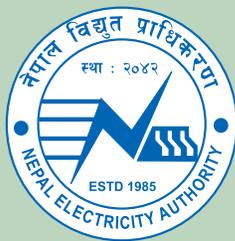


COMPLIMENTARY COPY

Contents

Message from the Minister for Energy.....	2
Message from the Minister of State for Energy	4
Message from the Chairman	5
Board of Directors	6
Corporate structure of NEA	7
Chief Executives of NEA	8
Directors & Department Chiefs	9
Managing Director's Report	13
Generation Construction Business Group	21
Generation Operation & Maintenance Business Group.....	31
Grid Development Business Group	40
Transmission and System Operation Business Group.....	49
Distribution and Consumer Services: West Business Group	54
Distribution and Consumer Services: East Business Group.....	63
Engineering Services Business Group.....	74
NEA's Subsidiary & Associate Companies.....	85
Central Activities	90
Administration.....	92
Internal Audit	96
Finance	97
Highlights of FY 2010/2011	101
Balance Sheet as of July 16, 2011	102
Income Statement for FY ending July 16, 2011	103
Accounting Policies.....	104
Tariff Rates.....	107
Statistics & Schematics.....	109



Nepal Electricity Authority

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Front Cover Photo : Construction of Dam of Chameliya Hydroelectric Project in progress

Back Cover Photo : A view of Mathatirtha 132 kV Substation

Message from the Minister for Energy



First of all, on this occasion of the 26th Anniversary of Nepal Electricity Authority, I would like to express my heartfelt congratulations to all members of the NEA family and wish them the very best for their steady progress and vibrant success on their business to serve the people.

While NEA is struggling to regain its vitality, we have been successful to make some substantial initiatives with a new concept, strategy and commitment in the water resources sector, particularly in hydropower. Given the commitment and hard work to harness the vast hydro potential, there is an every possibility that Nepal can be transformed into a prosperous nation. And, NEA has been, can and must play a significant role in this national quest.

I have noted that the NEA, its scope and its potential in the past were deeply dragged back by the man-made hurdles such as undue political intervention, poor leadership, excessive electricity leakage, loss of administrative and financial disciplines, and so on, which led to the irregular and unreliable service to the consumers and eroded NEA's very credibility. I have, on the other hand, also realized that if we work with clear vision, program, action plan supported by our bonafide intention and positive attitude, all these shortcomings can be corrected and the lost credibility can be regained.

Considering that hydropower is a multipurpose issue for Nepal, we have prepared and applied

a multi faceted strategy to deal with it. We have given a prioritized initiative to the ROR projects that carry national significance such as Upper Tamakoshi for which we have assured financial investment by signing the remaining loan agreement with Nepal Telecom. We have also signed memorandum of understanding (MoU) with Employees' Provident Fund of Nepal for developing four hydropower projects totaling 260 MW under Chilime Hydropower Company and its subsidiaries. On the front of reservoir schemes, we have made a decision to give special preference to study and gradually implement the large projects such as Budhi Gandaki, West Seti, and the ROR such as Upper Arun by the Government itself. These projects will play significant role to not only curb the load shedding but also for the long term hydropower development of Nepal.

For short term answer to the load shedding, we have started a national drive on electricity leakage control. We have started the drive, as a first step, by tripping power to government offices who have so far denied paying their dues since long. We have also begun similar drive on the supply side management by operating the systems to their maximum firm capacity possible, maintaining and even upgrading the systems to some extent and by regularizing the cross border power supply.

The Ministry has adopted certain initiatives to bring about distinct reforms in NEA. We have applied principles of good governance,

transparency, austerity and financial discipline in the procurement of goods and services. In this regard, I have given up using the excessively expensive vehicle. I have relinquished the seat of Chairperson of the NEA Board to the Ministry's Secretary. In the history of NEA, we have for the first time appointed the Managing Director of NEA through the process of open competition. I hope, these measures will help NEA in the long run to shape it into a smart, capable and competitive business firm that can stand and drive ahead on its own.

We have also achieved some milestone accomplishments in the area of forming conducive environment for the hydropower development. Recently, the Government has established Hydropower Development and Investment Company from which a new environment of softer loans will be available to the developers. Most Recently, the government has decided to establish National Transmission Grid Company Limited, which will play a vital role not only in smoothening the congestion currently faced in power transmission but will also contribute in developing power transmission super highway planning for the country.

We know, all that we dream, plan and say can not be accomplished if we can not forge an atmosphere of consensus among the political parties. We, the political parties and the leaders in particular must rise atop the political ideologies and chart out a united vision for speedy hydropower development in Nepal. I appeal to all leading stakeholders to understand the seriousness and the need of the hour that the only way to transform Nepal into a vibrant and prosperous nation is to let the hydropower development happen; let the investors and developers feel secured and attracted. Only then, the prosperity can flourish on the fertile

soil of Nepal.

Finally, I wish the 26th anniversary a grand success. May this anniversary become a milestone event to start a new beginning to making NEA a capable, competent and dynamic institution that assures its consumers regular, reliable and sustainable services.



Gokarna Bista
Minister for Energy

Message from the Minister of State for Energy



On the auspicious occasion of 26th Anniversary of Nepal Electricity Authority I would like to extend the best wishes to the NEA and all the stakeholders associated with it.

The role and responsibilities of NEA are growing continuously as the nation is reeling under the unprecedented energy shortage, and NEA is the prime player of the sector. Energy lies at the core of resources what nation needs for overall national development. NEA should not be synonym of load shedding and let it channelize every possible effort to get rid of load shedding in the days to come.

There are some rays of hope as NEA is coming up with new commitment and new mode of management. NEA should focus its efforts to increase generation, control electricity pilferage and losses improve operation and maintenance and expedite revenue collection in order to decrease load shedding and improve financial health. It should channelize every possible effort to transform present NEA into more efficient, effective and consumer oriented NEA.

I wish NEA a very bright and prosperous future.



Ramji Sharma
Minister of State

Message from the Chairman



I feel privileged and honoured as Chairperson of Nepal Electricity Authority while expressing these few words on the jubilant occasion of its twenty sixth anniversary. NEA is entering its twenty seventh year of service at a very crucial juncture where it is facing the challenge of its own financial survival and at the same time has to shoulder the expectations to rescue the nation from electricity crisis. This requires convincing plans & acts to deliver and excel its services in days to come.

Nepal Electricity Authority is undoubted leader of power sector and hence an important driving force for growth and industrial development of the country. NEA needs to articulate and implement a comprehensive rationalization program to ensure balance between demand and supply of electricity at the earliest possible and manage substantial cost reduction as well as increase in revenue for its own health.

NEA has more than ten thousand employees and geographical presence throughout the country. This large size is asking for performance based reorganization for efficient operation within itself or the natural fission. Bold structural and operational reforms in NEA have become essential. Many large power utilities have become extinct as they were not able to pace with the global changes in the industry. When state investments directly or through public sector cannot address the demand, domestic or external private sector becomes necessary. NEA needs to patron the slowly growing private sector.

In my opinion, NEA needs to concentrate its efforts at three fronts including improving its own financial health, improving quality of its operation and services delivered and accelerated expansions to wipe out the

imbalance between demand and supply. For that it has to increase its own generation and transmission capacity as well as take lead role in making possible the cross border trade through development of appropriate infrastructure and mechanisms.

Though NEA is facing many blames and criticisms for not performing as per the expectations of the people, but everybody believes that NEA only has the technical capability and human asset that can rescue the country from the present crisis and ultimate hope of people also lies on it. I hope that NEA will also acknowledge this sentiment of people and will make it the main thrust of its operations.

This fiscal year shall be marked as year of historical change as 26 year long tradition of the minister chairing the NEA Board has been discontinued by the Honourable Energy Minister. Furthermore, under his leadership, NEA managing Director was appointed through open competition. I want to extend my sincere gratitude to Minister of Energy for this daring step as well as for his vibrant leadership as chairperson though for very short time. My sincere thanks to Members of NEA Board for their cooperation in crucial decisions and expect the same in future.

To conclude, I wish to congratulate all the staff in NEA for their sincere efforts while performing their duties in quest for a brighter future.

A handwritten signature in black ink, appearing to read 'Balanand Paudel'. The signature is stylized and written in a cursive-like font.

Balanand Paudel
Secretary, Ministry of Energy
Chairman, Nepal Electricity Authority

Board of Directors



Chairman
Mr. Balanand Paudel
Secretary, Ministry of Energy



Member
Mr. Krishna Hari Banskota
Secretary, Ministry of Finance



Member
Mr. Sujit Acharya



Member
Mr. Subash Karmacharya



Member
Mr. Kedar Prasad Sanjel

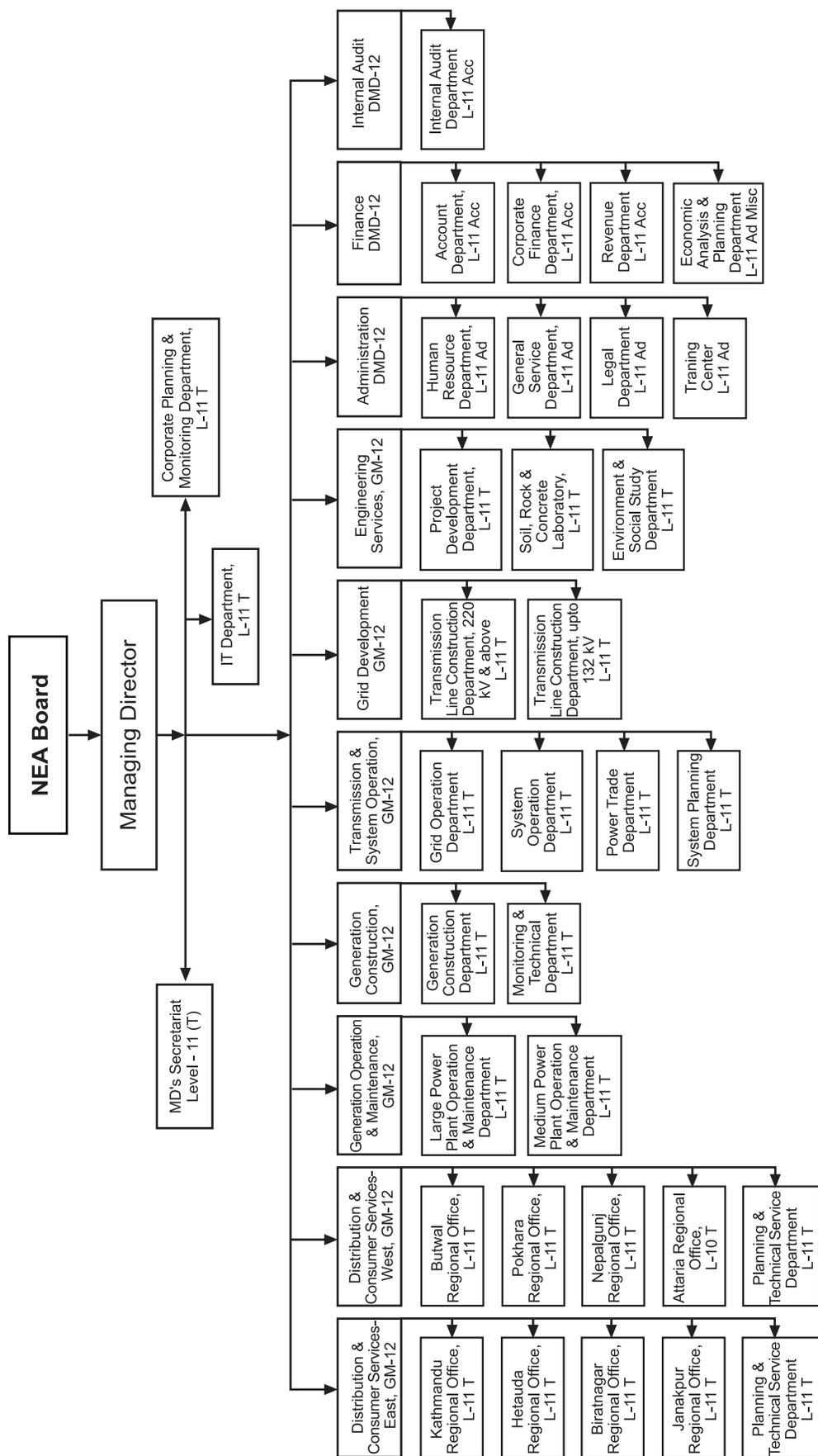


Member



Member Secretary
Mr. Deependra Nath Sharma

NEPAL ELECTRICITY AUTHORITY
Corporate Organisation Structure



Chief Executives of NEA



1. Mr. Rameshwar Yadav (GM, Distribution and Consumer Services, East)
2. Mr. Tika Ram B.C. (DMD, Administration)
3. Mr. Mahendra Lal Shrestha (GM, Distribution and Consumer Services, West)
4. Mr. Lava Bahadur Ghimire (DMD, Internal Audit)
5. Mr. Upendra Dev Bhatta (GM, Engineering Services)
6. Mr. Birendra Kumar Pathak (GM, Generation Operation and Maintenance)
7. Mr. Ram Chandra Pandey (GM, Grid Development)
8. Mr. Rajeswar Man Sulpya (Officiating GM, Generation Construction)
9. Mr. Chiranjibi Sharma Paudel (Officiating GM, Transmission & System Operation)
10. Mr. Badri Nath Roka (Acting DMD, Finance)

Directors and Department Chiefs



Mr. Ganesh Prasad Raj
Director
Planning & Technical Service
Department, DCS East



Mr. Mohan Krishna Upreti
Director
Generation Operation &
Maintenance Medium



Mr. Keshab Raj Bhatta
Director
Environmental & Social
Studies Department



Mr. Subhash Dahal Chhetri
Director
Kathmandu Regional Office



Mr. Puspa Raj Khadka
Director
Cross Border Transmission
Line Project



Mr. Sher Singh Bhat
Director
Power Trade Department



Mr. Sunil Kumar Dhungel
Project Director
Generation Construction
Department



Mr. Buddha Krishna Manandhar
Director
Soil Rock, Concrete Laboratory



Mr. Rishikesh Sharma
Director
Upper Trisuli 3A HEP

Directors and Department Chiefs



Mr. Ram Ekwal Mandal
Director
Planning & Technical Services
Department, DCS West



Mr. Kanhaiya Manandhar
Director
TL Construction Department
220 kV and above



Mr. Surendra Rajbhandari
Director
Corporate Planning &
Monitoring Department



Mr. Mahesh Prasad Acharya
Project Director
Upper Seti Hydroelectric
Project



Mr. Ishwori Prasad Khatiwada
Director
Human Resource Department



Mr. Madhav Prasad Luitel
Director
Training Center Department



Mr. Govinda Raj Kharel
Director
Legal Department



Mr. Arjun Kumar Chauhal
Director
Revenue Department



Mr. Bal Krishna Shrestha
Director

Directors and Department Chiefs



Mr. Sudhir Prasad Singh
Director
Biratnagar Regional Office



Mr. Dev Sharma Poudel
Director
TL Construction upto 132 kV
Department



Mr. Laxman Dangol
Director
Information Technology
Department



Mr. Hari Ram Shrestha
Director
Grid Operation Department



Mr. Hemanta Kumar Joshi
Director
System Planning
Department



Mr. Lilanath Bhattarai
Director
Project Development
Development



Mr. Gopal Babu Bhattarai
Director
Chameliya Hydroelectric
Project



Ms. Gosain K.C.
Director
General Services Department



Mr. Ishwori Prasad Tiwari
Officiating Director
Generation O & M Large

Directors and Department Chiefs



Mr. Asta Ratna Shakya
Act. Director
MD's Secretariat



Mr. Juju Kaji Ranjit
Act. Director
Nepalgunj Regional Office



Mr. Jayendra Shresha
Act. Director
Economic Analysis &
Planning Department



Mr. Yogendra Prasad Baidya
Act. Director
Internal Audit Department



Mr. Ram Chandra Gupta
Chief
Butwal Regional Office



Mr. Prakash Chandra Shrestha
Chief
Pokhara Regional Office



Mr. Lekh Nath Koirala
Chief
Finance & Account
Department



Mr. Badri Narayan Shah
Chief
Far Western Regional Office



Mr. Shankar Pd. Majhgiaiya
Act. Director
Corporate Finance
Department



Mr. Ram Ekbal Yadav
Chief
Janakpur Regional Office



Mr. Bajrabhushan Chaudhary
Chief
Hetauda Regional Office

Managing Director's Report



I feel privileged to present this annual report on the activities of Nepal Electricity Authority (NEA) for the fiscal year 2010/11 on the occasion of 26th year of its dedication in the service of nation. Year 2010/11 is marked as yet another year of exponential challenge towards meeting the growing demand for electricity. Our efforts could not produce tangible outcomes as expected due to existing undulations in the power sector but our initiatives and efforts to resolve the prevailing problems indicate a hopeful future.

Overview of Sector

FY 2010/11 has been marked and celebrated as historical centennial year of generation and commercial use of hydroelectricity in Nepal. Pharping, the first Hydroelectric Power Plant of Nepal, started generating electricity in 1911. Despite having a century long history of electricity generation and consumption, half of the population is still deprived from use of electricity and other half is facing long hours of power cut. The current crisis of electricity requires retrospective evaluation of our policies and actions as to what went wrong.

Neither the public nor private sector could exhibit remarkable performance to ease the crisis during FY 2010/11 and once again government had to declare state of electricity crisis. Expected imbalance aggravated the mismatch between demand and supply of electricity resulting in forced power interruption of upto 14 hours per

day per consumer. Impediments in the sector that accumulated for so many years cannot be wiped out overnight. What NEA can promise is concentrated and consistent effort that will ensure graded visible improvements.

FY 2010/11 strengthened our cooperation with Independent Power Producers (IPPs). NEA signed Power Purchase Agreements (PPAs) worth 714.77 MW during year 2010/11 which is almost double the total capacity of power purchase agreement signed in the past. Total capacity of power purchase agreement signed so far has reached 1,118.35 MW.

NEA has been finding itself uncomfortable with the net loss making business of rural electrification. It is realized that NEA cannot afford its scarce resources in this social activity as well as it cannot continue to provide bulk electricity to communities at a price much less than its purchase tariff. Idea of establishing a Rural Electrification Company has been floated which we wish to come to reality. Similarly, huge investment on grid expansion is not financially justifiable to NEA's balance sheet. Investment in transmission expansion should come from government side on the basis of economic feasibility.

System Operation

Integrated Nepal Power System (INPS) experienced sustained growth in peak demand of power and energy during FY 2010/11. The

annual peak power demand of INPS reached 946.10 MW. Likewise, annual energy demand totaled at 4,833.35 GWh. It is worthwhile to mention that these are estimated figures owing to the fact that assumed figures have been used for power and energy demand for the load shedding period. Compared to previous year figures of 885.28 MW and 4,367.13 GWh, FY 2010/11 has registered 6.87 % and 10.67 % growth in Peak Power and annual energy demand.

Presuming normal availability of domestic and import supply sources, we had forecasted a maximum fourteen hours of load shedding per day per consumer during driest months of January, February and March. NEA resorted to all possible options to minimize this crisis including purchase of all excess energy from IPPs, operation of costly diesel plants and all possible import under power exchange agreement and power trade with India. But as foreseen earlier, these measures were just inadequate to offset the huge gap between demand and supply.

System load factor remained at 58.3% during the year compared to 54.22% of previous year. Load Factor is a major demand side characteristic of system but analysis on the basis of this load factor is not true reflection of system when it is running in abnormal conditions of very long hours of load shedding. Similarly sharp drop in supply availability during dry season is a typical supply characteristic and indicates an over dependence on Run off the River Plants as well as urgent need of seasonal storage plants.

Operational Performance

Annual Energy Demand of INPS for FY 2010/11 was estimated at 4,833.35 GWh, out of which only 3,850.87 GWh (79.67%) could be

served from available sources and rest 982.48 GWh (20.33 %) had to be curtailed as load shedding to keep the system in operation. Of the supplied volume, 3,156.82 GWh (81.58%) was contributed by domestic generation and 694.05 GWh (18.42%) was imported from India. Domestic supply included 1,038.84 GWh (32.89%) from IPPs and rest 2,117.98 GWh (67.11%) was generation from NEA owned power stations with a share of 2,114.58 GWh from hydro and 3.40 GWh from thermal. NEA owned power stations attained the generation target by 94.22% outperforming the previous year's figure of 93.72%. This could be possible through continued repair and maintenance activities as well as periodic overhauling and renovation.

Major overhauling of turbine-runner assembly of Unit No. 2 of Kaligandaki 'A' and Marshyangdi as well as first overhauling of Middle Marsyangdi Hydropower Station since its commissioning to rectify the defects identified during defect liability period (DLP) under contractual obligations were successfully completed. Repair of Modernization and Upgradation (RMU) project undertaken in Devighat has been completed. Repair of Kaligandaki-A and Marshyangdi Hydropower Stations and overhauling of Multifuel Power Station are at various stages of implementation. Unit No. 2 of Kulekhani-I is renovated with digital governor and Automatic Voltage Regulator (AVR). Overhauling of Unit No. 5 of Multifuel Power Plant has been completed and additional machining works is underway in Unit No. 1, 2 and 6 by Wartsila, Finland under the rehabilitation project financed by loan assistance from the World Bank.

Although no new transmission or grid substation element was commissioned during the year to augment the transmission capacity,

altogether 183.9 MVA Power Transformer capacity was upgraded at different voltage level with reshuffling of existing Transformers. Similarly Routine Maintenance works were carried out as per schedule for Substations and Transmission Lines including foundation protection of transmission towers. Overall time-availability of the transmission system remained close to 99% during the period.

NEA has been able to maintain consistent growth in its number of customers during FY 2010/11 also. With an increase of 10.15 % over last year's figure, our total number of customers at the end of FY 2010/11 reached 2,053,259. Of this 94.92 % customers belong to domestic category accounting for 42.81 % of total energy sales and 42.37 % of total revenue earned during the year under review. Although industrial category of consumers is only 1.61 % of total number of consumers, it contributes a substantial 38.15 % of energy sales and 35.52 % of total revenue earned.

Despite continued efforts and measures taken to control system losses, the desired result could not be achieved. Collective and organized misuse of electricity has been main challenge to reduce the losses. Our efforts have not generated encouraging results and INPS has incurred 28.35% system loss (provisional) in FY 2010/11 compared to previous year's audited loss figure of 28.91%. We are committed to intensify our efforts to bring down the system loss to an acceptable level.

Financial Performance

Partial replenishment of water in Kulekhani reservoir and below average run off in various rivers during dry season had double side adverse effect on our financial performance. In one hand, we suffered a direct revenue loss

due to reduced supply, on the other, it imposed additional costs in managing the energy deficit through costly sources like thermal plants and import of energy under trading mode.

Total Sales volume during the year was 2,734.74 GWh of which internal sales mounted 2,705.15 GWh registering an increase of 7.07 % over the previous year figure whereas export sales remained only 29.59 GWh. Although we registered a growth of 5.12% in annual sales, it was not upto mark and remained 13.60% less than the projected sales.

Net revenue from sales of electricity during FY 2010/11 was NRs. 18,003.80 million with an increase of 4.89% over previous year figure of NRs. 17,164.59 million. With a contribution of 6.19% to total income, Other Incomes such as surcharge, interest, lease rent, service charge, dividend and interest etc. were NRs. 1,189.58 million. NEA allowed NRs. 383.54 million rebate to its consumers during FY 2010/11. Thus total income after rebate stood at NRs. 19,193.38 million showing an increase of 4.58% over last year's figure.

Operating expenses increased by 3.36% from NRs. 19,371.35 million in FY 2009/10 to NRs. 20,021.59 million in FY 2010/11. The growth was primarily due to the increase in power purchase costs, depreciation as well as staff costs incurred during the FY 2010/11. Major chunk of 54.72% of operating costs was constituted by Power Purchase. With an increase of 12.42% over previous year's figure, Power Purchase Costs during FY 2010/11 remained NRs. 10,956.81 million. Additional power import and escalation in power purchase rates contributed to increase in power purchase costs. Second largest component of Operating costs was Interest Expenditure, which totaled NRs. 3,535.60 million showing slight decrease

of 3.63% over the previous year's figure. NEA incurred a foreign exchange translation loss of NRs.44.44 million due to depreciation of Nepalese Rupees vis-a-vis the Japanese Yen loan for Kulekhani Disaster Prevention Project.

NEA's average cost of service stands at NRs. 9.40 per kWh against its average net revenue rate of NRs. 6.58 per kWh in FY 2010/11. After contribution from other income of NRs. 0.43 per kWh, NEA suffered a loss of NRs 2.39 per every kWh of energy sold. As a result, NEA incurred a net loss of NRs. 6,511.65 million in the FY 2010/11. The accumulated loss reached NRs. 27,534.01 million at the end of FY 2010/11. Retail tariff has the largest bearing on our revenue and ultimately on income statement. For last 10 years there has not been upward adjustment in electricity tariff.

NEA made additional investments of NRs. 9,211.91 million in capital works and projects during 2010/11 and with that net carrying amount of NEA's property, plant and equipment reached NRs. 85,762.76 million registering 3.20% growth on previous year's figure. Major chunk of this additional capital investment was on Rural Electrification. NEA long term borrowing reached NRs. 62,212.32 million by the end of FY 2010/11 of which NRs. 42,002.26 million comprises of GoN's investment in equity.

Total receivable by the end of FY 2010/11 reached NRs. 7,282.0 million from previous year's figure of NRs. 6,097.74. million registering 19.42% increase. NEA has maintained a collection rate of 93% from individual and private sector but 34.69% of total receivables is contributed from municipalities, government offices and public institutions that stood approximately NRs. 2,526.26 million at the end of FY 2010/11.

Overall picture and trend of the financial condition by the end of FY 2010/11 is crippling and asks for immediate review of retail tariff and effective financial restructuring for the sustainability of the organization.

During the year under review, remarkable success was achieved in settling the pending audit remarks related to projects executed during the FY 1961/62 to FY 1973/74. Out of the total outstanding of NRs. 50.16 million for the said period, NRs. 40.58 million has been settled down during the FY 2010/11.

Development Activities

Apart from professional operation and maintenance of existing plant and equipment, NEA has the responsibility to expand the system to meet the growing needs. This includes development activities related to generation, transmission and distribution services.

Construction of Kulekhani -3 Hydroelectric Project is in progress. Construction of Adit 1A, Adit 2 , Adit 3 and Adit 3A, Adit 4, headrace tunnel (1280 m) and penstock tunnel (234 m) have been completed whereas construction of headworks at Khani Khola and desander are in progress. The contract for the Electromechanical, Hydro-mechanical and Transmission Line works has been awarded and design work is in progress.

Chameliya Hydroelectric Project (30 MW) has recorded an overall progress above 73% with completion of Adits, diversion tunnel, connecting tunnels, aeration tunnel, access tunnel to desander, flushing tunnel, surge tank and excavation of 3409.10 m of head race tunnel out of total 4067 m. Concreting works for Dam, connecting tunnels and powerhouse

and excavation for penstock are in progress. Two draft tubes with all accessories installation works have been completed. Out of total 412 towers of 132 kV transmission line, foundation works of 292 towers have been completed of which 198 towers have already been erected. The Contract for the construction of Upper Trishuli -3A Project has been awarded to China Gezhouba Group Co. Ltd. (CGGC) under Engineering Procurement and Construction (EPC) mode. Similarly, the Contracts for construction of transmission line and construction supervision have been awarded to China International Water & Energy Corporation (CWE) and Northwest Hydro Consulting Engineers respectively.

Contract for construction of main civil works of Rahughat Project has been awarded to IVRC Limited and the contractor has initiated construction of access road and bridge. Appointment of Consultant is expected to be concluded shortly.

Development of domestic and cross border transmission network is progressing smoothly with ambitious plan. Feasibility Study of three 220 kV, four 400 kV and nine 132 kV transmission lines projects has been completed. Similarly survey of four 220 kV and ten 132 kV transmission lines projects has been completed.

All the transmission line projects under construction have been facing problems at worksite. 90% construction of Khimti – Dhalkebar 220 kV transmission line project has completed and rest is facing stoppage from locals. Supply and delivery of substation equipment and line materials and construction of Matatirtha substations is completed for Thankot – Chapagaon - Bhaktapur 132 kV Transmission Line Project. Rest of the Project

work has been stopped because of right of way issues raised by local inhabitants. The NEA Board has decided to terminate contract for the transmission line portion.

Route survey for loop-in-loop-out work of Syangja 132 kV Substation has been completed. The delivery of transformer and other associated equipment is in progress. The contract for the construction of Dumre – Damauli – Marsyangdi 132kV Transmission Line has been awarded while the contract for the construction of substation is in the final stage of approval. Stringing of second circuit on existing double circuit towers of Butwal – Kohalpur- Mahendranagar 132 kV Transmission Line is underway. Similarly, the construction of Chapali 132 kV Substation Project, Matatirtha Substation Expansion Project, Pathlaiya 132 Substation Project, Singati - Lamosangu 132 kV Transmission Line Project, Kabeli 132 kV Transmission Corridor and installation of capacitors at various substations are underway. Route alignment survey of the Bharatpur - Bardghat 220 kV Transmission Line has been completed.

The Hetauda – Dhalkebar – Duhabi 400 kV Transmission Line Project is being implemented to enhance cross boarder power exchange with India and augment the transfer capacity of the INPS. The detail survey of the project has been completed and land acquisition for Dhalkebar Substation is in final stage. Three transmission line and substation projects are also being implemented to facilitate power supply to cement industries.

Similarly numbers of electrification projects, distribution substation construction and upgrading projects and 33 kV transmission line and substation projects are underway throughout the country to increase the

accessibility of rural population to electricity.

Human Resource and Capacity Building

The total number of employees stood at 9,107 at the end of FY 2010/11 against 10,324 approved positions. During the year under review 217 employees were retired, 6 employees took voluntary retirement, 10 persons were terminated on charge of long absence, 21 employees resigned and 24 staff passed away. Total 526 vacant posts were filled during the year whereas 411 employees of different levels got promoted.

As part of human resource development activities, 276 staffs of various levels participated in trainings, seminars, workshops and study and inspection tours abroad. Similarly, 516 staffs received various types of training in NEA Training center while 14 staffs participated in local training programs outside NEA.

There have been major developments in the use of information technology for reporting, creating database, analyzing and developing a knowledge base to improve our operational efficiency. Enhanced availability and use of IT in our decision making and delivery of service has shown clear indication of improvement in these areas.

NEA's Subsidiary Companies and the Private Participation

Chilime Hydropower Company Limited (CHPCL), the first subsidiary company of NEA, has been successfully delivering deemed as well as excess energy to NEA from its Chilime Hydroelectric Power Plant. CHPCL is undertaking the development of Upper Sanjen (14.6 MW), Sanjen (42.5 MW), Rasuwagadhi (111 MW) and

Middle Bhotekoshi (102 MW). A Memorandum of Understanding (MoU) to this effect has been signed with Employee Provident Fund for debt financing of these projects. The financial closure for the construction of 456 MW Upper Tamakoshi Hydroelectric Project has been concluded. The contract for civil construction of the Project has been awarded and the project is scheduled to be commissioned by the end of 2015 AD. Similarly Upper Trishuli -3B Hydroelectric Company has been established in equity partnership with Nepal Telecom for the development of Upper Trishuli -3B Hydroelectric Project. Power Transmission Company of Nepal (PTCN), a transmission business subsidiary, is engaged in development of Dhalkebar – Muzaffarpur 400 kV cross border power transmission line. Implementation and Transmission Service Agreement (ITSA) has been initialed with the company.

NEA has always considered IPPs as trusted peers in meeting country's growing demand for electricity. Total number of PPAs concluded so far has reached 81 with total installed capacity of 1118.352 MW. Out of this total, 23 projects with total installed capacity of 174.526 MW are already in operation. NEA increased posted PPA rate by 20% to encourage developers of plant size upto 25 MW. During the year under review, 13 new PPAs for a total capacity of 708.07 MW were signed whereas two PPAs for capacity upgradation totaling 6.70 MW were amended. Thus power purchase agreements for total capacity of 714.77 MW were signed during the year.

Way Forward

NEA is passing through the most critical time since its establishment. It is facing challenges of running the business in net cash deficit situation, managing the exponentially increasing demand

for electricity and addressing the market risks perceived in future. Problems in the root of these challenges have been identified as long time pegged retail tariff, selection and implementation of projects with poor financial and system feasibility, inefficient operations resulting in high system and financial losses, low productivity of human resource and negative yield of capital employed. As substitute of electricity is electricity only, likewise substitute of NEA cannot be any other institution, but an improved NEA. It is the organization equipped with strong human base and capacity to rescue the country from the prevailing crisis through appropriate institutional and financial restructuring. NEA's own commitment for improvement of operational efficiency combined with the review of retail tariff and financial restructuring by government can rejuvenate the organization.

We have strategic plans to expand our generation, transmission and distribution capacity, curb the system losses and improve financial health. To improve the cash flow situation we will impose strong financial discipline to reduce the costs of operations as well as increase the revenue through efficient operations, reduction of system losses and additional income from mobilization of available resources. However, consistent proactive efforts shall be made for revision of retail tariff and financial restructuring.

We have the mission of face lifting our organization in four years. For the purpose, a three tier strategic reform plan encompassing corporate initiatives, corporate directives and root level intervention will be initiated for overall impact. In this perspective, corporate level initiatives shall focus on a gamut of activities such as financial restructuring, increased income, reimbursement of expenses

from GON incurred in social obligations, anti corruption policy and transparency, mobilization and management of funds for expansion, development of HR policy and preparation of action plan for reduction of load shedding. Corporate directives will be issued to core businesses for resolving immediate turbulence to ensure plant and system availability, loss reduction, improvement in metering and billing and undersizing receivables. Similarly root level intervention shall focus on measures to bring in the desired change in our work culture characterized by efficient service delivery to achieve consumer's satisfaction.

