Nepal Electricity Authority

FY 2000/01
A YEAR IN REVIEW

Bhadra 2058 (August 2001)
Durbar Marg, Kathmandu

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Cover Photo : Construction of Power House at Kaligandaki 'A' HEP

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MESSAGE
From The Chairman

I am pleased to send this message to the annual publication of Nepal Electricity Authority entitled A Year in Review. I believe this year's publication will review NEA's activities over the past fiscal year, 2000/01 - the year that also marks NEA's sixteenth year of operations. At the outset, I must congratulate NEA for its achievement despite the constraints that it faces in terms of resources and challenges.

I am glad to learn that the NEA is credited for systematic planning of its development works as well as for the quality of its consumer services. This is in comparison to similar services in other utilities of South Asia. However, this does not imply an end to the efforts that NEA must put in to further improve and extend its services. Almost 85 percent of the populace still remain without an electricity supply and are thus deprived of modern amenities in life that electricity provides. Over the next three years NEA will attempt to extend its services to 300,000 consumers over all districts of the country through rural electrification oriented projects. NEA will also strive to provide these services at a cost that the common man can afford.

In the years to follow, NEA will put an end to unpopular measures such as load-shedding and frequent supply interruptions. NEA will work towards better customer relations like handling their complaints and responding to their inquiries. Foremost in importance, NEA must act instantly to end pilferage of electricity. Pilfering of electricity implies an unacceptable burden on the honest consumer paying for the theft that someone else commits. Over the next three years NEA will take appropriate steps to bring the level of losses to internationally acceptable levels. His Majesty's Government, meanwhile, will prepare adequate statutory grounds for NEA to fight the crime on legal grounds.

Apart from providing its services to its consumers, NEA must also keep abreast with the demand for its services and advancements and innovations in the power sector. NEA must recognize its strengths of its human resources and improve its weaknesses, such as system losses and financial resources. These must be weighted equitably to design its development works. I believe NEA has developed the appropriate expertise to undertake projects of increasing complexity and magnitude. Again, NEA must base its works on sound engineering and financial ethics and assure that transparency is maintained at all stages. In keeping with the aims of the free market NEA must inculcate healthy competition among providers of services.

Electricity must transcend political and cultural boundaries and providing to mankind a form of energy that is conductive to sustainable existence. In all undertakings, NEA must be aware of our fragile environment and the universal concerns to preserve our environs and our heritage. The plentiful hydropower that we possess in our many rivers that criss-cross the country can provide the energy that can make these aims possible. Hydropower in Nepal must be developed as the clean form of energy the world is looking for and also what the world is willing to pay for. I am glad that NEA continues to rely on the country's plentiful hydropower resources for its generation. Hydropower has been rightly acclaimed to be the resource that will lend to the country's economic upliftment.

Democratic values form an inseparable part of our thinking and all the Nepali people look forward to a better livelihood for himself, his children and the generations to follow. It will be an essential part of NEA's corporate aims to orient its institutional setup and its programs to build on and adapt to these aspirations. I believe the Annual review will help NEA to attain these goals and also to provide to all concerned with a better appreciation of NEA's diverse activities. Through the coming year I also wish NEA all the best in its operations and undertakings.

Bijay Gachchhadar

Bijay Kumar Gachchhadar
Minister for Water Resources and
Chairman, Nepal Electricity Authority

BOARD OF DIRECTORS

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Water Resources.

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Ministry of Water Resources

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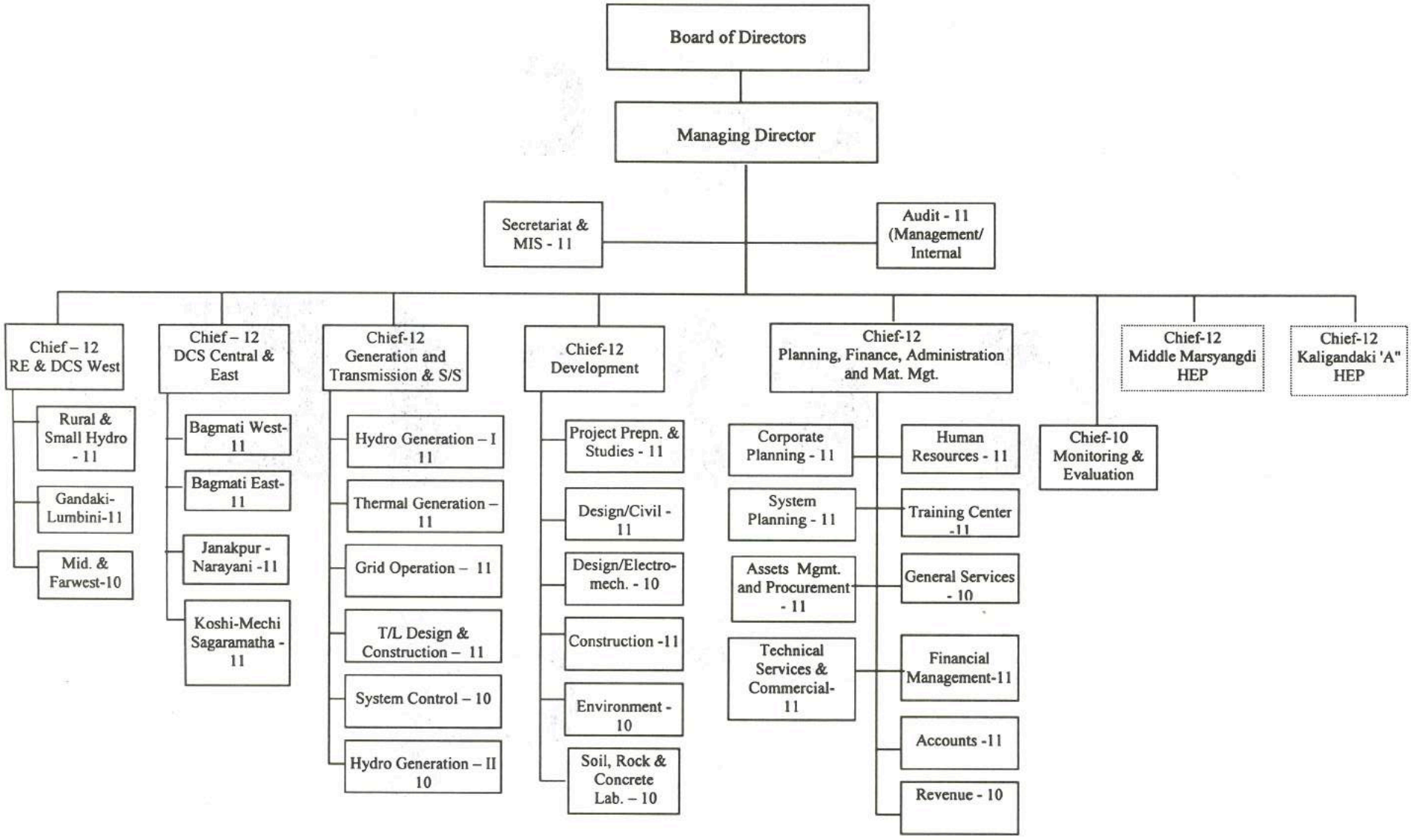
Mr. K. Baskota

Mr. R. B. Shrestha
President FNCCI

Member Secretary
Mr. Bishnu B. Malla
Managing Director, NEA

Corporate Structure of NEA



CHIEF EXECUTIVES

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Generation and Transmission & S/S

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Chief
DCS Central & East

Mr. B. C. Thakuri
Chief
Rural Electrification & DCS West

Mr. P.M.S. Pradhan
Chief
Planning Finance, Administration and Mat. Mgt.

Mr. D. R. Bhattarai
Chief
Middle Marsyangdi HEP

Mr. D. B. Thapa
Chief
Development

Dr. N. Kapali
Chief
Kaligandaki 'A' HEP

DIRECTORS & DEPARTMENT CHIEFS


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Mr B. R. Shrestha


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Mr R. P. Shah


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Mr U. K. Shrestha


Mr A. B. Kshatry


Mr L. M. Maskey


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Mr U. Vaidya


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Mr S. P. J. Rana


Mr K.P. Upadhyay


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Mr D. N. Singh


Dr J. Jha


Mr T. N. Thakur


Mr S. B. Shrestha

MANAGING DIRECTOR'S REPORT

As we enter into the second year of the new millennium and complete the sixteenth year of NEA's operations, I consider it my obligation to report the progress we made the past fiscal year 2000/01. Talking of transitions, during the past year we saw the ascent of His Majesty King Gyanendra Bir Bickram Shah Deva to the sovereign throne of Nepal. The past year also left behind memories of tragedy in the Royal Palace that will find a dark place in the pages of our nation's history. Through these events, in NEA we continued our works to meet our mission to maximise our contribution to the economic development of Nepal through the provision of electricity to our consumers in a sustainable, cost-effective and efficient manner. We also remain committed to achieve our corporate goals to be a financially viable, customer-oriented business entity, fully autonomous and accountable.

The Power Sector

Over the year, we continued to work under the universal concern for privatisation, commercialisation, regulatory functions and deregulation of differing concepts. These were the accepted panacea for efficient corporate performance and the outcome would be operations that are cost-effective, self-sustainable and transparent. We were poised to exist in a world of volatile finance and economics. We needed to create a mindset to be proactive and adaptable. Closer home, we also interacted with the government and international agencies in the preparation of the country's water resource strategy, reforms to the power sector and our hydropower policy. Over the year, we continued our efforts to promote the private sector to benefit from our immense water resources and provide the long-awaited impetus to our nation's ailing economy. We also continued to believe that we possessed in plenty a natural resource in the form of hydropower which the world would ultimately acknowledge as one that would lead to sustenance of a clean environment. There was no doubt that the world was set to promote clean energy. Mechanisms were being drawn up by world bodies to award those who promoted the generation of clean energy and thereby control the carbon content in the air which we and our future generations must breathe to live.

NEA has always been conscious of the necessity to improve its performance and turn towards appropriate reforms. Based on the concept of internal privatisation, one option that would create a more commercial oriented management within NEA without change in ownership of NEA's assets is the Profit Centre concept. This was earlier identified through a study of Commercialisation in NEA undertaken by NEA in 1998. NEA has decided to adopt this option for application in its distribution centres. Six of NEA's distribution and consumer divisions have been designated Profit Centres and nine more are expected to be so designated in the near future. Further in the future, these fifteen profit centres will be converted into fifteen public companies with sizeable public shares. In January, 2000, an in-house seminar was organised by NEA training Centre, Kharipati, to consolidate the concept of Profit Centres in NEA's operations.

