/17. This has increased the total number of IPP owned projects in operation to 60 with a combined installed capacity of 441.05 MW.

IPP's are developing 102 projects with a combined installed capacity of 2043.61 MW and are under construction after financial closure. Similarly, 51 IPP owned projects with a combined installed capacity of 910.31 MW are in the various stages of development.

During the last fiscal year 2016/17, a total of 28 new PPAs were signed with a combined capacity of 532.07 MW. This has increased the total number of PPA signed with the various IPPs to 213 with the combined installed capacity of 3394.97 MW.

PPAs with the grid-tied solar power projects are under process, for which the price was finalized through competitive bidding.. Bid for next lot of grid-tied solar projects with Viability Gap Funding (VGF) from ADB will be invited soon.

Power Trading with India

NEA signed the power purchase Agreement with NTPC Vidyut Vyapar Nigam (NVVN), the nodal agency of Government of India for cross border power trading with Nepal, for power purchase up to 160MW at the rate of INR. 3.60 through Dhalkebar-Mujaffarpur transmission line and Nepal imported power up to 145MW through this line during the fiscal year under review. Similarly, NEA purchased power about 35MW at PPA rate of INR 3.44 with PTC India Limited through Tanakpur-Mahendranagar transmission line during some months of the dry season. The power import below 50 MW from Bihar, UP and Uttrakhand was at the rates finalized by 10th Power Exchange Committee (PEC) meeting and above 50 MW was at BERC rates of Bihar

The long pending Power Exchange Committee (PEC) meeting which was not held after 2011 has been convened on August 8, 2017 at New Delhi and the Nepalese delegation led by Managing Director of NEA sorted out the issue of power exchange rate which was increasing every year by 5.5 percent. It has been a major breakthrough decision in the 11th PEC meeting that the annual tariff escalation is stopped and the power exchange rate has been fixed for IRs. 5.55, 6.00 and 6.45 at 132kV, 33kV and 11kV voltage levels respectively up to the Indian fiscal year ending in March 2018. It will carry positive impacts on financial health of NEA in the new fiscal year 2074/75. Further, Nepal will be purchasing the power up to 50MW from each of new 132kV Kataiya-Kushaha and Raxaul- Parwanipur transmission lines and the PEC rate would be applicable for it as per the

decision of the 11th PEC meeting.

Way Forward

NEA has two important objectives to meet. One is to supply sufficient electricity to consumers to their satisfaction and the other is to sustain as a business organization with reasonable financial returns for its further investment portfolio. Our immediate requirement is to get rid of decade long crippling problem of load shedding, which can be achieved with integrated resource planning including imports and efficient management. However, our long term strategy should be to become self-reliant in electricity with due consideration for quality, reliability and energy security.

To improve its financial health, NEA has strategic plan to reduce operation cost, increase self-generation, maximize sales with reduction in system loss and increase additional income from mobilization of additional resources. Further, proactive efforts will be made to adjust electricity tariff to cover the cost of service.

For short term, Thermal Import from India and Domestic Solar and Biomass Generation will be the best energy mix with Nepal's RoR hydro based system. Completion of Dhalkebar 220/132 kV Substation will add additional import capacity of 100 MW and commissioning of Kushaha-Kattaiya second circuit and Raxaul Parwanipur 132 kV Transmission Line will also add another 100 MW import possibility. With addition of these transmission and substation facilities in place, Nepal can draw more than 500 MW from coming dry season. Price of electricity in Indian electricity market in short term is in decreasing trend. NEA's financial health can also be improved if we can import cheaper electricity from Indian electricity market. Completion of Grid tied solar projects and under construction Hydropower projects including Upper Tamakoshi and IPP's projects within a year will add about 600 MW power to the system. Our major focus should be to complete these under construction generation and transmission projects that will add more than 1200 MW to the system in the next 2-3 years.

NEA has already concluded PPA with IPPs for more than 3400 MW RoR/PRoR projects in 'take or pay' basis. As a long term strategy, NEA has to focus on Reservoir and Peaking RoR projects as per generation mix defined in 'National Energy Crisis Mitigation and Electricity Development Decade Concept/Action Plan, 2072'. We are developing Dudhkoshi (900 MW), Tamor (762 MW), Uttarganga (300-600 MW), Andhikhola (180 MW) reservoir Projects and Upper Arun (700 MW), Tamakoshi-5 (95 MW) Peaking Run-of-River Projects to meet the long term demand. PPA rates for Reservoir and Peaking Run-of-River projects are also fixed for private developers. This will attract domestic and FDI investment in all types of Hydro Power development. To encourage general public investment in Hydropower development, a program called “Nepal Ko Pani Janatako Lagaani”(People's Investment for Nepal's Hydro) has been launched by Ministry of Energy.

Without Transmission backbone of 400 kV or above from East to West and North to South, Power from different generating sources cannot be evacuated to the load centers. NEA is developing 400 kV backbone transmission lines with support from various Development Partners including World Bank, ADB, EU etc. Millenium Challenge Corporation, funded by US government has also initiated development of 400 kV Transmission Line in central part of the country. Moreover, one 400 kV cross border link with India from New Butwal (Nepal) – Gorakhpur (India) and one with China from Galchhi (Nepal) – Kerung (China) has already been initiated and are expected to be completed within next 5 years. About eight other cross border links with India are proposed for construction in future. These Transmission Connectivity lines will enhance the power wheeling possibility across the border and promote energy banking and export/ import opportunity.

The distribution system expansion is another area for huge investment to be made within the

next 2-3 years. Without major augmentation and reinforcement of Distribution network, demand cannot be increased to match with upcoming supply from Hydro generations. NEA has initiated distribution capacity expansion in industrial corridor of Terai region and main cities including Kathmandu to cater load up to 10-12 thousand megawatt in the next five to ten years. Due to safety and reliability reasons, main distribution lines of Kathmandu are planned to have underground system.

The implementation of smart Grid and Smart metering system will get importance within NEA to gain efficiency in operation, loss reduction and better service delivery to the consumer. The smart Grid system with combination of solar and energy storage battery system will be implemented as a pilot project in one of the Grid substations. Similarly, integration of solar energy to its grid system through net metering will also be expanded in future. This will enable NEA to adopt modern digital technology in its system. The online and centralized bill payment system will be initiated for all consumers. It will also reduce the cost of service and facilitate consumers to pay their bills.

The demand side management with energy efficiency program will be NEA's another focus area in the years to come. LED lamps, efficient fans, capacitor banks are the major energy efficiency programs to be implemented to reduce the peak and energy demand of the system.

Moreover, our effort will be to increase revenue by utilizing available resources optimally. The communication network of NEA that is available all over Nepal can be a good source of additional income by leasing them at a reasonable price. Communication network can be expanded even to the ward level through our distribution infrastructure which can be utilized for our own purpose too. The other source of income can be our land at prime locations of the cities with its utilization by building business complexes. NEA has plans to develop these infrastructures for its additional income. Furthermore, the existing pole plant and transformer workshops will be augmented to diversify manufacturing business to meet the demand of NEA in long run.

NEA is going to implement Enterprise Resource Planning (ERP) system, which will enhance the efficiency and management capability within the organization. Our effort is to make the organization digitalized and paperless.

NEA has initiated institutional reform and financial restructuring process already. The second phase of financial restructuring has already been endorsed partially by Council of Ministers, Government of Nepal and is expected to improve NEA's financial performance. Financial Restructuring process should continue until the organization is fully sustainable in all respect. Generation, Engineering and Power Trading Companies have already been established with majority shareholding from NEA. NEA has 48% share in the Government owned Grid Company which is already in operation. NEA board has already approved for seven autonomous regional distribution offices as per the federal restructuring of the country. These distribution offices can act as distribution companies with 100% shareholding of NEA and can be later handed over to the state governments. This will also create multiple buyers and sellers in electricity market. Load dispatch center will be augmented to central and regional levels too. Modern trading platform will be developed for short term trading of electricity. NEA will have its corporate and system planning functions for its short term and long term strategic planning.

Power trading will be a challenging business for NEA in future. After commissioning of Upper Tamakoshi and Chillime's subsidiary projects, Integrated Nepal Power System may experience the wet energy surplus and dry energy deficit situation. To face this challenge, cross border trading and energy banking may be the suitable

options. There are enough grounds to be optimistic for energy banking mechanism with neighboring states of India. Our major focus in future will be on energy levelling by increasing domestic energy demand during off-peak hours.

Capacity building within NEA will be a key agenda for efficient operations and implementation of the project activities. Training needs for different level of staffs will be assessed and appropriate training will be conducted for all levels through well restructured Training Center. NEA has plans to develop internal resource pool and build ties with international training organizations to meet its training requirements. The Training Center will be developed as a Center of Excellence.

We firmly believe that ensuring the best service delivery, building software and hardware infrastructure for increasing income and improving morale health of our organization will definitely improve our public image and will open avenues for all round development of the organization in a better way. Our every endeavor should be for better and efficient NEA.

Acknowledgements

I would like to take this opportunity to acknowledge all those who have been directly or indirectly contributing to NEA's performance and achievements. I want to express my deep gratitude to honorable Minister for Energy for his dynamic and proactive leadership in boosting the morale of team NEA and providing right direction to the organization. My sincere gratitude also goes to the Chairman and members of the NEA Board of Directors for their expert and valuable guidance in decision making and formulating policies for the overall organizational performance and achievements within the framework of authorities and responsibilities envisaged in the NEA Act 2041.

I would also like to thank the Government of Nepal, Ministry of Energy, Ministry of Finance and other concerned Ministries for their continuous support, encouragement and patronage. I sincerely acknowledge the great concern shown by parliamentary committees in our regular operation and development pursuits.

My sincere appreciation also goes to Government of India through Embassy of India in Kathmandu and Embassy of Nepal in Delhi for their cooperation and support for power exchange between two countries. This has significantly helped us to improve power supply situation in the country.

I am also grateful to the donor communities and development partners, who have always helped us in the past and are willing to continue their involvement in the coming days with us to achieve our goal of fulfilling the growing needs of energy.

I sincerely appreciate banks, auditors, IPPs, suppliers and the investor communities for bestowing faith on us and in helping us move forward.

The media has always been helpful to us in disseminating factual reports about the organization. I thank them for this cause and wish to have the same support in our future endeavor.

I am thankful to the entire team NEA and the employee unions for their hard work, support and cooperation to the management. Finally, I would like to express my sincere thanks and appreciation to our valued customers and different professional organizations for being with us at time of extreme difficulties and for boosting our morale by recognizing our untiring efforts. I would like to assure that every possible step will be taken to ensure that load shedding is completely eradicated from the entire country in the near future and everyone is availed of reliable and uninterrupted supply of energy.

Thank You.

Kul Man Ghising
Managing Director

GENERATION DIRECTORATE

Generation Directorate, headed by Deputy Managing Director is responsible for construction of 4 ongoing hydropower projects together with operation and maintenance of NEA owned 19 power stations totaling 666.70 MW. The main objective of this directorate is to construct new projects owned by NEA and smooth operation and maintenance of existing power plants with optimal use of resources. The directorate is supported by four departments, namely Generation Development Department (GDD), Technical Support Department, (TSD) Large Generation Operation and Maintenance Department (LGO&MD), Medium Generation Operation and Maintenance Department (MGO&MD) each headed by a Director. It is supported by three divisions/sections namely, Finance, Administration and Monitoring and IT. At present, this directorate is taking care of construction of the following four hydropower projects.

- Kulekhani III Hydroelectric Project (14MW)
- Chameliya Hydroelectric Project (30MW)
- Rahughat Hydroelectric Project (40 MW)
- Upper Trishuli 3'A' Hydroelectric Project (60MW)

Chameliya Hydroelectric Project, Rahughat Hydroelectric Project and Upper Trishuli 3'A' Hydroelectric Project are headed by respective Project Directors and report to the Deputy Managing Director. Whereas, Kulekhani III Hydroelectric Project is headed by Project Manager and reports to the Director, GDD. The TSD provides technical support needed for the ongoing projects and existing power plants on coordination with respective Directors. LGO&MD is responsible for five (5) hydropower and one (1) thermal plant above 30MW installed capacity owned by NEA. Similarly MGO&MD is responsible for twelve (12) hydropower and one (1) diesel plant which are below 30MW installed capacity owned by NEA. Improved operation and maintenance practices have been instrumental to enhance generation and minimize load shedding in the last FY 2016/17. Some of them are-

- Kaligandaki 'A', Middle Marsyangdi and Marsyangdi hydropower plants were operated in their full capacity in peak time during dry season using their pondage capacity first time in the plants history.
- The plant shutdown duration required by Indian irrigation authority for headworks and canal maintenance was kept minimum for Gandak hydropower station and 100% plant availability was achieved in all other times. This helped to improve voltage of that area and import more power (upto 40 MW) from Balmikinagar-Gandak 132 kV line for supply in the adjacent areas.
- The machine overhauling time under scheduled maintenance were reduced to almost half by mobilizing the extra staff and resources efficiently.
- Co-ordinated maintenance scheduling among the plants was efficiently carried out and operational practices were improved to get higher output.

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

CHAMELIYA HYDROELECTRIC PROJECT

Project Background

Chameliya Hydroelectric Project under joint funding of GoN, NEA and EDCF K-Exim Bank, Korea loan started in 23rd October, 2008. The power house site is located at Sailya Municipality, Sikhar, Balanch and the Dam site is located at Bitule of

Dam site of Chameliya HEP

Darchula District. The plant capacity is 30 MW (6 hour Peaking Run of River) with average annual energy generation of 184.21 GWh. As per the Joint Co-ordinated Working Schedule the completion date (including Testing and Commissioning) is December 2017.

Project Status

The project is at the stage of completion with full completion of dam works, desanding basin, connecting tunnel, adit tunnel, headrace tunnel, surge tank, penstock (both horizontal and vertical) and tail race. Similarly, 99.8 % of intake and 99.99% of power house has been completed. The overall progress of civil works is 99.95%.

Due to weak geology and presence of fault zones, squeezing in 843 m length of the Headrace tunnel (HRT) was encountered between Adit 2 down stream and Adit 3 up stream. This resulted in deformation of several lattice girders/steel ribs, localized cracking of shotcrete and extremely large deformations in the crowns and side walls which is upto maximum 40% of the design diameter. The treatment of squeezing of HRT started on May 2013 and was completed on May 2017. Similarly, the power house had to be relocated which resulted in requirement of slope protection, that was completed in 2015. The vertical shaft also encountered huge cavity formation with debris flow making the construction very difficult.

The installation of turbines and generators has been completed. Switchyard area has been completed with 2 nos. of 16 MVA power transformers being installed. Foundation and erection of 412 nos. of 132 kV Transmission line towers has been completed including stringing works of 131 km single circuit of conductor and OPGW (Optical Ground Wire) has also been completed. The project has initiated the process of cutting around 2300 nos. of trees which

Switchyard of Chameliya HEP

impose great danger to the transmission line. Around 85% of the work has been completed and is under process of testing and charging the transmission line.

The Project is under final stage of completion with plugging of Adit tunnel 2 and installation of Adit # 3 gate. The Project after completion of all test work is set to be fully commissioned by December 2017.

RAHUGHAT HYDROELECTRIC PROJECT

Project Background

Rahughat Hydroelelctric Project is located at Galeshwor, near Beni in Myagdi District, Dhaulagiri Zone of Western Nepal. The cost of the project was initially estimated to be NRs 827.35 Crores (including all taxes). Out of the total estimated cost, US$ 67 million was to be made available from the soft loan provided by the EXIM Bank of India. US$ 31 million was made available from EXIM Bank of India under US$ 100 million Dollar Line of Credit Agreement dated 14th September, 2007 for the main civil works and consultancy services for civil works. The remaining amount of US$ 36 million for electromechanical, hydro-mechanical and transmission line works and the remaining amount for main civil works was made available from EXIM Bank of India under US$ 250 million Dollar Line of Credit Agreement dated 21st October, 2011.

Contract Agreement for the consultancy services for construction of main civil works was signed with WAPCOS Ltd. (A Govt. of India Undertaking) in association with TATA CONSULTING ENGINEERS LIMITED AND LARSON & TOUBRO LIMITED on 16th February, 2012 and the concurrence from EXIM Bank of India was received on 2nd August, 2012.

The EXIM Bank of India approved the appointment of WAPCOS Limited, Consultant for the construction of Main Civil works of the project, as consultant also for Electro-mechanical, Hydro-mechanical and Transmission Line (EM, HM and TL) works. A supplementary contract was signed with WAPCOS Limited for the consultancy Services of EM, HM and TL works on 24th March, 2014.

The contractor could not accelerate the construction work even after repeated instructions from the consultant, because of the very poor financial condition of the company. The Employer, with the recommendation of the Consultant, issued “Notice for Termination” to the Contractor on 18th June, 2015 and the Bank Guarantees were seized on 28th June, 2015 as the Appellate Court rejected the Contractor’s plea to issue stay orders to prevent the seizure of the Bank Guarantees. The contractor IVRCL has initiated the arbitration process under UNCITRAL rules of Arbitration as per the Condition of Contract. Both parties have appointed their respective arbitrators and the appointment of the third arbitrator is in process.

The Determination process of the Contractor was also initiated by the Consultant with a joint site visit and the Engineer has already completed the determination of the Civil Works executed by the Contractor, M/S IVRCL. The Determination for the plant and machineries, equipment and vehicles is going on and shall be completed very soon.

Adit No. III

The Construction of the Camp Facilities being undertaken by Gorkha Swachchanda JV has also entered into dispute for which final verdict on the Arbitration process from NEPCA is already received. The Construction of Infrastructures for Camp Facilities is being undertaken by Lama Construction and majority works is completed. However Lama Construction has also gone for arbitration for few disputable items that need to be sorted out. The project is working hard to settle these disputes contractually.

Project Status

Most of the land necessary for the construction of the Project and permission for cutting of the trees has already been acquired.

After the revision of the river hydrology, the design discharge was fixed at 16.67 cumecs and the installed capacity optimized to 40 MW. An Upgraded Detailed Project Report (UDPR) for the revised installed capacity, with detail cost estimate, was prepared by the Consultant. The total cost of the Project for the revised installed capacity has been estimated as NRs 859.90 crores (@ NRs 105 per US$) including VAT. After the approval by the NEA management to go for Tendering in Engineering Procurement and Construction (EPC) mode, the Bidding Documents were prepared by the Consultant in EPC mode for Lot 1: Civil and Hydro-mechanical works and in Plant and Design Build (PDB) mode for Lot 2 : Mechanical and Electrical works.

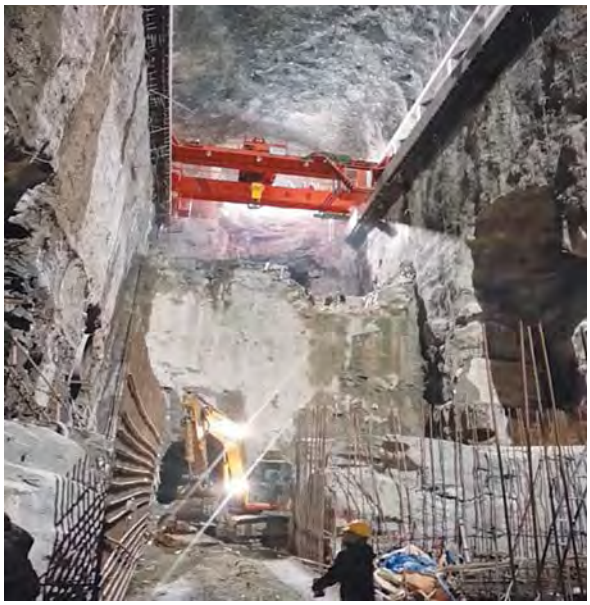
The Tender call for Lot 1 was first published on 6th May, 2016 with the final submission date on 7th July, 2016. On the advice of EXIM Bank of India and the request from the Bidders for the extension of submission dates, the final submission date was extended up to 14th Nov 2016.

The Technical Evaluation of the Bid is already completed and Price Bid Evaluation process is going on. The preparation of Tender Document for Lot-2, Electro-mechanical works is completed.

UPPER TRISHULI 3A HYDROELECTRIC PROJECT

Project Background

Construction of Upper Trishiuli-3A HEP, a run-of- river project of 60 MW was initiated in June 2011. The agreement was signed between the Government of Nepal and China Exim Bank for a concessional loan of 120 million US Dollar in 2011. The estimated cost of the project is 125.775 Million US$. Contract for the major construction work (Civil, Electro-mechanical &



Underground Powerhouse

Hydro-mechanical works) was signed with China Gezhouba Group Company Ltd., China (CGGC) at a cost of 89.177 Million US$ excluding VAT. Contract for construction supervision of the project was made with Northwest Engineering Corporation Limited (previously known as Northwest Hydro-Consulting Engineers), 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. The Contract for major construction work and construction supervision work has been effective from 1st June 2011 and that of the transmission line has become effective from 26 February 2012.

Dam site of Upper Trishuli 3 'A'

CGGC has completed construction of steel bridge and a pedestrian bridge over Trishuli River, temporary camp at headworks and excavation of four no. of adits totaling 753 m. CGGC has completed 2nd stage of river diversion with installation of four radial gates, construction of intake works and 106 m of approach channel.

Prior to the earthquake of April 25, 2015 nearly 95% of headworks (Intake, weir, settling basin and gravel trap) concreting work has been completed. About 97% of desander concreting work has also been completed. Excavation of 3867 m out of 4076 m long headrace tunnel (~95%) has been completed. About 23% of Concrete lining in the headrace tunnel, excavation work of vertical and horizontal pressure shaft and about 57% of excavation of surge shaft has been completed. Excavation of underground powerhouse cavern, upper and lower drainage tunnel, switch yard and tailrace tunnel has been completed as well.

Concreting of draft tube unit-1 & 2 and upper conical part of unit-1 together with gantry crane installation has been completed. About 33% of concrete lining in the tailrace tunnel has been completed. About 35% of steel lining in penstock branch pipe has been completed.

The transmission line comprises of 132 kV line from powerhouse switchyard to Trishuli 3B hub and 220 kV line from Trishuli-3B hub to Matatirtha substation in Kathmandu totaling 44.7 km. In addition, about 1 km of 220 kV underground cable route leads to the Matatirtha Substation and two 132kV line bay extension works will be conducted for interconnection with existing Matatirtha substation.

400 km ACSR 'BISON' Conductor and 650 tones out of 2200 tonnes manufactured tower materials have already arrived at the site. 132 kV Line bay equipment is ready for dispatch to the site from China. In addition, Land acquisition for tower foundation has been completed and approval for tree cutting has been obtained from the relevant district forest offices. Tree-cutting works has been completed 94.60% in 26 community forests. Till date, 90-tower foundation concrete work out of 142 has been completed and other 4 are in progress.

The project has conducted skill enhancement training to 60 persons from the project-affected area under Public Support Program (PSP). PSP also consists of the construction of four school buildings, implementation of two water supply systems, upgrading of road from Trishuli to Champani, road improvement to Trishuli hospital, Supply of hospital equipment, and construction of Irrigation drainage works, pedestrian trails and various village roads in project-affected areas through DDC-Rasuwa and DDC-Nuwakot, which are under progress.

Post-Earthquake Status

The project work which was being carried out at a rapid pace came to a standstill by the devastating earthquake of 25 April 2015. Several huge landslides occurred along the 5 km access road from powerhouse to the headworks, which made the headworks virtually inaccessible. The landslide also blocked the access road to Surge Shaft and adit-1. Many construction equipment of the contractor including the temporary labor camps located near the Headworks, Adit-1 tunnel, Adit-2 tunnel and powerhouse, were heavily damaged. Contractor repatriated all Chinese labor back to China and dismissed all local labors. The earthquake followed by the rainy season also triggered further landslide at various places, including a huge landslide uphill side of the Tunnel Inlet portal, downstream of the desander. Later earthquake also triggered a huge debris flow at uphill of the dam site on left bank. After the earthquake, the cabinet decided to mobilize Nepal army to open the track from powerhouse to Headworks. The army opened the track by the end of March 2016. Now, the Nepal Army is constructing retaining structure and slope protection measures on the access road for its stabilization as per MOU between NEA and Nepal Army dated on March 30, 2017.

Now, the Contract duration for the main works was extended by 34 months i.e. till April 30, 2019 as a second extension of time (EOT) for which Supplementary Contract Agreement was signed on 7 March, 2017 between NEA and CGGC.

The Transmission line Contractor (CWE) also repatriated the Chinese workers and dismissed the entire local labors, considering the unsafe working environment after 25 April 2015 earthquake. However, from 15 March 2016, the Contractor resumed its work and the tower foundation and other related works are in progress. The contract duration of Transmission line works was extended by 20 month i.e. till 2 January, 2018 as a second extension of time (EOT) for which Supplementary Contract Agreement was signed on 7 March, 2017 between NEA and CWE.

Regarding Consulting work, the time was extended from July 1, 2016 to 30 April, 2020 including Defect Liability Period of 12 months and Second Supplementary Contract Agreement was signed between NEA and Consultant NWH on 28 March, 2017.

Now, both the Contractors CGGC and CWE have resumed their respective works on the site after the earthquake of April 25, 2015. CGGC has resumed work in headrace tunnel, power house and access road to surge shaft. After earthquake, about 74 meter of headrace tunnel excavation has been made thus only 135 meter of tunnel excavation is remaining.

GENERATION DEVELOPMENT DEPARTMENT

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

KULEKHANI III HYDROELECTRIC PROJECT

Project Background

Kulekhani is the only storage project in Nepal, which has been providing much needed peaking energy to the Integrated National Power System (INPS). The 14-Megawatt (MW) Kulekhani III Hydroelectric Project with two numbers of Francis turbine is a cascade project which utilizes the regulated flow of Kulekhani Reservoir and additional water from Khani Khola. It is expected to generate about 40.85 Giga Watt hours (GWh) of electrical energy per annum.

Adit No. 4

The funds are provided by the Government of Nepal and Nepal Electricity Authority (NEA) for the construction work. The total estimated cost of the Project is NRs. 4.63 billion. The Project is located on the southwest of Kathmandu in Makawanpur district, Narayani zone of the Central Development Region. The headworks site is located on the left bank of Khani Khola at Bhainse, about 11 km north of Hetauda. The Powerhouse is located about 5 km north of Hetauda at Sanutar village adjacent to the Tribhuwan Highway.

The Civil Works Contract has been awarded to M/S Sinohydro Corporation, China and the Electromechanical & Hydro-mechanical Works Contract has been awarded to M/S Zhejiang Jinlun Electromechanic Co. Ltd., China.

After termination with WRC-SILT-HEDCO JV, a new contract with M/S WAPCOS Ltd., India in association with TMS, Nepal has been made for construction management and construction supervision of the Project.

Project Status

The project was initiated in 2008 April with the contract being awarded to the civil contractor while the contract for Electromechanical & Hydro-mechanical was awarded in 2010. Over the years, the project went through a lot of complexities of various nature which resulted in serious project delays. Nevertheless, every effort is being made to resolve the issues, overcome the problems and complete the project as early as possible. By the end of fiscal year 2073/074 (July 2017) approximately 86 percent of the works in total has been completed. About 98 percent of the civil construction works and 75 percent of the Electromechanical & Hydro-mechanical works has been completed.

The remaining Civil works entails works related to the forebay, bellmouth concreting, powerhouse finishing, cable duct concreting, powerhouse road and second stage concreting along with some minor independent works.

The remaining EM works include powerhouse cabling, switchyard equipment installation, ongoing transmission line works, gates/trash racks installation, and completion of ongoing turbine generator installation along with the supply and delivery of remaining EM equipment including LV/MV switchgear equipment, communication and cables. The remaining works are expected to be completed by December 2017.

Generator Floor

LARGE GENERATION OPERATION & MAINTENANCE DEPARTMENT

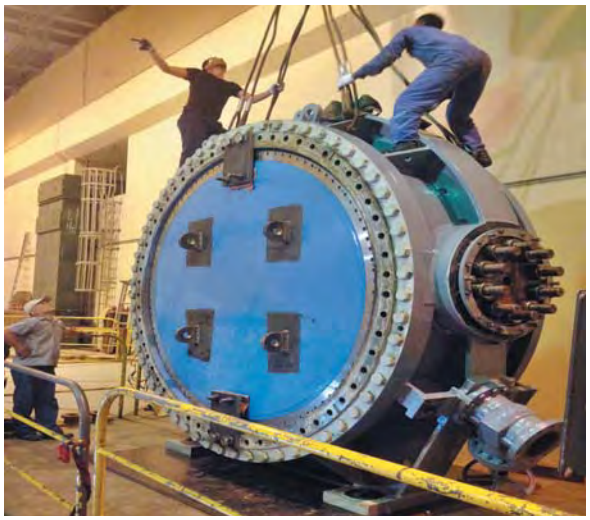
The operation and maintenance of five (5) hydropower plants and one (1) Multifuel diesel power plant with capacity above 30 MW fall under the jurisdiction of this department. The total installed capacity of these plants is 414 MW. The actual generation from the plants under this department has increased significantly this year because of the favouring hydrology along with the proper operation and regular preventive maintenance activities carried out. Total generation from the hydropower plants under this department in fiscal year 2073/74 is 1.87 TWh, with an increment of 7.94% as compared to that of last fiscal year's generation. The generation from cascade Kulekhani I and Kulekhani II plants are mainly intended for meeting peak load demand as per system requirement. The Multifuel power plant was brought into operation in the month of Chaitra to meet the peak demand during SEE exams.

Overhauling of generating units is a regular practice normally carried out in the lean season avoiding energy loss. This ensures that design capacity is available during wet season. Apart from preventive and corrective maintenance works, periodic overhaulings were 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.

Under this department, Kaligandaki 'A' Hydropower Plant Rehabilitation Project (KGAHPPRP) under loan financing from International Development Association (IDA) is under implementation. The following sections provide a concise description of the power stations and highlight major activities carried out under this department during the fiscal year.

1. Kaligandaki 'A' Hydropower Station

Kaligandaki 'A' Hydropower Station is the largest Power Plant of Nepal having an installed capacity of 144 MW, with 3 units each having a capacity of 48 MW. It is a six-hour peaking run-of-river type power station, commissioned in 2002, having annual design generation of 842 GWh and is located at Krishna Gandaki, Syangja. The actual generation of the plant in this fiscal year is 842.15 GWh with an increment of 12.16% as compared to the last year's generation. The increment in generation is mainly due to adequate hydrology throughout the year, specially during dry season. The MIV modification work of Unit No. 3 which was started on 24th June 2016 was completed on 6th August 2016. Under this work, repair and modification of old MIV, replacement of hydraulic servo motor, butterfly valve disc seal, bypass valve and steam bush were carried out. The significant maintenance works this year comprises overhauling of unit number 1 from 29th march, 2017 to 19th april, 2017 under which electrical works such as maintenance and testing of excitation transformer, inspection of equipment of generator housing, replacement of the carbon brushes as required, inspection and testing of neutral cubical, maintenance and testing of synchronizing breaker, inspection and cleaning of speed signal generator (SSG), testing of power transformer, maintenance of GIS and



Modified MIV Shifting for Assembly

protection cubicals, dry and wet tests; along with mechanical works such as dismantling of turbine components (i.e. balancing pipes, wicket gates, shaft seal, facing plates, runner, wearing rings etc.), installation of the repaired HVOF coated runner, assembling of the repaired & HVOF coated wicket gate and repaired upper stem bearings, installation of new fabricated balancing pipes, installation of new spare turbine guide bearing were carried out. Other significant works carried out this year are installation of online bushing monitoring device on the transformer of unit no. 1, replacement of governor's actuator/solenoid valve set of turbine of unit no. 2, cleaning of dewatering tanks & repairing of pumps. Dam site repair and maintenance works includes repairing of existing facing plates of all three diversion dam radial gate, repairing of de-sander stop log slot and civil works like repair and maintenance of access road, desander basin, commissioning of digital inclinometers along the u/s of diversion dam to address slope stability issue of left bank. Maintenance of Bote house and primary school were also completed this year.

As part of implementation of Kali Gandaki 'A' Hydropower Plant Rehabilitation Project (KGAHPPRP), under Technical Assistance and Capacity-Building component, the Contract Agreement for the Consulting Services for Dam Safety, Civil, Electromechanical Works and Capacity Building have been signed between Nepal Electricity Authority and MWH International Inc, USA on 23rd April 2015. The consultant has submitted the final design reports. Since the loan from World Bank has already closed on 30 June 2017, the remaining work as per study shall be conducted by mobilizing the internal & external resources, if any. Under Electro-Mechanical Works, all mechanical packages except trash rack cleaning machine supply has been completed. Trash rack cleaning machine has already dispatched from Manufacture's factory and expected to complete the installation and commissioning by Sep 2017.

2. Middle Marsyangdi Hydropower Station

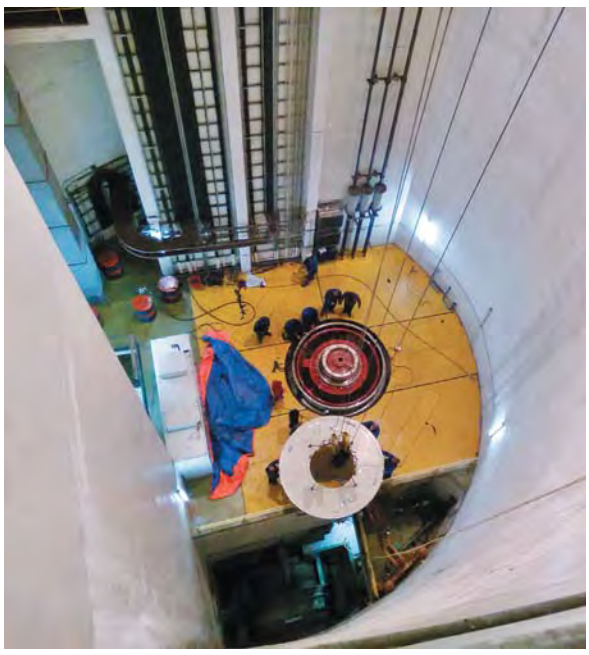
Middle Marsyangdi Hydropower Station with installed capacity of 70 MW and annual design generation of 398 GWh is located at Bhoteodar, Siundibar, Lamjung. It was commissioned in 2008 and has consistently performed well thereby generating 454.65 GWh this year with an increment of 4.38% as compared with last year. Its remarkable operational performance is rightly supported by periodic overhauling of units and adequate hydrology.Major repair and maintenance activities during this fiscal year included overhauling of unit no. 1, fault identification, repair and maintenance of cooling water control system, restoration of automatic functioning of drainage and dewatering system, repair and maintenance of all three spillway radial gates, repair and maintenance of desanders, dewatering and inspection of downstream roller bucket & bathymetric survey and eco sound survey of the reservoir. Similarly, problem identification and solving of Startup sequence of the Unit No.1, changing of LV breaker (400V, 1250A ACB) for Bus-Coupler 2, problem identification and solving of intake gate no.1 position display system were also carried out. Furthermore, SCADA system issues of cooling water system, prestart conditions, HDSR recordings, etc. were addressed with assistance of Alstom expert. Similarly, problem in DCS system, SCADA display and operation of 132kV controller

Fitting of Pipes and Pumps for dewatering of downstream to enable inspection of roller bucket

and integration of MMHPS to LMHPS double circuit 132kV line in SCADA were addressed. Works like auto operation of trash rack cleaning machine, replacement of faulty drives, updates in the HMI and programs, changing of toothed lath etc. are in progress.

3. Marsyangdi Hydropower Station

Marsyangdi Hydropower Station is located at Aabookhaireni, Tanahun in the central region with installed capacity of 69 MW and annual design generation of 462.5 GWh. It was commissioned in 1989 AD. This year it generated 465.31 GWh of energy, an increment of 5.34% compared to previous year's generation. Major works carried out this year are overhauling works of unit no. 2, upgradation of generator protection system & transformer protection system of all three units, replacement of isolators of all the 3 units, replacement of generator cooler of unit no.2. Upgradation of communication system of power house, weir and colony was completed this year. Works like maintenance of radial gate no. 4 & 5, extraction of debris from weir site under sluice canal and maintenance works at Dhakaltar road were also conducted this year. Maintenance of



Slip Ring of generator being dismantled as seen from ground level

6 numbers of staff buildings damaged by the earthquake was completed as well as construction of 4 new staff buildings, new boundary wall at staff colony and a new VIP guest house were completed in this fiscal year. Moreover, Extension of 132 KV GIS bus inside GIS sub-station is still ongoing.

4. Kulekhani-I Hydropower Station

Kulekhani-I Hydropower Station, located at Dhorsing, Makwanpur at about 30 km southwest of Kathmandu, is the only seasonal storage type plant in Nepal with installed capacity of 60 MW and annual design generation of 211 GWh. This Hydro Power plant is designed to generate 165 GWh as primary energy and 46 GWh as Secondary energy. The construction of this plant was started in 1977, first unit was commissioned in 14th May 1982 and the Project was completed in 4th December of the same year. The plant is very critical for INPS for meeting peak load demand especially during dry season and also for restoring Power in INPS at the time of Black out. It generated 73.40 GWh of energy in this fiscal year which is 2.87% greater than annual generation of previous fiscal year. The maximum and minimum water level recorded this year is 1523.67 m and 1500.24m respectively measured from mean sea level. Major works this year consists of repair/maintenance of local control panel of butterfly valve at valve house, installation, testing and commissioning of VRLA battery banks of various capacities for telemetry system at dam site, Deurali and control house, replacement of 110V, 240Ah maintenance free battery bank of switchgear and protection system at dam site, installation, testing & commissioning of 110 V, 355 Ah maintenance free Ni-Cd Pocket Plate battery & 110 V 325 A DC online duel float cum boost battery charger at power house. Debris removal work at Sera and Palung check dam, construction of new gabion check dams at upstream of Chakhel and Sim Intake were also carried out. In addition, construction of cantilever RCC wall at intake access road for landslide

Access Tunnel of Kulekhani Powerhouse

control was also conducted. Similarly, some major works conducted this year includes installation of firefighting system for the protection of the 35 MVA Power Transformer of both units, repair and maintenance work for proper alignments/ adjustment and greasing of penstock pipeline's rocker arms, replacement of damaged non-returning (lubricating) grease valve, repair and maintenance of intake gate foundation, its alignment and operating shaft at simkhola dam site. Furthermore, laying, installation, testing and commissioning of single core 240 sq. mm, 66 kV XLPE power cable -4 km, termination kits will be conducted in the next fiscal year.

5. Kulekhani-II Hydropower Station

Kulekhani II hydropower plant is a cascade power station of Kulekhani I hydropower plant with diversion of Mandu river and water lift system from Rapti river having 32MW installed capacity and annual design generation of 104.6 GWh. This plant is located at Bhainse VDC of Makawanpur district and was commissioned in 1986 AD. In addition to the cascade from Kulekhani-I, water intake from Mandu and Rapti pumping also boost the generation of this hydropower station. This plant

Turbine Floor

generated 37.8 GWh of electricity this year which is 4.83% greater than previous year's generation. Besides regular maintenance works, major works carried out this year includes replacement of total four layers of filter material (gravel) at Mandu dam, installation of CC camera in Mandu intake for water level monitoring, replacement of limit switches of inlet valve, replacement of LV side bushing connection pad of main transformer, repair and maintenance of drain water pump and seat ring control valve.

6. Multi-Fuel Power Plant

Multifuel Power Plant, with an installed capacity of 39 MW, is located at Bansbari, Morang in the

Engine Hall

eastern industrial corridor of Nepal. Out of total installed capacity of 39 MW, 26 MW capacity was put into service in fiscal year 1990/91 and additional 13 MW capacity was put into service in fiscal year 1997/98 making it the largest thermal power plant in Nepal. It consists of 6 (Six) Wartsila Diesel engines which use furnace oil (FO) as a source of energy. There are two units each 7.5 MVA from Leroy Somer France and four units each 8.144 MVA from Alsthom, France. Major overhauling of engines of all the six units were concluded in 2013. This year the plant was operated in the month of Chaitra for the peak power supply during SEE examinations generating 26.66 MWh of power. Major work this year include repair and maintenance of unit no.5, plate heat exchanger unit, lube oil/fuel oil separator unit, deep well pump and motor. Also this year, maintenance of office compound wall, patrolling of 33 KV transmission line & quarter road P.C.C works were performed.

MEDIUM GENERATION OPERATION AND MAINTENANCE DEPARTMENT

Medium Generation Operation and Maintenance Department (MGO&MD), headed by a Director, is responsible for the operation and maintenance of twelve (12) hydropower stations and one (1) diesel power plants with individual installed capacity below 30MW and owned by NEA with an objective to maximize energy generation by optimally utilizing generation resources while undertaking rehabilitation, periodic overhauling and maintenance of generating facilities. It has always strived to uphold economy, operational efficiency and an acceptable level of reliability in its drive for improvement. The installed capacity of 12 hydropower stations and 1 diesel power plant with installed capacity below 30 MW is 108.7 MW. The actual generation from the hydropower generating stations under this department on FY 2016/17 is 414.22 MWh which is 6.98% of excess energy as compared to that of past year and have achieved about 95.08% of target generation this year. The Modikhola & Ilam Puwakhola hydropower stations have achieved a maximum generation from their first run this year. The rehabilitation projects ongoing under this department is Sundarijal with loan assistance from the Asian Development Bank (ADB) under Energy Access and Efficiency Improvement Project (EAEIP).

The refurbishment of Panauti and Chatara hydropower stations are on the progress. The following sections provide a concise description of the power stations and highlight major activities carried out under this department during the fiscal year.

1. Trishuli Hydropower Station

Trishuli Hydropower Station is constructed on the banks of Trishuli River at Trishuli Bazar, Nuwakot. It was commissioned in 1967 AD in assistance with the Government of India at a cost of INR 140 million with its initial installed capacity of 21 MW having 7 units of 3 MW each. It was later rehabilitated in 1995 AD and upgraded to 24 MW with 6 units each 3.5 MW and one unit 3 MW. It is a peaking run-of-river plant with peaking capacity of 21 MW. The annual design generation is 163 GWh where as its actual generation of this year is 125.97 GWh, a 0.75% increase as compared to previous year. Cumulative generation from its first run is 5,061GWh.

The major activities accomplished this fiscal year 2016/17 were repair of butterfly and by pass

Trishuli Hydro Power Station

valve of Unit no 3, which was not working properly for years, is now in satisfactory operation after repair.

Repair and maintenance of butterfly and bypass valve of unit no 4 and 7 were also done this year. Parallel bearing oil cooler was installed in Unit no 7. MIV of unit no 1 and 2 (currently not in satisfactory condition) shall be repaired and put into operation in next year by devising similar method used for unit 3. New overhead crane was installed at head gate. New Line relay and control Panel was installed for 66kV Trishuli-Balaju transmission line. Repair and maintenance of Unit no 7 Excitation System and installation of excitation field breaker in unit no -6 was carried out.

Repair of spillway slab at desander and removing of trash, sand from B0 Reservoir trash rack were carried out. Boundary Wall construction works around NEA owned territory were also done in this fiscal year. As Trishuli River carries large quantity of silt, after upgrading of Trishuli Hydro power plant due to increase of discharge capacity, desander capacity has proven to be insufficient during wet season. NEA, Engineering Directorate is involved for detail engineering and design of Trishuli Desander upgrading and balancing reservoir. Instrumentation, control and monitoring system needs major upgrading for which preparation works are being carried out.

2. Devighat Hydro Power Station

Devighat Hydropower Plant is a cascade development of Trishuli Hydropower Plant with installed capacity of 14.1 MW and annual design generation of 114 GWh. It is located at Devighat, Nuwakot and was commissioned in 1984 AD. Improved operational performance is observed after successful completion of renovation, modernization and upgrading (RMU) in 2010/2011. The capacity of the units was improved and upgraded to 15MW and the actual generation of this year is 97.61 GWh.

Devighat Hydro Power Station

Currently, all 3 units are operating satisfactorily, moreover major maintenance works completed in fiscal year 2016/17 include motorization works of flushing gate instead of manual operation, maintenance of bypass valve of unit No. 1, maintenance of dewatering & drainage pump, repair of Samari khola syphon, gabion protection works in the Samari khola, fencing works on the side of open canals, repair and construction of school building, repair of water leakage due to earthquake in expansion joints (only some portions) of the concrete structures of ground floor of power house, repair of quarter building damaged during earthquake and 66kV SF6 breaker maintenance by replacing new link pin of operating mechanism. Furthermore, Governor and SCADA system need repair and maintenance which will be carried by suitable experts in next fiscal year. Preparation for overhauling of runners is on the process and is being planned to be implemented by utilizing the shutdown period of Trishuli HPS during F/Y 2017/18.

3. Gandak Hydropower Station

Gandak Hydro Power plant is a canal drop low head Plant located in Western Canal at Surajpura, Nawalparasi. This Canal with maximum discharge of 12,000 cusec advances further for irrigation in Uttar Pradesh, India. The plant has three horizontal mounted tubular bulb 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. It was commissioned in 1979 AD in assistance with the Government of India and Government of Nepal with the total cost of NRs. 170 million.

Unit No. 3 Turbine Cover Opening.

The actual generation from this plant is 21.87 GWh this year, which is 34.61% more than that of previous fiscal year. Currently unit no. 2 and 3 are in operation but the generation is disrupted occasionally due to non- synchronization and trip because of low voltage from Indian grid. The rehabilitation of Intake (procurement & installation of TRCM & gantry crane) of plant jointly financed by ADB and GON under EAEIP is under final stage of completion. The plant is coordinating with Indian irrigation authority to minimize the duration of irrigation canal maintenance which is about 4 months each year. A substantial progress has been achieved in last FY in the report which helped to maintain the voltage level of supply and increase import from India which become instrumental to reduce load shedding in that area.

4. Modikhola Hydropower Station

Modikhola Hydropower Station with installed capacity of 14.8 MW and annual design generation of 92.5 GWh is located at Dimuwa, Parbat. It was commissioned in 2000 AD. Operation of this Plant has been adversely affected especially during rainy season reportedly due to sub-optimal design and inadequate sediment handling facilities as the Modikhola brings high content of abrasive sediments. The actual generation of this fiscal year is 69.55 GWh which is 10.78 percent more than previous year's generation. Major maintenance works carried this year in electrical section include replacement of 132 kV SF6 circuit breaker on 132/33 kV, Transformer replacement of synchronizing breaker of unit no 1 and 2, replacement of 132 kV lightening arrester on 132 kV substation, repair and maintenance of 100 kVA generator of power house, condition monitoring tests done on switchyard and power house equipment and that in mechanical section are overhauling of unit no 1, replacing of Francis runner of unit no 1, repair of butterfly valve and replacement of its seal in unit no 1, replacement of pressure pipes of inlet gates butterfly valves for unit no 1 and 2. Similarly civil works carried out this year include rehabilitation works on damsite, construction of sentry post for security army, repair and maintenance of foundation on protection wall of the tailrace and construction of bypass canal of the pondage at intake.

The rehabilitation works in Modi Khola Hydropower Station consists of demolition of upstream boulders, repair of diversion weir, extension of downstream apron, replacement of trash rack panels with more height, construction of new cantilever R.C.C. retaining wall, replacement

Overhauling of Unit no. 1

of cover slabs of de-silting basin silt drain, incorporation of a bye-pass steel pipe system on the right bank of the regulating pondage with control gate, repair and modification of hydro-mechanical parts in headworks area. The contract is awarded to M/S Lumbini/Prakritik J V, Baneshwor, Kathmandu, Nepal. The revised contract cost of the above works (civil and hydro-mechanical) has been estimated to NRs. 16.69 million. The total estimate budget of civil and hydro-mechanical works is 180 Million without VAT and Contingencies. The construction of civil and hydro-mechanical works is nearly to the completion stage, only about 24 m of by-pass steel pipeline with R.C.C. concrete bed and control gate is remaining. The rehabilitation works are expected to be completed by 2017/18. Positive result is seen after completion of rehabilitation work of civil and hydro mechanical structures at headwork. The generation record has been exceeded than targeted value in last three year after modification works.

5. Sunkoshi Hydropower Station

The 10.05 MW Sunkoshi Hydropower station, located on the upper reach of Sunkoshi River 81 km east from Kathmandu, in Sindhupalchowk district, is a run-of-river daily pondage power plant with an annual design generation of 70 GWh. This station has 3 units of 3.35 MW each and was commissioned with an assistance from People's Republic of China and Government of Nepal, in January 1972. The cost of the project was approximately NRs. 109.4 million including 66 kV single circuit transmission line up to Kathmandu.

Repairing of runner during overhauling of unit no. 2

The actual generation of this fiscal year is 46.19 GWh, which is an increase of 28.33% as compared to that of previous fiscal year. Significant works carried out this year include unit no 2 & 3 complete overhauling, repair & maintenance of radial arm & radial gate of barrage gate no.5, repair & maintenance of heavy equipment at dam site for debris removal works, removal of debris (logs, tyres etc.) trapped inside runner blades through penstock manhole of unit no 1. Staffs quarter building construction works is ongoing as old quarter buildings were demolished by last year's earthquake. Major electrical works including installation of new C&R Panel with energy meter for 6 MVA Power Transformer, replacement of damaged generator protection relay of unit 3 with overcurrent protection relay and then final replacement with new generator protection relay, replacement of damaged distribution transformer with new one for internal supply and condition monitoring test of major electrical equipment: power transformers, current transformers, voltage transformers, lighting arrestors and generator unit 1 has been carried out. Similarly, in civil works, river training works with Gabion to protect store of Sunkoshi HPS, debris removal works at Dam site's upstream and downstream area, and construction of cofferdam at Tauthali khola to withdraw water during Magh to Jestha for power generation are of major significance. Rehabilitation works has been planned for the power plant in this fiscal year with an aim to increase energy generation, energy efficiency and availability of the plant, by means of financial support from Government of Nepal.

6. Ilam (Puwakhola) Hydropower Station

Puwa Khola Hydropower Station is a run of river type of plant with an installed capacity of 6.2 MW and annual design generation of 48 GWh. It is located at Golakharka, Ilam and was commissioned

Ilam Puwakhola Hydro Power Station

in 1999 AD jointly by the Government of Nepal and NEA at a cost of USD 15.7 million. It has two identical pelton turbines of 3.1 MW each and has generated 36.414 GWh of energy this year, exceeding the last fiscal year's generation by 7.63% thereby generating its maximum energy in a fiscal year till date, surpassing its previous best generation of 34.64 GWh of 2005/06.

Major works carried out this year in electromechanical section include replacement of broken/cracked pipeline and valves of hydro-mechanical system, replacement of 33 kV Protection Panel at control room, replacement of 1250 Ampere VCB of main Breaker at high Voltage Room, replacement of rotating diodes of the excitation system. Similarly major maintenance works in civil section are maintenance of quarters at office premises and maintenance of drinking water supply system for office, quarter and power house.

7. Chatara Hydropower Station

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

Kaplan runner

Sunsari Morang Irrigation Project (SMIP) on 29 March, 1999.

Presently, the plant is in shutdown condition since last year due to problems in turbine parts, for which a contract agreement for the renovation & modernisation of unit no. 2 has been done with Andritz Hydro, being OEM of the plant and the works are being continued in this fiscal year. The governor, excitation panel and synchronizing panel seals, bushes, instrumentations of unit no.2 will be replaced by new ones after being delivered to CHPS site by Andritz Hydro Pvt. Ltd. All the dismantled Turbine parts like runner, turbine shaft, pinion shaft have been repaired in workshop and delivered to CHPS site. The unit will be running after complete overhauling targeted to be completed by this fiscal year (2017/18). After completion of overhauling of unit no. 2, future plans are to start for complete overhauling of unit no. 1.

8. Panauti Hydropower Station

Panauti Hydropower Station built in 1965 with the assistance of the then USSR, is located at khopasi, panauti, 35 km east of Kathmandu. The

scheme was an installed capacity of 2.4 MW and annual design generation of 6.97 GWh. The Project was designed for operation of only two units at a time with third unit as a standby. Power canal of 3,721 m long with discharge of 3.2 cu. m/s from headwork to reservoir has seven (7) outlet gates for irrigation in the vicinity of Khopasi and also for drinking purposes as well. The annual generation of this fiscal year was 2.6 GWh.

This year Installation, and Commissioning for Unit-1, Unit-2 & Unit-3 Electro-Mechanical Works including Governor, Excitation, HMI & SCADA System were completed. Also, repair & replacement of Unit-1 turbine system & Unit-2 turbine generator male/female coupling were accomplished. Other works include Repair & Replacement of Synchronizing Check Relay for Synchronizing System, Repair and maintenance of Canal, Repair and Maintenance of office damaged building, Construction of Boundary Wall, Construction of Power House SCADA System Control Room. This power plant is under rehabilitation with procurement & installation of new governor control system including MIV, PLC & SCADA based control, monitoring & protection systems and brushless excitation systems for which the contractor is doing the works.

9. Seti Hydropower Station

Seti Hydropower Station is a run of river plant with installed capacity of 1.5 MW and design generation of 9.8 GWh. It consists of 3 units of 500kW each. It is located at Nadipur, Pokhara and was put into operation in 1985 AD with assistance from the People's Republic of China. Power canal of this Plant serves both objectives of irrigation and energy generation. Intake of the canal is regulated primarily for irrigation by Department of Irrigation and hence, normal operation of the Plant sometimes gets affected regardless of availability of units. This plant can generate in full capacity almost all days of the year and all 3 units are in running condition. The annual generation

Overhauling of Unit No. 3

of this station for the F.Y 2016/17 is 8.045 GWh with decrease of 26.84% due to a heavy flood, in Seti River in July last year, severely damaging the headworks.

The maintenance works carried out this year include maintenance of governor and high pressure oil system, repair of governor air oil pressure in unit no. 3, overhauling of unit no. 3, repair of big desander gate and stoplog gate at Jaubari, Inspection of generator stator, rotor and checking of insulation and protective gear, 11kV VCB maintenance work, rewinding of step-up transformer no. 2, rewinding of magnetic amplifier and phase compound transformer of excitation panel of unit no. 2. In civil works, construction of weir section of head works which was damaged by flood last year, temporary diversion works at intake of headworks, relocating desander basin flushing gate to original position, removal of huge deposition of debris, logs and silt during flood at power cannel and protection works in old buildings and civil structures were carried out. The ongoing modification and renovation works of control system and replacement of existing governor with digital governor and SCADA embedded control panel will be initiated in FY 2017/18.

10. Fewa Hydropower Station

Fewa Hydropower Station is a canal drop type power station with an installed capacity of 1.0 MW and located at Pardi, Pokhara. It is built at the end

of the canal for which the water comes from end of the Fewa lake at a portion called Damsite in Pokhara. It consists of 4 units each 250kW with an annual design generation of 6.5 GWh. It was commissioned in 1969 AD with assistance from the Government of India.