The projects under construction by IPPs and projects for which PPAs have been signed are run-of-river type only. These projects generate lot of energy during wet season and very small quantity during dry season. This results in surplus during wet season and deficit during dry season. A concrete and comprehensive plan is required to utilize this surplus energy and to manage the deficit in dry season. In this regard, completion of Muzaffarpur – Dhalkebar 400 kV Cross Border Transmission Line and trading with India will constitute viable and immediate option whereas development of storage projects will provide a long term solution to resolve this problem. Budhi Gandaki, Upper Seti, Nalsyaugad and Tamor Storage Hydroelectric Projects have been identified as prospective and viable projects for implementation in near future. NEA will implement these projects on a priority basis.

NEA will improve the quality of its services through the use of new technologies and capacity building to meet the challenges of new environment of utility business. Centralized customer care center shall be established to ensure single point of contact for all consumer related activities, timely service, and grievance

handling. NEA will also implement Automatic Meter Reading system and internet facilitated billing system. Financial Management Information System (FMIS) will be implemented to provide the reliable and timely information for decision-making.

Capacity building of NEA will be a key agenda, for which the Training Center will be institutionally restructured. The project resources will be pooled to fund the capacity development program in a comprehensive manner with due mechanisms put in place for Training Needs Assessment (TNA) and planned training activities. The idea is to develop Training Center as a Center of Excellence for HR development in the power sector.

We firmly believe that ensuring human touch in our service delivery and improving moral health of our organization will definitely improve our image and open new avenues for financial resources mobilization in the years to come.

Acknowledgements

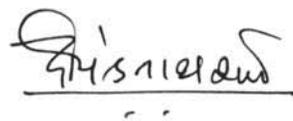
I take the opportunity to acknowledge that credit for NEA's performance and achievements attained during 2010/11 goes to all those who have been directly or indirectly contributing to this cause. I want to express my deep gratitude to Minister of Energy for his leadership initiatives in boosting the morale and encouraging for one forward step every day. Our deep gratitude goes to members of NEA Board of Directors who have steered the course in all adverse conditions.

I sincerely acknowledge that concerned parliamentary committees and government showed great concern on financial health of NEA and extended support in our regular operation and development pursuits. I am also indebted

to bilateral donors such as China, Germany, India, Japan, South Korea, Norway and USA as well as the international development banks such as World Bank, Asian Development Bank, Japan Bank for International Cooperation and Kreditanstalt fur Wiederaufbau (KfW) that have generously supported us and contributed in our development and institutional strengthening activities. I am aware that NEA has a large well wisher community in the society that stands in its favor at difficult times. I sincerely thank this community including the media and request for continued support in future.

Despite very adverse working conditions, our staffs have shown consistent strive for betterment and dedication throughout the year. I am thankful to the entire staff of NEA as well as their representative Unions for their support and cooperation. At last I am indebted to our valued customers for bearing with us during adversities and apologize for not meeting their expectations.

Thanking You.



Deependra Nath Sharma
Managing Director

Generation Construction Business Group

Generation: Construction Business Group is responsible for construction management including detail engineering of new power projects. It is headed by a General Manager and has Generation Construction Department and Monitoring and Technical Support Department. NEA Board's decision in the line with new organization set-up, this Business Group is overseeing the construction of Chameliya Hydroelectric Project (30 MW), Kulekhani III Hydroelectric Project (14 MW), Rahughat Hydroelectric Project (32 MW), and Upper Trisuli 3 'A' Hydroelectric Project (60 MW). Chameliya Hydroelectric Project, Rahughat Hydroelectric Project and Upper Trisuli 3 'A' Hydroelectric Project report to the General Manager while Kulekhani III Hydroelectric Project reports to the Director, Generation Construction Department. This Generation Construction Group will have to take more responsibilities in near future as Nepal Government has initiated more investment in generation sector in order to reduce dark and frightening shadow of load-shedding.

Generation Construction Department

Generation Construction Department headed by a Director is responsible for constructing new power projects. Currently, this Department is managing the construction of Kulekhani III Hydroelectric Project. The construction activities and project features are as described below:

Kulekhani III Hydroelectric Project

The Kulekhani III Hydroelectric Project (14 MW), under construction, is located in Bhainse Village

Development Committee of Makawanpur District. It is cascade project, which utilizes the regulated flow of the Kulekhani reservoir. The discharge from Mandu River at the intake of Kulekhani II and discharge from Khani Khola at the intake of Kulekhani III are further added to it.

Main features of the project comprise of a head pond, a 4293 m long headrace tunnel, an underground forebay, a 370 m long penstock and a semi underground powerhouse. Two units of vertical shaft Francis Turbines each of 7.0 MW capacity shall be installed to generate 40.85 GWh of energy annually. Power generated from the project will be evacuated to Hetauda Substation through 0.5 km long 132 kV transmission line.

M/S Sino Hydro Corporation, China was awarded the Civil Work Contract for the construction of civil work of the Project on April 4, 2008. The Construction of Adit 1A (308 m) Adit 2 (15m), Adit 3 (80 m) & Adit 3A (83 m) and Adit 4 (180 m) and headrace tunnel (1280 m), penstock tunnel (234 m) has been completed. Similarly, the construction of headworks at Khani Khola and desander are in progress.

The Contracts for the Electromechanical, Hydro-mechanical and Transmission Line works have been awarded to M/S Jheijiang Jinlin, Electromechanical Company, China on July 2011 and design work is in progress. The Project has been accorded National Priority by the Government of Nepal (GoN). The estimated cost of the project is NRs. 2.43 billion which is jointly funded by GoN and NEA. The Project is scheduled to be completed in July 2012.

Salient Features of the Project

Location	: Headwork near the tailrace of Kulekhani II at Bhaise Dobhan and Powerhouse in Sanutar village (4.5 km north of Hetauda city), Makawanpur district
Type	: Cascade project of Kulekhani Storage Project
Installed Capacity	: 14 MW
Annual Energy	: 40.85 GWh
Catchment Area	: 143 km ²
Design Discharge	: 16.0 m ³ /s
Gross Head	: 109.8 m
Net Head	: 103.17 m
Headwork	: Khani Khola Intake Conventional Side Intake on stilling basin downstream of the consolidation check dam : Conveyance length 302 m
Head pond	: Capacity 2067 m ³ ; Size 30m×10m; Siphon Barrel Size 2.7m×2.7m×68.8 m
Headrace Tunnel	: Horseshoe shaped concrete lined; Length 4.294 m; Diameter 3.5 m
Forebay	: Underground; Horseshoe shaped concrete lined; Length 107 m; width/height 6 m/9 m
Adit Tunnel	: 4 numbers; Inverted D shaped; 1118.5 m (including branch of Adit 3; Diameter 3.5m)
Tunnel Penstock	: Horseshoe shaped; Length 370 m; Diameter steel/tunnel 2.3 m/3.8 m
Powerhouse	: Subsurface, 13.10 m × 21.8 m × 31.1 m
Tailrace	: 44.3 m RCC closed duct and 57.89 m open channel; Size 3 m×3.5 m for closed duct; 10m width of open channel
Turbine	: 2 Vertical Axis Francis Turbine
Generator	: Two 3 phase, Synchronous AC
Transmission Line	: 132 kV; 0.5 km



Chameliya Hydroelectric Project

Chameliya Hydroelectric Project (CHP) site is at ward no. 4, Balanch of Darchula District of Mahakali Zone. The project was identified by NEA in 1991. The feasibility study of the project was carried out by METCON Consultants in 1996 by using South Asian Development Fund. Detailed Design and tender preparation of the project was prepared by Hundai Engineering Company Pvt. Ltd. and Korea Water Resources Corporation in December 2001 with grant assistance of Korea International Co-operation Agency (KOICA).

CHP was started in December 21, 2006 and is scheduled to be completed by December 2012 if required funding is available. The total estimated cost of project is 100 million US\$ jointly financed by GON, NEA and Korean Government. Installed Capacity of the plant is 30 MW with average annual energy generation of 184.21 GWh. This is a peaking run of river (PROR) project with six -hour daily peaking capacity.

18 km long access road has been completed and local transportation services are in operation. Six bridges and one cause way on the access road have also been completed. Seventeen numbers of buildings which include administration; workshop and guard house have been completed. Likewise, 32.3 km 33 kV transmission line from Gothalapani in Baitadi to Balanch in Darchula is completed and 33/11 kV, 3 MVA sub-station work is at final stage of completion.

Contract for the civil works was awarded to China Gezhouba Water and Power (Group) Co. Limited (CGGC) on December 21, 2006 with construction period of 54 months. The mass concreting work (M15/A80) in dam has been completed on March 30, 2011. Total volume of structural concrete (M25) 2682.50 m³ and

mass concrete (M15) including stilling basin is 24091 m³ has been completed.

Excavation works of 3,429 meters of headrace tunnel has been completed and 619 meter is remaining. Excavation work is in progress. In headrace tunnel 266 m excavation work is remaining in Adit 1 down stream and Adit 2 upstream. 353 m excavation works is remaining in Adit 2 down stream and Adit 3 upstream. In downstream of Adit 2 and upstream of Adit 3 of the head race tunnel, excavation has become difficult due to poor geological condition. The daily progress of Adit 2 down stream and Adit 3 upstream is around 1 meter each. In connecting tunnel concrete in invert and sides are in progress. In connecting tunnel no. 1; 270m³ concrete and in connecting tunnel no. 2; 426m³ concrete has been completed.

Out of 299.65 m of horizontal section of penstock tunnel, only 6.8 m excavation works is remaining. Out of 81.95 m of vertical section 71.95 m is remaining for excavation.

For the tail race, concreting started on November 22, 2010; the concreting work in 19 blocks out of 21 has been completed and total volume of concrete is 5,744.4 m³. River has been diverted through diversion tunnel from December 02, 2010.

The consultancy services for construction management and supervision of civil works is being carried out by SHAH/SILT/ICON JV in association with Engineering Services, Project Development Department, NEA.

In April 30, 2009, KHNP Consortium which includes Korea Hydro & Nuclear Power Co. Ltd, (KHNP); Hwachon Plant Construction Co. Ltd. (HWACHON) Korea; Sean Engineering and Construction Co. Ltd. (SEAN) Korea and Nepal Hydro & Electric Ltd., (NHE) Nepal has been awarded the contract for the construction of Electro-Mechanical, Hydro-Mechanical and



132kV Transmission Line works of the project.

The model tests for turbines and tower destruction tests for the 132 kV T/L has been witnessed and inspected, and manufacturing works are in progress. Soil investigation and detailed topographical survey including foundation design has been completed. The embedded parts for powerhouse have been installed. Installation of two draft tubes with all accessories has been completed. 132 kV tower members and stubs have been delivered at site. 303 nos. of foundation works for 132 kV transmission line (out of 412 nos.) has been completed. 208 nos. of towers has been erected. Turbine and power transformer has been witnessed and inspected. Workshop at site for fabrication of penstock etc. has been established and fabrication are in progress. In May 11, 2009, Saman Corporation, Korea was appointed as Consultant to supervise the works of Electro-Mechanical, Hydro-Mechanical & 132 kV Transmission Line Works.

Delay in progress is specially due to adverse physical condition encounter at construction areas and delayed payment. The geology of Adit 3 u/s and Adit 2 d/s consist of very weak and sheared rock mass which has caused excavation work in this face extremely slow and difficult. The local problems and security of the project area also has caused delay in the progress of works.

Environment and Social Studies Department NEA has been carrying out the Environment Monitoring and Mitigation measures works as per the approved EIA report. The overall progress of Project is 73.5% .

Salient Features of the project

Type of Project	:	Run-off- river plant with (6 hours daily peaking)
Catchment area	:	835 Km ²
Gross head	:	103.7m
Design discharge	:	36 cumecs (38% exceedence flow)
Installed capacity	:	30 MW
Dam	:	Concrete with gated weir
Desanding basin		
Type	:	Underground
Number of basin	:	2
Headrace Tunnel		
Tunnel Type	:	Horse shoe, Pressure tunnel
Length/diameter	:	4067m/5.2m (4.2 m)
Type of surge tank	:	Restricted orifice
Surge tank		
diameter/height	:	8.0m/49.8m
Penstock		
length/diameter	:	383.64m/3.7m
Powerhouse		
Type	:	Semi-underground
Length/Width/height	:	37.5m/23.5m/27.4m
Turbine		
Type of turbine	:	Vertical Shaft Francis
Number of unit	:	2
Tailrace	:	Cut and cover box culvert
Transmission Line	:	132 kV single circuit, 131km long
Access Road	:	18 km
Annual Energy	:	184.21 GWh
Year of completion expected	:	December, 2012

Upper Trishuli 3A Hydroelectric Project

Upper Trishuli 3A Hydroelectric Project, a 60 MW run- of-river (ROR) Hydropower Project with annual energy generation of 460 GWh is located in Rasuwa and Nuwakot districts. The construction of this Project has been initiated in FY 2067/68. The loan agreement for 640 Million Chinese Yuan (about 93 Million US\$) covering the major project works (Civil, Electro-Mechanical, Hydro Mechanical works) and its construction supervision was signed on 28 February 2011 between Nepal Government

and China Exim Bank. Estimated cost of the project is 125.775 Million US\$ and China Exim Bank has committed to provide concessional loan of 120 Million US\$. Land acquisition for the major Project work has been basically completed including leasing of land for the temporary facilities.

The construction of this project is being undertaken under Engineering Procurement and Construction (EPC) model and comprises of three packages as follows. Contract for construction supervision of the project was signed with Northwest Hydro Consulting

Engineers on September 2010. The contract amount is 3.923 Million US\$ and the supervision work has started since 1 June 2011.

Contract for the major construction work (Civil, electro-mechanical, hydro-mechanical works) was signed on 28 May 2010 with China Gezhouba Group Co. Ltd. (CGGC) at a cost of 89.1779 Million US\$. After signing of the Loan Agreement and subsequent Subsidiary Loan Agreement (SLA) between Government of Nepal and NEA the Contract has become effective since 1st June 2011. The construction work has started from 1st June 2011 and shall be completed in 35 months. CGGC has been undertaking up gradation of the 11.5 km long access road, construction of steel bridge over Trishuli River, temporary camp at headworks, excavation of Adit no. 1 and head pond

excavation.

The Transmission line comprises of 48 km long 220 kV line from switchyard to Matatirtha substation in Kathmandu. This line includes 1 km of underground cabling leading to the Matatirtha Substation and bay extension work. The contract for Transmission line was signed in February 2011 with China International Water & Energy Corporation (CWE) and its cost is 22.6 million US\$.

As per the recommendation of Initial Environmental Examinations, IEE, NEA is preparing to impart skill enhancement training to 120 persons from the project site.



Concreting of bridge abutment over Trishuli River in progress

Salient Features of the Project

Type of project	: Run of River hydropower
Project location:	
District/Zone	: Rasuwa & Nuwakot of Bagmati zone
Headworks	: 1 km downstream of Mailung Trishuli confluence
Powerhouse	: Near Simle village
Nearest Town	: Trishuli about 19 km to the south
Nearest Roadhead	: Simle near proposed powerhouse site
Length of access road	: 2.3 km new and upgrading of 11.3 km between Betrawati & headworks site
Hydrology:	
Name of River	: Trishuli
Reference Hydrology	: Betrawati St. no. 447
Catchment area	: 4542 sq. km
Design Discharge	: 51 cumecs based on 70% exceedance flow
Geology:	
Regional geology	: Lessar Himalyas
Geology of project area	: Good rock type, Gneiss, Schist
Project General Description:	
Gross Head	: 144.5 m
Type of headworks	: Gated weir with side intake
Design flood	: 2424 cumecs based on 1:1000 year flood
Full Supply level	: El: 870.5 m
Undersluice gate size	: 4 nos. 11.6 m x 10 m
Intake type	: Side intake
Intake channel length	: 148 m
Desander	: Twin Berri type
Desander size	: 95 m x 30 m x 9.2 m (L x B x H)
Headrace tunnel length	: 4095 m
Headrace tunnel Shape	: D type (excavated) and circular (finished)
Headrace tunnel Size	: 5.4 m for concrete lined and 5.9 m for shotcrete
Shotcrete lined portion	: 60% of total length
Surge shaft	: Restricted orifice type 17 m dia. 37.7 m high
Inclined shaft	: Length 168.27 m, diameter 4 m
Pressure tunnel	: Length 86.6 m, diameter 4.0 m to 2.0 m
Powerhouse Type	: Underground
Powerhouse Size	: 42.6 m x 14 m x 30.2 m
Turbine Type	: Vertical Francis
Installed Capacity	: 60 MW (2 X 30 MW)
Switchyard Size	: 2 nos of 50 m X 15 m
Tailrace Conduit	: D type 6.2mx5.0 m size, 115 m length And twin conduits 25 m length
Tail water Level	: El. 726 m
Power & Energy:	
Minimum power	

Generation	:	43.75 MW
Annual average Energy	:	489.76 GWh (gross)
Power Evacuation:		
Length of Transmission Line	:	48 km
Transmission Voltage	:	220 kV initially charged at 132 kV
Interconnection point	:	Thankot substation at Kathmandu
Project Cost:		
Estimated cost	:	109.224 Million US \$
Project Economics:		
Benefit cost ratio	:	2.18
EIRR	:	21.6%
Specific energy cost	:	3.03 cents/kWh
Estimated Project Completion date	:	2014

Rahughat Hydroelectric Project

Rahughat Hydroelectric Project with installed capacity of 32 MW with average annual energy generation 187.66 GWh located in Galeshwor, near district headquarters Beni of Myagdi district in Dhaulagiri zone of western Nepal, is in the initial stage of construction. The Project envisages generating hydropower from the Rahuganga river in Myagdi district. This is a peaking run of river (PROR) project with six-hour daily peaking capacity.

The fund requirement for the Project is US\$ 67 million out of which US\$ 31 million is available from the Export-Import Bank (EXIM Bank) of India. A Credit Line Agreement was signed between Nepal Government and Export & Import Bank, India on 14th September 2007 for US\$ 100 million out of which US\$ 31 million was later allocated for implementation of Rahughat Hydroelectric Project. Out of US\$ 31 million available from EXIM Bank of India, US\$ 28.5 million will be utilized for the construction of "Main Civil Works" and remaining US\$ 2.5 million will be utilized for the Consultancy Services for the construction of "Main Civil Works". The Project is facing a fund deficit of

US\$ 36 million (for works including Electro-mechanical, Hydro-mechanical, Transmission Line, Main Civil Works & Consultancy Services), which is also expected to be funded by the Government of India.

Tender for Construction of Infrastructures for Camp Facilities has been invited from 9 (nine) prequalified Contractors and last date for the submission of the tender is 7th August 2011. Land required to be acquired for Project needs (camp, road, power-house, etc.) has been accessed and about 16 hector (300 ropani) of land is to be acquired. Payment for the cost of acquired land is being distributed from the office of Chief District Officer (CDO) of Myagdi District and is almost complete.

Construction of Camp-facilities for the project includes 14 numbers of buildings (office, guest-house & staff-quarters) along with compound wall and associated works. It is to be constructed in Myagdi District at Raku-Piple VDC near the proposed Power-house site. Contract for construction of Camp-facilities has been signed on 21st October 2010 and construction works are in progress.



A View of Headworks

Expression of Interest (EOI) for consulting services for civil works was invited on 8th January 2011, only from Indian Consulting Firms. EOI was received from three (3) consulting firms till 23rd January 2011 and all three (3) firms were short-listed for seeking Request for Proposal (RFP). RFP from three (3) short-listed Indian Consulting Firms were invited on 29th January 2011 and out of the three shortlisted, only two firms submitted RFP on the last day of submission (15th March 2011). The evaluation of the Technical Proposal of RFP is complete and the appointment of Consultant is expected to be concluded by September 2011.

About 1,200 trees are required to be cut-down for clearance of construction site for the Project works. Clearance for tree-cutting is long pending in the Ministry of Forestry and its delay is severely affecting progress works of

the Project.

Contract Agreement for construction of main civil works of the project has been signed with IVRCL Limited, India on 4th November 2010 and the Contract Agreement has been approved by EXIM Bank of India. The contractor has mobilized for the construction of access road and bridge construction and the road construction is in progress.

Prequalification Bidding Documents are under preparation for Electromechanical and Hydro-mechanical Works.

Salient Features of the Project:

Location	:	Myagdi District
Total Catchment Area	:	305 km ²
Design Flow	:	13 m ³ /s
Diversion during Construction Designed for (dry season, 1:10 yrs)	:	27 m ³ /s
Type of Weir & Undersluice Gated		
Capacity of Weir & Undersluice (1 in 1,000 years flood)	:	688 m ³ /s
Number of Desanding Basin	:	2
Size of Desanding Basin (Length x Width x Depth per bay)	:	80.0 x 8.0 x 5.2 (m)
Length of Headrace Tunnel	:	6,151 m
Internal diameter of Headrace Tunnel-Shotcrete lined/ Concrete lined	:	3.5 / 2.9 (m)
Diameter of Surge Tank	:	10 m
Height of Surge Tank	:	47 m
Length of Concrete Lined Pressure Tunnel	:	740.5 m
Internal Diameter of Concrete Lined Pressure Tunnel	:	2.6 m
Length of Steel Lined Penstock	:	352 m
Diameter of Penstock (underground)	:	1.95 m
Size of Power House Length x width	:	52.6 x 16.7 (m)
Number of generating units (19 MVA each)	:	2
Turbine type: Pelton (vertical axis)		
Turbine rated capacity	:	2 x 16 MW
Gross Head	:	295.5 m
Rated Net Head	:	284.3 m
Installed Capacity	:	16 x 2 = 32 MW
Transmission Line (Powerhouse site to Modi Sub-station, Double circuit)	:	28 km
Access road (from Powerhouse to headworks)	:	12.9 km
Project Cost	:	67 MUSD
Total Financial Cost	:	90 MUSD
Total Annual Salable Energy Generation	:	187.66 GWh
Firm Energy (90 % Hydrological Firm)	:	98.92 GWh
Secondary Energy	:	88.74 GWh
Benefit / Cost at 10 % discount rate	:	1.135

Monitoring and Technical Support Department

Monitoring and Technical Support Department is responsible for monitoring of structures and technical support to the power projects as necessitated by site conditions, supporting the supervision works and monitoring the progress

the construction activities. The department is providing technical supports to all the power projects under construction.

Generation Operation and Maintenance Business Group

Generation Operation and Maintenance Group is responsible for daily operation and maintenance of existing seventeen (17) hydropower stations and two (2) thermal power plants owned by NEA. This business group, headed by the General Manager, is structured with Operation and Maintenance Department: Large, Operation and Maintenance Department: Medium.

This Business Group also looks after the periodic overhauling, major maintenance works and rehabilitation projects of the generating stations.

This year has been a centennial year in the history of hydropower generation started with the commissioning of Pharping Hydropower Station way back in 1911 AD. The total installed capacity of hydropower stations and thermal power plants under this business group now has reached 469.29 MW and 53.41 MW respectively. The total generation of this year has registered a modest growth of 0.6% over that of the previous year which is recorded at 2117.98 GWh with a share of 2114.58 GWh from hydro and 3.4 GWh from thermal. The business group has achieved the generation target by 94.22% outperforming the previous year figure of 93.72%. The run-off river (ROR) generating unit could operate at only 59.47% of its installed capacity to register a load factor of 81.71% whereas the only storage hydropower station Kulekhani-I along with its cascade Kulekhani-II has shown the aggregate load factor of 64.85%. The maximum and minimum water-levels of the Kulekhani reservoir were recorded at 1521.34 m on November 24th, 2011 and 1495.22 m on

July 17th, 2011 respectively.

The Business Group has continued to work on the repair and maintenance activities, periodic overhauling and renovation, modernization and upgradation (RMU) projects in assistance with Government of Nepal and multilateral agencies. The installed capacity of Devighat Hydropower Station has been upgraded to 15 MW after the successful completion of RMU project carried out by BHEL. The other RMU projects in KGA, Marsyangdi and Multi-fuel Power Plant are at various stages of implementation.

Ailing generating stations, burgeoning operation & maintenance costs, inadequate skilled workforce, unavailability of spare parts and rapid technological advances are imminent challenges to overcome for generation growth. The business group, however, will continue to work on generation improvement initiatives in a broader framework under generation asset management.

Large Power Plant Operation & Maintenance Department

The Operation and Maintenance Department: Large headed by the Director is responsible for operation and maintenance of five (5) hydropower stations and one (1) thermal power plant above 30 MW owned by NEA. The Department continued to work on the operation and maintenance activities in an effort to keep the generating stations in good operating condition.

In an initiative to improve generation,

overhauling and rehabilitation along with repair and maintenance works are underway in generating stations. The major overhauling of turbine-runner assembly of Unit No. 2 of Kaligandaki 'A' and Marsyangdi has been successfully completed. The procurement of turbine runner and associated spare parts, Trash Rack Cleaning Machine (TRCM), Main Inlet Valve (MIV) and auxiliary system of KGA is underway in loan assistance from World Bank. Similarly, the repair and maintenance of 132 kV GIS, switchgear, control and protection and under water repair works of three (3) diversion gates at headwork are proposed. The capacity increment of line side GIS CTs of Marsyangdi Hydropower Station for power evacuation and modernization and modification of weir control and excitation under Energy Access and Efficiency Improvement Project (EAEIP) funded by ADB are initiatives for generation improvement.

The first overhauling of Middle Marsyangdi Hydropower Station since its commissioning in 2008 was carried out from November 17th, 2010 to December 8th, 2010 to rectify the defects identified during defect liability period (DLP) under contractual obligations. The major works consist of emergency repair of turbine parts and associated auxiliaries under supervision and guidance of Voith Hydro's Supervisor, inspection and minor maintenance of Generators and their auxiliaries, repair and maintenance of left bank rip-rap, service gate and controlled flushing at headworks.

The Unit No. 2 of Kulekhani-I is renovated with digital governor and Automatic Voltage Regulator (AVR). NEA has applied for Japan's Grant Aid General for Modernization Work of Electrical Control Panels & Cubicles and Substation Equipments of KL-I and KL-II. There have been initiatives for additional inflows from Rapti Khola & Mandu Khola as well. The rehabilitation project of Multi-fuel Power Plant

operated under Nepal Power Development Project in loan assistance from World Bank commenced on December 26th, 2011. The overhauling of Unit No. 5 has been completed and additional machining works is underway in Unit No. 1, 2 and 6. It is carried out by Wartsila, Finland and is under implementation.

The following sections provide a terse description of the power stations and highlight major activities carried out by this Department during the fiscal year under consideration:

Kulekhani-I Hydropower Station

Kulekhani-I Hydropower Station, located at Dhorsing, Makwanpur is the only storage type power station with installed capacity of 60 MW and annual design generation of 211 GWh (165 GWh primary and 46 GWh secondary) was commissioned in 1982 AD in assistance from World Bank, Kuwait Fund, UNDP, OECF, OPEC and Government of Nepal. Presently, all of the two units are in normal operation. The maximum and minimum water-level of the Kulekhani reservoir this year was recorded at 1521.34 m on November 24th, 2010 and 1495.22 m on July 17th, 2010 respectively.



Kulekhani-II Hydropower Station

Kulekhani-II Hydropower Station, located at Nibuwatar, Makwanpur is a cascade of Kulekhani-I with installed capacity of 32 MW

and annual design generation of 104.6 GWh. It was commissioned in 1986 AD in assistance from OCEF Japan and Government of Nepal at a cost of NRs. 124 million. Presently, all of its two units are in normal operation.

Marsyangdi Hydropower Station

Marsyangdi Hydropower Station is located at Aanbookhaireni, Tanahun with installed capacity of 69 MW and annual design generation of 462.5 GWh. It was commissioned in 1989 AD with the assistance from IDA, KFW, KFED, SFD, ADB and GON at a cost of USD 22 million. The turbine runner assembly of Unit No. 2 has been overhauled this year. Presently, all of its three units are in normal operation.



Kaligandaki 'A' Hydropower Station

Kaligandaki 'A' Hydropower Station, located at Beltari, Syangja is the largest with installed capacity of 144 MW and annual design generation of 842 GWh. This is a peaking run of river (PROR) power station with six-hour daily peaking capacity. It was developed with the assistance from ADB, JBIC, Government of Nepal and NEA at estimated cost of USD 452.8 million. The major overhauling of Unit No. 2 along with Main Inlet Valve (MIV) have been successfully completed this year and the repair and maintenance of 132 kV GIS, switchgear, turbine runner assembly and unit control and

protection system are in progress. The station has recorded the highest generation of 775.172 GWh this year since its commissioning in 2002 AD. Presently, all of its three units are in normal operation.

Middle Marsyangdi Hydropower Station

Middle Marsyangdi Hydropower Station is located at Bhoteodar, Siundibar, Lamjung with the installed capacity of 70 MW and annual design generation of 398 GWh. It was commissioned in 2008 in assistance from Government of Germany and Government of Nepal at an estimated cost of NRs. 30 billion. Presently, all of its two units are in normal operation.



Multi – Fuel Power Plant

Multifuel Power Plant, located at Bansbari, Morang with installed capacity of 39 MW uses furnace oil (F.O.) supplied by Nepal Oil Corporation as a source of energy. There are four units each of 7.5 MVA from Leroy Somer France and two units each of 8.144 MVA from Alstom, France. The plant with installed capacity of 26 MW was put into service in FY 1990/91 in assistance from Finish Government and additional 13 MW was put into service in FY 1997/98 in loan assistance from FINIDA and other Donor Group. The rehabilitation project of Unit No. 1, Unit No. 2, Unit No. 5 and Unit No. 6 commenced on December 26th, 2011 by

Wartsila, Finland, and is under implementation in financial assistance from World Bank.



Medium Power Plant Operation & Maintenance Department

The Operation and Maintenance Department: Medium headed by the Director is responsible for operation and maintenance of twelve (12) hydropower stations and one (1) thermal power plant below 30 MW.

The department continued to work on the repair, maintenance and overhauling works of the various generating stations. The excitation system in five units of Trishuli Hydropower Station has been replaced with static digital excitation system and replacement in two other units is under implementation. The RMU project consisting of design, manufacture, testing, supply of 3x5 MW Turbine, Generator, Control & Auxiliaries including Dismantling of existing machines, Rehabilitation, Erection and Commissioning of Devighat Hydropower Station has been successfully completed and handed over to NEA on July 13th, 2011. The project was completed with financial assistance of INR 150 million Grant from Government of India, INR 150 million soft loan as line of credit of Exim Bank of India and INR 38.15 million shared jointly by Government of Nepal and Nepal Electricity Authority (NEA).

The intermittent operation of Gandak Hydropower Station in the recent past has been a concern. Government of Nepal and NEA have jointly initiated budgetary provision to address the problems in generator and turbine runner assembly in Unit No. 1 and Unit No. 2 of Gandak Hydropower Station and excitation and control system of Seti Hydropower Station. The rehabilitation of Panauti Hydropower Station is under consideration and ADB has assured to include rehabilitation of electromechanical system of Sundarikal Hydropower Station in the second phase of its aid program. The assessment of potential damage to penstock alignment of Ilam Hydropower Station due to fragile geology in the vicinity and the study of possibility of modification of headworks of Modikhola Hydropower Station by physical modeling are underway.

The rehabilitation of Devighat Hydropower Station and shutdown of two units in Gandak primarily restrained the expected increase in generation this year. Key challenges in achieving higher plant factor in the existing generating stations remain the enforcement of maintenance schedule, reducing downtimes, imparting skills and operating prudence.

The following sections provide a terse description of the power stations and highlight major activities carried out by this Department during the fiscal year under consideration:

Pharping Hydropower Station

The first in Nepal and second in Asia, Pharping Hydropower Station with installed capacity of 500 kW, is a century old hydropower station commissioned in May, 1911 AD and is located at Setidevi VDC, Pharping, Kathamandu. Constructed on a grant from British Government at a cost of NRs. 0.713 million is presently not in operation. The GON has proposed to celebrate May 22 as the National Energy Day to

mark the centenary celebration of hydropower development in Nepal. A master plan has been prepared to develop the site as Live Museum with construction and establishments including model power station of wind, solar and hydro; swimming pool, fun park, picnic area, centenary celebration memorial and scientific research within five years at a cost of NRs. 400 million jointly shared by Government of Nepal and NEA. The construction of view tower and centenary gate has been completed and inaugurated by Honorable Deputy Prime Minister Mr. Bharat Mohan Adhikari on May 22nd, 2011 this year.



Sundarijal Hydropower Station

Sundarijal Hydropower Station, located at Sundarijal, Kathmandu with installed capacity of 640 kW and annual design generation of 4.77 GWh was commissioned in 1934 AD in



a grant from British Government. Both of its

units are in normal operation and ADB mission has assured to include rehabilitation of its electromechanical system in the second phase of ADB assistance.

Panauti Hydropower Station

Panauti Hydropower Station, located at Khopasi, Panauti with installed capacity of 2.4 MW and annual design generation of 6.97 GWh was commissioned in 1965 AD and developed jointly by Soviet Union and GON at a cost of NRs. 27 million. The rehabilitation project of turbine-generator units is under consideration with the assistance of GON. However, the unilateral decision of Banepa/Dhulikhel/Panauti Municipality to implement the project called Kavre Valley Integrated Drinking Water Project funded by ADB for consumptive use of water from the resources of Roshi Khola in Kavre, Dhulikhel and surrounding areas has jeopardized its long term operation. Presently, all the three units are down due to problems related to electromechanical systems.



Trishuli Hydropower Station

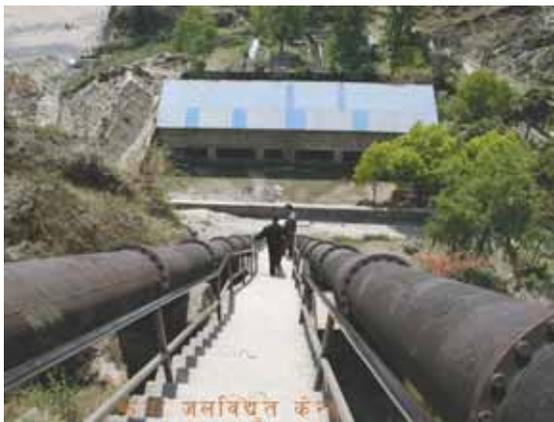
Trishuli Hydropower Station, located at Trishuli, Nuwakot has annual design generation of 163 GWh with installed with capacity of 21 MW consisting of 7 units each 3 MW. It was commissioned in 1971 AD and developed jointly by Government of India and Government of Nepal at a cost of INR 140 million. It was

rehabilitated in 1995 AD and upgraded to 24 MW with 6 units each of 3.5 MW and one unit of 3 MW. The old excitation system of five units has been replaced with static digital excitation system and replacement in two other units is under implementation.