The Supply Side

NEA's consumers have endured the

inconvenience of generation deficiency in the form of load shedding over the past decade. The turn of the century has brought in welcome relief with the coming on-line of two hydro-generation projects. Continuing this trend, the past year saw the completion of two more hydropower projects. Coming from NEA's own undertaking was the 14 MW Modi Hydropower Project that integrated into NEA's grid at the Pokhara sub-station in September 2000. Commencing commercial operations in January 2001, the entry from the private sector was the 36 MW Upper Bhote Koshi linking up at the Lamosangu sub-station. With the added generation, we attempted to remove load shedding but were compelled to retain some of this unpopular measure because of unusually low river discharge in the rivers used for generation. With the coming on-line of at least one 48 MW unit of the 144 MW Kali Gandaki A Hydropower Project in the first quarter of 2002, we will definitely see an end to load shedding ever after.

Planned generation to meet future demand also looked optimistic for the 70 MW Middle Marsyangdi Hydropower Project with the commencement of its civil works. Interest from donors for the engineering studies of the Chameliya (30MW) and Kulekhani III (42MW) hydropower projects also promised a healthy stream of generation projects even further into the future. With the mushrooming number of generation plants and sub-stations in the country, the state-of-art Load Dispatch Centre (LDC) designed to deliver swifter and more reliable control and dispatch facilities finally started construction at Siuchatar, Kathmandu. Construction of the Chilime (20MW) hydropower project by NEA's subsidiary, the Chilime Hyrdopower Co., continued as an entirely in-country effort but was somewhat upset by delays arising from retarding geological findings. Also in the future, joint ventures with private investors enter as a possible formula in hydropower development along BOT/BOOT lines. Such ventures are now being proposed for the Upper Karnali (300 MW), Khimti II (26 MW) and Thulo Dhunga (24 MW) hydropower projects.

NEA, in the meanwhile, retained its identity as the sole buyer of power generated by the Independent Power Producer (IPP). Interest shown by the IPPs was encouraging under market-strapped conditions. Following the issuance of survey and development licenses to BOT/BOOT promoters by the Ministry of Water Resources, several more IPPs sought to sell their generation to NEA including those for the projects of Madi I (20 MW), Upper Marsyangdi II/III (300 MW) and the Lower Modi (20 MW). Also, in accordance with the NEA's commitment to buy upto 50 MW of generation from small hydropower projects in the range from 1 -10 MW, power purchase agreements (PPA) were signed for purchase of power from the Syange (0.1MW), Pheme (0.95MW), Khudi (5MW) and Mailung (5MW) Khola Small Hydropower Projects. On the eve of the last fiscal year, NEA also entered into a agreement for power purchase with Butwal Power Co. (BPC) from their Andhi Khola and Jhimruk plants.

The Grid and Regional Prospects

Two major challenges came into sharper into focus for NEA's grid and transmission system - the delivery workhorse. The first was to strengthen the transmission capacity to handle the increasing generation capacity within the country. The second was to bolster the grid to enable it cash in on the country's immense hydro resource through regional exchange and wheeling opportunities. The urgency to rehabilitate the transmission system was evident in many overloaded industrial centres. NEA has attempted to improve this situation by rehabilitating sub-stations, introducing shunt capacitors and increasing the capacity of power transformers. Where possible, these were undertaken with NEA financial resources. Larger undertakings such as the upgrading the system voltage to 220 kV along the Hetauda-Bardghat section, the stringing of additional circuits and the construction of cross-border exchange links had to look to financing from international development banks and donors.

Cross-border enhancements was the key topic of discussion during the Sixth India-Nepal Power Exchange Committee Meeting which was held in Kathmandu in January 2001. The Meeting confirmed the in-principle approval of both Governments to increase the quantum of power exchange from a level of 50 MW to 150MW and further worked on a schedule to construct three additional 132 kV interconnection links to make

this enhancement possible. Both sides also agreed to study the feasibility of interconnection using high voltage direct current (HVDC) techniques for future exchange.

A very timely effort to boost regional co-ordination in energy use was undertaken by the USAID with the introduction of the South Asia Regional Initiative for Energy (SARI/E). The initial efforts of the initiative took the form of establishing interaction between senior officials of the South Asian countries. NEA has taken a proactive role by participating in more than twenty training programs, seminars, workshops and executive level meetings under the SARI/E banner. We need to keep in mind that a consensus among the nations for economical use of regional resources could mean large benefits for NEA. To be updated on the current situation, we have also sent our senior officers to participate in international events such as the Fourth International Conference on Hydropower Development (Hydropower 2001) held in Bergen, Norway, in June 2001.

Customer Orientation

Providing adequate quality supply of electricity and increasing accessibility to households at reasonable cost are major challenges that NEA continues to face. The introduction of democratic values combined with the dissemination of ideas by the media have give new dimensions to the peoples awareness and their right to good service from utilities. We must learn to work under these enlightened conditions to be a successful utility.

NEA's distribution and consumer services now covers consumers in all the districts of the country. But immense amounts of work remain to extend connections to consumers in the remote and rural areas of the country. Consumers benefiting from an NEA supply from its grid or isolated power plants remained in the neighbourhood of a negligible 15 percent although the coverage from the distribution facilities that NEA has constructed is in the neighbourhood of 32 percent. Rural electrification (RE) and its effective undertaking remains an area of heavy investment which needs to be built on an appropriate institutional structure. RE in Nepal is evidentially on the crossroads. A semi-commercial approach emerges as the viable solution embodying designs such as co-operatives and other forms of autonomous bodies.

Referring to other areas of the distribution and consumer services, there are also the important aspects of improving consumer relations, introducing a systematic consumer inquiry system and providing prompt attention to consumer complaint. To assist large consumers manage their electrical consumption better and provide a more systematic metering arrangement, time-of-day meters were introduced incorporating electronic meters which would be fitted with additional modems to provide telemetering and make possible remote monitoring of the consumer consumption.

An area of NEA's operations which continues to meet with loud public resentment has been the losses in its system. NEA has attempted to tackle this affliction by a series of projects and action plans but it is obvious that more concerted efforts will be required before the desired results are obtained. Given the financial resources, the reduction of technical system losses is physically possible with refurbishment and reinforcement of existing lines, installation of capacitor banks and other means. On the other hand, reduction of non-technical losses, and its pilferage implications, will need to be deterred by adequate statutory provisions to punish such violation of law. Presently, legislation in the form of an Anti-Pilferage Act awaits enactment in the Parliament and is expected to afford better control when put to use. It is evident that theft of electricity imposes undue burden on the honest consumer and eradication will ultimately depend not only on customer consciousness to stay away from such crime but also on the customer taking proactive action to prevent being cheated by the other person's criminal actions.

NEA's services to provide street lighting services to its consumers is another area that has led to stand-off with the entity liable for making the payments. Progressing from mere rhetoric and correspondence, last year concerted efforts were made to bring Mayors of Municipalities and other key players to the negotiating table to find a solution to the long debated issue. A two-day interaction was arranged in NEA's Training Centre at Kharipati in February 2001. As a subsequent result, the accumulated dues over a period of 10 years which totalled Rs. 720 million would be

paid up in a number of annual instalments. Of this figure, a sum of Rs. 175 million has already been paid by HMG with arrangements with the Municipalities. Also in agreement with the Municipalities, from the fiscal year 2001/02, NEA's expenses towards the provision of streetlights would be recovered by NEA from its customers.

Development and Finance

It is evident that development activities will remain a core NEA activity for many years to come. While development banks in the international circuits formed the sole resource for credit financing, added liquidity in the domestic financial markets now promise increasing availability of credit from domestic Lenders. However, major development activities in the near future will still be through credit from international Lenders such as the Asian Development Bank (ADB), World Bank, Japan Bank for International Co-operation (JBIC), and KfW.

The ADB credit for US$ 50 million, including a co-financing of a US$ 10 M loan from the OPEC Fund, to undertake the Transmission Distribution and RE project has been approved and is expected to see a loan effectiveness in the near future. The World Bank has a US$ 46.4 million credit allocated for NEA's undertaking of the Power Development Project (in conjunction with the Power development Fund) which encompasses transmission, distribution and institutional building activities. The credit is also expected to see loan effectiveness towards the end of the calendar year. DANIDA, meanwhile, still holds the interest to finance the construction of the 220 kV Hetauda-Bardghat transmission line with mixed credit Although investment from the private sector has eased off NEA investment in generation projects, the interest for the investors for NEA to come in as a partner in joint venture could set a new trend for the future.

Grant financing continues to form a part of NEA's development works. KfW commitments include grant financing for the construction of the state-of-art Load Dispatch Centre and the Middle Marsyangdi Hydropower Project, alluded to in earlier paragraphs. Japanese grant though JICA is active in the conduct of a feasibility study for the storage type Kulekhani III hydropower project in the district of Makwanpur, and a similar South Korean grant for the engineering report of the Chameliya hydropower project in the district of Accham. A Danish grant through their international co-operation agency, DANIDA, is active in the undertaking of the distribution and RE works in the districts of Kailali and Kanchanpur. A similar Swedish agency, SIDA, is opting to undertake a similar RE assignment in several districts of the far-west and mid-west development regions.

The USAID presence in NEA's activities made a welcome entry in the form of the Energy Partnership Program organised by the USEA. The program got off to a formal start last year with a signing ceremony in November 2000. The program is expected to broaden the perspectives of NEA's senior staff by enabling dialogue with counterparts from the American utilities of Tacoma Power and Wisconsin Electric Co. in the states of Washington and Wisconsin, respectively.

I believe more information on the projects I have referred to, and other projects that NEA is associated with, may be obtained from other sections of this Review.

In essence, the heavy up-front investment needed to carry out development works and the need to carry out its work in a healthy business atmosphere are important factors in NEA's application for tariff increases. The last increase was filed at the end of the past year and since been approved by the Electricity Tariff Fixation Committee. The Government has also approved the implementation of a semi-automatic tariff adjustment commensurate with the consumer produce index but limited to an increase of five percent per annum. In the meanwhile, we have made concerted efforts to curtail our expenses and achieve a trim fiscal management. We also succeeded to some extent in achieving a well-managed inventory and timely completion of audit reports. Such efforts on streamlining financial management will continue into the coming years.