Fewa Hydropower Station

Generation from the station was 1.47 GWh in fiscal year 2016/17. Presently, three units are in operation while unit no. 4 is not in operation due to problem in generator-turbine coupling. Some of the works completed in this fiscal year include maintenance of governor, excitation system, high pressure oil system, Installation of trash rack at intake of forebay, repair and maintenance of draft tube of unit no. 1, drain valve and cooling system maintenance, repair and maintenance of generator of unit no 1, replacement of Air Circuit Breaker (ACB) of unit no 1, replacement of 11kV lightning arrester ,drop out fuses and 200-400 A load disconnecting switches, complete wiring change of unit no 1 and 2. Furthermore, civil maintenance works regarding repair and maintenance of forebay gate, repair and maintenance of approximately 300 m power canal, repair and maintenance of power house as well as tail race were carried out.

11. Sundarijal Hydropower Station

Sundarijal Hydropower Station is located at Sundarijal, 15 km northeast of Kathmandu and serves twin purpose of water supply and energy. The tailwater discharge is utilized for water supply system to Kathmandu Valley. It has two turbogenerator sets with total installed capacity of 640 kW & annual generation 4.77 GWh. This Plant was erected under Colombo Plan scheme whereby the main equipments were supplied by The English Electric Company Ltd., England. It was commissioned in 1934 AD, being second old hydroplant constructed in Nepal. The actual generation from this plant in this year is 4.49 GWh. Major maintenance works carried out in this year for the plant are repair and maintenance of main inlet valve, construction of cover slabs for Nagmati canal, cleaning of balancing reservoir, painting works at roof and exterior wall of powerhouse. Similarly, construction of single storey new staff quarter & construction of colony compound wall are in progress.

Sundarijal Hydropower Station

The rehabilitation of this power station is underway under the joint assistance from ADB, GON and NEA. Nepal Electricity Authorityhas received loan (Loan Number 2808-NEP, Grants 0270-NEP and 0271-NEP) from Asian Development Bank (ADB) towards the cost of Power Efficiency Improvement as part of Electricity Transmission Expansion and Supply Improvement Project. NEA intends to apply a portion of the proceeds of this loan for Rehabilitation and upgrading of Sundarijal hydropower plant from 640 kW to 970kW . The

proposed rehabilitation works largely consists of electromechanical rehabilitation and the recruitment of international individual consultant in intermittent assignment for design and implementation support for Part C: Rehabilitation of Small Hydropower Plants. The design part of individual international consultancy has been completed. The contract in EPC model has been awarded on April 2017 based on the inception report of the consultant. The execution of the project is going on most of the design drawings of electromechanical equipments and electrical work has been approved, most of the civil works of Nagmati headwork has been completed. The project is scheduled to be completed by July, 2018. The project is estimated to cost 4.86 MUSD including taxes and duties, physical and price contingencies and interest charged during implementation out of which ADB loan is 2.3 MUSD and GON/NEA counterpart funding is 2.56 MUSD.

This Project is a part of an effort of Nepal Electricity Authority to renovate and modernize aged hydropower plants as this plant has become 83 years old.

12. Pharping Hydropower Station

Pharping Hydropower Station is the first power station in Nepal, which upholds the legacy of hydropower development in Nepal for more than a century. It was inaugurated by the late king Prithivi Bir Bikram Shah Dev on Monday, 22 May, 1911 (B.S. 1968, 9th Jestha). It was erected with a grant from British Government at a cost of NRs. 0.713 Million. It is located in Pharping of Kathmandu district, nearly 12 km south from the city. 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. In this year construction of new roof truss & installation of CGI sheets for the chamber building in forebay, construction of retaining walls, repair of drains, construction of toilets, septic tank near quarter buildings, false ceilings installation and other minor repairs in quarter building has been carried out.

Pharping Hydropower Station

13. Hetauda Diesel Power Plant

Hetauda Diesel Power Plant with installed capacity of 14.41 MW is located at Hetauda, Makawanpur and acts as a backup to hydropower plants. The first phase with three engine sets of English Electric Co. Ltd. was commissioned in 1963 and the second phase with four engine sets of GEC Diesel Ltd. was commissioned in 1980 in assistance with British Government. It adds to generation mix providing operational flexibility. This Plant is in standby condition and operates in an emergency when there will be severe power shortage. Soaring fuel prices severely restricts its operation. Out of

Engine Hall

7 units installed in the plant, all of them are in operable condition. The actual generation from this plant of this FY is 0.33 GWh. The major works carried out this year are replacement of rotor shaft assembly of turbocharger of engine no. 6, replacement of Four Entry Casing of Engine no. 4,5&6, Replacement of outlet casing of engine no. 5, repair and maintenance of cooling towers of engine no 2 & 3, repair & maintenance of oil circuit breaker in 11kV busbar . Other regular & routine maintenance works for the diesel engine has been carried out.

TECHNICAL SUPPORT DEPARTMENT (TSD)

Technical Support Department, headed by Director, provides expert advice for the under-construction projects and existing power plants as required by the respective Projects, and, Operation and Maintenance Department. Deputy Managing Director, Generation Directorate, coordinates between the Technical Support Department and Projects or Operation and Maintenance Department.

In the FY 2073/74, TSD has carried out following services:

Rehabilitation Study of Trishuli Hydropower Station

1. A Contract Agreement was made between Technical Support Department and Project Development Department (PDD) of Engineering Directorate to carry out rehabilitation study of Trishuli Hydropower Station mainly to solve the problem of sediment deposition in the balancing reservoir. The balancing reservoir was used for the peaking of the plant, however, now it is not possible due to sediment/debris deposition. The present annual generation is about 25% below the design annual generation.

   The Project Development Department has carried out the topographical survey of the balancing reservoir and desanding/channel area. It is also carrying out hydrological survey and sediment sampling of Trishuli River at headworks, intake, desanding basin, reservoir, forebay and tailrace of the powerhouse. A conceptual design is in the process of finalization, which foresees a by-pass canal to divert the flow of Kholas (which is being discharge to the reservoir bringing lots of debris) toward the downstream of the reservoir intake and crossing over the intake which finally to be discharged at the location downstream of BO flushing outlet. Another by-pass canal for uninterrupted generation during the cleaning of the balancing reservoir is foreseen which will be parallel to the by-pass canal for diverting the flow of kholas.

2. TSD reviewed the retrofitting works of Headworks Barrage, Intake and Control room structure of Sunkosi Hydroelectric Project prepared by the Consultant. As per the recommendation of the TSD, the retrofitting works shall include repairing of cracks in columns and beams, jacketing of columns with shear walls for Barrage and the Intake structures. The underwater maintenance of Spillway Gate sill beam of the Kali Gandaki A Hydropower Station was also reviewed and recommended to carry out the works for Gate No. 3 only. As the underwater maintenance works is very costly, the system should consist of similar size plant in order to carry out maintenance works in dam, intake and reservoir by lowering the water level.

3. TSD has formed a study committee involving various experts in the field of electrical, mechanical and civil for identifying problems in six hydroelectric plant, namely, Trishuli, Devighat, Modi, Gandak, Kulekhani I and II due to decrease in generation, aged electro-mechanical equipments. As per the recommendation of the Committee's report, major maintenance, overhauling works and rehabilitation study will be carried out in this fiscal year.

Nepal Electricity Authority

Generation Operation and Maintenance
Actual Generation for the FY 2073/74 (FY 2016/17)

Unit: MWh

S.N.	Power Stations/Month	Shrawan	Bhadra	Ashwin	Kartik	Mangsir	Poush	Magh	Falgun	Chaitra	Baishakh	Jestha	Ashad	Total
1	Kaligandaki 'A'	60,206.00	89,668.00	90,518.00	91,053.00	80,170.00	53,708.00	42,031.00	39,253.00	51,118.00	60,017.00	88,297.00	96,110.00	**842,149.00**
2	Mid-Marsyangdi	48,932.74	49,469.13	47,004.38	47,550.87	38,579.13	27,121.87	21,285.00	20,666.25	27,627.25	32,370.88	44,234.75	49,809.37	**454,651.62**
3	Marsyandi	46,750.40	46,225.10	46,015.90	47,630.50	43,117.30	30,838.70	24,960.00	22,961.80	31,122.10	34,827.00	44,950.10	45,906.60	**465,305.50**
4	Kulekhani I	3,946.00	566.00	256.00	723.00	918.00	6,253.00	10,743.00	13,289.00	14,232.00	13,226.00	6,141.00	3,109.00	**73,402.00**
5	Kulekhani II	1,760.66	297.25	256.12	442.12	618.48	3,265.20	5,387.70	6,789.00	7,367.00	6,831.50	3,137.10	1,643.00	**37,795.13**
6	Trishuli	10,409.90	10,154.50	10,322.60	11,345.60	11,523.00	10,950.50	9,570.70	9,153.00	9,022.40	11,230.50	11,474.30	10,812.40	**125,969.40**
7	Gandak	954.30	1,846.90	2,112.40	683.90	928.70	3,086.70	3,008.80	2,990.80	1,262.90	-	1,491.70	3,505.60	**21,872.70**
8	Modi	4,344.10	6,607.30	8,188.80	9,023.00	6,664.20	4,465.60	3,128.40	3,022.40	4,143.20	5,476.80	7,891.00	6,601.60	**69,556.40**
9	Devighat	8,081.99	8,334.08	8,169.93	8,614.03	8,927.98	8,653.23	7,642.74	7,275.52	6,876.10	8,339.48	8,556.50	8,138.38	**97,609.96**
10	Sunkoshi	8.60	2,772.20	4,252.70	6,527.20	5,728.10	4,261.20	3,684.50	2,881.40	3,503.90	3,492.90	4,794.10	4,283.90	**46,190.70**
11	Puwa	4,457.24	4,408.80	4,239.61	4,279.92	3,478.20	2,269.38	1,535.49	1,331.75	1,836.17	1,877.65	2,587.23	4,112.81	**36,414.24**
12	Chatara	-	-	-	-	-	-	-	-	-	-	-	-	**-**
13	Panauti	188.82	312.55	397.08	405.94	324.72	260.02	144.60	79.82	73.21	118.13	81.20	217.24	**2,603.33**
14	Seti	881.31	566.82	488.61	791.19	958.95	909.36	773.10	729.81	915.48	172.62	101.25	756.36	**8,044.86**
15	Fewa	122.48	168.43	180.27	86.39	114.53	214.88	228.40	152.29	37.46	-	-	162.56	**1,467.69**
16	Sundarijal	429.57	447.55	446.32	447.32	438.00	428.66	326.00	286.33	239.66	253.99	291.33	456.00	**4,490.73**
17	Pharping	-	0.14	0.06	0.11	0.07	0.04	0.031	0.167	0.128	0.035	0.055	0.063	**0.88**
	Total (Hydro)	**191,474.11**	**221,844.75**	**222,848.78**	**229,604.08**	**202,489.35**	**156,686.35**	**134,449.46**	**130,862.34**	**159,376.96**	**178,234.48**	**224,028.61**	**235,624.88**	2,287,524.14
18	Multifuel	-	-	-	-	-	-	-	-	26.66	-	-	-	**26.66**
19	Hetauda Diesel	7.75	7.23	7.68	59.79	8.17	8.80	5.77	7.31	167.63	33.73	5.65	6.48	**325.98**
	Total (Thermal)	7.75	7.23	7.68	59.79	8.17	8.80	5.77	7.31	194.29	33.73	5.65	6.48	352.64
	Grand Total	**191,481.86**	**221,851.98**	**222,856.46**	**229,663.87**	**202,497.52**	**156,695.14**	**134,455.22**	**130,869.65**	**159,571.25**	**178,268.21**	**224,034.26**	**235,631.36**	**2,287,876.78**

Note: Provisional figures subjected to final audit

Nepal Electricity Authority

Generation Operation and Maintenance

Generation Related Statistics and Performance Factors for the FY 2073/74 (FY 2016/017)

S.N.	Power Stations	Total Installed Capacity (MW)	Total No. of Units Installed	Actual Generation (MWh)			Maximum Generation in a year till date/year (MWh)	Design Generation (MWh)	Generation Target (MWh)	Backfeed (MWh)	Transmission to Grid (MWh)	Self Sufficiency Ratio (%)	Plant Factor (%)	Current No. of Employees
				FY 2071/72	FY 2072/73	*FY 2073/74								
1	Kaligandaki 'A'	144.00	3	929,983.00	750,842.00	842,149.00	929,983.00 (2071/72)	842,000.00	835,759.98	53,378.00	892,269.26	99.73%	66.76	122
2	Middle Marsyangdi	70.00	2	457,318.09	435,558.76	454,651.62	457,318.09 (2071/72)	398,000.00	432,438.89	232,675.96	674,852.43	98.29%	74.14	66
3	Marsyandi	69.00	3	472,981.50	441,736.60	465,305.50	483,928.20 (2052/53)	462,500.00	461,375.39	428,475.00	874,258.00	97.82%	76.98	68
4	Kulekhani-I	60.00	2	90,081.00	71,356.00	73,402.00	249,680.00 (2056/57)	211,000.00	104,369.40	74,188.02	137,905.87	99.00%	13.97	75
5	Kulekhani-II	32.00	2	44,740.63	36,055.35	37,795.13	122,757.00 (2056/57)	104,600.00	55,663.68	3,286.40	40,521.40	98.64%	13.48	42
6	Trishuli	24.00	7	124,763.40	125,025.70	125,969.40	154,423.75 (2053/54)	163,000.00	135,188.85	172,499.32	279,433.31	94.28%	59.92	72
7	Gandak	15.00	3	1,793.70	16,249.00	21,872.70	52,272.70 (2043/44)	106,380.00	23,587.32	117,955.28	105,431.93	99.45%	16.65	31
8	Modi Khola	14.80	2	58,955.20	62,787.20	69,556.40	69,556.40 (2073/74)	92,500.00	67,655.66	52,735.63	105,982.00	98.67%	53.65	34
9	Devighat	15.00	3	97,742.69	94,306.49	97,609.96	106,277.70 (2056/57)	114,000.00	105,066.14	88,140.98	184,511.82	99.70%	74.28	41
10	Sunkoshi	10.05	3	23,014.10	35,994.20	46,190.70	66,383.10 (2068/69)	70,000.00	43,778.02	586.50	41,754.20	99.80%	52.47	49
11	Ilam (Puwa Khola)	6.20	2	32,412.28	33,831.51	36,414.24	36,414.24 (2073/74)	48,000.00	37,030.41	19.51	36,373.32	99.83%	67.05	35
12	Chatara	3.20	2	53.25	-	-	5,219.75 (2063/64)	6,000.00	3,225.60	-	-	-	-	22
13	Panauti	2.40	3	1,632.38	2,052.59	2,603.33	4,654.80 (2058/59)	6,970.00	2,749.57	-	-	#	12.38	21
14	Seti	1.50	3	10,264.81	10,996.74	8,044.86	11,616.19 (2067/68)	9,800.00	10,506.32	-	-	#	61.22	34
15	Fewa	1.00	4	2,310.74	1,664.77	1,467.69	3,919.47 (2034/35)	6,500.00	2,214.02	-	-	#	16.75	
16	Sundarijal	0.64	2	4,530.26	4,293.95	4,490.73	4,530.26 (2071/72)	4,770.00	4,624.61	-	4,483.30	99.83%	80.10	21
17	Pharping	0.50	2	4.46	1.93	0.88	48.65(2064/65)	-	-	-	-	-	0.02	4
	Total (Hydro)	**469.29**	**48**	**2,352,581.49**	**2,122,752.79**	**2,287,524.14**	**-**	**2,646,020.00**	**2,325,233.86**	**1,223,940.60**	**3,377,776.83**	98.06%	55.64	**737**
18	Multifuel	39.00	6	-	-	26.66	86,215.07 (2055/56)	-	-	148.87	25.50	14.53%	0.01	17
19	Hetauda Diesel	14.41	4+3	1,254.54	122.07	325.98	24,203.64 (2055/56)	-	-	-	311.77	95.64%	0.26	24
	Total (Thermal)	**53.41**	**13**	**1,254.54**	**122.07**	**352.64**	**-**	-	-	**148.87**	**337.27**	67.25%	0.08	**41**
	Grand Total	**522.70**	**61**	**2,353,836.03**	**2,122,874.85**	**2,287,876.78**	**-**	**2,646,020.00**	**2,325,233.86**	**1,224,089.47**	**3,378,114.10**	**98.06%**	**49.97**	**778**

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

TRANSMISSION DIRECTORATE

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

This business group monitors, operates and constructs transmission lines and substation facilities to evacuate power generated by both NEA and IPP owned power plants and undertakes reinforcement of the existing transmission system. Nepal's first-ever 400kV Nepal-India cross-border transmission link is completed with the leading involvement of this business group. Currently this line has been charged at 132kV voltage level and importing upto 145 MW of power. In order to develop a strong east-west Transmission Network the Hetauda-Dhalkebar-Inaruwa 400kV transmission line is under construction.

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

Implementation of "Rastriya Urja Sankat Nibaran tatha Bidhut Bikash Dasak 2072" and as directed by Government of Nepal (GoN) to improve Power Sector following projects has been completed within this FY:

Dhalkebar-Muzzafarpur 400kV Transmission line; Construction of this project completed on February 2016 and started importing up to 145MW of power from India to decrease load shedding in first phase and construction work to upgrade Dhalkebar Substation in 220kV voltage level has been accelerated to implement second phase of the plan to increase import up to 230MW.

Raxual-Parwanipur 132kV Transmission Line and Kusaha-Kataiya 132kV Transmission Line has been completed and put into operation under grant assistance of Government of India. These transmission lines will be used to import 50MW of additional power from each line.

Khimti-Dhalkebar 220kV Transmission Line single circuit has been completed on January 2017 and charged into 132kV voltage level which has increased national grid connectivity and established network reliability.

Besides, Bhulbhule-Middle Marsyangdi 132kV Transmission Line is completed on August 2016 for 50MW power evacuation generated from Upper Marsyangdi-A.

Hetauda-Kulekhani II-Siuchatar 132kV 2nd circuit stringing project is completed on August 2016 which has increased power evacuation capacity targeted to Kathmandu Valley.

Chapali 132/66/11kV Substation Expansion Project is completed and put into operation on June 2017 for strengthening of power supply to northern part of the Kathmandu Valley.

Construction of Mirchaiya 132/33kV substation and Kusum-Hapure 132kV Transmission Line project are completed which contributed in

supplying reliable power in the surrounding area. They shall also be utilized to supply the Cement Industries of the area namely Dang Cement, Maruti Cement etc.

Phidim and Kabeli 132/33kV Substation under Kabeli Corridor 132kV Transmission Line Project has been completed this year and put into operation via 33kV network as construction of 132kV Damak-Kabeli Transmission Line work is in progress.

Major part of the east-west 400kV Transmission Line from Hetauda to Dhalkebar to Inaruwa (285km) is under construction. Upgrade Dhalkebar Substation in to 220kV is in final stage and the same time tender has been called for up gradation of Dhalkebar Substation at 400kV voltage level to connect Muzzafarpur, India cross boarder transmission system.

Furthermore to extend 400kV Transmission System to the west Project Management Directorate (PMD) under ADB financial assistance is developing Upper Karnali - Chhinchu and New Butwal-Kohalpur-Lamki-Attariya 400kV Transmission System. For the work EoI has been published for the study and Evaluation underway for short listing of the Consultants.

Major Transmission Corridors like Kaligandaki Corridor, Marsyangdi Corridor, Marsyangdi-Kathmandu 220kV Transmission Line construction work has been initiated through PMD under ADB financial assistance in the name of South Asia Sub-regional Economic Cooperation (SASEC), Power System Expansion Project. Preparation of Distribution System Master Plan, Grid Substation Reinforcement Projects also included under this SASEC projects.

PMD has initiated other projects like 132kV GIS Substation inside Kathmandu Valley, 220kV Substations at Lapsiphedi and Barhabise, Enhancement of Distribution Network inside Kathmandu Valley (Underground Cabling) under Power Transmission and Distribution Efficiency Enhancement Project.

Likewise from Office of Millennium Challenge Nepal (MCC) under US Government Grant Assistance has a plan to execute the Mid Hill 400kV Transmission Line Network. This grant will be utilized to develop 400kV Network from Lapsiphedi to Ramate (Gallchi), Naubise and then one part will be extended to New Hetauda and other part will be extended up to New Butwal through New Damauli. This 400kV Network will be the part of the extension of Khimti-Kathmandu 400kV Network which is under construction with the assistance of ADB.

I. GRID OPERATION DEPARTMENT

The Grid Operation Department (GOD) has the main responsibility of transmitting reliable and quality power from distant generators to various load centers. The department also provides connection facilities to IPPs and bulk consumers at different voltage levels by accomplishing connection agreement as per NEA grid code. The other major responsibility of this department is to look after the operation of 66kV & above substations and transmission lines along with routine and breakdown maintenance works including up-gradation, extension, replacement works, reactive compensation, rehabilitation works etc. The three division offices in Kathmandu, Hetauda & Butwal and three branch offices in Duhabi, Pokhara & Attaria are functioning under GOD for the fulfillment of these responsibilities:

Major Works performed in the F/Y 2073/74 are as follows:

This department has executed number of Transformer addition and up gradation works in various Substations. Up-gradation, Reactive Power Compensation and rehabilitation of power system equipments in the Substations are being carried out to meet the increasing power

demand and Voltage drop problem. The existing Transformers after being replaced are reused in other Substations after necessary Overhauling and Maintenance works. Reallocations of such Power Transformers are a cost effective solution for load management. Various works executed by this department have supported to reduce forced load shedding caused by inadequate substation capacity.

The department has carried out and completed following major up-gradation and reinforcement works in FY 2073/74.

a. Major Up gradation and Reinforcement Works

- Installation of new 132/33kV, 30MVA Transformer to replace existing 15MVA at Kohalpur S/S.
- Installation of new 132/11kV, 22.5MVA Transformer Bay at Lekhnath S/S.
- Installation of new 33/11kV, 16.6MVA Transformer Bay at Kamane S/S.
- Installation of new 132/11kV, 22.5MVA Transformer to replace existing 7.5MVA at Bardghat S/S.
- Installation of new 132/11kV, 22.5MVA Transformer Bay at Parwanipur S/S. (GSRP I Project)
- Shifting and Installation of 66/11kV, 7.5MVA Transformer replacing the existing 3.15MVA at Amlekhgunj S/S.
- Shifting and Installation of 132/33kV, 15MVA Transformer replacing the existing 7.5MVA at Lamki S/S.

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

- Installation of new 132/33kV, 63MVA Transformer Bay at Duhabi S/S.
- Installation of new 132/33kV, 63MVA Transformer to replace existing 30MVA at Lamahi S/S.
- Installation of new 33/11kV, 16.6MVA Transformer to replace existing 8MVA at Chandranigahpur S/S.
- Installation of new 132/33kV, 63MVA Transformer to replace existing 30MVA at Dhalkebar S/S.
- Installation of new 33/11kV, 16.6MVA Transformer to replace existing 7.5MVA at Lamki S/S.
- Installation of new 132/66kV, 3x12.6MVA Single Phase Transformer to replace existing old 3x12.6MVA at Siuchatar S/S.
- Installation of new 66/11kV, 18MVA Transformer Bay at Patan S/S.
- Installation of new 33/11kV, 16.6MVA Transformer Bay at Butwal S/S.
- Installation of new 33/11kV, 16.6MVA Transformer to replace existing 8MVA at Yadukuwa S/S.
- Installation of new 132/33kV, 63MVA Transformer to replace existing old 63MVA at Butwal S/S.
- Installation of new 132/33kV, 63MVA Transformer to replace existing old 63MVA at Duhabi S/S.
- Installation of new 132/11kV, 30MVA Transformer to replace existing old 30MVA at Pokhara S/S.
- Installation of new 132/11kV, 30MVA Transformer to replace existing old 22.5MVA at Matatirtha S/S.
- Installation of new 33/11kV, 16.6MVA Transformer to replace existing 16.6MVA at Butwal S/S.
- Installation of new 33/11kV, 16.6MVA Transformer to replace existing 16.6MVA at Anarmani S/S.
- Installation of new 132/11kV, 30MVA Transformer Bay at Siuchatar S/S.

- Installation of new 132/11kV, 22.5MVA Transformer Bay at Bhaktapur S/S.
- Installation of new 220/132kV, 315MVA Transformer to replace existing 160MVA at Dhalkebar S/S.
- Installation of 132kV 20MVAr Capacitor Bank at Lahan S/S.
- Installation of 33kV 12.5MVAr Capacitor Bank at Chandranigahpur S/S.
- Installation of 11kV 10MVAr Capacitor Bank at Pathlaiya S/S.
- Shifting and Installation of 132/33kV, 30MVA Transformer replacing the existing 12.5MVA at Lekhnath S/S.
- Shifting and Installation of 132/33kV, 15MVA Transformer replacing the existing 7.5MVA at Lamki S/S.
- Shifting and Installation of 132/33kV, 15MVA Transformer replacing the existing 7.5MVA at Mahendranagar S/S.
- Shifting and Installation of 33/11kV, 8MVA Transformer replacing the existing 3MVA at Chanauta S/S.

c. Grid Connection Agreement

The Department has successfully accomplished the Grid Connection Agreement with 32 IPPs (Independent Power Producers) for 525.594MW Capacity (11 IPPs for 461.594MW Capacity for Hydropower Projects and 21 IPPs for 64MW Capacity for Solar Photo Voltaic Projects) to mitigate the future load demand.

d. Maintenance Works

- Re-routing work from Tower No. 177 to 181 on Siuchatar—Marshyangdi 132kV Transmission Line at Jogimara, Dhading.
- Routine Maintenance works were carried out as per schedule for Substations and Transmission Lines.
- Breakdown maintenance works were carried out as per requirement.
- Regular Relay Testing works were also carried out. Total of 66 relays were tested on 7 Substations (Attaria, Lamki, Mahendranagar, Kohalpur, Hetauda, Chandranigahpur and Kamane Substation).
- Regular Energy Meter Testing works were also carried out on our Testing Lab. Total of 123 Enermy Meters (91 Meters from NEA and 32 Meters from IPP) were tested.

e. Revenue Generation:

The Department has made a total income of NRs. 52,73,186.00 from Grid Impact study, hiring testing equipments, programming and testing of energy meters and by selling Grid Code and Tender Documents.

f. Transmission Loss Status

Comparison of Transmission Line Loss of different F/Y

S. No.	F/Y	Total Import Energy(MWh)	Total Export Energy(MWh)	Transmission Line Loss Energy(MWh)	Transmission Line Loss in Percentage
1	2069/70	3772905.51	3574865.10	198040.41	5.25%
2	2070/71	4120153.81	3889823.10	230330.71	5.59%
3	2071/72	4394005.17	4193004.03	201001.14	4.57%
4	2072/73	4476682.97	4260912.71	215770.26	4.82%
5	2073/74	5552927.57	5275058.79	277868.79	5.00%

II. SYSTEM OPERATION DEPARTMENT (SOD)

As in the preceding year, Load Dispatch Centre has been working round the clock to keep the operation of the Integrated Nepal Power System (INPS) on the right track through the use of computer based Supervisory Control and Data Acquisition (SCADA) system. The availability of real time data and better communication system have improved the overall availability of power stations and transmission lines and has helped towards fast restoration of the power system in case of black-outs, thereby reducing loss of revenue.

In this fiscal year load shedding has been drastically reduced throughout nation and from 14th Kartik 2073 load shedding of Kathmandu valley is completely uplifted and small magnitude of load shedding is being implemented in other parts of nation. This was only possible with vision of new management, addition of new IPP power plants in the system, increase in import and continuous effort of LDC team with support from concern departments. The operation of Khimti-Dhalkebar 220kV line (presently operated at 132kV level) contributed meaningfully to reduce the load shedding and enable maximum import of 145 Megawatt from Dhalkebar-Mujjaffpur Transmission line. However, in previous year only maximum of 80 Megawatt was imported.

For the continued smooth functioning of the system, it is necessary that the data acquisition from the power stations and substations be updated according to the latest changes/modifications in the respective stations. The trained manpower in the LDC has been able to keep the data up-to-date in the SCADA software in the LDC, through the regular maintenance works. In this fiscal year new stations Upper Marsyangdi and Upper Madi have been integrated on SCADA software system. Around Rs.247 million revenue is being received annually by leasing (to Nepal Telecom and other private companies) fibers from the fiber optic cable, an increase in 15.5 % from last year.

Exiting software and hardware installed in the LDC control building is of 2002 and earlier. Malfunction of installed equipment has been increased compared to previous years and the spare parts are also not available in the market. To mitigate this problem process of upgrading and rehabilitation of existing hardware and software was initiated in this fiscal year.

III. GRID DEVELOPMENT DEPARTMENT

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

Recently Completed Projects

1. Bhulbhule-Mid. Marsyangdi 132kV Transmission Line

Erected tower of Bhulbhule to Middle Marsyandi 132kV T/L Project

Conductor stringing work of Bhulbhule to Middle Marsyandi 132kV T/L Project

Objective of this project is to evacuate power generated by Upper Marsyangdi A (50MW). Cost of this project is estimated to US$ 3.0 Million and funded by GoN. The project is started in 2070/071 (2013/014) and estimated revised completion is FY 073/74 (within August 2016). Scope of the project includes construction of 22km single circuit transmission line from Bhulbhule Upper Marsyangdi-A switchyard to Middle Marsyangdi switchyard and 132kV Bay extension at Middle Marsyangdi Swithchyard. The line has been successfully charged after completion of construction on September 2016.

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

Objective of this project is to increase power evacuation capacity and reinforcement of National Grid. Scope of the project includes construction of 46km second circuit 132kV Transmission Line on same existing Tower, Bay extension at substations and reinforcement work on existing 132kV Line. Cost of this project is estimated to US$ 2.5 Million and is funded by GoN.

As of Asadh 2074, the ROW under the newly constructed second circuit transmission line has been cleared and the line has been successfully charged. For charging the line, few houses lying under RoW in Matatirtha and Syuchatar area has been dismantled. After successfully completing the project, it handed over to Grid Operation Department for operation.

3. Chapali 132kV Substation Expansion Project

Objective of this project is to cater the increased power demand of residential and commercial area of northern part of Kathmandu Valley and to increase reliability of National Grid by making 132 kV Double Circuit Connection from Bhaktapur Substation to Balaju Substation. Cost of this project is estimated to US$ 11.18 Million and jointly funded by GoN and ADB. Project started in 2065/066 (2008/09) and completed by April, 2017. Scope of the project includes installation of 132/66 kV, 7X15/16.5 MVA signal phase Transformers at Chapali Substation, make 132 kV Double Circuit Connection in between Balaju and Bhaktapur, 132/66 kV link in between Chapali and New Chabel and Interconnection of Devighat HEP in National Grid.

132kV Chapali Substation

4. Phidim and Kabeli 132/33 kV Substation of Kabeli Corridor

Objectives of this project is to facilitate evacuation of power generated from Kabeli-A Hydro Power Project and power produced from Hydro Power Projects in Kabeli, Hewa, Mai and other river basin the eastern region. The capacity of Phidim and Kabeli 132/33 kV are 16 MVA and 30MVA respectively. The charging of these substaions have been completed via 33 kV existing line on February 2017 and Power Evacuation from Hewa Khola has been possible dut to this substation.

5. Mirchaiya 132/33 kV Substation

The objective of this project is to provide power supply to Maruti Cement Industry to be established at Katari. Cost of this project is estimated to NRs. 374 Million and funded by GoN. Project components includes construction of 132/33 kV, 30 MVA substations at Mirchaiya. For this purpose one circuit of existing Dhalkebar – Lahan 132kV line will be looped-in and looped-out at Mirchaiya in Siraha district. The construction work has been completed and charged on March 2017.

6. Kusum - Hapure 132kV Transmission Line

The main objective of this project is to develop transmission system up to the site of Dang Cement to be established at Hapure of Dang.

Hapure Substation

Further extension of this line will be benefited to Sonapur and Rolpa cements. The project started in 2065/066 with estimated cost of NRs. 500 Million and has been completed on July 2017. The project is financed by GoN.

Main activities of the project include: construction of 22km Kusum-Hapure 132kV transmission line and 132/33kV, 30MVA substation at Panchakule of Dang.

7. Khimti – Dhalkebar 220 kV First Circuit Transmission Line

The project was started in 2059/60 with the objective of enhancing transmission capacity, improving supply reliability, reducing losses and voltage drops through construction of 220 kV double circuit line. The first circuit has been completed and charged on February 2017 in 132 kV voltage level. This line evacuates power from India to Kathmandu via Dhalkebar Substation. The project cost is estimated at US$ 22 Million and was jointly funded by World Bank, GoN and NEA.

The scope of the project includes construction of 75 km long Khimti-Dhalkebar 220 kV transmission line on double circuit tower with single circuit of twin Bison ACSR conductor (initially charged at 132 kV) and two nos. of 132 kV line bays at Khimti and Dhalkebar substations.

8. Grid Substation Reinforcement Project

Objective of this project is to the primary focus in the reinforcement & up gradation of transformer capacity and voltage improvement of substation supplying power to Birgunj Corridor by upgrading transformer capacity as well as construction of new transformer bays at various substations. Project started in 2069/070 (2012/13.

Scope of the project includes shifting, up gradation of 132kV power transformers and associated extension works at Hetauda and Parwanipur Substation, supply & installation of 66kV, 30MVAR capacitor Bank. Cost of this project is estimated to US$ 4.56 Million and jointly funded by GoN, NEA and ADB. The project has been completed on January 2017.

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

Objective of this project is to provide adequate power to western Nepal so as to meet the electricity demand requirement of ADB and Danida funded rural electrification projects in the region, to provide upcoming cement factories, to evacuate power from Chameliya, to supply part

Bhurigaun Substation

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

Transmission line construction works have been completed and preparation is going on to put in to operation.

10. Kushaha – Kataiya 132 kV Cross Border Transmission Line Project

The Project is executing under Indo-Nepal co-operation. Indian Government invests for construction of transmission line whereas Nepal

Pit Excavation work for Tower Foundation

Government is facilitating for land acquisition and ROW compensation. Main theme of the Project is to import the additional 50 MW power from India to minimize the loadshedding as much as possible. Project started in November 2014 when contract is awarded by Ministry of External Affairs (MEA) India and contract signed on May 2015. Construction of transmission line started at site on Feb. 2016 and completed on Feb. 2017. After completion of testing formalities, test charge has been done on March 2017 and currently power is flowing from Kataiya to Kushaha.

11. Raxaul – Parwanipur 132 kV Cross Border Transmission Line Project

The Project is executing under Indo-Nepal co-operation. Indian Government invests for construction of transmission line whereas Nepal Government is facilitating for land acquisition and ROW compensation. Main theme of the Project is to import the additional 50 MW power from India to minimize the loadshedding as much as possible. Project started in November 2014 when

Tower Erection Work

contract is awarded by Ministry of External Affairs (MEA) India and contract signed on May 2015. Construction of transmission line started at site on Feb. 2016 and completed on Feb. 2017. After completion of testing formalities test charge has been done on March 2017.

PROJECTS UNDER EXECUTION

1. Thankot – Chapagaon - Bhaktapur 132 kV Transmission Line

The project was started in 2055/056 with the objective of enhancing transmission capacity, improving supply reliability in Kathmandu Valley, reducing losses and voltage drops through construction of 132 kV ring main. The project cost estimated at US$ 23 Million and project is financed by GoN and NEA. Scope of Thankot-Chapagaon-Bhaktapur 132 kV Transmission Line Project includes construction of 28km 132 kV transmission line from Matatirtha (Thankot) to Bhakatpur, construction and upgrading of different substations at Kathmandu valley. Upgrading and construction of substations in Kathmandu valley

and transmission line portion within Kathmandu and Bhaktapur Districts has been completed.

However, construction of transmission line in Lalitpur district which was stopped due to protest of local inhabitants demanding 100% RoW compensation.

2. Kabeli 132kV Transmission Corridor

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

Cost of this project is estimated at US$ 31 Million and funded by WB, GoN, NEA. Project was started in 2008/09 and remaining works including second and third section of the 132kV double circuit transmission line construction from Illam to Fidim to Kabeli is in progress scheduled to be completed on Ashadh 2075.

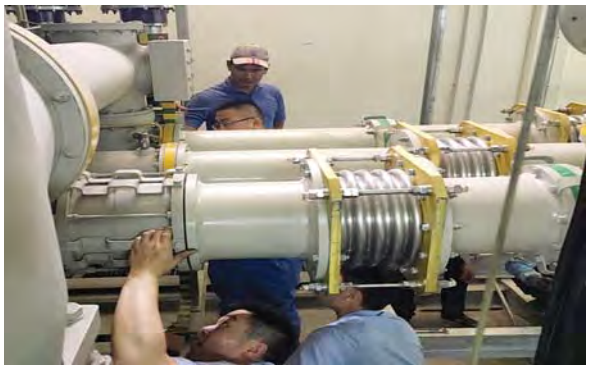
3. Singati-Lamosangu 132kV Transmission Corridor

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

As of Ashadh 2074, about 65% construction of Singati 132/33 kV substation is completed. Regarding transmission line construction preliminary works like Route alignment survey, Check Survey and Tower Spotting for transmission line has been completed, IEE study completed, Design of the Towers has been approved, Conductors and Hardware Fittings received at site for the Transmission Line Package. About 12 numbers of tower foundation has been completed.

4. Dumre – Damauli – Marsyangdi 132 kV Transmission Line

Objective of this project is to evacuate power generated by Middle Marshyangdi power plant, enhance the reliability of Middle Marshyangdi power plant and facilitate the power evacuation from candidate hydro power projects of Marshyangdi Corridor. Cost of this project is estimated to US$ 18.62 Million which is jointly funded by loan assistance of ADB, GoN and NEA. The project started in 2008/09 (2065/066) and estimated revised scheduled is on Asadh 2076. Scope of the project includes construction of 20km of double circuit transmission line from Dumre to Damauli, 1km four circuit loop-in loop-out transmission line at Middle Marshyangdi power plant, stringing



Installation of GIS at
Marsyandi Power Plant Switchyard

Constructoin of New Marsyandi 132/33 kV
Substation, Markichowk

of 39km of 132kV second circuit transmission line from Middle Marshyangdi to Dumre and construction of 132/33kV, 30MVA substation at Markichowk, bay estension at Damauli Substation and Middle Marsyandi Switchyard and GIS bay extension at Lower Marshyangdi Switchyard.

As of Ashadh 2074, Second Circuit stringing works is completed. Rest of the transmission line and substation construction work is in progress.

5. Rupani 132/33kV Substation Project

Objective of this project is to reinforce the power supply system in this region and for evacuating power to load center of Saptari District and certain part of Udaypur district. Cost of this project is estimated to US$ 3.5 Million and funded by GoN. Project is expected to be completed by December 2017. Scope of the project includes construction of Rupani 132/33 kV substation and reinforcement of existing 33 kV network of the area.

Substation Construction Work in Progress

As of Asadh 2074, control room construction, foundation work in the switchyard, erection of steel structure are almost completed and other civil construction works including staff quarter, store house, guard house are in progress.

6. Syaule 132/33kV Substation Project

Objective of this project is to reinforce the power supply system in this region and to support power evacuation from Chameliya HEP, with the aim of strengthening power system reliability and quality of supply in several districts of far western development region. Cost of this project is estimated to US$ 5.11 Million and funded by GoN. The project is initiated in 2070/071 (2013/014) and scheduled to be completed in Asadh 2075.

As of Asadh 2074, substation equipment's have been tested and are in process to arrive in site. Civil works of control room are in the final stage.

7. Kusma-Lower Modi 132kV Transmission Line Project

Objective of this project is to facilited power evacuation of the IPP's up coming in the Kaligandaki Corridor. The project is started in 2070/071 (2013/014) and expected to be completed on December 2017. Cost of this project is estimated to US$ 3.5 Million and funded by GoN. Scope of the project includes construction of 6.2 km 132kV single circuit transmission line from Kusma to Lower Modi HEP and + 132kV Bay extension at Lower Modi.

As of Asadh 2074, transmission line equipment's have been tested and are in process to arrive in site. About 56% of physical progress has been achieved upto the end of FY 073/74.

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

Objective of this project is to increase power transmission capacity to serve to the industries of the area. The project is started in 2072/073 (2015/016). The estimated cost of this project is NRs. 368 million and funded by GoN. Scope of the project includes replacement of ACSR 'WOLF' conductor used in existing double circuit 66 kV transmission line from Simra to Birgunj (22.2 km) via Parwanipur substation with high power carrying capacity high temperature low sag (HTLS) conductor.

As of Asadh 2074, preparation for the preliminary works like check survey for replacement has been completed. Engineering work is going on to check

whether proposed HTLS conductor can meet the requirement set in NEA.

9. Ramechap Garjyang Khimti 132kV Transmission Line Project

The objective of this project is to evacuate the power generated by various IPP's in the Garjyang Khimti corridor. This project started in FY 067/68.

Check Survey of transmission line

The estimated project cost is US$ 12 Million which is funded by the GoN. Construction of 30 MVA 132/33 kV substation at Garjyang and construction of 31 km, 132 kV double circuit transmission line from Garjyang to New Khimti are the scope of this project.

All the major legal approvals e.g. EIA, construction license etc. have been obtained. Contract Agreement have been signed for the Civil construction, Transmission Line and Substation construction. Land acquisition for the substation has been completed and the construction of boundary wall, store building, staff quarter, gabion wall etc. are going on.

10. Modi-Lekhnath 132 kV Transmission Line Project

Objective of this project is to increase power evacuation capacity of the IPP's up coming in the Modi and Madi Corridor. Scope of the project includes construction of 45km, 132kV Double Circuit Transmission Line from New Modi via Lahachwok Substation to Lekhnath Substation, Switching Substation at New Modi and 132/33kV new Substation at Lahachwok. Cost of this project is estimated to US$ 21.0 Million and jointly funded by Exim Bank of India and GoN.

As of Ashadh 2074, EIA has been approved. Contract Agreement have been signed for the civil construction work like boundary wall, guard quarter. Tender for construction of Transmission Line has been published. Substation tender yet to be called.

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

Objective of this project is to increase power evacuation capacity of the IPP's up coming in the Solu Corridor and expansion of INPS. Construction of 90km of Double Circuit Transmission Line with CARDINAL conductor from Tingla (Solu) substation to Mirchaiya and 132/33kV new Substation at Tingla is the main output of the project. Cost of this project is estimated to US$ 29 Million and jointly funded by Exim Bank of India and GoN.

As of Ashadh 2074, All the major legal approvals e.g. EIA, construction license etc. have been obtained. Contract Agreement have been signed for Civil construction, Transmission Line and Substation construction. Check survey is completed from the contractor, engineering design work is in progress.

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

Objective of this project is to increase power evacuation capacity of the IPP's up coming in the

Baglung area and extension of National Grid. The project is initiated in 2066/067 (2009/10). 1st section Motipur-Sindikharka is under execution. Cost of this project is estimated to US$ 22.24 Million and funded by GoN. Scope of the project includes construction of 84km 132kV double circuit transmission line for Motipur to Burtibang, five 132/33kV new substations at Burtibang, Paudi Amrai, Tamghash, Sandikharka and Motipur.

As of Asadh 2074, Detail survey and EIA have been completed. Contract for construction of

Compound Wall of Motipur Substation

Boundary wall at Sandhikharka substation has been done. Cost estimation for transmission line and substation construction work under 1st phase started.

13. Dordi Corridor 132 kV Transmission Line

Objective of this project is to increase power evacuation capacity of the IPP's up coming in the Dordi Corridor and reinforcement of National Grid. The project is initiated in 2067/068 (2010/11). Cost of this project is estimated to US$ 10.4 million which is funded by GoN. Scope of the project includes construction of 132kV double circuit 16 km transmission line from Kirtipur to Udipur and new 132/33kV substation at Kirtipur. As of Asadh 2074, Tender for construction of both substation and transmission line have been called and technical proposal evaluation process started.

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

Objective of this project is to reinforce the power supply system in Biratnagar Industrial Area, reinforcement of existing Rani and Tankisinwari Sub-stations, 33kV and 11 kV network of the area through New Biratnagar 132/33kV, 2*63MVA Substation. Scope of the project includes construction of 23km 132kV double circuit steel Monopole transmission line from Inaruwa 400/220/132kV substation to Ramganj Belgachiya and construction of New Biratnagar 132/33kV, 2*63MVA Substation.

Estimated Cost of this project is US$ 18.32 Million and funded by GoN. As of Asadh 2074, land acquisition for New Biratnagar Substation has been completed. Tender for Plant Design, Supply, Installation, Testing and Commissioning of 132/33kV, 2*63MVA Biratnagar Sub-station has been floated, IEE report of project has been approved from Ministry of Energy and estimates & tender document preparation for 23km 132kV double circuit transmission line at Steel Monopole is under progress.

15. Purbi Chitawan 132/33kV Substation

Objective of this project is to reinforce the power supply system in this region. The project is initiated in 2072/073 (2015/016). Cost of this project is estimated to US$ 4.0 Million and funded by GoN.

As of Asadh 2074, preparation of office estimate and tender document are in progress, land acquisition for the substation has been accomplished.

16. Butwal-Lumbini 132kV Substation

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

Compound Wall Foundation of Mainahiya Substation

As of Asadh 2074, Construction of Staff quarter and Compound Wall of Mainahiya Substation is in progress. Tender for substation construction work is in final stage, office estimate for transmission line is in progress.

17. Balefi-Barhabise Corridor 132kV Transmission Line Project

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

As of Asadh 2074, the land acquisition for the substation has been accomplished. Detail route survey work is completed. MoU has been signed for IEE study, preparation of office estimate and tender document is in progress.

PROJECTS FOR POWER SUPPLY TO CEMENT INDUSTRIES

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

1. Lamahi-Ghorahi 132kV Transmission Line

The objective of this project is to provide power supply to Ghorahi Cement Industry and Ghorahi Municipality. Cost of this project is estimated to US$ 6.5 Million and GoN through Ministry of Industry allocated budget for this work. The project is scheduled to be completed By Ashadh 2075. Project components includes construction of 15 km 132kV single circuit transmission line from existing Lamahi Substation to Laxmipur VDC Goglee and construction of 132/33 kV, 30 MVA substations at Laxmipur VDC Goglee.

2. Bardaghat- Sardi 132kV Transmission Line

The objective of this project is to provide power supply to Hongshi-Shivam Cement Industry. Cost of this project is estimated to US$ 4 Million and GoN through Ministry of Industry allocated budget for this work. Project components includes construction of 20 km 132kV double circuit transmission line from existing Bardaghat Substation to switchyard of Hongshi-Shivam Industry and construction of two 132 kV line bay at Bardaghat. As of Ashadh 2074, EIA for Transmission Line construction has been approved. Construction contract is about to be signed.

3. Sunuwal 132 kV Substation

The objective of this project is to provide power supply to proposed Palpa Cement Industry as well as existing Laxmi Steel Industry along with the reinforcement of existing 33 kV distribution network. Cost of this project is estimated to US$ 4 Million and GoN through Ministry of Industry allocated budget for this work. Project components includes construction of 63 MVA 132/33 kV substation near Sunuwal of existing Butwal-Bardaghat 132 kV transmission line. As of Ashadh 2074, IEE and Land Acquisition for substation is in progress.

MAJOR TRANSMISSION LINE PROJECTS 220 KV

Projects under Execution

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

The project was started in 2059/60 with the objective of enhancing transmission capacity, improving supply reliability, reducing losses and voltage drops through construction of 220kV double circuit line. The project cost is estimated at US$ 6 million and is jointly funded by World Bank, GoN and NEA.

Khimti-Dhalkebar 220kV Second Ckt.
Stringing works in progress

The scope of the project includes construction of second circuit 75 km long Khimti-Dhalkebar 220kV transmission line on same double circuit tower with twin Bison ACSR conductor.

2. Hetauda - Bharatpur 220 kV Transmission Line

The objective of the project is to enhance the transmission capacity and reliability of the National Grid, to evacuate the power to be generated by other hydro power plants from western region of Nepal. Cost of this project is estimated to US$ 24.25 Million and funded jointly by loan assistance of WB, GoN and NEA. The project is started in 2009.

Construction of about 75 km long double circuit Hetauda-Bharatpur transmission line initially to be string single circuit 220kV transmission line and associated 132kV substations are being taken.

As of Ashadh 2074, Acquiring Land for Tower Foundation is in final stage, RoW Clearance work is in progress. Earth Wire, OPGW cable, ACSR BISON conductor, Insulators, Hardware Fittings and partially Tower accessories received at site, out of 226 towers 137 Tower Foundations and 95 Tower Erection works are completed on Transmission Line Construction side.

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

3. Bharatpur - Bardghat 220kV Transmission Line

The objective of the project is to enhance the transmission capacity and reliability of the Integrated Nepal Power System (INPS), to evacuate the power to be generated by other hydro power plants from western region of Nepal. Cost of this project is estimated to US$ 17 Million and funded jointly by loan assistance of WB, GoN and NEA. The project is started in 2009 and scheduled to be completed by June 2018.

The project comprises of construction of approx. 74 km long double circuit 220 kV line connecting New-Bharatpur substation (under construction) and existing Bardaghat substation using ACSR "Bison" duplex conductors. 220 kV lines shall be initially energized at 132 kV.

As of Ashadh 2074, 98 % of the transmission line construction materials have been received at site,

Bharatpur-Bardghat 220kV Transmission Line Project Tower Erection work is in Progress

Bardghat-Bharatpur 220 kV Transmission line Project Nursery Bed required replacing the trees.

out of 28000 trees only 6856 trees has been cut out. Out of 246 towers 70 Tower Foundations and 70 Tower Erection works are completed, 97000 trees has been planted on 61 hector land. Price fixation for 52 tower pads from compensation committee has been completed. Construction contract with contractor CCPG, China has been terminated due to unsatisfactory construction work. Preparation is going on for new contract.

4. Chilime-Trishuli 220 kV Transmission Line

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

Scope of the project includes construction of 220kV double circuit 26.5 km transmission line from Chilime Hub Substation to Trishuli 3B Hub substation and a 220/132kV a new GIS substation at Chilime.

As of Ashadh 2074, final IEE Study report submitted by Environment and Social Study Department has been approved by DoED, detail Survey work for 220kV Voltage Level is completed by Project Development Department, NEA, Feasibility Study for 220 kV transmission line and Chilime Hub substation has been completed by M/S Lahmeyer International. Other Environmental studies such as Land Acquisition Compensation Plan (LACP), Stakeholders Engagement Plan (SEP), IEE Gap Analysis, Environment and Social Management Plan (ESMP) has been completed as per the requirements of funding agencies KfW Development Bank and European Investment Bank(EIB). Financing agreement with both KfW and EIB has been concluded. Similarly, Transmission license has been obtained from DoED, Ministry of Energy for construction of line and substation. Moreover, agreement has been signed with the Consultant Power Grid Corporation of India for the design and construction supervision consultancy services.

Chilime Hub Sub Station Site

Tender has been called for the construction of Chilime-Trisuli 220 kV transmission line and 220/132 kV substation at Chilime. Reaching to

the final stage of the bid evaluation process the major achievement of the fiscal year. Contract within 18 months is expected to be signed during August 2017 and project shall be completed.

5. Trishuli 3B 220 kV HUB Substation

Objective of this project is to facilitate power evacuation capacity of the IPP's generations up-coming in the Trishuli area with expansion the existing grid. Cost of this project is estimated to US$ 22.9 Million and jointly funded by German Development Bank (KfW) with European Investment Bank (EIB) and GoN.

As of Asadh 2074, various studies like feasibility study, SEP, IEE, ESIA & LACP have been completed and contract for social and environmental monitoring have been finalized with ESSD, NEA. Civil construction of staff quarter and boundary wall have been completed in the acquired land at Manakana, Nuwakot. Reaching to the final stage of the bid evaluation process for the construction of 220kV Trishuli 3B Hub Substation is the major achievement of this fiscal year. Contract is expected to be signed during August, 2017 and project shall be completed within 18 months period from the effective date of contract. POWERGRID of India was appointed as the Consultant for the Design and supervision of the project.

6. Tamakoshi -Kathmandu 220/400 kV Transmission Line

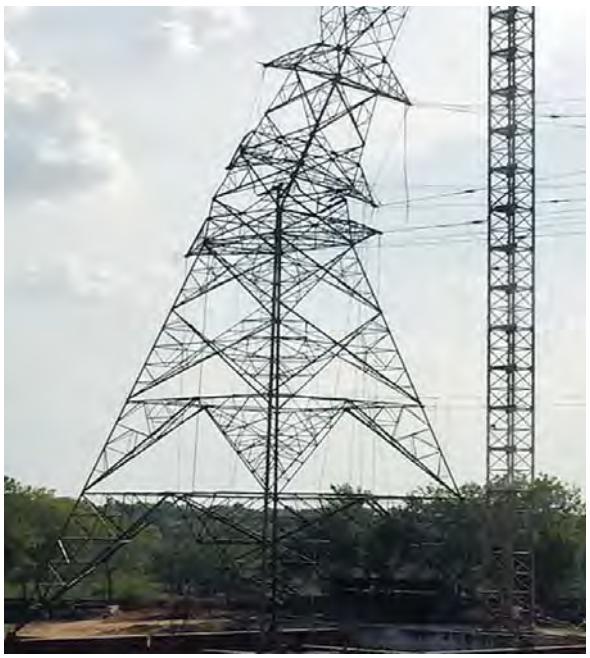
Objective of this project is to evacuate power from generating power stations upcoming in the Khimti (Tamakoshi)-Kathmandu area. Project will construct 90 km Double Circuit 400kV Transmission Line (initially charged at 220kV), 14 km Double Circuit 132kV Transmission Line, 220/132 kV GIS substation at Barhabise and 220 kV line bay extension at New Khimti. Cost of this project is estimated to be US$ 70 Million and jointly funded by ADB and GoN.

As of Ashadh 2074, detailed survey from Tamakoshi (New Khimti) to Lapsiphedi (Kathmandu) 400kV line and Lapsiphedi to Duwakot (Bhaktapur) 132kV line has been completed and IEE has been approved. Power Grid India has been appointed as Construction/Design Supervision Consultant. The Project has signed Contract Agreement with (i) The JV of Guangxi Transmission & Substation Construction Co. and Shenzhen Clou Electronics Co. Ltd, China for construction of New Khimti-Barhabise 400kV Transmission Line and (ii) Larsen and Toubro Ltd, India for Barhabise-Kathmandu 400kV and 132 kV Transmission Line. IFB has been published for procurement of Plant for GIS 220 kV Barhabise substation on 26 May 2017. Land acquisition for substations at Barhabise and Changunarayan is in final stage.