Fewa Hydropower Station

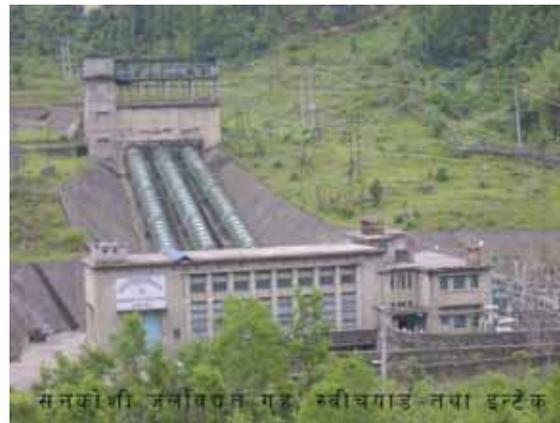
Fewa Hydropower Station, located at Pardi, Birauta, Pokhara with installed capacity of 1 MW and annual design generation of 6.5 GWh consists of 4 units. It was commissioned in 1969 AD and developed jointly by GOI and GON. The public encroachment of power canal leading to power house is a concern for normal operation regardless of the availability of generating units.



Sunkoshi Hydropower Station

Sunkoshi Hydropower Station, located at

Lamosanghu, Sindhupalchowk with installed capacity of 10.05 MW and annual design generation of 70 GWh was commissioned in 1972 AD and developed in assistance from Government of People’s Republic of China and Government of Nepal. It consists of 3 units each of 3.35 MW. Presently, all of the three units are in normal operation. The replacement of 6.3 MVA, 6.3/66 kV power transformer has been completed.



Gandak Hydropower Station

Gandak Hydropower Station, located at Surajpura, Nawalparasi with installed capacity of 15 MW and annual design generation of 106.38 GWh was commissioned in 1979 AD and developed in assistance from Government



of India and Government of Nepal. The Unit No. 1 and Unit No. 2 are down due to problems related to electromechanical systems

whereas Unit No. 3 is in normal operation. The rehabilitation of the plant is proposed in assistance from Government of Nepal.

Devighat Hydropower Station

Devighat Hydropower Station, located at Devighat, Nuwakot with installed capacity of 14.1 MW and annual design generation of 144 GWh was commissioned in 1984 AD and developed in assistance from Government of India and Government of Nepal. The rehabilitation of all the three units at a cost of INR 338.15 million has been completed by the contractor BHEL and handed over to NEA on July 13th, 2011. The installed capacity has been upgraded to 15 MW and presently, all the three units are in normal operation.



Seti Hydropower Station

Seti Hydropower Station, located at Nadipur, Pokhara with installed capacity of 1.5 MW



was commissioned in 1985 AD and developed in assistance from Government of People's Republic of China and Government of Nepal. The renovation of excitation system along with switchgear control and protection system has been proposed in assistance from Government of Nepal. Presently, all the three units are in normal operation.

Chatara Hydropower Station

Chatara Hydropower Station is located at Chatara, Sunsari with installed capacity of 3.2 MW and annual design generation of 6 GWh. It was commissioned in 1996 AD in assistance from Government of India at a cost of NRs. 162.6 million. Presently, Unit No. 2 is not in normal operation due to problems related to turbine runner assembly and Unit No. 1 is in normal operation. The sharing of water inflow with Sunsari-Morang Irrigation Project, Biratnagar for irrigation purposes restrains the normal operation of this plant.



Ilam Hydropower Station

Ilam Hydropower Station is located at Golakharka, Ilam with installed capacity of 6.2 MW and annual design generation of 48 GWh. It was commissioned in 1999 AD and jointly developed by Government of Nepal and NEA at a cost of USD 15.7 million. The assessment of impact on the alignment of the penstock which has been observed lately due to fragile geology

in the surrounding area is underway. Presently, all of its two units are in normal operation.



Modikhola Hydropower Station

Modikhola Hydropower Station is located at Dimuwa, Parbat with installed capacity of 14.8 MW and annual design generation of 92.5 GWh. It was commissioned in 2000 AD and developed in assistance from EDCF (Korea), Government of Nepal and NEA at a cost of USD 30 million. The functioning of headworks has been a concern since its commissioning. Its physical modeling is being studied for possible modification. The procurement of two sets of digital AVR and one set of Francis Runner is underway. Presently, all of its two units, Unit No. 1 and Unit no. 2 are in normal operation.



Hetauda Diesel Power Plant

Hetauda Diesel Power Plant, with installed capacity of 14.41 MW, is located at Hetauda,

Makawanpur, The first phase with three sets of English Units was commissioned in 1963 and the second phase with four sets of Ruston Units was commissioned in 1980 in assistance from British Government and Government of Nepal. The World Bank has assisted in the procurement of spare parts from Man Diesel, UK for replacement of worn out components. The plant operates during peak, however, the soaring fuel price has made its operation costlier compared to operation costs of hydropower stations.



Nepal Electricity Authority

Generation Operation and Maintenance

Actual Generation for the FY 2067/68 (FY 2010/11 A.D.)

Unit: *MWh

S.N.	Power Stations/ Month	Shrawan	Bhadra	Ashwin	Kartik	Mangsir	Poush	Magh	Falgun	Chaitra	Baishakh	Jestha	Ashad	Total
1	Kaligandaki 'A'	53,269.00	87,880.00	82,943.00	76,109.00	72,479.00	52,327.00	40,719.00	38,588.00	38,994.00	52,656.00	85,843.00	93,365.00	775,172.00
2	Mid-Marsyangdi	38,821.40	34,967.10	38,460.50	37,942.20	20,057.90	27,531.70	21,542.80	19,874.80	20,831.30	28,733.20	44,877.40	43,511.00	377,151.30
3	Marsyangdi	38,272.10	42,258.30	41,360.20	40,607.20	39,868.40	30,600.30	23,859.00	22,755.80	21,900.40	29,757.00	46,449.00	45,473.60	423,161.30
4	Kulekhani I	9,633.00	3,171.00	4,396.00	3,927.00	5,545.00	9,594.00	12,680.00	11,999.00	17,468.00	8,149.00	6,726.00	5,598.00	98,886.00
5	Kulekhani II	4,932.56	1,477.54	2,016.09	1,892.44	3,035.70	5,108.52	6,529.30	6,566.41	8,700.85	4,132.94	3,348.07	2,727.71	50,468.13
6	Trishuli	11,091.60	12,732.20	11,976.10	11,248.70	10,631.50	10,455.30	8,644.00	7,974.60	7,446.10	10,063.10	13,316.90	12,719.90	128,300.00
7	Gandak	2,000.90	1,245.40	1,922.9	1,014.00	-	1766	1561.7	896.6	493.9	-	-	430.00	11,331.40
8	Modi	3,661.30	5,073.20	8,786.20	8,321.80	5,153.80	3,955.90	2,917.90	2,199.05	2,923.40	4,475.70	6,653.30	5,839.80	59,961.35
9	Devighat	7,617.80	8,379.30	6,449.70	-	5,487.20	6,394.20	6,458.00	6,133.30	6,083.10	6,478.20	6,659.83	7,992.00	74,132.63
10	Sunkoshi	6,500.80	6,400.60	6,902.10	6,819.60	5,480.90	3,789.60	3,163.00	2,888.70	2,776.60	3,433.60	5,314.20	6,885.70	60,355.40
11	Puwa	3,757.73	3,794.36	3,629.72	3,910.51	2,759.77	1,877.91	1,480.84	1,021.18	1,374.88	2,212.69	2,700.74	3,027.51	31,547.81
12	Chatara	653.25	666.25	522.75	317.25	265.00	260.75	70.75	167.00	99.75	227.75	357.50	489.75	4,097.75
13	Panauli	369.85	557.42	609.79	238.54	258.74	230.84	107.18	146.39	68.56	141.91	-	-	2,729.22
14	Seti	957.87	940.12	1,012.59	1,016.91	887.85	1,040.58	871.20	917.10	1,022.85	1,012.77	999.36	936.99	11,616.19
15	Fewa	156.62	144.19	134.62	78.41	280.06	356.88	235.70	203.54	96.98	-	-	226.40	1,913.40
16	Sundarjal	460.33	390.00	392.00	459.66	429.33	189.66	162.33	282.00	243.66	288.00	391.66	432.99	4,121.61
17	Pharping	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total (Hydro)	182,156.10	210,076.98	211,514.26	193,903.22	172,620.15	155,479.14	131,002.70	122,613.46	130,524.33	151,761.85	223,636.96	229,656.35	2,114,945.49
18	Multifuel	661.12	79.67	119.68	301.23	781.68	234.02	2.71	-	108.73	60.02	-	-	2,348.86
19	Hetauda Diesel	332.70	96.12	87.62	155.06	122.28	145.12	163.72	23.85	88.54	79.80	25.91	12.25	1,332.96
	Total (Thermal)	993.82	175.79	207.30	456.29	903.96	379.14	166.43	23.85	197.27	139.82	25.91	12.25	3,681.82
	Grand Total	183,149.92	210,252.77	211,721.55	194,359.51	173,524.11	155,858.28	131,169.12	122,637.31	130,721.60	151,901.67	223,662.86	229,668.60	2,118,627.31

* Provisional figures subjected to final audit

Grid Development Business Group

Grid Development Business Group is responsible for reinforcement and expansion of 66 kV and above voltage level transmission system including the cross border transmission lines and substations. It is headed by a General Manager. The organization structure of the Business Group consists of Transmission Line Construction Department 220kV and above voltage level, Transmission Line Construction Department up to 132kV and Power Development Projects, each headed by a Director.

In response to the perceived energy crisis, Government of Nepal introduced a 38-point Electricity Crisis Resolution Action Plan in Poush 2065 (January 2009) in order to alleviate the acute power shortages problem faced by nation. A key part of the Action Plan included construction of many transmission lines to ease out the congestion and facilitate the smooth transfer of power to be generated by planned hydropower stations. The Action Plan included construction of Bardaghat - Bharatpur, Marsyangdi-Kathmandu and Bharatpur-Hetauda 220 kV transmission lines and the development of Kali Gandaki, Kabeli, Singati-Lamosangu, Sunkoshi-Dolkha and Dhnakuta-Tirtire transmission line corridors along with 29 numbers of new 132/220/400 kV transmission lines with total line length of 2,255 km. To address the construction of transmission networks on a priority, Grid Development was established.

Transmission Line Construction Department: 220 kV and above

Voltage Level

This Department is responsible for construction of 220 kV and above voltage level transmission lines and substations. Construction of transmission line and substations are guided by the Transmission Planning Studies carried out by System Planning Department. Transmission Planning Studies are part of the overall system planning studies of NEA.

Different phases of transmission and substation projects include: feasibility study, survey license, route survey, IEE/EIA studies, construction license, land acquisition, design, tendering, construction, testing/commissioning and handing over for operation. Most of the transmission/substation development works are carried out under turnkey contracts. The key transmission lines and substations and the major activities with regard to the development of these lines under the jurisdiction of this Department are presented below:

Projects under Execution

1. *Khimti – Dhalkebar 220 kV Transmission Line*

The project was started in 2059/60 with the objective of enhancing transmission capacity, improving supply reliability, reducing losses and voltage drops through construction of 220kV double circuit line and is scheduled to be completed in 2067/68 (2010/11). The project cost is estimated at US\$ 22 Million and is jointly funded by World Bank, GoN and NEA.

The scope of the project includes construction of 75 km long Khimti-Dhalkebar 220kV transmission line on double circuit tower with single circuit of twin Bison ACSR conductor (initially energized at 132kV) and two numbers of 132kV line bays at Khimti and Dhalkebar substations. In the second phase stringing of second circuit and associated work will be carried out.

As of Ashadh 2068, supply and delivery of line materials and substation equipment is completed, construction of transmission line is 90% completed whereas bay extension has been completed.

2. Hetauda - Bharatpur 220kV Transmission Line

The objective of the project is to enhance the transmission capacity and reliability of the Integrated Nepal Power System (INPS), and to evacuate the power to be generated by other hydro power plants from western region of Nepal. The project cost is estimated at US\$ 19 Million and funded jointly by loan assistance of WB, GoN and NEA. The project was started in 2009 and is scheduled to be completed in 2011/012.

The scope of the project includes the construction of 73 km long double circuit Hetauda-Bharatpur transmission line initially energized at 132 kV and associated 132kV substations. The substations component includes expansion of existing Hetauda and Bardghat substations and construction of New Hetauda and New Bharatpur substations. As of July 2011, route alignment survey has been approved, acquisition of land for tower foundation is in final stage and acquisition of RoW for transmission line is in progress. The delivery of line materials is underway.

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. The project cost is estimated at US\$ 20 Million and funded jointly by loan assistance of WB, GoN and NEA. The project was started in 2009 and is scheduled to be completed in 2012/013.

The scope of the project includes the construction of 75 km 220kV double circuit transmission line. As of July 2011, route alignment survey has been completed. Detail survey is nearing completion and RAP, SIA, VCDP studies are in the process of finalization.

4. Hetauda – Dhalkebar – Duhabi 400kV Transmission Line

The overall objective of this project is to enhance cross boarder power exchange with India and augment the transfer capacity of the INPS. The cost of this project is estimated at US\$ 144 million and jointly funded by WB and GoN. The project is scheduled to be completed in 2013/014.

The project activities include the construction of 400kV double circuit transmission line of 290 km, construction of 220kV bus bar at New Hetauda Substation, erection of 400 kV and 220kV bus bar at Dhalkebar substation, and construction of interconnection facility with existing 132kV in Inaruwa substation.

The detail survey of the project been completed and land acquisition for Dhalkebar Substation is in final stage. The procurement of the consulting services for this project is underway.

Survey Completed and IEE Study in Progress :

- Marshyangdi - Kathmandu 220kV Transmission Line, 85 km

Survey Completed Projects :

- Koshi 220kV Transmission Corridor, 110 km
- Lekhnath-Damauli 220kV Transmission Line, 45 km
- Kaligandaki (Dana-Kusma-New Modi-New Butwal-Bardghat) 220/132kV Transmission Corridor, 150 km
- Tamakoshi -Kathmandu 220kV Transmission Line, 100 km

Feasibility Study Completed Projects :

- Chilime-Trishuli 220kV Transmission Line, 40 km
- Marsyangdi-Bharatpur 220kV Transmission Line, 25 km
- Damauli-Bharatpur 220kV Transmission Line, 40 km
- Duhabi-Anarmani 400kV Transmission Line, 100 km
- Hetauda-Butwal 400kV Transmission Line, 168 km
- Butwal-Lamki 400kV Transmission Line, 300 km
- Lamki-Mahendranagar 400kV Transmission Line, 102 km

Transmission Line Construction Department: Up to 132 kV Voltage Level

This Department is responsible for construction of transmission lines and substations up to 132 kV voltage level. The Department is headed by a Director. The key transmission lines and



substations and the major activities with regard to the development of these lines under the jurisdiction of this Department are presented below:

Projects under Execution

1. *Thankot – Chapagaon - Bhaktapur 132kV Transmission Line*

The project was started in 1998/99 with the objective of enhancing transmission capacity, improving supply reliability in Kathmandu Valley, reducing losses and voltage drops through construction of 132kV ring main and was scheduled to be completed in 2011/012. The project cost is estimated at US\$ 23 Million and project is jointly financed by loan assistance of ADB and OPEC, GoN and NEA.

The scope of the project includes construction of 28km Thankot-Chapagaon-Bhaktapur 132kV double circuit transmission line, construction of a 132/11kV, 22.5MVA sub-station at Matatirtha, addition of 132/11kV, 45MVA transformer at Bhaktapur, addition of 66/11kV, 45MVA transformer at Balaju substation.

As of July 2011, supply and delivery of substation equipment and line materials are completed, construction of Matatirtha substations work is completed. Rest of the Project work has been

stopped because of right of way issues raised by local inhabitants of few VDCs of Lalitpur District. NEA Board has decided to terminate contract for the transmission line portion after completion of Matatirtha Substation testing work.

2. Syangja 132kV Substation

The basic objective of this project is to improve the power supply in Syangja and its vicinity. The project started in 2009/10 is scheduled to be completed in 2011/012. Total project cost is estimated at US\$6.6 Million which is jointly financed by GoN and NEA.

The main activities of the project include construction of 132/33kV, 30MVA and 33/11kV, 8MVA substation. The existing Kaligandaki-A Lekhnath 132kV transmission line will be looped-in looped-out at Rang Khola of Shyangja District for the construction of this substation. Route survey for loop-in-loop-out work has been completed. Civil work for control building and staff quarter and the construction of approach road is in progress. The delivery of transformer and other associated equipment is in progress.

3. Dumre – Damauli – Marsyangdi 132kV Transmission Line

The objective of this project is to evacuate power generated by Middle Marshyangdi power plant thereby enhancing the reliability of Middle Marshyangdi power plant and facilitate the power evacuation from candidate hydro power projects along Marshyangdi Corridor. The objective also includes enhancing the performance of INPS and reduces outage frequencies of Bharatpur-Pokhara 132kV transmission line. The cost of this project is estimated at US\$ 16.6 Million which is jointly funded by loan assistance of ADB, GoN and NEA. The project started in 2008/09 is scheduled to

be completed in 2012/013.

The main activities of the project include construction of 18km of double circuit transmission line from Dumre to Damauli, 1km four circuit loop-in loop-out transmission line at Middle Marshyangdi power plant, stringing of 39km 132kV second circuit transmission line from Middle Marshyangdi to Dumre and construction of 132/33kV, 30MVA substation at dam site of Lower Marshyangdi power plant.

Construction work for this project has been carried out in to two packages. The contract for the construction of transmission line has been awarded while the contract for the construction of substation is in the final stage of approval.

4. Butwal – Kohalpur- Mahendranagar 132kV Transmission Line Second Circuit

The objectives of this project are to supply increased power to Western Nepal, to meet growing electricity demand in the area, to supply upcoming cement factories and to evacuate power from Chameliya Hydropower plant, power to be received from Upper Karnali. It will also augment the transfer capacity for import of additional power from Tanakpur.

The project comprises of two parts, part one includes stringing of 132 kV second circuit from Butwal to Kohalpur while part two includes stringing from Kohalpur to Mahendranagar. First part was started in 2008/09 with US\$13.8 million loan assistance from ADB and NRs. 276.4 Million from GoN and NEA and is scheduled to be completed in 2012/013.

The scope of the project includes second circuit stringing on existing 132 kV double circuit towers between Butwal and Kohalpur (208km), replacement of existing ground wire between Butwal and Kohalpur with Optical ground

wire (208km), addition of one 132kV line bay at Butwal substation, addition of two 132kV line bays at Shivapur and substations, addition of one 132kV line bay, one 20MVar capacitor bay, one 132/33kV, 30MVA transformer bay at Kohalpur substation. Also included in the project is construction of new 132kV substation at Kusum with five 132kV line bays, one 132/11kV, 30MVA transformer bay, 12kV switchgears and associated lines, one control building and double bus bar.

The contracts for construction of substation works and stringing of second circuit on existing double circuit towers have been awarded and the construction is underway.

5. Chapali 132kV Substation

The objective of the project is to cater to the increased residential and commercial demand of northern part of Kathmandu and to improve power supply reliability of the area. The project started in 2008/09 is scheduled to be completed in 2012/013. The total cost of the project is US\$ 16 Million jointly financed by loan assistance of ADB, GoN and NEA.

The main output of the project includes 132/11kV, 30MVA substation at Chapali, 66kV GIS bay at Lainchhour substation and Chabahil-Lainchhour 7.7 km long interconnection by 66kV underground cable.

The land required for the substation has been acquired and the award of contract for construction of substation is in the evaluation process.

6. Matatirtha Substation Expansion

The objective of the project is to cater to the increasing electricity demand of western part of Kathmandu as well as to supply United Cement, Naubise and Laxmi Cement, Lalitpur. This

substation will also help to relieve overloaded Siuchatar, Teku and New-Patan substations feeding core areas of the Kathmandu Valley. Cost of this project is estimated at US\$ 3.3 million and is jointly funded by loan assistance of ADB, GoN and NEA. The project started in 2008/09 is scheduled to be completed in 2011/012.

The scope of the project includes addition of 132/33kV, 30MVA transformer, 33kV and 11kV switchgears at existing Matatirtha substation and 132/11kV, 22.5MVA transformer at Bharatpur substation.

The contract for construction has been awarded and construction work is in progress.

7. Kabeli 132kV Transmission Corridor

This project was started with the objectives of facilitating evacuation of power generated from Kabeli-A Hydro Power Project and power produced from other IPP's in the region, meeting increasing demand of Damak area, relieving Anarmani 132/33kV substation and reducing transmission losses of that area. Cost of this project is estimated at US\$ 31 Million and is funded by WB, GoN and NEA. This project was started in 2008/09 and is scheduled to be completed in 2013/014.

The scope of the project includes the construction of 90km of double circuit 132kV transmission line from Damak to Kabeli; construction of 132/33/11kV Damak substation with 132/33, 30MVA and 33/11kV, 8MVA transformers; 132/33/11kV Illam substation with 132/33kV, 30MVA and 33/11kV, 3MVA transformers; 132/33kV Phidim substation with 132/33, 15MVA transformer; and 132/33/11kV Kabeli substation with 132/33kV, 30MVA, 33/11kV, 3MVA transformers.

Project status as of July 2011 includes completion of transmission line survey works,

IEE, acquisition of land required for substation works, contract agreement for construction of Damak substation, construction of boundary wall and staff quarter at Damak and Illam substations in progress.

8. Pathlaiya 132kV Substation

The objective of this project is to provide adequate supply to the Birgunj industrial corridor, improve quality of supply and reduce technical losses in the area. The project started in 2008/09 is scheduled to be completed in 2011/012. Cost of this project is estimated at US\$ 5.4 Million and is jointly funded by loan assistance from WB, GoN and NEA.

The Project activities include construction of 132/11kV, 22.5MVA substation at Pathlaiya, 24km of 11kV distribution line and replacement of existing earth wire by OPGW conductor from Pathlaiya to Birgunj and old Parwanipur to Simra substation.

The contract for construction has been awarded and civil work of the control room, guard quarter is in progress.

9. Singati-Lamosangu 132kV Transmission Corridor

The objective of this project is to evacuate power from different hydroelectric projects to be developed by IPP's in the Tamakoshi-Singati basin. The cost of the project is estimated at US\$ 13 million. The project was started in 2008/09 and is scheduled to be completed in 2011/012.

The scope of the project includes the construction of Lamosangu-Singati 38 km 132 kV transmission line and 132/33 kV, 30 MVA substation at Singati.

The contracts for construction of substations

and transmission line have been awarded. IEE and the route alignment survey for transmission line have been completed. Construction of civil work of staff quarter and boundary wall is in progress.

10. Capacitor Banks at Grid Substations

The objective of this project is to improve the voltage profile and reduce the losses through installation of capacitor banks in Grid substations. Cost of this project is estimated at US\$ 2.2 Million and is jointly funded by loan assistance of ADB, GoN and NEA. The project is estimated to be completed in 2011/012.

The project scope includes installation of 33kV 2X12.5MVar at Bharatpur, 2X12.5MVar at Dhalkebar, 2X20MVar at Butwal and 11kV 3X5MVar at Simra, 2X5MVar at Hetauda, 2X10MVar at Siuchatar, 2X10MVar at Patan, 2X12.5MVar at New-Baneshwor, 2X12.5MVar at Balaju and 2X12.5MVar at Chabel substations. Construction Contract has been awarded and design approval is in the final stage.

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

The objective of this project is to increase power evacuation capacity from the different IPP's and reinforcement of INPS. The project is scheduled to be completed in 2012/013. Cost of this project is estimated at US\$ 2.5 Million and funded by GoN.

The scope of the project includes stringing of 45km of second circuit on the existing 132kV transmission line, bay extension at substations and reinforcement work on existing 132kV Line.

Survey Completed and IEE Study started Projects:

- Kohalpur-Surkhet 132kV Transmission Line, 50 km
- Hapure-Tulsipur 132kV Transmission Line, 18 km

Survey Completed Projects :

- Marshyangdi Transmission Corridor, 78 km
- Sunkoshi 132kV Substation, 15 km
- Middle Marshyangdi-Manang 132kV Transmission Line, 20 km
-
- Kaski (Bhurjung)-Parbat (Kusma) 132kV Transmission Line, 45 km
-
- Gulmi-Arghakhanchi-Chanauta 132kV Transmission Line, 60 km
- Modi – Lekhnath 132kV Transmission Line, 42 km
- Samundraratar-Naubise/Chapali 132kV Transmission Line, 37 km
- Ramechhap – Garjyang – Khimti 132kV Transmission Line, 30 km
- Solu Corridor (Katari-Okhaldhunga-Solu) Transmission Line, 100 km
- Dordi Corridor (Kirtipur-Udipur/Marsyangdi) Transmission Line, 16 km
- Madi-Lekhnath 132kV Transmission Line, 22 km

Feasibility Study Completed Projects :

- Karnali Corridor (Lamki-Upper Karnali) 132kV Transmission Line, 60km
- Bajhang-Deepayal-Attariya 132kV Transmission Line, 130 km
- Surkhet-Dailekh-Jumla 132kV Transmission Line, 31 km
- Kaligandaki-Gulmi (Jhimruk) 132kV Transmission Line, 43 km

- Baneshwor-Bhaktapur 132kV DC Under Ground Cable Transmission Line, 12 km
- Dhalkebar-Loharpatti 132kV Transmission Line, 20 km
- Butwal-Lumbini 132kV Transmission Line, 22 km
- Trishuli 3B HUB Substation

Projects for Power Supply to Cement Industries

In order to promote cement industries, the GoN has adopted the policy of developing transmission line and road networks up to the site of cement industries. The budget was allocated under the Ministry of Industry. A minute of understanding, MOU was signed between Ministry of Industry (MoI) and NEA with regard to development of transmission line. 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:

Kamane, Hetauda 132kV Substation

The main objective of this project is to provide power supply to Shivam Cement located at Hetauda. This project started in 2008/09 is scheduled to be completed in 2011/012. Estimated cost of the project is US\$ 3.5 Million which is financed by GoN.

The main project output includes construction of a new 132/33kV, 30MVA substation and construction of 11 km of 33kV sub transmission line. The contract for construction of substation has been awarded. Land for construction of substation has been acquired from Ministry of Forest. The delivery of substation equipment is in progress.

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. Further extension of this line will benefit Sonapur and Rolpa cements. The project started in 2008/09 with estimated cost of NRs. 500 Million is scheduled to be completed in 2011/012. Total cost of 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.

Construction of staff quarter, boundary wall, and control building, switchyard is in progress. The contracts for construction of transmission line and substation have been awarded and delivery of equipment is in progress.

Mirchaiya-Katari 132kV Transmission Line

The objective of this project is to provide power supply to Maruti Cement Industry to be established at Katari. Cost of this project is estimated to NRs. 675 Million and funded by GoN. The project is scheduled to be completed by FY 2012/013.

Project components includes construction of 25 km 132 kV double circuit transmission line from Mirchaiya to Katari and construction of 132/33 kV, 30 MVA substations at Mirchaiya and Katari. For this purpose one circuit of existing Dhalkebar – Lahan 132kV line will be looped-in and looped-out at Mirchaiya in Siraha district to extend the 132kV transmission line to Katari.

Transmission line route survey has been completed and TOR for IEE study has been submitted for approval.

Apart from above projects, feasibility study has been completed for the following transmission line projects aimed at supplying different cement industries :

- Matatirtha – Malta 33kV Transmission Line (Laxmi Cement Industry)
- Lamahi-Ghorahi 132 kV Transmission Line Project (Ghorahi Cement Industry)
- Tulsipur-Kapurkot 33kV Sub-Transmission Line (Sonapur Cement Industry)

Power Development Project – Part C

The NEA Transmission and Distribution, the Power Development Project is being implemented under the loan/grant assistance of the World Bank. The initial allocation to this project was about USD 31 million. As part of the original scope, the following projects are being implemented:

- Khimti-Dhalkebar 220 kV Transmission Line Project
- Distribution and Rural Electrification Project
- Chandranigahapur System Reinforcement Project
- NEA Institutional Strengthening Project

Under the Khimti-Dhalkebar 220kV Transmission Line Project, a 75 km long 220 kV line is being constructed. The Distribution and Rural Electrification Project consists of reinforcement of distribution systems and electrification in Lalitpur, Bhaktapur, Kavre, Dhading and Nuwakot districts. The Chandranigahapur System Reinforcement Project involves construction of a 132/33 kV substation at Chandranigahapur and related 33 kV sub-transmission lines. Finally, the Institutional Strengthening Project focuses on improving the processes in finance, accounts and internal audits within NEA.

The 220 kV Khimti-Dhalkebar Transmission

Line and the facilities under the Distribution and Rural Electrification projects are currently under construction. Construction of the 132/33 kV substation at Chandranigahpur and the related sub-transmission lines have been completed. The scope under the Distributing and Rural Electrification sub-component is also almost completed.

In February 2008, the Power Development Project was restructured, whereby the scope of work under the NEA Transmission and Distribution component was increased providing an additional allocation of about 36 million. Under this additional scope of work the following projects are being implemented:

- Hetauda-Bharatpur 220 kV Transmission Line Project
- Distribution System Reinforcement Project, and
- NEA Institutional Strengthening (II)

Hetauda-Bharatpur 220 kV Transmission Line Project consists of construction of about 73 km of 220 kV line and 132/11 kV substations at Hetauda and Bharatpur. 132/11 kV substations at Hetauda and Bharatpur are ongoing. The Distribution and System Reinforcement Project includes two major activities (a) Energy and Customer Accountability Enhancement focusing large customers in Kathmandu valley and in major industrial corridors, and (b) distribution system reinforcement and rehabilitation of 33/11 kV substation in the following ten locations are being implemented: (i) Khanar, (ii) Inaruwa, (iii) Rupani, (iv) Jankpur, (v) Haripur, (vi) Chanauli, (vii) Bhairahawa, (viii) Ghorahi, (ix) Tikapur, and (x) Gularia.

The progress of implantation of distribution system reinforcement is satisfactory. All the contracts have been awarded and the rehabilitation of the 33/11 kV is in advanced stage. Similarly, the rehabilitation of distribution

system is also progressing well.

In May 2009, the World Bank has decided to provide additional credit of about USD 74 million to NEA primarily to address the energy crisis. The loan agreement for this additional financing was signed on August 21, 2009. The activities being implemented as part of this additional financing are:

- Kali Gandaki 'A' HEP rehabilitation
- Duhabi Multifuel Plant rehabilitation
- Hetauda Diesel Centre Rehabilitation
- Bharatpur-Bardaghat 220 kV Transmission Line construction
- Pathlaiya 132 kV substation construction
- Kathmandu Valley distribution network strengthening

Consultants have been hired to design the rehabilitation of Kali Gandaki 'A' HEP, and the design activity is going on. For Duhabi Multifuel plant and for Hetauda Diesel Center, contracts have been awarded to respective original equipment manufacturers and supply of the spares has been partially completed. The awards of contract for Bharatpur-Bardaghat 220 kV line, and Pathlaiya 132 kV sub-station have been completed and construction is ongoing. The procurement of materials for the Kathmandu valley distribution network strengthening is currently under progress.

Transmission and System Operation Business Group

Transmission and System Operation Business Group is entrusted with the key responsibilities of generation and transmission system planning, system operation, operation and maintenance of national grid and trading of power. It is headed by a General Manager. The System Planning Department carry out load forecasting, generation expansion planning and transmission system planning of the power system of Nepal while System Operation Department performs the operation planning and real time system operation. Similarly, Grid Operation Department carries out overall operation and maintenance of national grid and Power Trade Department executes the trading of power with Independent Power Producers and also carries out the business activities of power exchange and trading of power with India.

System Planning Department

With the placement of System Planning Department (SPD) under Transmission and System Operation (TSO) following the abrogation of planning wing in the new NEA organization structure, the role and functions of SPD have to be re-assessed. Moreover, in the context of increased private sector participation in electricity generation, and the Government of Nepal's 10,000 MW in 10 years and 25,000 MW in 20 years plans made public in recent years, the role of centralized generation planning by NEA has become minimal.

However, least cost generation expansion plan is vital for any power system planning. After the entry of private sector in generation;

different driving factors make this deterministic approach to least cost generation expansion planning very complex. In the changed context, a modified approach for generation expansion planning has become inevitable.

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

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

SPD also assists other departments of NEA by providing suggestions regarding implementation of planned projects. At the request of Engineering Services, NEA; System Planning Department carried out Power Evacuation Study of Tamakoshi-V Hydro Electric Project (87 MW) and preliminary Power Evacuation Study of Upper Arun Hydro Electric Project (335 MW). Similarly, at the request of Grid Development, NEA; load flow studies for Kabeli transmission corridor, Tamakoshi-Kathmandu-220 kV transmission line, Chapali sub-station

and New Khimti-Sangutar-Dhalkebar 400 kV transmission line were carried out.

In FY 2010/11, System Planning Department completed Grid Impact Study for the following projects to be developed by the private sector.

Table: List of GIS conducted projects in FY 2010/11

S.N.	Name of Projects	Capacity MW)	Connection S/S
1	Ghar Khola	8.3	Dana Hub
2	Upper Mailung	14.3	Trishuli Hub
3	Uppper Dordi	22.0	Udipur Hub
4	Chahare Khola	17.5	Manang S/S
5	Mardi Khola	1.7 (Capacity Upgrading)	Modi S/S
6	Super Madi	44.0	Lekhnath S/S
7	Down Piluwa	9.5	Baneshwor S/S
8	Trishuli III	20.0	Naubishe Hub
9	Khoranga Khola	4.8	Basantapur S/S
10	Upper Khoranga	6.8	Basantapur S/S
11	Lower Tadi	5.0	Samundratar S/S
12	Upper Tadi	11.0	Samundratar S/S
13	Upper Sanjen	14.6	Chilime Hub

System Operation Department

As in the past years, System Operation Department, popularly known as Load Dispatch Centre, LDC carried its activities 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 has improved the overall availability of power stations and transmission lines and has helped to minimize the time required for restoration of the power system in case of black-outs, thereby reducing loss of revenue.