Operational Performance

Over the financial year, the system peak of the interconnected system was recorded on January 18, 2001 at the level of 391 MW registering an 11.11 percent increase over the last winter's figure.

During the past financial year, the electrical energy available for use within the NEA system totalled 1868.42 GWh which was an increase of 166.97 GWh (9.81 percent) over the previous year's figure of 1701.45 GWh. This comprised of 1113.36 GWh obtained from NEA's hydro generation and 27.14 GWh from NEA's thermal generation. A total of 226.54 GWh was imported from Indian State Electricity Boards in accordance with the Power Exchange agreements and 501.38 GWh purchased from the Nepalese private generators. Despite generation additions, energy availability was marginal because of unusually low river discharge in rivers providing the generation. During these months, our generation plants performed well, and aided by efforts from grid maintenance and the LDC, we managed to pull off with a fair degree of availability and scattered application of load shedding.

Electricity sales totalled 1407.127 GWh – an increase of about 137.53 GWh (10.86 percent) over last year's sales figure. Internal sales within Nepal increased to 1281.127 GWh and accounted for 91.05 percent of the total sales and registered an increase of 106.859 GWh (9.1 percent) over the last year's figures. Exports to India increased to 126 GWh - an increase of 31GWh over last year.

Over the past financial year, the number of consumers grew by an estimated 91,418 (or 13.56 percent) over the previous year's figure to reach a total of 765, 397. The domestic category accounted for 95.64 percent of the total consumer numbers, 36.84 percent of the sales and contributed to 38.47 percent of the revenue. The industrial category formed only 2.31 percent of the total consumers, but accounted for 37.00 percent of sales and contributed to 35.57 percent of the revenue. Non-commercial category constituted 1.08 percent of the consumers, accounted for 5.20 percent of the sales and 7.36 percent of the revenue. Likewise, the commercial category constituted 0.45 percent of the total consumers, accounted for 6.69 percent of the sales and provided 9.27 percent of the revenue.

The financial picture remained encouraging for another year. NEA's net revenue totalled NRs.8901.2 million, an increase of 23.42 percent over the figure for the precious year. NEA's net fixed assets increased to reach an estimated NRs. 39.0758 Billion.

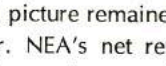
To improve our financial position, we made concerted efforts to improve and taking stern action against those charged on cases of theft and misuse of our supplies. To keep expenditures down, we attempted to cut down our costs in operation and maintenance. To exemplify NEA's commitment to achieve a trim administration, the number of employees has remained the same as they were ten years ago. The past fiscal year was outstanding in that there was not even a single new recruitment over the entire year. Instead, we endeavoured to improve the capability of the existing staff at all levels and faculties instead of their numbers. This is where our Training Centre is playing a very important role. For a full-fledged academic functioning of the spacious Training Centre, we look forward to investment from interested donors in the public or private sector.

Acknowledgement

To end this report I wish to take this opportunity to extend my sincere thanks to all associated with NEA's activities during the past year. I wish to acknowledge the goodwill of His Majesty's Government for the continued assistance and investment in our activities. Thanks are also extended to the Donors and Development Banks who have taken interest in our operations and made available financing for our development works. This acknowledgement would be grossly incomplete without thanking our consumers for staying connected to our supply lines and sharing some turbulent times together.

In the end I must thank the staff of NEA at all levels and offices for their continued support I have received from them. I believe our human resource is our biggest strength and we have within us the talent and capability to take NEA to new heights of success.

Thank You.



(Bishnu Bam Malla)
Managing Director

INTRODUCTION

Like any story of growing up, NEA has quietly reached its prime teens. Now sixteen, it has become evident that besides reaching a very sweet age, NEA has reached maturity in its thinking and action. The past year was star-studded with positive pointers for NEA. Examples -

- NEA's efforts to fight losses and theft in the system shored up support from the Government and the public. The Electricity Pilferage Act now awaits enactment in the Parliament. NEA geared up its structure to meet the challenges ahead. Anti-pilferage issues saw intense media offensive.
- Although conceived several years ago, definite steps were taken towards NEA's commercialisation functions. NEA has designated six of its divisions to function as Profit Centres.
- NEA took a hard look at its receivable accounts and was sternly proactive in bringing the defaulters to the negotiating table. Dues have started to be paid and more payments are committed. This applies more specifically to dues from the government and parastatals and the decade long stand-off in the payment of streetlight bills by the Municipalities.
- In keeping with NEA's commitment to trim its organisation and slice off expenses, there were no new recruitment of staff the last year. This helped fade NEA's portrait as a staff-bloated organisation.
- NEA's corporate planning took on firm roots. NEA now has a well-studied pipeline of generation projects and supporting grid reinforcements. A defect in planning smeared the entire past decade with generation deficiency and landed the customers with sometimes-severe load shedding. The private sector has joined in firmly in the generation area with BOT/ BOOT projects which redresses NEA's commitments and investment obligations in this area.
- NEA reviewed its generation picture and its seasonal hydrology related characteristics. Actions were initiated to close the nagging phase difference in generation and demand nature by looking towards enhanced exchange with India and promoting industrial use of electricity. The results of the Sixth India-Nepal Power Exchange Committee meeting produced positive agreements.

However, NEA operates in Nepal's power sector which is still in a state of flux. There is reportedly considerable duplication of responsibilities among the organisational units and an adequate regulatory mechanism needs to be set up. Again, the hydropower policy promotes private sector participation in the power sector and an institutional set up is required to reflect the stand.

What would be NEA's role in the midst of all the reform? There could be a number of issues here. One would obviously be the service-oriented role with NEA taking up its social obligations with more extensive commercial outlook. It is getting increasingly evident that the large extent of rural electrification that constitutes the future development agenda in power sectors development would best be dealt by a quasi-government set-up with a subsidy arrangement originating from the Government. Another issue emerges from private sector participation in power sector investment. NEA as (i) a licensed generator, (ii) the monopoly buyer of IPP power, (iii) the owner of the country's only load dispatch centre, and (iii) a promoter in a joint venture with IPPs from which it would buy back generation is a situation that could be incriminating.

But the fact that NEA is regarded as one of the best functioning utilities in the south Asian region will obviously catapult NEA into newer heights of institutional responsibility and success in the years to come.

SECTORAL REVIEW

NEA BOARD AND MANAGEMENT MATTERS

In the beginning of the FY 2000/01 the then Minister of Water Resources Mr. Khum Bahadur Khadka was the Chairman of the Board of Directors of NEA.

After the change in the cabinet, Prime Minister Girija Prasad Koirala took the portfolio of Ministry of Water Resources and State Minister of Water Resources Mr. Ram Bahadur Gurung was assigned to assume responsibility as the Chairman of NEA Board from August 28, 2000. On February 7, 2001 cabinet was reshuffled and Mr. Baldev Sharma Majgaiya became new Minister of Water Resources as well as Chairman of NEA Board. After the resignation of Minister of Water Resources Mr. Majgaiya State Minister of Water Resources Mr. Benup Raj Prasai became the Chairman of NEA Board from May 3, 2001. On July 26, 2001 new cabinet took oath and Mr. Bijay Kumar Gachchadar became the Minister of Water Resources and Chairman of NEA Board.

There were changes in the members of the Board of Directors also. Secretary of Ministry of Water Resources Mr. B.N. Sapkota retired and Mr. Lokman Singh Karki became new secretary of Ministry of Water Resources and Member of NEA Board. Similarly, Mr. Kishor Banskota was inducted to NEA Board as a Member from February 23, 2001 replacing Mr. P. P. Dahal and newly elected President of FNCCI Mr. R. B. Shrestha has replaced the outgoing President of FNCCI Mr. P. K. Shrestha.

GENERATION

In the FY 2000/01 the total available energy recorded was 1868.42 GWh (9.81% increase), the peak load recorded was 391.0 MW on January 18, 2001. Of the total available energy hydropower generated by NEA contributed 1113.36 GWh (59.59 %), thermal 27.14 GWh (1.45 %), Import from India 226.54 GWh (12.12 %) and purchase from Nepal 501.38 GWh (26.83%). The purchase from Nepal has increased significantly compared to the last year purchase of 169.3 GWh which is almost threefold increase. This is mainly due to increase in supply from Khimti Hydroelectric Power Project (HEP) and Bhotekoshi HEP.

The performance of major hydropower stations and thermal stations are as follows:

HYDRO GENERATION

Marsyangdi Hydro Power Station (HPS) Generation of Marsyangdi HPS was reduced to 430.986 GWh which is about 5.80% less than last year. This reduced generation is due to unfavorable hydrological conditions and "Take or Pay" contractual obligation of power purchase agreement with Khimti and Bhotekoshi HEP which compels NEA to purchase all the power generated from Khimti HEP and Bhotekoshi HEP irrespective of NEA's need.

Regular repair and maintenance works were carried out in Marsyangdi HPS. Some of the important repair works are as follows:

- Worn out runner of lower wearing ring of unit no.2 was replaced and damaged blades were repaired.
- The gate body of Radial Gate No.1 and concrete surface were repaired to stop heavy leakage of water.
- CDP (diamond) plates were repaired by using hard surfacing electrodes. Further, the right bank vertical concrete wall of Sluice Canal was also repaired by installing 9 pieces of MS plates of size 121.9 cm x 243.8 cm. x 1.5cm
- Logic card of governor of unit No.2 was replaced.

Necessary maintenance works were carried out but annual scheduled overhaul of unit No. 3 could not be carried out because of system requirement did not permit the shut down of this unit.

Kulekhani – I HPS: The generation of Kulekhani–I HPS in this fiscal year was reduced to 175.752

GWh which is about 29.61 % less than that of last year. The main reason being insufficient rainfall. Regular maintenance works were carried out on generator air coolers, generator exciters, SF_6 circuit breakers, air circuit breakers, etc. Some problems occurred in the governor system of unit No.2 which resulted in malfunctioning of automatic synchronization load control. The problem has been solved temporarily and permanent solution will be sought in the coming year.

Kulekhani – II HPS : In this fiscal year the generation of Kulekhani-II HPS was also reduced accordingly to 81.810 GWh which is about 33.36% less than that of last year. Regular maintenance works such as oil filtration of 3 power transformers; cleaning and maintenance of generator air coolers, governors and generator exciter of unit No. 2; commissioning of a new cooling water pump; etc. were carried out.