7. Koshi 220 kV Transmission Corridor

Objective of this project is to increase power evacuation capacity of upcoming HEPs in the Koshi and Mechi zone of Nepal. Followings are the main components of the project.

Package-KC1: Construction of 107 km of 220kV Double Circuit Transmission Line from Inaruwa-Basantapur- Baneshwar- Tumlingtar.(Inaruwa-Basantapur Double Circuit Vertical Configuration



Koshi Corridor Twin Moose DB(t) Tower destruction test at KPTL's Test bed, Gujarat, India

Galvanized Steel Towers with twin peak, initially only one Circuit will be strung with Quad Moose ACSR conductor with single Peak i.e. OPGW and Basantapur-Baneshwar-Tumlingtar Double Circuit Vertical Configuration Galvanized Steel Towers with twin peak, initially only one Circuit will be strung with Twin Moose ACSR conductor with single Peak i.e. OPGW).

Package-KC2: Construction of 220/132/33kV Substation at Basantapur and Tumlingtar, Construction of 220/33kV substation at Baneshwar and 2 Nos. of Bays Extension at Inaruwa substation.

Package-KC3: Construction of about 33km of 220kV double circuit Transmission Line from Basantapur to Dhungesangu, Taplejung (Vertical Configuration Galvanized Steel Towers with twin peak, initially only one circuit will be strung with twin moose ACSR conductor with single Peak, i.e OPGW) and construction of 132/33kV Substation at Dhungesangu.

Cost of this project is estimated to US$ 112.0 Million and jointly funded by Exim Bank of India and GoN. 90 MUSD has been set aside for this project out of 250 MUSD Line credit Agreement (21st October, 2011) between government of Nepal and Exim Bank of India. The Project is expected to be completed by July 2020. WAPCOS Ltd, India has been appointed as the PMC of the Project.

Contract between NEA and M/s Kalpataru Power Transmission Limited, India has been signed for the execution of Package-KC1 of the project and the Contract has become effective from 14th June, 2016. Design/Engineering and Detailed survey, Check survey & Tree Enumeration has been completed and Cadastral survey is under process upto date. 75% Design and Engineering works has been completed till date. Construction work is expected to be started in August 2017. Package-KC2 and Package-KC3 are under bidding Process.

8. Lekhnath-Damauli 220kV Transmission Line

Objective of this project is to increase power evacuation capacity of the IPP's upcoming in the Western basin and reinforcement of INPS. Cost of this project is estimated to US$ 40 Million and funded by Gernam Cooperation (kfw) and GoN. Scope of the project includes construction of 220kV, 40 km double circuit transmission line from New Lekhnath to New Damauli and 220/132/11kV substations at New Lekhnath and New Damauli.

As of Asadh 2074, detailed survey had been completed and IEE is at last stage. The land acquisition for the substation is under progress. Technical Team from kfw is conducting the feasibility study of the line and substation.

220/132 kV Transmission Line
Projects under Feasibility Study

1. Trishuli 3B HUB- Jharlyang- Malekhu 220 kV Transmission Line
2. Dadakhet-Rahughat 132 kV Transmission Line
3. Dhalkebar-Loharpatti 132 kV Transmission Line
4. Surkhet-Dailekh- Kalikot- Jumla 132 kV Transmission Line
5. Ghorahi-Madichaur (Khumdi) 132 kV Transmission Line
6. Nawalpur 132 kV Substation Project

IV. MAJOR TRANSMISSION LINE PROJECTS 400KV

Projects under Execution

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

Nepal-India Electricity Transmission and Trade Project (NIETTP) funded by World Bank was started with the objective of establishing cross-border transmission capacity of about 1,000 MW

Under construction Dhalkebar Substation

to facilitate electricity trade between India and Nepal; and to meet the increasing demand of electricity in Nepal by the sustainable import of electricity.

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

Out of 792 tower pads, 513 foundation & 423 erection works have been completed so far. The parts remaining mostly fall in the forest area and the process of tree- felling and stacking along the right-of-way of the route is under process in different districts.

Dhalkebar substation, which is now at high priority of Government of Nepal is the pulling station for the Dhalkebar Muzzaffapur 400 kV Cross Border Line between Nepal and India and it is a major hub for the exchange of power in Integrated Nepal Power System. Around 90 percent of the civil works of this substation has been completed so far while installation of electrical and control equipment is underway. The targeted completion date of this substation is October 2017.

2. Bheri Corridor 400 kV Transmission Line

Objective of this project is to evacuate power of the Uttarganga Hydro Project as well as IPP's upcoming in the Bheri river basin. Government of Nepal is funding for this project currently. Scope of the project includes construction of 400kV, 20 km double circuit transmission line from Uttarganga HUB to Nalsyangadh Hydropower project switchyard and 400 kV substations at Uttarganga Hub for the pulling of power from IPP's in 1st phase.

As of Asadh 2074, detailed survey has been started and land acquisition for the substation is under progress.

Projects under Feasibility Study

1. Rupalgadh- West Seti- Pahalwanpur 400kV Transmission Line
2. Rasuwagadhi- Chilime HUB- Ratmate 400kV Transmission Line

DISTRIBUTION AND CONSUMER SERVICES DIRECTORATE

Distribution and Consumer Service Directorate (DCSD) as a service provider to the nation, the key responsibility of the (DCSD) is to provide safe, reliable and quality electricity at an affordable price. DCSD is accountable for overall management of electricity distribution services and networks of NEA including planning, expansion, operation, maintenance and rehabilitation of the electricity distribution networks including substations up to 33 kV voltage level and consumer services activities such as new consumer connections, meter reading, billing, revenue collection, customer grievance handling and so forth. DCSD has introduced some of the smart meter reading, GIS (Geographical Information System) technologies as a pilot projects in the Kathmandu valley with plans to introduce even better technologies and expand them in the entire areas. Implementation of a Common Revenue Billing System (M-power) in 128 Revenue Collection Centers (in operation) has helped NEA for improved Billing and Revenue collection processes in a modern efficient and cost effective manner. DCSD is also involved in encouraging and supporting energy saving activities and Demand Side Management for the optimal use of electricity. The operation and maintenance of off grid small hydro power plants also falls under the jurisdiction of this directorate. DCSD is headed by the Deputy Managing Director (Level 12) and is organized into six departments at Corporate Level namely Planning & Technical Service Department, Community & Rural Electrification Department, Monitoring & MIS Section, Material Management Division, Finance Division and Administration Division. These Departments and Divisions are responsible for carrying out planning and preparation of distribution system expansion programs, preparing and monitoring of rural electrification programs, preparing yearly O &M and capital budget, procurement activities, planning and managing human resources respectively. Under the directorate there are Eight Regional Offices each headed by a Directors/ Chiefs to manage the overall distribution and consumer services activities in more effective and efficient manner.

DCSD is the largest directorate of NEA in terms of number of employees and business activities. Approximately 74% of the total staffs of NEA are employed in DCSD. This is also on the forefront to earn revenue for sustaining operation, maintenance and development activities of NEA. DCSD is providing services to consumers through its 102 Distribution Centers spread over the whole country.

Performance Highlights

In FY 2016/17, total number of consumers under DCSD reached 32,57,812 an increase of 8.85% over the last fiscal year's figure.

Customer Category	No of consumer (% of total consumers)	Sales %	Revenue %
Domestic	93.96	45.08	42.04
Non-Commercial	0.59	3.37	5.42
Commercial	0.58	7.36	10.78
Industrial	1.42	36.48	35.35
Others	3.45	7.71	6.41

Similarly, in FY 2016/17, a total of 4,764.678 GWh of energy was sold earning gross revenue of

Rs. 47,065.57 Million. Industrial and Commercial consumer categories combined together represent only 2.00% of the total number of consumers but shared 43.84% of total sales. Similarly, the domestic consumer category represents 93.96% of total consumers and contributed 45.08% to the total sale.

Programs and Activities

As part of reinforcement and expansion of the distribution systems, many programs, projects and the activities are undertaken in FY 2016/17 to expand and improve the service delivery. These programs and activities are executed by the Departments at center and Regional Offices. DCSD took special drives to expedite the activities for loss reduction, metering & billing and decreasing amount receivables from black listed consumers. During the FY 2016/17, a total of 43,202 numbers of consumer lines were disconnected from which Rs 615.46 (millions) was recovered. Similarly legal action was taken against 32,962 consumers for electricity pilferage and Rs 25.31 (millions) was recovered from it. The goods on stock were closely monitored which resulted in substantial decrease in the stock material/amount.

Safety Day:

Safety is one of the aspects where DCSD is entrusting major priority. In this regard, not only the NEA employees, public awareness is also important. For this the directorate is giving priority for awareness for electrical safety, right from the implementation of the Project till completion. Every year on 26th Chaitra NEA organizes awareness program to mark "Electricity Safety Day". NEA in collaboration with Society of Electrical Engineers (SEEN) conducted people awareness campaign towards electrical safety on April 7, 2017. Similarly, various programs and activities under DCSD were executed by the various Departments at Center and Regional Offices on the same day.

Loss Reduction Activities

The Problem of "Distribution Losses" was addressed by mainly two separate ways : Reduction of Non-Technical losses and Reduction of Technical Losses. In FY 2016/17, special efforts were taken to reduce the technical and non-technical losses. Loss Controlling Committee at the center level issued directives to the concerned offices to improve the loss situation. Regional Offices were assigned loss targets to achieve within the prescribed time frame. This was also linked with the performance of concerned distribution center chief and a significant loss reduction was observed in many areas. During the year reviews following steps were taken to reduce the technical and non-technical losses.

'Electricity Safety Day' awareness program conducted by NEA Central Office

- Continuous loss reduction program is carried for hooking control. A team is deputed for meter resealing and instant inspection of meter.
- Regular monitoring, data downloading and analysis of the large industrial and commercial consumers were augmented.
- Replacement of electromechanical meters with programmable meters and replacement of unmatched current transformers to eliminate possible errors in multiplying factors.
- Various public awareness advertisement were made by the central as well as regional level through various media on the proper use of electrical appliances , use of energy efficient lamps, awareness for electricity theft etc.
- Handheld Meter Reading Device (HHD) also in operation has helped reduce human errors during meter reading and improve the energy sales consumption ratio.
- The special effort of employees and the support from local administration for investigation on meter tampering and action was taken for electricity pilferage.
- Replacement of bare conductor with Ariel Bundled Conductor (ABC) cable in loss prone areas.
- Upgrading of overloaded conductors and transformers were also carried out to reduce the technical losses
- As per NEA decision, the electromechanical meters of the consumers of capacity 25-50 kVA range continued to be replaced with electronic (TOD) meters

Despite the adverse working conditions at local levels especially in terai and some hilly areas, continued efforts and measures taken to control losses brought fruitful results by bringing down the distribution system losses to 16.83% in this Fiscal Year.

Demand Side Management

The electricity supply-demand gap in the country is increasing rapidly as a result of the fast growing demand for electricity to meet economic growth, increasing urbanization, electrification, generation capacity deficits, high costs of new generation capacity, and fuel supply issues. In order to assist NEA in resolving the existing energy crisis, an awareness campaign on the efficient use of electricity using more efficient LED lights instead of conventional, energy-intensive Incandescent lamps and CFL lamps. The advertisement was made in different electronic media as well as in the news papers and hording board display.

Future Plans and Programs

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

Planning and Technical Services Department

The Planning and Technical Services Department (PTSD) is the main wing of DCSD, primarily responsible for planning and preparation of distribution system expansion programs and

supporting DCSD in the technical and commercial matters. Major works under this department include-

- Identification of potential rural electrification and substation rehabilitation projects and implement them
- Programming/re-programming, data download and analysis of TOD energy meters & metering equipments
- Monitoring and evaluation of region wise monthly distribution system losses. Assist to identify and implement programs for loss reduction in distribution systems
- Initiate modern facilities for the electricity consumers in the field of meter reading, billing and revenue collection
- Plans to execute distribution planning incorporating demand side management and loss reduction as an integral part of it
- Preparing and updating the construction standards and guidelines and guidelines for implementation of electrical installations and construction activities up to 33KV and below.

One hundred Twenty Eight collection centers have computerized billing system till date and plans are to extend it to all with modern facilities in the coming years. The Computerized Billing Division under PTSD has successfully completed the entire distribution centers within Kathmandu valley with 'Any Branch Payment System'.

PTSD has recommended to approve Rs 68 million for 99 consumers in connection with the reconciled billings forwarded by different distribution centers.

Energy Monitoring and Auditing of Distribution Substations

Under the program, static energy meters were installed at distribution substations to measure the amount of energy delivered by the substations enhancing the energy accountability. The Planning and Technical Services Department co-operated with Grid Operation Department to install ToD meters in various grid substations. The static meters installed at different substations were downloaded to check and verify the data. The program for installation of Bulk Supply Meters and the Metering Unit was also continued in FY 2016/17. The energy monitoring and audit was also augmented verifying the data with concerned transmission grid and generation units.

Project Highlights

1. Energy Access and Efficiency Improvement Project

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

Project for Energy Efficiency through Loss Reduction

This project has been started with the objective of reducing technical losses in the distribution networks of Kathmandu valley and Birgunj Simara corridor. This project is jointly financed by Asian Development Bank (ADB), GoN and NEA. The project has identified 27 distribution feeders with unacceptable high loss in Kathmandu valley and Birgunj where rehabilitation is required. The scope of this project includes up gradation of 462 Nos. of Distribution Transformers (100, 200 and 300 kVA), replacement of 214 Km of overhead 11 kV undersized ACSR conductor with 120 sq.mm. XLPE Covered Conductor, use of 35 Km of 300 sq. mm. 11 kV Underground Power Cable and 401 Km of 95 sq. mm. LV ABC Cable.

The major line materials through three different packages such as (i) Supply and Delivery of Distribution Transformer, Contract No: DSRLRP-068/69-01 (Package D1) for 462 Nos. distribution transformers, (ii) Supply and Delivery of HV Covered Conductors, LV ABC Cables and UG Cables with Accessories, Contract No: DSRLRP-068/069-02 (Package D2) for 214 km CC, 35 km XLPE Power cable and 401 km LV ABC Cable and

(iii) Supply and Delivery of Various Line Materials and Installation of Lines, Contract No: DSRLRP-068/69-03 (Package D3) for various line materials were received and contract completed. The installation of 462 Nos. distribution transformers (100, 200 and 300 kVA), replacement of 214 km XLPE covered conductor, installation of 15.30 km 11 kV XLPE Underground Power Cable and Stringing of 343 km XLPE LV ABC Cable is completed. Line testing and charging works in some places of Kathmandu Valley and Birgunj is underway. The total overall progress of the project is ninety seven percent (97 %). The funding source from Asian Development Bank (ADB) for this component is already completed. From Fiscal Year 2017/2018, Government of Nepal and Nepal Electricity Authority is jointly funding for this project for remaining works. All the documentation works, capitalization and asset transfer work for the project is scheduled to be completed by end of FY 2017/18.

Distribution System Augmentation Project

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

i) Construction of new 33/11 kV, 6/8 MVA substation at Baniyani, Mirchaiya, Dhanushadham, Paraul, Barhathawa, Banskot, Kushma, Mainapokhar and 11 kV switching station in Mirmi, Swoyambhu & Mulpani; and

(ii) Construction of 95 km of 33 kV and 156 km of 11 kV lines in the vicinity of substation area.

Out of these substations Baniyani, Mirchaiya, Dhanushadham, Paraul, Barhathawa, Banskot, Kushma, Mainapokhar and 11 kV switching station in Swoyambhu & Mulpani; has been already commissioned. The remaining 11 kV switching station in Mirmi shall be commissioned soon.

Grid Solar Energy and Energy Efficiency Project (GSEEP)

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 And Component 2: Distribution System Planning and Loss Reduction with an estimated cost of 80 million USD dealing with the Rural Electrification in three(3) packages along with Distribution Business Management, Implementation of Loss Reduction and Distribution System Rehabilitation.

Expanded Electricity Distribution Project

This is one of the components of Electricity Transmission Expansion and Supply Improvement Project financed by ADB under Loan No. 2808-NEP (SF).The scope of project which is divided into three lots comprising of up-gradation of substations at Gaur, Nijgarh, Chandragadhi, Jare, Belbari, Jaleshwor & Bolo-Damak (Lot-1) Parasi, Gorkha, Krishnanagar, Tauliahwa, Amuwa, Gaddhachauki & Mirmi (Lot-2)and Lot-3 is development of 11 & 0.4 kV network in the affected area along the proposed Tamakoshi-Kathmandu 400 kV Transmission Line. The total cost of this project is USD 9.5 Million. All the works under Lot-1 is completed. All the works under Lot-2 except up-gradation of substations at Mirmi is remaining. The total progress of the project under Lot 3 is 80% and expected to be completed by FY 2017-18.

2. Computerized Billing and Networking Division

Implementation of a Common Revenue Billing System (M-power) in 128 Revenue Collection Centers (in operation) has helped NEA for improved Billing and Revenue collection processes in a modern efficient and cost effective manner. M-power Billing System has provided NEA with a wider and more sophisticated array of functions and features that would enhance the billing efficiency and provide greater visibility into the entire process chain. Handheld Meter Reading Device (HHD) also in operation has helped reduce human errors during meter reading and improve the energy sales consumption ratio. M-power Billing System covers 92% of the total consumers count and covers 94% of the total NEA revenue.

This Division has targeted the data migration/ Implementation (Completion) of M-power Billing System in all the remaining Revenue Collection Centers of NEA within this Fiscal Year.

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

Third party payment (Bank/other third parties) has already started in some of the Revenue Collection Centers. The division has plans to extend the third party payment system in more revenue collection centers. This system will be focused for urban/ rural consumers where the consumer can pay their billing through various services (counter/ mobile app/online/SMS etc.) and save time.

Computerized Billing and Network Division Targets to Centralized 20 revenue collection centers (inside and outside Kathmandu valley) as a pilot system which will:

- Help in the facilitation of uniform reporting formats across NEA for quickly responding to regulatory requirements.
- Present a real time view of statistical data facilitating easy and quick decision making for Senior and Top Management users through executive dashboards.
- Present a Centralized monitoring of the entire utility using the Business Intelligence & Analytics and Dash Boards as the dash boards show the real time information on operational & revenue activities.
- Implement Third Party Payments where the consumers can pay their bills real time.
- Web based services to the consumers (view the bills) and Interactive Voice response System where the consumer can query the bills through phone lines.
- Introduce “informative mobile App” where the consumer can get information about the dues and other information regarding NEA.
- Introduce automated “Compliant Management System” which would ease the organized compliant registration and speed up the response.

The Customer Management Information System (Lagat) has been implemented in various revenue collection centers which will help in keeping the consumer database up to date.

Customized training programs were conducted to NEA staff that has been operating with the billing system. In coordination with NEA Training Center, the division plans to conduct more training programs to enhance the skill and knowledge of these staff for smooth operation of the Mpower Billing System.

3. Matatirtha Naubise 33 kV Transmission Line Project

This project aims at supplying power to United Cement Industry Pvt. Ltd. in Naubise, Dhading and existing NEA consumers in its vicinity. The project

will help to improve the quality of supply and reduce the technical losses of the area also. The scope of the project includes the construction of 33/11 kV, 2*6/8 MVA substations along with double circuit 13 km 33 kV line. The project was started in FY 2009/10 with funds from infrastructure development program of Ministry of Industry, GoN. Construction of Naubise substation is completed and substation is charged from Dhadhing Feeder. Polling work of 33 kV Matatirtha, Naubise transmission line is done. Line construction work had been obstructed at different location by local community. Most of the local community issues have been sorted out by addressing some issues related with electricity supply, transformer, poles, etc. IEE report had been approved and counting & marking of trees within the right of way of 33 kV transmission line is going on. About 80% of the transmission line construction work is completed and remaining work is in rapid progress. The work is scheduled to be completed within FY 2074/75.

Under construction under ground cable laying work

4. Matatirtha Malta 33 kV Transmission Line Project

This project aims at supplying power to Laxmi Cement Industry Pvt.Ltd. in Malta, Lalitpur and evacuation of power produced by Pashupati Energy Pvt. Ltd. (6MW) and suply existing NEA consumers in its vicinity. The project will help to improve the quality of supply and reduce the technical loses of the area also. The scope of the project includes the construction of 33/11 kV, 10/13.3/16.6 MVA substation along with double circuit 35 km 33 kV line. The project was started in FY 2009/10 with funds from infrastructure development program of Ministry of Industry, GoN Here, civil and electrical work of Malta substation is completed and the substation is in operation charged with Khani khola hydropower feeder. Construction of 33 kV line from Matatirtha to Malta is in progress. Line construction work had been obstructed at different location by local community. Most of the local community issues have been sorted out by addressing some issues related with electricity supply, transformer, poles, etc. IEE report had been approved and counting & marking of trees within the right of way of 33 kV transmission line is going on. About 65% of the transmission line construction work is completed and remaining work is scheduled is to be completed within FY 2074/75.

5. Matatirtha Markhu 33 kV Transmission Line Project

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

33 kV Bay extension work at Matatirtha Substation

has been also completed. Transmission line construction work is in progress. The project was started in FY 2010/11 with funds from GoN and is expected to complete in FY 2017/18.

6. Distribution System Augmentation Project

This project is jointly financed by GoN and NEA. The scope of the project includes:

Rehabilitation of 33/11 KV Substation in Milanchowk (Butwal), Arghakachi, Dhankuta, Tulsipur, Devighat, Nepaljung, Balardaha (Rajbiraj), Yadukuwa (Janakpur), Malangwa and Sitalnagar Butwal.

Contract has already been awarded and this work is scheduled to be completed with FY 2017/18.

7. 33/11 KV Substation Rehabilitation Work

The Capacity of nine, 33/11kV Sub-stations shall be upgraded with 9x6/8 MVA power transformers and the old eight power transformers shall be upgraded to higher capacity. Funding of this work is bear by NEA itself. This work is scheduled to be completed with FY 2017/18.

8. Buipa-Okhaldhunga 33 kV Transmission Line Project

The scope of this project includes the construction of 32.5 km of 33kV transmission line, 80 km of 11kV and 80 km of LV distribution line and two 33/11kV, 1.5MVA substations one each at Okhaldhunga and Khotang districts. Substation construction work at Okhaldhunga S/S has been completed only substation testing and commissioning part is remaining. Construction of 32.5 km of 33kV line, 69.79km of 11kV line, 31.5 km of LV distribution line and installation & charging of 25 nos. of Transformers have been completed. Buipa-Lamidanda-Bhadaure parallel 11kV line construction has been completed. Buipa-Bakshila 11kV line construction has been completed & Bakshila, one of the remote VDC of Northern regions of Khotang has been electrified.

Jaljale-Buipa 33kV line (69km), constructed by the then Jaljale-Diktel 33kV line project, which is the only source line for this project, had been charging at 11kV. So, parallel new 11kV line was constructed & freed this line. Necessary maintenance of this Jaljale-Buipa 33kV line was completed & successfully charged at 33kV voltage level, first time after its completion on 2000 A.D. And, 33/11kV, 1.5 MVA Buipa Substation is charged after long time of its completion. Now, Khotang & Okhaldhunga districts have been

connected to central grid system of Nepal. Supply of line from 3 new 11kV feeders of newly charged Buipa Substation has solved the voltage drop problems & improved the quality of electricity in Khotang & Okhaldhunga districts. The project is expected to complete in FY 2017/18.

9. Rasuwaghat-Khotang S/S and RE Project

Major works to be performed under this Project include the construction of 14km of 33kV transmission line, 33/11kV, 1x3 MVA capacity substation at Rasuwaghat (Bagedhunga) of Khotang district, 90km of 11kV and 90 km of LV distribution line in Khotang and Udaypur district. Out of these, 10 km of 33kV transmission line, 37.2km of 11kV line and 33km of LV distribution line construction have been completed and 11nos. of distribution transformer have been installed & charged.

Store cum Quarter building has been constructed in Bagedhunga, Khotang. After charging of 5km long parallel 11kV line, Rasuwaghat-Bagedhunga 33kV line was freed and charged at 33kV level.

The 33/11kV, 750kVA transformer has been charged in Bagedhunga. Also, 33kV Bay extension at Jaljale substation has been completed & now put into operation. Construction of 33/11kV 3 MVA Bagedhunga substation is in progress.

10. Chautara-Sindhupalchok 33 kV substation Project

The project funded by GoN aims to meet the growing demand of electricity in Chautara area of Sindhupalchok District and its vicinity. The scope of the project includes the construction of 33/11 kV, 6/8 MVA Substation with interconnection facilities. The construction of 33 kV line from Lamosanghu to Chautara is about to complete. Substation Civil construction works is on the way. Major Electrical equipments have been manufactured and Inspection and Testing works are on the way. The project is scheduled to complete in FY 2018/19.

11. Transformer Testing Lab Construction Project

The aim of this project is to construct the Transformer Testing Lab at Biratnagar, Butwal and Nepalgunj. With the construction of the project, Various Routine Test of Power Transformer upto 16 MVA and Distribution Transformer of various rating under the corresponding regional offices will be available. Also, maintenance facilities for Distribution Transformer will be provided there. Civil Construction works of Transformer Workshop Building at different regional offices are on the way. Also, Tender has been floated for supply of Electrical Equipment & Installation works for Transformer Testing Lab. The project is scheduled to complete in FY 2018/19.

12. Madankudari-Makaibari-Singati 33 kV line Project

The project funded by GoN aims to meet the growing demand of electricity in Madan Kudari-Majhifeda area of Kavre District and its vicinity. The scope of the project includes the construction of 33/11 kV, 6/8 MVA Substation with interconnection facilities. The land acquisition process has completed recently. The tendering process for 33 kV line and Substation are ongoing in progress. The Project is scheduled to complete in FY 2019/20.

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

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

Madi area of Chitwan District has been completed and successfully charged on Baisakh 30, 2073.

14. Parsa 33 KV Sub-Station Project

The project funded by GoN aims to meet the growing demand of electricity in Parsa and its vicinity. The scope of the project includes the construction of 33/11 kV, 6/8 MVA Substation with interconnection facilities. About 90% of the substation construction work is completed and remaining work is scheduled is to be completed within FY 2017/18.

15. Rasuwa Nuwakot Distribution System Reconstruction Project (KfW Grant Project)

Neighborhood Electrification Component

The Project concerns the construction of the 220 kV Chilime-Trishuli Transmission System ("Portion I") as well as a Neighbourhood Electrification Component ("NEC") ("Portion II"). The purpose of the Project is to expand and improve the grid infrastructure for the efficient evacuation of electricity from hydropower to the Integrated Nepalese Power System and to contribute thereby to an increased power supply and to a reduction in transmission losses and in CO2 emissions. In addition, the project aims at reliable distribution of power evacuated through the Trishuli-Chilime transmission line and upstream hydropower projects to new customers in some specific locations in the vicinity of the transmission line. This is to contribute to sustainable economic and social development in Nepal and to improve living conditions by providing access to a reliable, sustainable and climate-friendly power supply, and contribute to poverty reduction and the fight against climate change.

The design of the Project is based on the Feasibility Study "FS 220 kV Transmission System Project" by Lahmeyer International GmbH dated July 2014 available to KfW and the Project-Executing Agency and on the agreements made between KfW and the Recipient and the Project-Executing Agency during the local Project appraisal: Minutes of Meeting dated December 17, 2014. The Portion II (NEC) related to the neighbourhood electrification in Salme, Valche and Kaule VDC and further measures benefitting the population in the vicinity of the transmission line. The project includes consulting services during project implementation for design, procurement and supervision.

The scope of work has been prepared based on the requirement of the project and the data collected through various resources and field visit from consultant. It includes construction of 6/8 MVA, 33/11 kV substation at Bhalche of Nuwakot district, construction of 12 km 33 kV line from Trishuli 3B Hub substation to Bhalche substation, construction of 50 km of 11 kV & 50 km of 0.4 kV lines using covered conductor & ABC cable and installation of 30 Nos. of distribution transformers in the vicinity of the 220 kV Chilime-Trishuli Transmission line corridor. The selection of contractor for Design, Supply and Installation of Neighborhood Electrification works consisting of 33/11kV New Substations and associated 33kV, 11kV & 0.4kV Lines is under process.

Reconstruction and Improvement of Electricity Distribution System

The project "Reconstruction and improvement of electricity distribution in earthquake affected districts" contributes to enhance the situation of the earthquake affected population in Rasuwa and Nuwakot by enabling them to satisfy their basic needs. It aims at improving the access to electricity in the respective districts by rehabilitating and improving the electricity distribution infrastructure after the earthquake in April 2015. The project comprises the financing of immediate relief measures with respect to the distribution network and short to medium term electrification measures as well as related project measures that will be identified in the further development of the project.

The envisaged scope of the project consists of two components:

Relief component: KfW agreed with the proposal of NEA to finance immediate activities such as the replacement of overloaded transformers as "immediate relief measures". The selection of contractor for immediate relief measures is under process.

Electrification component: The electrification measures will comprise the construction and reconstruction of several medium and low voltage distribution lines, the construction of small substations, the instalment of distribution transformers and other related project measures that will be identified during the design of the final project measures. The final design of the electrification component and the selection of project measures will lie within the responsibility of the implementation consultant in consultation with NEA and the target group.

KfW emphasized that the set-up of more detailed and quantified indicators for measuring the project's output and outcome will be required at latest after the formulation of the detailed design by the Implementation Consultant. The selection procedure for consulting services to be provided is under process.

16. Smart Metering Smart Grid Project

This project is funded by the Govt. of Nepal (GoN) in F.Y.2016/17. The scope of the project includes:

Phase 1: to implement Automatic Meter Reading (AMR) System with implementing Automatic Metering Infrastructure (AMI) application in existing TOD meters.

Phase 2: to implement three phase whole current meter with Smart Three phase meter

Phase 3: to implement single phase analog to Smart meter

Phase 4: to implement all NEA Meters in Smart meter then gradually transformer and then substation automation.

For Phase 1 contract has been awarded and work is in progress, scheduled to complete in FY 2017/18.

17. GIS Smart Grid Project

This project is funded by the Govt. of Nepal (GoN) in F.Y.2016/17. The scope of the project includes:

- To manage proper information about poles, transformers & meters along with the consumer's information geographically through GPS enabled system called as Survey Information Management System (SIMS).

In this Fiscal year 2073/74 as a pilot project currently a GIS mapping of Jorpati Distribution Center is in progress. Gothatar Feeder's under area survey has been completed and another Mulpani feeder's under area survey is going on. For the above work, the software that costs approximately of NRs 1.2 millions has already been developed in-house and tested by GIS Smart Grid Project of NEA, during the pilot survey of Jorpati DCS.

After successfully completion of the pilot project GIS mapping of 16 different Distribution Centers within & outside the valley will be conducted within F.Y 2017/18.

18. 33/11 KV Substation Rehabilitation Project

This project is financed by the Govt. of Nepal (GoN) and NEA. The aim of this Project is for improvement in the reliability of distribution system of 36 different distribution centers all around the country. The main scopes of work under this project are:

Package 1 (East Region): Rehabilitation of 33/11 KV substation in Dharan, Inaruwa, Mirchaiya, Rajbiraj, Mujalia, Damak,

Dhulabari, Buipa, Bharadaha, Traghari (Udayapur), Bhojpur, Jirikhimti .

Package 2 (Mid Region): Rehabilitation of 33/11 KV substation in Kalaiya, Harsa, Simraungarh, Pokharia, Kawasoti, Jeetpur, Chaumala,Baglung, Gularia, Bhiman, Kirnetar.

Package 3 (West Region): Rehabilitation of 33/11 KV substation in Palpa, Ghorahi, Lumbini, Bharaulia, Mukundapur, Belauri, Abu Kharaini, Baitadi, Dadheldhura, Doti.

Community Rural Electrification Department

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

Under CREP, the GoN is contributing 90 % of the rural electrification Cost through NEA and the Rural Electric Community (REC) is required to contribute remaining 10 % of the cost. NEA sells bulk power to the RECs and RECs are responsible for operation and management of electricity distribution within the area. NEA provides services up to 11 kV Line and the REC itself is responsible for 400/230 Volt Line. NEA, Community Rural Electrification By-Law 2071 governs the activities of NEA, REC and CREP.

Consumer friendly rural electrification program is becoming more effective to promote energy access, consumer capacity building and livelihood development. Community Rural Electrification Program (CREP) has been playing an integral role in rural development, empowering Rural Electric Community (REC) and to alleviate Poverty. In the journey of 14 years, CREP has achieved a major success of accessing electricity to more than 3,50,000 households of 52 districts through 275 nos. of Different Community entities.

Despite of having many problems like insufficient human resources and adolescent office itself, the performance of CRED evaluated as satisfactory in FY 2016/17. During review period, CRED initiated activities to resolve setback old community rural electrification contracts successfully and by the result hanged out contracts were regularized and most of them were completed in this year. CRED's major activities of the year include:

- New NEA, Community Rural Electrification By-Law has been approved by making the existing CRE By-Law 2071 compatible to the motive of re-formed CRED and addressing the problems experienced in community rural electrification program & operational activities. However, it is yet to be submitted for approval.
- In order to strengthen the operating capacity of RECs, training for Linemen and Accountant was conducted. 15 Linemen personnel and 20 Account personnel were trained this year.
- In order to bring uniformity in cost estimation of rural electrification work, the major line materials cost (Pole, Conductor, Insulator, Transformer and Stay set etc) has been fixed.
- The following programs of CRED are in different stages of execution.
  - Electrification: 50
  - Rehabilitations and wooden pole Replacement: 28
  - Substation:2 (Baglung and Udipur)

- Transmission Line: 1 (33 KV Line, Palpa)
- Building Construction: 1 (Pokhara)

CRED has planned different activities in FY 2017/18 for meaningful and result oriented implementation of CREP that will strengthen the CRED and support the sustainability of the RECs too.

REGIONAL OFFICES

There are Eight Regional Offices (ROs) under DCSD located at Biratnagar, Janakpur, Hetauda, Kathmandu, Pokhara, Butwal, Nepalgunj and Attariya. The ROs are main interface with the public and after a detailed study of the service facilities provided, many improvements have been effected for the convenience of the customers. The functions of operation, maintenance, and expansion of the distribution system up to 33 kV voltage level and consumer services such as new consumer connections, meter reading, billing, and revenue collection are carried out by various Distribution Center under Regional Offices. In addition, operation and maintenance of off grid small hydro power plants also falls under regional office's jurisdiction.

Each regional office is headed by a director/chief and reports to the Deputy Managing Director. There is provision of technical division headed by a Manager in each RO which looks after the technical matters, rural electrification activities and management of small hydro power plants. The regional chief is also supported by account and administrative sections in the related matters.

Loss Reduction Program

The distribution networks comprise of technical and non- technical losses, in which proportion of non-technical losses is quite high. During the year under review, various measures taken in the preceding years were continued to reduce the non-technical losses. Massive awareness campaigns as workshops and review meetings were implemented in various distribution centers. Besides review meetings were organized in each regional office by a DCSD central team to evaluate the overall performance of the office.

Strict measures for electricity theft control as confiscation of electric equipments and taking legal action against culprits were also conducted in various distribution centers with the help of local administration and security agencies. All the distribution centers are engaged to remove the hookings, to replace the defective meters and penalize the people who are involved in electricity theft.

NEA management made various decisions as 'Immediate Action Plans' to improve its functioning. Among many, this plan included regular inspection of Time-of-Day (TOD) meters, data download and analysis to curb any connection fault or manipulation. All regional offices and distribution centers actively participated in this drive which was found to be much effective.

Customer Care

Distribution centers work as interfaces between NEA and its consumers. So, special efforts were taken to improve the quality of service at the consumer interface points. The employees took special efforts to serve our valued consumers in more effective way.

With the Queue Management System at some of the cash collection centers, difficulties encountered by the consumers in queuing for making payments were minimized. Round the clock no-light services have been implemented in most of the urban no-light centers. These functions and activities were carried out by all regional offices.

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

BIRATNAGAR REGIONAL OFFICE

Operational highlights

There are 17 Distribution Centers under Biratnagar Regional Office (BRO) spread over Mechi and Koshi zones. The distribution loss of BRO is 17.65%. Sales contribution to NEA system of this RO is 15.50%. The performance highlights of this regional office during review period are as under.

Energy sales (MWH) –	738,664
Revenue (million) –	Rs.6,966.28
Numbers of consumers –	5,62,414

Project highlights

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

1. Rake-Rabi-Chisapani 33 kV Transmission Line Project

The project includes the construction of 25 km of 33 kV line, 40 km of 11 kV line, 40 km of LV distribution line, construction of 33/11 kV, 6/8 MVA substation at Chisapani and 33 kV Switching Station at Ranke . Out of which, 15 km 33 kV line has been completed and remaining 10 km 33 kV line works are in progress and will be completed in F/Y 2074/075. Land for Switching Station at Chamaita of Ranke and land acquisition for Substation at Chisapani has already been acquired. Contractor for the Construction of Substation has been awarded by Project Management Directorate (PMD) and the works are in progress.

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

The project includes the construction of 50 km of 33 kV transmission line, 52 km of 11 kV line, 50 km of LV distribution line and one 33/11 kV substation in Bhojpur district. Construction of 33 kV transmission line and 33 kV Bay/Switching Substation at Hile have been completed and are in operation. 23 km of 11 kV line and 15 km of LV line construction have been completed so far. Construction of 33/11 kV protection Scheme for 750 KVA Substation at Bhojpur is in progress and will be completed in F/Y 2074/075.

3. Ilam-Phidim-Taplejung 33 kV Transmission Line Project

The scope of the project includes the construction of 90 km of 33 kV transmission line in Panchthar and Taplejung district. Construction of 33/11 kV, 3 MVA Substation at Phidim and 33 kV Bay at Ilam Substation have been completed and in operation. Construction of 33 kV line from Phidim to Taplejung is also completed. Construction of 6/8 MVA substation at Taplejung and 33 kV Bay at Phidim Substation are in progress. A temporary 33/11 kV, 1.5 MVA substation at Dokhu, Taplejung is completed and is in operation.

4. Aathrai Sakrantibazar 33 kV Substation Project

The project includes the construction of 25 km of 33 kV line, 25 km of 11 kV line, 40 km of LV distribution line, construction of 33/11 kV, 6/8 MVA substation at Sakranti bazar and 33 kV Bay at Jirikhimti, Terahthum. Out of which, 13 km 33 kV line has been completed and remaining works are in progress. Land for Substation at Sakranti bazar has been already acquired and construction of boundary wall is completed. Contract for the Construction of Sub Station has been awarded by Project Management Directorate (PMD).

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

The project includes the construction of 15 km of 33 kV line, 15 km of 11 kV line, 15 km of LV distribution line, Construction of 33/11 kV, 3 MVA Sub Station at Rajarani and 33 kV Bay at Bhedetar, Dhankuta. The land acquisition for Substation construction has been completed and construction of boundary wall has also been completed. 33 kV line Construction works are in progress.

6. Dhulabari Jhapa 33 kV transmission line and Substation Project

The project includes the construction of 33 kV transmission Line, 11 kV Distribution Line and Construction of 33/11 kV, 6/8 MVA Sub Station at Dhulabari. Construction of 33 kV Transmission Line and 6/8 MVA Substation have been completed and they are in operation. Construction of four 11 kV feeder are in progress.

7. Ahale Dadhipurkot Electrification Project

The project includes the construction of HT/LT line and Installation of different sizes of distributions transformers in Kot VDC. The construction of 3 km 11 kV line and 5.7 km 0.4/0.23 kV line and installation of 50 KVA transformers have been completed. Construction of 3 km HT line, 5 km of LT line and installation of two (25 KVA) transformers in other wards of Kot VDC are in progress.

8 Damak Na.Pa. Dharampur VDC Electrification Project

The project includes the construction of HT/LT line and installation of different sizes of distributions transformers in Damak and Dharampur. Construction of 0.5 km HT line, 8 km of LT line and installation of two (50 KVA) transformers are in progress.

9. Hile Pakhribas Ranibas 33 kV Transmission and Substation Project

The project includes the construction of 33 kV transmission Line from Pakhribas, Dhankuta to Ranibas(Ghodetar), Bhojpur and Construction of 3 MVA substation at Ranibas. Construction of 33 kV line has been completed and Construction of Substation works are awarded by Project Management Directorate (PMD) and works are in progress.

Other Projects

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

- Panchthar, Taplejung and Bhojpur Distribution Line Strengthening Project
- Chainpur Sitalpati 33 kV transmission line and Substation Project
- Bhojpur Balardah 33 kV Transmission Line and Substation Project.
- Belbari Letang 33 kV Transmission Line and Substation Project.

JANAKPUR REGIONAL OFFICE

Operational highlights

There are 14 Distribution Centers under Janakpur Regional Office (JRO) spread over Sagarmatha and Janakpur zones. The distribution loss of JRO is 36.45%. Sales contribution to NEA system from this RO is 7.79%. The performance highlights of this regional office during review period are as under.

Energy sales (MWH) –	371,349
Revenue (million) –	Rs. 3,379.00
Numbers of consumers –	4,95,192

Programme at Janakpur Regional office

Project highlights

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

Sangutar-Okhaldhunga 33 KV Transmission line project.

The project scope includes construction of 40 km 33 kV line, 40 km 11 kV line, 40 km distribution line and 33 kV bay at Sangutar. 60% of pole erection and 20 km of conductor stringing works for 33 kV line has been completed and remaining work is in progress.

Okhaldhunga-Salleri 33 KV Transmission line project

The project scope includes construction of 40 km 33 kV line, 40 km 11 kV line, 40 km LT line, 33 kV bay at Okhaldhunga and 33/11 kV 1.5

MVA substation at Salleri of Solukhumbu district. 100% of pole erection and 80% of conductor stringing work of 33 KV Line has been completed and remaining work is in progress.

Khurkot-Nepalthok-Rakathum 33/11 kV Transmission Line & Substation Project

The project scope includes construction of 31 km 33 kV line, 30 km 11 kV line, 40 km distribution line at Sindhuli and Ramechhap District & 33/11 KV 10/13.3/16.6 MVA Substation at Rakathum. 80% of construction work of 33 kV transmission line has been completed and remaining work is in progress. Land acquisition work has been completed and tender evaluation for construction of 33/11 kV Line and Substation is in progress.

Gadhaiya-Dumariya 33 kV,11 kV Line & Substation Project.

The project scope includes construction of 25 km 33 kV line, 15 km 11 kV line and 33/11 kV 16.6 MVA substation at Gadhaiya- Dumariya of Sarlahi district. Land acquisition work has been completed and tender evaluation for construction of Line and Substation is in progress.

Haripurwa-Basantpur 33 kV Transmission Line & Substation Project.

The project scope includes construction of 20 km 33 kV line, 20 km 11 kV line and 33/11 kV 16.6 MVA substation at Haripurwa-Basantpur of Sarlahi district. Land acquisition work has been completed and tender evaluation for construction of Line and Substation is in progress.

Bhagwanpur 33/11 kV S/S Construction project.

The project scope includes construction of 20 km 33 kV line, 30 km 11 kV line and 33/11 kV 16.6 MVA substation at Bhagwanpur of Siraha district. Land acquisition work has been completed and tender evaluation for construction of Line and Substation is in progress.

Other Projects

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

Shingadevi Raniban Electrification Project: The project scope includes construction of 20 km 11 kV line, 20 km LT line. 17% of work has been completed. Construction of remaining work is in progress.

Nirmali Dada Electrification Project: The project scope includes construction of 10 km 11 kV line, 10 km LT line. Tender for the construction of 11 KV and LT Line has been awarded and the project is expected to be completed in 18 months.

HETAUDA REGIONAL OFFICE

Operational highlights

There are 9 Distribution Centers under Hetauda Regional Office (HRO) spread over Narayani zone. The distribution loss of HRO is 15.39%. Sales contribution to NEA system from this RO is 19.67%. The performance highlights of this regional office during review period are as under.

Energy sales (MWH) –	937,165
Revenue (million) –	Rs.8,800.72
Numbers of consumers –	38,1456

Project highlights

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

- Maulapur Pataura Rural Electrification and Distribution Line Project
- Chandranigahapur- Manpur 33 Transmission line Project

KATHMANDU REGIONAL OFFICE

Operational highlights

There are 19 Distribution Centers and one Transformer workshop under Kathmandu Regional Office (KRO) spread over Bagmati zone.

The distribution loss of KRO is 10.24%. Sales contribution to NEA system from this RO is 26.90%. The performance highlights of this regional office during review period are as under.

Energy sales (MWH) –	1,281,720
Revenue (MillonNRs) –	Rs.14,522.22
Numbers of consumers –	6,33,331

Project highlights

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

Khimti –Manthali 33 kV Trasmission line and Substation Project

The project includes construction of 33 kV Tramission line and 33 kV line bay at Ramechape District. Construction work is in progress and is scheduled to be completed in FY 2017/18.

Budhsing, Dansing, Gorsysng, Khadakbhanjhyang, Phikure, Kaule, Bhalche Distribution line Project

The project includes construction of distribution system in Budhsing, Dansing, Gorsysng, Khadakbhanjhyang, Phikure, Kaule, VDC of Nuwakot district. Construction work is in progress and is scheduled to be completed in FY 2017/18.

Sindhu-Dolakha Distribution line Project

The project includes construction distribution system different VDCSD of Dolkha and Sindupalchowk district. Construction work is in progress and is scheduled to be completed in FY 2017/18.

Saghutar - Manthali 33/11 KV transmission line Project

The project includes construction of 33 kV line from Saghutar to Manthali and construction of substation. Acquiring land for substation construction is under progress.

Sindhupalchok Electricity Distribution Expansion and System Reinforment Project

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

POKHARA REGIONAL OFFICE

Operational highlights

There are 11 Distribution Centers under Pokhara Regional Office (PRO) spread over Dhaulagiri and Gandaki zones. The distribution loss of PRO is 11.86%. Sales contribution to NEA system from this RO is 5.67%. The performance highlights of this regional office during review period are as under.

Energy sales (MWH) –	270,438
Revenue (million) –	Rs.2,574.88
Numbers of consumers –	2,65,126

Project highlights

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

Udipur-Besisahar-Manang 33 kV Transmission Line and Substation Project:

The project includes the construction of 90 km of 33 kV transmission line, 53 km of 11 kV, 53 km of LV distribution line and one 33/11 kV, 1.5 MVA substation in chame, Manang. Construction of 33 KV Transmission line is under completion stage.This line will be charged within 3 months. Land acquisition for Manang Substation has been completed. The construction of substation quarter, compound wall and substation work will be tendered soon.

Galkot 33 KV Transmission Line and Substation Project:

This project is being implemented to provide electric supply and Grid connection to IPP of Galkot area in Baglung district. The major

component of this project are construction of 2 km 33 KV line, 27 km 11 kV line, one 33 KV bay construction at Baglung substation and 3 MVA Substation at Galkot of Baglung district. 33 KV Bay extensions at Baglung substation has been completed. Land Acquisition and Civil works for land protection for Sub-station construction at Galkot has been completed. Construction of 33 KV line and substation works are in progress.

Damauli-Bhorletar 33 KV Transmission line and SubStation project:

This project is being implemented to provide electric supply and Grid connection to IPP of Bhorletar area in Lamjung district. The major component of this project are construction of 25 km 33 KV line, 5 km 11 kV and .4KV line, one 33 KV bay construction at Damauli substation and 6/8 MVA SS at Bhorletar of Lamjung District. Land acquisition for Bhorletar Substation has been completed. Construction of 25KM 33 KV line is in completion stage. Construction of SubStation quarter is already started and the substation construction work is in tendered process.

Lekhnath-Sindhabesi-Lamjung 33 KV Transmission Line and SubStation project:

The scope of the project consists of the construction of 18 km of 33 kV transmission line, 10 km of 11 kV and .4KV of LV distribution line and 33/11 kV 6/8 MVA substations at Sindhabesi Kaski and Construction of 33 KV Bay at Lekhnath Substation, Kaski districts. Land acquisition for Sindhabesi Substation has been completed. Construction of 33 KV line is on completion stage and substation work is completed 30-35%.

Damauli Khairenitar 33 KV Transmission Line project:

The scope of the project consists of the construction of 25 km of 33 kV transmission line. Land acquisition for Kharenitar 33 KV 6/8 MVA SS has been completed Construction of 33 KV line work is in progress.

Righa Kharbang 33 KV Transmission Line and SubStation project:

This project is being implemented to provide electric supply and Grid connection to IPP of Kharbang area in Baglung district. The major component of this project are construction of 25 km 33 KV line, 20 km 11 kV and 0.4KV line, one 33 KV bay construction at Galkot substation and 6/8 MVA Substation at Righa-Kharbang of Baglung District. The Detailed survey of transmission line has been completed. Land acquisition, Construction of 25 KM 33 KV line and SubStation construction work will be started in this F/Y.

Lekhnath Distribution Line Rehabilitation Project:

The purpose of this project is to supply the reliable electricity at Lekhnath area. The existing Khaireni feeder supplied electricity to Kaski, Tanahun and some part of Nawalparasi District. After completion of this project the kaski area is seperated from this feeder. The scope of this project is to construct 12 KM, 11 KV line from Lekhnath 132 KV Substation to kotre Pole plant.

Other Projects:

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

- Gorkhar Siranchour-Chiphleti 33 kV Transmission Line Project
- Tatopani Small Hydro Power Rehabilitation Project.

BUTWAL REGIONAL OFFICE

Operational highlights

There are 9 Distribution Centers under Butwal Regional Office (BuRO) spread over Lumbini zone. The distribution loss of BuRO is 16.52% Sales contribution to NEA system from this RO is 14.35%. The performance highlights of this regional office during review period are as under.

Energy sales (MWH) –	683,734
Revenue (million) –	Rs 6,471.18
Numbers of consumers –	4,19,433

Project highlights

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

Jeetpur Thada 33 kV Substation Project

The project scope includes construction of 30 km 33 kV line ,33/11 kV 6/8 MVA substation , 15 km 11 KV line, 5 km 0.4kv LT line and along this line connecting 50 numbers of 11/0.4 kv distribution transformer at Thada, Arghakhachi. Purchasing of land has been completed for the construction of Thada Substation. Upto this fiscal year 2073/074, Poling works 33 kV line as well as compound wall work was completed. The project is scheduled to complete in FY 2075/076.

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

The Major scope includes construction of 30 km 11 KV line and 33/11 KV 3 MVA substation , 30km 11 Kv line and connecting 60 number of 11/0.4 KV distribution transformer at Ridi ,Gulmi. Polling works has been completed up to this year and replacing the distribution transformer on the site. The project is scheduled to complete in FY 2074/075.

Gulmi Birbas 33/11 KV Substation Upgrading Project

The major activities are construction of 30 km 11 KV transmission line and 33/11 KV, 6/8 MVA substation. Upto this year, 3 MVA 33/11 KV Power transformer upgrading by 6/8 MVA 33/11 KV. The substation construction work will be completed in next fiscal year.

Amarai Dohali Wagla including 10 VDC Project (Rural Electrification)

The major activities of this projects are construction of distribution 11KV 100 km and LT line 350 km and connecting 60 number of 11/0.4 KV distribution transformer. Up to this fiscal year almost 70 % work was completed. The project is scheduled to complete in FY 2074/075.

Purkotdaha, Myalpokhari including 5 VDC Project (Rural Electrification)

The major activities of this project are construction of distribution line of 11 KV 50 km, connecting 30 number of 11/0.4 KV distribution transformer and LT line 0.4KV 50 km. The polling work has been running and Up to this year 70 % work was completed.. The project is scheduled to complete in FY 2074/075.

Bhairahawa - Taulihawa line Reinforcement Project.

The major activities of this project are construction of distribution of 11 kv line 20 km , 0.4 KV line 50 km and connecting 40 number of 11/0.4 KV distribution transformer. The polling work of 11 kv line has been running. The project is scheduled to complete in FY 2074/075.

Gulmi Shantipur 33 kV Transmission line and Substation Project.

The Major scope included construction of 30 km 33 KV line and 33/11 KV 6/8 MVA substation and 8 km 11 KV line at Shantipur ,Gulmi. Purchasing of land has been in process for the construction of Shantipur Substation. The project is scheduled to complete in FY 2074/075.

Other Projects

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

- Lamahi-Charinje 33 KV transmission line and S/S Project.
- Yogikuti Shitalnagar 33 KV transmission line project

NEPALGUNJ REGIONAL OFFICE

Operational highlights

There are 15 Distribution Centers under Nepalgunj Regional Office (NRO) spread over Rapti, Bheri and Karnali zones. The distribution loss of NRO is 18.53% Sales contribution to NEA system from this RO is 6.25%. The performance highlights of

this regional office during review period are as under.

Energy sales (MWH) –	297,925
Revenue (million) –	Rs. 2,818.40
Numbers of consumers –	3,10,609

Project highlights

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

Surkhet Bijaura 33 kV Substation Project:

The project scope includes construction of 30 km 33 kV line, 20 km 11 kV line and construction of 33/11 kV substation at Bijaura, Surkhet. Land acquisition work and construction of boundary fencing wall has been completed, erection of more than 170 Poles on the way to substation has been completed and procurement of goods like Power Transformer and and 33 kV switchgear has been done, installation and erection works are in progress.

Dang Bhalubang 33 kV Transmission Line Project:

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

Rajapur 33 kV Substation Project:

The project scope includes construction of 15 km 33 kV line, 10 km 11 kV line, 10 km of distribution line and construction 33/11 kV substation at Rajapur, Bardiya. Land acquisition work , civil construction and the supply of electrical equipment has been nearly completed. Contractor is obliged to complete the work within Bhadra of 2074 and at the same time the substation will be charged after testing and commissioning.

Sitalpati -Musikot 33 kV Transmission Line and Substation Project:

The project includes the construction of 50 km of 33 kV transmission line, 50 km of 11 kV line, 40 km of LV distribution line and one 33/11 kV substations of 3 MVA capacity at Musikot and another 33/11 kV substations of 1.5 MVA Sitalpati . Out of 50 km long 33 kV transmission line, stringing of 34 km line & pole erection and Construction of 33/11 kV has been completed and is charged in 11 k.V. Sital pati substation is almost completed and after a few arrangement of line from Tulsipur to sitalpati it will be charged by shrawan 2074. For Musikot 33/11 kV substation the acquisition work of land is in process , as soon as it will be done the work will keep in progress.