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 LDC has been able to keep the data up-to-date in the SCADA software. Besides the regular maintenance works, new sub station Matatirtha has been integrated into the SCADA software. Around Rs.75 million of revenue was being received during FY 2010/11 by leasing (to Nepal Telecom and other private companies) the fibers from the Optical fiber with Ground Wire (OPGW) cables. In the sector *Hetauda -*

Pathlaiya 132kV and Lahan – Duhabi 132kV Transmission Line Optical fiber with Ground Wire (OPGW) was installed by replacing the existing earth wire.

Grid Operation Department

Apart from regular operation and maintenance of transmission lines and substations of 66kV and above, the department under Transmission and System Operation (TSO) wing of Nepal Electricity Authority also executes up-gradation, reinforcement and rehabilitation works in various substations and transmissions lines. This Department along with six division/branch offices under it carried out the following major works in fiscal year 2010/11.

a. Transformer Upgrading and Substation Reinforcement Works

Completed

During FY 2010/11, the Department executed reshuffling of existing transformers to upgrade the substation capacity at various substations. Altogether 183.9 MVA capacity was added at different voltage levels through reshuffling of existing transformers. The Department also executed repair and overhauling of power transformers worth 110.2 MVA capacity in total. Similarly, new power transformers with total capacity of 159.2MVA were added in INPS (Integrated Nepal Power System).

Compensating components were repaired and put into operation to maintain voltage at specified limit. The Department accorded high priority to maintain system parameters at desired level with the help of compensating devices for power factor improvement, loss reduction, capacity displacement of power



transformers and generators. Activities like strengthening of Bus System to improve reliability and power delivery were also carried out. Grid also carried out number of connection agreements to evacuate power from Independent Power Producers (IPPs).

Major up-gradation and reinforcement works completed in FY 2010/11 are as follows:

- Shifting, Installation & Commissioning of 132/33kV, 30MVA Power Transformer at Anarmani Substation with replacement of the damaged OLTC was successfully completed. The existing 132/33kV, 15MVA Power Transformer at Anarmani was replaced by the 30MVA transformer.
- Both units of 66/11kV, 2x6MVA power transformer of Hetauda Substation were Overhauled. One of the above transformers was installed in the Sunkoshi Power House to replace the existing damaged 6.3MVA Transformer.
- The existing damaged 132/33kV, 10MVA Power Transformer at Kohalpur Substation was replaced by 15MVA Transformer shifted from Anarmani Substation.
- The 132/33kV, 30 MVA power transformer from Butwal Substation was overhauled and installed at Chanauta Substation to replace the existing 5 MVA Power Transformer.
- The 132/33kV, 5 MVA Power Transformer from Chanauta Substation was overhauled and installed at Mahendranagar Substation to replace the existing damaged 5 MVA Power Transformer.
- The 132/33kV, 30 MVA Power Transformer from Butwal Substation was shifted and installed at Dhalkebar Substation replacing the existing 15MVA Power Transformer.
- The 132/33kV, 15MVA Power Transformer from Dhalkebar Substation was shifted and installed at Attaria Substation replacing the existing 7.5MVA Power Transformer.
- The damaged 132/33kV, 10MVA Power Transformer was repaired, overhauled and installed at Damauli Substation.
- Supply, Delivery, Testing & Commissioning of 33/11kV, 2x16.6MVA Power Transformer at Duhabi Substation and overhauling work of the Transformers were successfully completed.
- The existing 132/33kV, 12.5MVA Power Transformer at Lahan Substation was replaced by new 63MVA Transformer.
- Supply, Delivery, Testing & Commissioning of 66/11kV, 10MVA Power Transformer with construction of new Transformer Bay at Banepa Substation was successfully completed.
- The existing 66/11kV, 5MVA Power Transformer at Paanchkhaal Substation was replaced by 10MVA Power Transformer from Bhaktapur Substation.
- The existing 132/33kV, 30MVA Power Transformer at Butwal Substation was replaced by new 63MVA Transformer and Commissioned successfully.

b. Major up-gradation & Reinforcement works in progress

- The repair works of damaged 132/33kV, 10MVA Power Transformer from Kohalpur substation is in progress.
- The repair of damaged 33/11kV, 5MVA Power Transformer from Dhalkebar substation is in progress.
- Supply, Delivery & Commissioning of new 132/66kV, 45MVA Power Transformer with new Transformer Bay at New Parwanipur Substation is in progress.

c. Grid Connection Agreement

During FY 2010/11, the Department accomplished the Grid Connection Agreement with 16 Independent Power Producers, IPPs for 313.4MW in total to facilitate evacuation of power.

d. Routine & Breakdown Maintenance Works

During FY 2010/11, the department also carried out routine maintenance works as per maintenance schedule for substations and transmission lines. The Department along with six division/branch offices undertook major protection works of transmission towers and regular patrolling of the transmission lines to achieve the targeted reliability of the system.

Power Trade Department

Power Trade Department is responsible for trading of electric power both in 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 in three categories:

- PPA processing and Execution Function:
This function covers PPA processing activities up to and including its execution
- PPA Implementation and Monitoring Function:
This function includes PPA administration after its execution till commercial operation
- Operational Administration Function of PPAs:

This function includes PPA administration after commercial operation.

During the year under review, two hydropower projects undertaken by IPPs, Mai Khola (4500 k W) Baramchi Khola (capacity upgraded from 990 k W to 4200 k W) were commissioned. With these, total number of the IPP projects in operation reaches 23 with their combined installed capacity of 172 MW. Similarly 11 projects of IPPs with their combined capacity of 55.58 MW are under construction.

During FY 2010/11, the Department concluded 20 new PPAs for total capacity of 747.68 MW. The Department also amended PPAs of two projects for upgrading of capacity by 5.8 MW in total. Beside this, PPAs for 28 projects with total capacity of 278 MW are in progress.

Apart from 50 MW import under Power Exchange Agreement, the Department concluded a short term PPA with PTC India Limited for import of 15 MW from January 1, 2011 to April 30, 2011.

Distribution and Consumer Services Business Group, West

The Distribution and Consumer Services, West (DCSW) Business Group is entrusted with the key responsibility of overall management of electricity distribution network of NEA in Lumbini, Ganadaki, Bheri, Rapti, Dhaulagiri, Seti, Karnali and Mahakali zones of Nepal. The organizational restructuring of NEA in FY 2010/11 split the Distribution and Consumer Services (DCS) Business Group into two Business Groups: DCS, East and DCS, West to manage the overall distribution and consumer services in more effective and better way. The responsibilities of DCS, West include construction, operation, maintenance, rehabilitation and expansion of the network up to the 33 kV voltage levels and consumer services such as new consumer connections, meter reading, billing, and revenue collection. It is also entrusted with the work of operation and maintenance of off grid small hydro power plants. DCS West is the second largest business group of NEA in terms of number of employees and business activities. Approximately 18% of the total staffs of NEA is employed in DCS, West. Also, DCS, West is on the forefront to earn revenue for sustaining operation and maintenance and development activities of NEA.

This Business Group provides service to consumers through 33 Distribution Centers spread over 39 districts of the country. This Business Group is headed by a General Manager. The General Manager is supported by one Department and three Regional Offices each headed by a Director.

Performance Highlights

In FY 2010/11, total number of customers under DCS, West reached 734,460. The shares of sales and revenues contributed by the various consumer groups under DCS West are as presented below:

Customer Category	No of consumer (% of total consumers)	Sales %	Revenue %
Domestic	95.45	52.33	46.25
Non-Commercial	0.79	2.88	7.84
Commercial	0.46	5.00	10.12
Industrial	1.37	32.59	29.37
Others	1.93	7.2	6.42

Similarly in FY 2010/11, a total of 707.321 GWh of energy was sold earning a gross revenue of Rs. 6305.034 million, an increase of 6.13 % and 16.93 % over the previous year's energy sales and revenue respectively. Industrial and Commercial consumer categories combined together represent only 1.83% of the total number of consumers but share 37.59 % of total sale. Similarly, the domestic consumer category represents 95.45 % of total consumers but contribute only 52.33 % to the total sale.

Programs, Activities and Projects

As part of system reinforcement and expansion of distribution system program, many activities, programs and the projects were undertaken in FY 2010/11 to improve the service delivery. These programs and activities were executed by the Departments and Regional Offices. The main activities undertaken are listed below:

Electrification Program

The program focuses on extensions of the existing distribution system and on completion of outstanding incomplete electrification works on a priority basis. The activities of the program are spread over all the areas under the jurisdiction of the DCS, West business group. During FY 2010/11, construction of one 33/11 kV substation with 5 MVA capacity was completed. Similarly 60.09 km of 33 kV line, 51.75 km of 11 kV line and 744.5 km of LT Line was constructed and energized. In addition, 393 numbers of distribution transformers were added.

Loss Reduction Activities

In FY 2010/11 special efforts were taken to reduce the technical and non-technical Losses. The distribution centers having loss figures of more than 50% loss were made public in the first stage and a public notice was issued stating that distribution centers with loss figures of more than 50 % would have more load shedding hours than distribution centers with loss figures less than 50%. In the second stage, distribution feeders with loss figures of more than 40% were made public. The special efforts of the employees and the support of the various institutions in controlling non technical losses brought in good results in many areas.

The Business Group carried out regular monitoring of the feeders and areas having

more than 40% loss. The Loss Reduction Committee was formed in many distribution centers under the chairmanship of Chief District Officer. Loss reduction committee at center level issued directives to the concerned offices to improve the loss situation. During the FY 2010/11, a total of 7522 numbers of direct hooking was caught and Rs 1,033, 818.90 was recovered from persons involved in direct hooking. Similarly, the Business Group took action against 343 customers for electricity pilferage and Rs 2,789, 425.79 was recovered from it.

Regular monitoring, data downloading and analysis of the consumption of large industrial and commercial consumers were initiated. Use of Ariel Bundle Conductor, ABC was adopted in high non technical loss prone areas. Upgrading of overloaded conductors and transformers was also carried out to reduce the non technical losses. Despite continued efforts and measures taken to control non technical losses, the desired result could not be achieved. This is mainly due to the adverse local work environment especially in terai and some hilly areas.

Small Hydro Power and Rural Electrification Projects

This Business Group also operates and maintains small hydropower plants located in different districts and oversees distribution and consumer service functions in those areas. Altogether, there are 19 small/micro hydro plants under its jurisdiction. Out of 19 small/micro hydro plants, 11 are in operation. These plants serve 24,261 consumers in total. Apart from 11 small/micro hydro plants, 13 more small/micro hydro plants located at various districts have been leased to private companies or communities. These leased small hydro plants serve around 2207 consumers. The installed

capacity and the number of consumers served by these plants are presented below:

S.N.	Name of the Center	Installed Capacity	No of Consumers
1	Aachham	400	2385
2	Arughat	150	745
3	Dolpa	200	920
4	Doti	200	6315
5	Helambu	50	783
6	Kalikot	500	837
7	Okhaldhunga	125	1200
8	Ramechhap	75	9288
9	Rupalgad	50	248
10	Tatopani	2000	942
11	Simikot	500	598
	Total	4250	24261

Small Hydro Plants Leased to Private Communities

S.N.	Name of Center	Installed Capacity (KW)	No of Consumers
1	Bajhang	200	1033
2	Bajura	200	803
3	Chame	45	218
4	Chaurjahari	150	611
5	Darchula	300	1320
6	Jomsom	240	1783
7	Jumla	200	1233
8	Manang	80	549
9	Phidim	240	1300
10	Syarpudaha	200	1850
11	Taplejung	125	790
12	Terathum	100	2082
13	Khandbari	250	8499
	Total	2330	22071

For Rural Electrification, a number of 33 kV transmission lines and 33/11 kV substation projects are under construction. The status

of projects carried out by then SHPRED in FY 2010/11 which is now managed by DCS, West is summarized below.

Gamgad Small Hydropower Project (Mugu District)

The construction of Gamgad Small Hydro Project (400 kW) was started in FY 2001/02 with the objective of providing electricity to the people of Mugu district. However, construction activities were stopped from FY 2008/09. NEA terminated the contract with main contractor in December 2010, and assigned a special construction task force in April 2011 to complete the remaining work on its own. After four months of taking over construction work by the task force, civil structures have been completed, electro-mechanical equipments have been installed and penstock has been modified and erected. 11 kV and 400 V distribution networks



have been completed to supply electricity in the 5 VDCs of the Mugu District. Testing and

commissioning work is scheduled to be carried out in August 2011.

Sitalpati -Musikot 33 kV Transmission Line Project (Salyan and Rukum Districts)

The objective of the project is to provide electricity to the people of Rukum and Salyan districts. The project includes construction of 50 km of 33 kV transmission line, 50 km of 11 kV line, 40 km of LV distribution line and two 33/11 kV substations of 1.5 MVA capacity one each at Sitalpati and Musikot. Out of 50 km long 33 kV transmission line, stringing of 32 km line & pole erection has been completed. Land acquisition for Musikot Substation has been completed. Construction of 33/11 kV, 1.5 MVA substation at Sitalpati and 33 kV bay extension at Tulsipur is in progress and is scheduled to be completed in FY 2011/12.

Chhinchu - Rakam- Jajarkot 33 kV Transmission Line Project (Surkhet and Jajarkot Districts)

The objective of the project is to provide electricity to the consumers of Surkhet and Jajarkot district. The scope of the project consists of 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. Construction of 33/11 kV, 750 KVA substation at Rakam is completed. Contract for 33kV and 11kV Protection Scheme of Rakam Substation has been awarded . The project is scheduled to be completed in FY 2011/12.

Ghorahi-Holeri 33 kV Transmission Line Project (Rolpa District)

The scope of this project consists of 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 33 kV transmission line and 7 km of 11 kV line & 7 km of distribution line and substation building has been completed. The delivery of power transformer and other major equipments has been completed. Construction of 33/11 kV, 750 KVA sub-station at Holleri and 33 kV bay extension at Ghorahi is nearing completion. Contract for procurement of 33 kV & 11 kV Protection Scheme of Holleri substation has been awarded. The project is scheduled to be completed in FY 2011/12.

Udipur-Besisahar -Manang 33 kV Transmission Line Project (Lamjung and Manang Districts)

The project includes the construction of 90 km of 33 kV transmission line, 53 km of 11 kV, 53 km of LV distribution line and one 33/11 kV, 1.5 MVA substation in Manang and 33 kV bay extension in the existing Udipur substation. Out of 70 km long 33



kV transmission line, pole erection for 66 km and stringing of conductor for 35 km have been completed. Tender has been invited for construction of additional 5 km 33kV transmission line in the Fiscal Year

2010/11.

Dadeldhura-Baitadi 33 kV Transmission Line Project

The scope of the project includes construction of 14 km of 33 kV transmission line, 15 km of 11 kV & LV distribution line, one 33/11 kV 3 MVA substation at Baitadi and 33 kV bay extension in the existing Dadeldhura substation. Construction of 33/11 kV, 3 MVA sub-station at Baitadi has been completed in FY 2010/11.

Dipayal-Saphebagar-Manma-Jumla 33kV Transmission Line Project

The project activities include construction of 155 km of 33 kV, 15 km of 11 kV & 3 nos. of 33/11 kV substations at Sanfebagar, Manma and Jumla. Out of 155 km long 33 kV transmission line, pole erection for 22 km has been completed. Tender has been invited for the construction of additional 4 km 33kV line has been done in the FY 2010/11.

Dailekh Substation Project

The project includes the construction of 25 km of 33 kV, 15 km of 11 kV, 10 km of LV distribution line & one 33/11 kV, 1.5 MVA substation at Dailekh and 33 kV bay extension at Surkhet. Contract has been awarded for construction of substation at Dailekh. The delivery of major substation equipments such as power transformers, VCB, DS etc has been completed. The project is scheduled to be completed in FY 2011/12.

Galkot Substation Project

This project is being implemented to provide electric supply to Galkot and its vicinity in Baglung district. Bay extension at Baglung substation has been completed. Land Acquisition process for Sub-station construction at Galkot has been

initiated.

33/11 kV, 6/8 MVA Substation at Ramghat (Surkhet)

The construction of Ramghat Substation was started to cater the growing demand for electricity in Ramghat and its vicinity. The scope of the project includes the construction of 33/11 kV, 6/8 MVA substation at Ramghat and the associated 11 kV distribution line. The project which is financed by GoN is expected to be completed in 2012.



Kapurkot-Koilachaur 33 kV Transmission Line Project

The scope of project includes construction of 15 km of 33 kV, 25 km of 11 kV, 25 km of LV distribution line in Salyan & Rolpa districts & 33/11 kV substation one each at Koilachaur & Kapurkot. The procurement of poles for 15 km of 33 kV transmission line has been completed. Contract has been awarded for construction of 15 km, 33 kV transmission line from Kapurkot to Koilachaur and construction work is in progress.

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

The project includes the construction of 48 km of 33 kV, 40 km of 11 kV, 40 km of distribution line in Achham and Bajura district, 33/11 kV substations at Martadi and 33 kV Bay extension at Saphebagar. Construction of 12 km of 33 kV transmission line has been completed. Procurement process is underway for construction of additional 20 km 33 kV.



Ridi Electrification Project

This project is being implemented to electrify Ridi area of Gulmi district. The project will also improve the reliability and quality of supply in the area. The project is financed by the Government of Nepal. The project is expected to be completed in 2012.

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

The scope of the project includes 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. Procurement of poles for 12 km of 33 kV transmission line and construction of 10 km of line has been completed. Procurement process is underway for construction of additional 28 km 33 kV.

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

The scope of the project includes construction of 90 km of 33 kV, 40 km of 11 kV, 40 km of LV distribution line in Baitadi and Bajura district, 33/11 kV substations at Chainpur and 33 kV bay extension at Baitadi Substation. Procurement of poles for 10 km of 33 kV transmission line and construction of 10 km of line has been completed.

Reinforcement of Birbas Substation

This project was initiated to improve the reliability of the power supply in Gulmi and Aargakhanchi area. The scope of this project includes construction of 33 kV line and installation of 33 kV breakers. The contract for construction has already been awarded and the project is expected to be completed in 2011.

Projects Initiated in FY 2010/11 and their Status:

The following projects were initiated in the fiscal year under consideration to provide electricity to the consumers of rural areas in various districts.

1. Udipur Substation Upgrading Project
2. Rajapur 33 kV Substation Project
3. Bojhapokhari Nawalparasi 33 kV Transmission Line Project
4. Dang Bhalubang 33 kV Transmission Line Project

These projects are in the initial stage of development. Evaluation of bids for the upgradation of Udipur substation in Lamjung is in progress. Similarly, process for acquisition of land for the construction of Rajapur Substation has been initiated. Preparation of bidding documents for the construction of other projects is in progress.

Planning and Technical Services Department

The Technical Services/Commercial Department is responsible for planning and preparation of distribution system expansion programs and supporting DCS, West Business group in the technical and commercial matters. The Department identifies potential RE projects and substation rehabilitation projects for implementation in phase wise manner. The Department also carries out management of TOD energy meter & metering equipment and develops and implements programs for reduction of distribution system losses. In addition, the Department also carries out impact studies for evacuation of power from IPPs to distribution substation.



Regional Offices

The functions of operation, maintenance, and expansion of the network up to the 33 kV voltage levels and consumer services such as new consumer connections, meter reading, billing, and revenue collection are carried out by Regional Offices. In addition, the regional Offices are also responsible for managing community based rural electrification and operation and maintenance of small hydro plants within their jurisdiction. Apart from the regular consumer services, the Regional

Offices focused on the following activities in FY 2010/11:

Loss Reduction Program

During the year under review the measures taken in the preceding years were continued to reduce the non-technical losses:

- Installation of tamper proof meter enclosures and refurbishment of metering facilities
- Implementation of meter enclosure seal management system.
- Replacement of electro-mechanical meters by programmable poly phase meters and replacement of unmatched current transformers to eliminate possible errors in multiplying factor.
- Investigations on illicit tapings and meter tempering
- Meter testing: Bulk/ Ordinary supplies
- Rehabilitation of meter cubicles
- Implementation of meter seal management system to secure energy meters from tempering
- Replacement of bare conductor with ABC cables in loss prone areas

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 substation. 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 2010/11.

Customer Care

Special efforts were taken to improve the

quality of service at the customer interface points. The staff members took special efforts to serve our valued customers in more effective way. With the Queue Management System at some of the cash collection centers, difficulties encountered by the customers in queuing for making payments were minimized.

These functions and activities were carried out by four Regional Offices, namely Butwal Regional Office (BRO), Nepalgunj Regional Office (NRO), and Attaria Regional Office (ARO).

Butwal Regional Office

Butwal Regional Office (BRO) serves the districts of Gandaki, Lumbini & Dhaulagiri zone. This office is headed by a director and reports to the General Manager. Out of 11 municipalities and 656 VDCs under BRO, all the municipalities and 119 VDCs are fully electrified, 433 VDCs are partially electrified and 104 VDC are yet to have electricity.

This Regional Office has 15 Distribution Centers to serve the consumers. The technical division headed by a Manager looks after all the technical matters, rural electrification activities and management of small hydro plants within the region.



Highlights of the year

- Units sold within the region during the year: 488.469 GWh
- Revenue earned from Units sold: Rs 3165.216 Million
- Total number of consumers within the region at the end of the fiscal year: 451,834
- Number of new connections provided during the year: 35,606
- Average revenue per consumer per month: Rs 583.77
- Average energy per consumer per month: 90.09 kWh

Distribution Infrastructures

- 33 kV Distribution Lines: 1016.8 km
- 11 kV Distribution Lines: 3696.72 km
- Number of 33/11 kV Primary Substations: 22
- LV Distribution Lines: 15106.94 km
- LV Distribution Substations (Distribution Transformers): 4026 Nos
- Total installed capacity of the distribution transformers: 282,460 kVA

Nepalgunj Regional Office

Nepalgunj Regional Office (NRO) serves the districts of Rapti & Bheri. This Office is headed by a director reporting to the General Manager. Out of 6 municipalities and 370 VDCs under NRO, 5 municipalities are fully electrified, 1 municipality and 204 VDCs are partially electrified and 166 VDC are yet to be electrified.

There are 9 Distribution Centers within this Regional Office for serving the consumers. The technical division headed by a Manager looks after all the technical matters, rural

electrification activities and management of small hydro plants within the region.

Highlights of the year

- Units sold within the region during the year: 130.214 GWh
- Revenue earned from Units sold: Rs 2586.72 Million
- Total number of consumers within the region at the end of the fiscal year: 173,175
- Number of new connections provided during the year: 27806
- Average revenue per consumer per month: Rs 1244.75
- Average energy per consumer per month: 62.66 kWh

Distribution Infrastructures

- 33 kV Distribution Lines: 461 km
- 11 kV Distribution Lines: 1468 km
- Number of 33/11 kV Primary Substations: 9
- LV Distribution Lines: 5381 km
- Number of distribution transformers): 1409
- Total installed capacity of distribution transformers: 97,000 kVA

Attaria Regional Office

Attaria Regional Office (ARO) provides electricity to the consumers of Seti & Mahakali zone. This Office is headed by a director who is directly responsible to the General Manager. Out of 6 municipalities and 257 VDCs under ARO, all the municipalities and 37 VDCs are fully electrified, 96 VDCs are partially electrified and 124 VDC have no access to electricity.

There are 9 Distribution Centers within the

regional office for providing electricity to the consumers of the region. The technical division headed by a Manager looks after all the technical matters, rural electrification activities and management of small hydro plants within the region..

Highlights of the year

- Units sold within the region during the year: 88.637 GWh
- Revenue earned from Units sold: Rs 553.098Million
- Total number of consumers within the region at the end of the fiscal year: 109453
- Number of new connections provided during the year: 12512
- Average revenue per consumer per month: Rs 421.1
- Average energy per consumer per month: 67.48 kWh

Distribution Infrastructures

- 33 kV Distribution Lines: 315.71 km
- 11 kV Distribution Lines: 2888.15 km
- Number of 33/11 kV Primary Substations: 13
- LV Distribution Lines: 7946.66 km
- Number of distribution transformers) 1248

Total installed capacity of distribution transformers: 68,156 kVA

Distribution and Consumer Services Business Group, East

The Distribution and Consumer Services, East (DCSE) Business Group is entrusted with the key responsibility of overall management of electricity distribution network of NEA in Mechi, Kosi, Sagarmatha, Janakpur, Narayani and Bagmati zones of Nepal. The organizational restructuring of NEA in FY 2010/11 split the Distribution and Consumer Services (DCS) Business Group into two Business Groups: DCS, East and DCS, West to manage the overall distribution and consumer services in more effective and better way. The responsibilities of DCS, East include construction, operation, maintenance, rehabilitation and expansion of the network up to the 33 kV voltage levels and consumer services such as new consumer connections, meter reading, billing, and revenue collection with the jurisdiction of its territory. It is also entrusted with the work of operation and maintenance of off grid small hydro power plants. DCS East is the largest business group of NEA in terms of number of employees and business activities. Approximately 18% of the total staffs of NEA is employed in DCS, West. Also, DCS, West is on the forefront to earn revenue for sustaining operation and maintenance and development activities of NEA.

DCS, East provides service to 64.32% of total consumers through 50 Distribution Centers spread over 33 districts of the country. This Business Group is headed by a General Manager. The General Manager is supported by one department and four regional offices each headed by a Director.

Performance Highlights

In FY 2010/11, total number of customers under DCS, East reached 13, 24,036 an increase of 14.36% over the last fiscal year's figure.

Customer Category	No of consumer (% of total consumers)	Sales %	Revenue %
Domestic	94.59	41.17	42.52
Non-Commercial	0.53	4.52	6.61
Commercial	0.49	7.5	10.78
Industrial	1.74	32.25	33.36
Others	2.65	14.56	6.73

Similarly, in FY 2010/11, a total of 2017 GWh of energy was sold earning a gross revenue of Rs. 14179 million, an increase of 6.33 % and 9.7% over the previous year's energy sales and revenue respectively. Industrial and Commercial consumer categories combined together represent only 2.23% of the total number of consumers but share 39.75% of total sale. Similarly, the domestic consumer category represents 94.59 % of total consumers but contributes only 41.17 % to the total sale.

Programs and Activities

As part of system reinforcement and expansion of distribution system program, many activities, programs and the projects were undertaken in FY 2010/11 to improve the service delivery.

These programs and activities were executed by the Departments and Regional Offices. The main activities undertaken are listed below:

Electrification Program

The program during the year under review focused on extensions of the existing distribution system and on completion of outstanding incomplete electrification works on a priority basis. The activities of the program are spread over all the areas under the jurisdiction of the DCS, West business group. During FY 2010/11, construction of one 33/11 kV substation with 26.3 MVA capacity was completed. Similarly 102 km of 11 kV line and 130 km of LT Line was constructed and energized. In addition, 174 numbers of distribution transformers were added.

Loss Reduction Activities

In FY 2010/11 special efforts were taken to reduce the technical and non-technical Losses. The distribution centers having loss figures of more than 50% loss were made public in the first stage and a public notice was issued stating that distribution centers with loss figures of more than 50 % would have more load shedding hours than distribution centers with loss figures less than 50%. In the second stage, distribution feeders with loss figures of more than 40% were made public. At the same time, targets for loss reduction were set for the concerned distribution centers 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. The special efforts of the employees and the support of the various institutions in controlling non technical losses brought in good results in many areas.

The Business Group carried out regular

monitoring of the feeders and areas having more than 40% loss. The Loss Reduction Committee was formed in many distribution centers under the chairmanship of Chief District Officer. Loss reduction committee at center level issued directives to the concerned offices to improve the loss situation. During the FY 2010/11, a total of 7522 numbers of direct hooking was caught and Rs 1,033, 818.90 was recovered from persons involved in direct hooking. Similarly, the Business Group took action against 343 customers for electricity pilferage and Rs 2,789, 425.79 was recovered from it.



Regular monitoring, data downloading and analysis of the consumption of large industrial and commercial consumers were initiated. Use of Ariel Bundle Conductor, ABC was adopted in high non technical loss prone areas. Upgrading of overloaded conductors and transformers was also carried out to reduce the non technical losses. Despite continued efforts and measures taken to control non technical losses, the desired result could not be achieved. This is mainly due to the adverse local work environment especially in terai and some hilly areas.

Demand Side Management

The DCS, East initiated program to install capacitor bank on the secondary side of

transformer located in areas where CFL lamps were distributed in order to improve the power factor and voltage level in those areas. Based on the successful outcome of this program, the program has been extended to other areas. Similarly, program has been initiated for installation of the capacitor bank on 11 kV feeders with voltage drop below the prescribed level.

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 corridor. This project is jointly financed by Asian Development Bank (ADB) and GoN. The project has identified 27 distribution feeders with unacceptable level of loss in Kathmandu valley and Birgunj where rehabilitation is required. The project is scheduled to be completed in 2013 AD.

Energy Access and Efficiency Improvement Project

This project is jointly financed by Asian Development Bank (ADB), GoN and NEA. The scope of the project includes: (i) Construction of new 33/11,6/8 MVA substation at Baniyani, Dhanusadham, Parual, Barathawa, Baskot, Kusma, Mainapokhar and 11 kV switching



station in Mirmi, Swoyambhu & Mulpani and (ii) Construction of 33 kV and 11 kV lines in the vicinity of substation area.

Contract for construction of substations has been awarded and the project is scheduled to be completed in 2013 AD. The procurement process for line materials and constructions is in progress.

Distribution System Rehabilitation Project

This project is being implemented to improve the quality and reliability of power supply and to reduce technical losses in various places. The project is jointly financed by World Bank (WB), GoN and NEA. The scope of the project includes (i) Reinforcement of 33/11 kV substations at Khanar, Inaruwa, Rupani, Janakpur, Haripur, Chanauli, Bhairahawa, Ghorahi, Guleria and Tikapur (ii) Construction of 64 km of new 11 kV line, rehabilitation of 131 km of existing 11 kV distribution network, construction of 49 km of 0.4 kV new line using ABC Cable and rehabilitation of 155 km of existing 0.4 kV distribution network; and (iii) Supply and delivery of computerized meter testing bench (single phase and three phase) and CT/PT testing equipments.

The project is scheduled to be completed in 2012 A.D.

Kathmandu Valley Distribution System Rehabilitation Project

This project has been started with the objective of the quality and reliability of the power supply and reducing technical losses in Kathmandu valley. The project will also enhance the capacity of the distribution networks to cater to the growing energy demand of Kathmandu valley. The project is jointly financed by World Bank (WB), GoN and NEA. The scope of the

project includes addition & upgradation of distribution transformers (735 nos.), extension & upgradation of 11 kV and 0.4/0.23 kV line using covered conductors and ABC cables (650 km), installation of switches and replacement of poles.

The project is scheduled to be completed in 2013 A.D. The procurement of line materials is in progress.

Energy and Customer Accountability Enhancement Project

This project is jointly financed by World Bank (WB), GoN and NEA. The project mainly focuses on (i) putting in place a system for regular energy audit of large customer & verification of the accuracy of the metering system (ii) setting up of the remote metering of large consumers via GSM or other appropriate communication network. (iii) implementing of GIS-based distribution network management (DNM) and Customer Relations Management (CRM) system in five distribution centers in the Kathmandu valley (iv) enhancing the features of the existing billing system, and developing necessary interface.

The selection of consultant is in advance stage. The project is scheduled to be completed in FY 2011/12.



Project for Solar Powered Street Lighting

The project aims at installing solar powered and solar wind hybrid powered street lighting systems in some part of Kathmandu valley as a pilot project. This project will facilitate the promotion of solar-powered street lighting in urban areas of Nepal. For the successful implementation of the project, an advisory committee comprising of representatives from Local Development Ministry and members from other stakeholders has been set up. The project includes purchase of solar powered street-lighting system, replacement/installation and setting up a system to ensure a smooth maintenance. Around 1000 existing street lamps will be replaced by solar energy which will reduce peak demand by 0.2 MW and save about 700 MWh per year. The procurement of consulting services is in the final stage.

Pilot Project for Public Private Partnership in Distribution System

This project is jointly financed by ADB and GoN. The project aims at enhancing the quality of service delivery and overall efficiency through Public Private Partnership program in the sector of electricity distribution. The scope of the project includes procurement of the consulting services for the implementation of Public Private Partnership in three distribution centers of NEA. The selection of the consultant is in the final stage.

33/11 kV, 6/8 MVA Substation at Dhulabari (Jhapa)

This project was started in FY 2009/10 to meet the growing demand of Dhulabari and its vicinity. The project will also help to improve the voltage profile of supply and reduce the technical losses of the area. The project funded by GoN is scheduled to be completed

in 2012. The scope of the project includes the construction of 33/11 kV, 6/8 MVA substation at Dhulabari.

Reinforcement of Ilam, Dhankuta, Bhedetar, Nijgarh, Lumbini, Butwal and Syangja Substations

This project financed by NEA was started to improve the quality and reliability of supply in Ilam, Dhankuta, Bhedetar, Nijgarh, Lumbini, Butwal and Syangja. The scope of the projects includes supply and installation of circuit breakers, control panel, battery and battery charger, CT at those substations. The contract for the construction has already been awarded and the project is expected to be completed in 2011/12.

Reinforcement of Damak and Janakpur Substation

This project financed by NEA is being implemented to augment the substation capacity. The scope of the project includes the replacement of the existing 33/11 kV, 6/8 MVA transformer by 33/11 kV, 10/13.3/16 MVA capacity transformer at Damak and Janakpur substations. The completion of the project will help to cater to the future demands in project areas. The project will also help to improve the quality of supply and reduce the technical losses of the area.