Problem of failure of electronic cards also occurred in the governors of both units causing problems in automatic synchronizing and load control. The governor of Unit No.1 has been fixed completely by replacement of the damaged cards and the governor No.2 will be repaired soon. At present, this unit is being operated in manual mode.

Thermal Generation

Addition of 116.2 MW of power from Khimti HEP (60MW), Modi Khola HEP(14 MW), Puwa Khola HEP (6.2 MW) and Bhotekoshi HEP (36 MW) in the Grid has greatly reduced the requirement for thermal generation this year. However, system was supported by generating 26.09 GWh of energy from thermal generation during this FY 2000/01 to meet the system energy and power requirement during the shortage period.

Most of the machines at Duhabi Multifuel Power Plant and Hetauda Diesel Power Plant are in operating conditions, however, major scheduled maintenance are planned to keep the machines in good operating conditions.

Grid Operation and Maintenance

Some of the major regular and routine preventive maintenance works carried out in the FY 2000/01 by the Grid Operation Department were as follows:

- 12 MVA, 132/33 kV transformer at Dhalkebar substation was shifted to replace the damaged 15 MVA transformer at Bharatpur substation and necessary major works were carried out at Baharatpur substation to install a new 30 MVA, 132/33 kV transformer
- 12.5 MVA damaged transformer at Dhalkebar substation was repaired and taken to Lahan substation where it is successfully operating.
- The old 3 MVA, 33/11 kV transformer at Anarmani substation was replaced by 7.5 MVA, 33/11 kV transformer from Rani substation.
- Preparatory works for the installation of 20 MVA transformer with new bay in Damauli substation were carried out.
- Six old VCBs in Anarmani and 5 old VCBs in Kohalpur substation were replaced by new ones.
- SF_6 circuit breaker received from Kaligandaki-A HEP was used to replace old MOCB of 132 kV Pokhara feeder at Bharatpur substation
- Old damaged earthing transformer was replaced at Simara substation.with a new one.
- Two sets of old OCBs and panels for a 3.15 MVA transformer at Parwanipur substation were replaced with new VCBs.
- Tower protection works were carried out in Mid Western, Far Western and Eastern branches and rerouting of three 132 kV towers at Surainaka under Western Transmission Branch is almost complete.
- Maintenance works for breakers and other accessories were done in Bharatpur, Hetauda, Anarmani substations.
- About 158 new electronic meters were installed in substations under Eastern Branch (50), Mid Division (8) and Bagmati Transmission Grid Division (100).
- Relays testing, calibration and resettings were done in some substations.

Transmission Line Design and Construction Department

Transmission Line Design and Construction Department (TLDC) is responsible for design and construction of grid transmission system of NEA, which includes transmission networks and substations. TLDC initiates the transmission projects recommended by the System Planning Department and prepares all the preparatory works for project implementation and monitors the projects under implementation.

In the FY1999/00 Khimti-Bhaktapur-Balaju 132 kV transmission line project and Chilime-Trishuli-Devighat 66 kV transmission line project were completed.

In this FY 2000/01 the following transmission line & substation projects are under constructions:

- Hetauda-Dhalkebar and Butwal-Bardaghat 132 kV Second Circuit transmission line project.
- Banepa and Panchkhal 66 kV substation project.
- Modi Khola substation expansion project.

- Butwal-Sunauli 132 kV transmission line project.

Detail engineering survey works for the proposed 132 kV Indo-Nepal power exchange interconnections and Environment Impact Assessment (EIA) for proposed Kathmandu Valley 132 kV Ring Main T/L and Pathalaiya-Parwanipur 132 kV transmission lines are completed.

Following Projects are planned for implementation :

- Thankot-Bhaktapur 132 kV (Kathmandu Valley 132 kV Ring) Transmission Line Project.
- Parwanipur-Birgunj 132 kV Transmission Line Project.
- Dhalkebar-Bhittamod 132 kV Transmission Line Project.

Load Dispatch Center

Launching of commercial operation of Bhotekoshi HEP (36 MW) in this FY 2000/01 supplemented the Integrated Nepal Power System to cope with the rising peak demand which is a welcome development. But this development increased suplus energy during the wet season without increasing much of peaking capacity during dry season when demand is highest. Accordingly, this has added further challenge to the operation of load dispatch center.

DISTRIBUTION & CONSUMER SERVICES

Distribution and Consumer Services (DCS) is one of the prime activities of NEA which includes of distribution and consumer services to consumers in integrated as well as isolated supply areas. The responsibilities of DCS involves supplying consumers with electric power and collecting revenue from them. Though at present only 15 percent of people are being supplied but about 32% of population have access to electricity.

The main functions undertaken by DCS are: (i) to plan, design and implement the distribution system up to 33 kV; (ii) to operate and maintain the distribution network; and (iii) to execute the meter reading, billing and revenue collection from the consumers. Electricity has reached district headquaters of all the 75 districts (74 districts from NEA and Solukhumbu district from a joint venture of NEA and a private company). However, at present only 57 districts are connected with the central grid, 2 districts have solar electricity supply and the remaining districts receive electricity supply from small hydropower. Total number of consumers and energy sold for FY2000/01 are 765397 and 1407.127 GWh respectively which are higher than that of last FY (1999/00) by 13.56% and 10.86% respectively. Total internal sales within Nepal increased to 1281.127 GWh and accounted for 91.05 % of the total sales and registered an increase of 106.853 GWh (9.10 %) over the last year's figure.

The regional breakdown of number of consumers and sales are shown in the table below:

Geographical Region	Regional Office	Consumers (No.)	Sales (GWh)
Central	Bagmati West	164330	363.339
	Bagmati East	115880	134.100
East	Eastern	127285	307.438
	Central	140600	346.434
West	Western	151470	187.851
	Mid and Far Western	65832	67.965
	Total	765397	1407.127

The domestic category of consumers accounted for 95.64 % of the total consumer number, 36.84 % of the sales and contributed 38.47 % of revenue. The industrial category consumers is only 2.31 % of the total number but consumed 37 % of the sales and accounted for 35.57 % of the revenue. Non-commercial category constituted 1.08 % of the consumers and accounted for 5.20 % of the sales and 7.36 %of the revenue. Likewise, the commercial category constituted 0.45 % of the total number, consumed 6.69 % of the sales and provided 9.27 % of the revenue.

DCS maintained its good relations and contacts with the consumers and conducted several programs in this direction like improvement in the quality of supply, introducing effective communication system, conducting public awareness programs regarding payment of bills, meter readings, accidents, loss reduction and safety through electronic media and newspapers, etc.

Despite the concerted efforts to curb the system loss, it remained a burning issue for NEA. DCS has undertaken various measures like installation of ABC cables, launching of public awareness program, regular and through inspection of big and medium consumers, correct metering system and introducing electronic meters in its network to reduce the losses. Yet it requires the continued and committed efforts from all walks of society to control the losses. An act related to control of unauthorized leakage of electricity has been submitted to HMG and is expected to be approved by the Parliament very soon.

For commercial operation, improved efficiency, better accountability and institutional strengthening of NEA, 6 distribution center are being run under the concept of profit center. One Profit Center has been chosen from each regional office and they are expected to achieve and fulfill the target regarding reduction of electricity losses, cutting the expenses, increasing the revenue and cash-flow and providing quality services to its consumers. In the coming FY 2001/02 the concept of profit center will be further expanded to 9 additional distribution branches and will be implemented as a separate project.

Small Hydropower and Rural Electrification

The responsibilities of Small Hydropower (SHP) and Rural Electrification (RE) sector includes of construction and maintenance of isolated small hydropower stations and the rural electrification around the SHPs and the extension of the National Grid to the remote and difficult hilly region along with the distribution works.The rural electrification works in 34 districts of the Kingdom are in progress of which 16 districts have been connected to the National Grid. Two districts Mugu and Humla have solar electric supply and 14 districts have electricity from small hydropower plants and 10 districts have partial supply from small hydropower plants in isolated mode. With only 6% of the population of these districts having electricity supply SHP and RE Department is actively engaged in trying to provide electricity to the remaining parts of these districts.

In the FY2000/01 nearly 80 km of 33 kV line, 120 km of 11 kV line and 350 km of 400/230 V line have been constructed and 60 distribution transformers have been installed increasing the capacity by 1.5 MVA. Nearly 6000 new consumers have been added.

DEVELOPMENT

The main activities carried out under Development Sector are as follows:

Project Identification Program

The Project Preparation and Studies Department identifies various new medium to large sized hydropower projects in Nepal. In the FY 2000/01, desk studies of seventeen hydropower projects in Eastern, Central and Western Development Region of the country have been carried out. Out of these seventeen projects at desk study level, four projects have been studied at reconnaissance level. The main features of the projects are summarized in the following table.

Name of t the Project	Development Region	District	Installed Capacity (MW)	Design Discharge (m^3/s)	Gross Head (m)	Annual Energy (GWh)	Type
Hewa Khola	Eastern	Panchthar	21.0	15.7	160	115.2	R-O-R
Ghunsa Khola	Eastern	Taplejung	100.0	19.8	600	545.4	R-O-R
Dudh Koshi-A	Eastern	Okhaldhunga	38.0	53.17	85	215.8	R-O-R
Lower Myagdi	Western	Myagdi	13.0	25.5	60	72.3	R-O-R

Environment

Since the beginning of 1980s, environmental issues have become an important aspect of the government's policies in development projects. HMG/N has promulgated the Environmental Protection Act, 1996 and the Environment Protection Rule,1997 (First Amendment 1999). This rule has made it mandatory to carry out Initial Environmental Examination (IEE)/ Environmental Impact Assessment (EIA) and Environmental Auditing (EA) for development projects. Projects that require IEE are transmission lines up to

66 kV, rural electrification of 1 to 6 MVA, hydropower projects of 1 to 5 MW. The projects that require EIA are transmission lines above 66 kV, rural electrification of more than 6 MVA, hydropower projects above 5 MW and thermal electricity generation plant above 1 MW.

NEA- Environmental Division (ED) was established to take all environmental issues into consideration when developing projects. It conducted the following works in the FY 2000/01.