Chhinchu-Rakam-Jajarkot 33 kV Transmission Line Project

The scope of the project consists of the construction of 70 km of 33 kV transmission line, 100 km of 11 kV, 100 km of LV distribution line and two 33/11 kV substations at Surkhet and Jajarkot districts. Out of 70 km long 33 kV transmission line, pole erection and stringing of conductor for 45 km and 11 km of 11 kV line has been completed. The substation work at kudu is in progress with procurement of all electrical equipment like Power Transformer , 33 and 11 kV switchgear. All civil work has been almost finished and contractor is obliged to charge the substation by Bhadra 2074.

Ghorahi-Holeri 33 kV Transmission Line Project

Scope of this project consists of the construction of 45 km of 33 kV transmission line, 50 km of 11 kV, 50 km of LV distribution line and two 33/11 kV substations at Holleri & Ghorahi. Construction of 45 km 33 kV transmission line up to Holleri has been completed. 33/11 kV, 750 kVA sub-station at Holleri will now come in operation by the end of Ashoj 2074.

Dailekh Substation Project

The project includes the construction of 25 km of 33 kV, 15 km of 11 kV, 10 km of LV distribution line & one 33/11 kV, 1.5 MVA substation at Dailekh , 3 MVA substation at Dullu and 33 kV Bay extension

at Surkhet. Construction of 33/11 kV, 1.5MVA sub-station at Dailekh, 33 kV bay extension at Surkhet substation and construction of 25 km of 33 kV has been completed, Contract for the construction of 11 kV line from surkhet to Dailekh and 3 MVA Substation at Dullu has been done and Project work is on progress after Contract agreement and expected to be completed by FY 2017/18.

Kapurkot-Koilachaur 33 kV Transmission Line Project

The project includes the construction of 15 km of 33 kV, 25 km of 11 kV, 25 km of LV distribution line in Salyan & Rolpa districts & 6/8 MVA 33/11 kV substation at Koilachaur & a switching substation at Kapurkot. Construction of 33 kV transmission line from Kapurkot to Kalachaur has been completed. Land acquisition for substation construction has been completed. Civil work of Project procurement of material is in progress and expected to be completed by FY 2017/2018.

Badikot-Bijuwar Distribution System Rehabilitation Project:

The Project includes the replacement of wood pole, upgrading of Conductor size and Transformer. Replacement of wood pole, upgrading of Conductor and installation Transformer work has been completed.

Pyuthan Substation Project

The project includes the construction of 3 MVA 33/11 kV substation at Damti, Pyuthan. Land acquisition for substation construction has been completed. Construction of boundary fencing wall and other civil structure works of equipment foundation and control building work is on progress and procurement of electrical equipment is nearly done and expecting that project will be completed by FY 2017/2018.

Dailekh-Seri Line Extension Project

The project includes the construction of 5 km 11 kV line, 10 km of LV distribution line in Dailekh district. Project work is on progress after Contract agreement and expected to be completed by FY 2017/18.

Surkhet Gangate Matela Project 33 kV Transmission Line Project

The project includes the construction of 50 km 33 kV line from Rato nangla to Matela and 3 MVA 33/11 kV substation at Matela, Surkhet. Poling works of 33 kV line has been almost completed. Land acquisition for substation construction has been completed and other work is in progress. It is to be expected to complete it by 2017/18.

ATTARIYA REGIONAL OFFICE

Operational highlights

There are 8 Distribution Centers under Attariya Regional Office (ARO) spread over Mahakali and Seti zones. The distribution loss of ARO is 16.31%. Sales contribution to NEA system from this RO is 3.85%. The performance highlights of this regional office during review period are as under.

Energy sales (MWH) –	183,683
Revenue (million) –	Rs.1,532.85
Numbers of consumers –	1,90,251

Project highlights

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

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

The scope of this Project includes the construction of 90 km of 33 kV, 40 km of 11 kV, 40 km of LV distribution line in Baitadi and Bajhang district , 33/11 kV substations at Chainpur and Bagthala. 33 kV bay extension at Baitadi Substation. Contract has been awarded for the construction of 33 kV line and 3 Mva substation at Bagthala and Chainpur.

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

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

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

The project includes the construction of 48 km of 33 kV, 40 km of 11 kV, 40 km of distribution line in Achham and Bajura district , 33/11 kV,1.5 Mva Substation at Jhakale's work is under process. Construction of 11 kV transmissions in progress. Contract has been awarded for the construction of 48 k.m. 33 kv transmission line from Sanfebagar to Martadi.

Balanch(Gokuleshwor)-Khalanga 33 kV Transmission line Project

The project includes the construction of 25 km of 33 kV, 5 km of 11 Kv/ distribution line in Darchula district , 33/11 kV 3 Mva substations at Thaligad, Darchula work is under process. Construction of 33 kV transmission is in progress. Contract has been awarded for the construction of 25 k.m. 33 kv transmission line from Balanch to Khalanga .

Other Projects

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

- Sakayal 33 kV Transmission line and Substation Project
- Mauwa-Nagardaha (Doti) 33 kV Transmission line and Substation Project
- Sanphebagar-Chamara-Chautara 33 kV Transmission line and Substation Project
- Budhar-Jogbudha Bagarkot 33 kV Transmission line and Substation Project
- Dipayal-Sanphe-Manma-Jumla 33 kV Transmission line and Substation Project
- Dhangadi-Attaria Distribution System Reinforcement Project
- Mahendranagar Distribution System Reinforcement Project
- Tikapur-Lamki Distribution System Reinforcement Project
- Kailash Khola Small Hydro Power Reinforcement project
- Chameliya Distribution line Expansion Project.
- Baitadi Distribution line expansion Project
- Lamki-Sugarkhal 33 kV Transmission line and Substation Project
- Attariya-Punarbas 33 kV Transmission line and Substation Project
- Patan-Melauli 33 kV Transmission line and Substation Project
- Musya 33 kV Transmission line and Substation Project
- Silyegada- Katujapani 33 kV Transmission line and Substation Project

Annex -1: Features of Eight Regional Offices

S.N.	Category	Biratnagar	Janakpur	Hetauda	Kthmandu	Pokhara	Butwal	Nepalgunj	Attariya	Total
No. of Consumers (Nos) for F/Y 2016/17										
1	Domestic	531,719	459,067	351,363	610,130	255,748	401,352	288,902	180,714	**3,060,995**
2	Non-Commercial	2,880	2,029	1,732	3,291	1,978	2,750	2,809	1,788	**19,257**
3	Commercial	2,800	1,659	2,030	5,800	1,704	2,058	1,775	1,034	**18,860**
4	Industrial	6,752	8,238	6,914	9,376	3,644	5,835	3,746	1,838	**46,343**
5	Water Supply	185	118	194	441	267	317	113	40	**1,675**
6	Irrigation	34,200	23,010	17,895	1,154	430	5,405	12,431	4,101	**98,626**
7	Street Light	713	443	411	781	78	336	135	38	**2,935**
8	Temporary Supply	49	27	98	664	36	93	63	40	**1,070**
9	Transport	0	0	1	41	2	0	0	0	**44**
10	Temple	861	365	575	576	604	965	448	279	**4,673**
11	Community Sales	119	110	75	116	491	223	128	335	**1,597**
12	Non Domestic	0	23	85	800	68	0	1	0	**977**
13	Entertainment	0	6	12	16	10	0	1	0	**45**
14	Internal Consumption	136	97	71	145	66	98	57	44	**714**
15	Bulk supply	0	0	0	0	0	1	0	0	**1**
	Total	**5,62,414**	**4,95,192**	**3,81,456**	**6,33,331**	**2,65,126**	**4,19,433**	**3,10,609**	**190,251**	**32,57,812**
Sales Unit (MWh) for F/Y 2016/17										
1	Domestic	316,523	197,821	248,023	724,043	156,872	263,530	139,748	101,278	**2,147,838**
2	Non-Commercial	17,693	6757	20296	76,555	12,358	11,217	10,016	5895	**160,787**
3	Commercial	38,733	15,681	30618	176,264	30,796	26,114	20,726	11,648	**350,580**
4	Industrial	316,657	116,207	585802	194,118	30,917	348,191	103,051	24,322	**1,719,265**
5	Water Supply	11,972	2447	9675	17,839	4571	11,097	3,351	1,754	**62,706**
6	Irrigation	16,142	11,914	11193	827	270	4,944	6,030	1,907	**53,227**
7	Street Light	6,771	12,841	20626	23,480	2,654	4,978	2,791	1,981	**76,112**
8	Temporary Supply	136	125	119	1,389	86	184	130	856	**3,025**
9	Transport	0	0	587	5,719	20	0	0		**6,326**
10	Temple	988	440	1,461	1,772	512	1,320	447	155	**7,095**
11	Community Sales	12,626	6,746	5,406	6,693	31,048	8,787	11,257	33,681	**116,244**
12	Non Domestic	0	13	2,703	50,845	133	0	49	0	**53,743**
13	Entertainment	0	20	309	845	30	0	9	0	**1,213**
14	Internal Consumption	423	337	347	1,331	170	336	320	206	**3,470**
15	Bulk supply	0	0	0	0	0	3,036	0	0	**3,036**
	Total	**738,664**	**371,349**	**937,165**	**1281,720**	**270,438**	**683,734**	**297,925**	**183,683**	**4,764,678**

Revenue (Figure. in NRs in 000) for F/Y 2016/17										
1	Domestic	277,4103	1,608,676	2,230,434	735,570	1,395,367	2,339,107	1,254,575	2,774,103	19,787,271
2	Non-Commercial	282,412	96,464	287,287	1,332,354	185,735	149,208	139,304	282,412	2,552,349
3	Commercial	588,547	233,251	436,774	2,562,991	444,998	363,782	281,636	588,547	5,072,564
4	Industrial	3,026,456	1,231,883	5,448,946	1,980,239	325,983	3,377,030	998,666	3,026,456	16,635,503
5	Water Supply	86,761	19,978	71,847	139,949	36,710	85,467	27,250	86,761	482,076
6	Irrigation	71,459	52,536	49,885	3,744	1,273	26,895	26,848	71,459	241,225
7	Street Light	57,270	94,899	179,778	223,184	25,974	38,114	24,873	57,270	663,350
8	Temporary Supply	2,878	2,502	2,338	26,349	1,723	3,751	2,524	2,878	53,215
9	Transport	0	0	6,125	37,417	296	0	0	0	43,838
10	Temple	6,326	2,168	8,009	11,954	3,006	10,428	2,764	6326	45,624
11	Community Sales	64,635	31,858	27,669	33,581	148,389	40,411	55,119	160,185	561,846
12	Non Domestic	0	205	41,692	781,730	2,348	0	765	0	826,740
13	Entertainment	0	337	5,183	14,639	743	0	136	0	21,038
14	Internal Consumption	5,441	4,248	4,759	18,324	2,345	4,368	3,940	2,880	46,305
15	Bulk supply	0	0	0	0		32,628	0	0	32,628
	Total	**6,966,288**	**3,379,005**	**8,800,726**	**14,522,225**	**2,574,888**	**6,471,189**	**2,818,400**	**1,532,850**	**47,065,571**
Loss percentage										
1	**F.Y 2016/17**	17.65	36.45	15.39	10.24	11.86	16.52	18.53	16.31	**16.83**
2	**F.Y 2015/16**	20.67	47.95	18.33	11.24	12.45	16.29	19.17	19.55	**19.80**
2	**F.Y 2014/15**	17.30	42.28	17.41	11.58	13.82	16.69	17.30	13.07	**18.14**

Annex- 2: Performance Status of Eight Regional Offices

Description	Biratnagar	Janakpur	Hetauda	Kathmandu	Pokhara	Butwal	Nepalgunj	Attariya	Total
Zonal Coverage	Mechi & Koshi	Jankapur & Sagarmatha	Narayani	Bagmati &Janakpur	Gandaki & Dhaulagiri	Lumbini	Bheri ,Karnali & Rapti	Mahakali & Seti	
No .of municipalities / VDC fully electrified	3	129	10	166	270	136	9	9	**732**
No .of municipalities / VDC partially electrified	98	393	12	232	69	228	301	90	**1,423**
No. of VDCS having no access to electricity	16	138	9	42	72	3	146	59	**485**
No. of community electrified VDC	23	41	29	50	104	87	33	40	**407**
No. of distribution center	17	14	9	19	11	9	15	8	**102**
Units sold during the year under review (MWh)	738,664	371,349	937,165	1281,720	270,438	683,734	297,925	183,683	**4,764,678**

Revenue (NRs in 000)

Description	Biratnagar	Janakpur	Hetauda	Kathmand	Pokhara	Butwal	Nepalgunj	Attariya	Total
Billing Amount	6,981,463	3,504,494	8,524,034	14,370,706	2,603,735	6,427,317	2,875,209	1,550,511	46,837,469
Total no of consumer at the end of year	5,62,414	4,95,192	3,81,456	6,33,331	2,65,126	4,19,433	3,10,609	190,251	32,57,812
No of Black listed consumer	5,076	3,976	5,737	9,132	2,007	3,533	2,350	1,151	32,962
Revenue to be collected from Black listed consumer	94,170.27	82937.24	36341.88	220482.43	17,264.05	100976.3	29898.0	16029.40	598,099.58
Revenue collected from Black listed consumer no.	2,534.42	1403.68	3938.10	7886.03	375.31	5817.640	3147.72	213.00	25,315.91
Number of line disconnection	9,975	11803	4325	3587	3,109	5572	1907	2924	43,202
Revenue to be collected from disconnection	135,889.67	409061.01	29180.27	75434.16	32,822.34	129695.8	49689.62	19620.65	881,393.54
Revenue collected from disconnection	111,282.39	185431.83	19662.13	74650.00	31,541.86	106206.4	54208.80	32478.70	615,462.10
Action against theft	9,829	3,575	445	2,645	256	450	876	457	18,533
Collection from action against theft	9,237.87	3,491.05	3,435.00	2,719.00	2,810.0	3,576.00	6,543.00	3,453	35,264.92
Loss Reduction Activities									
Meter change	3,472	3565	2,977	506	1,921	2,758	949	503	**16,651**
Resealing	27,893	13,649	20,124	3367	5,898	14,845	3,638	7,724	**97,138**
Conductor Upgrading(HT/ LT);Km	251.56	100	61.21	25	22.1	20	105	106.05	**691**
Transformer adding/ upgrading nos.	30	180	140	30	72	36	30	45	**563**
Meter inspection (TOD/Three phase/single phase); nos	656	15,506	8,317	257	6,276	300	200	10,475	**41,987**
Public interaction conducted; nos	20	28	22	20	217	15	25	30	**377**
Public hearing, awareness, notice published	15	40	24	25	85	17	20	25	**251**

PLANNING, MONITORING AND INFORMATION TECHNOLOGY DIRECTORATE

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

SYSTEM PLANNING DEPARTMENT

Currently, Grid Impact Study (GIS) for new generation projects is one of the main tasks of System Planning Department (SPD). GIS analyzes the effect of new connection to NEA Grid to ensure satisfactory operation of the Grid in conformity with the NEA Grid Code. It also analyses requirement for additional transmission lines, reinforcement in the network, and requirement for the installation of capacitors and reactors according to the study.

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

SPD assists other departments of NEA by providing necessary data and suggestions regarding implementation of planned projects. The department was involved in Network Analysis of Lekhnath- Damauli 220 kV transmission line and ranking of transmission line projects prepared by Project Management Directiorate (PMD).

The department was involved with India-Nepal Joint Operation Committee (JOC) in the joint study of Synchronous operation of Central part of Nepal with Indian system with National Load Dispatch Centre, India and prepared "Report on Synchronous Operation of Central Nepal Grid with India through 400kVV Muzaffarpur- Dhalkebar line (charged at 132 kV)".

The department was involved with India-Nepal Joint Technical Team JTT to study Nepal- India Cross Border Interconnections Master Plan and the power evacuation system indicated in the

Project Development Agreement (PDA) of Arun-3 and Upper Karnali and suggest any additional system to be built keeping in view the optimized transmission plan.

SPD has been working out on a Load Forecast Study which is required to be in line with the Electricity Demand Forecast Report (2015-2040) prepared by WECS.

In FY 2016/17, System Planning Department completed Grid Impact Study for the following hydropower projects to be developed by the private sector.

List of GIS conducted projects in FY 2016/17

S.N.	Name of Projects	Capacity (MW)	Connection Substation
1	Marshyangdi-1 HPP	112.5	Tadi kuna
2	Super Aankhu Khola HPP	25.4	Trishuli 3B hub
3	Chameliya Chhetigad HPP	85	Balanch
4	Nilgiri Khola - 2 Cascade HPP	62	Dana
5	Super Nyadi	40.27	Tadi kuna
6	Irkhuwa Khola-B HPP	15.524	Khandbari
7	Lower Irkhuwa Khola HPP	14.15	khandbari
8	Puwa-II HPP	4.96	Tilkeni
9	Middle Sunkoshi	3.4	Barahabise
10	Upper Piluwa -3 HPP	4.95	Baneswor
11	Upper Midim HPP	7.5	Bhorletar
12	Upper Chhandi Khola Small HPP	4	Udipur
13	Sabha Khola – A HPP	10.4	khandbari
14	Langtang Khola HPP	20	Chilime Hub
15	Sapsup Khola	7.151	Lahan
16	Upper Phawa HPP	5.8	Kabeli
17	Upper Chauri Khola HPP	6	Madankudari (Lamosangu)
18	Mathillo Richet	2	Salyantar
19	Super Mai	7.8	godak
20	Buku Kapati HPP	5	Bamti
21	Madhya Midim HPP	4.8	Bhorletar
22	Madhya Daram A HPP	3	Harichaur
23	Madhya Daram B HPP	4.5	Harichaur
24	Super Mai 'A' HPP	9.6	Godak
25	Ghalemdi Khola HPP (upgradation)	1	Dana
26	Bagmati SHPP	22	Kulekhani I
27	Singati Khola HEP	25	Singati
28	Upper Lohore HPP	4	Dailekh
29	Padam Khola	4.8	Dailekh
30	Gandi Gad	1	Balanch
31	Tanahu HPP	140	New Damauli

In FY 2016/17, System Planning Department completed Grid Impact Study for the bulk load of following industries.

S.N.	Name of Projects	Capacity (MVA)	Connection Substation
1	Tanhun Hydropower Ltd. Construction Power	8	Jaruwa
2	Hongshi Shivam Cement Pvt Ltd.	50	Sardi s/s
3	Aarti Strips Pvt. Ltd.	5	Tankisinwari
4	HID	5	Kamane
5	Nepal Shalimar Cement Pvt. Ltd.	Load Shift	Parwanipur
6	United Cement Pvt. Ltd	5	Naubise

CORPORATE PLANNING AND MONITORING DEPARTMENT

Corporate Planning and Monitoring Department is responsible for developing corporate and periodic development plans and programs, for carrying out periodic monitoring and evaluation of projects implemented by NEA, and for assisting the National Planning Commission,

Ministry of Energy and Ministry of Finance in the preparation of annual budget and programs for projects being undertaken by NEA. Besides, the Department also provides necessary support to NEA management for carrying out various studies related to institutional reforms and development. In addition, the Department also provides input for studies undertaken by various organizations on topics related to NEA.

The Department also plays the coordinating role in the development of hydropower projects under different financing mode. During the year under review, the Department collected, evaluated and reviewed monthly, trimester and annual progress of 190 development projects implemented by NEA. Of these 190 projects: 10 projects were for feasibility study of storage and medium/large hydropower projects; 6 projects were hydropower projects that are under construction; 61 projects were transmission line projects; 101 projects were distribution system expansion and rural electrification projects and the remaining projects included rehabilitation and maintenance of hydropower stations, institutional strengthening and renewable capacity addition.

IT DEPARTMENT

Information Technology Department is responsible for core IT-related activities/services within the organization with its rudimentary data center located at central office IT department building.

Apart from the implementation of new IT services, the Department provides continuous ICT maintenance / support and training at local and regional level including Internet, Intranet, email, ftp, database, Document management system, E-submission and network connection services for different applications. A significant effort is also being made by the department towards the Intranet expansion with fiber optics cable and wireless connectivity. Remote network services are also being provided through IPsec and ssl vpn.

Payroll and Pension applications that were running conventionally in decentralized mode in the respective offices of NEA are now being tested in the centralized database environment. System of about two hundred offices was brought under centralized system this year. Payroll and Pension of all the NEA staffs will be generated at the central office hereafter. Hopefully by the end of this fiscal year, applications such as fixed asset management system and accounting system of NEA will be functioning in the centralized mode. The department has also in this fiscal year introduced new NEA website and has added some portal services in this website. E-attendance system has been implemented in more than 20 new NEA offices this fiscal year and continuous support is being provided for more than 150 NEA offices altogether so far.

Other prominent IT services taken up by the department in this fiscal year are the implementation of new E-bidding portal site for double envelops system and the development and implementation of complain management system and online meter application system. Our new e-bidding portal has been implemented since this April and a total of 82 buyers have been registered so far. There are 189 bidders registered and 341 contracts till date in our portal.

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.

During 11th Power Exchange Committee (PEC) meeting held at New Delhi.

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 different stages involved are document study and investigation, technical review, grid connection agreement followed by Grid Impact Study and PPA draft preparation and negotiation. Finally, a PPA Processing Basket is formed and the applications which have fallen into it with the completion of necessary criteria are processed towards the conclusion of PPAs. When the earlier entries are completed, the Basket is periodically updated with fresh entries of projects.

A total of 10 new projects developed by the Independent Power Producers (IPPs) with their combined capacity of 116.61 MW was commissioned in FY 2016/17. Projects that were commissioned are: Jhyadi Khola (2 MW), Tungun-Thosne (4.36 MW), Upper Marsyangdi "A" (50 MW), Daraudi Khola "A" (6 MW), Khani Khola (2 MW), Miya Khola (0.996 MW), Upper Madi Khola (25 MW), Hewa Khola "A" (14.9 MW), Jogmai Khola (7.6 MW) and Dwari Khola (3.75 MW). With

these 10 projects, the total number of IPP-owned projects that are in operation has reached 60 with their combined installed capacity of 441.0524 MW. Similarly, 102 projects of IPPs with their combined capacity of 2043.613 MW are under construction.

Likewise, 51 projects of IPPs with their combined capacity of 910.311 MW are in other stages of development. During FY 2016/17, 28 new PPAs with their combined capacity of 532.078 MW were concluded. Additionally, the installed capacity of 3 projects, namely, Tinau Khola, Khani Khola-1 and Pikhuwa Khola were upgraded by 0.675 MW, 15 MW and 2.525 MW respectively. With this, the total number of PPAs concluded till the end of FY 2016/17 has reached 213 with their combined capacity of 3394.9764 MW.

In FY 2016/17, import from India through various transmission lines including Dhalkebar-Mujaffarpur reached an average of 250 MW.

ECONOMIC ANALYSIS DEPARTMENT

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

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

The department is the focal point of NEA to coordinate with Electricity Tariff Fixation Commission (ETFC). The department also supports Power Trade Department in the process of concluding PPA with IPPs.

In the absence of periodic tariff adjustment, NEA had been facing huge financial loss in the past. The tariff adjustment of 2013 and 2016 approved by ETFC have somehow made positive impact in improving NEA's financial health.

While approving tariff revisions of 2013 and 2016, ETFC had directed NEA to prepare an action plan for: loss reduction; administrative reforms and effective power plant operations. Complying to these directives of ETFC has also helped NEA in achieving better performance.

NEA is also seeking approval from ETFC for the formulation of an appropriate formula for the automatic adjustment of Electricity Tariff as per Electricity Tariff Fixation Rules.

ENGINEERING SERVICES DIRECTORATE

Engineering Services Directorate is entrusted with the responsibility to carry out engineering studies beginning from the identification to detailed engineering design, environmental studies, geological and geotechnical studies. It is headed by a Deputy Managing Director. The Directorate has rendered its services to NEA and private sector particularly for the study of hydropower and transmission line projects. The Project Development Department, Soil Rock and Concrete Laboratory, Environmental and Social Studies, Dudhkoshi Storage Hydroelectric Project and Upper Arun Hydroelectric Project provide these services to various departments within NEA and to the private parties. Likewise, Training Center under Engineering Services Directorate provide the much needed human resources skills and knowledge.

DUDHKOSHI STORAGE HYDROELECTRIC PROJECT

Dudhkoshi Storage Hydroelectric Project (DKSHEP) is located on Dudhkoshi River at the boundary of Khotang and Okhaldhunga districts in Eastern Development Region of Nepal. The dam site is located at Rabuwa at an aerial distance of approximately 1.5 km northwest of Lamidanda airport, which is at an aerial distance of about 140 km east of Kathmandu. The dam site is accessible from a 20 km long fair weather road that branches from Ghurmi – Diktel road at Bijule, Khotang. The dam site can also be accessed by other 30 km fair weather road from Okhaldhunga. The Powerhouse site is located at Dhitungat at an aerial distance of approximately 12.5 km southwest of Lamidanda airport. Nearest road for

Dam Site of Dudhkoshi Storage Hydroelectric Project

Terrestrial Laser Scanner Survey at Dam Site

proposed powerhouse site is located at a distance of about 8 km at Dhitung village. A fair weather road that connects Dhitung village and the Middle Hill Highway at Halesi is about 11 km long.

This project was first identified during the Master Plan Study of the Koshi River Basin in 1985. NEA carried out the feasibility study in 1998 for 300 MW installed capacity where it was identified as the viable and attractive option and hence recommended for development. The review study of the project was conducted by NEA in 2013. The study compared the two options i.e Toe Option and Tunnel Option assuming full supply level of 580 masl as conceived in the feasibility study and the comparison distinctly showed that the Tunnel Option with installed capacity 365 MW is better than Toe Option with installed capacity 210 MW. The study further revealed that with the possibility of increasing the full supply level up to 640 masl, the installed capacity of the project could be increased to 840 MW. The Nationwide Master Plan Study on storage type hydroelectric power development in Nepal conducted by JICA in 2014 identified and selected 10 most promising storage projects for development in which Dudhkoshi tops the ranking.

The procurement of consulting services for Updated Feasibility Study and Detailed Design of the project was initiated with the grant assistance from Asian Development Bank (ADB) under Project Preparatory Facility for Energy (PPFE). Government of Nepal approved the subsidiary Grant Agreement between NEA and GoN for (i) feasibility and/or engineering studies, including IEE/EIA/SIA, and detail engineering studies of DKSHEP (ii) civil works for core drilling and construction of test adit of DKSHEP.

A Contract agreement was made between NEA and ELC ElectroconsultS.p.A. (Italy) in association with NEWJEC Inc. (Japan) on 30th May 2016 and the Consultant commenced the work on 19th July 2016. The main objective of this study is to prepare the project for implementation from the current status of the existing Feasibility study. The overall objectives of the consulting services are to carryout necessary field investigation; update the existing Feasibility study of Dudhkoshi Storage HEP, carryout detail design, prepare tender documents and tender drawings; prepare Environmental Impact Assessment, Social Impact Assessment, Environmental Management Plan and Construction Plan to meet the NEA, GoN and leading multilateral agencies requirements

Core Drilling Work at Dam Site

for construction of the Project. The duration of Updated Feasibility Study and Detailed Design is 30 months. The inception presentation of the Updated Feasibility Study and Detailed Design was held on February 10, 2017 summarizing the results of the review of existing data/reports and field reconnaissance, including methodology and work plan for the ongoing studies.

Data regarding hydrology, access road, river morphology, past flood Records, Geology of proposed Dam-sites and powerhouse-sites and socio-environmental aspects of project development are being collected at the project site. Measurement of suspended sediment and bed-load sediment is being carried out in Dudhkoshi river and its tributaries Thotne Khola and Rawa Khola. Discharge measurement in these rivers is being done with the objective of up-grading the existing rating curve for water level monitoring station at Rabuwa Bazar, Khotang and determining the flow contribution of Rawa Khola and Thotne Khola. A Field survey was organized to understand the condition of upstream glacier lakes including Imja Lake and access the potential risk of a GLOF event.

The Scoping notice for Environmental Impact Assessment was published on 14 February 2017. The ToR and scoping report for EIA were prepared and submitted to DoED for approval and is under process of approval.

Terrestrial Laser Scanner Survey of the slopes at original dam site and potential powerhouse location 2.5 km downstream was conducted aimed at obtaining a detailed DEM and extracting geo-mechanical parameters of the rock mass. The geophysical survey and the geological mapping of the project area is going on. The geological and geotechnical report (Phase 1) has been prepared summarizing the investigations and results till date.

The Consultant has submitted the Interim Design Report considering eight different alternatives of project development with Full Supply Level of 600 masl and 640 masl. The report has analyzed the different alternatives, considering the geological and geotechnical stability, power system layouts, regulation volume, construction time, estimated cost and downstream release water volume from dam site. The report has also included the detail comparison of Roller Compacted Concrete (RCC) Gravity Dam and Rockfill Dam and also the economic and financial analysis of different project alternatives.

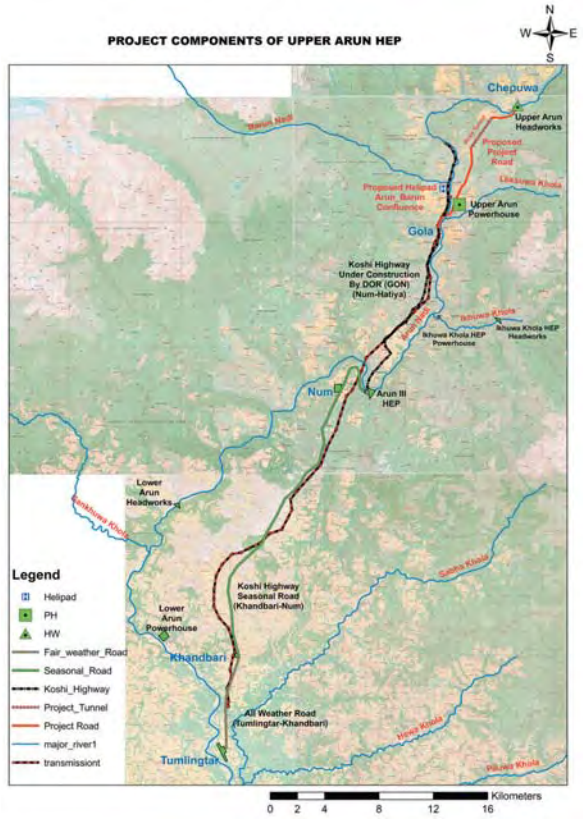
As a part of the study, the Core Drilling work and Construction of Test Adit is being carried out. Separate bids were called for Core Drilling and Construction of Test Adit necessary for Updated Feasibility Study of the Project. A Contract agreement was made between NEA and East Management & Engineering Service Pvt. Ltd., Satdobato, Lalitpur, Nepal for Core Drilling. A total of 370 m of core drilling has been completed as of 12 July 2017. The Contract Agreement was made between NEA and Himalaya Construction/ Waiba Infratech JV for Construction of Test Adit on 15 June, 2017 and the Contractor has been mobilized in project site.

The Project is in process of establishing its site office. The project and District Development Committee, Khotang have signed an agreement for renting land and buildings owned by DDC, Khotang located in Lamidada Rural Municipality near Lamidada airport for ten years. The Project has completed the preliminary activities such as supply of drinking water, site clearance, fencing around the plot and the rehabilitation of existing buildings is in progress. The Progress of Updated Feasibility Study achieved till March 2017 is 24%. To summarize the activities carried out till date, the updated feasibility study and detailed design of the project is taking a good pace and the Project team is working at its best to complete the planned works in time.

UPPER ARUN HYDROELECTRIC PROJECT

Upper Arun Hydroelectric Project (UAHEP) is located in Sankhuwasabha District about 700 km east of Kathmandu. The proposed dam site is located in a narrow gorge about 350 m upstream of the confluence with Chepuwa Khola near about to Chepuwa Village. The powerhouse lies at Sibrung in Hatiya Village, nearby the confluence of Arun River with Leksuwa Khola. The power house lies at the distance of about 32 km from Tumlingtar, the nearest air strip from the project site. An access road with total length of 24 km will be required to reach headwork site along the left bank of Arun River. The access road will consist of 1.8 km long road tunnel. The power from UAHEP is proposed to be evacuated to national grid from Tumlingtar Hub through 49 km long double circuit 220 kV transmission line.

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.



The Arun River is bestowed with high firm flow and steep river gradient making very favorable for the hydropower development. The UAHEP, which lies on the upper reach of the Arun River, is one of the most attractive projects in the Eastern Development Region of Nepal. Feasibility study of this project was carried out by NEA in 1991. Now the NEA has given priority for the development of this project as to augment the energy generation capability of the integrated Nepal Power System due to its relatively low cost of generation and availability of abundant firm energy.

Based on the feasibility study carried out on 1991, the installed capacity of Peaking Run-off the River type UAHEP is 335 MW. The design discharge of the project is 78.8 m3/sec (Q72) and generates the firm energy of 2050 GWh per annum. As per the FS report 1991, the project consists of 7.8 km long headrace tunnel, weir with three gated spillway, underground desanding basin, 18 m diameter surge shaft with 60 m long penstock tunnel, 454 m high, 2.8 m diameter pressure shaft and underground powerhouse with 4 no. of pelton turbine-generator units. The project has design head of 492 m.

Review Study of this project was carried out by NEA in the year 2011. The project cost is revised based on prevailing unit rate and road facilities which is already built up to Num, near the dam site of Arun 3 HEP. The Study reconfirmed the attractiveness of the project.

The Cabinet of Nepal Government, on 2069/11/04, had granted permission to Nepal Electricity Authority to implement UAHEP under the ownership of the GoN. Hence, the issuance of the Survey License to NEA for the Study of UAHEP was not needed.

Installed capacity of Ikhuwa Khola Hydropower Project (IKHPP) is proposed to be 30 MW as per the feasibility study conducted by Department of Electricity.

After the construction of the IKHPP, the ownership of this project is proposed to be transferred (fully or partially) to the local people based on their financing capacity for the operation of the project. NEA Board recently decided to develop both the projects under a Public Company for which Upper Arun Hydroelectric Limited has been formed by the Board.

As preparation of the projects for implementation, the study of UAHEP & IKHPP (Detailed Engineering design and Environmental and Social Study) is being carried out with the financial assistance of World Bank (WB) under Power Sector Reform and Sustainable Hydropower Development Project (PSRSHDP). The World Bank has provided a credit of US$ 20 Million on the proposed credit number 5728- NP to the Government of Nepal. The Engineering design and Construction Supervision of the Access Road for the UAHEP is being carried out with the funding of Government of Nepal.

Upper Arun Hydroelectric Limited (UAHEL) was registered in Company Registrar Office on 12 Falgun 2073.

The following is the summary of the activities performed in the FY 2073/74:

- Preparation of Project for construction viz. Detailed Engineering Design and Environments and Social Study of the Project and its components. This includes:
- Procurement of Consulting Services for Detail Engineering Design and preparation of Bidding Documents of UAHEP and IKHPP
  - Evaluation of EOIs for procurement of Consulting Services for the assignment for short listing of Consulting Firms.
  - Preparation and issuance of Request for Proposal (RFP), amendments and clarifications there on and Revision of Cost Estimate for the assignment. Evaluation of RFPs is ongoing.
- Procurement of Consulting Services for Environmental and Social Impact Assessment (ESIA), Cumulative Impact Assessment (CIA) and Social Planning Studies (SPS) for UAHEP and IKHPP
- Procurement of Consulting Services for Detail Engineering Design and Constructing Supervision of Access Road for UAHEP and IKHPP.
- Other Activities are as follows:
  - Formation of Project Management Unit (PMU), for overall managements of Projects under Component A for PSRSHDP.
  - Preparation of Procurement Plan for different components of PSRSHDP.
  - Preliminary preparation work for the land acquisition works for the construction of Camp Facilities. Initiating officer for the land acquisition has been approved by the Ministry of Energy.
  - Submission of TOR and Cost Estimate for Dam Safety Panel of Experts (DSPOE) to WB and preparation of draft TOR and Cost Estimate for Environmental and Social Panel of Experts (ESPOE).
  - Application for Survey and Generation Licenses of the Projects UAHEP and IKHPP under the ownership of UAHEL Company.

UPPER MODI 'A' & UPPER MODI HYDROELECTRIC PROJECT

Upper Modi 'A' Hydroelectric Project (UMAHEP) was identified during 1997 and the Feasibility study of this project was completed in the year 2000. The Feasibility study was revised and updated in the year 2012. The project is designed to generate 42MW. Environmental Impact Assessment (EIA) of the project was approved in 2004. Additional study regarding Biological part was approved in

Modikhola at headwork site

2014. The generation license for UMAHEP has been acquired in 2015.

The Upper Modi Hydroelectric Project (UMHEP) was identified and brought to preliminary study in 1990. The feasibility study of Upper Modi HEP was carried out in 1994. The EIA study of UMHEP with installed capacity of 14 MW with separate headwork was approved in the year 2002. Now, the project is conceptualized to be developed as cascade project of UMAHEP with installed capacity 18.2 MW. To address this change, supplementary EIA study has been initiated.

This project is located about 18 km from Nayapul. About 14 km of the access road from Nayapul to Kyumi has been constructed by the local authority. Remaining 4 km of additional road from Kyumi is required to access headwork site of UMAHEP. About one km of road is required to access this area. The P/H of UMHEP is located at Birethati which is just upstream of the bridge over Modikhola.

Power from these projects is proposed to be evacuated to the national grid from New Modi Substation through 7.6 km long Modi-Lekhnath 132 kV transmission line. Free circuit of the existing double circuit 132 kV Modi- Pokhara transmission line from Nayapul will be used to connect the power to proposed New Modi substation.

At present, the project is proposed to be developed in the Engineering, Procurement and Construction (EPC) Model. Evaluation of Expression of Interest (EOI) for the selection of International Consultant for Detailed Engineering Design and EPC Tender document preparation has been completed. The main committee with the assistance of sub-committee has evaluated Expression of Interest and short-listed 5 of the Consulting firms for RFP. The last date for submission of technical and financial proposal was on July 18, 2017. The Evaluation based on technical and financial proposal will be carried out in this fiscal year. A Consultant is expected to be in place by the end of October 2017.

NEA has also initiated land acquisition process for the construction of UMAHEP and UMHEP. In the fiscal year 2073/074 BS, land acquisition process for camp site and powerhouse was carried out. It includes about 157 Ropani of private land. Process for the acquisition of this portion of land is in the final stage of completion.

Detailed Engineering Design and preparation of EPC Tender Document is scheduled to be completed in ten (10) month.

PROJECT DEVELOPMENT DEPARTMENT

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

Tamakoshi V Hydroelectric Project

The Tamakoshi-V Hydropower Project is a cascade development of the Upper Tamakoshi Hydroelectric Project (UTHEP) with tandem operation. It is located approximately 170 km north east of Kathmandu, the capital of Nepal and approximately 40 km away from the district head-quarter of Dolkha District - Charikot Bazaar. The road connecting Singate Bazaar and Lamabagar for the construction of UTHEP passes through both powerhouse and headwork sites of this project. The feasibility study of the Project was carried out by NEA in fiscal year 2010/11. All the structures of this project are located on the right bank of Tamakoshi River. The project being a cascade development to UTHEP, it does not need separate headwork. Tamakoshi-V feeds on the discharge from the tailrace of the UTHEP through an underground inter connection arrangement; the water is conveyed to the headrace tunnel of the Project. An underground powerhouse is proposed at Suri Dovan approximately 8.2 km downstream from the interconnection. The design discharge of the project is 66 m3/sec with an installed capacity of 95 MW.

The general arrangement of the project comprises of underground inter connection arrangement of headrace tunnel with the tailrace tunnel of UTHEP. The interconnection system consists of connecting tunnel, a head pond required to maintain suction head before the pressurized headrace tunnel entrance, spillway and spillway tunnel. Discharge from the tailrace of UTHEP is diverted through an interconnection system and conveyed to 8.20 km long concrete lined headrace tunnel, 122.38 m high drop shaft, 41.44 m long pressure tunnel and to the underground powerhouse containing four number of vertical axis Francis turbine for the generation of 95 MW electricity equivalent to 483.12 GWh of energy (without Rolwaling). Tailrace tunnel of 487 m will release the water into the Tamakoshi River itself after the generation of power. The outlet of the tailrace is approximately 0.6 km downstream from the confluence of Tamakoshi River and Khari Khola at Suri Dovan. With the availability of the infrastructure developed for the UTHEP particularly the access road and transmission line and also being the cascade project of UTHEP, Tamakoshi V HEP can be developed along with UTHEP.

For the speedy implementation of Tamakoshi V, NEA has initiated the construction of interconnection system between the Upper Tamakoshi tailrace tunnel and headrace tunnel

Interconnection Tunnel being constructed

Power House Area

of Tamakoshi-V in this fiscal year system through UTHEP using the Contractor working for the UTHEP with the arrangement of work variation of UTHEP. Environmental Impact Assessment (EIA) of the project has already been approved by the Ministry of population and Environment on 2073/03/08. The Detailed Engineering Design and Tender Document Preparation Work of this project is being carried out thorough the international Consultant- Lahemyer International GmbH. Land acquisition process is also being carried out and is planned to complete within this fiscal year. The Generation license of the Project was obtained from the Department of Electricity Department (DoED) with revised license area on 2074/2/09 having validity date up to 2109/02/08. NEA Management has decided to develop Tamakohsi-V HEP in a company model. Under this modality, Tamakoshi Jalvidut Company Limited has been registered with the Company Registration Office on 20th Falgun 2073. Transfer of Tamakoshi- V Generation License from NEA to Tamakoshi Jalvidut Company Limited is under the process.

Andhikhola Storage Hydroelectric Project

NEA is carrying out Updated Feasibility study of Andhikhola Storage Hydroelectric Project (180 MW) which is situated in Syangja district. The existing Siddhartha (Pokhara-Butwal) 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 1.6 km upstream of Kaligandaki and Andhikhola rivers confluence whereas the proposed Powerhouse site is located 12 km downstream of Kali Gandaki 'A' (KGA) Powerhouse site.

During the present study the crest level of dam has been proposed at 710 masl so that Galyan Bazar on the highway will be protected. A semi surface powerhouse has been proposed on the left bank instead of the underground powerhouse proposed in earlier study. New surge shaft and vertical drop shaft has been proposed to suit the site condition. With the change in project layout, the field investigation works such as Geological drilling, Geological survey mapping, ERT survey, Topo Survey work have been carried out. The EIA study of this project has already been initiated. This study shows that the existing BPC owned Andhikhola HEP (9.4 MW) project will be inundated by the reservoir after construction. So far, the study shows that this project can generate about 619 GWh of total energy with 8 hour peak in dry season and 3 hour peak in wet season.

Andhi Khola Storage HEP Dam Site

Major structures of this storage project comprises of a 185 m high rockfill dam, sloping intake, 3.4 km long headrace tunnel, surge shaft, 216 m high dropt shaft, pressure tunnel, semi-surface powerhouse with three turbine-generator units and ancillary facilities. Concrete faced rockfill dam has also been proposed as an alternative. This project can also be developed as a pumped

storage scheme with additional generation of 3 hours in the dry season.

Due to easy access for construction, favorable location and minimum environmental impact, this project could be instrumental in augmenting the much needed dry season power/energy demand. Andhikhola Power Company Ltd. has been established as a subsidiary company of NEA to execute this project. In this fiscal year 2074/075 additional investigation and design work will be carried out. Furthermore, EOI and RFP will be called from International Consultant for Detail engineering design and Tender document preparation of this project.

Uttar Ganga Storage Hydroelectric Project

Uttar Ganga Storage Hydroelectric Project is one of promising potential projects, for which NEA has proposed to initiate the feasibility study in the fiscal year 2067/68 (2011/12 AD). The proposed project is located about 398 km west of Kathmandu in Baglung district of Dhaulagiri Zone in Western Development Region of Nepal (currently in Province No. 4). The dam site is located at Gaba village of Nisi VDC on Uttarganga River. The project site is accessible from the Baglung –Burtibang road. The access road to the powerhouse site forms a part of the Pushpalal Mid-Hill highway between Burtibang and Rukum and is already motorable during dry season. About 48 km of new road is to be opened and about 27 km of road upgrading is required to access all project components in all season. The survey license has been upgraded to conduct feasibility study for 828 MW in FY 2073/74 (2016/17 AD). The dam and reservoir area of the project are located within Dhorpatan Hunting Reserve, approval was received from Ministry of Forest and Soil Conservation for conducting Feasibility Study for 828 MW in FY 2072/73 (2016/17 AD).

Major components of the project are 200 m high rockfill dam with central clay core surrounded with filter layers, sloping type intake on the left bank of river, 9575 m long headrace tunnel, circular restricted orifice surge shaft, 229 m high drop shaft, two underground powerhouses, tailrace tunnel and ancillary facilities.

The installed capacity of the project has been optimized as 821 MW (414MW + 404MW) on the basis of 5 to 12 hours operation in dry season (November-April). The annual energy generation from the project after outage and losses will be 1299.36 GWh. Energy generated from the project will be evacuated to the INPS at the proposed Butwal sub-station through 105 km long 400kV transmission line. Alternative installed capacity based on 2 hours operation per day in wet season

Dam Site of UGHEP

is also studied, which yielded an installed capacity of 635 MW and annual energy generation of 1310.24 GWh.

During the fiscal year 2073/74, geological drilling is being carried out together with EIA study.

General Layout of Project, conceptual design of Headworks, headrace tunnel, drop shaft, powerhouse and tailrace has also been prepared. Cost estimate, construction planning and project economic study will be the carried out in the next fiscal year.

Uttarganga Power Company Ltd. has been established which is wholly owned subsidiary Company of NEA. It is envisaged that DPR level design will be carried out through international Consultants in the coming fiscal year. This high head storage project will be very much instrumental in generating the much needed peak power/energy in the Integrated Nepal Power System.

Tamor Storage Hydroelectric Project

Tamor Storage Hydroelectric Project (TSHEP) was identified during the Koshi River Basin Master Plan Study, 1985. It is located in the Eastern Region, bordering Teharathum, Taplejung and Panchthar District of Koshi and Mechi zone. The Dam site lies in Okhere and Syangrumba VDC of Teherathum and Pancthar District.

Project site is about 650 km east of Kathmandu. Myanglung Bazzar of Tehrathum district is the nearest existing road head, which is about 20 km from dam site. Similarly, the project can be accessed from Yashok Bazzar of Pachthar district via about 20 km long road.

TSHEP is a reservoir type of project with seasonal storage and suitably located near major load center of Eastern Region, this is one of the most promising storage project being studied by Nepal Electricity Authority (NEA). Tamor Power Company

Project Area

Limited has been established as a subsidiary company of NEA to execute this project

DoED had issued the license of 200 MW with FSL of 450 masl.

The project optimization study shows that the project is optimum at FSL of 550 masl with an installed capacity of 762 MW. NEA has applied for the amendment in license boundary for further study of the project at optimum capacity. As a part of Feasibility Study, Geological and Geotechnical investigation, Environmental Impact Assessment (EIA) studies are being carried out by Soil Rock and Concrete Lab (SRCL) and Environmental and Social Study Department (ESSD) of NEA. The conceptual layout design and costing of the project has been completed during this fiscal year. The estimated total cost of the project is about 1,234.966 Million US dollar at 2016/17 price level.

The average annual energy is 1,111.82 GWh in dry season and 1,872.21 GWh in the wet season. Even with the deduction of energy of the affected projects (Kabeli 'A' & Hewa) the net energy generation of TSHEP at this installed capacity will be about 1,077.93 GWh in dry season and 1,638.51 GWh in wet season. The dry season energy is about 37% of total average annual energy.

Geological and Geotechnical investigation includes ERT, Surface Geological mapping of project area, Construction material survey, Drilling works and

preliminary support design. Core drilling of 575 m out of 800 m has been completed so far. The EIA study is expected to be complete in the coming fiscal year.

The general arrangement of the project consists of a 210 m high rock fill dam with gated spillway on the right bank of the river. The conveyance system consists of three individual intake followed by 965 m long horizontal headrace tunnel, 132 m long steel lined drop shaft followed by 135 m long penstock to the underground powerhouse consisting of six vertical axis Francis turbine-generator units of 127 MW capacity each. The underground powerhouse cavern and transformer cavern are located in the left bank. The generated power will be evacuated by 75 km long 400 kV double circuit transmission line.

PDD is preparing documents for selection of Consultant for Detail Engineering Design and Preparation of Tender Document. It is expected to conclude the selection of Consultant in the coming fiscal year with technical assistance from ADB.

Chainpur Seti Hydroelectric Project

Chainpur Seti Hydroelectric Project (CSHEP), a RoR scheme, identified in the year 2015 by Project Development Department is being studied for feasibility. The project features includes headworks, desanding basin, headrace tunnel, surge shaft, steel lined pressure shaft, underground powerhouse and tailrace structures. Installed capacity of the project would be 210 MW at Q40% probability of exceedence. The power generated from the project shall be connected to proposed 220 kV Attaria sub-station.

The Project site is 16 km from nearest road head. The GoN has been constructing a highway which links the district headquarter Chainpur to the Nepal-China Border.

During the fiscal year 2073/74, the project completed additional topographic survey,

Headworks Area of
Chainpur Seti Hydroelectric Project

Geological mapping and geological investigation (Phase I), water discharge measurement and continuation of water level recording at project site while the possibility for peaking facility for the project is under consideration. Similarly, project optimization studies, alternative layout studies and electromechanical studies have been conducted in this fiscal year.

Other Activities

PDD has been carrying out various activities which have been instrumental in developing the institutional strength of Nepal Electricity Authority in the field of consulting services. The following are the few of the activities of PDD carried out during the fiscal year 2073/74.

1. Trishuli Hydropower Station Rehabilitation Project

Trishuli Hydropower Station was upgraded to 24 MW in 1995. This is a peaking run-of-river hydropower station with annual design generation of 163 GWh per annum. Due to problems with Desander, Balancing reservoir and other issues this plant is unable to operate at full daily peaking mode at present. It has been operating only about 2/3 of its design capacity because of the loss of storage in the balancing reservoir and insufficiency of desanding basin capacity.

Sediment Deposition in the Reservoir observed during emptying

Project Development Department has been undertaking further rehabilitation of the project so as to enable peaking generation at full rated capacity. It is expected that this study will be completed by the end of 2017.

2. Construction Supervision of Chameliya Hydroelectric Project

SHAH, SILT and ICON JV in association with PDD has been conducting the construction supervision of Chameliya Hydroelectric Project. The project is expected to be completed in year 2017.

Construction of Corporate Office Building Project

NEA has applied for building permit for 10 storey Corporate office that shall have additional 2 storey underground parking area. ESSD, NEA is currently undertaking IEE of the building which in the first stage of construction will be just below 50 m height. A stakeholder meet was made as part of the building permit process and it is expected that tendering for the construction will be made before December 2017.

NEA planned to establish a corporate office, commercial complex and business complex at 26 ropanis land at Durbarmarg, Kathmandu. A master plan was developed in 1989. Due to enormous

change in building technology, evolution in latest office design concept and changed scenario in commercial building requirements, NEA modified the existing master plan. NEA has selected the joint venture consortium of "BDA nepal (P.) Ltd., Innovative CREATEERS Architects & Engineers Pvt. Ltd. and MRB Associates." The detail design of Corporate Office Building was completed in FY 2070/71 by the Consultant.

The project consists approximately rectangular building of 40 m x 29 m (Gross floor area just above 1100 m2 at the basement level). The building will ultimately have 16 floor + 2 attic floor above ground, double basement for parking. (Floor area approximately 16,000 Sqm). In this fiscal year 2073/74 the projects Initial Environmental

Examination studies have been started and the project construction is expected to be started as soon as the approval from the metropolitan city office is obtained.

3. Identification of New Projects for study:

PDD has been involved in the identification of new projects for further studies in the country. In this context few projects were identified among which Manang Chame Storage Hydroelectric Project (MCSHEP) with initially estimated capacity of 1700MW has been identified for further studies. Application has been filed for survey license of the project lately in this fiscal year.

ENVIRONMENT AND SOCIAL STUDIES DEPARTMENT

Environment and Social Studies Department (ESSD) is one of the integral departments of Engineering Service Directorate of NEA. This department executes the activities related to environmental and social aspects of hydropower and transmission line projects 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 2016/17, ESSD was actively engaged in environment and social studies, monitoring and protection of the environment. The department has successfully completed and get clearance from concerned ministries for EIA of 2 Transmission Line (TL) projects, IEE of 7 projects, Scoping and Terms of Reference (SD/ToR) of 1 Project and IEE ToR of 2 projects. The environmental studies conducted by ESSD in fiscal year 2016/2017 and their status are as follows:

1. Study Reports approved by Concerned Ministries

a. Ministry of Population and Environment

i. EIA of Garjyang-Khimti 132kV TL Project

ii. EIA of New Modi-Lekhnath 132kV TL Project

iii. SD/ToR of Marsyangdi Corridor (Manang-Udipur) 220kV TL Project

b. Ministry of Energy

i. IEE of Koshi Corridor (Basantapur-Change) TL Project and Kaligandaki Corridor (Kushma-New Butwal) at 220kV, Burtibang-Paudi Amrai-Tamghas-Sandhikharka-Gorusinghe, Raxaul-Parwanipur, Kusaha-Kataiya, Kusaha-Biratnagar at 132kV, Matatirtha-Naubise 33kV and ToR of Dordi Corridor 132kV and Butwal (Gorusinghe)-Lumbini 132kV TL Project.

2. Study Completed by ESSD

a. EIA Completed Projects

i. Tanahu Hydroelectric Project (140MW)-Supplementary EIA

b. IEE Completed Projects

i. Lekhnath-Damauli 220kV TL Project

ii. Dordi Corridor 132kV TL Project

iii. Butwal (Gorusinghe)-Lumbini 132kV TL Project

c. ToR Completed Projects

i. Kaligandaki Corridor (New Butwal-Bardghat) 220kV TL Project

ii. Grid Tied Solar Power Project (GTSPP) , Block No. 1, 2,3,4 in Nuwakot with a capacity of 25 MW

In addition, ESSD has successfully completed monitoring and mitigation works of Kaligandaki A HEP Rehabilitation Project. The department has signed Memorandum of Understanding (MoU) for EIA of three storage projects (Uttarganga Storage HEP; Tamor Storage HEP and Andhi Khola Storage HEP) and Access Road of Upper Arun HEP. In addition, MoU for supplementary EIA of Upper Modi HEP and IEE of NEA corporate Office Building was also signed in June, 2017. Desk study and field preparation are in progress.