Buipa-Okhaldhunga 33 kV Transmission Line Project (Khotang and Okhaldhunga Districts)

The scope of this project includes the construction of 32.5 km of 33 kV transmission line, 35 km of 11 kV and 30 km of LV distribution line and two 33/11 kV, 1.5 MVA substations each at Okhaldhunga and Khotang districts. Construction of 33/11 kV, 1.5 MVA substation

at Buipa has been completed. Overall, 30 km of 33 kV transmission line, 6.5 km of 11 kV transmission line and 7 km of LV distribution line have been completed.

Ilam-Phidim-Tablejung 33 kV Transmission Line Project (Panchthar and Tablejung Districts)

The scope of this project includes the construction of 90 km of 33 kV transmission line and 33/11 kV, 1.5 MVA substation each at Phidim and Tablejung districts. Out of 90 km long 33 kV transmission line, stringing of conductor for 60 km & erection of poles for 80 km have been completed. The project is scheduled to be completed in FY 2011/12.

33/11 kV, 1.5 MVA Substation at Khayarmara

The construction of Khayarmara substation, funded by GoN was started in FY 2009/10 to meet the growing demand of project area and to improve the quality of supply. The construction of major civil work and delivery of major electrical equipment have been completed and the project is scheduled to be completed by the end of 2011.

Chitwan Madi Electrification Project

This project jointly financed by the Govt. of India (GoI) and Govt. of Nepal (GoN) is being implemented for the electrification of Madi and its vicinity in Chitwan district. The scope of the project includes construction of one 3 MVA 33/11 kV substation, 22 km of 33 kV overhead line, 8 km of 33 kV underground line, 30 km of 11 kV line and 50 km of 0.4 kV line and installation of 30 distribution transformers. The project will provide electricity to about 11,000 households of the area. The contract for the procurement of line materials has already been awarded and the project is scheduled to be

completed in 2013.

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

The project includes the construction of 35 km of 33 kV transmission line, 52 km of 11 kV, 50 km of LV distribution line and one 33/11 kV substations in Bhojpur district. Out of 35 km long 33 kV transmission line, pole erection for 34 km and stringing of conductor for 28 km have been completed. Construction of 33/11 kV, substation at Bhojpur is in progress and is scheduled to be completed by FY 2011/12. Construction of Bhojpur substation is in progress.

Tumlingtar-Dingla-Bhojpur 11 kV Transmission Line Project

The project includes the construction of 30 km of 11 kV, 25 km of LV distribution line in Sankhuwasabha and Bhojpur districts. Pole erection for 27 km & stringing for conductor in 19 km have been completed. Similarly, 16 km of LV distribution line has also been completed.

Manthali-Sangutar 33 kV Transmission Line Project

The Project includes the construction of 30 km of 33 kV, 40 km of 11 kV, 40 km of LV distribution line in Ramechhap district. The construction of line is in progress.

Furkot-Nepalthok 33 kV Transmission Line Project

Major components of the Project include the construction of 25 km of 33 kV, 25 km of 11 kV, 40 km of LV distribution line in Kavrepalanchowk district & 33/11 kV, 1.5 MVA substations at Nepalthok. The procurement of poles for 12 km of 33 kV transmission line has been completed and construction of line is in progress.

Aathrai VDC-Sankranti Bazaar 33/11 kV Substation Project

Major components of the Project include the construction of 25 km of 33 kV, 25 km of 11 kV, 40 km of LV distribution line in Tehrathum district & one 33/11 kV substation at Sankranti Bazaar. The construction is in progress..

Bokhim Lekharka (Bhojpur) Electrification Project

The Project includes the construction of 70 km of 11 kV, 100 km of LV distribution line in Bokhim, Khawa, Sidheswor, Gupteswor, Nagi, Lekharka, Gogane, Timma, Kot, Chinamakhu, and Annapurna VDC of Bhojpur district. The procurement of poles for 11 kV transmission line has been completed. The construction of line is in progress.

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

The Project includes the construction of 27 km of 33 kV, 50 km of LV distribution line in different V.D.C. of Bhojpur district. Procurement of poles for 33 kV transmission line has been completed.

Rasuwaghat-Khotang 33 kV Transmission Line Project

Major works to be performed under this Project include the construction of 14 km of 33 kV transmission line, one 33/11 kV, 1.5 MVA capacity substation at Rasuwaghat of Khotang district, 90 km of 11 kV and 90 km of LV distribution lines in Khotang district. Out of these, 6 km of 33 kV transmission line, 14 km of 11 kV line and 21 km of LV distribution line construction have been completed. Construction of 33 kV bay extension at Jaljale substation is nearing completion.



Separate Industrial Feeders Program

As part of the government program to provide the reliable and continuous electric supply to industrial consumers, construction of dedicated 11 kV feeders for the industrial areas has been completed at many places.

Energy Efficiency in lighting (CFL) Project:

The success of the pilot CFL program which was launched in 21 locations of the country has encouraged NEA to design and implement CFL distribution program in other part of country. Under this program, around one million high quality CFLs with a capacity of 12 W - 15 W will be distributed. The implementation of the project is expected to reduce annual energy consumption by 23 GWhr. About 500,000 residential customers are expected to be benefited from this program. The project is financed by ADB & GoN.

Bhadratar Talakhu Electrification Project, Nuwakot

This project is financed by GoN to electrify Mahakali, Likhu, Talakhu, and Chhap VDC of Nuwakot district. The scope of the project includes construction of 12 km of 11 kV line, 16 km of 0.4/23 kV line and installation of 5 number of distribution transformers. The

implementation of project is in progress and it is scheduled to be completed by the end of 2011.

Belkot Kumari Chauthe Electrification Project, Nuwakot

This project is financed by GoN to electrify Belkot, Kumari, Chauthe VDC of Nuwakot district. The scope of the project includes construction of 9 km of 11 kV line, 10 km of 0.4/23 kV line and installation of 4 number of distribution transformers. The implementation of project is in progress and it is scheduled to be completed by the end of 2011.

Community Electrification

As part of the government policy to promote community participation in rural electrification, the Business Group carried out community based electrification in various parts of the country and handed over the facilities to the community for operation. The government provided 80% of the capital cost of electrification, and the remaining 20 percent of the capital cost was borne by the Community. NEA is responsible for maintenance of HT line where as Community/ Users' Group is responsible for maintenance of LV distribution system.

The public response to this initiative of NEA has been overwhelming. Altogether, about 198,200 households have been provided with electricity by the end of FY 2010/11. The status of the community based electrification as of July 16, 2011.

Description	CBRE	CBOM	CBG	Total
Applications registered	279	197	4	480
Applications approved	220	48	-	268

Agreements signed	216	25	-	241
Currently in operation	107	25	-	132

Note:

BRE : Community based rural electrification program;

CBOM: Community based operation and maintenance,

CBG : Community based generation

KKREP: Kailai Kanchanpur rural electrification

Planning and Technical Services Department

The Technical Services/Commercial Department is responsible for planning and preparation of distribution system expansion programs and supporting DCS, West Business group in the technical and commercial matters. The Department identifies potential RE projects and substation rehabilitation projects for implementation in phase wise manner. The Department also carries out management of TOD energy meter & metering equipment and develops and implements programs for reduction of distribution system losses. In addition, the Department also carries out impact studies for evacuation of power from IPPs to distribution substation.

Regional Offices

The functions of operation, maintenance, and expansion of the network up to the 33 kV voltage levels and consumer services such as new consumer connections, meter reading, billing, and revenue collection are carried out by Regional Offices. In addition, the regional Offices are also responsible for managing community based rural electrification and operation and maintenance of small hydro

plants within their jurisdiction. Apart from the regular consumer services, the Regional Offices focused on the following activities in FY 2010/11:

Loss Reduction Program

During the year under review the measures taken in the preceding years were continued to reduce the non-technical losses:

- Installation of tamper proof meter enclosures and refurbishment of metering facilities
- Implementation of meter enclosure seal management system.
- Replacement of electro-mechanical meters by programmable poly phase meters and replacement of unmatched current transformers to eliminate possible errors in multiplying factor.
- Investigations on illicit tapings and meter tempering
- Meter testing: Bulk/ Ordinary supplies
- Rehabilitation of meter cubicles
- Implementation of meter seal management system to secure energy meters from tempering
- Replacement of bare conductor with ABC cables in loss prone areas

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 substation. 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 2010/11.

Customer Care

Special efforts were taken to improve the quality of service at the customer interface points. The staff members took special efforts to serve our valued customers in more effective way. With the Queue Management System at some of the cash collection centers, difficulties encountered by the customers in queuing for making payments were minimized.

These functions and activities were carried out by four Regional Offices, namely Biratnagar Regional Office (BRO), Janakpur Regional Office (JRO), Hetauda Regional Office (HRO) and Kathmandu Regional Office (KRO).

Biratnagar Regional Office

Biratnagar Regional Office (BRO) serves the districts of Mechi and Kosi zones. This office is headed by a director and reports to the General Manager. All the municipalities and 200 VDCs are fully electrified, 207 VDCs are partially electrified and 87 VDCs are yet to have electricity.

This Regional Office has 11 Distribution Centers to serve the consumers. The technical division headed by a Manager looks after all the technical matters, rural electrification activities and management of small hydro plants within the region.



Highlights of the year

- Units sold within the region during the year: 460.08 GWh
- Revenue earned from Units sold: NRs 2,393.08 million
- Total number of consumers within the region at the end of the fiscal year: 343,488
- Number of new connections provided during the year: 42,127

Distribution Infrastructures

- 33 kV Distribution Lines: 747 km
- 11 kV Distribution Lines: 4,240 km
- Number of 33/11 kV Primary Substations: 19
- LV Distribution Lines: 12,830 km
- LV Distribution Substations (Distribution Transformers): 3107 Nos
- Total installed capacity of the distribution transformers: 328,000 kVA

Janakpur Regional Office

Janakpur Regional Office (JRO) serves the districts of Sagarmatha and Janakpur zones. This Office is headed by a director reporting to the General Manager. All municipalities and 353 VDCs are fully electrified, 227 VDCs partially electrified and 97 VDCs are yet to be electrified.

There are 10 Distribution Centers within this Regional Office for serving the consumers. The technical division headed by a Manager looks after all the technical matters, rural electrification activities and management of small hydro plants within the region.

Highlights of the year

- Units sold within the region during the

- year: 200.09 GWh
- Revenue earned from Units sold: NRs 1,114.68 million
- Total number of consumers within the region at the end of the fiscal year: NRs. 268,257
- Number of new connections provided during the year: 43,334

Distribution Infrastructures

- 33 kV Distribution Lines: 621 km
- 11 kV Distribution Lines: 2421 km
- Number of 33/11 kV Primary Substations: 18
- LV Distribution Lines: 4687 km
- Number of distribution transformers): 1409
- Total installed capacity of distribution transformers: 131,000 kVA

Hetauda Regional Office

Hetauda Regional Office (HRO) provides electricity to the consumers of Narayani zone. This Office is headed by a director who is directly responsible to the General Manager. All the municipalities and 240 VDCs are fully electrified, 114 VDCs are partially electrified and 14 VDC have no access to electricity.

There are 8 Distribution Centers within the regional office for providing electricity to the consumers of the region. The technical division headed by a Manager looks after all the technical matters, rural electrification activities and management of small hydro plants within the region.

Highlights of the year

- Units sold within the region during the year: 544.04 GWh

- Revenue earned from Units sold: NRs 2,941.86 million
- Total number of consumers within the region at the end of the fiscal year: 225,533
- Number of new connections provided during the year: 10,735

Distribution Infrastructures

- 33 kV Distribution Lines: 530 km
- 11 kV Distribution Lines: 3,042 km
- Number of 33/11 kV Primary Substations: 8
- LV Distribution Lines: 6592 km
- Number of distribution transformers): 2,427
- Total installed capacity of distribution transformers: 235,000 kVA

Katahmandu Regional Office

Kathmandu Regional Office (KRO) provides electricity to the consumers of Bagmati zone. This Office is headed by a director who is directly responsible to the General Manager. All the municipalities and 128 VDCs are fully electrified, 336 VDCs are partially electrified and 53 VDC have no access to electricity.

There are 16 Distribution Centers within the regional office for providing electricity to the consumers of the region. The technical division headed by a Manager looks after all the technical matters, rural electrification activities and management of small hydro plants within the region.

Highlights of the year

- Units sold within the region during the year: 823.20 GWh
- Revenue earned from Units sold:



NRs 6,229.87 million

- Total number of consumers within the region at the end of the fiscal year: 481,519
- Number of new connections provided during the year: 17,072

Distribution Infrastructures

- 33 kV Distribution Lines: 181 km
- 11 kV Distribution Lines: 3,222 km
- Number of 33/11 kV Primary Substations: 10
- LV Distribution Lines: 18,422 km
- Number of distribution transformers) 4,498
- Total installed capacity of distribution transformers: 508,941 kVA

Future Plans and Programs

NEA has taken the high system loss as a major challenge and shall make every effort to bring down the distribution system loss. 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 of utility business. Consumer complaints shall be addressed without delay and the procedure for new connection related works shall be made simple and user friendly. Centralized customer care center shall be

established to ensure single point of contact for all consumer related activities, timely service, less processing time for new connection and centralized control and monitoring over the entire customer care process. NEA is planning to implement Automatic Meter Reading, AMR system. Payment and billing information shall be made available in internet so that consumer can access information on line. A system will be implemented for consumers to pay the electricity bill either through bank or in NEA's revenue collection center. Payment KIOSK shall be installed in major branches to facilitate bill payment outside office hours.

Engineering Services Business Group

Engineering Services is entrusted with the responsibility to carry out engineering studies beginning from identification to detailed engineering design, environmental studies, geological and geotechnical studies. It is headed by a General Manager. The Business Group has rendered its service to NEA and private sector particularly for the study of hydropower and transmission line projects. The Project Development Department, Soil Rock and Concrete Laboratory and Environmental and Social Studies Department provide these services to the various departments within NEA and to the private parties.

Project Development Department (PDD)

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 Business

Group.

The following works were being carried out by this Department during the year under review:

Tama Koshi V Hydropower Project

Tamakoshi-V Hydroelectric Project is the downstream cascade development of Upper Tamakoshi Hydroelectric Project, UTHEP (currently under construction by Upper Tamakoshi Hydropower Limited). The discharge coming out of the tailrace of UTHEP powerhouse is planned to be diverted towards the Tamakoshi V powerhouse with the help of a connecting tunnel, a head pond, a headrace tunnel and a dropshaft. This project is being planned to operate in tandem with Upper Tamakoshi HEP. The project is located in Dolakha District approximately 170 km north east of Kathmandu and approximately at a distance of 42 km from Charikot Bazaar.

The project will utilize 160.93 m of gross head by conveying the tailwater of UTHEP through a 8.2 km long headrace tunnel of diameter 5.6 m to the underground powerhouse to generate 87 MW of power through four units of Francis turbine each having a capacity of 21.75 MW. The turbines will be housed in the underground powerhouse located at Suri dovan, approximately 7 Km upstream from the present road head at Singati bazaar. The project will be able to generate 460.5 GWH of Energy (Without Outages) annually. The feasibility study of this project has been completed in the fiscal year 2010/11 with the department's own

manpower.



Nalsyaugad Storage Hydropower Project

Nalsyaugad is a reservoir type project having a seasonal storage capacity. The Project is located in Jajarkot District in the Mid-western Development Region. Nalsyaugad is a tributary of Bheri River in the Karnali River Basin. An

access road of approximately 30 km length is required to reach the powerhouse site from the district head quarter. An additional 20 km of road will be required to access other components of the project.

The feasibility study of this project is nearing completion. As per the study completed so far, the project will have an installed capacity of 390 MW with an annual energy generation capacity of 1330 GWh. Lack of adequate budget and manpower has seriously hindered the progress of the study. The ongoing study has established the dam site approximately 9.25 km upstream from the confluence of Nalsyaugad and Bheri rivers. The powerhouse site will be located on the right bank of Bheri River, approximately 1.0 km upstream towards Bheri River from the confluence of Nalsyaugad and Bheri rivers or at the left bank of Nalsyaugad river near the suspension bridge.



A View of Powerhouse Site

The topographical survey including reservoir mapping and surface geological mapping of the project area have already been completed. Gauging stations at the powerhouse site has been established and hydrological and sedimentological data is currently being updated. Detailed geological investigation in the form of core drilling is being carried out at eight different locations of important structures of the project. Seismic refraction survey and surface geological mapping have been completed. The route alignment survey for the 112 km long 400 kV transmission line has been completed. The power from the project will be evacuated to the national grid from Kohalpur Substation.

Budhi Gandaki Storage Hydropower Project

Budhi Gandaki Hydropower Project is a storage type project with a capacity of 600 MW. The project is located in Dhading and Gorkha districts. Identified during the Gandaki Basin Study in

1978, the prefeasibility study of this project was completed in 1984. The prefeasibility study had recommended this project to be implemented immediately. However, the project remained in hibernation for about 26 years. With the onset of the present energy crisis, the project got revitalised and fresh studies have begun. Based on the prefeasibility study, the estimated cost of the project is 774 Million US Dollars.

The pre-feasibility study of this project has recommended a 225m high rockfill dam on Budhigandaki river about 2 km upstream of the confluence of Trishuli and Budhigandaki Rivers. The dam will create a reservoir having a surface area of about 50 km² and a gross capacity of 3320 MCM. The stored water will be diverted to the underground powerhouse through a 276 m long headrace tunnel with a diameter of 12 m and a penstock of 4 m diameter and 240 m length to feed four Francis turbines each having a capacity of 150 MW. The project will be able to generate about 2500 GWh of energy annually. The ability to generate vital



Budhi Gandaki Headworks

dry season energy, the proximity of the project to Kathmandu (About 79 Km) make this project an attractive prospect.

The PDD completed the preliminary environmental impact study, counting of household in the reservoir area, establishment of survey monuments around the reservoir area, topographical survey of the project area establishment of gauging station in the tailrace area and upgradation of gauging station at the dam site, Ankhu Khola and Arughat in the fiscal year 2010/11. The department has already initiated the process to hire an international consultant for the feasibility study and to carry out the detailed design of the project in the fiscal year 2011/12. The consultant will also prepare the tender document for construction of the project.

Upper Trishuli 3B Hydropower Project

Upper Trishuli 3B Hydropower Project is located in Nuwakot district of Central Development

Region. This project has been conceived as a cascade development of Upper Trishuli 3A Hydropower Project. It will have a capacity of 37 MW. A company by the name of "Trishuli Jalvidyut Company Limited" has already been established with Nepal Electricity Authority and Nepal Telecom Company as equal partner promoters. The company will also include the local people of the project area, the local organizational bodies, the staff of NEA and NTC and the general public as shareholders in the company.

Being a downstream cascade development of Upper Trishuli 3A HEP, Upper Trishuli 3B Hydropower Project will not require a separate transmission line, access road, headworks and desanding basin. The project will use 51 m³/s of water coming out of the tailrace channel of UT3A Hydropower Project to generate 37 MW of power through a gross head of 87 m. The annual energy generation from this project will be about 296.34 GWh.



The feasibility study of this project was carried out and completed in the fiscal year 2009/10 by PDD. Now with the incorporation of a separate company to develop the project, further works of the project will be done by the company. The PDD has prepared the necessary documents for the procurement of consulting services from local and international consultants to carry out the Detailed Engineering Study of this project in the fiscal year 2067/68.

Kaligandaki A Model Test Project

Kaligandaki A Hydropower Project was commissioned in August 2002. It has an installed capacity of 144 MW and is the largest hydropower project in operation in Nepal till date. From the very beginning year of its operation, the power station has been facing problems related to floating debris and sediment at its headworks. The hydraulic performance of the headworks and desander has also been below par leading to unexpected damage to turbines and other hydromechanical parts resulting in frequent shutdowns for repair and this has caused a loss in the overall generation from the project. To identify the cause behind these problems and to propose appropriate remedial measures, the World Bank has provided financial assistance to conduct a physical hydraulic model study of the KGA headworks. Hydro Lab Pvt. Ltd., has been appointed to carry out the physical model study. PDD is also carrying out the numerical model study of the KGA desander with its own technical manpower.

The consultant has completed the collection of necessary data, reports and field measurements required for the model study. The construction of the model is underway at the premises of Hydrolab Pvt. Ltd. at Pulchowk, Lalitpur. About 80% of the model construction work has been completed. The consultant is expected to complete the study in December 2011 as per the contract. In addition to the consultant's

physical model study, PDD is also carrying out a Numerical Model Study of the KGA desanding basin with its own technical manpower to supplement the study carried out by the consultant. The development of the numerical model has been completed and calibration of the model is underway. The numerical model study is also expected to be completed in December 2011.

Tamor Storage Hydropower Project

Tamor Storage Hydropower Project lies in Terhathum and Panchthar districts of Eastern Development Region. The Project was identified during the Koshi basin study way back in 1985. However, further studies on the project started only in 2009, after about 25 years of its identification. The Project is in its initial stage of study. As per the study conducted so far, the Project will have an installed capacity of 530 MW and an annual energy generation capacity of about 2406 GWH. The Project site can be accessed via Biratnagar – Dhankuta – Myanglung black topped road. An earthen track of about 25 Km connects Myanglung to Lubughat which is located at about 1.5 Km upstream of the proposed dam site. Being a reservoir project with seasonal storage capacity and suitably located to cater the energy hungry industries of Eastern Development Region, this is one of the promising storage projects being studied by PDD.

The topographical survey, preliminary geological and hydrological study of Tamor Storage project has been completed with the assistance from JICA. A gauging station has been established at Lubughat on Tamor River. The PDD completed the site reconnaissance study and Power Evacuation Study in fiscal year 2010/11. The site reconnaissance study identified and confirmed the new location for dam. NEA has applied for survey licence for generation for this Project at DOED. The detail study of this

Project including environmental assessment is planned to be carried out in fiscal year 2011/12 after obtaining the survey licence.

Dudhkoshi Storage Hydropower Project

Dudhkoshi Storage Hydropower Project is another reservoir type project identified during the Koshi basin study in 1985. It lies in Khotang and Okhaldhunga districts of Eastern Development Region. The Project was studied further in 1995 by Medium Hydropower Study Project. The studies done so far have shown that the installed capacity of the project will be 300 MW with an annual energy generation capacity of 1806 GWh. A seasonal road from Khurkot of the Banepa – Bardibas National Highway via Harkapur and Halesi to the proposed dam site exists at present.

PDD completed the site reconnaissance study of this project in the fiscal year 2010/11. The application for the survey licence for the study of the project will be submitted to Department of Electricity Development, DoED in 2011 and the process for hiring an international consultant to carry out the detailed feasibility study of the project will be started after obtaining the survey licence.

Upper Arun Hydropower Project

Upper Arun Hydropower Project lies in Sankhuwasabha district of Eastern Development Region. The feasibility study of this Project was completed in 1991 by NEA with the help of World Bank and UNDP. The installed capacity of Upper Arun Hydropower Project will be 335 MW with annual energy generation capacity of 2050 GWh. The high firm flow of Arun River ensures high firm energy generation from this project. The Tumlingtar – Kimathanka road (By DoR) under construction passes through

nearby the Powerhouse site of this Project. The track has been opened upto Num Bazar and detailed engineering design of the section from Num Bazar to Tenjugharka (Near P/H site) has already been completed by the Department of Roads. NEA has applied for survey licence for generation of this project on 2065/07/05 BS. However, the licence is yet to be issued. The lack of the survey licence has forced NEA to delay the environmental and detailed engineering study of the project.

PDD plans to start the detail engineering and environmental study of the project in fiscal year 2011/12 provided that the survey licence is issued by DOED.

Upper Modi A Hydropower Project

Upper Modi A is a 42 MW run of the river type hydropower project with one hour peaking capacity. It lies in Parbat district of Western Development Region. The feasibility study of this project was completed in 2000 by NEA and the Upgrading Feasibility Study carried out by Korean Electric Power Corporation through Saman Consult, Korea was completed in 2007. The Environmental Impact Assessment study of the project has also been completed and approved by the concerned ministry. The powerhouse site of the Project lies on the right bank of Modi river near Syauli Bazar. An earthen track connects the Nayapul Bazar to Syalul Bazar. The construction of bridge across the Modi river at Birethanti has also been completed. At present there is no motorable access to headworks site of this project. The headworks site lies about 150 m upstream of Himalkyu. About 5 Km of new track has to be opened to provide motorable access to the headworks site. This is one of the very few projects, which can be taken to construction stage within a year if necessary work is started immediately.

The Upper Modi A Hydropower Project will generate 283.2 GWh of energy annually. The proposed headworks near Himalkyu will divert 16.71 m³/s of water to surface powerhouse at Syaulibazar through 6085 m long headrace tunnel and 675 m long penstock pipe. The project will utilise gross head of 305 m to generate 42 MW of power through two Francis turbines each of 21 MW capacity in the surface powerhouse.

PDD conducted a review study of this project in fiscal year 2010/11 to identify the completed works and additional works required to be done. In 2011/12, PDD has planned to start the work to open the track upto headworks, start detail engineering study, acquire land necessary for camp facility and excavate a test adit to confirm the geological condition near the proposed powerhouse site.

Bagmati – Kulekhani – Pharping – Study Project

To augment the generation of vital firm energy, a study is being carried out by PDD to divert the water from Bagmati River by pumping it to Indrasarovar of Kulekhani through an 11 km long tunnel. A dam has to be built across Bagmati River at Katuwal Daha at the border of Kathmandu and Lalitpur districts. The water from Bagmati River has to be lifted approximately 350 m to gain a head of about 1020 m which can be utilised through Kulekhani I, II, and III powerhouses to generate about 110 MW of firm power. The preliminary study has identified the dam site, fixed the tunnel alignment and location of adits and portals. The hydrological analysis has shown that surplus water after meeting the irrigation requirement from Bagmati River will only be available for three months in a year. Further, the Bagmati Irrigation Project of GoN is planning for a high dam across the Bagmati River to augment the irrigation facility in the near future. In this

context, it was learnt from Bagmati Irrigation project that water may however not be available for this project.

Andhikhola Storage Hydropower Project

Andhikhola Storage Hydropower Project lies in Syangja district of Western Development Region. The feasibility study of this project was completed in 1998 by NEA. As per the study, the project will generate about 693 GWh of energy annually with installed capacity of 180 MW. NEA has applied for survey license of this Project in fiscal year 2010/11.

In fiscal year 2010/11, the PDD conducted a review study of this project. PDD plans to begin the upgraded feasibility and environmental impact study of this project in 2011/12 provided that the survey licence is issued to NEA by DoED.

Masterplan of Storage type Hydropower Projects

A Memorandum of Understanding was signed between MoE, JICA and NEA for the study on “Project for the National Wide Master Plan Study on Storage type Power Development in Nepal” on 9 November 2009 to prepare a Master Plan of appropriate storage type project (100 MW-300 MW) in the present situation. For this, a long list of storage type projects studied so far including some new projects will be prepared and the Master Plan will be prepared based on the long list. As per the signed MoM, the expatriate manpower required for the study will be provided by JICA and the local counterparts and other facilities has to be provided by NEA. The minutes of meeting on the scope of work for the project between The Ministry of Energy, Nepal Electricity Authority and Japan International Cooperation Agency was signed on 19th November, 2009 and similarly

the scope of work for the project was signed on 30th June, 2011. It is envisaged that the study will commence in the Fiscal Year 2011/12.

A view of Signing Ceremony of MOU between NEA and JICA for the Master Plan Study of Storage Projects.



Transmission Line Projects

PDD has been rendering its consulting services for the survey of transmission line projects being carried out by Grid Development Business Group. During the Fiscal Year 2010/11, PDD carried out survey and study of 16 transmission line projects. Most of these have already been completed. The status of these projects is as follows.

S.N.	Name of the Project	Project Status
1	Hetauda-Dhalkebar, 400 kV	Completed
2	Dhalkebar-Duhabi, 400 kV	Completed

3	Marsyangdi-Kathmandu, 220 kV	Completed
4	Upper Tamakoshi-Kathmandu, 220 kV	Completed
5	Kaligandaki Corridor, 220 kV	Completed
6	Modi-Lekhnath, 132 kV	Completed
7	Katari-Solu, 132 kV	Completed
8	Marsyangdi Corridor, 132 kV	Completed
9	Samudratar-Naubise, 132 kV	Completed
11	Dhankuta-Tirtire, 132 kV	Completed
12	Parwanipur-Raxaul, 132 kV	Completed
13	Lamahi-Ghorahi, 132 kV	Completed
14	Hapure-Tulsipur, 132 kV	Completed

Other Activities

In addition to the regular work consisting of carrying out studies at different levels for different projects, PDD has been carrying out various other 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 2010/11:

- Continuation of the construction supervision of Chameliya Hydroelectric Project in association with the Joint Venture of three local consulting firms (Shah SILT and ICON JV).
- The conduction of the annual sediment survey at Kulekhani Reservoir.
- Construction Supervision of Bridge construction at Devighat Hydropower Station
- Construction Supervision of Slope Stabilisation works near Powerhouse of Puwa Khola Hydropower Station
- Preliminary Engineering Study of Slope Stability of Kulekhani Valve house area and Puwa Khola Penstock alignment
- Initiation for the design of three new NEA Office Complexes based on the new master plan within the premises in Ratna Park.
- Construction supervision of the following substation buildings
 - Unichaur substation building in Lalitpur District (11kV-33kV)
 - Salyantartar substation building in Dhading District (33kV-66kV)
 - Chaughada substation building in Nuwakot District (33kV-66kV)
- Detailed survey and design of Access Road of Upper Trishuli 3 A HEP for upgrading of road from Trishuli Colony to Upper Trishuli 3 B hub site at Champani.
- Detailed survey and design of Access Road of Upper Seti Storage HEP.

Environment and Social Studies Department

The Environmental and Social Studies Department (ESSD) of Nepal Electricity Authority is one of the integral Departments of Engineering Services, which executes activities related to all aspects of environmental studies of hydropower and transmission line projects being planned, designed, constructed or operated by NEA. This Department is a commercial unit of NEA with its technical expertise in conducting Environmental Impact Assessment (EIA), Initial Environmental Examination (IEE), Social Impact Assessment (SIA), Acquisition Compensation Resettlement Plan (ACDP), Vulnerable Community Development Plan (VCDP) studies and monitoring and auditing of hydroelectric, transmission line and distribution line projects.

During this fiscal year 2010/2011, ESSD was actively engaged in overall environmental assessment, monitoring and protection of environment. The Department successfully conducted several environmental studies out of which EIA of Upper Trishuli 3 "A" HEP and IEE of Rahughat HEP report has been already approved by Ministry of Environment (MoEnv) and Ministry of Energy (MoE) respectively. The preliminary EIA study of Budhi Gandaki HEP (600 MW) has also been successfully completed in this fiscal year. The SIA, RAP, Social Management Framework and IEE studies of Hetauda-Dhalkebar-Duhabi 400 kV Transmission line (T/L) Project have been completed as per the World Bank requirements. Similarly, Site Specific Nursery Development Plan of Kabeli Corridor 132 kV T/L project has been completed and submitted to the World Bank.

Currently, ESSD has been undertaking environmental monitoring and mitigation of Khimti-Dhalkebar 220 kV T/L project and Chameliya Hydroelectric Project under which activities like establishment of nursery and compensatory plantation works at Sindhuli, Dhanusha, Mahottari and Ramechhap Districts, training program to the affected communities, placement of hoarding boards for conveying safety messages are being carried out.

Currently, the Department is carrying out following assignments and their status is as follows:



Compensatory Plantation for Khimti-Dhalkebar 220 kV T/L Project

- The Scoping Document and ToR of EIA Study of Upper Trishuli Hydropower Project (UT-3B) has been approved by MoEnv and IEE study is being carried out.
- The Scoping Document and ToR for EIA study of Tamakoshi V has been submitted to Ministry of Environment for approval.
- The IEE report of Upper-Trishuli - Matatirtha 220 kV T/L project has been submitted to MoE for approval.
- The IEE of Koshi Corridor T/L project has commenced and ToR has been submitted to MoE for approval
- The IEE study of Rahughat –Modi 132 kV is on going.
- The IEE Report of Marsnyandi-Kathmandu

220 T/L Project has been completed and submitted to MoE for approval

- The SIA, RAP, VCDP studies of Heatauda-Bharatpur 220 kV T/L line project is on going.
- The ToR for IEE study of Mirchaiya-Katari 132 kV Transmission line has been approved by the MoE and Draft Report is being prepared.

The Terms of Reference, ToR for IEE of Surkhet-Kohalpur 132 kV T/L V has been submitted to MoE. for approval.

Soil Rock and Concrete Laboratory

Soil, Rock and Concrete Laboratory (SRCL) provides services in material testing, geological and geotechnical investigations for the different phases of a hydroelectric project development. It also provides services like geological mapping, various types of geophysical surveys, core drilling and construction material investigation at different levels to the different departments of NEA and the private sector. In the field of soil and rock engineering, it also provides services of carrying out in-situ tests and laboratory tests viz. determination of index properties, tri-axial tests, consolidation tests, point load tests, direct shear tests, uniaxial compressive



Core Drilling works in progress at Dam site of Karnali-7 Hydroelectric Project.

strength tests etc. on a regular basis for clients inside and outside NEA. SRCL also provides drilling machines and their accessories for hire on a commercial basis. The following works

were undertaken by this laboratory during the FY 2010/11.

Core Drilling Works.

Soil rock and concrete laboratory has undertaken a total of 1081m core drilling with field test of rock and soil at various hydropower projects of NEA, and independent hydropower companies in this fiscal year.

Name of the Project	Contract Drill length (m)	Completed Drill length (m)	Remarks
Tamakoshi 3 HEP	107.00	107.00	Completed
Solu Hep	262.00	262.00	Completed
Nalsyagu gad HEP	600.00	410.00	Drilling in Progress
Upper Seti HEP	600.00	175.00	Drilling in Progress
Karnali-7 HEP	600.00	100.00	Drilling in Progress
Rasuwadgadhi HEP	125.00	27.00	Drilling in Progress
Total	2294.00	1081.00	

Construction Material Survey:

Construction material survey works for Solu HEP and Karnali -7 Hydroelectric Projects are completed.

- Laboratory Tests:
- Laboratory tests of rock and soil samples for Karnali-7 HEP, Tamakoshi V HEP, Solu HEP, Nalsyagu gad Storage Hydroelectric Project are completed.
- Survey for River bed material for Upper Seti HEP is completed and laboratory test of construction material is completed.