- Fieldwork of Lalitpur 33 kV substation transmission line and 33/11 kV substation project was completed. ToR has been forwarded to Department of Electricity Development (DoED) for approval.
- Scoping of Upper Tamakoshi HEP for EIA, prepared its ToR and submitted it to DoED for approval.
- Coordinated and supervised the work of the consultant GEOCE for carrying out the EIA of Upper Modi-A HEP. Final Draft Report has been submitted to DoED for approval.
- EIA Report of Kulekhani-III HEP has been forwarded to Ministry of Water Resources (MoWR) for approval.
- Carried out the scoping of Chameliya Gad HEP for EIA and ToR preparation is under process.
- Completed the preparatory work for carrying out Goplingtar Lift Irrigation Project at Marsyangdi HEP affected area.
- Coordinated and supervised the work of the consultants for carrying out IEE of Rural Electrification and Distribution Strengthening Project in 37 districts:

NEA-ED organized successfully the Environmental Training (April 23-May 9, 2001) to NEA staff, Level 6, 7 and 8 from different offices and disciplines. 28 persons partici-

pated in this training. Resource persons of NEA, Ministry of Population and Environment, Tribhuwan University, etc. imparted concise and fruitful environmental know-how on different aspects and current trends of environment.

Electromechanical Design Division

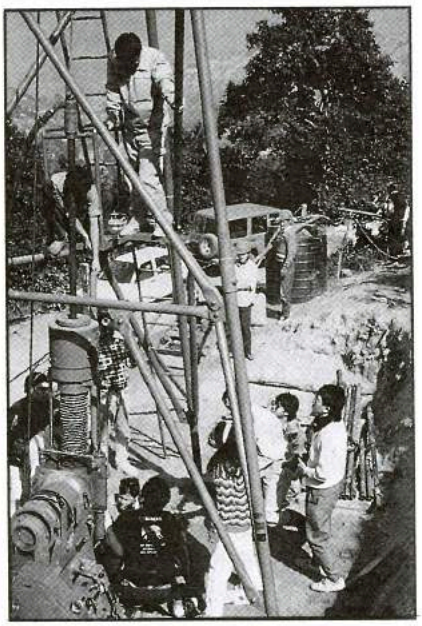
In the FY2000/01 Puwa Khola HEP (6.2 MW) and Modi Khola HEP (14.8 MW) were completed. Electromechanical Design Division was involved in testing and commissioning of both these projects.

This division is working as the engineering consultant for Chilime HEP (20 MW) which is under construction. The design of Pelton turbines, overhead cranes, gates and valves, generators, transformers etc. are complete and many of these equipment are at site. In the FY 2000/01 the division has completed the electromechanical feasibility study of the Kulekhani-III HEP and Upper Tamakoshi HEP. This division is engaged in preparation of the tender document of Chameliya HEP (30 MW) and in the rehabilitation of power stations.

Soil, Rock and Concrete Laboratory

The Soil, Rock and Concrete Laboratory (SRCL), a Unit of NEA was established in 1986 to provide professional consulting and advisory services on commercial basis in accordance with NEA Act. The laboratory management is controlled, supported and guided by the SRCL Board with the Chief of Development acting as the Chairman and laboratory Chief as the member secretary.

This unit was originally established as a specialized unit to provide services on exploration of construction sites and testing of construction materials. It has been involved in one way or another in almost all of the hydropower projects which have been studied, under



construction or have completed. Presently, it has been providing consulting services not only in the fields of geotechnical engineering, hydrology and topography but also in other fields such as design works, environmental studies such as Environmental Impact Assessment, Social Impact Assessment, Acquisition Compensation and Rehabilitation Plan for all power projects.

Some of the areas of expertise of this laboratory are :

- Field exploration including survey, exploratory diamond core drilling as deep as 250 m, drilling in soil, penetration tests, test aditing, geophysical prospecting, ground monitoring, slope design and analysis, instrumentation of natural as well as cut/fill slopes, etc.
- Construction material investigation including field works, material sampling, field and laboratory testing and establishment as well as operation of field laboratory. It is capable of handling works of any scale.
- Feasibility (Technical and Economic) and Design of hydropower projects covering hydrological, hydraulic studies, design of infrastructures such as roads, bridges, houses, water supply schemes, electrification systems, etc.
- Construction management as well as construction supervision of hydropower projects.
- Study of glacial lakes as well as natural and artificial lakes and reservoirs, study of reservoir sedimentation.
- Environmental Impact Assessments.
- Cadastral mapping including land acquisition assistance, negotiation and payment.
- All other studies related to rivers, water resources, hydropower and energy, etc.

Concrete Pole Plant, Amalekhgunj

The Pre-stress Concrete (PSC) Pole Plant was established in December, 1994 under the Seventh Power Project at Amalekhgunj, Bara district. It has the production capacity of 1400 pieces of PSC poles of different sizes. This plant is now under the supervision of the Construction Department.

The plant consists of following equipment:

a) Concrete mixing plant with a capacity of 15-20 cu.m. per hour, 0.5 cu.m. per batch.

b) Steam boiler machine with a capacity of 3 tons per hour.

c) Moulders of 11 m. (4 sets), 9m. (10 sets) and 8m. (15 sets).

d) Main gantry crane with a capacity of 5 tons and yard gantry crane with a capacity of 2.5 tons.

e) Tensioning equipment with a capacity of 350 ton.

Central Workshop : Under the IDA loan for the Power Sector Efficiency Project (PSEP), the Central Workshop of NEA was established in 1998 at Hetauda, Makawanpur district in Narayani Zone. After the completion of the project the workshop is running under Electro-mechanical Division.

The function of the workshop has been divided into two sections: (1) Repair and maintenance of distribution transformer up to 500 kVA and (2) Operation and maintenance of heavy equipment.

Transformer Workshop: Transformer Workshop has equipment such as lathe, shaping, bench drill machine, grinders, air compressor, gas welding, 25 ton electric overhead traveling crane, electric oven for distribution transformer, electric oven for power transformer (under construction), transformer testing equipment, etc. It has various testing facilities also.

Operation and Maintenance of Heavy Equipment: The workshop has various kinds of heavy equipment such as 12 and 25 ton wheel cranes, 2.3 m^3 wheel loader, 1.3 m^3 backhoe, 26 and 30 ton bulldozers, 8 ton dump trucks, 30 ton tractor trailer, 7 ton flat bed trucks, road roller, grader, etc. The workshop is providing equipment services on hire basis to various government organizations and NEA projects such as Kulekhani Disaster Prevention Project, Ilam, Chilime, Chameliya, Kaligandaki, Modi Middle Marsyangdi, Trishuli, Devighat, Sunkoshi HEPs, etc.

Rehabilitation Work of Existing Hydropower Stations : Civil Design Department has provided technical support for rehabilitation of Trishuli HPS and Devighat HPS. The rehabilitation works include repair of under sluice at the barrage, forebay and power channel.

The scouring at under sluice gate No. 5, 6 and 7 of flushing gate of Trishuli HPS was repaired by concrete fill anchored with steel plates whereas the scouring area of about 600 m^2 and 4.20 m deep at forebay of Devighat Hydropower station was backfilled with suitable fill material and was covered by reinforced concrete slab. The slope failure in the left side of forebay was protected by 5 m high stone masonry wall. The concrete slabs in power channel were replaced by new concrete slabs and minor repair works were carried out. Furthermore the department is continuing the study for other required rehabilitation works for Sunkoshi and Panauti HPS.

HUMAN RESOURCES

The total approved positions of staff in NEA during the fiscal FY 2000/01 is 9470 and total number of permanent, temporary and daily wage staff currently being employed is 9694.

NEA has undertaken many personnel welfare activities to boost the morale of its staff. These welfare activities include personal loans, financial assistance to the needy staffs and supports to the families of staffs who died during accidents. Personnels have been covered under life insurance and accidental insurance policies also.

During the year under review (2000/01) 8 staffs have resigned, 99 staffs have been retired and 40 staffs have died.

A total of 294 staffs were promoted in the FY 2000/01 of which 34 were officer level and 260 were assistant level.

In order to maintain discipline, actions were taken against 11 staffs of whom 6 were suspended and departmental actions were taken against 5.

Training was imparted 347 staffs out of which 263 received training in Nepal and remaining 84 received training aboard.

Personnel Status Fiscal Year 2000/01

Level	Service	Approved Position				Existing Situation		
		Regular	Pool	Total	Permanent	Seasonal	Daily Wage	Total
Officer Level	Technical	845	45	890	677	100	7	784
	Administration	368	0	368	307	10	0	317
	Total	1213	45	1258	984	110	7	1101
Assistant Level	Technical	5039	173	5212	4140	563	741	5444
	Administration	2707	293	3000	2429	319	401	3149
	Total	7746	466	8212	6569	882	1142	8593
Grand Total		**8959**	**511**	**9470**	7553	**992**	**1149**	**9694**

Staff Training FY 2000/01

	Abroad	In-country
Higher Studies	2	9
Seminars, Workshop, Conference, etc.	8	223
Inspection	4	-
Training	70	31
Total	**84**	**263**

Note staffs trained in the NEA Training Centre is not included.

NEA Training Center

NEA Training Center continued its efforts during the FY2000/01 for enhancing human resource development of NEA's employees. Following works were carried out by the center:

- A steering committee named as Training Center Management and Development Committee was formed coordinated by Chief, Human Resources and Administration and represented by Chiefs of Finance, Human Resource and Corporate Planning for guidance to the Center. Training Center Chief is the member secretary of the project. The Center started operation of all its facilities for academic purposes with restoration of hostel, cafeteria and library facilities.
- The Center conducted several management, technical and functional enhancement training programs based upon NEA's needs. In this regard 475 NEA employees were provided training in different technical and non-technical courses. This included 7 courses in management, 6 in generation, 7 in information technology, 5 in distribution and 5 in other fields.
- 36 officer level staff were deputed on short-term training and seminar programs in India in the field of technical, finance and information technology.
- Syllabuses for different courses in the field of power generation, hydropower, transmission, distribution, management and information technology were prepared and approved for implementation.
- Tariff was approved for renting of physical facilities, equipment and other facilities of the center to the clients outside of NEA.