ESSD has been undertaking environmental monitoring and mitigation of three under-construction hydroelectric projects (14MW to 60MW) and eight under-construction transmission line projects ranging 132kV to 400kV by establishing Environmental and Social Management Unit (ESMU) at project site. Under mitigation and enhancement programs, different activities were conducted in this FY 2016/17 and their status is as follows;

Kaligandaki A HEP Rehabilitation Project (144MW)

The completion report of Environmental and Social Mitigation and Monitoring works of the project was submitted on June 27, 2017. The major activities conducted under this project were distribution of 4 fishing boats, 16 paddles and 16 life jackets to Bote community, five days Pickle Making Training (April 2-6, 2017) to women headed PAFs, three day

Participants of 3 days Fisheries Training

Participants of 3 months Tailoring Training

fisheries training for 17 resettled Bote families of Andhimuhan and three months Tailoring Training (March 18 to June 15, 2017) to 10 females PAFs. The department provides 12 day Microfinance Training (April 7-20, 2017) to eight females PAFs and prepare Operation Manual for Steamer Boat Operation in Kaligandaki reservoir in consultation with concerned stakeholders.

Upper Trishuli 3 "A" HEP (60 MW)

A 15-days Vegetable Farming Training was conducted at two places for the PAFs. A total of 60 PAFs were trained under this program from Nov. 20 to Dec. 4, 2016 at Thulogaun-8, Simle, Rasuwa district and Nov 21 to Dec. 5, 2016 at Manakamana VDC-9, Nuwakot district. ESSD conducted four-days (December 2016) Buffer Zone Forest Conservation and Wildlife Management training at three places (Ramche-3, Ramche-8 and Thulogaun-9) of Rasuwa and one place (Manakamana-9) of Nuwakot benefitting 100 people. The program was extended in January, 2017 at two places of Laharepauwa of Rasuwa district and 53 local people participated in training.

Kulekhani III HEP (14 MW)

The department is conducting site based environmental monitoring and implementation of mitigation works of the project. The major works performed in fiscal year 2016/2017 were three-days

(October 25-27, 2016) Non timber forest products (NTFP) training to 20 participants, 1 month driving training to 35 participants; 3 months tailoring to 15 women participants and 2 months wiring training to 15 PAFs and local people.

Chameliya HEP (30MW) and Balanch Attariya 132kV TL Project

The department is conducting site based environmental monitoring and implementation of mitigation works of the Chameliya HEP since 2008 by establishing unit office at the project site. Besides regular monitoring the major work performed under this project was implementation of 390 hours (2months) welding and electrical/ house wiring training to 30 PAFs as per the CTEVT standard and distribution of vegetable seeds to 200 PAFs.

In Balach Attariya 132kV transmission compensatory plantation work was conducted at different location in project area and replacement plantation was done based on the mortality. Besides this Agricultural Productivity Intensification Training (Sept. 29 to Dec. 17, 2016) was conducted at five different places of the project area providing benefits to 150 PAFs.

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, Bardibash and Nijgadh. ESSD has prepared and submitted quarterly environment and social management report of the project to World Bank and Project office. The major works performed in fiscal year were implementation of One-day Community Health and Safety Awareness Program at 8 different locations of five project affected districts benefitting to 200 people, one-day hot spot awareness training to project workers at Nijgad of Bara and Paurahi of Rautahat covering 57 workers. The department organized Health and Safety awareness program for project workers at Dhalkebar substation, Jamunibas of Dhanusha and Singoul of Bara. A total of 150 project workers benefitted from the program and their health checkup was also done by the medical officer.

The other work performed by the department were implementation of 10 Wildlife Conservation Awareness Training one each in project districts covering 260 representative of affected Community Forest Users Group (CFUGs), 3 days capacity building training to 90 representatives of CFUGs and 3 days Forest Management and Conservation Training to 32 members of CFUGs from Mahottari and Sarlahi districts.

Under the community support program, the construction of Nagar Dihibar Temple at Dhalkebar and boundary wall of Yuba Barsha Primary School has been completed. Dihibar temple (Sthaniya Gram Devata) construction at Bhulke of Siraha is under construction. Water pump and other accessories in Harmanadi, Hetauda, and Makwanpur for drinking water support were distributed. Vulnerable Community Development Plan (VCDP) and Updated Resettlement Action Plan (RAP) prepared by the department is cleared by the World Bank and approved documents were kept for public review at NEA website and World Bank Infoshop.

Plant nursery for compensatory plantation has been established at Dhalkebar which consist about 150000 saplings of different plant species and plantation work is scheduled in July 2017. Stakeholder consultation is continued in project area and altogether 11 consultations with participation of 280 people were done in five project districts from January to May.

Hetauda-Bharatpur 220kV TL Project

The department is implementing community support program in local participation. Relocation of Bag Devi temple was completed in 30% contribution of the local community.

The other works performed during the period were two livestock training of 15 days each to 39 PAFs, three months tailoring training to 42 PAFs, two months training on electrician, plumbing, mobile repairing and motor rewinding to 40, 21, 40 and 12 peoples of PAFs respectively. In addition, 3 days health and safety awareness program was conducted at New Bharatpur substation for 25 labor force.

Bharatpur-Bardghat 220kV TL Project

The department is implementing community support program as per social safeguard documents prepared for the project. Construction of 10 houses for Mushar community is in progress. Hoarding boards having informative and warning sign were affixed at 24 different places along the major settlements and villages located close to forest area.

Kabeli Corridor 132kV TL Project

The department has successfully completed mitigation measures and monitoring works of the project within the MoU period. In fiscal year2016/2017 the department conducted one-day Biodiversity Awareness Program in Bajendrakali Lower Secondary School and Siddhakali Secondary School of Panchthar and Janaki Secondary School of Ilam districts. The programs aims to create awareness through school children and altogether 330 students were benefitted from the programs.

Biodiversity Conservation Program
at Janaki S. School, Ilam

Compensatory plantation of 100000 saplings was done in project area. Three plant nurseries were established in Ilam, Jhapa and Panchthar districts and replacement plantation was done based on the mortality in fiscal year 2016/2017 and the management of plantation site is continued by mobilizing CFUGs. Skill training as per the CTEVT standard course was given to 100 PAFs.

Dumre–Damauli 132 kV TL Project

Construction phase environmental and social monitoring and major mitigation works were completed in fiscal year 2016/2017. ESSD conducted 5 days (Nov. 20 to 24, 2016) Agricultural Intensification Training to 23 PAFs.

Bhulbhule-Middle Marsyangdi 132kV TL Project

Under the skill development program, House Wiring Training of 390 hours (CTEVT standard) was provided to 18 participants from project affected families of Lamjung district. Preparatory works for the compensatory plantation completed and plantation work will be conducted soon.

SASEC Projects:

Under SASEC, currently three projects are under construction which include Kali Gandaki corridor (Dana-Kusma) 220kV TL Project, Marsyangdi-Kathmandu 220kV TL Project and Samundratar-Trishuli 3B Hub 132kV TL Project. ESSD has been carrying out environment and social monitoring of these projects by establishing the site based Environment and Social Management Units (ESMUs). The monitoring program will be continued till November, 2020. Monthly Environmental and Social Monitoring Report for the period of June, 2017 has been prepared and submitted to the Project Management Directorate (PMD) office. In addition following activities were carried out in these projects.

Kaligandaki Corridor (Dana-Kushma) 220kV TL Project

The ESMU of the project is established at Galeshwor of Myagdi. Two full time safeguard (environmental and social) officers are deployed for day-to-day monitoring. The department conducted one day Social/Community Awareness Program at 4

Public consultation with Dalit Women in Danda Gau, Myagdi

places of Parbat and 6 places of Myagdi district in the month of April and May, 2017 where a total of 444 locals participated. Similarly, Informative and warning signs (hoarding board) were placed at 28 different locations of Parbat and Myagdi districts.

Marsyangdi-Kathmandu 220 kV TL Project

The ESMU for the project is established at Aanbu-Khaireni, Tanahun and two safeguard officer are fully deputed at site. School support program was conducted by providing educational materials to Janakalyan Aadharbhut School at Thakre, Dhading.

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

Soil, Rock and Concrete Laboratory

Soil, Rock and Concrete Laboratory (SRCL) established and developing as Geotechnical Department is under the Engineering Services Directorate of Nepal Electricity Authority. It provides services in geological and geotechnical investigations, in-situ and laboratory testing for the different phases of a hydropower project development. It provides services like geological mapping, various types of geophysical surveys, core drilling and construction material investigation at different levels to the different departments of NEA and the private sector. In the field of soil and rock engineering, it also provides services of carrying out in-situ tests and laboratory tests.

Following are the major works executed by SRCL in fiscal year 2073/74

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

This project is being developed by Tanahu Hydropower Limited; a subsidiary company of Nepal Electricity Authority (formally Upper Seti Hydroelectric Project) in Tanahu district. Additional Geological and geotechnical investigation works in this fiscal year including Core drilling in 3 - dimensional direction for the rock mechanical test at the Test adit and test chamber at the powerhouse site of the project.

2) Geotechnical and Geophysical investigation works of Andhikhola Storage Hydroelectric Project:

Geological and Geotechnical investigation works includes regional geological mapping of the whole reservoir and project area, detail engineering geological mapping, 2D-ERT (2000 m) and Core drilling (90 m) at the Surge shaft and powerhouse site of the project.

3) Geological and geotechnical investigation of Uttarganga Storage Hydropower Project:

The geotechnical investigation works at the Dam site of the project is at completion stage. Additional geotechnical investigation (phase II) include core drilling works at Dam Axis of the project and it is in progress.

4) Geological and geotechnical investigation works of Tamor Storage Hydropower Project:

The geotechnical investigation works (Phase II) includes core drilling at the dam site, Intake area and Powerhouse area of the project. Core drilling works at the last hole (powerhouse area) is in progress.

5) Geological and geotechnical investigation works of Upper Tamakoshi Hydroelectric Project:

Geotechnical investigation works at left bank slope of the dam includes exploratory borehole drilling of 201.70 m has been completed in this fiscal year.

6) Geological and geotechnical investigation works of Chainpur-Seti Hydroelectric Project:

Geological and Geotechnical investigation works includes regional geological mapping and detail engineering geological mapping of the project area has been completed in this fiscal year.

7) Geological and geotechnical investigation works of Kaligandaki 'A' Hydropower Plant Rehabilitation Project:

Geotechnical investigation works includes seismic refraction survey and borehole drilling at the left bank slope of dam site for geotechnical instrumentation works (total of 530 m) has been completed in this fiscal year.

8) Geological and geotechnical investigation works at new building sites of Nepal Redcross Society:

Geotechnical study at the proposed building site at the 7 district headquarters of Nepal Redcross Society has been completed in the fiscal year.

9) Geological and geotechnical investigation works of 'Chilime Tower' construction site at Dhumbarahi:

Geotechnical investigation works of the proposed Chilime Tower construction site at Dhumbarahi includes exploratory core drilling, in-situ test and bearing capacity calculation for foundation design which has been completed in this fiscal year.

10) Geotechnical and Geophysical investigation works of Upper Modi and Upper Modi 'A' Hydroelectric Project:

Geological and Geotechnical investigation works includes detail engineering geological mapping, 2D-ERT (2800 m) and Core drilling (360 m) at the Dam site, Surge shaft and powerhouse site of these two projects. About 75% of the investigation works has been completed and remaining works are in progress at site.

11) Geotechnical investigation works at central workshop, Hetauda:

Geotechnical investigation works which includes test pit excavations, SPT and laboratory tests for foundation design works of proposed building has been completed in this fiscal year.

Laboratory Works:

SRCL provides laboratory services of carrying out in-situ tests and laboratory tests including construction material survey/quarry site investigations of various hydroelectric project and field geotechnical investigation works (SPT/DCPT in test pit/borehole) to determine the bearing capacity for structural design purposes. Following are the major works carried out in this fiscal year 2073/74.

- Construction materials survey of Upper Modi & Upper Modi 'A' Hydroelectric Project, Kaski.
- Laboratory test works on construction material samples for Middle Bhotekoshi Hydroelectric Project, Sindhupalchok (Guangxi Hydroelectric Construction Bureau, Management Office)
- Laboratory test works on construction material

Core drilling at Dam site of Tamor Storage Hydroelectric Project.

samples for Upper Jhimruk Hydroelectric Project, Pyuhan (Smart Earthworks Engineering Consultancy Pvt. Ltd.)

- Laboratory test works on construction material samples for Upper Bhurungi Khola Hydroelectric Project, Kaski (Niltara W & E Pvt. Ltd., Kathmandu.)
- Laboratory test works on core samples (Uniaxial Compressive Strength, Point Load test, densities etc.) of Shivam Cement factory construction site at Nawalparasi (Nepal Donghua Construction Engineering Co. Ltd.)
- Point load tests of National Society for Earthquake Technology Nepal (NCET)
- Compression tests on Compressed Stabilized Earth Brick of Build Up Nepal, Lalitpur
- Geotechnical Investigation Works of Chapagaon Sub-distribution Centre, Lalitpur Distribution Centre, NEA. Lalitpur.
- Geotechnical Investigation Works of Central Workshop, NEA. Hetauda, for Power Transformer Laboratory.
- Geotechnical Investigation Works of proposed district office buildings of Dhading, Gorkha, Nuwakot, Makwanpur and Bhaktapur districts (Nepal Red cross Society, National Headquarters, Earthquake Resistance Programme), Kalimati, Kathmandu.
- Geotechnical Investigation Works of proposed health post building at Gothatar, Kageshwori - Manohara Municipality (Nepal Redcross Society, Kathmandu District Chapter.
- In-situ field density tests including proctor and laboratory testing of Nepal Army Headquarter Building Project at Bhadrakali, Kathmandu.
- Compressive Strength test works on concrete of Druk Pema Karpo Society, Ramkot, Kathmandu.
- Various in-situ SPT/DCPT tests and laboratory tests are performed on soil, gravel, sand, core, rock and concrete samples supplied by different private client/parties.

Electromechanical Design Division

Established under Engineering Services Directorate, the Electromechanical Design Division has been providing technical supports for all electro-mechanical issues associated with its own concrete pole plants as well as transformer workshop. The issues range from the design of electro-mechanical and hydro-mechanical equipment of hydropower projects under various stages of study as well as electrical installations for various projects. Since last year it has been fully involved for the establishment of a new concrete pole plant in Tankisinuwari, Morang. Apart from the design issues, this division has been monitoring the overall functioning of Central Workshop in Hetauda which is involved in repair, maintenance and testing 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 2074/075, this division is continuing the establishment of a new concrete pole plant in Tankisinuwari, Morang.

Central Workshop, Hetauda

Transformer Maintenance & Testing in Progress

Established in 2055 BS and located at Bhairav Road, Hetauda-5, Makawanpur, the Central Workshop being an entity under Engineering Services Directorate, has been contributing to NEA with its purpose of repairing Distribution and Power transformers of Regional Offices as well as transmission grid and power plants under NEA, Power transformers of various Hydroelectric Plants, testing of transformers and providing rental services of its available heavy equipment. Considering the increasing demand of electricity in Nepal and contributing to maintain best quality of supply, transformer itself being a major component of power system, the workshop has been striving to its best, using its available resources to meet time bound repair and testing services.

The achievements of the workshop in the last three fiscal years are tabulated below:

S.N.	Description	F.Y. 2071/072	F.Y. 2072/073	F.Y. 2073/074
1	Distribution Transformer Repair	363	433	636
2	Power Transformer Repair	12	10	13
3	Transformer Testing	1909	2448	4041
4	Heavy Equipment Rent (in thousands NRs.)	4543.08	5937.59	11125.05
5	Turnover (in thousands NRs.)	38555.92	49760.24	85205.45

Major Accomplishment of FY 2073/074

- Modern new transformer testing lab was established with testing yard.
- Repaired highest numbers of distribution transformer (636 numbers) in FY 2073/074.
- Repaired 13 Power Transformers from private as well as different sectors of NEA in FY 2073/074.
- Tested highest numbers of transformer (4041 numbers) in FY 2073/074.

Kotre Pole Plant, Kotre

Located at 180 km west from Kathmandu, Kotre Pole plant was jointly established by GoN and FINIDA in 2042 BS to implement for Pokhara Electrification Project. It was handed over to Engineering Service Directorate in FY 2061/062, since then, the plant started the production of PSC pole commercially. Being a wing of Electro-Mechanical Design Division, now it has been running with separate Budget Centre to implement concrete pole production and sales of poles to DCS, NEA. Apart from producing concrete poles of 8.5 m and 10.5 m, after the recent upgrading, the

plant is now capable to produce concrete poles of 9 m and 11 m as well. After the upgrading, the plant is expected to produce 62 poles per day.

Concrete Pole Plant, Amlekhgunj

Established in 2051 BS and located at Amlekhgunj road, Bara, the pole plant has been contributing to Nepal Electricity Authority being an entity under Engineering Services Directorate with its objectives of producing 8m, 9m and 11m size PSC poles for distribution to Regional office of NEA and private firm as well. Since the permanent employees are not sufficient to meet the current production target, so daily wages employees are also involved. The plant has been striving to its best using its available manpower and resources to meet time bound production and delivery of the poles.

Pole Production at Concrete Pole Plant Amlekhgunj

Production, Revenue, Profit Chart

S.N.	TYPE OF POLE	F/Y 072/073	F/Y 073/074	REVENUE EARNED IN F/Y 073/074	PROFIT EARNED IN F/Y 073/074
1	8 m	6212	10150	14,60,17,862	1,43,97,644
2	9 m	3563	6009		
3	11 m	1002	1638		
Total		10777	17797		

NEA Training Center

Background

NEA Training Center (NEA TC) has been contributing different skill enhancing trainings to the staffs and others. In the last 28 years, NEA TC has trained all total of 16,603 employees from the different core group of NEA and some of other organizations.

NEA TC occupies around 203 Ropanis of land in Bhaktapur District. It provides different technical as well as non technical trainings with its sovereign identity. Training Center has 23 (Technical 7 and Nontechnical 16) staffs under the control of Director. Those staffs cover all electrical, mechanical, computer, civil engineering as well as administration and management department functions. They prepare training/seminar programs annually and provide services effectively. The main function is preparing trainings/resource management/collecting appropriate trainees and other general management actions.

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

Objectives

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

Vision

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

Activities in F/Y 2073/74

As Human Resource is one of the most important ingredients of any organization, its development is indispensable for the survival and advancement of the organization. So, investment in training is treated as corporate assets of organization.

NEA TC has been providing need based short

The summary of trainings conducted on F.Y. 2073/74 by Training Center is presented below.

S.N.	Name of Training	Level	Service	Duration in days	No. of Trainees
1	Induction	Off.	All	3	17
2	Induction	Off.	Tech.	3	55
3	ToD Meter Data Download and Analysis (Kathmandu)	Off.+Asst.	Tech.	5	28
4	Induction	Asst.	Adm.	3	90
5	Induction	Asst.	Adm.	3	47
6	Induction	Asst.	Tech.	3	237
7	ToD Meter Data Download and Analysis (Hetuada)	Off.+Asst.	Tech.	5	19
8	Induction	Asst.	Adm.	3	429
9	ToD Meter Data Download and Analysis (Nepalgunj)	Off.+Asst.	Tech.	5	27
10	CAIS (Nepalgunj)	Off.+Asst.	Adm.	5	27
11	ToD Meter Data Download and Analysis (Attariya)	Off.+Asst.	Tech.	5	22
12	CAIS (Attariya)	Off.+Asst.	Adm.	5	26
13	ToD Meter Data Download and Analysis Biratnagar	Off.+Asst.	Tech.	5	46
14	CAIS(Biratnagar)	Off.+Asst.	Adm.	5	39
15	ToD Meter Data Download and Analysis (Janakpur)	Off.+Asst.	Tech.	5	25
16	CAIS (Janakpur)	Off.+Asst.	Adm.	5	32
17	Tod Meter / CAIS forDistribution Center Chiefs under JanakpurR.O.	Off.	Tech.	3	14
18	CAIS (Hetuada)	Off.+Asst.	Adm.	5	42
19	CAIS (Pokhara)	Off.+Asst.	Adm.	5	37
20	ToD Meter Data Download and Analysis (Pokhara)	Off.+Asst.	Tech.	5	26
21	ToD Meter Data Download and Analysis (Butwal)	Off.+Asst.	Tech.	5	39
22	CAIS (Butwal)	Off.+Asst.	Adm.	5	29
23	Electrical Safety (Butwal)	Asst.	Tech.	4	41
24	Advanced Excel with VB Programming	Off.	Tech.	7	20
25	M-Power Billing System (Kathmandu)	Asst.	Adm.	7	16
26	M-Power Billing System (Kathmandu)	Asst.	Adm.	7	16
27	Auto CAD Basic 2d	Off.	Tech.	7	19
28	Arc GIS-10.5 (Geographic Information System)	Off.	Tech.	9	18
29	Primavera P6	Off.	Tech.	10	18
	Total				**1501**

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 requested as required.

Extra Activities

In addition to training programs, NEA TC provides seminar halls, class rooms, hostels and ground space on rental facilities to different users, groups/organizations etc. on their request. Various Engineering Colleges, Political Parties, Co-operatives, INGO, Film Shooting Unit and other institutions used the facilities available in the NEA TC for various purposes and the total income generated from these services amounted to Rs. 3,809,268.50.

The Training Center has also provided space and services for various offices of NEA in its premises at Kharipati.

PROJECT MANAGEMENT DIRECTORATE

Project Management Directorate (PMD) in the Nepal Electricity Authority Organogram has a role to execute and to facilitate the projects funded by Asian Development Bank. PMD is responsible for project preparation, procurement and construction of all new and existing projects that is or will be funded by ADB. In addition to the execution of SASEC- Power System Expansion Project, PMDis coordinating, monitoring and reporting the implementation activities of the projects that are being run under Energy Access and Efficiency Improvement Project (ADB Loan 2587, Grant 0182 and Grant 0183), Electricity Transmission Expansion and Supply Improvement Project (ADB Loan 2808, Grant 0270 and Grant 0271) and Project Preparatory Facility for Energy (PPFE).Recently, another ADB funded project under loan no. 3542 PTDEEP (Power Transmission and Distribution Efficiency Enhancement Project) is being implemented by PMD.

PROJECTS BEING CURRENTLY EXECUTED BY PMD:

(A) SASEC Power System Expansion Project (SPSEP)

1. Samundratar-Trishuli3B132kV Transmission Line

The Samundratar-Trishuli3B Hub 132kV Transmission Line project is a must to evacuate power from different hydropower projects to be developed by IPPs in the vicinity of Nuwakot district. The project includes construction of 26 km 132 kV double circuit transmission line from Samundratar to Trishuli 3B Hub and construction of 132/33kV, 2x30MVA Substation at Samundratar, Nuwakot.

This project is financed by European Investment Bank (EIB) in coordination with ADB. The contract award for the Construction of Transmission line and Substation has been concluded. Construction of access road, boundary wall and river protection works of Substation and approval of Tower design are under progress. The project is expected to be completed by FY 2076/77.Picture shows the construction of substation.

2. Marsyangdi Transmission Corridor Project

Marsyangdi Transmission Corridor Project once completed will evacuate approximately 1600 MW of power generated by various hydropower stations in the Marsyangdi basin/ Marsyangdi River Corridor. The Project comprises of construction of 110 km long Double Circuit Transmission Line from Manang (Dharapani) to Chitawan (Bharatpur) and associated 220/132/33 kV, 160 MVA substations at Dharapani of Manang, Tarikuna and Khudi at Lamjung and New Bharatpur at Chitawan. The length of upper section of 220 kV, double circuit

transmission line with twin Moose conductor from Dharapani to Udipur is 45.57 km. Similarly, the length of lower section of 220 kV, double circuit transmission line with twin HTLSequivalent Drake conductor from Udipur to Bharatpur is 64.46 km. The bids for construction of Udipur - Bharatpur 220 kV D/C Transmission Line is under evaluation and is expected to award the contract in August. Estimated total project cost is US$ 90 million and is funded by EIB. Both the sections of transmission lines and associated substations of the Project are expected to be commissioned by FY 2078/079 (2020/021).

3. Marsyangdi-Kathmandu 220kV Transmission Line Project

The objective of this project is to augment power transmission capacity from the Marsyangdi Corridor to Kathmandu Valley. The project is to construct 220 kV Double Circuit, 85 km TL from New Marsyangdi(Markichok) to Matatirtha,

220/132kV, 160 MVA AIS substations at Matatirtha and 220/132 kV, 160 MVA GIS substation including bay extension Marsyangdi (markichowk).The project is jointly funded by ADB, Government of Norway and Government of Nepal (GoN). The contract for the construction of the transmission line and substation has already been awarded. The project is expected to be commissioned by FY 2075/076 (2018/019). Figure shows the construction of pole in the project site.

4. Kaligandaki Corridor 220kV Transmission Line Project

The prime objective of this project is power evacuation of the Kaligandaki River Corridor which ultimately will reinforce theINPS.The estimatedcost of the project is about US$ 96 Million and is jointly funded by ADB and GoN. The projectis expected to be commissioned by FY 2077/078 (2020/021).

The project includes the construction of 38.6 Double Circuit 220kV Transmission line from Dana (Myagdi) to Kusma (Parbat), 87 km Double Circuit (using HTLS conductor) 220kV line from Kusma (Parbat) to New Butwal Substation, 17 km Double Circuit 220kV line from New Butwal substation to Bardghat (Nawalparasi) and 220/132/33kV substations at Dana, Kushma and New Butwal each with 100MVA Capacity.

The contract of transmission line for Dana-Kusma section with substation at Dana &Kusma has been awarded and the construction work is in progress. Bids for construction of New Butwal 220kV substation and New Butwal –Bardaghat 220kV transmissions line are under evaluation. For Construction of 220 kV Line of Kushma-New Butwal section, re-bidding notice has been published. Figure shows the construction site of S/S in Dana.

5. Grid Substation Capacity Expansion Project

The objective of this project is to reinforce & upgrading the eight (8) numbers of existing grid substations of NEA. This project covers the GandakSS, ButwalSS,Bharatpur SS, Kawasoti SS, DamauliSS, Banepa SS, Dhalkebar SS and Lahan SS where transformer upgrading by replacing the existing one or by adding the new transformers along with protection system is being taken place. Among these Substation Automation System is also being installed in Gandak SS and Baneswar SS. With this project total 280 MVA capacity of transformer will be added in the systems. The project is s expected to be completed by September 2017.

6. Distribution System Augmentation and Expansion Project

Mainscope of the project is to augment and expand the Distribution system of NEA. The project work includes the constructionof twenty five (25)numbers of 33/11 kV new substations, upgradingof eleven(11) numbers of existing 33/11 kV substations and construction of 33kV, 11 kV and 400 Volt Lines at various districts of the country. With the completion of this project 260 MVA of 33/11 kV SS, 383 kM of 33 kV line, 572 km of 11 kV Line, 710 kM of 400 Volt line and 91 MVA total capacity of Distribution transformer will be added in the distribution system. The project is being executed in following 3 Lots of contracts namely:

Lot 1: Expansion of Distribution Network in the Eastern Region including 13 substations, lines and transformers

Lot 2: Expansion of Distribution Network in the West Regions including 12 substations, lines and transformers

Lot 3: Reinforcement of distribution system including 11 substations upgradation

All three Lots of Contract was awarded in F/Y 073/74 and the project is scheduled to be completed by FY 2075/76. The project is jointly funded by ADB and GoN.

7. Distribution System Master Plan Project

The principal objective of this project is to prepare a Distribution system/Rural Electrification Master Plan of Nepal (DS/REMP-N) for the entire country, with emphasis on providing electricity for enhancement of livelihoods in the remote settlements of the country in an efficient way.A consulting firm will be engaged to work closely with NEA to develop the master plan. The prime assignment of the consultant is to identify the least cost and economically viable means to reinforce, upgrade and expand Nepal's electricity system, including on- and off-grid, to achieve universal access to electricity by 2025 A.D. The master plan will include policy recommendations, a comprehensive electrification and distribution augmentation program and detailed case studies. The consultant recruitment process isin the advance stage of completion. The Project is funded by Norweign Grant and administered by ADB.

8. Utility Scale Grid tied Solar Project:

The aim of this project is to promote the Solar PV Projects in Nepal. With the Viability Gap Funding of USD 20 Million for the development of Solar PV Project, NEA will procure the energy from minimum 25 MW solar PV power to be developed by the IPPs. Currently PMD is preparing RFP for the procurement of Solar PV power through competitive bidding among the intended IPPs. Grid connected large scale Solar PV projectswill be located at nearby grid substations in different part of the country. The RFP will be issued in the year 2017 A.D. Grant agreement between ADB and GoN and the subsidizing Grant Agreement between Ministry of Finance and NEA has already been signed.

(B) Power Transmission and Distribution Efficiency Enhancement Project (PTDEEP) :

This project has been envisioned to strengthen the distribution system capacity of Kathmandu Valley including modernization of distribution system to provide reliable electricity supply in Kathmandu valley. The project value is of USD 189 Million and will be jointly funded by ADB and GoN. As part of the funding, Loan Negotiation for USD 150 Million has already been concluded between ADB and GoN on 19thMay 2017 in Kathmandu. Out of the Project cost of USD 189 Million, USD 2.0 Million will be provided as grant from JFPR. Different sub-projects and their status under PTDEEP are depicted below:

1. Kathmandu Valley Transmission Capacity Reinforcement Project

The primary focus of the project is to augmentthe Grid substation capacity by adding 3 new 132/11kV substations, 90 MVA each at Mulpani, Futung and Chapagaon. The project will enhance the transmission substation capacity and improve reliability and quality of electricity supply in the Kathmandu Valley by reducing distribution system overloads.The bids for construction of these three substationsare under evaluation and targeted to award the contract by October 2017.

2. Lapsephedi and Changunarayan Substation Construction Project

220/132 kV, 160 MVA GIS SS will be constructed at Lapsifedi and 132/11 kV, 90 MVA SS will be constructed at Changunarayan. These substations will play major role to evacuate the Power generated by the IPPs and Upper Tamakoshi Hydro Electric Plant through Khimti – Barhabise – Kathmandu 400/220 kV Line. The bids for construction of these two substations are under evaluation and targeted to award the contract by October 2017.

3. Kathmandu Valley Smart Metering Project

The main focus of the project is to deploy the Advanced Metering Infrastructure (AMI) communication network with its auxiliary system all across Kathmandu valley (Kathmandu, Lalitpur and Bhaktapur) within a radius of 220 sq miles. The scope shall be of design, supply, establish, install, testing, commissioning, operate and maintain (AMI) for consumers equipped with single phase & Three Phase meters and other Smart Grid Applications. In this phase of the project, 90,000 Smart meters will be connected to the consumers of Maharajganj and Ratnapark Distribution Centre of NEA. The bidding documents are under preparation and intended to float the bid before 15th August 2017.

4. Enhancement of Distribution Networks in Central & Northern Region of Kathmandu Valley

This project will be helpful to increase the capacity and reliability of distribution networks in Kathmandu valley by undergrounding 11 kV and 400 Volt lines, deployment of distribution system automation and smart meters etc. This is the part of distribution system modernization in Kathmandu valley. In this phase we are covering two Distribution Centres (i) Maharajgunj D C and (ii) Ratnapark D. C. , out of eleven (11) of Kathmandu Valley. Bids are already invited for Maharajgunj DC and before 15 August, Bids will also be invited for Ratnapark D.C.

(C) Upcoming Projects

1. Engineering and Environmental Study of Kohalpur-Surkhet-Upper Karnali 400 kV Transmission Line and Kohalpur-New Butwal 400 kV Transmission Line.

As a part of the development of East – West 400 kV trunk line, PMD is proud to be associated with the development of 400 kV Line and SS from western part of the country i.e; from Butwal to Attariya. With the ADB grant assistance for Project preparatory Facility for Energy, consultant selection process is underway to conduct the detail engineering and complete design of 400 kV TL and associated SS

along the route. Proposals submitted from the shortlisted consultants are under evaluation and the consultant selection process is targeted to be concluded by October 2017. The detail study and engineering design is supposed to be completed by July 2019 and Procurement process will be begun by early 2020. The proposed TL route and SS under the scope of detail study and engineering design are as follows:

- the 400 kV Double circuit New Kohalpur (Tulasipur) – New Butwal transmission line and 400 kV substations at New Butwal and New Kohalpur (Tulasipur)
- the 132 kV Double circuit Chinchu (Surkhet)-Subakuna (Surkhet) and 132 kV substation at Subakuna (Surkhet)
- the 400 kV substation at Upper Karnali
- New Kohalpur(Tulasipur)-New Lumki (Dododhara)-New Attaraiya 400 kV Double circuit transmission lines, and associated 400 kV substation at New Lumki and 765kV or 400 kV susbtations at New Attariya.

2. Uprating 220kV Substations to 400 kV along the New Khimti – Barhabise – Kathmandu Transmission Line Section

As in near future New Khimti – Barhabise – Kathmandu 220/400 kV Line is going to be charged in 400 kV, the three major under construction 220 kV SS along this TL route (i) New Khimti SS (ii) Barhabise SS and (iii) Lapsifedi SS is required to be uprated to 400 kV. PMD has formulated this project and requested for financial assistance of USD 64 Million to ADB through MoEn. The Project will comprise the uprating of existing/ under construction new Khimti S/S by 400/220 kV, 630 MVA, Barhabise S/S and Lapsifedi SS by 400/220 kV, 160 MVA.

3. Automation of Existing Grid Substation

PMD has strongly felt the need of automation of existing grid SS to have efficient, reliable and automatic operation of the grid system. This will be a move of NEA towards modernization of NEA grid system. PMD has prepared a project for automation of existing grid SS. Under this project all Forty-six (46) NEA grid SS will be fully automated and be operated remotely from Control Centre.There will be all together 6 (six) Control Center for the operation and control of the SS, each at the Grid operation division office of Grid operation branch office. The estimated Project Cost is USD 16 Million. ADB is positive to provide financial assistance for this project. This project is very important for NEA in the sense of reduction of ongoing operational cost, improvement of grid reliability, lengthening the life of the equipment and improvement of organizational effectiveness.

4. 400 kV TL and SS in Eastern Region of Nepal:

To strengthen the transmission system and power evacuation from power plants in districts like Sankhuwasabha, Solukhumbu, Okhaldhunga, Dolakha, Ramechhap in Eastern Region of Nepal two (2) projects : (a) Arun Hub –Tingla - Dhalkebar 400 kV Transmission line and associated substation at Arun Hub and Tingla (b) Tingla – Likhu - New Khimti - Sunkoshi Hub - Dhalkebar 400kV transmission line and associated substations at Likhu, Sunkoshi Hub and substation expansion at New Khimti and Dhalkebar has been formulated. Study and detail design of these projects will be initiated by early 2018. Financial assistance for study and detail design will be sought from ADB as it has been listed in ADB Pipe line projects. Brief features of these projects are as follows:

(i) Arun Hub-Tingla- Dhalkebar 400kV Transmission Line Project

This 400 kV line is required to evacuate power generated from the projects situated in the Eastern hilly region of Nepal especially in the districts of Sankhuwasabha, Solukhumbu, Okhaldhunga. Estimated line length of 400 kV double circuitArun Hub – Tingla – DhalkebarTLis

185 km. Two new 400/220 kV SS, 630 MVA at Arun Hub and 315 MVA at Tingla Hub including Bay extension at existing Dhalkebar SS has been proposed. Estimated Project Cost is USD 230 Million.

(ii) Tingla- New Khimti-Sunkoshi Hub-Dhalkebar 400kV Transmission Line Project

This 400 kV double circuit Tingla- New Khimti-Sunkoshi Hub-Dhalkebartransmission line has been plannedkeeping in the mind of huge hydro power potential of theLikhu, Khimti, Tamakoshi and Sunkoshiriver basins &corridorsand the limited power transfer capability of existing under construction 220kV line from Khimti to Dhalkebar. Theestimated length ofthe line is 165km. Two new SS, each 400/220 kV, 630 MVA at Sunkoshi Hub and at Likhu Hub and Bay extension at existing New Khimti SS has also been planned. Estimated Project Cost is USD 208 Million.

5. Grid Connected Battery Energy Storage System (BESS)

In the perspective of energy arbitrage, spill energy management of generating station, grid stabilization, reliability, power quality, loss reduction, deferral value and flexibility, installation of grid connected Battery Energy Storage System (BESS) in the proximity of grid SS is considered as one of the best option. Technical Assistance has been requested to ADB to procure consulting services for NEA for detail study and construction of viable size of BESS in the substations inside Kathmandu valley in context of load management, dedicated feeder and uninterruptable power supply to the President Office and residence at Maharajgunj, Prime Minister Office and different ministry at Singhadurbar area, Prime minister Quarter at Baluwatar, Army, Police headquarters, hospitals, business complex, factories etc. As advised by ADB, TOR for Consultant has been prepared and submitted. The assignment will be for two and half (2.5) months period. After the study and findings, necessary actions will be initiated for financing.

6. Kathmandu Valley 220kV Ring Main Project

To meet the future demand of Kathmandu Valley this project has been formulated. This project comprises the construction of 75 kM 220 kV double circuit line on monopole along the proposed outer ring road being developed by Kathmandu Valley Development Authority. Total three numbers of 220/132 kV SS of 400 MVA each and 132/11 kV SS of 90 MVA each at Kathmandu, Bhaktapur and Lalitpur districts are proposed. Due to rapid urbanization in Kathmandu valley, land acquisition for TL and SS construction is being very tough, as such using monopole for TL along the outer ring road and initiating construction along with is the best opportunity for NEA. Estimated cost of the project is USD 150 Million. PMD will initiate the study of this project by early 2018. ADB will be requested for financing this Project.

7. Power Transmission and Distribution Efficiency Enhancement Project (2nd phase)

This project is supposed to be continuation of the ongoing Power Transmission and Distribution Efficiency Enhancement Project financed by ADB under Loan No. 3542. This project is formulated for the transmission system expansion and distribution system modernization (Distribution system reinforcement, automation, undergrounding, smart metering etc;) of remaining nine (9) Distribution Centers of Kathmandu Valley and all fourteen (13) Metropolitan and Sub-metropolitan cities outside Katmandu valley. This project is enlisted in ADB Pipeline projects. PMD is carrying out the detail study of this project and Planned to be executed by 2019 in different stages. The estimated cost of the project is USD 560 Million and its breakdown is given in table

S.N.	Description	Amount MUSD
A	**Transmission System Reinforcement**	**55**
1	132/11 kV, 2 x 45 MVA GIS S/S at Koteswor & Thapathali including construction of 132 or 66kV underground lines of approx. 30Km.	50
2	Upgradation work of existing Teku Substation	5
B	**Distribution Network Modernization and Reinforcement**	
B1	Kathmandu Valley (Remaining Distribution Centers from ongoing PTDEP)	**199**
1.	Remaining Nine (9) Distribution Centres (Balaju, Kuleshwor, Jorpati, Kirtipur, Bhaktapur, Thimi, Lagankhel, Pulchowk, Baneswar)	166
2.	Smart metering for above DC (300,000 Nos)	17
3	Procurement of Distribution Transformer of various size (>200kVA) (2000 Nos)	14
4	Upgrading of existing switching station and construction of new switching station (sites to be confirmed after study)	2
B2	Outside Kathmandu Valley (Distribution Centers Metropolitan and Sub-metropolitan cities across Nepal)	**306**
1	Bharatpur	25
2	Pokhara	30
3	Biratnagar	35
4	Dharan Itahari	16 15
5	Birgunj	19
6	Janakpur	25
7	Hetauda	25
8	Butwal	15
9	Ghorahi	22
10	Tulsipur	15
11	Nepalgunj	27
12	Dhangadhi	17
13	Bhimdutta	20
	GRAND TOTAL	**560**

NEA'S SUBSIDIARY AND ASSOCIATE COMPANIES

CHILIME HYDROPOWER COMPANY LIMITED

Introduction

Chilime Engineering and Services Company Ltd. (ChesCo) was established to give complete engineering and services for hydropower project development in Nepal. The company is initiated and invested by Chilime Hydropower Company Limited (CHPCL) as pre-dominant share-holder and contains 100% ownership of CHPCL. ChesCo's main motive is to develop the skilled manpower and give complete hydropower solution for the sustainable hydropower development.

Background

Chilime Hydropower project (22.1 MW) holds a prestigious history of constructing a project which has its own complete experience in engineering design and management, site supervision including operation and maintenance of 22.1 MW Chilime hydropower project. It was long way back when there wasn't substantial development of hydropower in the nation. Having many hydropower projects under construction, ChesCo has a strong technical team to handle the various project assignments. On top of the glorious history of CHPCL, it should also be noted that CHPCL has a strong collaboration with government of Nepal. The statement is justified by the 51% share of NEA in CHPCL; and ChesCo, being a subsidiary company with 100% ownership of CHPCL, holds a strong assurance from CHPCL by both technical and managerial aspects. The other benefits working with ChesCo are as follows:

- In house experienced technical experts in Hydropower, Civil and Environmental Engineering including Electro-mechanical, Hydro-mechanical Study and other Design works.
- Key experts are already involved in design and construction supervision of different size of hydropower projects from small to more than 100MW size.

Scope

- Provide engineering services to the Government and other private companies in identification of projects, investigation, planning, feasibility study, environment studies, detail engineering , construction supervision along with due diligence study
- Give consulting services in Electromechanical, transmission and distribution lines survey and design works.
- Provide broad engineering services on Operation, Repair & Maintenance , Testing, Project Management and training works related to different hydropower projects running under Government as well as private Sectors
- Rehabilitation works of hydropower projects

Strategy

- Support the Development of Hydropower Projects in Nepal and internationally by optimally utilizing the locally available Technical Resources and Manpower.

Our Projects

Project: Sanjen Hydroelectric Project (SHEP)

- Task: Design and construction supervision
- Status: Ongoing

SHEP, lower scheme of the cascade has the installed capacity of 42.5 MW at a gross head of 442.0 m. The design discharge of the project is 11.57 m3/sec at an exceedence of Q40. The total length of headrace tunnel from headrace inlet to the surge tank is 3629 m.

Project: Upper Sanjen Hydroelectric Project (SUHEP)

- Task: Design and construction supervision
- Status: Ongoing

SUHEP has an installed capacity of 14.8 MW at a gross head of 161.3 m. The design discharge of the project is 11. 07 m3/ sec at an exceedence of Q40. The total length of headrace tunnel from headrace inlet to the Surge tank is 1397 m.

Sanjen Hydroelectric Project (SHEP) and Upper Sanjen Hydroelectric Project (SUHEP) are the projects being developed by Sanjen Jalavidhyut Company Limited (SJCL) located at 150 km road head distance towards north-west of Kathmandu. Sanjen Jalavidhyut Company Limited (SJCL) is a company promoted by Chilime Hydropower Company Limited. Sanjen was established in 2010 A.D.

SANJEN JALVIDHYUT COMPANY LTD.

Sanjen (Upper) 14.8 MW and and Sanjen 42.5 MW

Sanjen Jalvidhyut Company Ltd. is developing two hydro projects Sanjen (Upper) 14.8 MW and and Sanjen 42.5 MW. The overall progress of the Sanjen (Upper) 14.8 MW is approximately 55% and Sanjen is approximately 45%.

The progress status of Sanjen (Upper) in this fiscal year is: Civil Works: Headrace tunnel excavation completed, final support is ongoing. Intake and Weir approx. 90% completed. Powerhouse slope excavation is ongoing, Bypass canal completed and Desander approx. 70% completed, Flushing Canal completed. EM Works: Manufacturing of major EM equipment such as Turbines, Generators, Transformers, Energy Dissipating Valve (EDV) and Inlet Valves completed. HM Works: Manufacturing of Gate, Penstock and Trash Rack Cleaning Machine (TRCM) are completed. Delivery of penstock pipes is almost completed.

SUHEP Weir and Intake

The progress status of Sanjen in this fiscal year is: Civil Works: Tunnel excavation including penstock tunnels and adit tunnels from 700 m at start to 2500m out of approx. 5250 m has been completed. Powerhouse excavation completed and raft foundation of powerhouse is in progress. The Inlet Slope excavation in headworks is almost 90 % finished, balancing pond embankment earthwork filling is approx. 90% finished. Chhipchung Khola Headworks and Desander is almost 60% completed. EM Works: Manufacturing of major EM equipment such as Turbine, Generator, Transformer, Energy Dissipating Valve (EDV) and Inlet Valve completed. HM Works: Manufacturing of Gate, Penstock are completed. Syphon in Chhipchung Khola is 50% completed.

Contract of Transmission Line Works for both projects from each powerhouse to Chilime Hub has been concluded and survey works started.

Under Corporate Social Responsibility (CSR), company has made major contribution to public road from Simbu to Tatopani, maintenance of Goljung to Thambuchet road. It is evident that company has given first priority to local in job placement as out of 125 employee of the company, around 85 are locals. Also company has contribution in public water supply, health, education etc.

As per the Power Purchase Agreement (PPA) with Nepal Electricity Authority, the expected commercial operation date of the both project 01 January 2019.

RASUWAGADHI HYDROPOWER COMPANY LIMITED

Rasuwagadhi Hydropower Company Limited (RGHPCL), promoted by Chilime Hydropower Company Limited (CHPCL) and Nepal Electricity Authority (NEA), was established in Shrawan 17, 2068. The company is developing Rasuwagadhi Hydroelectric Project (RGHEP) having capacity of 111 MW in Rasuwa district. The project is accessed with Kathmandu -Trisuli -Rasuwagadhi road of 150 km North from Kathmandu. The project was planned to be completed in August 2017, but the devastating earthquake of April 2015, heavy rainfall during last year monsoon and subsequent landslides at access road and in the project site have severely affected the project construction works. After continuous efforts with series of discussions and meetings with the contractors, the project construction works have been resumed from 25th November 2016 and the construction works are ongoing at greater pace. The project has now been scheduled to be completed on 31st Dec, 2019.

The company has planned to manage the capital requirement for the construction of the project from debt and equity with 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 33% from Chilime Hydropower Company Ltd. (including maximum of 3% from VDCs and DDC of Rasuwa district) and 18% from Nepal Electricity Authority. The public share constitutes Depositors of EPF (19.5%), Employees of Promoter & Investor Institutions (4.5%), General Public and Employees of the Company (15%) and Local (10%).

Rasuwagadhi Hydroelectric Project

The project is located in Thuman and Timure village (ward no. 1 and 2) of Rasuwa district. The headworks site is about 400m downstream from the confluence of Kerung and Lende khola which are the Boundary Rivers between Nepal and China. The project is a run-of-river type having installed capacity of 111 MW and the annual energy generation will be 613.875 GWh.

Key Features of the Project:

Type of Project:	Run-of-River(ROR)
Design Discharge (Q40):	80.00m3/s
Geology:	Quartzite, Migmatite and Gneiss Rock
Gross Head:	167.9 m
Headwork:	Overflow diversion Weir with Undersluice and Side
Desander, Type and Size:	Underground (3 -125mx15mx12m)
Headrace Tunnel length and size:	4203m, dia. -6m~7m
Powerhouse type and size:	Underground, 76.3m x 15.0m, 35.5m
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 has been categorized into three different Lots. For the

construction of Lot 1: Civil and Hydro-Mechanical Works under Engineering, Procurement and Construction (EPC) contract model, the contract agreement was signed with M/S China International Water and Electric Corp. (CWE), on 5th January, 2014. Similarly, for Lot 2:

Electromechanical Works, the contract agreement was signed with M/S VOITH Hydro Pvt. Ltd, India on 31st July, 2014. For Lot 3: Transmission Line works which includes construction of about 10 km long 132 kV double circuit transmission line, the contract agreement has been signed with M/S Mudbary and Joshi Construction Pvt. Ltd., Kathmandu on 15th June, 2017. The project Consultant for Lot 1 & 2, M/S SMEC International Pty. Ltd., Australia has been continuously supervising the construction works, reviewing the designs submitted by the contractors and co-coordinating the contractors for smooth operation of construction work activities.

Present Status of the Project

The work progress before April, 2015 earthquake was impressive and was in line with the scheduled time as per PPA. However, after the hard time faced as a result of the aforesaid earthquake followed by the scarcity of construction materials and fuels due to the blockade, and due to the heavy rainfall in the last year monsoon creating massive landslides in the public road as well as the project work fronts, the Company has been successful in remobilizing the contractor on 25th Nov 2016 and resumption of construction works of the project.

The progress summary of the major project activities are as follows:

1. Infrastructure works

- Because of the continuous landslides during rainy season, maintenance of the 16 km long 11 kV transmission line for the construction power of the project is continuously being carried out.
- The construction of Employer's Camp Facilities on Ghatte khola, Timure has been stopped due to safety risk and the construction of Employer's temporary camp facilities (Pre-fab buildings) on the right bank of the Bhotekoshi river near to Adit 2 has now been completed.

Lot 1: Civil and Hydro-Mechanical Works

- All access tunnels (adits) has already been completed. The underground works in the powerhouse and transformer cavern excavation and support works is ongoing. The pilot tunnel excavation using raise boring machine for vertical penstock shaft and surge shaft has been completed. About 1220m Headrace Tunnel out of 4203m has been excavated with primary support. The excavation of headrace tunnel and underground desander is continue and the desander intake tunnel excavation and support works has been completed. Excavation of undersluice/ intake area upto foundation level and jet grouting piles for foundation treatment was completed before earthquake but it was completely filled with debris after the earthquake. The re-excavation and the foundation works of intake and undersluice has been completed and concreting works is ongoing. The contractor has mobilized about 185 Chinese and 518 Nepalese manpower at site. The overall progress of the project construction in this package is approximately 40%.

Lot 2: Electro-Mechanical Works

For the construction of Lot 2: Electromechanical Works, contract agreement was signed with M/S VOITH Hydro Pvt. Ltd, India on 31st July, 2014. The contractor has been mobilised and the detail design and manufacturing of the project components is ongoing.

Lot 3: Transmission Line Works

For the construction of Lot 3: Transmission Line Works, Contract Agreement has been signed with

Project Supervision from High Level Management

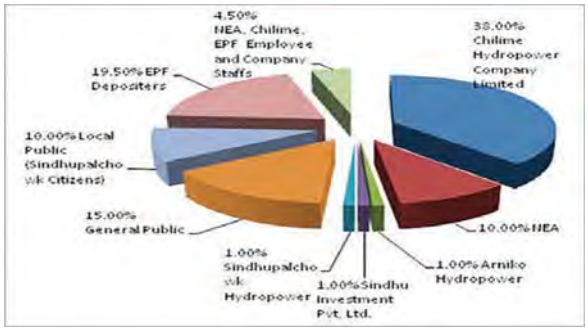
M/S Mudbary and Joshi Construction Pvt. Ltd., Kathmandu on 15th June, 2017. Check survey of overall length of line has been completed by the Contractor. The contractor is now undergoing detail design of the line components.

MADHYA BHOTEKOSHI HYDROELECTRIC PROJECT (MBKHEP-102MW)

Madhya Bhotekoshi Jalavidyut Company Ltd. (MBJCL), a subsidiary of Chilime Jalavidyut Company Limited, is constructing Middle Bhotekoshi Hydroelectric Project (102 MW) located in Sindhupalchowk District of Bagmati Zone of the Central Development Region.

I. Capital Structure

The Company has planned to manage its capital requirement from Debt and Equity under the debt equity ratio of 50:50 excluding IDC cost. Financial



closure has been made for the debt part which is managed through a long term loan agreement with the Employees Provident Fund (EPF). The equity investment will be made from 51% promoter share and 49% public share.

Details of shareholdings are as follows:

II. Major Project Activities

The activities of the project are summarized below:

1. Land acquisition Activities:

Among the land required for construction and other purposes, the private land constitutes about 374 ropani for which the acquisition process has completed and the compensations for 374 ropani has already been distributed. The estimated compensatory amount for private lands' acquisition stands at NRs. 389.24 Million out of which NRs. 374.24 Million has already been distributed. The leased private land for temporary usage stands at 191.5 ropani. The government land including community forest required for the project purpose is 14.69 hectares out of which 10.11 hectares lie in the three different community forest of Gati VDC, and 4.54 hectares lie in the Gaurishankar Conservation Area Project of Marming VDC. 12.89 hectares of government land including community forest is required for short-term lease (muck disposals) and only 1.80 hectares is necessary for construction of permanent structures like Headworks, Access Roads etc. The approval on the use of government land including community forest is currently in its final stage with the Updated EMP (Environmental Management Plan).

2. Construction Activities

The Construction works are divided into following three contract packages excluding the construction of camp facilities for employer & consultant:

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

Lot 2: Electromechanical works on PDB contract model.

Lot 3: Transmission line and substation contract model to be finalized.

View of Power- House Area:- Powerhouse Excavation, Site 11, Camp Facility, Adit 2 , Adit 3, Storage yard

2.1.1 Construction of Camp facilities for Employer and Consultant

The construction of the camp facilities for the employer company and its consultant is completed and operational.

2.1.2 Lot 1: Civil and hydro-mechanical works

The contract agreement with the LOT 1 contractor was made on Jan 01, 2014 and the work commencement date was Feb 11, 2014. Major achievements by Contractor for LOT 1 are as follows:

- Adit-1 tunnel (250m long,5m diameter) completed by Himal Hydro on Jan 2013 has been enlarged by Contractor for LOT 1 through lowering invert by 1 meter;
- Excavation, invert lining, inlet portal and outlet structure of Diversion Tunnel completed and ready for river diversion;
- Geological boreholes completed;
- Construction of Access Roads to Adit-1, Adit-2 and Surge Tank accomplished;
- Adit-2 tunnel and Adit 3 Tunnel completed;
- Headworks slope excavation in progress
- HRT Excavation with completed length of 1,112 meter is being carried out;
- Power house excavation and support has been completed;
- Batching Plant at Head Works is in operation & Camp facilities for Contractors completed;
- Aggregate crushing plant has been installed and operational,
- New Laboratory Building is completed and operational now.

The work progress of the Contractor for LOT 1 is slow due to series of natural disasters like Jure landslide of Aug 02, 2014, followed by the great earthquake of April 25, 2015 and series of aftershocks thereafter. The six months and long unofficial economic Indian Blockade continued from September 2015 and the flash flood of July 5, 2016 too added to the existing woes.

2.1.3 LOT 2 Electromechanical Works

Contract agreement was made with M/s Andritz Hydro Private Limited, India on July 10, 2014 and the commencement date September 09, 2014. The detailed design is almost completed and manufacturing of major components/equipment are in progress and being delivered to site.

2.1.4 LOT 3 Transmission Line and Substation:

The project has renewed the survey license for 220 kV Transmission line from powerhouse to Barhabise substation hub and the topographical survey works for transmission line is completed.

Head-Works Excavation works

Initial Environmental Examination (IEE) has been started and draft TOR is on the Process of approval.

III. Construction planning and scheduling

The planned commercial operation date of the project was June 15, 2017. However, construction activities of project has been disturbed by social as well as natural calamities, and owing to these, the construction schedule is shifted by two years and New completion date is 30th June 2019.