Test on Soil and Rock Samples

Similarly, SRCL has completed the laboratory tests on rock and soil samples for many projects from private sector.

Electromechanical Design Division

This Division handles all of the electromechanical

issues arising within Engineering Services. These issues range from the design of electromechanical equipment of projects that are under various stages of study to the transmission line and evacuation studies for private sector projects.

Apart from the above mandate, this division also runs and maintains a central workshop in Hetauda and manufactures concrete poles from its two concrete pole manufacturing plants, one in Kotre and the other one in Amalekhgunj. During the last fiscal year, a total of 12,588 concrete poles were manufactured at the Concrete Pole Plant in Amalekhgunj. Similarly, a total of 1960 concrete poles were produced from Kotre Pole Plant in Tanahun.

NEA's Subsidiary and Associate Companies

Chilime Hydropower Company Limited

Chilime Hydropower Company Limited (CHPCL), a subsidiary of Nepal Electricity Authority (NEA), is the first public limited company in hydropower sector. The company was established in 1996 with the main objective of harnessing the hydropower potential of the country for the benefit of the people at large by optimally utilizing the untapped resources and creating synergy with the private sector. The Company's 51% stake belongs to NEA, 25% to employees of NEA and CHPCL, 10% to local public of Rasuwa District and the remaining 14% stake to the general public. With the distribution of 24% share to local and general public, the Company has set a mile stone to become one of the leading public companies in the hydropower sector.

The Company is undertaking the development of four hydropower projects with total capacity of 270.7 MW through its three subsidiary companies. Total project cost (without financing) to develop these four projects is around NRs. 32 billion. The required debt for these projects will be made available from Employees Provident Fund (EPF). The Memorandum of Understanding for loan arrangement was signed on 7 June 2011 with EPF.

Chilime Hydropower Plant (CHPP)

The Chilime Hydropower Plant, a peaking run off river type plant with installed capacity 22.1 MW, is delivering its power to the National

Grid through a 38 Km long 66 kV single circuit transmission at Trisuli Power House Switchyard at Trishuli, Nuwakot.

The plant is able to transmit the chargeable energy of 141.856 GWh against the annual deemed energy of 132.795 GWh sealable to NEA. The plant is able to generate 12.25% excess energy in addition to the deemed energy besides the deemed energy as per the Power Purchase Agreement with Nepal Electricity Authority.



A view of partial discharge testing in Generator

The partial Discharge Test in both units of Generators was carried out by High Voltage Partial Discharge Limited, Manchester, UK in February 2010. The main purpose of the partial discharge test was to assess the condition of stator winding insulation condition of each unit of the Generator using the equipment of HFCT sensors and HVPD Longshot machine. The winding was found in good condition.

Under the scope of corporate social responsibility, the company has allocated

budget of Rs. 24.6 Million in the field of community health, education, electricity, road, drinking water, and sanitary works etc. for the project affected areas in last fiscal year.

Sanjen Jalavidhyut Company Limited

Sanjen Jalavidhyut Company Limited (SJCL), a subsidiary of Chilime Hydropower Company Limited (CHPCL) was established in December 2010. The promoters of the company and share participation are as follows:

- Chilime Hydropower Company Limited 38%
- Nepal Electricity Authority 10%
- Rasuwa DDC and 18 VDCs 3%
- General Public 49%

The authorized capital of the company is 3750 million rupees and its issued capital is 3650 million rupees.



Signing of MoU with Employees Provident Fund

Sanjen (Upper) Hydroelectric Project (14.8MW) and Sanjen Hydroelectric Project (42.9MW) in a cascade are in the pipeline of projects to be developed by this company. These projects are at the implementation stage. At present access road construction has been started after land acquisition. The main construction works are planned to start from mid 2012 and both projects will be commissioned by September 2015. Currently, the evaluation for prequalification of main civil works contractors is being carried out and prequalification

notice for electromechanical works has been published. The Minutes of Understanding (MOU) for financing of the two projects has been signed with Employees' Provident Fund on June 7, 2011.

Madhya Bhotekoshi Jalavidyut Company Limited

Madhya Bhotekoshi Jalavidyut Company Limited, another subsidiary company of Chilime Hydropower Company Ltd., was established on 2010-07-29 to develop Middle Bhotekoshi Hydroelectric Project with installed capacity of 102 MW located in Sindhupalchowk district. Equity participation for this company includes stakes of 38% for CHPCL, 10% for NEA, 1% each for three local hydropower developers namely Nepal Araniko Hydropower Company Ltd., Sindhu Investment Pvt. Ltd., Sindhupalchowk Hydropower Company Limited, 49% for general and local public.

The Project has completed its feasibility study, scoping document and terms of reference for environmental impact assessment study. Tendering for the construction of test adit of 250 m length and size 5 m diameter has been finalized and will be awarded to Himal Hydro & General Construction Ltd. soon. It is planned to construct additional 400 m long test adit along the headrace tunnel.



A view of headworks site of the Project

Preparation of detailed project report, environmental impact assessment study, public hearing, land acquisition, infrastructure development, selecting the consultant and prequalification process for the main construction work will be completed by the end of 2011. It has already been processed for the power purchase agreement with NEA. Construction work is planned to start by 2013 and scheduled to complete the project by the end of 2016.

Rasuwadhi Hydropower Company Limited (RGHCL)

Rasuwadhi Hydropower Company Limited (RGHCL), a subsidiary company of Chilime Hydropower Company Limited (CHPCL), has been established for the implementation of Rasuwadhi Hydroelectric Project (RGHEP). Rasuwadhi Hydroelectric Project (RGHEP) is located in Rasuwa district. The installed capacity of the project is upgraded to 111 MW from its previous capacity of 100 MW. The Environmental Impact Assessment (EIA) study of the project is in the process of approval at Ministry of Environment.

The project will be financed with 50% debt and 50% equity and the debt part of the project cost will be financed by Employees Provident Fund (EPF) for which the Minutes of Understanding (MoU) has already been signed on June 7,



A view of headworks site of the Project

2011 between Chilime Hydropower Company Limited (CHPCL) and Employees Provident Fund (EPF).

Chilime Hydropower Company Limited (CHPCL) is the major share holder of the Company with 33% equity share, in which a provision of 3% share has been made for District Development Committee (DDC) and eighteen Village Development Committee (VDC) of Rasuwa District. Nepal Electricity Authority (NEA) will contribute 18% equity share and the remaining 49% of the equity share will be allocated to the local people, general public, employees and the depositors of Employees Provident Fund (EPF).

Detail Project Report (DPR) and bid document preparation work is in progress and the bidding process for the construction of test adit tunnel at powerhouse site is initiated. The project is scheduled to be commissioned by 2016.

Upper Tamakoshi Hydropower Limited

Upper Tamakoshi Hydropower Limited (UTKHPL) was formed as a subsidiary company of NEA on March 9, 2007 (Falgun 25, 2063) with the primary objective of developing and managing 456 MW Upper Tamakoshi Hydroelectric Project (UTKHHEP) utilizing the financial and the technical resources from within the country. NEA is the major shareholder of the Company with 41% stake. Employment Provident Fund (EPF) will contribute 20%, Nepal Telecom (NT) 6%, Citizen Investment Trust (CIT) 2% and Rastriya Beema Sansthan (RBS) 2% of the share equity. The rest of the equity capital will be raised from general public (10%) natives of Dolakha District (10%), NEA and Company staff (6%), and staff of financial institutions providing the debt for the Project (3%). A Six-member Board of Directors for the Company has been constituted after shareholder agreement between UTKHPL and NEA, NT, CIT and RBS was signed on 26 July, 2010 (Shrawan 10, 2067). A tripartite loan

agreement between NEA, EPF and UTKHPL was signed on 30 July, 2010 (Shrawan 14, 2067) for NRs 10 Billion loan and 2 Billion debenture. A loan agreement for Rs. 2 Billion each from CIT and RBS was signed on (Mangsir 21, 2067) and for Rs. 6 Billion from NTC was signed on (Baisakh 29, 2068). Also, the Government has decided to provide loan up to Rs. 11.8 Billion during construction period in case of shortfall. With this the financial arrangement for the project has been completed. The new Board with representatives from all the shareholders will be constituted after shareholder agreement with all the other stake holders. The Company also has plans to develop other hydropower projects in Nepal.

Project Features

Upper Tamakoshi Hydroelectric Project (UTKHHP) is located in Lamabagar Village Development Committee of Dolakha District and is a peaking run-of-river type of project with 820 m gross head, design discharge of 66 m³/s and Installed capacity of 456 MW. The Project will be generating about 2,281.2 GWh of energy annually. The major components of this Project are: an intake, a 22.0 m high concrete dam, twin desanding basins, 7.86 km long headrace tunnel, 360 m high surge shaft, 495 m long penstock pipe, underground powerhouse with six units of pelton turbines, 2.9 km long tailrace tunnel and 47 km long 220



Hon'ble Prime Ministry Mr. Jhala Nath Khanal laying the foundation stone for the constructio of civil works of UTKHHP

kV transmission line to Khimti substation.

Financial Management of the Project

The total cost of the project is estimated at 441.17 MUSD without interest during construction (IDC). Out of the total estimated cost of 441.17 MUSD, project cost is 376.26 MUSD, price Contingencies is 29.81 MUSD, VAT is 24.89 MUSD and taxes and duties are estimated 10.21 MUSD. The project funding comprises of NRs. 10.59 Billion (30%) of equity and NRs. 24.70 Billion (70%) of debt.

Project Status

Power Purchase Agreement, PPA was signed on Poush 14, 2067 with NEA for the sale of energy to be generated by the Project. The PPA rate agreed stands at NRs. 3.5average per KWh for the base year (2010/11) and NRs. 4.06 average per KWh at RCOD.

Upgrading of the Dolakha Singati road (35 Km) has been completed and Singati Lamabagar road (28.6 Km) is nearing completion. The contract for the construction of the Lot 1(civil works) has been awarded to M/S Sino Hydro Corporation, China. Honorable Prime Minister Mr. Jhala Nath Khanal laid foundation stone at underground powerhouse site , Gongar on May 18, 2011 (Jestha 4, 2068) signaling the construction of main civil works.

Similarly, contract for consultancy services for construction supervision has been awarded to JV Norconsult AS –Lahmeyer International GmbH on December 16, 2010. Evaluation of the bids received for Hydro-mechanical and Electro-mechanical works are in progress. Similarly, procurement process for "Management Team" including Chief Executive Officer (CEO) of UTKHPL is underway.

Power Transmission Company Nepal Limited

In order to facilitate the cross border power exchange between Nepal and India following three cross border Indo-Nepal Transmission Interconnections have been identified Under Cross-Border Transmission Line interconnection Projects.

- Dhalkebar-Mujaffarpur 400kV Transmission Interconnection
- Duhabi-Purnia 400kV Transmission Interconnection
- Butwal-Gorkhapur 400kV Transmission Interconnection

Among above Dhalkebar-Mujaffarpur 400 kV Transmission Line (D-M line) has been prioritized in the first phase. This project will be developed in commercial basis under public private partnership, PPP mode. This PPP involves two transmission companies, one each in India and Nepal and shall be responsible for developing and executing the transmission system within their territory. As a consequent to this the JVC-Nepal called Power Transmission Company Nepal (a joint venture company comprising of NEA and IL&FS;) and JVC- India called Cross Border Power Transmission Company (a joint venture company comprising of PGCIL, SJVNL, IL&FS) has already been registered in Nepal and India respectively.

All the efforts are underway to realize the -Mujaffarpur 400 kV Transmission Line. Approximately 40 km of transmission line from Dhalkebar to Bitthamod near Indo-Nepal border falls under the Nepalese territory and around 100 km falls under Indian Territory. This interconnection is envisaged to be initially charged at 220kV and would be operated in synchronous mode between two grids. The Nepalese portion of the project cost includes

NRs 1.28 billion (USD 20.0 million) out of which USD 13.2 million is to be funded by government of India through soft loan as a line of credit from to GoN . The remaining part would be funded through shareholder's equity or commercial borrowing. The funding of Indian portion would be through domestic sources by Indian JV Company named "Cross Border Power Transmission Company" in Indian rupees.

To realize the project NEA has to sign fundamental legal and commercial agreements namely Power Sale Agreement (PSA) with PTC India for the purchase of 150 MW of power for the long term and Implementation and Transmission Service Agreement (ITSA) with JVC-Nepal and JVC-India for the construction, operation and maintenance of line and to book whole of the capacity of the transmission line. These documents have been negotiated with the respective counterparts and initialed. The final signing on these documents is expected to occur by the end of August. The signing of these legal and commercial documents will lead to the financial closure of the project. The D-M line is expected to be commissioned in 2014, June. The D-M line is intended to import power from India in the initial 4-5 years of operation in order to reduce the crunch power shortage of Nepal and then to export power to India when sufficient hydropower will have been developed in Nepal.

The other two links namely Duhabi-Purnia 400kV Transmission Interconnection (approximately 22 km of transmission line falls under Nepalese territory and around 90 km of line falls under Indian Territory) and Butwal-Gorkhapur 400 kV Transmission Interconnection (approximately 25 km of transmission line falls under the Nepalese territory and around 100 km of line falls under Indian Territory) will be gradually developed in coherence with demand supply situation in Nepal.

Central Activities

Information Technology Department

The Information Technology Department is responsible for all IT related activities within the organization. It is headed by a Director and reports directly to the Managing Director. IT Department has completed a fruitful year with the introduction of new, innovative IT services, continuous ICT maintenance / support and further enhancements and expansions of its network infrastructure and server systems.

Despite many challenges, the Department has been successful in implementing E-bidding system, within a short span. NEA has floated more than 20 tenders using this service and has received a significant number of e-submissions. With the introduction of this service, procurement process of NEA can now be considered as transparent, trustworthy and up-to-date.

IT Department this year was able to establish itself as a service provider and has signed a service contract with Chillime Hydropower Ltd. for providing email, e-bidding and computer server / network based services.

The Department has also made significant progress in the area of Intranet expansion with the laying of fiber optics cable to newer locations. The intranet reach is now expanded upto Hetauda Regional Office and central workshop. Within Kathmandu valley, Bagmati Grid Division, Minbhawan, Kathmandu East Distribution Center and Chahabil DCS office were added to the intranet network.

During this fiscal year, accounting system of NEA was also revamped; this was necessitated by the change in the organizational structure. The accounting system now is capable of consolidating its data on regional office and business unit wise. Several changes and enhancements were also made to Payroll system to accommodate the changes in the taxation regulation.

The Department has also made a contributing role towards the implementation of computerized billing systems. A team of engineers was assigned this year to take up the task of implementing the billing system at several billing locations. This has greatly assisted the computerized billing project in its stride to computerize more and more revenue accounting units. The team of engineers and computer operators from the department has successfully completed the billing system installation at six revenue accounting units.

Corporate Planning and Monitoring Department

Corporate Planning and Monitoring Department undertakes various tasks involving plans and programs at corporate level. The Department assists the National Planning Commission, Ministry of Energy and Ministry of Finance in the preparation of national budget by providing data related to projects undertaken by NEA. Besides, the Department also provides necessary support to NEA management and data input for studies undertaken by various organizations on topics related to NEA.

This Department also assists in obtaining new licenses and any extension there of as required of for development of power projects. During the year under review, NEA obtained 2 survey licenses for transmission line and one generation license.

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

The Department also carries out periodical monitoring and evaluation of projects implemented by NEA. The Department collects and evaluates monthly, quarterly and annual progress reports of the projects implemented by NEA and conducts internal review. The Department also furnishes required data and reports to Ministry of Energy (MoEn), National Planning Commission (NPC) and other concerned authorities of Nepal Government and participates in the ministry-level quarterly progress review meeting.

During FY 2010/11, this Department reviewed the progress of a total of 133 (80 priority 1 and 53 priority 2) projects being implemented under various business groups of NEA.

NEA Board Matters

During the year under review, Dr. Prakash Sharan Mahat, Honorable Minister of Energy continued as Chairman of Board of Directors till April, 2011. Similarly, Mr. Shital Babu Regmi, Secretary, Ministry of Energy, Mr. Lekh Man Singh Bhandari, Mr. Anand Raj Batas and Mr. Mukesh Kafle continued as the Board Members till May 2011 while Mr. Krishna Hari Banskota, Secretary, Ministry of Finance continued as the Board Member. However, with the reshuffling of the cabinet, the NEA Board underwent change with Mr. Gokarna Bista, Minister of Energy as the Chairman. Mr. Balanand

Paudel, Secretary, Ministry of Energy replaced Mr. Shital Babu Regmi as Board Member in May 2011. Mr. Lekh Man Singh Bhandari resigned as NEA Board Member effective from June 26, 2011. Mr. Sujit Acharya, Mr. Subhash Karmacharya, Mr. Kedar Prasad Sanjel have been appointed Board Members by the decision of Government of Nepal effective from April 11, 2011, May 05, 2011 and June 26, 2011 respectively. Dr. Jivendra Jha, Managing Director of NEA continued as Member Secretary till May 06, 2011 and was replaced by the Officiating Managing Director Mr. Rameshwar Yadav. Recently, Mr. Balananda Poudel has been appointed as the Chairman of the NEA Board of Directors and Mr. Deependra Nath Sharma as Managing Director of NEA by the Government of Nepal.

During the year under review, altogether twenty three Board meetings were convened to deliberate and decide on various agenda. Scores of important and far reaching decisions were made. Furthermore, various bylaws relating to personnel, financial and consumer management were amended to impart greater degree of efficiency and effectiveness on the functioning of NEA.

Administration

Administration wing of NEA is responsible for management of human resources, logistic support, legal advice and arbitration, property management and promotion of public relations functions. Timely amendment of Personnel Administration Regulation and Financial Administration regulation also falls under the purview of this wing. This wing is headed by a Deputy Managing Director and supported by four departments, namely, Human Resources Department, General Services Department, Legal Department and Training Center each headed by a Director.

Human Resource Department

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

By the end of FY 2010/11, there are 10324 approved positions. However the total number of staff persons employed is 9107. During the year under review 217 employees were retired while 6 employees took voluntary retirement. The service of 10 employees was terminated on charge of long absence. Similarly, 21 employees resigned and 24 staff passed way. During the year under review, 411 employees of different levels were promoted to higher levels based on performance evaluations and internal competition and 24 employees were promoted to higher level under special promotion scheme. During the year, the Department filled 526 vacant posts. These posts included 121 officer level and 405 posts non officer level. In the year under review, 9

staff persons were cautioned and 1 employee was suspended under disciplinary action. Similarly, the promotion of 2 staff was halted and yearly increment in the salary of 3 staff was decreased.

As part of staff welfare activities, financial support was provided to 10 employees for different causes. Similarly, under the staff welfare loan, a total sum of Rs. 102,078,640.00 was disbursed as loan to employees for purchase, construction and maintenance of house/land, social event/rituals and so forth. Similarly, a sum of Rs. 14,497,990.00 was disbursed to various employees under the accidental insurance and medical facility scheme and a sum of Rs. 371,590,778.16 was disbursed to different employees under the life insurance scheme.

In fiscal year 2010/11, as part of human resource development activities, arrangements were made for 276 staff persons of various levels to participate in training programs, seminars, workshops, and study and inspection tours abroad. Similarly, 516 staff persons received various types of training in NEA Training center while 14 staff persons participated in local training programs outside NEA.

At the end of the fiscal year 2010/11, the status of manpower employed is as given below in the table.

Employees Status FY 2010/2011

Level	Service	Approved Position				Existing Situation			
		Regular	Project	Pool	Total	Permanent	Periodical	Daily Wages	Total
Managing Director		1	0	0	1	0	0	0	0
GM/DMD (Level-12)		9	0	0	9	7	0	0	7
Officer Level (Level 1-11)	Technical	1006	69	2	1077	789	8	1	798
	Non.Tech.	479	20	0	499	405	1	0	406
	Total	1495	89	2	1586	1201	9	1	1211
Assistant Level (Level 1-5)	Technical	5290	0	172	5462	4394	794	1	5189
	Non.Tech.	2985	0	291	3276	2410	292	5	2707
	Total	8275	0	463	8738	6804	1086	6	7896
	Grand Total	9770	89	465	10324	8005	1095	7	9107

General Services Department

General Services Department is responsible for vehicle management, repair and maintenance of vehicles, maintenance of corporate office buildings, property management, logistics and support management and security management of NEA's corporate offices. The Department also deals with media, organizes press conferences and releases various ceremonial activities..

The Department also brings out 'Vidhut', a half yearly magazine covering the wide spectrum of technical, managerial and other activities. The Department also publishes 'A Year in Review', the Annual Report highlighting the different activities of NEA during the year. It also appoints the advertising agency for the publication of various notices of NEA.

During the year under review, the Department updated the records of land owned by NEA and their utilization. The Department prepared a report based on the updated records and submitted the report to Managing Director of NEA.

The Department has also been entrusted with responsibility of managing/ providing sports activities for staffs. The Department is in the process of establishing NEA Sports Club. In the Inter Corporation Badminton Tournament organized by Public Enterprises Sports Development Association, Nepal in shrawan 2067, NEA bagged the first position.

Legal Department

The Legal Department deals with all legal matters of NEA. It provides legal advice to

the NEA managements as well as to different departments of NEA. The Department is also involved in negotiations for power purchase agreements. Another area of its participation is to defend court cases of NEA through legal advisors in different courts of the country and abroad for dispute resolution. Generally, cases to be resolved are related to theft/unauthorized use of electricity, land acquisition, employees' service termination, staff promotion and so forth.

During the fiscal year under review, the Department organized legal workshops in the Distribution Centers and Regional Offices of Distribution & Consumer Services in Hetauda, Pokhara, Butwal & Biratnagar. The Department provided 148 number of legal advices to the NEA Management & other departments.

Out of 144 cases registered in different courts during the fiscal year 2010/11, NEA won 32 cases, lost 7 and the other cases remained subjudice. Some disputes related to Contracts of construction projects are presently being resolved through arbitration and some others are under consideration.

Training Center Department

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

For upgrading and enhancing the skill, knowledge and attitudes of human resources,

NEA Training Center (NEATC) is another important Department which has been providing need based short term trainings 2 days to 23 days for NEA employees with an objectives of upgrading the professional knowledge, skills and attitudes of manpower at operational and managerial levels involved in the power sector. During the year under review, NEA TC conducted 26 training programs for staffs of NEA in different fields of specialization. A total of 516 participants participated in those training programs. Out of 516 participants, 45 participants were of officer level and 471 participants were of assistant level. The training types involved induction, in-services or refreshers course and custom designed as per request and requirement. The training programs are designed as per the training need assessment (TNA) of an organization.

Training programs were conducted according to the contract agreement with the different corporate and business groups of NEA. The

participation details in accordance with the Corporate Offices and Business Groups are presented below.

S.N.	DMD/GM Offices	No. of Trainees		
		Allocated	Attended	in percent
1	Administration	19	17	89%
2	DCS East	91	52	57%
3	DCS West	64	32	50%
4	Generation O&M	40	25	63%
5	Generation Construction	9	5	56%
6	Transmission and SO	15	6	40%
7	Grid Development	8	2	25%
8	Engineering	20	16	80%
9	Finance	8	3	38%
10	Internal Audit	7	3	43%
Total		281	161	57%

In addition, NEATC also provided three months (90 days) training for 39 participants from the project affected area of Dolakha district on the request of Upper Tamakoshi HEP. Besides conducting trainings in Training Centre premises only, NEATC also conducted on site trainings at Minbhawan Grid, Lainchour workshop, Hetauda workshop etc. The Training Center also provided training to 15 heavy equipment operators of NEA on Heavy Equipment Operation at Central Workshop, Hetauda using the local and inhouse experts.

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

In addition to training programs, the NEATC provided seminar halls, class rooms, hostel and ground space on rental facilities to different users, groups/ organizations etc on their request. Engineering colleges, Scout, Political parties and various organizations used the facilities available in the training center for various purposes. The total income generated from these services approximately amounted to Rs. 21 lakhs.

Internal Audit

Internal Audit, led by the Deputy Managing Director, is responsible for reviewing the internal control system, economy, efficiency and effectiveness of operation, risk issues and compliance to applicable rules and regulations. The Deputy Managing Director is assisted by a Director and four regional units responsible for the audit of regional offices of their jurisdiction.

The Internal audit functions are structured into financial audit, technical audit, energy audit and management audit. Division wise summaries of the performance/ non-performance and associated reasons for non-performance during the period are given in the following paragraphs in brief.

Financial Audit

During the FY 2010/11 financial audit was carried out in 134 budget centers out of 208 budget centers of NEA altogether. The audit findings, suggestions and recommendation thereon are included in the annual report for the year. The audit of the transactions of the FY 2010/11 is in progress. Up to the end of second trimester of the fiscal year transaction of total 99 offices has been audited. The audit of the transactions of the third trimester has already been started. The status of progress on clearance of audit observations is in improvement.

Technical / Energy Audit

Non-availability of adequate technical audit staffs constrained the coverage of technical audit. It also audits management activities, energy balance and technical aspects carried out by various business groups.

Management Audit

Although, no management audit as such was carried out due to non-availability of capable audit staff, some aspects of management audit were covered under the financial audit. The findings under this activity are to be covered under the financial audit report.

Reporting and Progress Monitoring

The annual audit report for the year 2009/10 was submitted to the Managing Director in January 2011. In addition, a comprehensive presentation was made on the annual report to high level team including the Managing Director in order to bring further effectiveness in future. Viewing the need of interaction at least on regional basis to enhance the audit effectiveness by facilitating the clearance of audit observation and monitoring the progress thereon, an open discussion and interaction program was organized at Biratnagar Regional Office of Distribution & Consumer Service in February 2011.

Capacity Building

Continuing the program for enhancing the professional skill of Internal Audit personnel, a group of 14 support staff has been trained in Internal Audit from the Institute of Cost and Works Accountants of India, Delhi during the FY 2010/11.

Finance

The corporate level finance wing of NEA, led by the Deputy Managing director, is responsible for overall financial management and accounting functions. Apart from the conventional role of financial management, accounting, budgeting, treasury operations, the wing is also responsible for financial analysis & planning, financial administration, supervision & control. Finance wing is subdivided into four functional departments namely Corporate Finance Department, Accounts Department, Revenue Department and Economic Analysis and Planning Department. Each Department is headed by the director who is accountable to the Deputy Managing Director and independently responsible for its functional areas of operation.

Corporate Financial Performance

Despite the various problems and challenges encountered during the FY 2010/11, NEA registered a growth of 5.12% in total energy sales to reach 2,734.74 GWh. However, this energy sale is less than the projected sales by 13.60%. Internal Sales increased by 7.07% to reach 2,705.15 GWh. Export of energy to India decreased by 60.58% over previous year's figure to register a sale of 29.59 GWh.

In FY 2010/11, the total number of consumers increased by 10.15% over previous year's figure to reach 2.053 million. Out of the total 2.053 million consumers, 94.92 % are domestic consumers. Domestic consumer's share in the total sales revenue is 42.37% where as industrial consumer that comprise only 1.61% of the total consumers contribute 35.52% to the total sales revenue in FY 2010/11.

For the FY 2010/11, net revenue from sales of electricity increased by 4.89% to reach NRs. 18,003.80 million. Total rebate given to the consumers for early payment of bill amounted to NRs. 383.54 million, a marginal increase of 0.21% over the previous year figure.

Income from other services such as surcharge, interest, lease rent, service charge, dividend and interest etc amounted to NRs. 1,189.58 million, an increase by 0.11% over previous year's figure. The contribution of other income to total income is 6.19 %. Total income after rebate stood at NRs. 19,193.38 million registering an increase of 4.58% over previous year's total income.

NEA's operating expenses increased from NRs. 19,371.35 million in FY 2009/10 to NRs. 20,021.59, an increase of 3.36%. This increase in the operating expenses was primarily due to the increase in power purchase costs, depreciation as well as staff costs incurred during the FY 2010/11.

Power purchase costs constituted 54.72% of the total operating expenses. For the FY 2010/11, power purchase cost increased from NRs. 9,746.57 million in FY 2009/10 to NRs. 10,956.81 million, registering an increase of 12.42%. Additional power import and escalation provision in power purchase rates contributed to the increase in power purchase costs. Depreciation increased from NRs. 2,902.92 million in FY 2009/10 to NRs. 2,960.98 million in FY 2010/11, an increase of 2%. Depreciation accounted for 14.78% of the total operating expenses in the FY 2010/11. During the year, staff costs registered an increase of 0.96% to reach NRs. 3,091.06

million. Main reasons behind this increase are annual increment in grade and recruitment of additional employees.

During FY 2010/11, the operation and maintenance expense stood at NRs. 1,288.55 million, a decrease of 30.14% over previous year's figure. The decrease in operation and maintenance expenses was mainly due to the fact that most of the maintenance works as planned in annual program were not carried out in the major power plants. Likewise, expenses for fuel generation amounted to NRs. 386.26 million, a decrease of 24.29% over the previous year expenses.

In FY 2010/11, administrative expenses, royalty, deferred revenue expenses, provision for employee's benefits amounted to NRs. 783.56 million, NRs. 855.02 million, NRs. 150 million and NRs. 2,053.40 million respectively. Interest expenditure, the second largest component of the total expenditure decreased by 3.63% over the previous year figure to register a total amount of NRs. 3,535.60 million. NEA incurred a foreign exchange translation loss of NRs. 44.44 million due to depreciation of Nepalese Rupees vis-a-vis the Japanese Yen loan for Kulekhani Disaster prevention project.

In FY 2010/11, NEA's average cost of service for providing electricity to consumers stood at NRs. 9.40 per kWh against its average net revenue rate of NRs. 6.58 per kWh. After contribution from other income of NRs. 0.43 per kWh, NEA incurred a net loss of NRs 2.39 on every kWh of energy sold. As a result, NEA incurred a net loss of NRs. 6,511.65 million in the FY 2010/11. At the end of FY 2010/11, accumulated loss reached NRs. 27,534.01 million. This FY 2010/11 is the 10th consecutive year NEA carried its business without an upward adjustment in its electricity tariff. NEA has filed a petition with Electricity Tariff Fixation Commission (ETFC) for upward adjustment in electricity to adjust

mismatch between sales revenue and cost of supply. With the abrogation of ETFC, the adjustment in the electricity tariff is pending.

The net carrying amount of NEA's property, plant and equipment increased from NRs. 83,105.63 million in FY 2009/10 to NRs. 85,762.76 million in FY 2010/11 registering an increase of 3.20%. This addition was mainly due to the capitalization of rural electrification projects.

In FY 2010/11, NEA invested NRs. 9,211.91 million in capital works and projects. Out of NRs. 9,211.91 million, NRs. 3,350.50 million was received as Government equity, NRs. 4,162.30 million was received as Government loan and NRs. 1,699.11 million was born from NEA's internal source.

In FY 2010/11, NEA invested NRs. 4,973.98 millions in subsidiaries and associate companies. Out of NRs. 4,973.98 millions invested in subsidiaries and associate companies, NRs. 3,866.31 millions constituting 77.69% of the total investment was invested in Upper Tamakoshi Hydro Power Company Limited (UTKHPL) as equity. NEA holds 40% of the total equity in UTKHPL. Other major equity partners comprise of Nepal Telecom, Citizen Investment Trust and Rastriya Beema Sansthan. The financial closure of UTKHPL was completed in the FY 2010/11. Likewise, NEA's equity in Chilime Hydro Power Company Limited (CHPCL) reached NRs. 489.60 million. In the FY 2010/11, NEA received NRs. 279.07 million (60%) as dividend from CHPCL. The CHPCL is undertaking the development of Upper Sanjen HEP (14.6 MW), Sanjen HEP (42.5), Middle Bhotekoshi (100MW) and Rasuwagadhi (102 MW) Hydropower Projects. The CHPCL has established three separate subsidiary companies for the development of these projects. NEA also holds equity shares in these companies. A Memorandum of Understanding

(MoU) for financing of these projects has been signed with Employees Provident Fund. Other investments of NEA include equity investment in Khumbu Bijuli Company (NRs. 20.65 million), Salleri Chaylsa Hydro Electric Company (NRs. 11.63 million), Nepal Engineering Consultancy Service Center Ltd (NRs. 2.28 Million), Nepal Hydro Lab (NRs. 1 million), Power Transmission Company Limited (NRs. 2.50 million) and Butwal Power Company (NRs. 8.8 million). NEA is not receiving any dividend from these subsidiary and associate companies except CHPCL and Butwal Power Company Limited (BPCL). NEA received dividend from BPCL (20% cash and 10% bonus share) in the FY 2010/11. In addition to the above investment, NEA deposited NRs. 50 million in Citizen Investment Trust (CIT) towards gratuity and pension liabilities. Total amount invested in CIT reached NRs. 534.89 million at the end of FY 2010/11.

Even though NEA maintained more than 93% collection rate from individual and private sectors, NEA's cash situation worsened during the FY 2010/11. The outstanding receivables from municipalities, government offices and public institutions stood at approximately NRs. 2,526.26 million at the end of FY 2010/11. This is about 34% of the total receivables. Total receivable increased from NRs. 6,097.74 million registered in FY 2009/10 to NRs. 7,282 million in FY 2010/11, registering an increase of 19.42%.

NEA is finding it very difficult to manage short term payment to its creditors as well as Government. The huge gap between the average revenue rate and cost of service had adverse impact on its payment obligations. Consequently, NEA has not been able to make its payment obligation to GoN in full amount. However, NEA paid NRs. 308.42 million on account of interest, NRs. 312.12 million on account of royalty and NRs. 226.08 million for repayment of loan to GoN. NEA also provided

NRs. 1,635.11 million as counterpart fund for various projects funded jointly by GoN, bilateral and international financial institutions. During the year under review, NEA managed its working capital requirements through short term borrowings from local financial institutions.

NEA long term borrowing increased by 6.84% to reach NRs. 62,212.32 million. Government's equity in NEA increased from NRs. 38,651.76 million in FY 2009/10 to NRs. 42,002.26 million in FY 2010/11.