LEGAL ASPECTS OF NEA

The Legal and Arbitration Division of NEA performs legal activities, and provides legal advice to the management in all legal aspects which include power purchase and contract agreements with different companies, joint venture programs, power theft and pilferage cases, etc. In the FY 2000/01, 33 new cases were filed. In the FY 2000/01, with the 30 pending cases of the previous year there were a total of 63 cases of which verdict went in favor of NEA for 10 cases while 11 cases were against NEA and 2 cases were settled by mutual agreement. So 40 cases are under consideration. Most of the cases belong to the misuse of electricity, billing differences, land acquisition, termination of services etc.

PLANNING

Planning as usual is busy updating data, carrying out system plans, preparing the Corporate Plans and monitoring and evaluating the projects of NEA.

System Planning Department: As its regular proceedings, System Planning Department updated the load forecast which had been prepared by Norconsult in 1997. It carried out generation expansion plans including the projects for which PPAs had been signed. Several different scenarios were studied. Transmission studies were also carried out based on different generation expansion plans. This department also provides technical support to other departments of NEA for carrying out load flow and power system studies and contingency analysis of the power system.

Corporate Planning Department This Department has as usual been dealing with independent power producers (IPPs) and has signed or is in the process of signing several power purchase agreements (PPAs), it is very heartening to know that more and more private companies are showing keen interest in developing hydropower projects in Nepal. The Corporate Development Plans were also prepared and this is updated every six months. Projects such as Nepal Electricity Utility Statistics 2000 was successfully undertaken and a lot of useful data has been painstakingly compiled.

Partnership programs in the energy sector have been sponsored by USAID and managed by United States Energy Association (USEA) for the formation of partnerships between utilities in the USA and those in several countries in Asia, Africa, the Baltic countries and Central America. The aim of these partnerships is to foster development of ideas through the exchange of visits by delegates from the utilities of the two countries and to explore areas where further assistance could be provided.

A signing ceremony in the presence of the Minister of State for Water Resources, Hon. Ram Bahadur Gurung and the US Ambassador to Nepal, His Excellency Ralph Frank, was held on November 2, 2001 in Kathmandu in which Nepal Electricity Authority signed agreements with Tacoma Electric and Wisconsin Electric Power Co., from the states of Washington and Wisconsin respectively. Mr. Bishnu Bam Malla, Managing Director, signed on behalf of NEA and Mr. Steven Klien, Superintendent and Mr. Richard White, Vice President, signed on behalf of Tacoma Power and Wisconsin Electric, respectively. The signing ceremony

indicated the formal commencement of the energy partnership program between NEA and the two US utilities. The partnership program will initially be for a period of two years and will focus on discussing current issues such as loss reduction and metering, tariff issues, computerization and the independent power producer.

As programmed in the exchange, three delegations from NEA have visited department of interest at the two utilities in the USA and an equal number of delegations from the US utilities have visited Nepal to continue discussions in the areas of common interest. The partnership has been useful to NEA in bolstering its confidence in the understanding of current issues by sharing the experiences which the US utilities have faced in similar situations.

FINANCE AND ACCOUNTS

NEA's financial performance remained encouraging for FY 2000/2001. NEA's total revenue increased by NRs. 1688.8 million (23.42% increase) to reach a figure of NRs. 8901.2 million as compared to NRs. 7212.4 million in the previous year. NEA's revalued assets increased to 39075.8 million as compared to NRs. 35195.7 million in the previous FY 1999/00. Expenditure in operation and maintenance have increased by 39.3% reaching a figure of NRs. 8255.3 million as compared to NRs. 5925.0 million in fiscal year 1999/00. Overall, NEA registered a net profit before tax of 409.2 million as compared to NRs. 756.5 million in FY 1999/00.

In FY 2000/01, NEA has invested NRs. 8972.0 million in capital works and projects, the funding of which comprised of NRs. 974.07 million equity, NRs. 7092.51 million from borrowing and the rest from NEA's own resources. NEA also has invested NRs. 475.0 million in the Chilime HEP which is being developed by a subsidiary company. By the end of FY 2000/01 NEA's total borrowing stood at NRs. 37255.7 million and a total of NRs. 1523.76 million as debt service.

The financial audit for FY 1999/00 has been completed. The audit for the year 1999/00 was undertaken by auditors M/S Price Waterhouse, India, Chitracar Sharma & Co. of Nepal. For the financial audit of FY 2000/01 auditors M/S Price Waterhouse, New Delhi and Chitracar Sharma & Co., Nepal have been appointed. Tax assessment for the FY1994/95, 1995/96 and 1996/97 are in final stage and assessment for the FY1997/98, 1998/99 and 1999/00, are in process.

Management Information System

The MIS Department of NEA is working hard in setting up a computerized network within NEA headquarters and linking it with some offices of NEA outside Kathmandu Valley via telephone network system. This network system will be used for providing management information system (MIS) reports also on a regular basis. The installation of computerized network system is almost complete and the system will be commissioned in the FY 2001/02. The development of customized application software for producing MIS reports is also almost complete and is under testing.

To improve revenue performance in some of the branches under distribution and consumer services, MIS Department has undertaken to extend existing computerized billing system of Kathmandu West Division to Kirtipur, Biratnagar, Janakpur, Birgunj, Bhairahawa and Nepalgunj. The computerized billing system in Kirtipur is already in operation while computer hardware have been already installed in the remaining 5 places for computerized billing system and they will be in operation in the FY 2001/02.

Internal Audit

In order to improve auditing functions Internal Audit Department introduced revenue auditing software which was developed with the help of a local consultant and which was found to be very useful for consumer and revenue auditing.

To familiarize ledger clerks with this software training was given to 115 ledger clerks at the NEA training center.

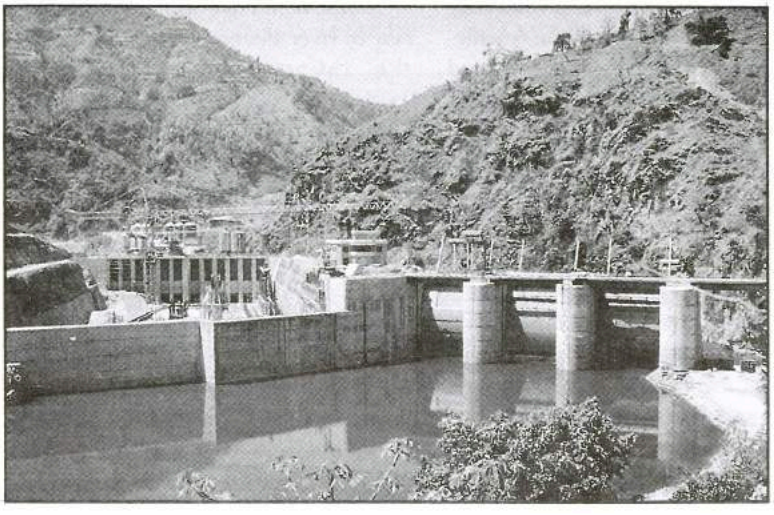
To ascertain losses of distribution transformer a pilot project was undertaken to install meters on all the transformers of Pulchowk branch (177 transformers) and Baneshwer collection center (167 transformers) which will be completed by September 2001.

PROJECT HIGHLIGHTS

Kaligandaki - 'A' HEP

Kaligandaki-A is located approximately 180 km west of Kathmandu on the southern edge of middle mountains on the Kaligandaki river in Gandaki zone. This project is a run-of-river type hydroelectric scheme, with an installed capacity of 144 MW, with peaking capability of 6 hours even during the dry season. The project is expected to generate 842 GWh of energy annually using a power tunnel of about 6 km length. The power generated from the project will be evacuated to the central grid through 132 kV transmission lines to Pokhara and Butwal. The total cost of the project is estimated to be US$ 452 million which is being funded by HMG, NEA, Asian Development Bank and Bank of Japan for International Cooperation.

The contract for consulting services for design and construction supervision works was awarded to Morrison Knudsen International Inc. in association with Norconsult International and IVO International. All the construction works such as civil works, hydraulic steel works, electrical and mechanical works, and 132 kV transmission lines and substations are in place. The contract for civil works was awarded to Impregilo SpA of Italy; hydraulic steel works to Noell Stahl of Germany; electrical works to Mitsui/Toshiba/Alstom Joint Venture; mechanical works to Mitsui/Toshiba Joint Venture and 132 kV transmission lines and substations to TATA/Marubeni Joint Venture.



Though the project was originally supposed to be completed by the end of 2000, unfavorable geological conditions, delay in the commencement of civil works and several local problems have delayed the project. The latest review of the work schedule carried out by the Consultants shows that the wet testing of the first unit is expected to be started around end of December, 2001, while the project is anticipated to be completed by March, 2002. The tunnel breakthrough ceremony was celebrated in the presence of the then Hon. Minister of State for Water Resources Mr. R.B. Gurung on January 26, 2001. All the three spillway radial gates in the main diversion dam were successfully installed on March 15, 2001. Electro-mechanical works, transmission line tower erection and stringing of transmission lines are at the final stage and the Lekhnath substation has already been charged since January, 2001. The transmission line works in Pokhara sector suffered due to site access and land clearance denials posed by local residents at 13 tower sites. A solution has been reached through negotiations. However, the agreement has yet to be implemented and work remains suspended. The overall progress of the project achieved so far is about 90%.

Middle Marsyangdi HEP

The Middle Marsyangdi HEP, with an installed capacity of 70 MW, is a peaking run-of-river hydropower scheme located about 170 km west of Kathmandu in Lamjung district. The Government of Federal Republic of Germany (through KfW), His Majesty's Government of Nepal and NEA are jointly financing the project. An European consulting firm Fichtner Joint Venture is the engineering consultant and the local consulting firm TAEC-NESS is the environmental consultant of this project.

The major structural components of the project are a 62 m high 95 m long concrete and rockfill dam, a 1.6 million m3 capacity peaking reservoir, three 12m x 19.5 m spillway gates, underground desanding caverns, 5210 m long power tunnel, a surgetank, a 450 m long penstock and a surface powerhouse equipped with 2 Francis turbines of 36 MW capacity each. The project will generate about 398 GWh of annual energy, which will be evacuated through 41 km long 132 kV transmission line to the national grid at the existing Marsyangdi Power Station.