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 NEA, Nepal Telecom (NT), Citizen Investment Trust (CIT) and Rastriya Beema Sansthan (RBS) with stakes of 41%, 6%, 2% and 2% shares respectively. The company has already issued the shares to the contributors in Employees' Provident Fund (17.28%), NEA and UTKHPL staffs (3.84%) and staffs of debtor institutions (2.88%). The remaining 25% of equity capital have been allocated to General Public (15%) and Residents of Dolakha district (10%).

Project Features

UTKHEP, one of the national pride projects of Nepal, is located in Bigu Rural Municipality, ward No.1 of Dolakha district in Central Development Region of Nepal. The project is a daily peaking run-of-the river project of installed capacity 456 MW with a live storage volume sufficient for four hours daily peaking operation in the driest month. The project will generate 2,281 GWh of energy annually with the available gross head of 822 m and design discharge of 66 m3/s. The major components of the project are as follows: „ 22 m high and 60 m long diversion dam integrated with 35 m wide intake; „ 225 m long and 26 m wide each twin settling basin; „ Headrace tunnel having inverted D-shape section with 6m x 6m size and length 8.45km; „ 3.6 m diameter penstock of length 1,134m; „ 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 shaft Pelton Turbines, 6 nos. synchronous generators and 18 (plus 1 spare) single phase transformers; „ 47 km long double circuit 220 kV transmission line from Gongar to New Khimti Sub-station.

Power Purchase Agreement (PPA) & Financial Arrangement

As per the PPA signed with NEA on 29 December 2010, 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 will invest NRs. 10 Billion as loan and NRs 2 Billion as debenture in the project, whereas NT will invest NRs. 6 Billion as loan. Similarly, CIT and RBS will provide loans of NRs. 2 Billion each. Furthermore, Government of Nepal (GoN) has decided to provide loan up to NRs. 11.08 Billion

as the gap funding during implementation of the project.

Project Status

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 90.5% by the end of the fiscal year 2073/74 (2016/17). The breakdown of progress in major Civil Works is as follows:

SN	Project Components	Progress
1	Headworks Concrete	89.5%
2	Headrace Tunnel Excavation	93%
3	Powerhouse/Transformer Caverns Excavation	100.0%
4	Tailrace Tunnel Excavation	100.0%
5	P/H and Transformer Caverns Concrete	83.8%
6	Tailrace Tunnel Concrete Lining Works	13.4%

The Lot 2 Contractor has installed second stage embedded parts such as guide frames, sill beams and wall plates of most of the Headworks Hydro-mechanical Equipment and also the branch pipes from Unit 1 to Unit 4 in the Powerhouse have been erected. The Contractor has completed all design and fabrication works except for some additional works required after design modification. The Lot 3 Contractor has installed all six turbine spiral distributors as well as housings. Main inlet valves for unit 1 to 4 and water cooling systems for the same have been installed. The Lot 4 Contractor has completed 91% (116 out of 127) of tower foundation works, erected 76% (96 out of 127) of towers of transmission line. Lot 4 Contractor has

also completed 11% (5km out of 47km) conductor stringing works. The design and manufacturing of most of the equipment to be installed in the New Khimti Sub-station has been completed.

A temporary diversion was made across Sunkoshi River at Khadichaur to facilitate the transportation of heavy consignment of hydro-mechanical and electro-mechanical equipment. The Lot 2 Contractor has transported all branch pipes as well as lower bend to the project site and has temporarily stored some penstock pipes in the powerhouse of Sunkoshi power plant of NEA, whereas the Lot 3 Contractor has transported most of the electro mechanical equipment to the Project Site and a few electro-mechanical equipments are temporarily stored in the premise of Sunkoshi Power plant. The Lot 4 Contractor is continuously engaged with the remaining foundation works, erection of towers for the transmission line. However, in spite of some land acquisition problem arised in the substation site, remaining civil works including installation works are expected to be completed by fiscal year 2017/18.

Project Cost & Schedule

The approved cost estimate of the project prior to bidding of different construction lots and consultancy services in different stages was 456 MUS$ excluding Interest during Construction (IDC). The project cost has been forecasted as 512 MUS$ as of December 2016 because of increase in time and scope of works and also risks arisen due to various reasons such as earthquakes and design modification etc. In accordance with the Contractor All Risk (CAR) insurance policy, the Lot 1 Contractor as the insuring party has lodged the interim claim of about 2.5 Billion Rupees for recovery of losses and damages due the devastating earthquake. The Lot 1 Contractor has received USD 2.4 Million as an advance payment for rectification of losses and damages caused by the earthquake and it is in the process for additional USD 2.0 Million. Similarly, under Erection All Risk (EAR) insurance policy, the Lot 3 Contractor has received the interim advance payment of USD 3 Million for placing the order of lost and damaged electro-mechanical equipment. In addition, process has been initiated by submitting all required documents for additional USD 4 Million. In consideration of the delay of almost one year due to the earthquakes and blockade in the border, a new Integrated Time Schedule comprising water on in Headrace Tunnel on 30 June 2018 and starting of generation from first unit in July and starting of generation from all units in December 2018 has been established.

TANAHU HYDROPOWER LIMITED

Tanahu Hydropower Limited (THL) is established as a subsidiary company of Nepal Electricity Authority (NEA) in 2012 to develop Tanahu Hydropower Project (formerly, Upper Seti Hydropower Project). The management of THL is entrusted to a Board of Directors which is constituted as follows:

1. Managing Director, NEA : Chairman
2. DMD, Finance Directorate, NEA: Member
3. DMD, Engg. Directorate, NEA: Member
4. Managing Director, THL: Member

Background of Project:

The feasibility study of the project was carried out by NEA from July 2000 to July 2001. Under the technical assistance of Japan International Cooperation Agency (JICA), J-Power upgraded the Feasibility in June 2007. The Detail Engineering Design of the project was conducted by J-Power from April 2011 to Sept. 2015 under technical assistance from the Asian Development Bank (ADB).

Dam Site of Tanahu Hydropower Project

Key Features of Project:

The Project site is located nearby Damauli, the district headquarters of Tanahu District of

Construction of Camp Facilities

Western Development Region, about 150 km west of Kathmandu. The storage type Project is envisaged to have an installed capacity of 140 MW with a design discharge of 131 m3/s and a gross head of 126 m. The average annual energy generation after outage is estimated to be 474.2 GWh, of which, the dry season Energy is 171.5 GWh and the wet season Energy is 302.7 GWh. The Project is designed for minimum six hours of peaking operation even during the driest month of the year. The main components of the Project are as follows:

- A 140 m high concrete gravity dam with a crest length of 215 m on Seti River creating a reservoir with a total surface area of 7.26 km2 at FSL of 415 masl;
- A 1,162 m long 7.4 m diameter headrace tunnel;
- A 61.5 m high restricted orifice type surge shaft of internal diameter 28m;
- An underground powerhouse of dimensions 89m long x 22m wide x 44m high ;
- A 243 m long 7.4m diameter tailrace tunnel to discharge the tail water back into Seti River;

The hydro-mechanical equipment consists of four spillway radial gates of size 12.8m x 18.7m, two water lowering gates of size 3.8m x 3.8m, two sets of sediment flushing facilities of size 5m x 5m with steel liners and a 160m long steel penstock pipe. The electro-mechanical equipment consists of two units of Francis Turbines with the maximum output of 71.8MW each coupled with a three phase synchronous generator of maximum output 82.3 MVA. A 36.9 km long 220 kV double circuits Transmission line will evacuate the generated power to the New Bharatpur Substation. Additionally, the Project will electrify 18 VDCs of the district with two new 33/11 kV sub-stations through the Rural Electrification (RE) Program.

Funding Arrangement

The total project cost is estimated to be USD 505 million as of January 2013.The project is being co-funded by the Asian Development Bank (ADB), the Japan International Cooperation Agency (JICA) and the European Investment Bank (EIB). The financing plan is shown below:

Source	Amount in MUSD
Asian Development Bank	150
Japan International Cooperation Agency	184
European Investment Bank	85
Government of Nepal /Nepal Electricity Authority	86
Total	**505**

Project Supervision Consultant

Contract agreement was signed with M/S Lahmeyer International GmbH, in association with Manitoba Hydro International as Project Supervision Consultant (PSC) on June 29, 2015. The Consultant

Construction of 33/11 kV Sub-station

will provide services for twelve years including 5 years of plant operation after the completion of the Project.

Bidding Process

After the pre-qualification process, THL issued a notice of Invitation for Bids from eligible applicants for Package 1 (Headworks and River Diversion) and Package 2 (Waterway, Powerhouse and Related Equipment) on 01 February 2017. Out of 5 pre-qualified bidders for Package 1, the following 3 bidders submitted their bids on 17 May, 2017, the deadline for bid submission:

- M/S Jayprakash Associates Limited, India
- China Gezhouba Group of Company, China
- CMC Di Ravenna, Italy

Similarly, out of 3 pre-qualified bidders for Package 2, only the following 2 bidders submitted their bids on 07 June 2017, the deadline for bid submission:

- CMC Di Ravenna, Italy
- Sinohydro Corporation Limited, China

The received bids for both packages are being evaluated by PSC and Bid Evaluation Committee of THL. The Bidding Documents for Package-3 (Transmission Line & Sub-station) are being prepared by PSC.

Pre-Construction Activities

Access Road from RCC Bridge to Powerhouse

Total length of access road from RCC Bridge to the powerhouse along the right bank of Seti River is 3,314m. The road from RCC Bridge to the camp area is 2,000m long and the pavement surface will be Double Bituminous Surface Treatment (DBST). The construction of cross drainage and retaining structures has been completed along with the track opening up to the proposed powerhouse site. After completion of Sub grade preparation, laying sub-base and base course is being carried out. It is expected that this section of the road will be completed by the end of August, 2017.

Access Road from Chapaghat to Dam Site

In parallel, construction of the 3,234m long access road from Chapaghat to Beni Patan (toward the dam site area) is ongoing. Surfacing dressing course (DBST) of 2,400m length from Chapaghat to RCC Bridge has been completed. It is expected that this section of access road will be completed by September, 2017.

Camp Facilities

All together 33 nos. of buildings, (28 nos. of residential buildings, 1 Guest house, 1 health post, 2 restaurants and 1 guard house) are to be constructed for camp facilities. Foundation works of 28 buildings have been completed so far. It is expected to complete the construction of camp facilities by the end of December, 2017.

Construction Power Sub-Station:

A 33/11 kV Sub-station of capacity 6/8 MVA for construction power supply is under construction nearby the camp site.

Power transformer and all accessories have been delivered to the site and are in the phase of installation. The control building along with almost all civil works have been completed. It is expected that the construction of the Sub-station will be completed by October, 2017.

Rock Mechanical Test inside Test Adit

Required preparatory works (including all core drilling) to carry out Rock Mechanical Tests are being carried out by Soil, Rock and Concrete Laboratory (SRCL) of NEA. Five numbers of block shear tests have been completed, whereas Borehole Slotter Tests will be commenced, as soon as the core drilling works are completed.

Power Purchase Agreement

As further processing of the PPA application, NEA and THL have finalized the salient features of the Project along with the Estimated Energy Generation Table and the Single Line Diagrams

for power evacuation. Subsequently, THL has submitted the application for the Grid Connection Agreement. Presently, the Grid Impact Study (GIS) of the Project is being carried out by System Planning Department of NEA as a pre-requisite for the Grid Connection Agreement. Upon conclusion of the Grid Connection Agreement, negotiations for the PPA will be initiated.

Supplementary EIA for Upgrading Generation License from 127 MW to 140 MW:

THL has signed a contract with Environmental & Social Study Department (ESSD) of NEA for carrying out required supplementary EIA. After incorporating all comments from Department of Electricity Development (DOED) in SEIA prepared by ESSD, Ministry of Energy has forwarded the report to the Ministry of Population and Environment (MoPE) for the final approval. After approval of SEIA by MoPE, the process for upgrading the generation license from installed capacity of 127 MW to 140 MW will be initiated.

SIEE for New Route Alignment of Transmission:

THL has submitted the SIEE report prepared by a Local Consultant- IESM to DoED for approval. A presentation was organized at DoED and the revised SIEE report has been submitted after incorporating the comments received so far. After the approval of the SIEE, construction license of Damauli - Bharatpur 220 kV Transmission Line will be issued by DOED.

Compensation Distribution for Land Acquisition

After determination of the compensation rate by the Compensation Determination Committee (CDC), THL has distributed about NRs 450 million for the land acquisition and resettlement costs within the reservoir area in the FY 2016/17. So far, 215 affected households out of a total 335 affected HHs have collected their compensation payment.

The compensation distribution will be continued in the current FY 2017/18.

Engagement of ESMSP

THL has established the Environmental and Social Monitoring Unit (ESMU) in order to implement the environmental monitoring and social safeguard activities. As provisioned in the Project Administration Manual, an International firm as Environmental and Social Management Service Provider (ESMSP) will be engaged for supporting ESMU. The EoI documents along with the complete ToR have been submitted to the ADB for approval. After receiving the concurrence from the ADB, the EoI notice for engagement of ESMSP will be issued.

Future Development: Lower Seti (Tanahu) HEP:

THL envisages to further develop Lower Seti (Tanahu) Hydropower Project located about 15 km downstream of the tailrace of Tanahu Hydropower Project. The proposed project will utilize the flows of Madi Khola in addition to the regulated discharge of Seti River from Tanahu Hydropower Project. The installed capacity of the Project has been computed to be 92,000 kW with a design discharge of 130.8 m3/s and a gross head of 85 m. The main components of the project are a 45 m high concrete gravity dam, a double chambered underground desilting basis of size 180m x 16m x 20m, a 5.5 km long headrace tunnel of 8m diameter, a 55 m high surge tank of diameter 18m, a supported steel penstock of length 100m and a surface powerhouse of dimensions 60m x 24m x 43m on the right bank of Trishuli River nearby Gaighat. THL has applied for the Survey License of Generation with the submission of required documents along with license fees to DoED. Upon receipt of the Survey License of Generation, THL intends to receive technical assistance from ADB/ JICA for preparation of Detail Project Report (DPR) of the Project.

TRISHULI JAL VIDHYUT COMPANY LIMITED

1. Introduction

Trishuli Jal Vidhyut Company Limited (TJVCL) was established in 2011 as a joint venture of Nepal Electricity Authority (NEA) and Nepal Doorsanchar Company Limited (NDCL). The main objective of the Company is to develop the Upper Trishuli 3B Hydroelectric Project (37 MW) located in Nuwakot and Rasuwa District. Both NEA and NDCL have equal equity shareholding in the Company. The equity share structure of the Company is as follows:

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

2. The Project

Upper Trishuli 3B Hydroelectric Project is a cascade scheme of Upper Trishuli 3A Hydroelectric Project (60 MW). The installed capacity of the Project is 37 MW and annual energy generation after outage is 292.59 GWh.

Key Features of the Project :

Type of the project:	Cascade Development of UT3A HEP
Design Discharge (Q_{70}):	51 m^3/s
Maximum Gross Head:	90 m
Head Pond size :	29m(L) x 5.2 to 11.2 m (B) x 7.35 to 16.8(H) m
Headrace Tunnel length and size:	3666 m , Dia. 5.2~6m
Powerhouse type and size:	Surface, 37.60 m x 14.0 m x 28.2 m
Turbine, Type & No:	Francis, Vertical Axis & 2 Nos.
Turbine Unit Capacity:	19.1 MW
Generator, Capacity & No:	3 phase Synchronous AC, 2x22 MVA
Installed Capacity :	37MW
Annual Energy Generation:	292.59 GWh
Dry Months(16 Mangsir-15 Jestha) Energy:	134.88 GWh
Wet Months(16 Jestha-15 Mangsir) Energy:	157.71 GWh
Transmission line length , Voltage:	3 km, 132kV Single Circuit to Proposed Trishuli 3B Hub

3. Project Status

Feasibility study of Upper Trishuli 3B HEP was completed by NEA in fiscal year 2007/08. TJVCL furthered the study by conducting additional investigations and exploring different options having different capacities. A scheme with 37 MW installed capacity was selected for development and different relevant and required processes were started accordingly. The company aims to commission the Project by March 2022. The current status of the project is as follows:

- Pre-Qualified Bidders were invited to submit their Bids for "Engineering Procurement Construction of Upper Trishuli 3B Hydroelectric Project" vide "Invitation for Bids" notice published in Gorkhapatra daily on 27 and 28 January 2017. Two Pre-Qualified Bidders submitted their Bids by the stipulated deadline

Application of Shotcrete in Test Adit Tunnel

of 16 June 2017. Bid evaluation is going on at present.

- Signing on the Draft Power Purchase Agreement (PPA) with NEA was done in June 2017. The signed Draft PPA has already been approved by both NEA and TJVCL. Final signing of the PPA is expected to be concluded within August 2017.
- Acquisition of private land required for the Project is almost complete. Process of leasing of government land by the Company is going on.
- Company has signed "Indicative Term Sheet" with the consortium of Nepalese Banks led by Nabil Bank and co-led by Jalvidhyut Lagani Tatha Bikas Company Ltd. as part of financial closure for the debt portion required for the Project. Loan agreement will be signed as soon as the PPA is concluded with NEA.
- A 463.6m long Test Adit Tunnel which intersects the Head Race Tunnel (HRT) at about HRT's mid-point is under construction. The Test Adit Tunnel is expected to be completed by August 2017.
- Construction of camp facilities (office and residential buildings) at Project site has been completed.
- The EIA of Upper Trishuli 3B Hydroelectric Project (37 MW) has been approved by the Ministry of Environment.
- The MoU between NEA and TJVCL for the construction of 3km transmission line through Trishuli 3B Hub Project has been signed. As per MoU 45% of the total cost shall be shared by NEA and 55% by TJVCL.

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)

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.

- 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

The estimated revised cost of Nepal Portion of the project is NRs 1616 Mn (≈ INRs 1010 Mn). & is being funded in D: E as 70:30. Nepal Government & EXIM Bank of India has entered into a Loan agreement on September 14, 2007, where EXIM Bank agrees to provide 100 Million US Dollar to Nepal Government. NEA has signed Subsidiary Finance Agreement with Power Transmission Company Nepal Ltd. (PTCN) on 2070.11.27 (11th March, 2014). As per the agreement, NEA shall provide in Nepali currency amount equivalent to US Dollar 13.2 Million, for execution of 400 kV Nepal India Cross Border Transmission Line.

- India portion of Line consists of about 86 kms from Muzaffarpur Substation of POWER GRID 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. 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, 2017.

Dhalkebar - Bhittamod 400 kV Transmission Tower

NEA is presently drawing 145 MW of power from India through this line. Import of power through this cross border Transmission line has been major backbone in reducing the load shedding in Nepal. Upon the completion of the 220 kV substation at Dhalkebar, this line is expected to be charged at 220kV by Sep/Oct 2017, Nepal would be able to draw around 270 MW of power through this line from India.

CENTRAL ACTIVITIES

INTERNAL AUDIT DEPARTMENT

The Internal Audit Department, guided by the Audit Committee and headed by the Director is responsible for the planning, conducting and monitoring & evaluation of financial, technical and management audits based on enterprise risks. The department performs the aforesaid audits on quarterly basis and reports to the Audit Committee and Managing Director of NEA. Among these audits, financial audit is performed basically to help the final audit which is mandatory by law, and other audits are performed to evaluate the directorate-wise performance and to support managerial decision making.

The division-wise summaries of the audits performed during FY 2016/17 are given below in brief:

Audit Committee

As per international practices, and to provide independency to the internal audit system as well as to improve corporate governance, NEA has incorporated the concept of Audit Committee consisting of three members, headed by a member of the NEA Board and two peripheral sectorial experts. The committee is responsible for reviewing the accounts, financial statements and reports of final audit and conducting internal audit functions. The department holds regular meetings and interactions with audit committee for their directions on matters related to audit.

Financial Audit

The financial audit covers the audit of internal control system, compliance with existing rules and regulations, financial discipline and fairness of financial statements. During FY 2016/17, annual audit of FY 2015/16, was completed and the annual audit report was submitted and half yearly financial audit for FY 2016/17 were carried out. The total 128 budget centers were covered for both annual as well as half yearly audit out of 228 (including project offices) budget centers of NEA.

Technical Audit

The technical audit covers the audit of technical norms and standards, energy balance, preventive as well as breakdown maintenance, condition monitoring and electricity loss as per the guidelines available. The division carried out technical audits of 35 offices during FY 2016/17, which was in excess of the initial target of 30.

A vehicle audit team has been set up under technical audit division which conducted vehicle audit of 46 offices in the last FY.

Management Audit

The management audit covers the review and implementations of managerial plans, policies, procedures, programs and targets, procurement management, organization structure, job analysis, accountability and monitoring & evaluation. The division carried out management audit of 60 offices including Regional and Directorate offices during FY 2016/17.

Capacity Building

A customized training program was conducted for senior and junior officers in Chennai, India by

National Productivity Council, India during June-July 2017 to enhance their auditing skills and transfer professional knowledge related to various aspects of internal audit.

Challenges

The main hurdle faced by the Internal Audit Department is the shortage of manpower, both qualitatively and quantitatively. There must be some kind of incentive to the auditors, as a motivational factor, to attract and retain good auditors thereby increasing the overall effectiveness of the internal controls of NEA. The department also lacks the required support like equipment, vehicles to carry out internal audit effectively which has seriously jeopardized the mobility and effectiveness of auditors.

NEA BOARD MATTERS

The Secretary at the Ministry of Energy has been chairing the NEA Board meetings since Poush 10, 2072. Mr Suman Prasad Sharma chaired it upto the 735th meeting held on Shrawan 4, 2073. Mr Anup Kumar Upadhyay, after taking over as the Secretary at the Ministry of Energy, became the Chairman of NEA Board of Directors and has been chairing the Board Meetings since 28 Bhadra, 2073.

In the past fiscal year 2073/074 a total of 24 (no. 734 to 757) Board Meetings were held. Important decisions relating to Company formulation, financial restructuring, performance based evaluation system, employees' services and financial by laws and other significant decisions relating to and for the benefit of NEA were taken.

LOSS REDUCTION DIVISION

Loss & Leakage Control Activities:

The Loss Reduction Division led by Manager is entrusted with the responsibility to control the electricity theft, energy leakage and loss. Division has been conducting activities that involve inspection of energy meters and conducting field raid operations as and when required. The Division is dedicated towards supporting in additional revenue generation by controlling electricity theft, pilferage, tampering, demand leakage, CT/PT outage, wrong multiplying factor (MF) calculation, and wrong connection.

Target of Loss Reduction Division of FY 2073-074:

In the fiscal year 2073/074, the Division had set a target to inspect 500 consumers with TOD meter installed and 350 consumers with whole current meter installed under different Regional offices. The major focus has been given to Industrial consumers as they are few in numbers but consume energy at par with the domestic category. Division has also set a target of monitoring, inspection and data download of rural community consumers. Beside the annual target, Division has also conducted activities as directed by Managing Director, NEA, and as per the complaints received from public. The Division has also aimed at the control of stock units, theft, demand leakage and pilferage in energy meters.

Major Activities and Achievements of FY 2073-074:

This year Division has performed its monitoring and inspection activities of the consumers in 35 different Distribution Centers of Distribution and Consumer Services Directorate of NEA. This year around 575 TOD meters have been inspected, out of which 59% were found with remarks. The major remarks found during inspection were reverse unit, C.T./P.T outage, wrong MF calculation, inappropriate time-slot, display outage of meter and pilferage of energy meter. In few consumers, demand leakage and direct tapping from the secondary side of transformer were also observed.

A total of 1382 whole current meters were inspected this year, 72% of which were found with remarks. The major remarks found among the whole current meters were demand leakage due to oversized fuse or MCB or no MCB at all, pilferage

of meter and stock units. The key statistics are given in the following tables:

S.N.	Regional Office	Number of whole current meter inspected	Number of TOD meter inspected	Remarks	
				Whole current	TOD
1	Biratnagar	120	106	78	28
2	Janakpur	253	29	221	21
3	Hetauda	242	144	105	117
4	Kathmandu	369	83	293	39
5	Pokhara	252	68	157	54
6	Butwal	116	108	110	47
7	Nepalgunj	30	37	30	35
Total		**1382**	**575**	994	341

Assessment of Electrical equipments during Loss Reduction Campaign

Units recovered from theft under recommendation for billing by the Division to concerned Regional Offices and Distribution Centre:

DC	Units	Amount (Rs)	Remarks	Meter type
Tandi	1566	16665.5	Meter Bypass	3 phase whole current
Gaushala	24170	168366.2	Meter Bypass	
Gaushala	25574	177622.5	Meter Bypass	
Bhairahawa	23668	228812.8	Meter Bypass	
Malangwa	29872	72507.5	Meter Bypass	
Total	104850	663974.5	Meter Bypass	

Total of the several remarks found in energy meters during field raid:

S.N	Remarks	Total
1	Bad Condition of meter	27
2	Theft/Bypass/Leakage	21
3	Seal Absent	593
4	High rated/No MCCB	615
5	TOD meter required to be installed	57
6	Meter in stop condition	6
7	Demand Leakage	66
8	HT metering Unit required to be installed	66
9	CT/VT outage	25
10	Display out	1
11	Reverse energy and connection	80
12	Inappropriate Time-slot	6
13	Wrong MF calculation	5
14	Stock units	14

ADMINISTRATION DIRECTORATE

Administration Directorate is responsible for human resource management, logistic support, property menegement. public relations enhancement, legal service and recruitment & promotion related activities of the organization. This Directorate is lead by Deputy Managing Director and supported by four departments, namely, Human Resources Department, General Services Department, Legal Department and Recruitment Department, Each department is led by a Director.

HUMAN RESOURCE DEPARTMENT

Human Resource Department is basically responsible for human resources managment activities like manpower planning, preparation of job description and job specification based on job analysis, staff welfare, disciplinary actions, employes's transfer associated activities etc. This departmant is also responsible for managing training, seminars, workshops and sponsorship of educational program intended to human resource development.

The total numbers of aporved position in NEA stand at 11,142 whereas working staff by the end of F/Y 2016/17 remained 8259 Remaining vacant positions are in the process of recuritmane, During the year under review, 440 employees got retirement and this retirement comprises of compulsory retirement 278, voluntary retirements 54, terminations from job 3, resignation 80 and 23 employees passed way during service life, cancellation of appointment 1 and force retirement 1.

Regarding the Departmental Action Activities, 18 employees were suspended from the job and annual increment (grade) of 2 employees were withheld.

Staff welfare loan including land/ house purchase; house maintenance, social events & rituals was agreed to 972 empioyees amounting Rs.15,10,10,282 Likewise, Natural disaster grant was provied to 1 employees (Rs. 76,000/-) Life insurance scheme of organization benefited 409 employees with amount of 20,29,68,453/59

Employees Status FY 2016/2017

Level	Service	Approved Position			ExistingSituation			
		Regular	Project	Total	Permanent	Periodical	Daily/Wages contract	Total
Managing Director		1	0	1	0	1	0	1
DMD(Level 12)		9	0	9	2	0	0	2
Officer Level	Technical	1248	113	1361	1062	0	1	1063
(Level 6-11)	Non-tech	582	23	605	540	1	0	541
	Total	1830	136	1966	1602	1	1	1604
Assistant	Technical	5883	0	5883	4127	22	39	4188
(Level 1-5)	Non-tech	3284	0	3284	2528	12	17	2557
	Total	9167	0	9167	6284	34	56	6372
	Grand Total	11006	136	11142	8259	35	57	8351

During the period under review 5 employees had been granted accidental insurance amount and 661 got medical facilities amount altogether 1,88,56,2,42/-. Kaj Kiriya Anudan given away to 383 employees and 18 employees had been provied medical assistance for treatment of Hard Disease.

GENERAL SERVICE DEPARTMENT

General Service Department (GSD) is basically responsible for vehicle managment; logistic support and security management of corporate office; Record keeping; safeguarding of related documents and provide necessary support to concerned offices for defense against encroachment and misuse of land property. The Department is also entrussdted with responsibility of events management; coordinaton of NEA publication Vidyut and public relation and public grievance handing functions. In the year under review 625 grievancesw were lodged through toil free number, SMS and other channels, Out of those, 542 complaints were settled.

NEA has 31707-11-3-0 Ropani land spread all ovr the country. Similarly NEA has 982 vehiciles in service throughout the country. Of which, 860 are in running condition.

RECRUITMENT DEPARTMENT

Recruitment Department is basically responsible for recruitment and promotion of the employees. The major functions of this department are syllabus preparation and update; vacancy announcement; examination coordination and selection of competent and deserving canidate. Similary, it furnishes staff promotion function through internal competition and performance computation to upgrade competent and high performer emmployees. During the year in review period, 1463 people selected as successful candidate passing through the different level examinations and recommended for appointment in NEA's permanent service at different positions. 501 on the process of result at various level and 277 on the process of free competition examinations at verious level. Likewise, 302 employees of different levels were recommended for promotion to higher level. Of them, 133 employees were promoted on seniority basis; 169 on performance evaluation basis; 101 on internal competition under process.

LEGAL DEPARTMENT

The Legal Department is responsible for dealing with legal matters. It provies legal advice to the NEA management where and when necessary. The Department also involves in various negotiations for power purchase and contract agreements.

Another vital area of its participation is to defend legal cases of NEA in different courts of the country and abroad for dispute resolution. The Department also provides legal assistance through the representation to the various committees formed for formulation of rules, regulations, procedures etc of the organization.

During the year under review, the Department provided 120 numbers of legal advices to the NEA Management & other departments. Out of 57 cases registered in different courts of the country. 45 verdicts came in favor of NEA.12 gone against NEA and 78 cases are waiting for courts judgment. Department is also actively participating in arbitration deed to resolve the disputes mostly related to project construction contracts.

FINANCE DIRECTORATE

The Finance Directorate, headed by a Deputy Managing Director (DMD), is responsible for carrying out overall financial and accounting functions of NEA. Key responsibility areas include revenue administration, accounting system operation, budgetary control and treasury management. The finance wing is also responsible for financial planning, control and monitoring at corporate level of decision-making process. Two functional departments, namely Accounts Department and Corporate Finance Department, are structured to support the finance wing. Both Departments are headed by an individual Director responsible for its functional areas of operation and report directly to the DMD, Finance. A separate project office, Institutional Strengthening Project, has been placed in operation to implement Integrated Financial Management Information System (IFMIS) and Nepal Financial Reporting Standards (NFRS) under Accounts Department.

The year 2016/17 remained successful year for Nepal Electricity Authority in terms of minimizing load shedding, improvement in operational performance and financial health. Kathmandu Valley including other major cities turned into load shedding free and remaining parts of the country felt a minimum load shedding as compared to previous year 2015/16. This became possible by efficient demand side management, new commissioning of power plants about 116 MW by Independent Power Producers (IPPs) and capacity increment in import of power from India up to 370 MW. During the year long awaited projects Khimti- Dhalkebar and Chapali substations were completed. These infrastructures helped for further evacuation of power to Kathmandu Valley. During the year, GoN endorsed new financial restructuring proposal submitted by NEA. Upward revision of retail tariff and reduction of system losses contributed to enhance revenue and improve financial health of NEA. These operational and financial improvement measures helped NEA to achieve operating surplus of NRs. 4,657.39 million in FY 2016/17.

NEA experienced reasonably progressive year in terms of electricity sales, power supply and financial results after years' long distressing performance. Energy generation from NEA's hydro power plant recorded 2,305.17 GWh as compared to actual generation of 2,133.14 GWh in previous year 2015/16. During the year, Kaligandaki A, Middle Marshyangdi and Marshyangdi power plants operated in their designed generation capacity which contributed higher energy availability to the distribution system.

Total energy purchased during the year stood at 1,777.24 GWh from IPPs. NEA purchased 611.00 GWh additional energy from IPPs including 232 GWh from newly commissioned Upper Marsyangdi (50 MW) and Modi (25 MW). Similarly, NEA increased power import from India in order to minimize long prevailed load shedding in the country. Completion of Dhalkebar – Bhittamod 400 KV Cross Border Transmission Line made possible to import additional energy from India up to 140 MW. Total import from India constituted 2,175.04 GWh which was 22.35 % excess import against the previous year's import of 1,777.68 GWh. NEA succeeded to increase total availability

of energy in the distribution system to 6,257.73 GWh by improving its own power plants and adding more purchased energy from IPPs and India.

Despite the growth in total availability of energy in the system, NEA's own contribution got reduced to 36.84% as compared to 42.02% in the previous year. Energy supplied by IPPs and import from India constituted 28.40% and 34.76% respectively. Out of the total available energy, NEA's billing system measured only 4,773.84 GWh energy as sold to the consumers and station consumption and rest of the units were considered as technical and non-technical losses. During the review period, NEA initiated substantial efforts to minimize leakage by implementing distribution system reform programs and administrative restructuring activities which brought positive impact on loss reduction by 2.88 % from 25.78% to 22.90%.

Domestic consumers continued to be the largest consumer category with 93.96% share of entire consumers' base. However, contribution to the gross revenue by domestic consumers stands at only 41.85%. On the other side, Industrial consumer category holds only 1.42% of entire consumer volume but contributes 35.61% to the total gross revenue. During the year, NEA's total consumers increased from 2.97 million to 3.26 million including community and bulk buyer.

NEA achieved attractive growth in total revenue from sale of electricity amounting to NRs. 46,144.66 million in FY 2016/17 from 31,824.21 milliion in FY 2015/16. The factors behind this growth included an increase in retail tariff, higher energy availability in the system and reduction in system losses. Overall growth in sales revenue measured 45% higher as compared to the previous year sales revenue and individual growth in domestic and industrial consumer category noted 41.85% and 35.61% respectively. Out of the total gross revenue, NEA allowed NRs. 917.15 million as rebate in order to inspire consumer to pay their electricity bills earlier than given credit period. Additionally, NEA earned NRs. 4,084.82 million from non-core business activities in a form of surcharge, dividend, interest, lease rent and sale of goods and services. During the year, NEA received NRs. 2,140.93 million as interest income on bank deposits, loans and as dividend income from investment in subsidiaries. NEA's total income including income from non-core business activities reached to NRs. 50,229.48 million as compared to NRs. 35,073.54 million in the previous year 2015/16. The growth in the overall income was maintained at 43.21% as compared to the corresponding year.

NEA's total operating expenses increased from NRs. 36,087.53 million to NRs. 45,572.09 million for the year 2016/17. Major growth in operating expenses was experienced under the head of generation expense, power purchase cost, and transmission and distribution expense. Power purchase cost continued to be the largest cost element since long. NEA paid NRs. 28,457.34 million for power purchase which became 27.43% higher than the previous year. However, growth in power purchase cost still remained less than the increase in energy purchased of 34.76%. Similarly, transmission cost increased to NRs. 1,907.15 million from NRs. 1,094.58 million in the previous year with a growth of 74.24% due to payment of wheeling charge for power import through Cross Boarder Transmission Line. Likewise, NEA increased expenses for strengthening distribution system in Kathmandu valley & other cities that resulted into increase in distribution costs from NRs. 5,671.35 to NRs. 7,457.82 million. Other operating expenses included generation, royalty and administration that remained NRs. 1,823.98 million, 967.50 million and 1,306.72 million respectively.

Interest cost on long term borrowing reduced by about NRs. 1,200 million due to reduction in interest rate from 8% to 5% for the GoN funded loans and conversion of some loan into equity shares. Interest expense for the year calculated

as NRs. 3,879.39 million as compared to NRs. 5,079.73 million. Likewise, minor increase in depreciation expenses on property, plant and equipment resulted depreciation cost amounting to NRs. 3,651.59 million against NRs. 3,554.36 million in previous financial year. NEA recorded foreign exchange translation gain of NRs. 493.08 million in FY 2016/17 due to fluctuation of Japanese Yen vis-a-vis Nepali Rupees for the loan taken on Kulekhani Disaster Prevention Project. NEA estimated provision of NRs. 2,250.00 million towards long term employee liabilities in respect of gratuity, pension, medical facilities and accumulated leave facilities under employees' benefit plan scheme.

NEA experienced remarkable improvement in its operating performance as compared to corresponding financial year. Net loss for the year reduced to NRs. 978.92 million from NRs. 8,890.19 million in FY 2015/16. Reduction in system losses, power import in lower rate, increment in retail tariff and continuous supply of power in major cities all contributed to decrease financial losses for the year under review. Despite the huge reduction in financial losses and adjustment of subsidies for power import loss from India, NEA's accumulated losses still appears to be NRs. 30,388.39 million.

The total trade receivables including dues from government offices and local bodies remained NRs. 14,434.05 million at the end of the financial year. Total receivables increased by NRs. 3,247.21 million as compared to previous year due to the non-recovery of government dues and significant increase in sales revenue. However, GoN instructed the Ministry of Finance to clear the previous dues payable by local bodies up to the fiscal year 2073/74 and also directed NEA to recover the electricity bill directly from local bodies.

Property, plant and equipment (PPE) constitute the largest component of NEA's return generating assets. Net carrying amount of PPE reached to NRs. 90,204.23 million at the end of the FY 2016/17. During the year, NEA completed various distribution system reinforcement and rural area electrification projects resulting in additional capitalization of NRs. 5,335 under the category of property, plant, and equipment.

During the review period, NEA invested significant amount of resources in various projects relating to generation, transmission and distribution. Accumulated investment in capital works in progress reached to NRs. 83,939.73 million with addition of NRs. 22,590.64 million for the year 2016/17. The sources of investment included government equity and loan, foreign loan and grants and NEA's internal cash generation. However, financial returns of those assets are not being obtained due to considerable delays in project completion schedule. The major investment is in hydroelectricity projects, namely Chameliyagadh (30 MW), Kulekhani III (14 MW), Trishuli 3A (60 MW) and transmission line projects of different voltage level and rural community electrifications in the various parts of the country.

Investment in subsidiaries, associates, joint ventures and others reached NRs. 25,350.07 million in the year 2016/17. During the year, NEA increased its investment in subsidiaries and other companies by NRs. 3,595.02 million. NEA holds 51% of equity investment at a cost of NRs. 489.60 million in Chilime Hydro Power Company Limited (CHPCL), a subsidiary company of NEA. NEA, being the promoter of four under construction generation projects of CHPL holds direct equity investment ranging from 10% to 18%. During the year, NEA invested NRs. 30 million in Middle Bhotekoshi Co. Ltd., NRs. 66.58 million in Rasuwagadhi Hydro Power Co. Ltd. and NRs. 13.14 million in Sanjen Hydro Power Company Ltd. Total equity investment in Middle Bhotekoshi, Sanjen and Rasuwagadi reached to NRs. 600, NRs. 365 and NRs. 1,232 million respectively.

During the year, NEA received NRs. 143.87 and NRs. 3.57 million as cash dividend from CHPCL and Butwal Power Company Ltd. respectively. NEA holds 41% interest in equity share capital in Upper Tamakoshi Hydro Power Co. Ltd. At the end of the FY 2016/17, total investment in Upper Tamakoshi Hydro Power Company Limited reached NRs. 4,341.90 million as equity and NRs. 14,347.71 million as long-term loan.

Similarly, NEA invested NRs. 35 million in Trishuli Hydro Power Co. Ltd., NRs. 996 million in Tanahu Hydro Company Ltd. and NRs. 14.11 million in Cross Border Power Transmission Company Ltd. and deposited NRs. 310 million in Citizen Investment Trust against the future liabilities incurred towards employees benefit. Additionally, NEA maintained its loan investment of NRs. 808.37 in Power Transmission Company Nepal Ltd. at the end of FY 2016/17. Likewise, NEA invested NRs. 225.30 million as share capital in Electricity Generation Company Ltd. and Betan Karnali Sanchayakarta Hydropower Company Ltd. and holds rest of the investments in various subsidiaries and associate companies.

During the year, NEA decided to adopt company model to develop its existing projects and subsequently registered 12 companies in Company Registrar Office. Newly registered companies included Upper Arun Hydro Electric, Tamakoshi Jalabidhyut, Doodhkoshi Jalabidhyut, Modi Jalabidhyut, NEA Engineering, Nepal Power Trading, Raghugunga Hydropower, Uttargunga Power, Tamor Power, Aandhikhola Power, Tower and Pole Production and Transformer Production. These newly incorporated companies require significant investment in a form of equity and loan in the succeeding financial years.

At the end of the financial year, total long-term borrowings from GoN, the main source of project financing, reached to NRs. 117,484.21 million from NRs. 111,303.64 million in FY 2016/17. NEA received NRs. 16,805 million as long-term loan from GoN internal source to invest in different projects relating to generation, transmission, and distribution. Likewise, donor agencies provided around NRs. 6,000 million as long-term loans in the FY 2016/17. In addition to this, GoN also provided NRs. 3,388 million as equity investment in NEA.

Council of ministers via its cabinet decision (cabinet meeting no. 11/074) dated 2074/02/09 has endorsed the New Financial Restructuring Proposal of NEA. Major decisions included increasing authorized share capital to NRs. 125 billion, converting foreign grants into share capital, converting the power import cost payable to GoN from Tanakpur point into share capital, reducing interest rate from 8% to 5% for GoN funded loans and allowing NEA to reverse share capital into operating income which was previously reimbursed for import loss from India. Accordingly, necessary accounting adjustments have been made in the books which affected an increase in equity capital by NRs. 12,376 million, conversion of long term borrowing into equity share and adjustments of accumulated loss by NRs. 14,625 and NRs. 5,199 million respectively.

NEA repaid NRs. 1,670 million against long term loan to the GoN. During the year, NEA contributed NRs. 967 million towards royalties and paid NRs. 1,830 million as interest on long term loan to GoN treasury.

NEA is required to achieve a number of covenants in respect of borrowing from the donor agencies. Major covenants related to financial performance are Rate of Return (RoR) (6%), Debt Service Coverage Ratio (DSCR) (1.2 times), Average Collection Period (ACP) (<3month). During the year, NEA could not achieve required financial performance to meet loan covenants set by the funding agencies.

Electricity Tariff Fixation Commission (ETFC) allowed NEA to increase electricity tariff by about

15 % on an average with effective from July, 2016. However, such increment in tariff is felt insufficient to fill a huge gap between cost of sales and retail tariff. Therefore, NEA has recently proposed for upward revision of overall retail tariff. The proposal is under consideration of ETFC for appropriate decision.

Office of the Auditor General has appointed Mr. Nanda Kishor Sharma, Mr. Gyanendra Bahadur Bhari and Mr. Hem Kumar Kafle, Chartered Accountant, to carry out statutory audit for the financial year 2016/17. The auditors have commenced their audit procedures by attending physical verification and submitting audit-planning memorandum. Mr. Sudarshan Raj Pandey and Mr. Parakram Nath Sharma, Fellow Chartered Accountants jointly completed the statutory audit for the year 2015/16. NEA has submitted the approved financial statements to the auditors for issuing final audit report.

Large Tax Payer's Office has concluded final income tax assessment up to the FY 2012/13. NEA has deposited Rs. 1,500 million as advance tax, which is to be settled by Large Tax Payer's Office. NEA expects to settle long pending audit qualifications of NRs. 1.15 million which is being brought since FY 1993/94. NEA Board periodically reviews the audit qualifications and instructs the management to settle by complying applicable rules and procedures. Management is in a process of resolving policy related audit qualifications by implementing time bound action plan.

NEA is in a process of strengthening financial accounting and management decision support system. It plans to introduce modern IT based Integrated Financial Management Information System (IFMIS). Accordingly, Institutional Strengthening Project is under implementation with the assistance from World Bank to strengthen financial management, accounting and internal control system. Consultation with World Bank is in progress to select short term consultancy services to procure IT system integrator. Implementation of Nepal Financial Reporting Standards (NFRS) is a mandatory obligation from fiscal year 2016/17 for public sector entities. During the year, preparatory works have been completed to engage professional firms through competitive national bidding process to implement NFRS in NEA.

Nepal Electricity Authority

Highlights of FY 2016/17

Description	FY 2017*	FY 2016	Increase/(Decrease)	
			Amount	%
Revenue				
Net Sale of Electricity (M.NRs.)	46,144.66	31,824.21	14,320.44	45.00
Income from other Services (M.NRs.)	4,084.82	3,249.33	835.49	25.71
Total Revenue (M. NRs.)	**50,229.48**	**35,073.54**	15,155.93	43.21
Operating Expenses:			-	
Generation Expenses (M. NRs.)	1,823.98	1,333.13	490.85	36.82
Power Purchase (M. NRs.)	28,457.34	22,332.39	6,124.95	27.43
Royalty (M. NRs.)	967.50	883.13	84.37	9.55
Transmission Expenses (M. NRs.)	1,907.15	1,094.58	812.57	74.24
Distribution Expenses (M. NRs.)	7,457.82	5,671.35	1,786.47	31.50
Administration Expenses (M. NRs.)	1,306.72	1,218.58	88.14	7.23
Depreciation Expenses (M. NRs.)	3,651.59	3,554.36	97.23	2.74
Total Operating Expenses (M. NRs.)	**45,572.09**	**36,087.53**	9,484.56	26.28
Operating Surplus (M. NRs.)	**4,657.39**	**(1,013.98)**	5,671.37	(559.32)
Interest on Long-Term Loans (M. NRs.)	3,879.39	5,079.73	(1,200.34)	(23.63)
Foreign exchange translation losses/(Gain)	(493.08)	746.48	(1,239.56)	(166.05)
Provision for Employee benefits	2,250.00	2,050.00	200.00	9.76
Net Income/(Loss) (M. NRs.)	**(978.92)**	**(8,890.19)**	7,911.27	(88.99)
Long-Term Loans (M. NRs.)	117,484.21	111,303.64	6,180.57	5.55
Net Property, Plant & Equipment (M. NRs.)	90,204.23	88,521.09	1,683.14	1.90
Number of Consumers	**3,257,812**	**2,969,576**	288,236	9.71
Total Sales of Electricity (GWh)	**4,776.53**	**3,718.97**	1,057.56	28.44
Internal Sold/Utilised (GWh)	4,773.84	3,715.82	1,058.02	28.47
Annual Average Consumer's Consumption (kWh)**	1,466.18	1,252.36	213.82	17.07
Average Price of Electricity (NRs./kWh)	9.85	8.73	1.12	12.85
Cost of Service (NRs. /kWh)	10.61	11.57	(0.96)	(8.30)
Peak Load Interconnected System (GWh)	1,444.10	1,385.30	58.80	4.24
Total Available Electric Energy (GWh)	**6,257.73**	**5,077.14**	1,180.59	23.25
NEA Hydro Generation (GWh)	2,305.17	2,133.14	172.03	8.06
Thermal Generation (GWh)	0.28	0.08	0.20	257.14
Purchased Energy (GWh) - India	2,175.04	1,777.68	397.36	22.35
- Nepal (Internal)	1,777.24	1,166.24	611.00	52.39
Average Power Purchase Rate from IPPs (NRs./kWh)	7.00	7.10	(0.09)	(1.32)
Average Power Purchase Rate from India (NRs./kWh)	7.36	7.91	(0.55)	(6.90)
Average Power Purchase Rate (NRs./kWh)***	7.20	7.59	(0.39)	(5.08)
Exported Energy (GWh)	2.69	3.15	(0.46)	(14.60)
Self Consumption (GWh)	48.19	49.25	(1.06)	(2.16)
Net System Losses (Percentage)	22.90	25.78	(2.88)	(11.17)

Note: *Provisional figures,
**On internal sales
***On total purchase

Nepal Electricity Authority

Statement of Financial Position as at July 15, 2017

(NRs. in million)

Particulars	2017*	2016	2015	2014	2013	2012	2011	2010	2009	2008
Assets	-									
Non Current Assets										
Property, Plant & Equipment	90,204.23	88,521.09	86,439.05	84,238.72	83,873.47	85,460.71	84,725.47	83,105.63	81,238.50	52,030.28
Capital Work in Progress	83,939.73	66,684.09	58,052.39	46,993.93	39,843.17	29,905.45	22,832.03	17,040.47	13,550.46	35,699.71
Investments	25,350.07	21,755.05	17,550.91	12,288.26	6,807.56	5,049.17	4,855.07	3,445.74	2,501.14	2,043.52
Total Non-Current Assets	**199,494.04**	**176,960.24**	**162,042.34**	**143,520.91**	**130,524.20**	**120,415.33**	**112,412.57**	**103,591.84**	**97,290.10**	**89,773.51**
Current Assets :-										
Inventories	3,922.80	3,376.41	3,169.78	2,859.44	3,043.02	3,033.83	2,502.93	2,431.99	2,159.12	1,800.13
Trade and other Receivables	14,434.05	11,186.84	9,927.45	9,015.61	7,930.03	6,693.17	6,871.19	6,097.74	4,854.02	5,721.08
Cash and Cash Equivalents	15,955.70	15,361.60	10,621.60	6,121.57	4,714.98	2,697.48	2,016.58	1,244.65	1,724.76	1,337.15
Prepaid, Loans & Advances and Deposits	4,230.74	3,804.28	3,782.99	3,644.70	3,300.57	4,222.65	2,976.82	4,585.60	2,495.13	2,319.72
Total Current Assets	**38,543.30**	**33,729.14**	**27,501.82**	**21,641.33**	**18,988.60**	**16,647.13**	**14,367.52**	**14,359.98**	**11,233.03**	**11,178.08**
Total Assets	**238,037.33**	**210,689.37**	**189,544.17**	**165,162.24**	**149,512.80**	**137,062.46**	**126,780.09**	**117,951.82**	**108,523.13**	**100,951.59**
Equity and Liabilities										
Capital and Reserves										
Share Capital	74,283.67	58,527.86	49,275.07	44,510.75	37,364.90	31,422.44	25,694.81	38,651.77	33,659.46	28,609.97
Reserves and Accumulated Profits										
Reserve	2,089.24	2,089.24	2,021.87	1,908.53	1,721.41	1,706.03	1,677.55	1,631.30	1,497.85	1,407.83
Accumulated Profits (Loss)	(30,388.39)	(34,608.47)	(25,751.42)	(20,238.58)	(13,238.16)	(9,866.97)	0.00	(21,022.36)	(14,098.83)	(8,985.61)
Total Equity	**45,984.52**	**26,008.62**	**25,545.52**	**26,180.69**	**25,848.15**	**23,261.50**	**27,372.36**	**19,260.71**	**21,058.48**	**21,032.19**
Non-Current Liabilities										
Borrowings	117,484.21	111,303.64	98,253.08	82,691.67	75,034.89	68,909.20	62,631.85	58,231.66	53,788.45	51,368.84
Deferred Tax	693.20	693.20	693.20	693.20	693.20	693.20	693.20	693.20	693.20	791.01
Total Non-Current Liabilities	**118,177.42**	**111,996.85**	**98,946.28**	**83,384.87**	**75,728.09**	**69,602.40**	**63,325.05**	**58,924.86**	**54,481.65**	**52,159.85**
Current Liabilities										
Borrowings	-	-	-	700.00	1,200.00	3,500.00	790.00	1,280.00	250.00	1,140.00
Sundry Creditors and Other Payables	50,265.94	51,324.45	45,742.90	37,637.22	33,019.22	29,137.09	27,825.95	32,909.45	29,402.22	24,534.17
Provisions	23,609.45	21,359.45	19,309.45	17,259.45	13,717.34	11,561.47	7,466.73	5,576.80	3,330.78	2,085.38
Total Current Liabilities	**73,875.40**	**72,683.90**	**65,052.36**	**55,596.67**	**47,936.56**	**44,198.56**	**36,082.68**	**39,766.25**	**32,983.00**	**27,759.55**
Total Liabilities	**192,052.81**	**184,680.75**	**163,998.64**	**138,981.55**	**123,664.65**	**113,800.96**	**99,407.73**	**98,691.11**	**87,464.65**	**79,919.40**
Total Equity and Liabilities	**238,037.33**	**210,689.37**	**189,544.17**	**165,162.24**	**149,512.80**	**137,062.46**	**126,780.09**	**117,951.82**	**108,523.13**	**100,951.59**

Note:- *Provisional figures

Nepal Electricity Authority

Income Statement for the year ended July 15, 2017

(NRs. in million)

Particulars	2017*	2016	2015	2014	2013	2012	2011	2010	2009	2008
Sales	46,144.66	31,824.21	**30,168.77**	**28,205.70**	**25,354.62**	**20,088.64**	**17,946.82**	**17,164.60**	**14,405.93**	**15,041.39**
Cost of Sales :										
Generation	1,823.98	1,333.13	1,383.95	1,886.51	1,604.31	1,147.69	929.56	1,541.27	1,119.71	979.76
Power Purchase	28,457.34	22,332.39	19,210.19	17,041.53	13,572.46	11,948.41	10,493.74	9,746.57	7,691.28	7,437.04
Royalty	967.50	883.13	892.46	888.67	890.49	941.60	854.76	849.77	796.12	839.18
Transmission	1,907.15	1,094.58	579.63	519.45	416.74	421.38	345.96	337.73	328.16	274.85
Gross profit	**12,988.69**	**6,180.97**	**8,102.54**	**7,869.54**	**8,870.62**	**5,629.56**	**5,322.80**	**4,689.26**	**4,470.66**	**5,510.56**
Other Income	4,084.82	3,249.33	3,116.26	2,156.90	1,868.37	1,695.42	1,382.94	1,188.27	1,601.67	934.66
Distribution Expenses	7,457.82	5,671.35	5,341.48	4,575.15	4,087.97	3,685.15	3,004.18	3,091.21	2,575.09	2,110.01
Administrative Expenses	1,306.72	1,218.58	1,339.02	1,239.19	1,327.50	973.38	866.74	789.52	651.69	683.98
Interest Expenses	3,879.39	5,079.73	4,670.21	4,234.51	4,039.65	3,885.49	3,594.01	3,668.65	2,492.55	2,274.37
Depreciation	3,651.59	3,554.36	3,471.02	3,296.62	3,228.68	3,175.80	3,031.33	2,902.92	2,361.20	1,895.17
Loss (Gain) on Foreign Exchange	(493.08)	746.48	(523.17)	(52.77)	(652.14)	896.57	85.01	28.67	813.96	484.10
Provisions & write offs	-	-	-	-	-	(549.79)	(323.68)	(112.36)	(959.68)	(168.51)
Provision under Employees' Benefits Plan	2,250.00	2,050.00	2,050.00	3,542.11	2,112.74	4,106.68	1,890.01	2,246.02	1,246.00	1,354.00
Net Profit/(Loss) before Tax	**(978.92)**	**(8,890.19)**	**(5,129.76)**	**(6,808.36)**	**(3,405.41)**	**(9,947.88)**	**(6,089.22)**	**(6,961.82)**	**(5,027.84)**	**(2,524.92)**

Note:- *Provisional figures

Significant Accounting Policies

For the year ended July 15, 2017 (Ashad 31, 2074)

CONSTITUTION AND OWNERSHIP

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

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

1. SIGNIFICANT ACCOUNTING POLICIES

1.1 Basis of preparation of Financial Statements

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

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

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

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

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

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

1.2 Foreign Currency Transactions

The transactions in foreign currency are recognised at the prevailing rate on transaction date. The balances of monetary assets and liabilities in foreign currencies are translated at closing rate. The resulting gain or loss due to the translation is taken to profit and loss.