The statutory financial audit of NEA for the FY 2009/10 was carried out and completed in FY 2010/11 by Prabhuram Bhandari, Chartered Accountant, appointed by the Office of the Auditor General. Similarly, tax audit and verification of income tax returns for the above period was performed by the same auditor. Income tax return for the year 2009/10 under self assessment procedure was filed with the Large Tax payer's Office at the end of FY 2010/11.

In FY 2010/11, remarkable success was achieved in settling the pending audit remarks related to projects executed during FY 1961/62 to FY 1973/74. Out of the total outstanding NRs. 50.16 million pending audit remarks for the said period, NRs. 40.58 million was settled down during the FY 2010/11. The reply on audit observations for the period 2003/04 to 2008/09 reported by Auditor General in his annual report has been presented to the Parliamentary Public Accounts Committee.

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%), Self Financing Ratio (SFR) (23%), Debt Service Coverage Ratio (DSCR) (1.2 times), Average Collection Period (ACP) (<3month)

and Average Payment Period (APP) (<3month). NEA could not achieve any of the above loan covenants due to the deteriorating financial health. Considering the weakening financial health of NEA, the World Bank revised these covenants while granting the additional financing to Power Development Project. Accordingly, NEA has to comply with only ACP and APP towards World Bank funded projects. In FY 2010/11, NEA was unable to achieve both of these covenants.

During the year under review, NEA continued replacement of its manual accounting system by computerized system. Oracle based Customized Accounting and Inventory System (CAIS) having financial accounting and inventory module has been implemented in 143 budget centers. A separate Oracle based payroll system has been implemented in more than 75 budget centers to automate payroll computation. NEA is in the process of implementing integrated financial software (Enterprise Resource Planning – ERP) for its entire financial functions. This will help NEA to produce financial information in real time basis and prepare annual financial statements in due timeframe. The ultimate goal of ERP implementation is to maintain reliability of financial information, financial discipline and control.

NEA, Institutional Strengthening Project-II is under implementation with the technical and financial assistance from the World Bank to strengthen the financial management, accounting system and internal control system as recommended in the study under the first phase of NEA Institutional Strengthening Project. The scopes of the Project include accounting framework reform, development and implementation of new financial accounting system and capacity building to meet the requirement of national and international accounting standards in preparation and presentation of financial statements.

For strengthening financial accounting and financial management decision support system, NEA is planning to put in place a modern IT based Financial Management Information System (FMIS), in order to provide the reliable and timely information for decision-making. Deloitte Touche Tohmatsu India Private Limited (Deloitte) in association with Raj MS & Co. has been appointed the Consultants to provide consulting services for Institutional Strengthening Project- Finance & Accounts Strengthening under the Nepal Power Development Project of NEA. NEA is reviewing the recommendations and operational strategies provided by the Consultants in their Inception Report, Review Report and Action Plan. The Project is scheduled to be completed in December 2012.

Nepal Electricity Authority

Highlights of FY 2010/11

Description	FY 2011 *	FY 2010	Increase (Decrease)	
			Amount	%
Revenue:				
Net Sale of Electricity (M.NRs.)	18,003.80	17,164.59	839.21	4.89
Income from Other Services (M.NRs.)	1,189.58	1,188.27	1.31	0.11
Total Revenue (M.NRs.)	19,193.38	18,352.86	840.52	4.58
Operating Expenses:				
Generation Exps. (M.NRs.)	1,045.26	1,541.27	(496.01)	(32.18)
Power Purchase (M.NRs.)	10,956.81	9,746.57	1,210.24	12.42
Royalty (M.NRs.)	855.02	849.77	5.25	0.62
Transmission Expenses (M.NRs.)	381.91	337.74	44.17	13.08
Distribution Expenses (M.NRs.)	2,888.05	3,091.21	(203.16)	(6.57)
Administration Expenses (M.NRs.)	783.56	789.52	(5.96)	(0.75)
Depreciation Expenses (M.NRs.)	2,960.98	2,902.92	58.06	2.00
Deferred Revenue Expenditure (M.NRs.)	150.00	112.35	37.65	33.51
Total Operating Expenses (M.NRs.)	20,021.59	19,371.35	650.24	3.36
Operating Surplus (M.NRs.)	(828.21)	(1,018.49)	190.28	(18.68)
Interest on Long-Term Loans (M.NRs.)	3,535.60	3,668.65	(133.05)	(3.63)
Foreign exchange translation losses	44.44	28.67	15.77	55.01
Provision for Employee benefits	2,053.40	2,246.01	(192.61)	(8.58)
Other Exps. (income) including prior year's Adj.	50.00	(38.29)	88.29	(230.58)
Net Income/(Loss) (M.NRs.)	(6,511.65)	(6,923.53)	411.88	(5.95)
Longterm Loans (M.NRs.)	62,212.32	58,231.66	3,980.66	6.84
Net Property, Plant & Equipment (M.NRs.)	85,762.77	83,105.63	2,657.14	3.20
Number of Consumers	2,053,259	1,864,067	189,192	10.15
Total Sales of Electricity (GWh)	2,734.74	2,601.53	133.21	5.12
Internal Sale/Utilised (GWh)	2,705.15	2,526.46	178.69	7.07
Annual Average Consumer's Consumption (kWh)+	1,317.49	1,355.35	(37.86)	(2.79)
Average Price of Electricity (NRs./kWh)	6.72	6.75	(0.02)	(0.32)
Peak Load Interconnected System (MW)	945.70	885.28	60.42	6.82
Total Available Electric Energy (GWh)	3,858.37	3,711.77	146.60	3.95
NEA Hydro Generation (GWh)	2,122.08	2,108.65	13.43	0.64
Thermal Generation (GWh)	3.40	13.01	(9.61)	(73.87)
Purchased Energy (GWh)-India	694.05	638.68	55.37	8.67
-Nepal(Internal)	1,038.84	951.43	87.41	9.19
Average Power Purchase Rate(NRs./kWh)++	6.32	6.13	0.19	3.15
Exported Energy (GWh)	29.59	75.07	(45.48)	(60.58)
Self Consumption (GWh)	29.61	37.12	(7.51)	(20.23)
Net System Losses (Percentage)	28.35	28.91	(0.56)	(1.93)

Note:

* Provisional figures; Subject to final audit.

+ on Internal sales.

++ on total purchase

Nepal Electricity Authority

Balance Sheet as of July 16, 2011

Particular	(NRs. in million)										
	2011*	2010	2009	2008	2007	2006	2005	2004	2003	2002	
Capital and Liabilities											
Capital and Reserve											
Share Capital	42,002.26	38,651.76	33,659.46	28,609.97	26,382.18	23,113.10	20,161.80	18,215.85	16,976.87	16,601.30	
Reserve and Accumulated Profit											
Capital & other Reserve	1,631.31	1,631.31	1,497.85	1,407.83	999.02	550.49	513.87	477.51	425.03	417.61	
Accumulated profit	(27,534.01)	(21,022.36)	(14,098.83)	(8,985.61)	(6,650.14)	(6,095.81)	(4,808.01)	(3,475.20)	(1,694.90)	278.90	
Total reserve and accumulated profit	(25,902.70)	(19,391.05)	(12,600.98)	(7,577.78)	(5,651.12)	(5,545.32)	(4,294.14)	(2,997.69)	(1,269.87)	696.51	
Secured Long Term Loan	62,212.32	58,231.66	53,788.45	51,368.84	47,616.15	46,487.91	44,537.51	41,103.14	39,637.11	37,325.61	
Deferred Tax	693.2	693.2	693.2	791.01	848.40	-	-	-	-	-	
Grand Total	79,005.08	78,185.57	75,540.13	73,192.04	69,195.61	64,055.69	60,405.17	56,321.30	55,344.11	54,623.42	
Asset											
Property, Plant & Equipment	85,762.76	83,105.63	81,238.50	52,030.28	51,781.76	51,743.38	52,166.56	51,415.14	50,094.75	51,080.91	
Capital Work in Progress	20,634.28	17,040.46	13,550.46	35,699.71	29,145.19	21,991.50	16,060.40	10,619.55	8,655.48	4,837.80	
Investment	4,973.98	4,973.98	2,139.92	1,620.19	882.05	819.90	777.00	713.01	613.01	553.00	
Sub Total	111,371.02	105,120.07	96,928.88	89,350.18	81,809.00	74,554.78	69,003.96	62,747.70	59,363.24	56,471.71	
Current Asset											
Inventories	2,509.75	2,431.99	2,159.12	1,800.13	1,498.45	1,354.80	1,372.70	1,048.01	1,017.22	1,058.10	
Sundry Debtors and Other Receivable	7,282.00	6,097.74	4,854.02	5,721.08	5,151.41	4,088.00	3,697.70	3,735.71	3,380.20	2,284.90	
Cash and Bank Balance	1,288.49	1,244.66	1,724.76	1,337.15	1,447.58	1,258.60	1,322.60	1,036.42	1,076.15	664.60	
Prepaid, Advance, Loan and Deposits	2,821.08	2,733.68	2,495.13	2,319.72	2,225.53	2,293.90	2,098.60	2,063.27	2,216.91	3,314.40	
Total Currents Asset	13,901.32	12,508.07	11,233.03	11,178.08	10,322.97	8,995.30	8,491.60	7,883.41	7,690.48	7,322.00	
Less: Current Liabilities and Provision											
Sundry Creditors and Payables	38,433.00	33,651.36	29,221.35	25,482.01	22,119.00	19,144.39	16,768.69	13,856.61	11,593.69	8,852.79	
Provision	7,630.20	5,576.80	3,330.78	2,085.38	693.13	709.80	697.70	681.48	753.31	1,244.20	
Total Current Liabilities and Provision	46,063.20	39,228.16	32,552.13	27,567.39	22,812.13	19,854.19	17,466.39	14,538.09	12,347.00	10,096.99	
Net Currents Assets	(32,161.87)	(26,720.09)	(21,319.10)	(16,389.31)	(12,489.16)	(10,858.89)	(8,974.79)	(6,654.68)	(4,656.52)	(2,774.99)	
Deferred Expenditures (To be Written Off)	334.02	323.67	361.22	423.33	130.94	32.40	126.70	250.01	506.82	916.50	
Inter Unit Balance(Net)	(538.08)	(538.08)	(430.87)	(192.16)	(255.17)	327.40	249.30	(21.73)	130.57	10.20	
Total Def. Exp. & Inter.	(204.06)	(214.41)	(69.65)	231.17	(124.23)	359.80	376.00	228.28	637.39	926.70	
Grand Total	79,005.08	78,185.57	75,540.13	73,192.04	69,195.61	64,055.69	60,405.17	56,321.30	55,344.11	54,623.42	

* Provisional figures

Nepal Electricity Authority

Income Statement for the FY ending July 16, 2011

(NRs. in million)

Particulars	2011*	2010	2009	2008	2007	2006	2005	2004	2003	2002
Sales	18,003.80	17,164.59	14,405.93	15,041.49	14,449.73	13,331.90	12,605.20	11,874.70	11,012.60	9,476.20
Cost of sales	13,239.00	12,475.35	9,935.27	9,530.83	9,034.55	8,332.70	7,462.41	6,765.40	5,348.00	5,886.70
Generation	1,045.26	1,541.27	1,119.71	979.76	855.64	811.12	642.06	544.18	422.17	478.33
Power Purchase	10,956.81	9,746.57	7,691.28	7,437.04	6,967.57	6,391.95	5,760.31	5,415.62	4,087.01	4,659.32
Royalty	855.02	849.77	796.12	839.18	970.46	897.50	844.11	606.10	660.22	591.05
Transmission	381.91	337.74	328.16	274.85	240.88	232.13	215.93	199.50	178.60	158.00
Gross profit	4,764.80	4,689.24	4,470.66	5,510.66	5,415.18	4,999.20	5,142.79	5,109.30	5,664.60	3,589.50
Other income	1,189.58	1,188.27	1,601.67	934.66	1,016.61	639.90	617.50	671.40	512.50	459.60
Distribution Expenses	2,888.05	3,091.21	2,575.09	2,110.01	1,834.39	1,703.70	1,484.20	1,376.10	1,308.60	1,174.40
Administrative Expenses	783.56	789.52	651.69	683.98	479.59	419.50	622.40	489.10	536.10	447.40
Profit from operation	2,282.77	1,996.78	2,845.55	3,651.33	4,117.81	3,515.90	3,653.69	3,915.50	4,332.40	2,427.30
Interest	3,535.60	3,668.65	2,492.55	2,274.37	2,385.41	3,050.90	3,079.80	2,991.50	2,973.40	1,395.50
Depreciation	2,960.98	2,902.92	2,361.20	1,895.17	1,856.47	1,816.90	1,733.50	1,686.00	1,656.70	1,420.10
(Profit) loss on foreign Exchange	44.44	28.67	813.96	484.10	(493.39)	42.70	(230.00)	59.10	-	271.60
Street light dues written off	-	-	863.00	-	-	-	-	-	-	-
Provision for losses on property, plant & equipment	-	-	-	60.00	60.00	65.00	40.00	-	191.50	37.00
Provisions (including employee retirement benefit plan)	2,053.40	2,246.01	1,246.00	1,354.00	-	-	-	-	-	-
Deferred revenue expenditure written off	150.00	112.35	96.68	108.51	42.56	105.40	123.30	320.10	411.10	512.50
Sub total	8,744.42	8,958.60	7,873.39	6,176.15	3,851.05	5,080.90	4,746.60	5,056.70	5,232.70	3,636.70
Profit (loss) from operation in the current year	(6,461.65)	(6,961.82)	(5,027.84)	(2,524.82)	266.76	(1,565.00)	(1,092.91)	(1,141.20)	(900.30)	(1,209.40)
Prior years (Income) Expenses	50.00	(38.29)	163.19	(151.96)	(47.26)	(297.20)	219.90	344.90	444.40	492.00
Net profit (loss) before tax	(6,511.65)	(6,923.53)	(5,191.03)	(2,372.86)	314.02	(1,267.80)	(1,312.81)	(1,486.10)	(455.90)	(717.40)
Provision for Tax	-	-	-	-	-	-	-	274.20	1,497.80	143.30
Deferred Tax Expenses (Income)	-	-	(97.81)	(57.39)	73.42	-	-	-	-	-
Net profit (loss) after tax	(6,511.65)	(6,923.53)	(5,093.22)	(2,315.47)	240.60	(1,267.80)	(1,312.81)	(1,760.30)	(1,953.70)	(860.70)
Balance of profit as per last account	(21,022.36)	(14,098.83)	(8,985.61)	(6,650.14)	(6,095.81)	(4,808.01)	(3,475.20)	(1,694.90)	278.90	-
Prior years Deferred Tax Expenses	-	-	-	-	774.93	-	-	-	-	-
Total profit Available for appropriation	(27,534.01)	(21,022.36)	(14,078.83)	(8,965.61)	(6,630.14)	(6,075.81)	(4,788.01)	(3,455.20)	(1,674.80)	-860.7
Insurance fund	-	-	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00
Profit (loss) transferred to balance sheet	(27,534.01)	(21,022.36)	(14,098.83)	(8,985.61)	(6,650.14)	(6,095.81)	(4,808.01)	(3,475.20)	(1,694.90)	278.9

* Provisional figures

Accounting Policies

1. Basis of preparation of Financial Statements

The financial statements have been prepared on the basis of historical cost convention in accordance with the generally accepted accounting principles.

The financial statements comply with Nepal Accounting Standards (NAS) and presentational requirement of the Companies Act 2063.

2. Revenue from Sale of Electricity

- i. Revenue from sale of electricity is recognized at the time of raising of bills on the customers as per the billing cycle. Revenue from the billing cycle date up to 32 Ashad (16 July) has been accrued taking average rate. Revenue from sale of electricity is shown net of rebate.
- ii. Rebate and surcharge for delayed payments are accounted on cash basis.

3. Income from Other Services

- (i) Interest on investments and lease rent are recognized on accrual basis.
- (ii) Dividend on investment in shares is recognized when received.
- (iii) Revenue from other services is recognized on cash basis.
- (iv) Revenue from services provided by Engineering Services are accounted for on cash basis on the completion of the relevant job.

4. Property, Plant and Equipment

Property plant and equipment are stated at cost of acquisition or cost of construction less accumulated depreciation. The cost of acquisition, construction/erection include interest on loans related to the period of construction/erection up to the date of completion of the project, along with other incidental costs and charges attributable to bringing the asset to its working condition for its intended use. The incidental costs include proportionate overheads relating to the following offices at the rates given below:

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

5. Foreign Currency Loans

Liabilities on foreign currency loans which remained unpaid at the year end are converted at the year end exchange rates. The profit/loss arising there from is recognized as income or expenses in the Income Statement.

6. Depreciation

Depreciation is provided on all categories of property, plant and equipment on straight line basis which reflects the estimated useful lives of the assets.

The rate of depreciation on property, plant and equipment is as follows

Assets		Depreciation Rate (p.a)
(a)	Land	-
(b)	Buildings	2.00%
(c)	Hydro Electric Structures	2.00%-3.00%
(d)	Hydro Electric Plant & Machinery	3.00%
(e)	Internal Combustion on plant & machinery	2.50%
(f)	Transmission lines (66 KV, 132 KV and above)	3.00%
(g)	Transmission lines (33 KV)	3.00%
(h)	Transmission Substations	3.00%
(i)	Distribution system (including below 11 KV Transmission lines)	3.00%-4.00%
(j)	Solar Power	3.00%
(k)	Meter & metering equipment	10.00%
(l)	Consumer Services	7.00%
(m)	Public lighting	3.00%
(n)	Vehicles, tools and instruments, furniture and fixtures.	20.00%
(o)	Office Equipment	15.00%
(p)	Miscellaneous properties	50.00%
(q)	Additions during the year	At applicable rates for half year

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

Grants-in-Aid received from the GoN or other authorities towards capital expenditure as well as consumers' contribution to capital work are treated initially as Capital Reserve and subsequently adjusted as income in the same proportion as the depreciation written off on the assets acquired out of the grants/ consumer contribution.

8. Investments in Shares

Investment in the shares of subsidiary and other companies held for long term are stated at cost.

9. Inventories

Inventories are valued at cost, using the

weighted average method.

10. Accounts Receivable

Accounts receivable are stated at book values, less provision as may be considered appropriate by the management.

11. Deferred Revenue Expenditure

Certain expenditure incurred on training, investigation, survey, software development, feasibility studies of infrastructure projects and major overhauling etc. which are expected to generate benefits over a period of time, are treated as deferred revenue expenditures and written off over a period of five years, including the year in which the said expenditures are incurred.

12. Employees Benefits

The employee benefits are accounted for as per the provisions of NAS 14 on the basis of categories in which the employees are covered namely defined contribution plan & defined benefits plan. In respect of benefits covered under the defined contribution plan namely the provident fund, the employer contribution paid with the PF is recognized as the expenditure of the year. In respect of the benefits covered under the defined benefit plan namely pension, gratuity, leave encashment and medical facilities etc, the expenditure is recognized on the basis of present value of obligations as on the date of balance sheet as per the actuarial valuation.

13. Insurance Fund

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

14. Prior year's figures/ Regrouping

Previous year's figures have been reclassified/ regrouped, where necessary, to make them comparable with current year's figures.

15. Taxes on income

Current tax is determined as the amount of tax payable in respect of taxable income for the year. Deferred tax is recognized on temporary difference; being the difference between tax base of assets and liability and carrying amount thereto. Where there is carry forward losses, deferred tax asset are recognized only if there is virtual certainty of realization of such assets. Other deferred tax assets are recognized only to the extent there is reasonable certainty of realization in future.

16. Provisions

Provisions involving substantial degree of reliable estimation in measurement are recognized when there is a present obligation as a result of past events and it is probable that there will be an outflow of resources to settle the obligations. Provisions are determined based on the best estimate required to settle the obligation at the year end date. These are reviewed at each year end date and adjusted to reflect the best current estimate.

TARIFF RATES

(Billing Effective since September 17, 2001)

1:	DOMESTIC CONSUMERS			
	A	Minimum Monthly Charge: METER CAPACITY	Minimum Charge (NRs.)	Exempt (kWh)
		Up to 5 Ampere	80.00	20
		15 Ampere	299.00	50
		30 Ampere	664.00	100
		60 Ampere	1394.00	200
		Three phase supply	3244.00	400
	B	Energy Charge:		
		Up to 20 units	Rs. 4.00 per unit	
		21 - 250 units	Rs. 7.30 per unit	
		Over 250 units	Rs. 9.90 per unit	
2:	TEMPLES			
		Energy Charge	Rs. 5.10 per unit	
3:	STREET LIGHTS			
	A	With Energy Meter	Rs. 5.10 per unit	
	B	Without Energy Meter	Rs. 1860.00 per kVA	
4:	TEMPORARY SUPPLY			
		Energy Charge	Rs. 13.50 per unit	
5:	COMMUNITY WHOLESALE CONSUMER			
		Energy Charge	Rs. 3.50 per unit	
6:	INDUSTRIAL		Monthly Demand Charge (Rs./kVA)	Energy Charge (Rs./unit)
	A	Low Voltage (400/230 Volt)		
		(a) Rural and Cottage	45.00	5.45
		(b) Small Industry	90.00	6.60
	B	Medium Voltage (11 kV)	190.00	5.90
	C	Medium Voltage (33 kV)	190.00	5.80
	D	High Voltage (66 kV and above)	175.00	4.60
7:	COMMERCIAL			
	A	Low Voltage (400/230 Volt)	225.00	7.70
	B	Medium Voltage (11 kV)	216.00	7.60
	C	Medium Voltage (33 kV)	216.00	7.40
8:	NON-COMMERCIAL			
	A	Low Voltage (400/230 Volt)	160.00	8.25
	B	Medium Voltage (11 kV)	180.00	7.90
	C	Medium Voltage (33 kV)	180.00	7.80

9:	IRRIGATION		
A	Low Voltage (400/230 Volt)	-	3.60
B	Medium Voltage (11 kV)	47.00	3.50
C	Medium Voltage (33 kV)	47.00	3.45
10:	WATER SUPPLY		
A	Low Voltage (400/230 Volt)	140.00	4.30
B	Medium Voltage (11 kV)	150.00	4.15
C	Medium Voltage (33 kV)	150.00	4.00
11:	TRANSPORTATION		
A	Medium Voltage (11 kV)	180.00	4.30
B	Medium Voltage (33 kV)	180.00	4.25

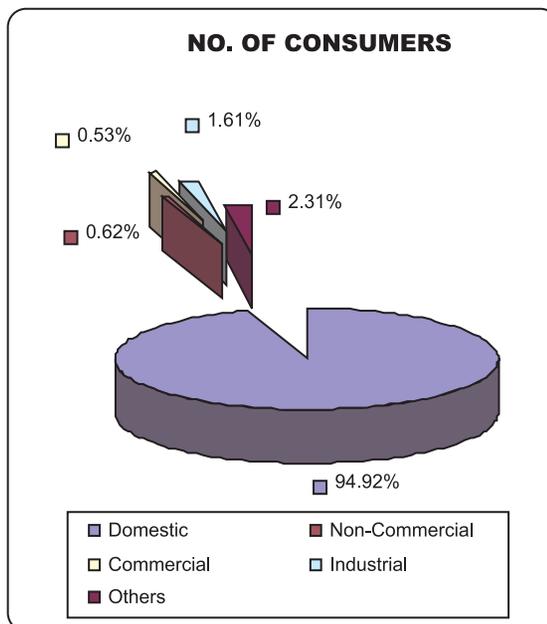
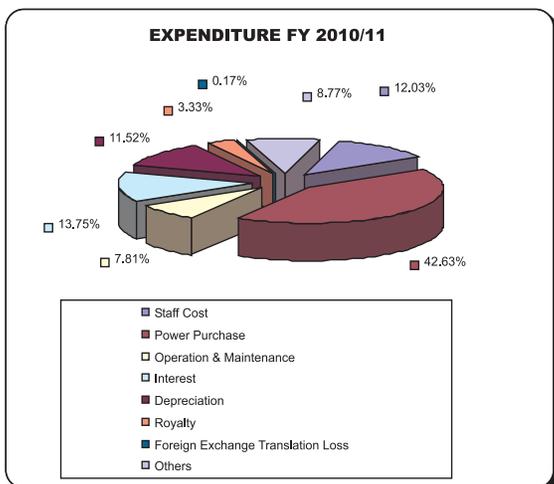
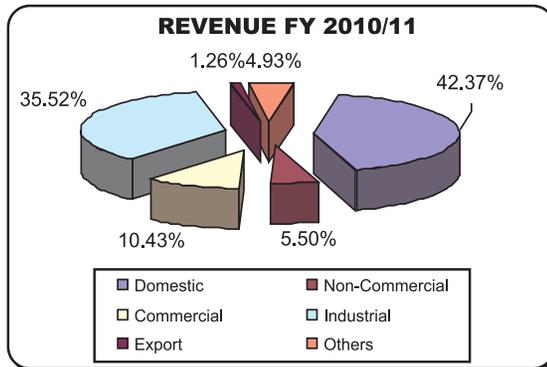
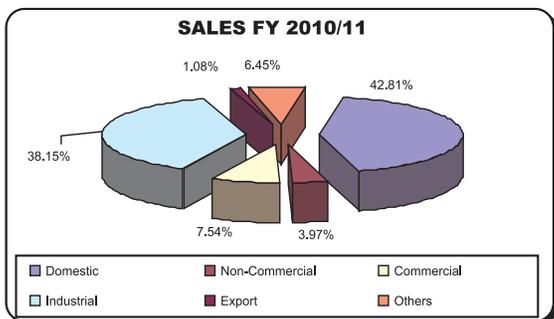
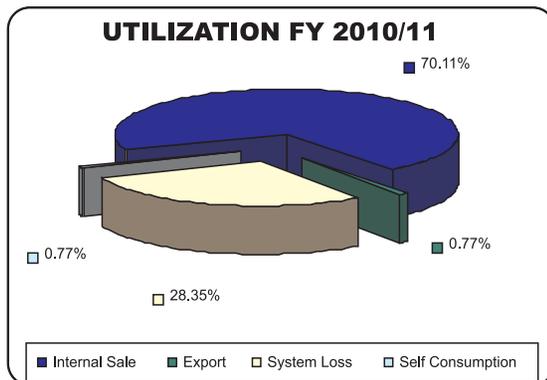
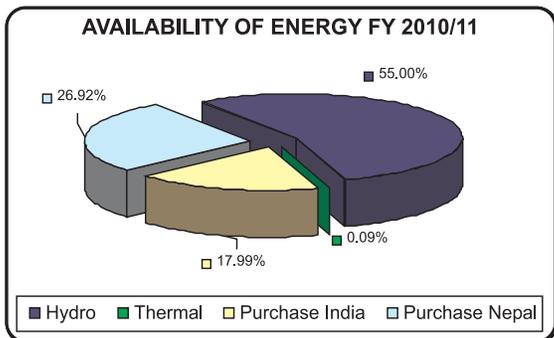
TIME OF DAY (TOD) TARIFF RATES

Consumer Category & Supply Level		Monthly Demand Charge (Rs./kVA)	Energy Charge (Rs./unit)		
			Peak Time 18:00-23:00	Off-Peak 23:00-6:00	Normal 6:00 - 18:00
A: High Voltage (66 kV and Above)					
1	Industrial	175.00	5.20	3.15	4.55
B: Medium Voltage (33 kV)					
1	Industrial	190.00	6.55	4.00	5.75
2	Commercial	216.00	8.50	5.15	7.35
3	Non-Commercial	180.00	8.85	5.35	7.70
4	Irrigation	47.00	3.85	2.35	3.40
5	Water Supply	150.00	4.55	2.75	3.95
6	Transportation	180.00	4.70	2.95	4.15
7	Street Light	52.00	5.70	1.90	2.85
C: Medium Voltage (11 kV)					
1	Industrial	190.00	6.70	4.10	5.85
2	Commercial	216.00	8.65	5.25	7.55
3	Non-Commercial	180.00	9.00	5.45	7.85
4	Irrigation	47.00	3.95	2.40	3.45
5	Water Supply	150.00	4.60	2.80	4.10
6	Transportation	180.00	4.80	3.00	4.25
7	Street Light	52.00	6.00	2.00	3.00

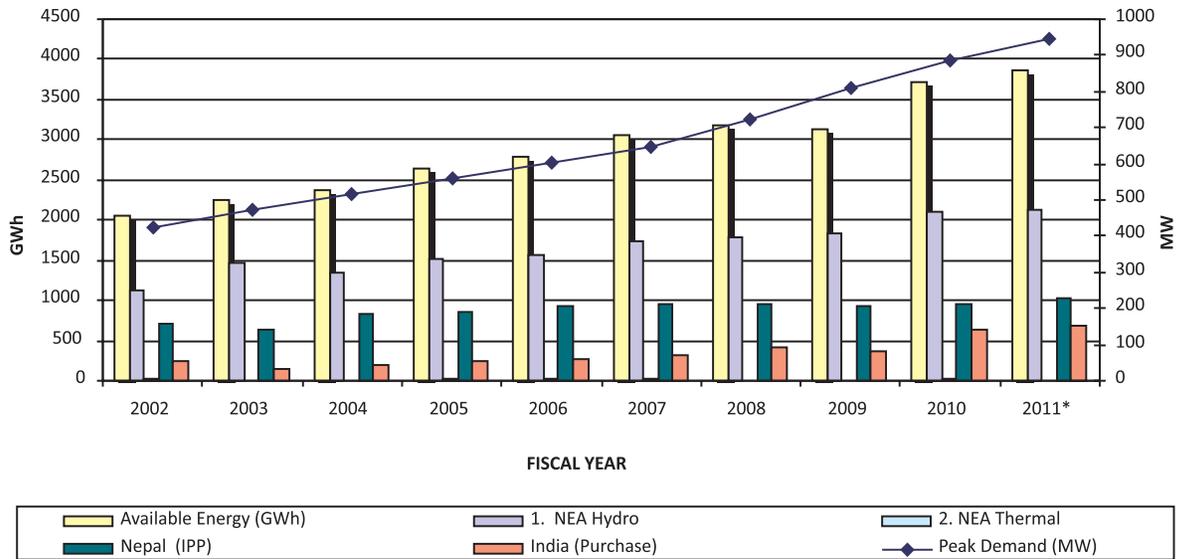
Note:

- If demand meter reads kilowatts (kW) then kVA = kW/0.8
- 10% discount in the total bill amount will be given to the Government of Nepal approved Industrial District
- 25% discount in the total bill amount will be given to the Nepal Government Hospital and Health Centers (except residential complex)

Statistics & Schematics



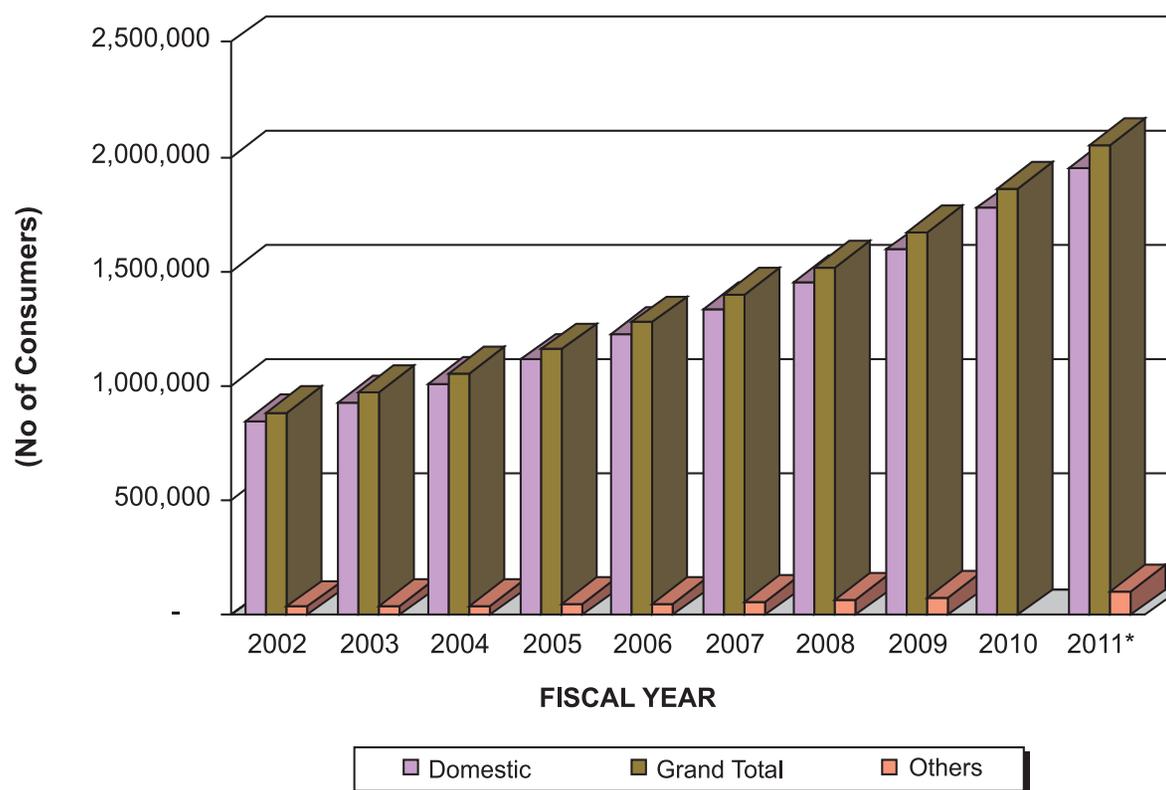
Total Energy Available & Peak Demand



Particulars	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011*
Peak Demand (MW)	426	470.33	515.24	557.53	603.28	648.39	721.73	812.50	885.28	946.10
Available Energy (GWh)	2066.45	2261.13	2380.89	2642.75	2780.92	3051.82	3185.95	3130.79	3711.77	3858.37
1. NEA Hydro	1113.13	1478.04	1345.46	1522.9	1568.55	1747.42	1793.14	1839.53	2108.65	2122.08
2. NEA Thermal	17.01	4.4	9.92	13.669	16.1	13.31	9.17	9.06	13.01	3.40
3. Purchase (Total)	936.31	778.69	1025.519	1106.184	1196.27	1291.09	1383.64	1282.20	1590.11	1732.89
India (Purchase)	238.29	149.88	186.675	241.389	266.23	328.83	425.22	356.46	638.68	694.05
Nepal (IPP)	698.02	628.81	838.844	864.795	930.04	962.26	958.42	925.74	951.43	1038.84

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

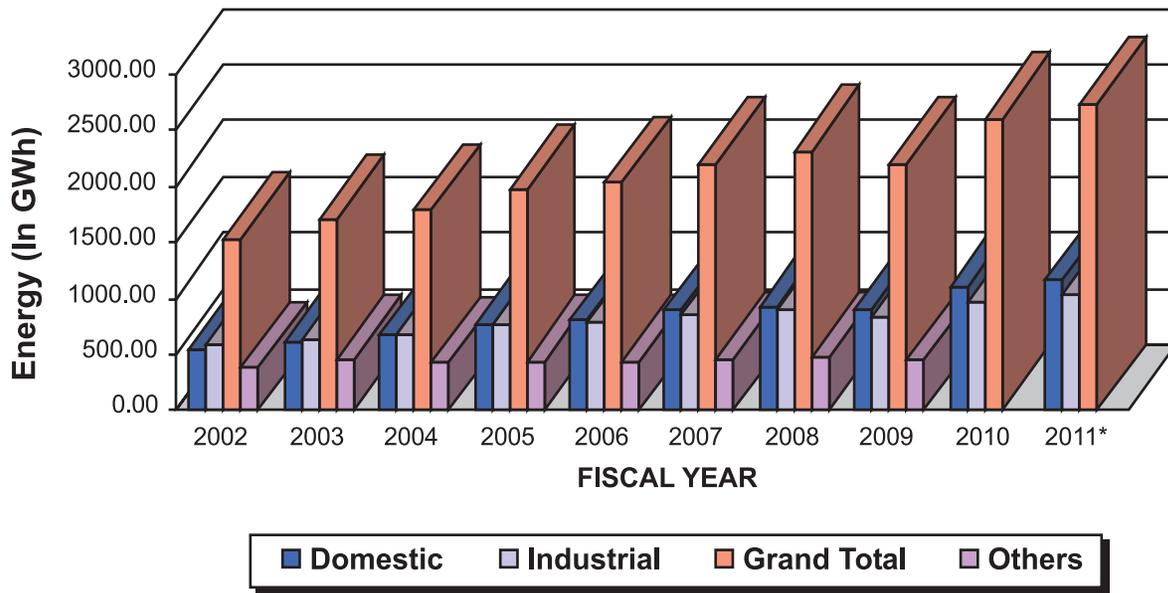
Growth of Consumers



Particulars	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011*
Domestic	848,540	930,554	1,010,719	1,113,740	1,227,295	1,339,253	1,450,254	1,595,015	1,775,571	1,948,968
Non-Commercial	8,629	9,722	9,865	9,950	10,010	10,215	10,556	10,518	10,952	12,805
Commercial	3,898	5,317	5,454	6,000	6,170	6,000	6,052	7,305	8,919	10,938
Industrial	18,789	19,833	21,374	22,500	23,020	24,089	25,548	28,559	29,410	33,155
Water Supply	251	305	352	370	380	414	434	584	609	725
Irrigation	1,353	1,721	2,557	3,400	6,450	13,183	18,614	22,335	32,089	39,470
Street Light	1,048	1,229	1,437	1,500	1,550	1,608	1,961	2,339	2,214	2,310
Temporary Supply	172	138	150	155	165	210	300	403	522	607
Transport	49	48	48	50	54	39	38	42	41	41
Temple	1,800	1,738	1,959	2,150	2,290	2,628	2,746	2,911	2,941	3,218
Community Sales	1	1	15	35	58	169	375	594	795	1,018
Total (Internal Sales)	884,530	970,606	1,053,930	1,159,850	1,277,442	1,397,808	1,516,878	1,670,605	1,864,063	2,053,255
Bulk Supply (India)	5	5	5	5	5	5	5	5	4	4
Grand Total	884,535	970,611	1,053,935	1,159,855	1,277,447	1,397,813	1,516,883	1,670,610	1,864,067	2,053,259

Note : * Provisional figures; subject to final audit.