The project work has been divided into several Lots such as Lot C, Lot C-C4, Lot HSS, Lot M, Lot E, Lot SSI, Lot SS2 and Lot TRL. Out of the above lots, contract agreement has been concluded for Civil Works (Lot C) with the lowest evaluated bidder Dywidag-Dragados-CWE Joint Venture on June 25, 2001 and the contractor has already started the mobilization, site installations and survey works at the project area. The work of NEA and Engineer's Camp (Lot C-C4) is being carried out by Tundi-Lama Joint Venture. The camp contractor's work for roads, power lines, boundary wall, foundation and erection of temporary and permanent buildings is ongoing. Tubewell drilling has reached the necessary depth and permanent pump has been installed. Nine pre-fabricated houses have already been shifted to the NEA Camp from the existing Marsayngdi Hydropower Station. Tender (financial proposals) received for Hydraulic Steel Structure (Lot HSS) and Mechanical Equipment (Lot M) are being evaluated by the consultant and tenders have already been invited for Electrical Equipment (Lot E) and 132 kV substation (Lot SSI). Offer obtained for GIS Switchgear (Lot SS2) is also being evaluated. Tendering for Transmission Line (Lot TRL) will be started soon after receiving of the tender documents from the consultant.

The Environmental Impact Assessment (EIA) of the project was carried out in 1997 during the upgrading of feasibility study. Since HMG/N has made changes in the Environmental Regulations, EIA of the project has to be carried out according to the new regula-tions. Accordingly, Scoping and Terms of Reference (ToR) for hydropower gene-ration and transmission line has been prepared, which has been approved by Ministry of Population and Environment (MOPE). Based on the approved Scope and ToR, the environmental consultant has prepared the EIA report for hydro-power generation which has been forwar-ded to the MOPE for approval. The EIA of the transmission line based on the approved Scoping and ToR is being carried out by the environmental consultant.

Meanwhile, construction license for the hydropower generation and survey license for the transmission line has been issued to the project. The process for issuance of construction license for the transmission line is going on.

The project has already acquired the necessary land for the resettlement area at Udipur, NEA camp at Phedikuna, headwork and contractors' camps and site installation areas at Phaliasangu. Distribution of special allowances and plots free of cost to affected families at the dam site has been done and the affected families have taken their belongings and moved out of the construction area. Some of them have already constructed their houses at the resettlement area and started living there. Land required for powerhouse, surgetank, penstock, site installations, etc. at Siudibar has also been acquired for the project and the compensation is being distributed. Shifting of temple, cremation area and local post office out of the construction area is already complete.

The project has carried out income generation oriented training programs to the members of the project-affected families and the local people of the project area. Community awareness programs focusing on public health and traffic safety has also been carried out at the project site. Similar other income-generating training programs and public awareness programs will be carried out at the project site in the coming days.

Ilam (Puwakhola) HEP

The feasibility study of the project was carried out with the assistance of JICA in the year 1993. Further detailed design and subsequent implementation of the project have been carried out by NEA. The 6.2 MW hydropower project has been completed with the in house capability of NEA. The main civil works of the project commenced on October, 1995 and was completed in December, 1999. Similarly, the hydromechanical and electromechanical works of the project commenced on February, 1996 and June, 1996 respectively. Testing and commissioning of the project was successfully made on April 4, 2000 and the hydropower station is under commercial operation since then.

During the construction, due to the adverse geological conditions encountered which were very different and difficult from that envisaged during the project design phase, and the fragile and unstable slope at the initial penstock alignment, it was decided to relocate the penstock pipes and the associated civil structures.

Since Ilam Hydropower Project is a run of river development and most of the infrastructures are located underground, the negative impact of the project construction on the local environment is insignificant. The projects has been built at a cost of US$ 15.7 million.

The main civil work consists of the construction of 30m long diversion weir, undersluice and intake facilities, two underground desanding basins, spillway tunnel and flushing tunnel, 3238 m long headrace tunnel, head tank, regulating pond (capacity 2057 m3), penstock supports and the power house and

switchyard facilities located at the right bank of Maikhola.

Two units of horizontal axis Pelton turbines have been installed at the power house. The power plant is expected to generate 48 GWh of energy annually. The power is transmitted through 33 kV transmission line to Anarmani. In the FY2000/01 the power station has been remedied to supply power to Ilam Bazaar in an isolated mode when there is no power available from the National Grid.

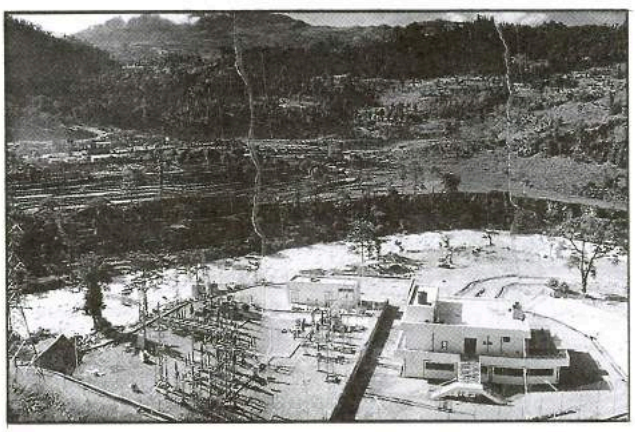
Modi Khola HEP

The construction of this 14.8 MW Modi Khola HEP was completed in July 2000 and the test generation from the plant was carried out in September, 2000. The inauguration of the project was performed by then Rt. Hon. Prime Minister on December 9, 2000. The plant is operating satisfactorily and has already generated 41.4 GWh of electric energy till July 15, 2001.

The construction of this project was initiated in 1996. The project was implemented in Deupur VDC of Parbat District on the Pokhara-Baglung Highway. Main features of the project includes a 7.5 m high, 33 m long diversion weir, which diverts 27.5 m3/sec of water from Modi Khola into a 155 m long desanding basin through four gated 30 m wide intake and a 250 m long underground box culvert. An open canal of 63 m length, conveys 25 m3/s of water to a regulating pondage of 32,900 m3 capacity located at the right bank of Modi Khola. The semi-underground power house, housing two generating equipment is connected to the pondage through a 1,507 m long headrace tunnel of 3.15 m diameter, 41 m long horizontal tunnel (below the surge tank) of 4.24 m diameter, 38 m high surge tank of 9 m diameter, vertical shaft of 51 m height with 4 m diameter, 123 m long pressure tunnel with 4 m diameter and 328 m long underground penstock pipe with 3.2 ~ 3.5 m diameter. A 282 m long underground tailrace releases the water into the Modi Khola. The generated power is evacuated to the national grid through a 40 km long 132 kV trans-mission line to Pokhara.

Because of weak geological condition encountered during tunnel excavation, the length of the underground works was increased from 1888 m to 2409 m and that of steel penstock was increased from 90 m to 328 m. The project was built at a cost of US$ 30 million. The Government of Republic of Korea has provided a loan assistance of 12,441 million Korean Won for funding the electromechanical works, transmission line and technical assistance. HMG/N and NEA has managed the remaining fund for the construction of the project.

Originally, two units of 7 MW capacity vertical shaft turbines were planned to be installed and with a net head of 67 m and total installed capacity of 14 MW the plant was to generate 91 GWh of energy annually. But due to the high efficiency of the installed generating equipment, the installed capacity of the units has been increased up to 7.4 MW each making the total plant capacity 14.8 MW. The plant now is expected to generate 92.5 GWh of electric energy annually.



Chameliya HEP

Chameliya HEP is a medium size (30 MW) Peaking Run-Of-River (PROR) plant with 6 hours peaking capacity. The project is located on the Chameliya river, a tributary of the Mahakali river, situated in Darchula district of Far Western Development Region, 18 km north east of Gokule, the nearest road head on Baitdi-Darchula road. The project is about 950 km away from Kathmandu. The detailed study of the project was carried out by the Civil Design Department of NEA, in association with Soil, Rock and Concrete Laboratory (SRCL), NEA. Since July, 2000, the detailed design and preparation of tender documents of the project is being carried out by a consortium of consultants Hyundai & KOWACO and NEA. For this purpose a grant assistance from Korea International Co-operation Agency (KOIKA) has been utilized.

The project will generate 197 GWh energy annually. The main features of the project are 23 m high diversion weir with three 13 m high gates, underground desander with 2 chambers, 4075 m long headrace tunnel, restricted orifice type surge tank and semi underground powerhouse with three unit of 10 MW vertical shaft Francis turbines. The power will be evacuated by 127 km long 132 kV transmission line from switchyard at Balanch to Attariya substation. Out of 18 km long access road, the construction (earth work and structural work) of 15 km portion with 40 m span Bailey bridge construction over Chameliya river has been completed which facilitates the transportation of vehicles. The construction of access road and 22 m span concrete bridge over Agari Gad is under progress. Two buildings are constructed at powerhouse site and construction of two more buildings are in progress. The total cost of the project is estimated at US$ 74.22 million . The detailed design

and tender documents preparation work are planned to be completed within 2001. The project is envisaged to be implemented with co-financing of HMG/N, NEA and some donor agencies. HMG/N has initiated funding arrangement process. The construction of the project will be completed within 4 years.

Kulekhani Disaster Prevention Project (II)

The Kulekhani No.1 and No.2 hydropower stations with capacity of 60 MW and 32 MW were put into operation in May, 1982 and December, 1986 respectively. These being the only reservoir type hydropower plants in the system are very useful for providing power and energy during system requirements especially during the dry season.

Unprecedented heavy rainfalls on July 19 and 20, 1993 triggered landslides and flooding in the Kulekhani project area seriously damaging some important structures of Kulekhani power station resulting in the power stations being completely shut down from July 19, 1993 at 21:25 hr.

In order to have continued supply of power from the Kulekhani power stations and to efficiently operate the Kulekhani reservoir, the Kulekhani Disaster Prevention Project (II) has been implemented under an agreement between HMG/N and Japan Bank for International Cooperation. The major works under this project were as follows:

After the commencement of the project on May, 1996, the overall project was completed within the scheduled target on April 28, 2001.