1.2.1 Functional and Presentation Currency

Items included in the financial statements of the authority are measured and presented using the

currency of the primary economic environment in which the Authority operates (the functional currency), which is the Nepalese Rupees (indicated as Rs. in short).

1.3 Property, Plant and Equipment

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

1.4 Depreciation

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:

1.5 Capital Work in Progress (CWIP)

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

1.6 Investments in Shares

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

1.7 Inventories

- Inventories include goods in hand being held for use, sale or as spares.
- Inventories are valued at lower of cost or net realisable value, using the weighted average method.
- Net realizable value is the sale price as estimated by the management in the ordinary course of business, less estimated costs, if any, necessary to make the sale. Further, adjustments are made for those inventories identified by management as obsolete or otherwise.

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

1.8 Trade Receivables

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

1.9 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 deposits with banks in the various forms of deposit accounts which may or may not bear interest, but which are not of the nature of investments.

1.10 Finance Cost

Borrowings that are due after 12 months from the date of the financial position are classified as non-current liabilities and those less than 12 months are classified as current liabilities.

Finance costs that are directly attributable to the construction of a qualifying asset are included in the cost of that asset irrespective of the physical progress. Other borrowing costs are treated as an expense in the period in which it occurs.

1.11 Foreign Currency Loans

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

1.12 Trade and Other Payables

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

1.13 Provisions

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

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

1.14 Employee Benefits

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

b. For Retirement Benefits Plans

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

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

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

1.16 Contingent Liabilities

Contingent liabilities are disclosed in respect of possible present obligations that have arose from past events but their existence can only be confirmed on occurrence or non-occurrence of

one or more uncertain future events not wholly within the control of NEA and possibility of outflow of resources is not determinable.

1.17 Revenue from Sale of Electricity

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

b. Rebate on payment before due date, surcharge on delayed payment etc. are accounted for on cash basis.

1.18 Income from Other Sources

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

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

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

d. Penalty chargeable on late commercial operation date (COD) under power purchase agreement (PPA) are accounted for on cash basis.

1.19 Insurance Fund

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

1.20 Taxes

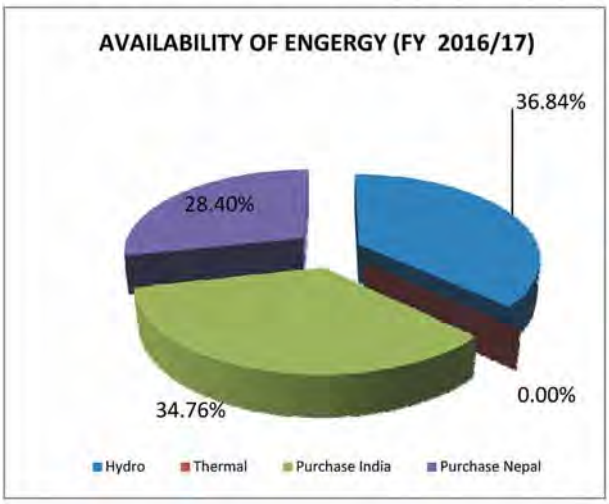
a. Current tax

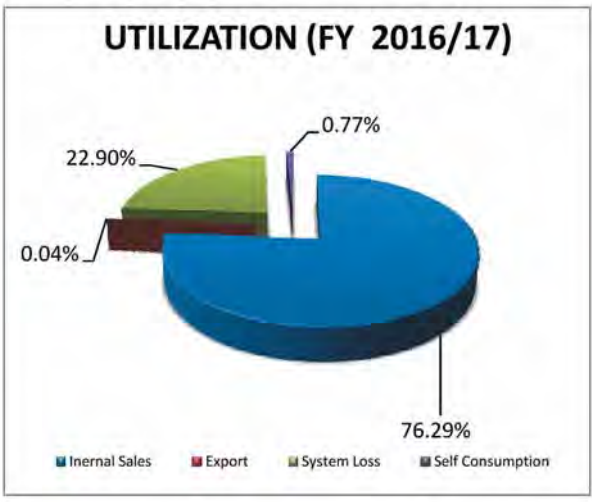
Current Tax is determined as the amount of tax payable in respect of taxable income for the year.

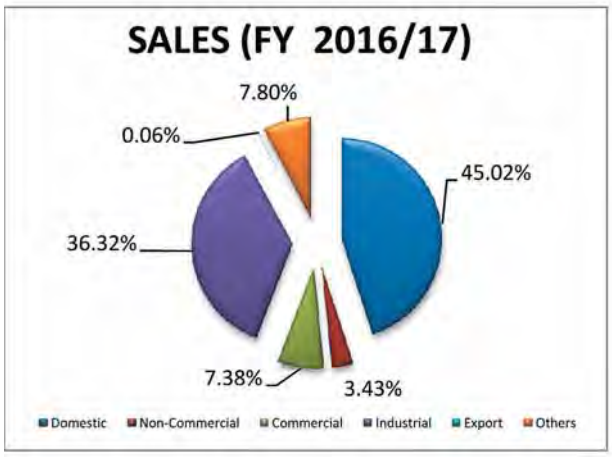
b. Deferred tax

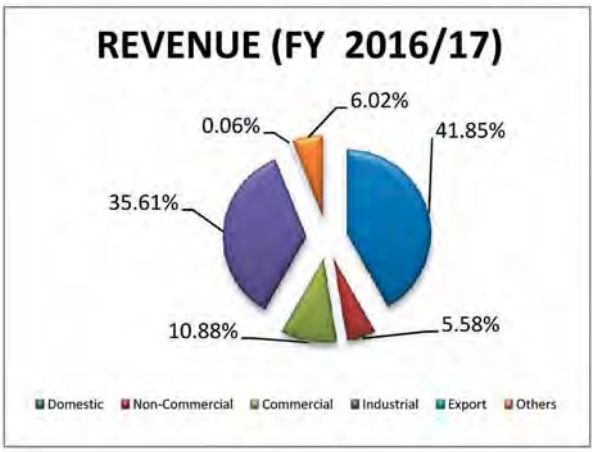
Deferred tax is recognised on temporary difference, being the difference between tax base of assets and liability and carrying amount thereto. Where there is carry forward losses, deferred tax asset are recognized only if there is virtual certainty of realization of such assets. Other deferred tax assets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

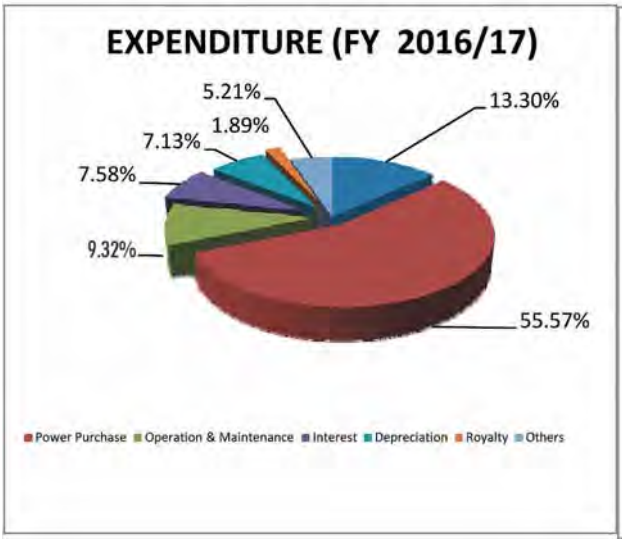
Statistics & Schematics

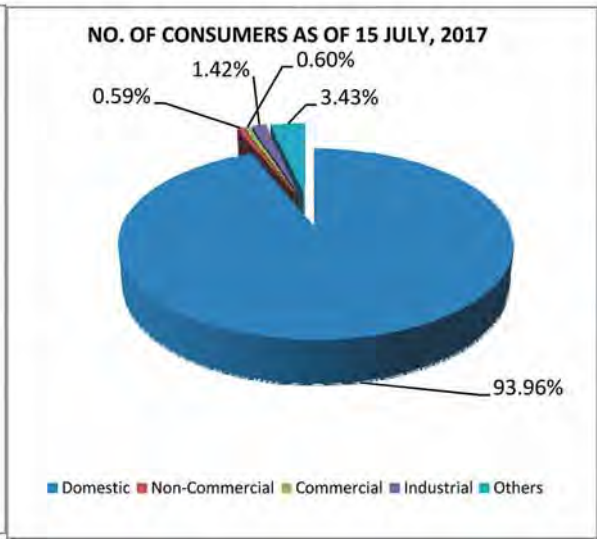




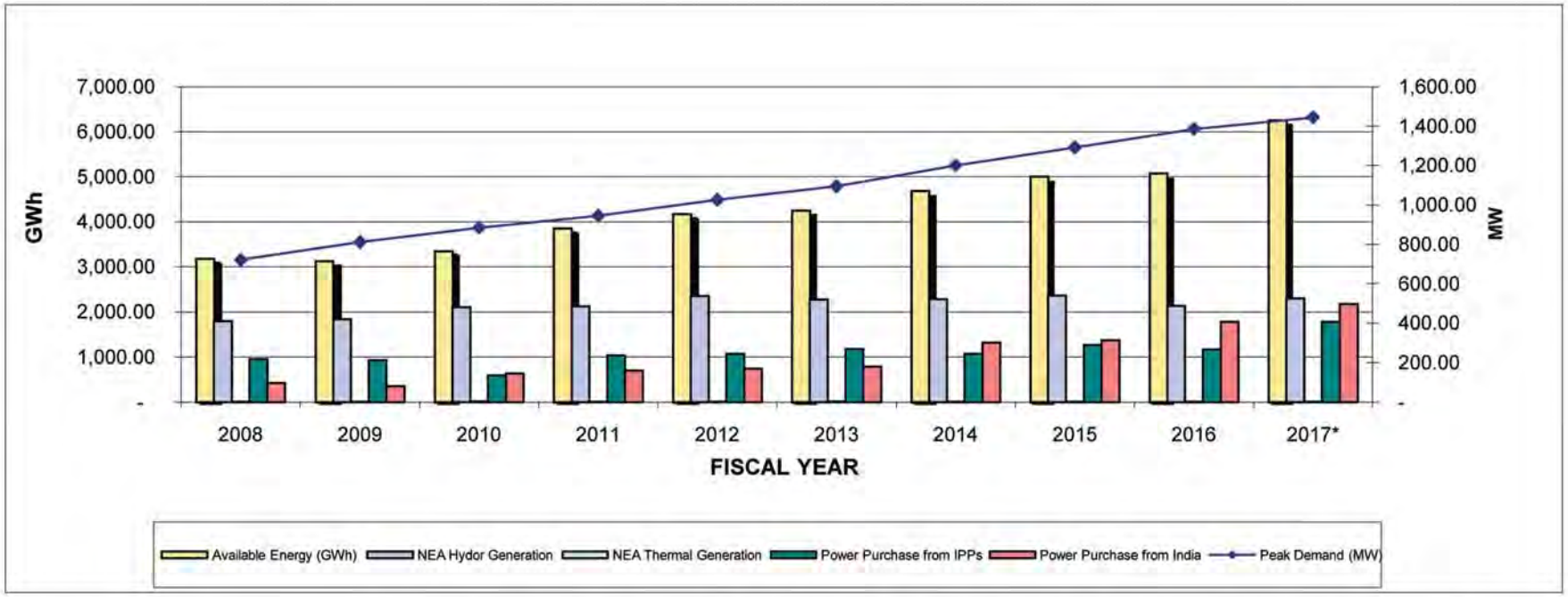








Total Energy Available & Peak Demand

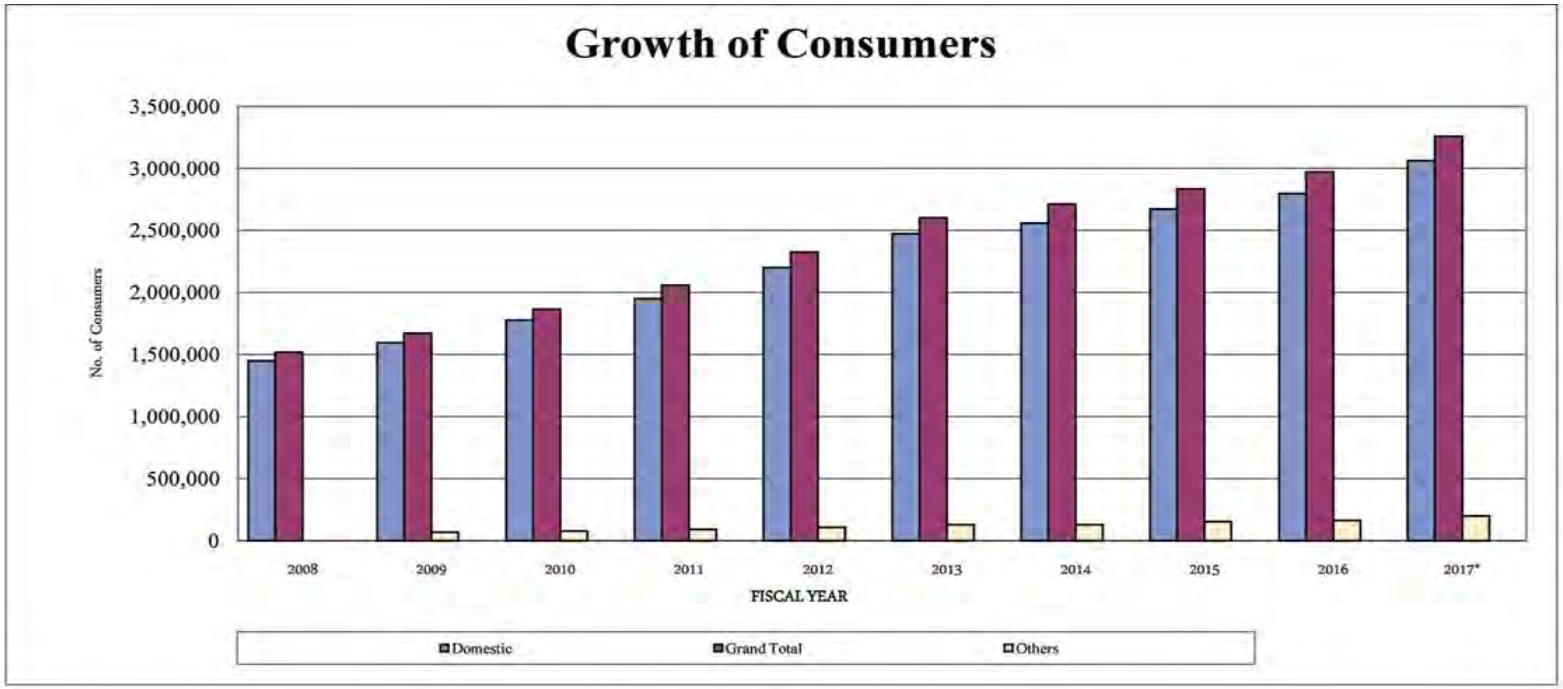


Particulars	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017*
Peak Demand (MW)	721.73	812.50	885.28	946.10	1,026.65	1,094.62	1,200.98	1,291.10	1,385.30	1,444.10
NEA Hydor Generation	1,793.14	1,839.53	2,108.65	2,122.08	2,357.43	2,273.11	2,288.23	2,366.88	2,133.14	2,305.17
NEA Thermal Generation	9.17	9.06	13.01	3.40	1.56	18.85	9.65	1.24	0.08	0.28
NEA Generation Total (GWh)	**1,802.31**	**1,848.59**	**2,121.66**	**2,125.48**	**2,358.99**	**2,291.96**	**2,297.88**	**2,368.12**	**2,133.22**	**2,305.45**
Power Purchase from India	425.22	356.46	638.68	694.05	746.07	790.14	1,318.75	1,369.89	1,777.68	2,175.04
Power Purchase from IPPs	958.42	925.74	591.43	1,038.84	1,073.57	1,175.98	1,070.47	1,268.93	1,166.24	1,777.24
Power Purchase Total (GWh)	**1,383.64**	**1,282.20**	**1,230.11**	**1,732.89**	**1,819.64**	**1,966.12**	**2,389.21**	**2,638.82**	**2,943.92**	**3,952.28**
Available Energy (GWh)	**3,185.95**	**3,130.79**	**3,351.77**	**3,858.37**	**4,178.63**	**4,258.08**	**4,687.09**	**5,005.70**	**5,077.14**	**6,257.73**

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

* Provisional figures

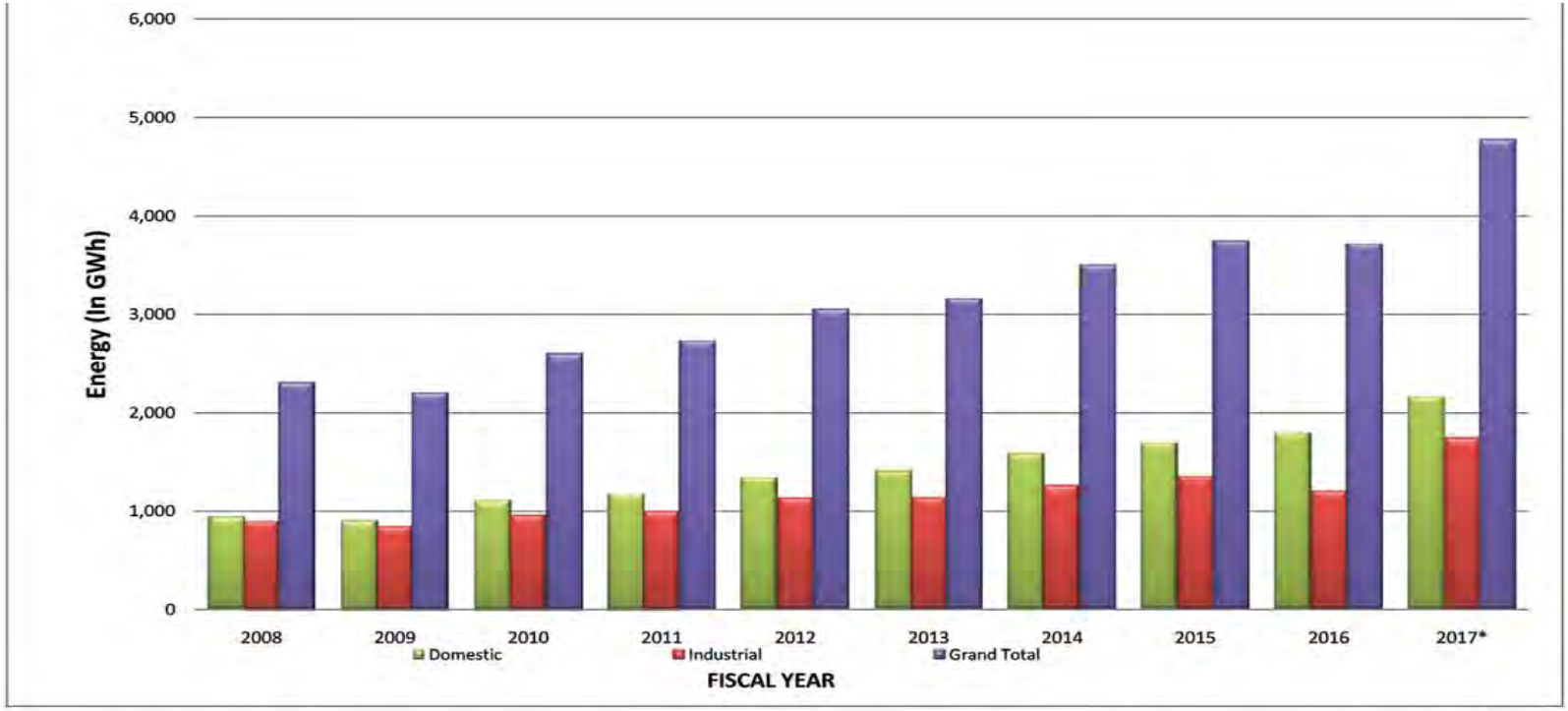
Growth of Consumers



Particulars	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017*
Domestic	1,450,254	1,595,015	1,775,571	1,949,530	2,198,680	2,472,264	2,558,726	2,671,039	2,796,621	3,060,995
Non-Commercial	10,556	10,518	10,952	12,520	14,055	15,179	16,155	16,717	17,732	19,257
Commercial	6,052	7,305	8,919	10,802	13,297	13,096	14,955	15,899	17,191	19,574
Industrial	25,548	28,559	29,410	33,030	36,409	37,498	40,265	41,825	43,639	46,343
Water Supply	434	584	609	688	860	834	1,141	1,266	1,426	1,675
Irrigation	18,614	22,335	32,089	42,494	53,165	51,520	71,845	77,066	83,283	98,626
Street Light	1,961	2,339	2,214	2,374	2,590	2,878	2,774	2,813	2,829	2,935
Temporary Supply	300	403	522	634	619	768	726	733	883	1,070
Transport	38	42	41	42	44	51	1	44	43	44
Temple	2,746	2,911	2,941	3,181	3,529	3,857	4,048	4,181	4,391	4,673
Non- Domestic	-	-	-	-	-	-	-	-	-	977
Entertainment	-	-	-	-	-	-	-	-	-	45
Community Sales	375	594	795	995	1,161	1,207	1,377	1,459	1,537	1,597
Total (Internal Sales)	**1,516,878**	**1,670,605**	**1,864,063**	**2,056,290**	**2,324,409**	**2,599,152**	**2,712,055**	**2,833,042**	**2,969,575**	**3,257,811**
Bulk Supply (India)	5	5	4	2	5	4	2	1	1	1
Grand Total	**1,516,883**	**1,670,610**	**1,864,067**	**2,056,292**	**2,324,414**	**2,599,156**	**2,712,057**	**2,833,043**	**2,969,576**	**3,257,812**

Note:- *Provisional figures

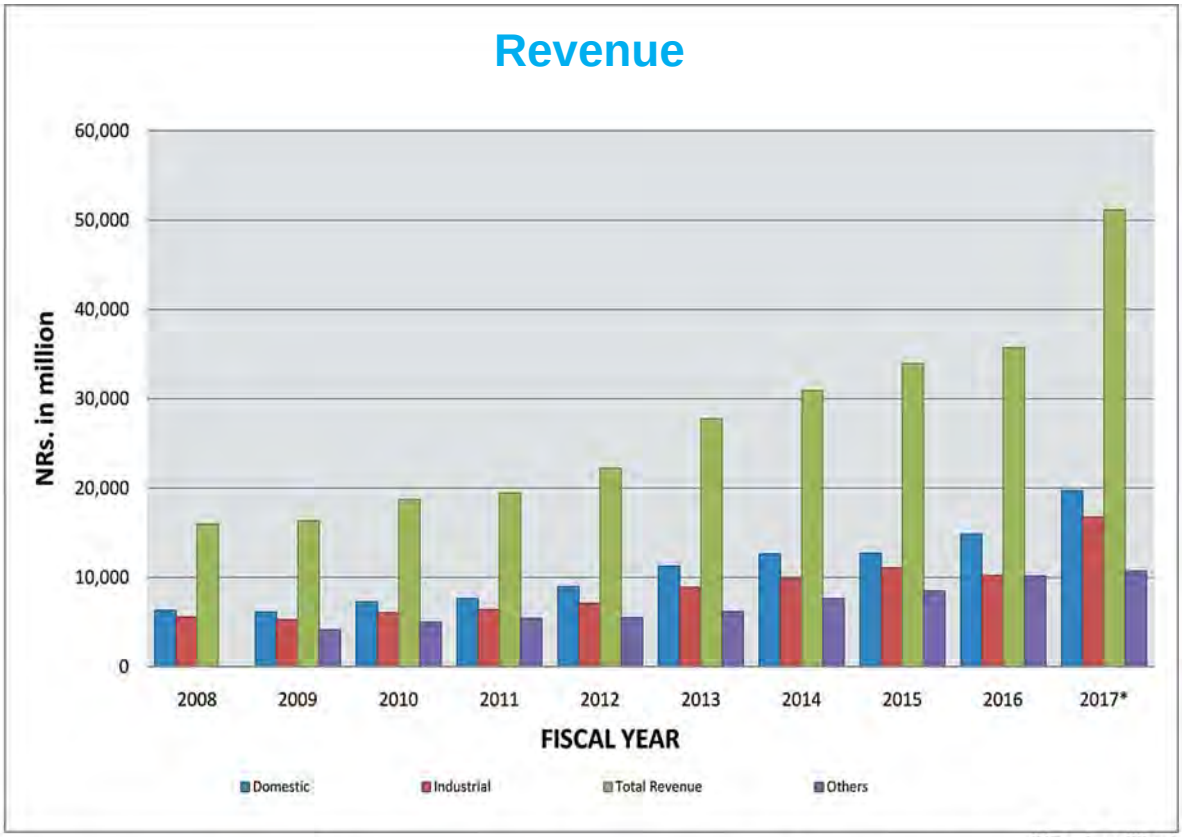
Electricity Sales



(in GWh)

Particulars	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017*
Domestic	931.35	908.67	1,108.87	1,169.31	1,342.67	1,401.64	1,571.39	1,679.35	1,796.78	2,150.21
Non-Commercial	109.93	98.89	103.47	109.49	115.68	115.21	126.64	130.53	134.37	163.77
Commercial	154.38	146.29	187.12	204.03	240.74	256.82	285.42	300.25	286.48	352.37
Industrial	901.09	845.68	960.43	1,001.73	1,123.94	1,141.07	1,251.69	1,352.15	1,205.69	1,735.05
Water Supply & Irrigation	46.86	48.14	55.98	82.80	64.59	72.55	82.52	86.56	100.42	113.00
Street Light	70.26	67.51	65.58	67.21	72.06	76.24	76.44	76.48	73.88	78.90
Temporary Supply	0.70	1.04	1.00	1.00	1.20	1.47	1.34	1.52	2.10	3.10
Transport	5.88	5.22	5.42	5.54	6.72	6.26	6.22	6.24	6.09	6.60
Temple	5.12	4.76	3.64	3.46	3.95	4.11	5.18	4.85	5.53	7.40
Non- Domestic	-	-	-	-	-	-	-	-	-	45.46
Entertainment	-	-	-	-	-	-	-	-	-	0.97
Community Sales	24.65	32.01	34.95	51.95	69.02	77.04	86.08	102.62	104.48	117.01
Total (Internal Sales)	**2,250.22**	**2,158.21**	**2,526.46**	**2,696.52**	**3,040.57**	**3,152.41**	**3,492.91**	**3,740.54**	**3,715.82**	**4,773.84**
Bulk Supply (India)	60.10	46.38	75.07	31.10	4.12	3.60	3.40	3.17	3.15	2.69
Grand Total	**2,310.32**	**2,204.59**	**2,601.53**	**2,727.62**	**3,044.69**	**3,156.01**	**3,496.31**	**3,743.71**	**3,718.97**	**4,776.53**

Note:- *Provisional figures

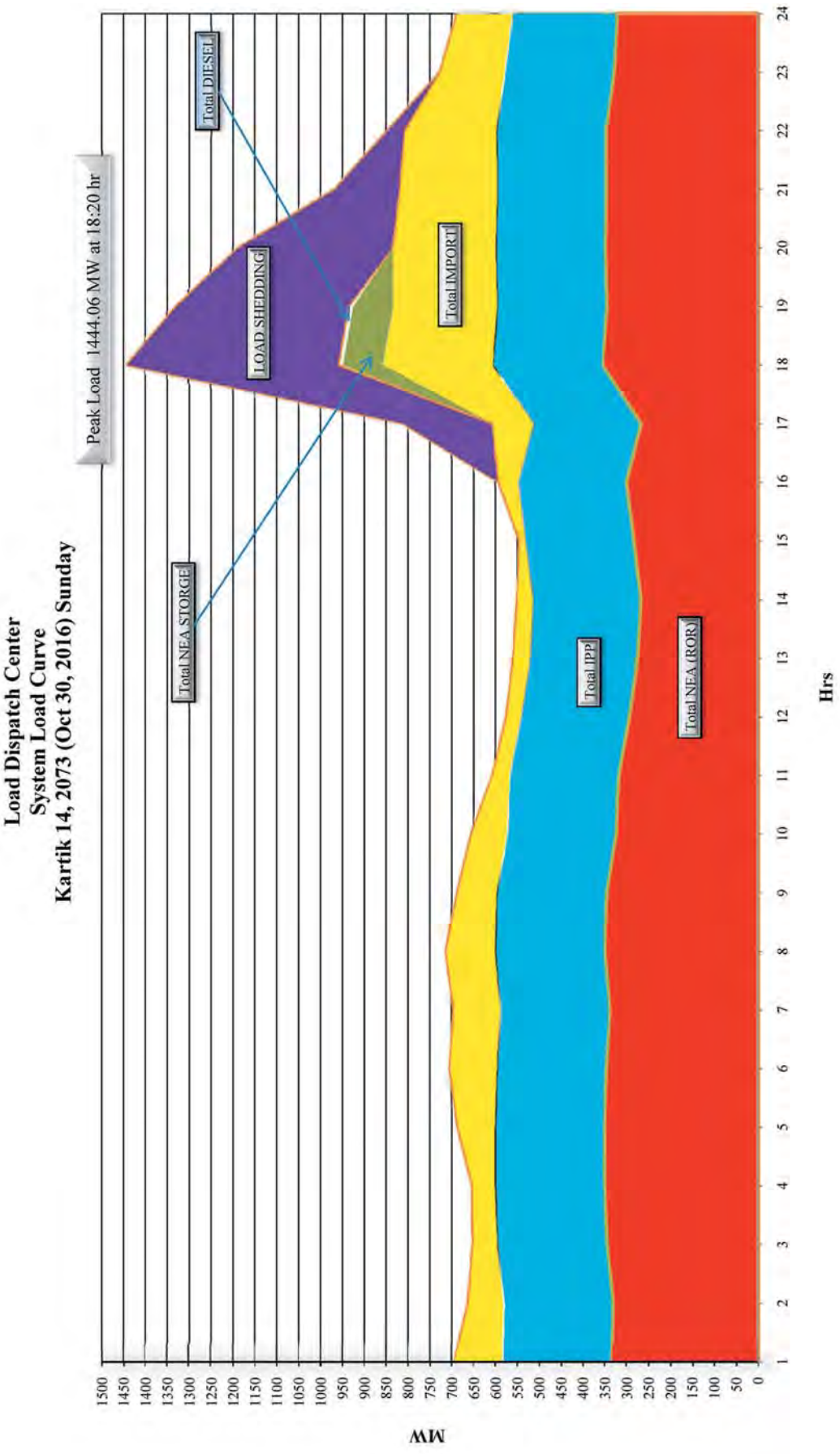


(NRs. in million)

Particulars	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017*
Domestic	6,297.65	6,100.65	7,252.06	7,602.34	8,967.77	11,247.77	12,622.11	12,706.55	14,833.65	19,693.53
Non-Commercial	982.08	900.75	983.63	1,020.51	1,091.52	1,355.17	1,486.63	1,644.45	1,995.10	2,626.01
Commercial	1,399.51	1,384.67	1,719.35	1,910.28	2,259.50	2,994.00	3,359.69	3,735.00	3,788.76	5,121.75
Industrial	5,544.80	5,264.33	6,060.20	6,378.25	7,102.37	8,885.21	9,844.18	11,064.84	10,182.32	16,759.77
Water Supply & Irrigation	204.67	215.62	353.14	250.60	294.82	389.34	418.20	480.71	525.30	711.27
Street Light	467.31	445.96	333.90	433.42	464.22	582.69	601.84	629.65	602.37	686.83
Temporary Supply	10.51	12.20	13.58	13.98	16.18	24.48	23.07	27.39	29.25	54.11
Transport	33.70	26.95	27.58	27.78	31.70	39.53	39.32	41.44	39.74	45.86
Temple	26.38	24.41	28.16	26.51	21.38	23.66	26.34	29.17	33.92	47.21
Non- Domestic	-	-	-	-	-	-	-	-	-	708.39
Entertainment	-	-	-	-	-	-	-	-	-	17.43
Community Sales	64.22	70.10	170.90	189.28	244.97	301.38	334.94	400.12	411.50	560.91
Total (Internal Sales)	**15,030.83**	**14,445.64**	**16,942.50**	**17,852.95**	**20,494.43**	**25,843.23**	**28,756.31**	**30,759.31**	**32,441.91**	**47,033.07**
Bulk Supply (India)	361.14	295.49	604.85	215.42	23.97	32.22	30.90	39.36	32.07	28.74
Gross Revenue	**15,391.97**	**14,741.13**	**17,547.35**	**18,068.37**	**20,518.40**	**25,875.45**	**28,787.21**	**30,798.67**	**32,473.98**	**47,061.81**
Income from Other Services	584.18	1,601.66	1,188.27	1,382.94	1,695.42	1,868.37	2,156.90	3,116.26	3,249.33	4,084.82
Total Revenue	**15,976.15**	**16,342.79**	**18,735.62**	**19,451.31**	**22,213.82**	**27,743.82**	**30,944.11**	**33,914.93**	**35,723.31**	**51,146.63**

Note:- *Provisional figures

System Load Curve of Peak Load Day



ANNEX-1

ELECTRICITY TARIFF

TARIFF RATES

1. Domestic Consumers

(a) Service and Energy Charge (Single Phase)

kWh (Monthly) Units	5 Ampere		15 Ampere		30 Ampere		60 Ampere	
	Service Charge	Energy Charge	Service Charge	Energy Charge	Service Charge	Energy Charge	Service Charge	Energy Charge
0-20	30.00	3.00	50.00	4.00	75.00	5.00	125.00	6.00
21-30	50.00	7.00	75.00	7.00	100.00	7.00	150.00	7.00
31-50	75.00	8.50	100.00	8.50	125.00	8.50	175.00	8.50
51-150	100.00	10.00	125.00	10.00	150.00	10.00	200.00	10.00
151-250	125.00	11.00	150.00	11.00	175.00	11.00	225.00	11.00
251-400	150.00	12.00	175.00	12.00	200.00	12.00	250.00	12.00
Above 400	175.00	13.00	200.00	13.00	225.00	13.00	275.00	13.00

(b) Service and Energy Charge (Three Phase)

Low Voltage (230/400 V)

kWh	Up to 10 KVA		Above 10 KVA	
	Service Charge	Energy Charge	Service Charge	Energy Charge
Up to 400	1100.00	12.50	1800.00	12.50
Above 400		13.50		13.50

(c) Service and Energy Charge: Three Phase

Medium Voltage (33/11 KV)

kWh	Up to 10 KVA	
	Service Charge	Energy Charge
Up to 1000	1100.00	11.00
1001-2000		12.00
Above 2001		13.00

Billing Method (For 5 Ampere)

S. No.	Electricity Consume Block	Rate Rs. Per Unit	Billing Method
1	Up to 20 units	3.00	Minimum Monthly Service Charge Rs. 30.00 for up to 20 units and Energy Charge Rs. 3.00 per unit
2	21 to 30 units	7.00	Minimum Monthly Service Charge Rs. 50.00 and Energy Charge per unit Rs. 3.00 for per unit up to 20 units and Rs. 7.00 per unit for 21 units to 30 units
3	31 to 50 units	8.50	Minimum Monthly Service Charge Rs. 75.00 and Energy Charge per unit Rs. 3.00 for per unit up to 20 units and Rs. 7.00 per unit for 21 units to 30 units and Rs. 8.50 per unit for 31 units to 50 units
4	51 to 150 units	10.00	Minimum Monthly Service Charge Rs. 100.00 and Energy Charge per unit Rs. 3.00 for per unit up to 20 units and Rs. 7.00 per unit for 21 units to 30 units and Rs. 8.50 per unit for 31 units to 50 units and Rs. 10.00 per unit for 51 units to 150 units
5	151 to 250 units	11.00	Minimum Monthly Service Charge Rs. 125.00 and Energy Charge per unit Rs. 3.00 for per unit up to 20 units and Rs. 7.00 per unit for 21 units to 30 units and Rs. 8.50 per unit for 31 units to 50 units and Rs. 10.00 per unit for 51 units to 150 units and Rs. 11.00 per unit for 151 units to 250 units
6	251 to 400 units	12.00	Minimum Monthly Service Charge Rs. 150.00 and Energy Charge per unit Rs. 3.00 for per unit up to 20 units and Rs. 7.00 per unit for 21 units to 30 units and Rs. 8.50 per unit for 31 units to 50 units and Rs. 10.00 per unit for 51 units to 150 units and Rs. 11.00 per unit for 151 units to 250 units and Rs. 12.00 per unit for 251 units to 400 units
7	Above 400	13.00	Minimum Monthly Service Charge Rs. 175.00 minimum charge and Energy Charge per unit Rs. 3.00 for per unit up to 20 units and Rs. 7.00 per unit for 21 units to 30 units and Rs. 8.50 per unit for 31 units to 50 units and Rs. 10.00 per unit for 51 units to 150 units and Rs. 11.00 per unit for 151 units to 250 units and Rs. 12.00 per unit for 251 units to 400 units and Rs. 13.00 per unit for above 400 units

Similarly, billing will be made for 15, 30 and 60 Ampere.

2. Other Consumers

2.1 Low Voltage (230/400 V)

Consumer Category	Tariff Rate	
	Demand Charge	Energy Charge
	Rs. per KVA/ month	Rs./unit
1. Industrial		
a) Rural and Domestic	60.00	7.80
b) Small Industry	110.00	9.60
2. Commercial	325.00	11.20
3. Non-Commercial	215.00	12.00
4. Irrigation		4.30
5. Water Supply		
a) Community Water Supply	155.00	5.20
b) Other Water Supply	230.00	7.20
6. Temple		6.10
7. Street Light		
a) Metered		7.30
b) Non-Metered	2475.00	
8. Temporary Supply		19.80
9. Non-Domestic	350.00	13.00
10. Entertainment Business	350.00	14.00

2.2 High Voltage

Consumer Category	Tariff Rate	
	Demand Charge	Energy Charge
	Rs./KVA/month	Rs./unit
A. High Voltage (66 KV or above)		
1. Industrial	240.00	7.50
B. Medium Voltage (33 KV)		
1. Industrial	255.00	8.40
2. Commercial	315.00	10.80
3. Non-commercial	240.00	11.40
4. Irrigation	55.00	4.80
5. Water Supply		
a) Community Water Supply	220.00	6.00
b) Other Water Supply	220.00	6.60
6. Transportation		
a) Trolley Bus	230.00	5.60
b) Other Transportation	255.00	8.60
7. Non-Domestic	350.00	12.55
8. Entertainment Business	350.00	13.50
C. Medium Voltage (11 KV)		
1. Industrial	255.00	8.60
2. Commercial	315.00	11.10
3. Non-commercial	240.00	11.50
4. Irrigation	55.00	4.90
5. Water Supply		
a) Community Water Supply	220.00	6.20

b) Other Water Supply	220.00	6.80
6. Transportation		
a) Trolley Bus	230.00	5.60
b) Other Transportation	255.00	8.80
7. Temple	220.00	9.90
8. Temporary Supply	330.00	12.00
9. Non-Domestic	350.00	12.90
10. Entertainment Business	350.00	13.90

Under Non-Domestic: Embassy, Foreign Mission, INGO, Private Campus, Star Hotel, Shopping Mall etc.

Under Entertainment: Cinema Hall, Fun Park, Theater etc.

3. Time of Day (ToD) Tariff Rate

a) Electricity Tariff Rate from Baishakh to Mangsir

Consumer Category	Tariff Rate			
	Demand Charge Rs. per KVA/ month	Pick Time (17.00-23.00)	Off Pick Time (23.00-5.00)	Normal time (5.00-17.00)
A. High Voltage (66 KV or above)				
1. Industrial	240.00	9.30	4.15	7.50
B. Medium Voltage (33 KV)				
1. Industrial	250.00	10.20	5.25	8.40
2. Commercial	315.00	12.30	6.75	10.80
3. Non-Commercial	240.00	13.20	7.00	12.00
4. Irrigation	55.00	6.30	3.15	4.70
5. Water Supply				
a) Community Water Supply	220.00	7.30	3.60	5.90
b) Other Water Supply	220.00	10.20	5.25	8.40
6. Transportation				
a) Trolley Bus	230.00	7.00	3.70	5.50
b) Other Transportation	255.00	9.35	3.70	8.40
7. Street Light	80.00	8.40	3.50	4.20
C. Medium Voltage (11 KV)				
1. Industrial	250.00	10.50	5.40	8.55
2. Commercial	315.00	12.60	6.90	11.10
3. Non-commercial	240.00	13.50	7.15	12.25
4. Irrigation	55.00	6.40	3.50	4. 75
5. Water Supply				
a) Community Water Supply	220.00	7.45	4.40	6.10
b) Other Water Supply	220.00	10.50	5.40	8.50
6. Transportation				
a) Trolley Bus	230.00	7.15	4.20	5.60
b) Other Transportation	255.00	9.65	4.20	8.50
7. Street Light	80.00	8.80	3.75	4.40
8. Temple	220.00	11.30	5.15	9.10
9. Temporary Supply	330.00	14.40	6.60	11.75

b) Electricity Tariff Rate from Paush to Chaitra

Consumer Category	Tariff Rate		
	Demand Charge Rs. per KVA/ month	Pick Time (17.00-23.00)	Normal Time (23.00-5.00)
A. High Voltage (66 KV or above)			
1. Industrial	240.00	9.30	7.50
B. Medium Voltage (33 KV)			
1. Industrial	250.00	10.20	8.40
2. Commercial	315.00	12.30	10.80
3. Non-Commercial	240.00	13.20	12.00
4. Irrigation	55.00	6.30	4.70
5. Water Supply			
a) Community Water Supply	220.00	7.30	5.90
b) Other Water Supply	220.00	10.20	8.40
6. Transportation			
a) Trolley Bus	230.00	7.00	5.50
b) Other Transportation	255.00	9.35	8.40
7. Street Light	80.00	8.40	4.20
C. Medium Voltage (11 KV)			
1. Industrial	250.00	10.50	8.55
2. Commercial	315.00	12.60	11.10
3. Non-commercial	240.00	13.50	12.25
4. Irrigation	55.00	6.40	4.75
5. Water Supply			
a) Community Water Supply	220.00	7.45	6.10
b) Other Water Supply	220.00	10.50	8.50
6. Transportation			
a) Trolley Bus	230.00	7.15	5.60
b) Other Transportation	255.00	9.65	8.50
7. Street Light	80.00	8.80	4.40
8. Temple	220.00	11.30	9.10
9. Temporary Supply	330.00	14.40	11.75

4. Community Wholesale Consumer:

Voltage Level	Energy Charge (Rs./unit)
a) Medium Voltage (11KV/33KV)	
Upto (N* x 30) units	4.25
Above (N* x 30) units	6.00
b) Lower Voltage Level (230/400 Volt)	
Upto (N* x 30) units	4.25
Above (N* x 30) units	6.25

N*= Total Number of Consumers of a Community Group

Notes:

a) Low Voltage refers to Electricity Supply of 230/400 V, Medium Voltage refers to 11 KV and 33 KV and High Voltage refers to 66 KV or above.

b) If Demand Meter of any consumer reads kilowatts (kW), then KVA=kW/0.8. Consumers having kW demand meter shall mandatorily install capacitors within the given time. Otherwise their KVA demand shall be calculated as KVA=kW/07.

c) 10% rebated in total bill amount will be given to the Government of Nepal approved Industrial Districts, if the bill is paid within 21 days of billing date.

d) If the Crematory House, Governmental Hospital and Health Centers (except Residential Complex or part thereof) under the Government of Nepal pay the bill within 21 days, 20 percent rebate will be given in total bill amount.

e) Consumers supplied at High Voltage (66 KV or above) and Medium Voltage (33 KV and 11 KV) should compulsorily install ToD Meter.

f) If New Additional Consumers applying for 11 KV supply are to be supplied at 33 KV, they will be charged as per 11 KV Tariff Structure.

Electricity Generation Power Plants and Projects

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

Small Hudropower Plants(Isolated)		
1.	Dhankuta***	240
2.	Jhupra(Surkhet)***	345
3.	Gorkhe(Illam)***	64
4.	Jumla**	200
5.	Dhanding***	32
6.	Syangja***	80
7.	Helambu	50
8.	Darchula**	300
9.	Chame**	45
10,	Taplejung**	125
11.	Manag**	80
12.	Chaurjhari(Rukum)**	150
13.	Syaprudaha(Rukum)**	200
14.	Bhojpur**	250
15.	Bajura**	200
16.	Bajhang**	200
17.	Arughat(Gorkha)	150
18.	Okhaldhunga	125
19.	Rupalgad(Dadeldhura)	100
20.	Achham	400
21.	Dolpa	200
22.	kalokot	500
23.	Heldung(Humla)	500
	Total	**4,536**

S.No	Thermal Power Plants	Capacity(KW)
1	Duhabi Multifuel	39,000
2	Hetauda Diesel	14,410
	Total	**53,410**
	Solar Power Plants	
1	Simikot	50
2	Gamgadhi	50
	Total	**100**

Total Major Hydro (NEA)-Grid Connected	473,394
Total Small Hydro(NEA)-Isolated	4,536
Total Hydro(NEA)	477,930
Total Hydro(IPP)	441,052
Total Hydro(Nepal)	918,982
Total Thermal(NEA)	53,410
Total Solar (NEA)	100
Total Installed Capacity	**972,492**
Total installed Capacity (NEA & IPP)-Grid	**967,856**

S.N.	Under Construction Projects	Capacity(kW)
1	Upper Tamakoshi Hydropower Project	456,000
2	Tanahu Hydropower Project	140,000
3	Chameliya HEP	30,000
4	Kulekhani III HEP	14,000
5	Upper Trishuli 3A HEP	60,000
6	Rahughat HEP	40,000
7	Upper Sanjen	14,600
8	Sanjen	42,500
9	Rasuwagadi	111,000
10	Madhya Bhotekoshi	102,000
11	Upper Trishuli 3B	37,000
	Total	**1,047,100**

S.N.	Planned & Proposed Projects	Capacity (kW)
1	Upper Arun HEP	335,000
2	Upper Modi A HEP	42,000
3	Upper Modi HEP	18,200
4	DudhKoshi Storage HEP	300,000
5	Tamor Storage HEP	762,000
6	Uttar Ganga Storage HEP	828,000
7	Tamakoshi V HEP	95,000
8	Chainpur Seti HEP	210,000
9	Andhikhola Storage HEP	180,000
	Total	**2,770,200**

Note

** Leased to Private Sector

*** Not in Normal Operation

Existing High Voltage Transmission Lines & Substations

S.N	132 kV Transmission Line	Type of Ckts	Length Circuit km	Conductor Type	Conductor Size (Sq.mm)
1	Anarmani-Duhabi	Single	75.76	BEAR	250
2	Kusha-Katiya(India)	Single	15	BEAR	250
3	Duhabi-Lahan-Cha-pur-Pathaliya/Parwanipur-Hetauda	Double	598	BEAR	250
4	Hetauda-KL2 P/S	Double	16	BEAR	250
5	Bharatpur-Marsyangdi P/S	Single	25	DUCK	300
6	Hetauda-Bharatpur	Single	70	PANTHER	200
7	Marsyangdi P/S-Suichatar	Single	84	DUCK	300
8	Suichatar-KL2 P/S	Double	72	BEAR	250
9	Suichatar-Balaju-Chapali-New Bhaktapur	Double	26.9	BEAR	250
10	New Bhaktapur-Lamosangu	Double	96	BEAR	250
11	Lamosangu-Khimti P/S	Single	46	BEAR	250
12	Lamosangu-Bhotekoshi P/S	Single	31	BEAR	250
13	Bharatpur-Damauli	Single	39	WOLF	150
14	Bharatpur-Kawasoti-Bardghat	Single	70	PANTHER	200
15	Bardghat-Gandak P/S	Double	28	PANTHER	200
16	Bardghat-Butwal	Double	86	BEAR	250
17	Butwal-KGA P/S	Double	116	DUCK	300
18	KGA P/S-Lekhnath	Double	96	DUCK	300
19	Lekhnath-Damauli	Single	45	WOLF	150
20	Lekhnath-Pokhara	Single	7	DOG	100
21	Pokhara-Modikhola P/S	Single	37	BEAR	250
22	Butwal-Shivapur-Lamahi	Double	230	BEAR	250
23	Lamahi-Jhimruk P/S	Single	50	DOG	100
24	Lamahi-Kohalpur-Lumki-Attariya	Double	486	BEAR	250
25	Attariya-Mahendranagar-Gaddachauki	Double	98	BEAR	250
26	Marsyangdi -M. Marsyangdi	Double	80	CARDINAL	420
27	Damak-Godak	Single	35	BEAR	250
28	Kusum-Hapure	Single	20.3	BEAR	250
29	Bhulbhule- Middle Marsyangdi P/S	Single	22	BEAR	250
30	Chameliya-Attaria	Single	118	BEAR	250
Total			**2,819.0**		
S.N	**400/220 kV Transmission Line**	**Type of Ckts**	**Length Circuit km**	**Conductor Type**	**Conductor Size (Sq.mm)**
1	Dhalkebar-Muzzaffarpur Cross Border Line	Double	78	MOOSE	500
2	Khimti- Dhalkebar 220 kV 1st Ckt. Transmission Line	Single	75	BISON	350
Total			**153.0**		
S.N	**66 kV Transmission Line**	**Type of Ckts**	**Length Circuit km**	**Conductor Type**	**Conductor Size (Sq.mm)**
1	Chilime P/S-Trishuli P/S	Single	39	WOLF	150
2	Trisuli P/S-Balaju	Double	58	DOG	100
3	Trisuli P/S-Devighat P/S	Single	4.56	WOLF	150
4	Devighat P/S-Chapali	Double	58.6	DOG	100
5	Chapali-New Chabel	Double	10	DOG	100
6	Balaju-Lainchor	Single	2	PANTHER	200
7	Balaju-Siuchatar-KL1 P/S	Double	72	WOLF	150
8	KL 1 P/S-Hetauda-Birgunj	Double	144	WOLF	150
9	Suichatar-Teku	Single	4.1	BEAR	250
10	Suichatar-New Patan	Double	13	WOLF	150
11	Teku-K3 (underground)	Singlecore	2.8	XLPE Cable	400
12	Suichatar-K3	Single	6.9	XLPE Cable	250 & 500
13	New Patan-New Baneswor	Single	2.8		120
14	Bhaktapur-Banepa-Panchkhal-Sunkoshi P/S	Single	48		120
15	Indrawati- Panchkhal	Single	28		95
Total			**493.76**		

Existing/Underconstruction Grid Substations

132 kV SUBSTATIONS (CAPACITY IN MVA)

S.N.	Substation	Capacity (MVA)	S.N.	Substation	Capacity (MVA)
1	Mahendranagar	17.5	19	Lahan	63.0
2	Attariya	60.0	20	Duhabi	126.0
3	Lamki	22.5	21	Anarmani	60.0
4	Kohalpur	60.0	22	Pokhara	60.0
5	Lamahi	60.0	23	Lekhnath	22.5
6	Shivapur	35.0	24	Damauli	60.0
7	Butwal	189.0	25	Lamosagu	30.0
8	Bardghat	30.0	26	Bhaktapur	94.5
9	Kawasoti	30.0	27	Balaju	45.0
10	Bharatpur	67.5	28	Suichatar	113.4
11	Hetauda	90.0	29	Matatirtha	22.5
12	Parwanipur	193.5	30	Hapure	30.0
13	Chandranigahapur	60.0	31	Chapali	30.0
14	Pathlaiya	22.5	32	Mirchaiya	30.0
15	Kusum	12.5	33	Damak	30.0
16	Kamane	30.0	34	Godak	30.0
17	Syangja	30.0	35	Phidim	16.0
18	Dhalkebar	93.0	36	Kabeli	30.0
Total				**1,996**	

66KV SUBSTATIONS (CAPACITY IN MVA)

S.N.	Substation	Capacity (MVA)	S.N.	Substation	Capacity (MVA)
1	Birgung	85.0	8	Baneshwor	36.0
2	Amlekhgunj	7.5	9	Indrawati	7.5
3	Simra	30.0	10	Banepa	45.0
4	K-3	45.0	11	Panchkhal	10.0
5	Teku	45.0	12	Lainchour	45.0
6	Patan	54.0	13	New-Chabel	67.5
7	Balaju	45.0	14	Chapali	99.0
Total				**621.5**	

UNDER CONSTRUCTION S/S			PLANNED & PROPOSED S/S		
S.N.	**Substation**	**Capacity (MVA)**	**Voltage Level**	**No. of S/S**	**Total Capacity (MVA)**
1	132/33 kV Singati	30	Up to 400kV	5	2025
2	132/33 kV Purbi Chitwan	30	Up to 220kV	18	3876
3	132/33kV Ghorahi	30	Up to 132kV	21	917
4	132/33 kV Markichwok	30	Total		6818
5	132/33 kV Rupani	63			
6	132/33kV Syaule	30			
7	220/132 Trishuli 3B HUB	320			
Total		**533**			

Under Construction & Planned High Voltage Transmission Lines

S.N.	132 kV Transmission Line	Type of Ckts	Length Circuit km	Conductor Type	Conductor Size (Sq.mm)
1	Thankot-Chapagaon	Double	57	BEAR	250
4	Dumre- Damauli	Double	40	BEAR	250
6	Kabeli-Godak	Double	145	BEAR	250
7	Singati-Lamosangu	Double	76	BEAR	250
8	Solu Corridor	Double	180	CARDINAL	420
9	Butwal-Lumbini	Double	44	BEAR	250
10	Gulmi-Arghakhanchi-Gorusinghe	Double	220	BEAR	250
11	Ramechap-Garjyang-Khimti	Double	60	BEAR	250
12	Dordi Corridor	Double	32	BEAR	250
13	Modi-Lekhnath	Double	84	BEAR	250
14	Lamahi-Ghorahi	Double	38	BEAR	250
15	Balefi Corridor	Double	40	BEAR	250
16	Bardaghat-Sardi	Double	40	BEAR	250
17	Kushaha- Biratnagar	Double	46	BEAR	250
18	Kusma-Lower Modi	Single	6.2	BEAR	250
Total			**1,108.2**		