Electricity Sales

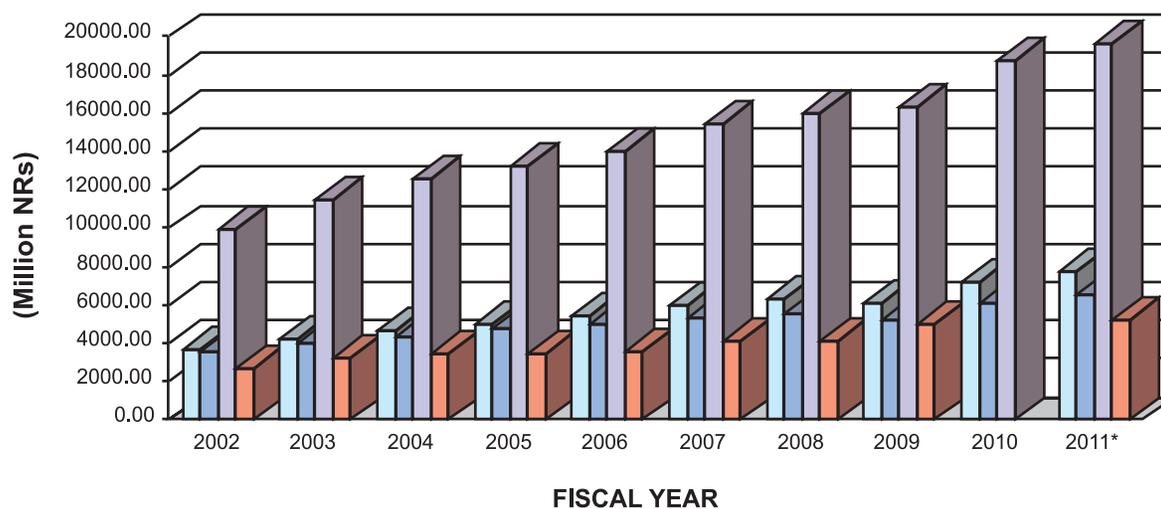


(in GWh)

Category	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011*
Domestic	552.22	612.37	670.78	758.19	805.72	893.27	931.35	908.67	1108.87	1170.77
Non-Commercial	78.22	80.74	83.01	100.54	95.29	100.52	109.93	98.89	103.47	108.58
Commercial	90.43	92.74	108.12	109.31	120.30	141.69	154.38	146.29	187.12	206.21
Industrial	596.68	629.51	689.80	764.00	785.55	849.13	901.09	845.68	960.43	1043.32
Water Supply & Irrigation	29.28	29.98	31.67	49.98	45.50	47.96	46.86	48.14	55.98	55.01
Street Light	39.52	45.80	55.20	54.86	63.24	66.90	70.26	67.51	65.58	66.12
Temporary Supply	0.28	0.35	0.25	0.39	0.87	1.26	0.70	1.04	1.00	0.97
Transport	5.64	5.53	5.47	5.80	5.65	6.31	5.88	5.22	5.42	5.36
Temple	2.48	2.81	4.11	4.58	4.77	4.78	5.12	4.76	3.64	3.39
Community Sales	5.72	4.74	5.58	6.03	9.18	15.51	24.65	32.01	34.95	45.42
Total (Internal Sales)	1400.46	1504.57	1654.00	1853.69	1936.07	2127.33	2250.22	2158.21	2526.46	2705.15
Bulk Supply (India)	133.86	192.25	141.23	110.70	96.55	76.87	60.10	46.38	75.07	29.59
Grand Total	1534.32	1696.82	1795.23	1964.39	2032.62	2204.20	2310.32	2204.59	2601.53	2734.74

Note : * Provisional figures; subject to final audit.

Revenue



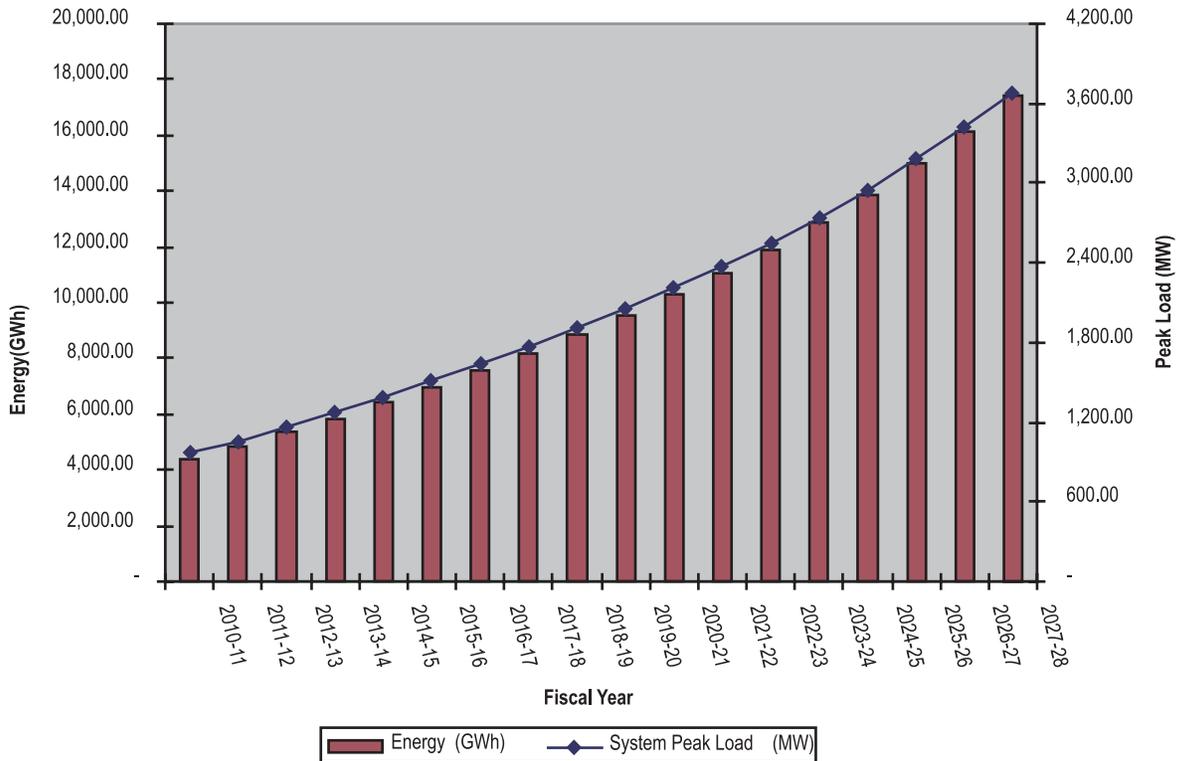
□ Domestic □ Industrial □ Total Revenue □ Others

(in million)

Category	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011*
Domestic	3641.43	4249.81	4701.07	4987.04	5405.12	6021.40	6297.65	6100.65	7252.06	7789.97
Non-Commercial	722.12	783.99	816.03	862.37	881.73	940.20	982.08	900.75	983.63	1010.70
Commercial	818.75	894.91	986.32	1012.66	1081.26	1288.05	1399.51	1384.67	1719.35	1918.37
Industrial	3608.13	4039.65	4380.89	4799.74	4978.69	5300.91	5544.80	5264.33	6060.20	6531.62
Water Supply & Irrigation	138.68	148.53	154.91	171.57	197.96	214.18	204.67	215.62	353.14	246.70
Street Light	200.74	246.79	329.31	354.10	422.35	454.85	467.31	445.96	333.90	435.42
Temporary Supply	3.63	4.74	3.46	5.06	11.18	17.36	10.51	12.20	13.58	12.99
Transport	27.90	29.29	28.92	30.72	29.78	31.65	33.70	26.95	27.58	26.80
Temple	12.16	14.24	26.38	29.17	24.42	26.03	26.38	24.41	28.16	20.43
Community Sales	-	16.59	20.09	24.03	23.94	53.70	64.22	70.10	170.90	163.51
Total (Internal Sales)	9173.53	10428.53	11447.39	12276.46	13056.43	14348.33	15030.83	14445.64	16942.50	18156.51
Bulk Supply (India)	514.12	808.96	673.93	609.51	579.33	428.93	361.14	295.49	604.85	230.84
Gross Revenue	9687.65	11237.49	12121.32	12885.97	13635.76	14777.26	15391.97	14741.13	17547.35	18387.35
Net Income from Other Services	248.17	287.64	424.75	336.70	336.09	689.08	584.18	1601.66	1188.27	1189.58
Total Revenue	9935.82	11525.13	12546.07	13222.67	13971.85	15466.34	15976.15	16342.79	18735.62	19576.93

Note : * Provisional figures; subject to final audit.

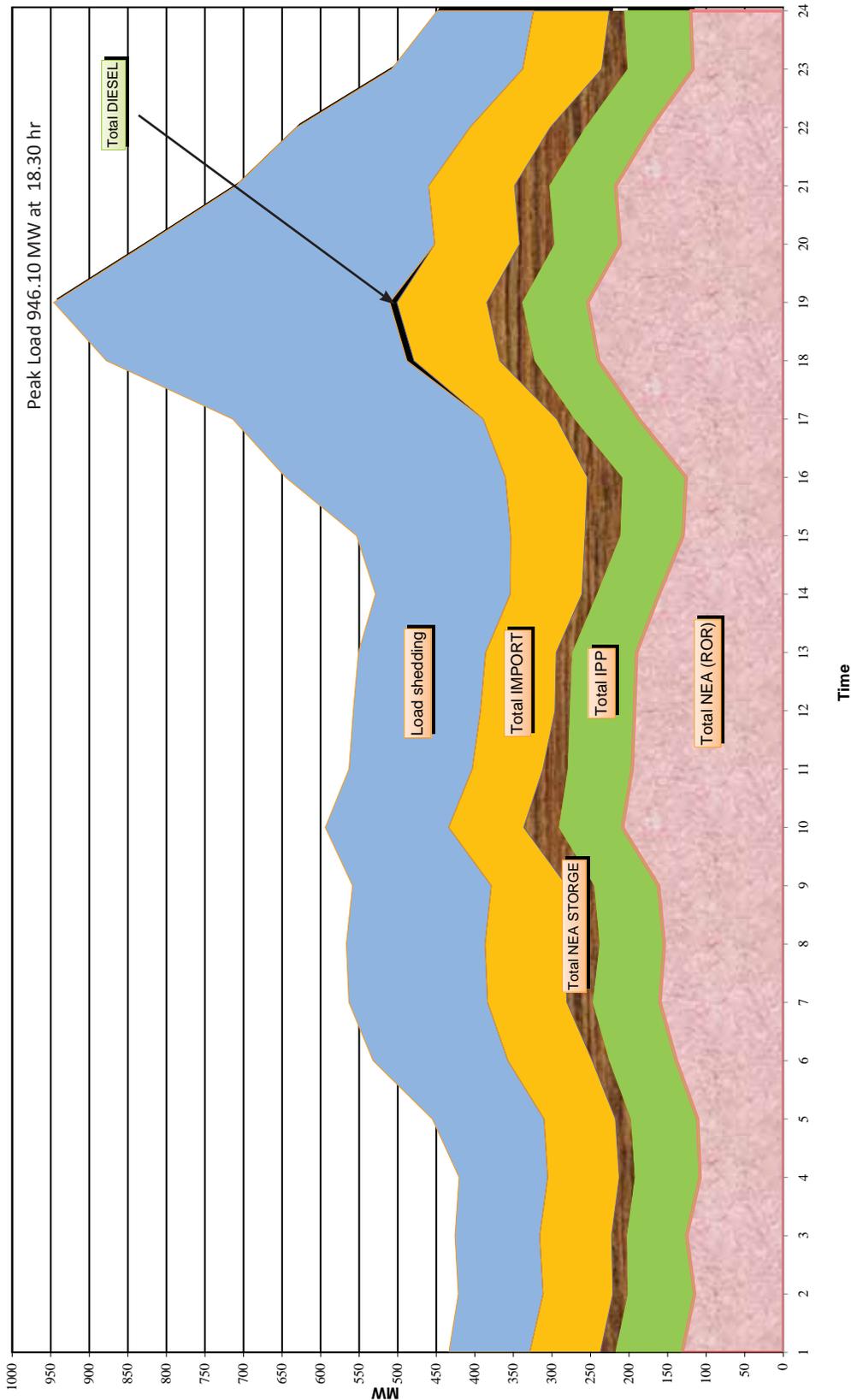
Load Forecast



Fiscal Year	Energy (GWh)	System Peak Load (MW)
2010-11	4,430.70	967.10
2011-12	4,851.30	1,056.90
2012-13	5,349.60	1,163.20
2013-14	5,859.90	1,271.70
2014-15	6,403.80	1,387.20
2015-16	6,984.10	1,510.00
2016-17	7,603.70	1,640.80
2017-18	8,218.80	1,770.20
2018-19	8,870.20	1,906.90
2019-20	9,562.90	2,052.00
2020-21	10,300.10	2,206.00
2021-22	11,053.60	2,363.00
2022-23	11,929.10	2,545.40
2023-24	12,870.20	2,741.10
2024-25	13,882.40	2,951.10
2025-26	14,971.20	3,176.70
2026-27	16,142.70	3,418.90
2027-28	17,403.60	3,679.10

System Load Curve of Peak Day of the Year

Magh 14, 2067 (January 28, 2011)



POWER DEVELOPMENT OF NEPAL

EXISTING		POWER PROJECTS		TRANSMISSION LINES	
Major Hydropower Stations	Diesel Power Stations	EXISTING	Planned & Proposed	132 kV Transmission Line	220 kV Transmission Line
Length (KM)	Length (KM)	Length (KM)	Length (KM)	Type of Ckts	Type of Ckts
1 Middle Marsyangdi	Existing	132 kV Transmission Line	132 kV Transmission Line	1 132 kV Thankot-Chapagaon	1 132 kV Chameliya-Attaria
2 Kalligandaki 'A'	1 144,000 kW	1 Anarmani-Duhabi	1 39,000 kW	2 132 kV Chameliya-Attaria	2 132 kV Chameliya-Attaria
3 Marsyangdi	2 69,000 kW	2 Duhabi-Katya(India)	2 14,410 kW	3 132 kV Butwal-Kohalpur Second Circuit	3 132 kV Butwal-Kohalpur Second Circuit
4 Kulekhan No. 1	60,000 kW	3 Duhabi-Hetauda	3 53,410 kW	4 132 kV Middle Marsyangdi-Dumre- Marshyangdi	4 132 kV Middle Marsyangdi-Dumre- Marshyangdi
5 Kulekhan No. 2	32,000 kW	4 Hetauda-KL2 P/S	4 50 kW	5 132 kV Dumre-Damauli	5 132 kV Dumre-Damauli
6 Trisuli	24,000 kW	5 Bharatpur-Marsyangdi P/S	5 100 kW	6 132 kV Kabele-Damak	6 132 kV Kabele-Damak
7 Gandak	15,000 kW	6 Hetauda-Bharatpur	6 472,994 kW	7 132 kV Singat-Lamasangu	7 132 kV Singat-Lamasangu
8 Modi Khola	14,800 kW	7 Marsyangdi P/S-Suchatar	7 477,530 kW	8 132 kV Kusum-Hapure	8 132 kV Kusum-Hapure
9 Devghat	14,100 kW	8 Suchatar-KL2 P/S	8 174,526 kW	TOTAL	589.5
10 Sunikosi	10,050 kW	9 Suchatar-New Bhaktapur	9 652,056 kW	Planned & Proposed	220 kV Transmission Line
11 Puwakhola	6,200 kW	10 New Bhaktapur-Lamasangu	10 53,410 kW	1 Koshi Corridor	1 Koshi Corridor
TOTAL	459,150 kW	11 Lamasangu-Khimti P/S	11 100 kW	2 Kailgandaki Corridor	2 Kailgandaki Corridor
Small Hydropower Stations		12 Lamasangu-Bhotokoshi P/S	12 456,000 kW	3 Leknath-Damauli	3 Leknath-Damauli
13 Chataru	3,200 kW	13 Bharatpur-Damauli	13 30,000 kW	4 Marsyangdi-Katmandu	4 Marsyangdi-Katmandu
14 Tapanani/Myangdi(I) & (II)	2,000 kW	14 Bharatpur-Bardhat	14 600,000 kW	5 Tamakoshi (Khimti)-Katmandu	5 Tamakoshi (Khimti)-Katmandu
15 Sundarjal	640 kW	15 Bardhat-Gandak P/S	15 32,000 kW	6 Marsyangdi-Bharatpur	6 Marsyangdi-Bharatpur
16 Phewa (Pokhara)	1,000 kW	16 Bardhat-Butwal	16 400 kW	7 Basantapur-Kusaha	7 Basantapur-Kusaha
17 Tinau (Butwal)	1,024 kW	17 Butwal-KGA P/S	17 705,566 kW	8 Khudi-Udipur-Marsyangdi	8 Khudi-Udipur-Marsyangdi
18 Sundarjal	640 kW	18 KGA P/S-Leknath	18 456,000 kW	9 Manang-Khudi	9 Manang-Khudi
19 Pharing**	500 kW	19 Leknath-Damauli	19 30,000 kW	10 Solu Corridor (Kataari-Okhaldhunga-Solu)	10 Solu Corridor (Kataari-Okhaldhunga-Solu)
20 Lomsom**	200 kW	20 Leknath-Pokhara	20 400 kW	11 Chhime-Trishuli	11 Chhime-Trishuli
21 Baglung	240 kW	21 Pokhara-Modikhola P/S	21 456,000 kW	TOTAL	917
22 Khandbari**	250 kW	22 Butwal-Lamahi	22 30,000 kW	132 kV Transmission Line	132 kV Transmission Line
23 Phidim**	240 kW	23 Lamahi-Jhimruk P/S	23 14,000 kW	1 Middle Marsyangdi-Khudi	1 Middle Marsyangdi-Khudi
24 Surnaivegad (Baitadi)	200 kW	24 Lamahi-Attaria	24 600,000 kW	2 Lamosangu-Barhabise HUB	2 Lamosangu-Barhabise HUB
25 Doti	200 kW	25 Attaria-Mahendranagar	25 32,000 kW	3 Gulmi-Arghakhanchi-Gorusinghe	3 Gulmi-Arghakhanchi-Gorusinghe
26 Rameshchhap	150 kW	26 Marsyangdi -M. Marsyangdi	26 400 kW	4 Ramechhap-Gariyang-Khimti	4 Ramechhap-Gariyang-Khimti
27 Terathum**	100 kW	TOTAL	592,400 kW	5 Kaski-Bhujung-Parbat-Kusma	5 Kaski-Bhujung-Parbat-Kusma
GRAND TOTAL	13,844 kW	66 kV Transmission Line	1,335,000 kW	6 Modi-Leknath	6 Modi-Leknath
472,994 kW	472,994 kW	1 Chhime P/S-Devghat P/S	1 37,000 kW	7 Samundrat-Naubise	7 Samundrat-Naubise
Existing (Isolated)		2 Trisuli P/S-Balaju	2 600,000 kW	8 Kohalpur-Surkhet	8 Kohalpur-Surkhet
1 Dhanukuta**	240 kW	3 Trisuli P/S-Devghat P/S	3 128,000 kW	9 Karmali Corridor	9 Karmali Corridor
2 Jhupra (Surkhet)**	345 kW	4 Devghat P/S-Balaju	4 42,000 kW	10 Baihang-Deeppayal-Attaria	10 Baihang-Deeppayal-Attaria
3 Gorkhe (Ilam)**	64 kW	5 Devghat P/S-New Chabel	5 400,000 kW	11 Hapure-Tulsipur	11 Hapure-Tulsipur
4 Jumla**	200 kW	6 Balaju-Lainchor	6 400,000 kW	12 Surkhet-Dalekh-Jumla	12 Surkhet-Dalekh-Jumla
5 Dhading**	32 kW	7 Balaju-KL1 P/S	7 1,335,000 kW	13 Kailgandaki-Gulmi (Jhimruk)	13 Kailgandaki-Gulmi (Jhimruk)
6 Syangja**	80 kW	TOTAL	1,335,000 kW	Sub-Station Capacity Existing	Sub-Station Capacity Existing
7 Helambu	50 kW	Power Plants Developed by IPP's		1 132/11 kV	1 186.00 MVA
8 Darchhula (I) & (II)**	300 kW	1 Khimti	60,000 kW	2 132/33 kV	2 470.50 MVA
9 Chame**	45 kW	2 Bhotokoshi	36,000 kW	3 132/66 kV	3 248.40 MVA
10 Taplejung**	125 kW	3 Chhime	22,000 kW	4 66/33 kV	4 25.00 MVA
11 Manang**	80 kW	4 Indrawati-III	7,500 kW	5 66/11 kV	5 485.20 MVA
12 Chaurjhari (Rukum)**	150 kW	5 Jhimruk	12,000 kW	TOTAL	1415.10 MVA
13 Syarpuudaha (Rukum)**	200 kW	6 Anandi Khola	5,100 kW	Sub-Station Under Construction	Sub-Station Under Construction
14 Bhojpur**	250 kW	7 Syange Khola	183 kW	1 132/11 kV Matairitha	1 22.5 MVA
15 Bajura	200 kW	8 Pilluwa Khola	3,000 kW	2 132/33/11 kV Syangja	2 38 MVA
16 Baihang**	200 kW	9 Rairang Lhola	500 kW	3 132/33/11 kV Damak	3 38 MVA
17 Arughat Gorkha	150 kW	10 Sunikoshi Khola	2,500 kW	4 132/11 kV Chapali	4 30 MVA
18 Okhaldhunga**	125 kW	11 Chaku Khola	1,500 kW	5 132/33/11 kV Matairitha	5 52.5 MVA
19 Rupaigad (Dadedhura)	100 kW	12 Khudi Khola	3,450 kW	6 132/33 kV Hapure	6 30 MVA
20 Achham	400 kW	13 Baramanchi Khola	4,200 kW	7 132 kV Hetauda (Kamane)	7 30 MVA
21 Dolpa	200 kW	14 Thooopal Khola	1,650 kW	8 132/11 kV Pathalya	8 22.5 MVA
22 Kailkot	500 kW	15 Sisme Khola	750 kW	9 132/33 kV New Marsyangdi	9 30 MVA
23 heldung (Humla)	500 kW	16 Seli Nadi	232 kW	10 132/33 kV Singati	10 30 MVA
TOTAL	4,536 kW	17 Preme Khola	995 kW	TOTAL	323.5 MVA
		18 Pati Khola	996 kW	Total Planned & Proposed Sub-Stations Capacity	Total Planned & Proposed Sub-Stations Capacity
		19 Seti-II	979 kW	1 Up to 400kV Voltage Level	1 1720 MVA
		20 Ridi Khola	2,400 kW	2 Up to 220kV Voltage Level	2 2805 MVA
		21 Upper Hadi Khola	991 kW	3 Up to 132kV Voltage Level	3 176 MVA
		22 Mardi Khola	3,100 kW		
		23 Mai Khola	4,500 kW		
		TOTAL	174,526 kW		

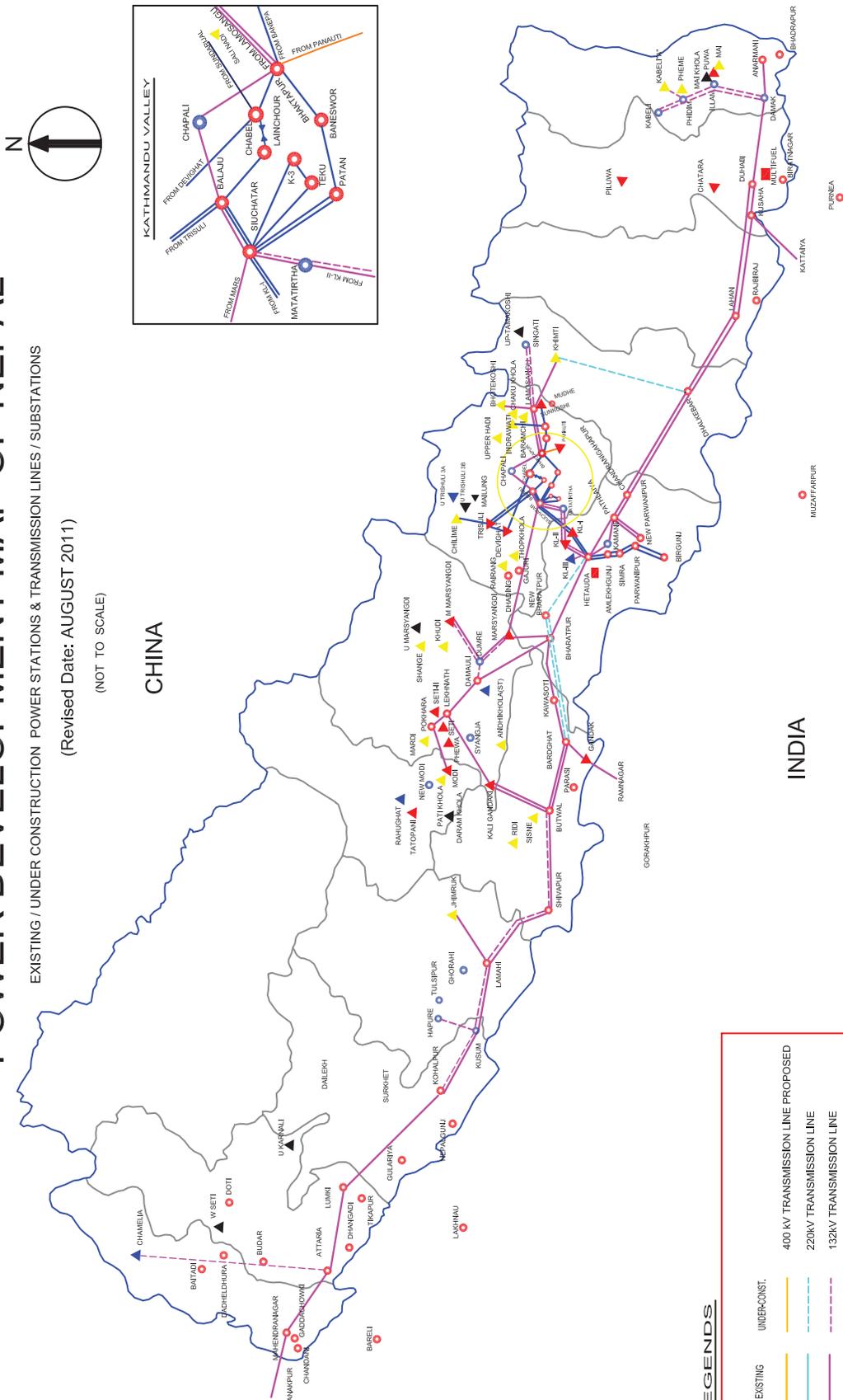
NOTE: * Line length within Nepal portion ** Leased to Private Sector *** Not in Normal Operation

POWER DEVELOPMENT OF NEPAL (Private Sector)

S.N.	Name of Company	Name of Project	Location (District)	Capacity (KW)
Projects In Operation(COD)				
1	Himal Power Ltd.	Khimti Khola	Dolkha	60,000
2	Bhotekoshi Power Company Ltd.	Bhotekoshi Khola	Sindhupalchok	36,000
3	Chilime Hydro Power Company Ltd.	Chilime	Rasuwa	22,000
4	National Hydro Power Company Ltd.	Indrawati - III	Sindhupalchowk	7,500
5	Butwal Power Company Ltd.	Jhimruk Khola	Pyuthan	12,000
6	Butwal Power Company Ltd.	Andhi Khola	Syangza	5,100
7	Syange Bidyut Company Limited	Syange Khola	Lamjung	183
8	Arun Valley Hydro Power Company Ltd.	Piluwa Khola	Sankhuwasava	3,000
9	Rairang Hydro Power Development Co. (P) Ltd.	Rairang Khola	Dhading	500
10	Sanima Hydro Power Company Ltd.	Sunkoshi Khola	Sindhupalchok	2,500
11	Alliance Power Nepal Pvt.Ltd.	Chaku Khola	Sindhupalchok	1,500
12	Khudi Hydro Power Ltd.	Khudi Khola	Lamjung	3,450
13	Unique Hydel Co. Pvt.Ltd.	Baramchi Khola	Sindhupalchowk	4,200
14	Thoppal Khola Hydro Power Co. Pvt. Ltd.	Thoppal Khola	Dhading	1,650
15	Gautam Buddha Hydropower (Pvt) Ltd	Sisne Khola	Palpa	750
16	Kathmandu Small Hydropower Systems Pvt. Ltd.	Sali Nadi	Kathmandu	232
17	Khoranga Khola Hydro Power Co. Ltd.	PHEME Khola	Panchtar	995
18	Unified Hydropower (P) Ltd.	Pati Khola	Parbat	996
19	Task Hydropower Company (P.) Ltd.	Seti-II	Kaski	979
20	Ridi Hydropower Development Co. (P.) Ltd.	Ridi Khola	Gulmi	2,400
21	Centre for Power Dev. And Services (P.) Ltd.	Upper Hadi Khola	Sindhupalchowk	991
22	Gandaki Hydro Power Co. Pvt. Ltd.	Mardi Khola	Kaski	3,100
23	Himal Dolkha Hydropower Company Ltd.	Mai Khola	Ilam	4,500
TOTAL				174,526

POWER DEVELOPMENT MAP OF NEPAL

EXISTING / UNDER CONSTRUCTION POWER STATIONS & TRANSMISSION LINES / SUBSTATIONS
(Revised Date: AUGUST 2011)
(NOT TO SCALE)



LEGENDS

EXISTING	400 KV TRANSMISSION LINE PROPOSED
UNDER-CONST.	220KV TRANSMISSION LINE
	132KV TRANSMISSION LINE
	66KV TRANSMISSION LINE
	GRID SUB-STATION
	HYDRO-POWER STATION
	IPP'S HYDRO-POWER STATION
	DIESEL/MP POWER STATION

NEPAL ELECTRICITY AUTHORITY
GRID DEVELOPMENT
TRANSMISSION LINE CONSTRUCTION DEPARTMENT
Prepared by : Dy. Manager Gagan Manandhar