S.N.	220 kV Transmission Line	Type of Ckts	Length Circuit km	Conductor Type	Conductor Size (Sq.mm)
1	Khimti-Dhalkebar 2nd Ckt Line	Single	75	BISON	350
2	Hetauda-Bharatpur	Double	146	BISON	350
3	Bharatpur-Bardghat	Double	150	BISON	350
4	Koshi Corridor	Double	286	MOOSE	500
5	Marsyangdi-Kathmandu	Double	170	MOOSE	500
6	Kaligandaki Corridor	Double	219.8	MOOSE	500
7	Marsyangdi Corridor	Double	230	MOOSE	500
8	Chilime-Trishuli	Double	80	BISON	350
Total			**1,357**		

S.N.	400 kV Transmission Line	Type of Ckts	Length Circuit km	Conductor Type	Conductor Size (Sq.mm)
1	Hetauda-Dhalkebar-Duhabi	Double	570	MOOSE	500
2	Tamakoshi-Kathmandu 220/400kV	Double	170	MOOSE	500
Total			**740**		

PLANNED & PROPOSED

S.N.	400/220 kV Transmission Line	Type of Ckts	Length Circuit km	Conductor Type	Conductor Size (Sq.mm)
1	Rupalgadh-Paschim Seti- Pahalwanpur 400 kV	Double	240	MOOSE	500
2	Hetauda-Butwal-Lamki-Mahendranagar	Double	1140	MOOSE	500
3	Kerung-Chilime Hub-Ratmate 400 kV	Double	160	MOOSE	500
4	Bheri Corridor 400 kV	Double	40	MOOSE	500
5	Trishuli 3B- Jharlyang-Malekhu 220 kV	Double	160	MOOSE	500
6	Lekhnath-Damauli 220 kV	Double	80	MOOSE	500
Total			**1820.0**		

S.N.	132 kV Transmission Line	Type of Ckts	Length Circuit km	Conductor Type	Conductor Size (Sq.mm)
1	Dhalkebar-Loharpatti	Double	40	BEAR	250
2	Dadakhet- Rahughat	Double	40	BEAR	250
3	Ghorahi-Madichaur	Double	80	BEAR	250
4	Samundratar-Naubise/Chapali	Double	40	BEAR	250
5	Bajhang-Deepayal-Attariya	Double	260	BEAR	250
6	Hapure-Tulsipur	Double	36	BEAR	250
7	Surkhet-Dailekh-Jumla	Double	240	BEAR	250
8	Kaligandaki-Gulmi (Jhimruk)	Double	86	BEAR	250
9	Baneshwor-Bhaktapur	Double	24	XLPE	800
Total			**846.00**		

NEPAL ELECTRICITY AUTHORITY

IPPs' Hydro Power Projects (Operation) as of FY 2073/74

S.N.	Developer	Projects	Location	Capacity (kW)	PPA Date	COD
1	Himal Power Ltd.	Khimti Khola	Dolkha	60000	2052.10.01	2057.03.27
2	Bhotekoshi Power Company Ltd.	Bhotekoshi Khola	Sindhupalchowk	45000	2053.04.06	2057.10.11
3	Chilime Hydro Power Company Ltd.	Chilime	Rasuwa	22100	2054.03.11	2060.05.08
4	National Hydro Power Company Ltd.	Indrawati - III	Sindhupalchowk	7500	2054.08.15	2059.06.21
5	Butwal Power Company Ltd.	Jhimruk Khola	Pyuthan	12000	2058.03.29	1994
6	Butwal Power Company Ltd.	Andhi Khola	Syangza	9400	2058.03.29	2071.12.22
7	Syange Electricity Company Limited	Syange Khola	Lamjung	183	2058.10.03	2058.10.10
8	Arun Valley Hydropower Development Company (P.) Ltd.	Piluwa Khola Small	Sankhuwasabha	3000	2056.10.09	2060.06.01
9	Rairang Hydro Power Development Co. (P) Ltd.	Rairang Khola	Dhading	500	2059.08.27	2061.08.01
10	Sanima Hydropower (Pvt.) Ltd.	Sunkoshi Small	Sindhupalchok	2500	2058.07.28	2061.12.11
11	Alliance Power Nepal Pvt.Ltd.	Chaku Khola	Sindhupalchok	3000	2056.11.03	2062.03.01
12	Khudi Hydropower Ltd.	Khudi Khola	Lamjung	4000	2058.03.04	2063.09.15
13	Unique Hydel Co. Pvt.Ltd.	Baramchi Khola	Sindhupalchowk	4200	2058.12.14	2063.09.27
14	Thoppal Khola Hydro Power Co. Pvt. Ltd.	Thoppal Khola	Dhading	1650	2059.11.23	2064.07.13
15	Gautam Buddha Hydropower (Pvt.) Ltd.	Sisne Khola Small	Palpa	750	2061.04.29	2064.06.01
16	Kathmandu Small Hydropower Systems Pvt. Ltd.	Sali Nadi	Kathmandu	250	2062.04.24	2064.08.01
17	Khoranga Khola Hydropower Dev. Co. Pvt. Ltd.	Pheme Khola	Panchtar	995	2057.12.31	2064.08.05
18	Unified Hydropower (P.) Ltd.	Pati Khola Small	Parbat	996	2062.10.28	2065.10.27
19	Task Hydropower Company (P.) Ltd.	Seti-II	Kaski	979	2063.06.08	2065.11.14
20	Ridi Hydropower Development Co. (P.) Ltd.	Ridi Khola	Gulmi	2400	2063.05.08	2066.07.10
21	Centre for Power Dev. And Services (P.) Ltd.	Upper Hadi Khola	Sindhupalchowk	991	2064.04.07	2066.07.22
22	Gandaki Hydro Power Co. Pvt. Ltd.	Mardi Khola	Kaski	4800	2060.07.07	2066.10.08
23	Himal Dolkha Hydropower Company Ltd.	Mai Khola	Ilam	4500	2063.11.19	2067.10.14
24	Baneswor Hydropower Pvt. Ltd.	Lower Piluwa Small	Sankhuwasabha	990	2064.07.21	2068.04.01
25	Barun Hydropower Development Co. (P.) Ltd.	Hewa Khola	Sankhuwasabha	4455	2061.04.02	2068.04.17
26	Nyadi Group (P.) Ltd.	Siuri Khola	Lamjung	4950	2064.04.17	2069.07.30
27	United Modi Hydropwer Pvt. Ltd.	Lower Modi 1	Parbat	10000	2065.10.20	2069.08.10
28	Bhagawati Hydropower Development Co. (P.) Ltd.	Bijayapur-1	Kaski	4410	2066.03.30	2069.05.04
29	Synergy Power Development (P.) Ltd.	Sipring Khola	Dolkha	9658	2065.10.20	2069.10.03
30	Ankhu Khola Jal Bidhyut Co. (P.) Ltd.	Ankhu Khola - 1	Dhading	8400	2066.02.22	2070.05.05
31	Laughing Buddha Power Nepal (P.) Ltd.	Middle Chaku	Sindhupalchowk	1800	2066.11.03	2069.11.15
32	Bhairabkunda Hydropower Pvt. Ltd.	Bhairab Kunda	Sindhupalchowk	3000	2065.08.02	2071.02.22
33	Nepal Hydro Developer Pvt. Ltd.	Charanawati Khola	Dolakha	3520	2067.01.13	2070.02.24
34	Laughing Buddha Power Nepal Pvt. Ltd.	Lower Chaku Khola	Sindhupalchowk	1800	2063.07.02	2070.04.24
35	Bojini Company Private Limited	Jiri Khola Small	Dolkha	2200	2065.10.23	2071.11.01
36	Sanima Mai Hydropower Limited	Mai Khola	Ilam	22000	2067.01.08	2071.10.14
37	Prime Hydropower Co. Pvt. Ltd.	Belkhu	Dhading	518	2064.04.04	2071.12.30
38	Mailung Khola Hydro Power Company (P.) Ltd.	Mailung Khola	Rasuwa	5000	2058.04.09	2071.03.19
39	Aadishakti Power Dev. Company (P.) Ltd.	Tadi Khola (Thaprek)	Nuwakot	5000	2061.12.15	2069.12.14
40	Joshi Hydropower Development Company Limited	Upper Puwa -1	Illam	3000	2066.01.23	2071.10.01

41	Ruru Hydropower Project (P) Ltd.	Upper Hugdi Khola	Gulmi	5000	2066.04.04	2071.12.09
42	Radhi Bidyut Company Ltd.	Radhi Khola	Lamjung	4400	2066.10.18	2071.02.31
43	Api Power Company Pvt. Ltd.	Naugadh gad Khola	Darchula	8500	2067.01.19	2072.05.02
44	Pashupati Environmental Eng. Power Co. Pvt. Ltd.	Chhote Khola	Gorkha	993	2067.11.09	2071.03.09
45	Chhyangdi Hydropower Limited	Chhandi	Lamjung	2000	2068.12.23	2072.12.13
46	Kutheli Bukhari Small Hydropower (P).Ltd	Suspa Bukhari	Dolakha	998	2069.04.32	2072.06.03
47	Kathmandu Upatyaka Khanepani bewasthapan Board	Solar	Lalitpur	680.4	2069.06.12	2069.07.15
48	Sanima Mai Hydropower Ltd.	Mai Cascade	Ilam	7000	2069.10.12	2072.10.29
49	Panchakanya Mai Hydropower Ltd. (Previously Mai Valley and prior to that East Nepal)	Upper Mai Khola	Ilam	9980	2061.12.19	2073.03.09
50	Sayapatri Hydropower Private Limited	Daram Khola A	Baglung	2500	2068.12.19	2073.03.12
51	Electro-com and Research Centre Pvt. Ltd.	Jhyadi Khola	Sindhupalchowk	2000	2067.01.30	2073.05.31
52	Khani Khola Hydropower Company Pvt. Ltd.	Tungun-Thosne	Lalitpur	4360	2069.04.05	2073.07.09
53	Sinohydro-Sagarmatha Power Company (P) Ltd.	Upper Marsyangdi "A"	Lamjung	50000	2067.09.14	2073.09.17
54	Daraudi Kalika Hydro Pvt. Ltd.	Daraudi Khola A	Gorkha	6000	2068.05.19	2073.08.13
55	Khani Khola Hydropower Company Pvt. Ltd.	Khani Khola	Lalitpur	2000	2069.04.05	2073.08.20
56	Sapsu Kalika Hydropower Co. Pvt. Ltd.	Miya Khola	Khotang	996	2069.08.10	2073.09.03
57	Madi Power Pvt. Ltd.	Upper Madi	Kaski	25000	2066.05.21	2073.09.25
58	Panchthar Power Company Pvt. Ltd.	Hewa Khola A	Panchthar	14900	2068.05.30	2073.10.22
59	Sanvi Energy pvt. Ltd.	Jogmai	Ilam	7600	2069.08.07	2074.01.18
60	Bhugol Energy Dev Compay (P). Ltd	Dwari Khola	Dailekha	3750	2069.12.30	2074.1.23
			TOTAL	**441,052.40**		

NEPAL ELECTRICITY AUTHORITY

IPPs' Hydropower Projects (Under Construction) as of FY 2073/74

(Financial Closure concluded projects)

S.N.	Developers	Projects	Location	Installed Capacity (kW)	PPA Date	RCOD
1	Eastern Hydropower Pvt. Ltd.	Pikhuwa Khola	Bhojpur	5000	2066.07.24	2069.11.30 (for 2475kW) 2076.03.30 (2525kW)
2	Upper Tamakoshi Hydropower Ltd.	Upper Tamakoshi	Dolkha	456000	2067.09.14	2072.9.10 - 4 Units, 2073.3.30 - 2 Units
3	Shibani Hydropower Co. Pvt. Ltd.	Phawa Khola	Taplejung	4950	2063.12.01 2065.10.06	2067.9.16
4	Nama Buddha Hydropower Pvt. Ltd.	Tinau Khola Small	Palpa	1665	2065.03.31 2074.03.22	2066.11.1 (for 990kw) 2077.09.15 (for 675kw)
5	Garjang Upatyaka Hydropower (P.) Ltd.	Chake Khola	Ramechhap	2830	2065.11.06	2073.02.17
6	Himalayan Hydropower Pvt. Ltd.	Namarjun Madi	Kaski	11800	2066.05.30	2071.4.1
7	Sikles Hydropower Pvt. Ltd.	Madkyu Khola	Kaski	13000	2066.08.03	2071.04.01 2075.04.01 (3032kw)
8	Jumdi Hydropower Pvt. Ltd.	Jumdi Khola	Gulmi	1750	2066.10.21	2069.10.11
9	Barahi Hydropower Pvt.ltd	Theule Khola	Baglung	1500	2066.12.16	2069.4.16
10	Hira Ratna Hydropower P.ltd	Tadi Khola	Nuwakot	5000	2067.01.09	2075.10.01
11	Energy Engineering Pvt. Ltd.	Upper Mailung A	Rasuwa	6420	2067.03.25	2075.10.01
12	Teleye Samyak Hydropower Company Pvt. Ltd.	Dhansi Khola	Rolpa	955	2067.04.12	2069.11.28
13	Shiva Shree Hydropower (P.) Ltd.	Upper Chaku A	Sindhupalchowk	22200	2067.05.22	2071.01.01
14	Greenlife Energy Pvt. Ltd.	Khani khola-1	Dolakha	40000	2067.06.24 2074.02.21	2074.12.17 (for 25MW) 2076.09.03 (for 15MW)
15	Himalaya Urja Bikas Co. Pvt. Ltd.	Upper Khimti	Ramechhap	12000	2067.10.09	2075.3.32
16	Mount Kailash Energy Pvt. Ltd.	Thapa Khola	Myagdi	11200	2067.10.11	2071.2.5
17	Green Ventures Pvt. Ltd.	Likhu-IV	Ramechhap	52400	2067.10.19 2073.03.29	2071.09.16 2077.06.30
18	Robust Energy Ltd.	Mistri Khola	Myagdi	42000	2067.10.20	2076.05.14
19	Manang Trade Link Pvt. Ltd.	Lower Modi	Parbat	20000	2068.05.20	2074.3.31
20	Sanjen Hydropower Co.Limited	Upper Sanjen	Rasuwa	14800	2068.06.23	2075.10.01
21	Middle Bhotekoshi Jalbidhyut Company Ltd.	Middle Bhotekoshi	Sindhupalchowk	102000	2068.07.28	2076.12.28
22	Chilime Hydro Power Company Ltd.	Rasuwagadhi	Rasuwa	111000	2068.07.28	2075.10.01
23	Water and Energy Nepal Pvt. Ltd.	Badi Gad	Baglung	6600	2068.08.13	2072.2.14
24	Sanjen Hydropower Company Limited	Sanjen	Rasuwa	42500	2068.08.19	2075.10.01
25	Gelun Hydropower Co.Pvt.Ltd	Gelun	Sindhupalchowk	3200	2068.09.25	2070.11.07
26	Dronanchal Hydropower Co.Pvt.Ltd	Dhunge-Jiri	Dolakha	600	2068.09.25	2072.10.22
27	Mandakini Hydropower Limited	Sardi Khola	Kaski	4000	2068.11.11	2072.7.11 2073.04.16
28	Dibyaswari Hydropower Limited	Sabha Khola	Sankhuwasabha	4000	2068.11.17	2072.09.03
29	Dariyal Small Hydropower Pvt.Ltd	Upper Belkhu	Dhading	750	2068.11.28	2071.7.16
30	Suryakunda Hydroelectric Pvt. Ltd.	Upper Tadi	Nuwakot	11000	2068.12.03	2074.6.23
31	Mai Valley Hydropower Private Limited	Upper Mai C	Ilam	5100	2068.12.23	2071.12.12
32	Himalayan Power Partner Pvt. Ltd.	Dordi Khola	Lamjung	27000	2069.03.01	2076.05.14
33	Sasha Engingeering Hydropower (P). Ltd	Khani Khola(Dolakha)	Dolakha	30000	2069.03.25	2074.12.17
34	Arun Kabeli Power Ltd.	Kabeli B-1	Taplejung, Panchthar	25000	2069.03.29	2074.01.10

35	Rising Hydropower Compnay Ltd.	Selang Khola	Sindhupalchowk	990	2069.03.31	2071.6.15
36	Liberty Hydropower Pvt. Ltd.	Upper Dordi A	Lamjung	25000	2069.06.02	2076.05.14
37	Hydro Innovation Pvt. Ltd.	Tinekhu Khola	Dolakha	990	2069.06.08	2071.9.30
38	Salankhu Khola Hydropower Pvt. Ltd.	Salankhu Khola	Nuwakot	2500	2069.06.14	2071.11.30
39	Moonlight Hydropower Pvt. Ltd.	Balephi A	Sindhupalchowk	10600	2069.07.14	2075.3.1
40	Middle Modi Hydropower Ltd.	Middle Modi	Parbat	15100	2069.08.21	2074.06.01
41	Reliable Hydropower Co. Pvt. Ltd.	Khorunga Khola	Terhathum	4800	2069.08.26	2073.08.16
42	Rara Hydropower Development Co. Pvt. Ltd.	Upper Parajuli Khola	Dailekh	2150	2069.08.28	2071.12.17
43	Lohore Khola Hydropower Co. Pvt. Ltd.	Lohore Khola	Dailekh	4200	2069.09.08	2073.06.20
44	Beni Hydropower Project Pvt. Ltd.	Upper Solu	Solukhumbu	18000	2069.09.16 2073.07.25 (PPA Revived)	2074.10.01
45	Dudhkoshi Power Company Pvt. Ltd.	Rawa Khola	Khotang	6500	2069.09.26	2073.05.31
46	Universal Power Company Ltd.	Lower Khare	Dolakha	11000	2069.10.22	2074.9.16 (For 8.26MW) 2076.04.03 (For 2.74MW)
47	Mandu Hydropower Company Pvt.Ltd	Bagmati Khola	Makawanpur	20000	2069.10.7	2076.03.30
48	Madhya Midim Jalbidhyut Company P. Ltd.	Middle Midim	Lamjung	3100	2069.10.23	2072.5.1
49	Volcano Hydropower Pvt. Ltd.	Teliya Khola	Dhankuta	996	2069.10.25	2071.7.24
50	Union Hydropower Pvt Ltd.	Midim Karapu	Lamjung	3000	2069.10.28	2071.12.14
51	Bindhyabasini Hydropower Development Co. (P.) Ltd.	Rudi Khola A	Lamjung and Kaski	8800	2069.10.28	2074.10.01 (for 2MW) 2073.10.01 (for 6.8MW)
52	Himal Dolkha Hydropower Company Ltd.	Mai sana Cascade	Ilam	8000	2069.11.14	2074.04.15
53	Molung Hydropower Company Pvt. Ltd.	Molung Khola	Okhaldhunga	7000	2069.11.21	2074.1.7
54	Betrawoti Hydropower Company (P).Ltd	Phalankhu Khola	Rasuwa	13700	2069.12.06	2075.10.01
55	Himalaya Urja Bikas Co. Ltd.	Upper Khimti II	Ramechhap	7000	2069.12.09	2075.12.01
56	Salmanidevi Hydropower (P). Ltd	Kapadi Gad	Doti	3330	2069.12.11	2073.08.15
57	Dovan Hydropower Company Pvt. Ltd.	Junbesi Khola	Solukhumbu	5200	2069.12.29	2076.08.30
58	Ghalemdi Hydro Limited (Previously, Cemat Power Dev Company (P). Ltd.)	Ghalemdi Khola	Myagdi	4000	2069.12.30	2074.07.30
59	Tallo Midim Jalbidhut Company Pvt. Ltd.	Lower Midim	Lamjung	996	2070.01.19	2071.8.1
60	Rairang Hydropower Development Company Ltd.	Iwa Khola	Taplejung	9900	2070.01.29	2075.4.1
61	Tangchhar Hydro Pvt. Ltd	Tangchhahara	Mustang	2200	2070.02.20	2073.7.1
62	Abiral Hydropower Co. Pvt. Ltd.	Upper Khadam	Morang	990	2070.02.21	2071.08.01
63	Manakamana Engineering Hydropower Pvt. Ltd.	Ghatte Khola	Dolakha	5000	2070.04.28	2074.3.17
64	Essel-Clean Solu Hydropower Pvt. Ltd.	Lower Solu	Solukhumbu	82000	2070.07.15	2076.8.30
65	Consortium Power Developers Pvt. Ltd.	Khare Khola	Dolakha	24100	2070.07.15	2075.08.15
66	Upper Solu Hydroelectric Company Pvt. Ltd	Solu Khola	Solukhumbu	23500	2070.07.24	2075.4.1
67	Singati Hydro Energy Pvt. Ltd.	Singati Khola	Dolakha	16000	2070.07.27	2074.6.1
68	Maya Khola Hydropower Co. Pvt. Ltd.	Maya Khola	Sankhuwasabha	14900	2070.08.30	2076.9.1
69	Idi Hydropower Co. P. Ltd.	Idi Khola	Kaski	975	2070.09.01	2074.09.16
70	Puwa Khola-1 Hydropower P. Ltd.	Puwa Khola -1	Ilam	4000	2070.10.09	2073.08.30
71	Buddha Bhumi Nepal Hydro Power Co. Pvt. Ltd.	Lower Tadi	Nuwakot	4993	2070.12.10	2074.9.30

72	Mountain Hydro Nepal Pvt. Ltd.	Tallo Hewa Khola	Panchthar	21600	2071.4.9	2075.01.09
73	Bindhyabasini Hydropower Development Co. (P.) Ltd.	Rudi Khola B	Lamjung and Kaski	6600	2071.4.20	2076.02.32
74	Dordi Khola Jal Bidyut Company Ltd.	Dordi-1 Khola	Lamjung	10300	2071.07.19	2076.08.16
75	River Falls Hydropower Development Pvt. Ltd.	Down Piluwa	Sankhuwasabha	9500	2071.10.18	2076.09.01
76	Rangoon Khola Hydropower Pvt. Ltd.	Jeuligad Small Hydropower Project	Bajhang	996	2071.10.20	2073.10.03
77	Peoples' Hydropower Company Pvt. Ltd.	Super Dordi 'Kha'	Lamjung	49600	2071.11.13	2077.03.29
78	Hydro Venture Private Limited	Solu Khola (Dudhkoshi)	Solukhumbu	86000	2071.11.13	2077.06.10
79	Global Hydropower Associate Pvt. Ltd.	Likhu-2	Solukhumbu/ Ramechap	33400	2071.11.19	2077.04.01
80	Paan Himalaya Energy Private Limited	Likhu-1	Solukhumbu/ Ramechap	51400	2071.11.19	2077.04.01
81	Numbur Himalaya Hydropower Pvt. Ltd.	Likhu Khola A	Solukhumbu/ Ramechap	24200	2071.11.22	2077.04.01
82	Research and Development Group Pvt. Ltd.	Rupse Khola	Myagdi	4000	2071.12.17	2076.08.02
83	Hydro Empire Pvt. Ltd.	Upper Myagdi	Myagdi	20000	2071.12.17	2077.05.30
84	Nyadi Hydropower Limited	Nyadi	Lamjung	30000	2072.02.12	2077.01.06
85	Suri Khola Hydropower Pvt. Ltd.	Suri Khola	Dolakha	6400	2072.02.20	2074.12.30
86	Bungal Hydro Pvt. Ltd. (Previously Sanigad Hydro Pvt. Ltd.)	Upper Sanigad	Bajhang	10700	2072.03.15	2076.05.29
87	Kalanga Hydro Pvt. Ltd.	Kalangagad	Bajhang	15330	2072.03.15	2076.05.29
88	Sanigad Hydro Pvt. Ltd.	Upper Kalangagad	Bajhang	38460	2072.03.15	2077.04.15
89	Menchhiyam Hydropower Pvt. Ltd.	Upper Piluwa Khola 2	Sankhuwasabha	4720	2072.05.11	2076.04.01
90	Kabeli Energy Limited	Kabeli-A	Panchthar and Taplejung	37600	2072.06.07	2076.06.13
91	Chauri Hydropower (P.) Ltd.	Chauri Khola	Kavrepalanchowk, Ramechhap, Sindhupalchowk, Dolakha	5000	2072.06.14	2075.12.30
92	Pashupati Environmental Power Co. Pvt. Ltd.	Lower Chhote Khola	Gorkha	997	2072.08.04	2076.05.15
93	Huaning Development Pvt. Ltd.	Upper Balephi A	Sindhupalchowk	36000	2072.08.29	2075.10.06
94	Upper Hewa Khola Hydropower Co. Pvt. Ltd.	Upper Hewa Khola Small	Sankhuwasabha	8500	2072.09.23	2076.03.17
95	Multi Energy Development Pvt. Ltd.	Langtang Khola	Rasuwa	10000	2072.09.29	2076.12.30
96	Myagdi Hydropower Pvt. Ltd.	Ghar Khola	Myagdi	8300	2073.02.11	2076.08.30
97	Richet Jalbidhyut Company Pvt. Ltd.	Richet Khola	Gorkha	4980	2073.02.23	2075.03.31
98	United Idi Mardi and R.B. Hydropower Pvt. Ltd.	Upper Mardi	Kaski	7000	2073.02.25	2075.04.01
99	Rapti Hydro and General Construction Pvt. Ltd.	Rukumgad	Rukum	5000	2073.03.07	2076.09.01
100	Api Power Company Pvt. Ltd.	Upper Naugad Gad	Darchula	8000	2073.07.12	2077.04.01
101	Terhathum Power Company Pvt. Ltd.	Upper Khorunga	Terhathum	7500	2073.07.29	2076.09.01
102	Super Mai Hydropower Pvt. Ltd.	Super Mai	Illam	7800	2073.12.06	2077.04.01
			Total	**2043613.0**		

NEPAL ELECTRICITY AUTHORITY

IPPs' Hydropower Projects in Different Stages of Development as of FY 2073/74

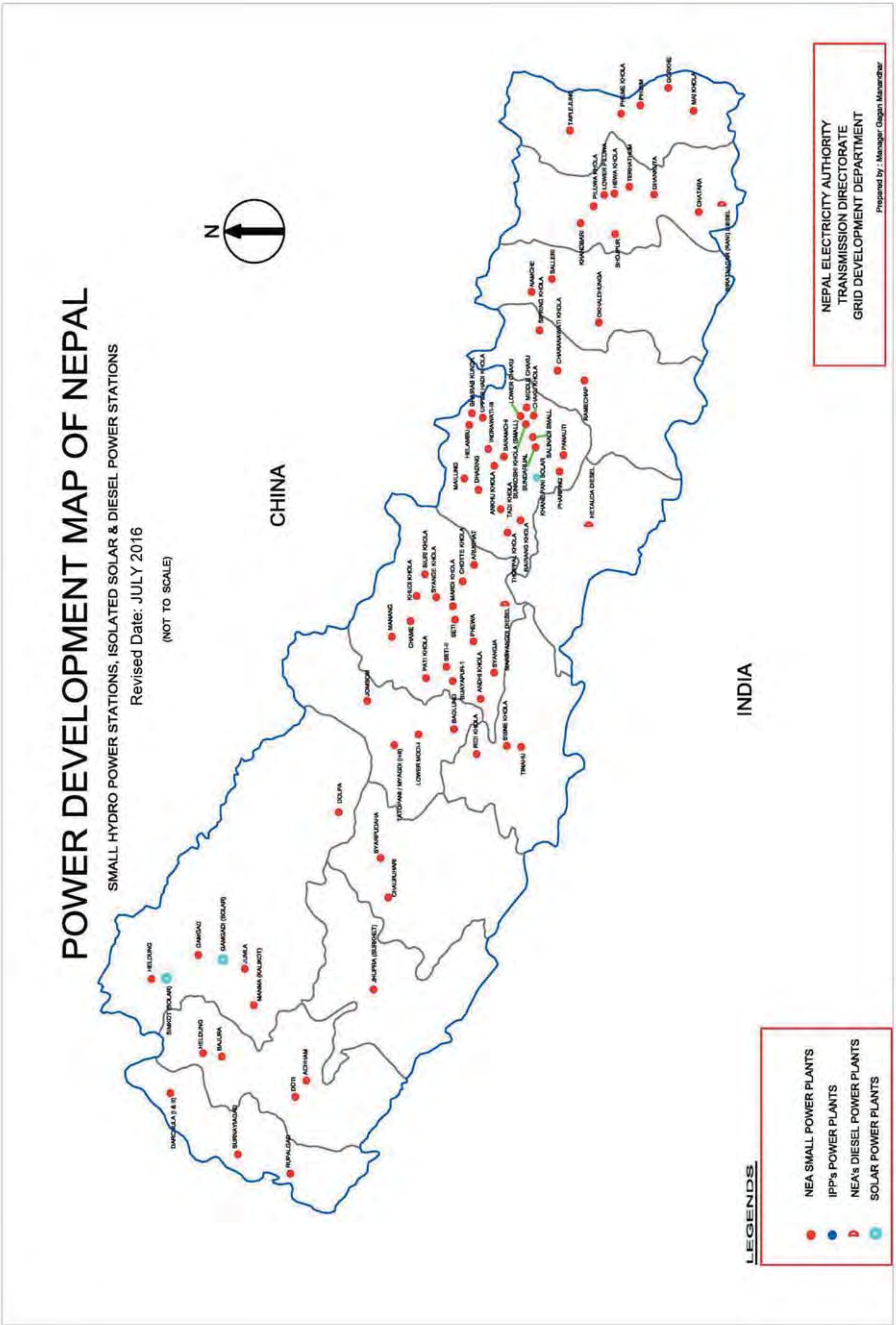
(Without Financial Closure)

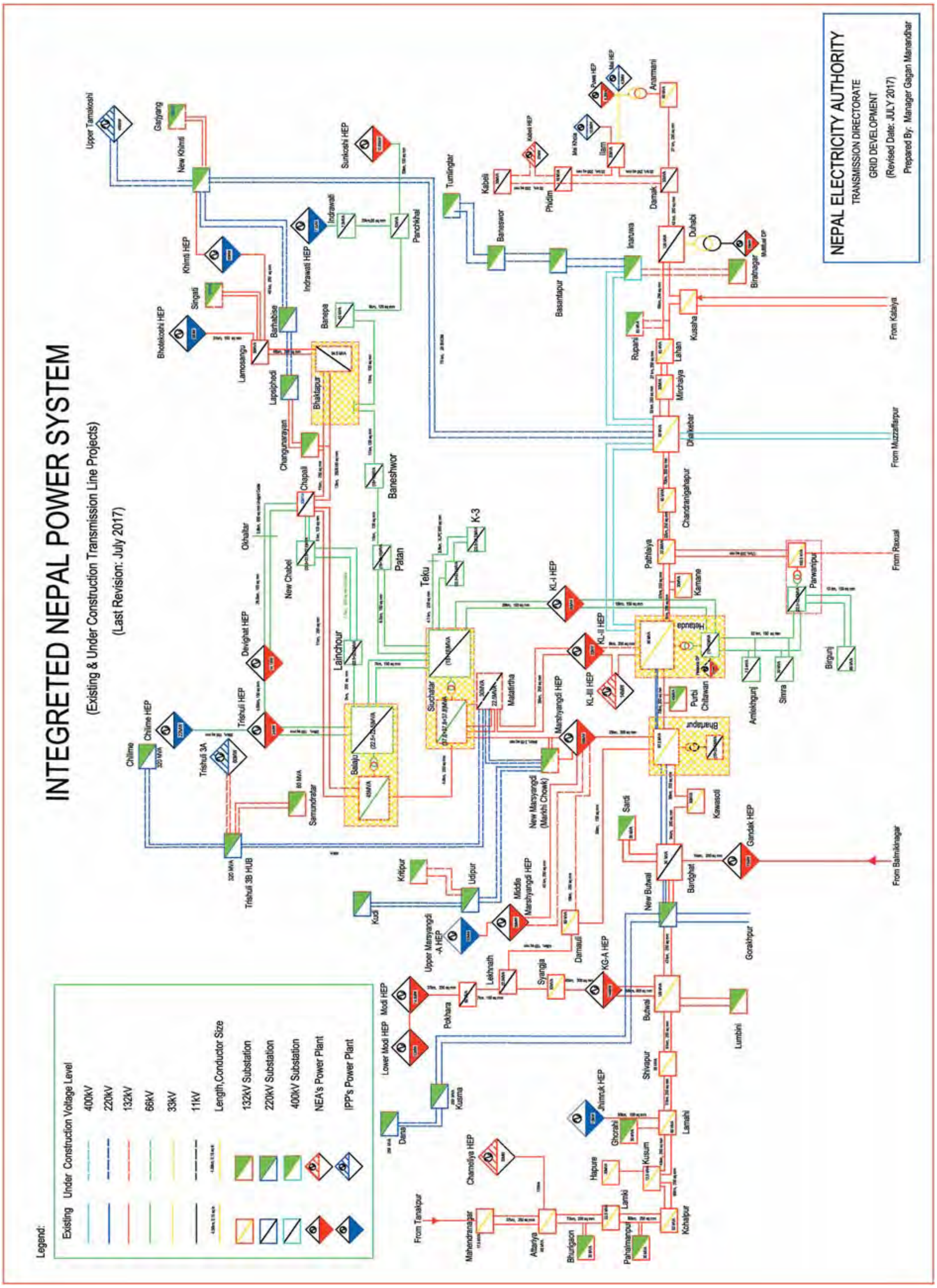
S.N.	Developers	Projects	Location	Installed Capacity(kW)	PPA Date	RCOD
1	TMB Energietechnik	Narayani Shankar Biomass	Rupandehi	600	2063.10.25	2065.12.18
2	Balephi Jalbidhyut Co. Ltd.	Balephi	Sindhupalchowk	23520	2067.09.08 2073.03.29	2071.09.16 2077.06.30
3	Ingwa Hydro Power Pvt. Ltd	Upper Ingwa khola	Taplejung	9700	2068.03.10	2073.04.01
4	Molnia Power Ltd.	Upper Mailun	Rasuwa	14300	2068.05.23	2072.04.01
5	Jywala Sajhedari Hydropower Company Pvt. Ltd.	Tame Khola	Dailekh	1250	2068.06.08	2070.11.15
6	Deurali Bahuudesiya Sahakari Sanstha Ltd.	Midim Khola	Lamjung	100	2070.02.20	2070.5.1
7	Ludee Hydropower Development Co. Pvt.Ltd	Ludee Khola	Gorkha	750	2071.4.21	2073.4.1
8	Rasuwa Hydropower Pvt. Ltd	Phalanku Khola	Rasuwa	5000	2071.08.24	2076.8.01
9	Dipsabha Hydropower Pvt. Ltd.	Sabha Khola A	Sankhuwasabha	8300	2071.12.02	2076.07.15
10	Chandeshwori Mahadev Khola MH. Co. Pvt. Ltd.	Chulepu Khola	Ramechhap	8520	2071.12.23	2073.06.13
11	Dhaulagiri Kalika Hydro Pvt. Ltd.	Darbang-Myagdi	Myagdi	25000	2072.04.28	2075.12.25
12	Upper Syange Hydropower P. Ltd.	Upper Syange Khola	Lamjung	2400	2072.06.14	2075.10.01
13	Peoples Hydro Co-operative Ltd.	Khimti-2	Dolakha and Ramechhap	48800	2072.06.14	2078.04.01
14	Diamond Hydropower Pvt. Ltd.	Upper Daraudi-1	Gorkha	10000	2072.08.14	2075.09.17
15	Makari Gad Hydropower Pvt. Ltd.	Makarigad	Darchula	10000	2072.08.29	2076.02.32
16	Civil Hydropower Pvt. Ltd.	Bijayapur 2 Khola Small	Kaski	4500	2072.09.12	2075.03.32
17	Yambling Hydropower Pvt. Ltd.	Yambling Khola	Sindhupalchowk	7270	2072.09.29	2077.03.17
18	United Modi Hydropwer Ltd.	Lower Modi 2	Parbat	10500	2072.11.14	2076.03.17
19	Syauri Bhumey Microhydro Project	Syauri Bhumey	Nuwakot	23	2072.11.16	2074.01.01
20	Leguwa Khola Laghu Jalbidhyut Sahakari Sastha Ltd.	Leguwa Khola	Dhankuta	40	2072.11.21	2074.01.01
21	Salasungi Power Limited	Sanjen Khola	Rasuwa	78000	2072.12.02	2077.03.08
22	Sano Milti Khola Hydropower Ltd.	Sano Milti	Ramechhap and Dolakha	3000	2073.01.13	2075.08.01
23	Ankhu Hydropower (P.) Ltd.	Ankhu Khola	Dhading	34000	2073.01.30	2076.12.30
24	Siddhakali Power Limited	Trishuli Galchi	Nuwakot & Dhading	75000	2073.02.20	2077.02.01
25	Him River Power Pvt. Ltd.	Liping Khola	Sindhupalchowk	16260	2073.02.28	2077.01.22
26	Chirkhwa Hydropower Pvt. Ltd.	Upper Chirkhwa	Bhojpur	4700	2073.03.01	2077.04.01
27	Energy Venture Pvt. Ltd.	Upper Lapche	Dolakha	52000	2073.04.20	2078.12.30
28	Rawa Energy Development Pvt. Ltd.	Upper Rawa	Khotang	2800	2073.04.24	2076.03.30
29	Sindhujwala Hydropower Ltd.	Upper Nyasem	Sindhupalchowk	41400	2073.07.24	2077.03.30
30	Samling Power Company Pvt. Ltd.	Mai Beni	Illam	9008	2073.07.26	2078.08.02
31	Taksar-Pikhuwa Hydropower Pvt. Ltd.	Taksar Pikhuwa	Bhojpur	8000	2073.09.01	2076.10.23
32	Swet-Ganga Hydropower and Construction Ltd.	Lower Likhu	Ramechhap	28100	2073.09.14	2078.08.15
33	Tamor Sanima Energy Pvt. Ltd.	Middle Tamor	Taplejung	52100	2073.09.26	2078.05.28
34	Daram Khola Hydro Energy Ltd.	Daram Khola	Baglung & Gulmi	7300	2073.10.09	2076.09.08
35	Pahadi Hydro Power Company (P.) Ltd.	Madhya Tara Khola Small	Baglung	1700	2073.10.26	2075.08.29
36	Himal Hydro and General Construction Ltd.	Super Madi	Kaski	44000	2073.10.27	2078.02.28
37	Sisa Hydro Electric Company Pvt. Ltd.	Sisa Khola A	Solukhumbu	2800	2073.10.28	2077.12.12
38	Nilgiri Khola Hydropower Co. Ltd.	Nilgiri Khola	Myagdi	38000	2073.11.30	2080.08.30
39	Chirkhwa Hydropower Pvt. Ltd.	Lower Chirkhwa	Bhojpur	4060	2074.01.20	2078.04.01
40	Him Consult Pvt. Ltd.	Rele Khola	Myagdi	6000	2074.01.28	2077.02.19
41	Himali Rural Electric Co-operative Ltd.	Leguwa Khola Small	Dhankuta	640	2074.02.08	2075.12.28
42	Siuri Nyadi Power Pvt. Ltd.	Super Nyadi	Lamjung	40270	2074.02.19	2079.04.01
43	Sabha Pokhari Hydro Power (P.) Ltd.	Lankhuwa Khola	Sankhuwasabha	5000	2074.02.21	2077.09.14
44	United Mewa Khola Hydropower Pvt. Ltd.	Mewa Khola	Taplejung	50000	2074.02.21	2078.04.01
45	Parbat Paiyun Khola Hydropower Company Pvt. Ltd.	Seti Khola	Parbat	3500	2074.02.22	2076.12.30
46	Sewa Hydro Ltd.	Lower Selang	Sindhupalchowk	1500	2074.02.22	2075.12.30
47	Nilgiri Khola Hydropower Co. Ltd.	Nilgiri Khola-2	Myagdi	62000	2074.03.05	2081.08.30
48	Gorakshya Hydropower Pvt. Ltd.	Super Ankhu Khola	Dhading	23500	2074.03.15	2080.09.15
49	Chhyangdi Hydropower Limited	Upper Chhyangdi Khola	Lamjung	4000	2074.03.22	2078.4.05
50	Pokhari Hydropower Company Pvt. Ltd.	Sabha Khola B	Sankhuwasabha	15100	2074.03.26	2078.2.31
51	Nyam Nyam Hydropower Company Pvt. Ltd.	Nyam Nyam Khola	Rasuwa	6000	2074.03.27	2077.12.31
			Total	**910311.0**		

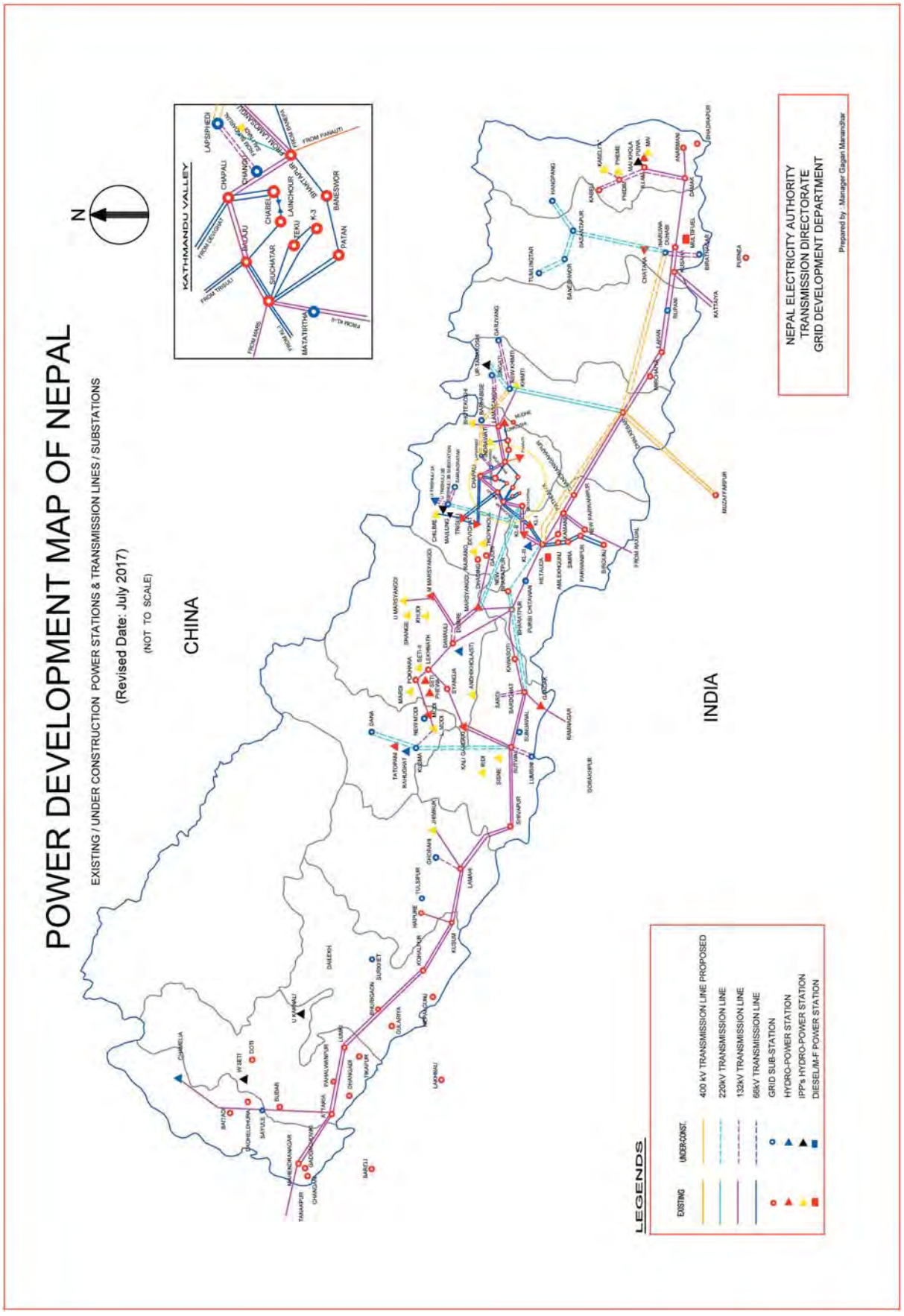
NEPAL ELECTRICITY AUTHORITY

IPPs' Hydro Power Projects (Terminated Projects) as of FY 2073/74

S.N.	Developer	Project	Location	Capacity (kW)	Reason for Termination
1	Mansarowar Powers (P.) Ltd.	Golmagad	Doti	580	Event of Default
2	Triyog Energy & Development Pvt. Ltd.	Middle Gaddigad	Doti	3500	Event of Default
3	Shreerup Hydropower Co. (P.) Ltd.	Seti Khola	Chitwan	465	Event of Default
4	Universal Power Company (P) Ltd.	Ladku Khola	Kavrepalanchowk	700	Event of Default
5	Gayatri Hydro Power (P.) Ltd.	Charanawati	Dolakha	980	Event of Default
6	Rshikesh Hydropower Pvt. Ltd.	Upper Jumdi	Gulmi	995	Event of Default related to Financial Closure
7	L. K. Power (P.) Ltd.	Dapcha-Roshi	Kavrepalanchowk	5000	Application of Generation License terminated by DOED
8	Eklekunda Hydropower Co.Pvt.Ltd	Dorkhu Khola	Nuwakot	990	Event of Default related to Financial Closure
9	Upper Piluwa Khola Hydropower Co. Pvt. Ltd.	Upper Piluwa Khola	Sankhuwa Sabha	9622	Event of Default related to Financial Closure
10	Baishno Devi Hydro Power (P.) Ltd.	Lower Sunkoshi -III	Sindhupalchowk	9900	Event of Default
11	Annapurna Group Pvt. Ltd.	Madi-1 Khola	Kaski	10000	Termination of Generation license by DOED
12	Swayambhu Hydropower Pvt. Ltd	Upper charnawati	Dolakha	2020	Auto termination due to financial Unclosure
13	Welcome Energy Development Co. (P.) Ltd.	Lower Balephi	Sindhupalchowk	18514	Event of Default
14	Midim Hydropower Pvt. Ltd.	Midim	Lamjung	3400	Event of Default related to Financial Closure
15	Apolo Hydropower Pvt. Ltd.	Buku Khola	Solukhumbu	6000	Event of Default related to Financial Closure
16	Dupcheshowr Mahadev Hydro Co. (P) Ltd.	Middle Tadi	Nuwakot	5325	Event of Default related to Financial Closure
17	Shakti Urja Bikash Company Pvt. Ltd.	Tauthali Khola	Sindhupalchowk	950	Event of Default related to Financial Closure
18	Ashmita Hydropower Co. Pvt. Ltd.	Sunkoshi (Tocardo)	Ramechhap	400	Auto termination due to financial Unclosure
19	Sunkoshi Hydro Power Co. Pvt. Ltd.	Lower Indrawati Khola	Sindhupalchok	4500	Termination of Generation license by DOED
			Total	**83841**	

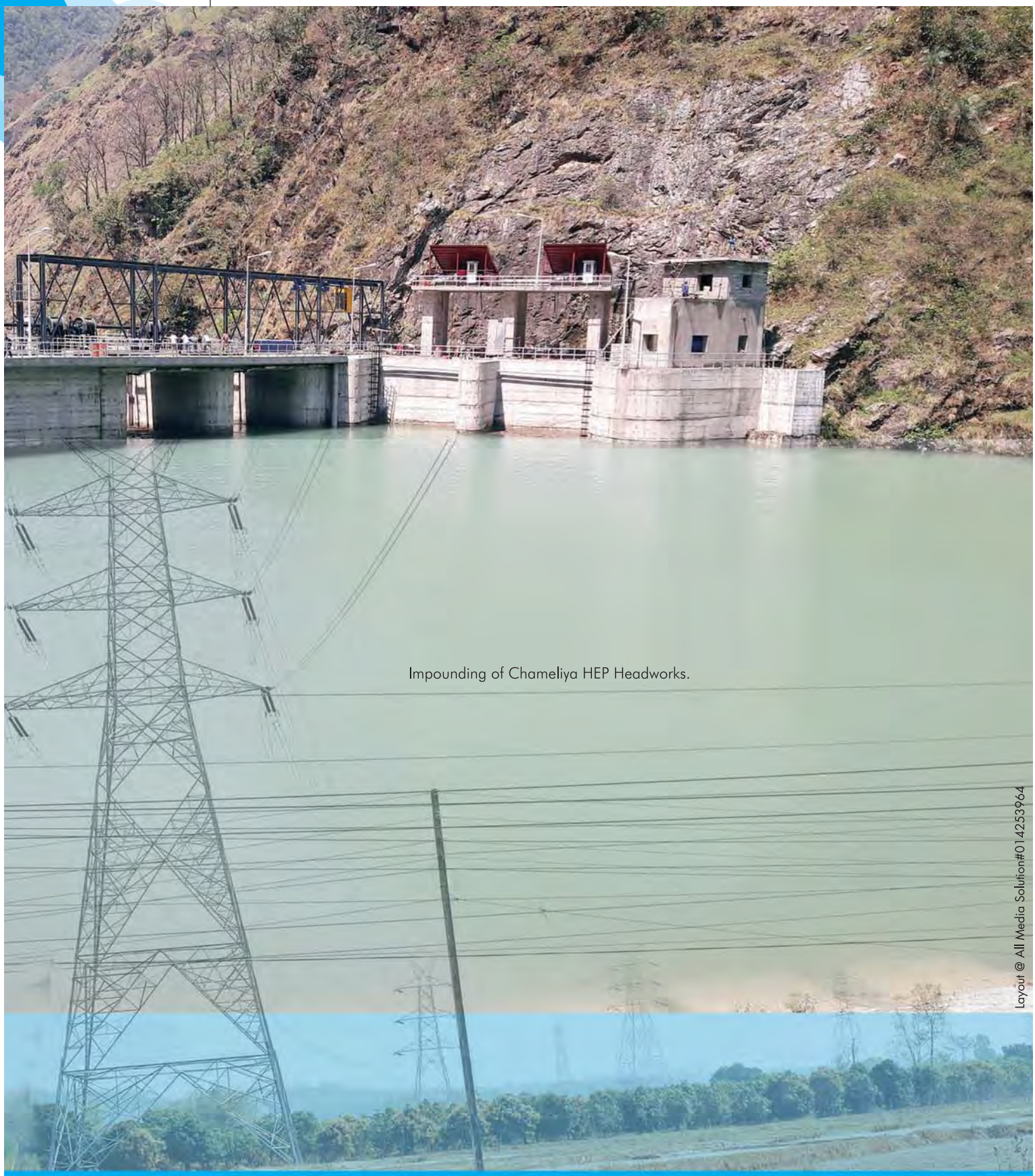

POWER DEVELOPMENT MAP OF NEPAL
SMALL HYDRO POWER STATIONS, ISOLATED SOLAR & DIESEL POWER STATIONS
Revised Date: JULY 2016
(NOT TO SCALE)
N
CHINA
INDIA
LEGENDS
NEA SMALL POWER PLANTS
IPP's POWER PLANTS
NEA's DIESEL POWER PLANTS
SOLAR POWER PLANTS
NEPAL ELECTRICITY AUTHORITY
TRANSMISSION DIRECTORATE
GRID DEVELOPMENT DEPARTMENT
Prepared by : Manager Gagan Manandhar


INTEGRATED NEPAL POWER SYSTEM
(Existing & Under Construction Transmission Line Projects)
(Last Revision: July 2017)
NEPAL ELECTRICITY AUTHORITY
TRANSMISSION DIRECTORATE
GRID DEVELOPMENT
(Revised Date: JULY 2017)
Prepared By: Manager Gagan Manandhar
Legend:
Existing
Under Construction
Voltage Level
400KV
220KV
132KV
66KV
33KV
11KV
Length,Conductor Size
132KV Substation
220KV Substation
400KV Substation
NEA's Power Plant
IPP's Power Plant
Upper Tamakoshi
Gaigang
New Khimti
Khimti HEP
Bhotekoshi HEP
Singati
Lamosangu
Barhabise
Sunkoshi HEP
Indrawati HEP
Indrawati
Panchkhal
Banepa
Bhaktapur
Lapsiphedi
Changunarayan
Chapali
Baneshwor
Okhaltar
New Chabel
Patan
K-3
Teku
Devighat HEP
Lainchour
Trishuli HEP
Chilime HEP
Chilime
Trishuli 3A
Samundratar
Balaju
Suchatar
Matatirtha
KL-I HEP
KL-II HEP
Marshyangdi HEP
KL-III HEP
Trishuli 3B HUB
New Marsyangdi (Markhi Chowk)
Kirtipur
Udipur
Kusum
Middle Marshyangdi HEP
Upper Marsyangdi -A HEP
Damauli
Lekhnath
Syangja
Modi HEP
Lower Modi HEP
Pokhara
KG-A HEP
Kushma
Dana
Chameliya HEP
From Tanakpur
Mahendranagar
Attariya
Bhurigaon
Pahalmanpur
Lamki
Hapure
Kohalpur
Kusum
Jhimruk HEP
Ghorahi
Lamahi
Shivapur
Butwal
Lumbini
Gorakhpur
New Butwal
Bardghat
Gandak HEP
From Balmikinagar
Kawasoti
Sardi
Bharatpur
Purbi Chitawan
Hetauda
Amlekhgunj
Simra
Birgunj
Parwanipur
From Raxaul
Kamane
Pathlaiya
Chandranigahapur
Dhalkebar
From Muzzaffarpur
Mirchaiya
Lahan
Rupani
Kusaha
From Kataiya
Biratnagar
Duhabi
Inaruwa
Basantapur
Baneswor
Tumlingtar
Damak
Anarmani
Ilam
Phidim
Kabeli
Kabeli HEP
Mai Khola
Puwa HEP
Mai HEP


POWER DEVELOPMENT MAP OF NEPAL
EXISTING / UNDER CONSTRUCTION POWER STATIONS & TRANSMISSION LINES / SUBSTATIONS
(Revised Date: July 2017)
(NOT TO SCALE)
N
CHINA
INDIA
KATHMANDU VALLEY
NEPAL ELECTRICITY AUTHORITY
TRANSMISSION DIRECTORATE
GRID DEVELOPMENT DEPARTMENT
Prepared by :Manager Gagan Manandhar
LEGENDS
EXISTING
UNDER CONST.
400 kV TRANSMISSION LINE PROPOSED
220kV TRANSMISSION LINE
132kV TRANSMISSION LINE
66kV TRANSMISSION LINE
GRID SUB-STATION
HYDRO-POWER STATION
IPP's HYDRO-POWER STATION
DIESEL/M-F POWER STATION

Managing Director of NEA receiving the Engineer Appreciation Award presented to NEA from Honourable PM Sher Bahadur Deuba on Engineer's Day 2017.

Welcome programme to Energy Minister Mahendra Bahadur Shahi at NEA Premises.



Impounding of Chameliya HEP Headworks.

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