Lot #	Working Area	Purpose	Provision
1	KL-1 Reservoir	To avoid clogging of existing intake, a sloping intake to be constructed	Sloping Intake
		Construction of check dams to trap sediment in the upstream reaches of the reservoir.	Check Dam - D-0 Check Dam No. 5 Check Dam No. 1
		Permanent Access Road to reach upstream of Check Dam No.1 to remove the trapped sediments in the upstream reaches of the reservoir.	Permanent Access Road.
	Mandu Area	To safeguard the Kulekhani No.2 Headworks from the debris flow, the reconstruction of Mandu Headwork were to be carried out.	Embedded Mandu Headpond. Intake Gate Shaft Outlet Tunnel Mandu Intake Rapti Intake.
2	Project Inspection Road	16 km long road connecting Kulekhani No.1 Powerhouse and Bhimphedi to Kulekhani No.1 Dam Site, Markhu.	Bhimphedi - Dam Site Road
3	Construction Equipment and Vehicle	To procure the construction equipment and vehicles for the proper Operation and Maintenance of the Kulekhani Power Stations.	Bulldozer-1, Backhoe -2, Wheel Loader -1, Dump Trucks -4, Pickup Jeep -4, Station Wagon -2
4	Telemetering System	Installation of Telemetering System to utilize reservoir water efficiently and provide warnings to downstream area during the spillway (gate) operation.	Rain Gauge Stations at Markhu, Tistung & Daman. Repeater stations at Deorali and Chandragiri. Master Station at KL-1 Powerhouse Control Station at Load Dispatch Center, KTM.

Load Dispatch Center and Balaju Sub-station Extension Project

In the FY 2000/01 Balaju substation extension works was completed. With two new 132 kV GIS switchgears and one isolator bay with one new 66 kV GIS switchgear in place, Balaju substation is now poised to evacuate more power to Kathmandu and beyond, implying that the capacity of Khimti, Bhotekoshi and the upcoming Chilime hydropower projects could now be fully evacuated and will result in enhancement of power system reliability and supply quality.

In Siuchatar, construction of the new Load Dispatch Center Master Station building is going on in full swing. Under a KfW grant, SCADA and associated telecommunication works are being executed through the contractor SIEMENS AG, (Germany) .

Hetauda-Dhalkebar and Butwal-Bardaghat 132 kV Second Circuit Transmission Line Project

This project is part of the Hetauda-Biratnagar 132 kV transmission line 2nd circuit stringing project. With this line, the power imported from India can be utilized in an even wider area. Along with increasing the flexibility of power export/import when necessary, it serves to transfer power generated in the west including from Kali-Gandaki to the central and eastern zones. It constitutes of 174 km, 132 kV, 2nd circuit stringing on existing transmission line towers from Butwal to Bardaghat and from Hetauda to Dhalkebar. NEA and HMG are funding the project. The 2nd circuit works is expected to cost NRs. 300 million.

In Hetauda-Dhalkebar section 131 km out of 138 km stringing works has been completed, similarly 36 km Butwal-Bardaghat section has been completed. The associated 132 kV line bays

necessary for the new circuit at Hetauda, Dhalkebar, Butwal and Bardaghat are also to be constructed soon.

Birgunj Corridor Reinforcement

Birgunj corridor comprising of Simra, Parwanipur and Birgunj is one of the major industrial areas in Nepal. The corridor's power demand is presently being supplied from Hetauda substation through a 66 kV double circuit transmission line. The overloaded 66 kV system has resulted in a serious low-voltage problem in the corridor. At the same time, additional power demand for new industries is putting increasing pressure on the 66 kV system. To eliminate the existing power supply problems the proposed scheme for reinforcement of the corridor constitutes the construction of the following :

a) 132 kV, double circuit transmission line from Pathlaiya to Parwanipur.

b) 132/11 kV substation in Parwanipur.

c) 132 kV switching station at Pathlaiya.

d) 132/33 kV and 132/11 kV substation in Chandranighapur.

The implementation of the project, which was initially proposed for IDA funding was held-up due to unavailability of funds. In view of its urgency the works covered by (a) and (b) above are to be started with HMG/NEA funds. The reinforcement is expected to cost NRs. 1000 million.

Thankot-Bhaktapur 132 kV Transmission Line Project

In line with Transmission System Master Plan (2002-2017) and NEA's necessity to cope with the growing demands to reduce excessive power losses and taking into account the reliability in power supply in Kathmandu valley by completing the second half of the 132 kV ring-main, the Thankot-Bhaktapur 132 kV Transmission Line Project is recommended to be implemented. On July 13, 2000 a loan agreement between Asian Development Bank and HMG/N was signed to implement the project. The project is composed of the following components:

i) **Transmission Line:** 26 km 132 kV double circuit transmission line with single circuit stringing.

ii) **Substations:** Supply and installation of high voltage substations in Kathmandu valley comprising: (a) New 132 kV Thankot switching substation, (b) New 132/11 kV Harisidhi substation and (c) Expansion of Patan, Balaju, Bhaktapur and Chabel substations.

As per the Environmental Protection Act 1997 and Environmental Protection Regulations, 1998 (with revisions), the final Environmental Impact Assessment report has been submitted to HMG/N for approval. Also request letter seeking the construction license has been submitted to Department of Electricity Development. Short listing of International Consultants has been completed. The project cost estimate including services is US$ 14.96 million.

Banepa Panchkhal Substation Project

Two 66/11 kV substations at Banepa and Panchkhal are being constructed under this project. Construction of Banepa substation with a 10/12.5 MVA, 66/11 kV transformer is in its final stage. The power transformer is planned to take distribution system load from September 2001. Construction of feeder lines from the substation has also taken place. This substation will improve distribution system voltage, reduce technical losses, relieve Bhaktapur substation to some extent and will create better condition for system control.

Panchkhal substation is being reconstructed to receive energy from Indrawati hydropower plant. A 5 MVA power transformer will be installed in this substation to improve the 11 kV distribution network of this area. Construction of this substation started in this FY 2000/01. Funded jointly by HMG/N and NEA, the estimated project cost is NRs. 160 million.

Indo-Nepal Power Exchange Enhancement Project

The systematic power exchange between India and Nepal began from 1992 after the first power exchange committee meeting held in New Delhi, India. Up to 50 MW of power is being exchanged between the two countries since the formation of this committee.

The requirement to enhance the level of power exchange between Nepal and India from the existing level of 50 MW to 150 MW has been discussed in the various India-Nepal Power Exchange Committee meetings. The following 132 kV transmission interconnections has been mutually considered for enhancing the level of exchange to 150 MW.

- Butwal (Nepal) - Anandanagar (UP): 22 km in Nepal and 45 km in UP.
- Birgunj (Nepal - Motihari (Bihar): 14 Km in Nepal and 45 km in Bihar
- Dhalkebar (Nepal) -Stitamarhi (Bihar) : 43 km in Nepal and 40 km in Bihar.

Considering the excessive energy available in the Nepalese system during the wet season from its hydro based power plants and power deficits during winter/dry season, it is more practical to export excess power to the Indian grid during the wet season and import power from the eastern grid of India during dry season.

The construction of the Butwal-Anandanagar interconnection in the Nepalese territory up to the border has been included in the forthcoming Rural Electrification, Distribution System

Reinforcement and Transmission Project to be implemented with loan assistance from the Asian Development Bank. The financial sources for the remaining two interconnections on the Nepalese side up to the border has also been managed with a target of completing them by the FY 2003/04.

Butwal - Anandanagar 132 kV Interconnection : The transmission line of this interconnection falling within the territory of Nepal is undertaken by the Butwal-Sunauli 132 kV T/L Project. About 22 km of double circuit line will be strung under this project from Butwal substation to Sunauli (Indo-Nepal border). This interconnection is on the priority list for construction, as this line would be useful for exporting the excess power to India after commissioning of the Kaligandaki HEP (144 MW) and the Middle Marsyangdi HEP (70 MW).

Detail engineering survey works has been carried out and the most feasible route alignment has been fixed. The land owners along the proposed line route have also been identified. All design works necessary for tendering purpose are under progress and the construction works will commence during the FY 2001/02.

Birgunj-Motihari 132 kV Interconnection: The transmission line of this interconnection falling within the territory of Nepal is undertaken by the Parwanipur-Birgunj 132 kV T/L Project. About 14 km of single circuit line will be strung under this project from the proposed Parwanipur substation to Raxaul (Indo-Nepal border).

Detail engineering survey works has been carried out and the most feasible route alignment has been fixed. The land owners along the proposed line route have also been identified. All the preparatory works for project implementation works will be completed by FY 2001/02.

Dhalkebar-Sitamarhi 132 kV Interconnection : The transmission line of this interconnection falling within the territory of Nepal is undertaken by the Dhalkebar-Bhittamor 132 kV T/L Project. About 43 km of single circuit line will be strung under this project from Dhalkebar substation to Bhittamor (Indo-Nepal border).

Detail engineering survey works has been carried out and the most feasibility route alignment has been fixed. The land owners along the proposed line route have also been identified. All the preparatory works for project implementation works will be completed by FY 2001/02.

Small Hydro Projects and Rural Electrification

Following works have been carried out by Small Hydro Projects and Rural Electrification Department during the year in review.

- **Heldung Small Hydropower Project (400 kW)** The tender for engineering procurement and construction (EPC) on turnkey basis have been floated and finalized. The project is estimated to cost nearly Rs. 114 million and the work is expected to start from the FY 2001/02 and shall be completed in FY 2004/05.

- **Gamgad Small Hydropower Project (500 kW):** The tender for EPC on turnkey basis for this project has also been finalized. The project is estimated to cost nearly Rs. 143.4 million and the work is expected to start from the FY 2001/02 and shall be completed in FY 2004/05.

- **Small Hydropower Master Plan Project:** To assess the potential of small hydropower projects ranging from 100 kW to 5000 kW, the Small Hydropower Masterplan Project (SHMP) was initiated in 1990. Since then many SHPs have been identified and inventory study, feasibility and detailed engineering design for different rivulets (khola) have been carried out. Under this plan the following works have been completed in the FY 2000/01:

  a) Inventory Study of Rok Khola SHP in Solukhumbu district (110 kW), Inwa Khola SHP in Panchthar district (2700 kW), Roshi Khola SHP in Kabhrepalanchowk district (4800 kW) and Charnawati Khola in Dolakha district (1000 kW)

  b) Detailed Engineering design of Galwa Gad SHP (150 kW) in Humla district

  c) Post evaluation study of Tatopani SHP (2000 kW) in Myagdi district

- **33 kV Transmission Line Projects:** Following 33 kV Transmission Line Projects under this department have been completed and are under construction:

Sindhuwa-Khandbari 33 kV transmission line Project: This 47 km long project with 20 km of distribution line of 11/0.4 kV, had been started from FY 1997/98 and was completed this FY 2000/01 at a total cost of nearly Rs. 50.7 million. This line connects Sankhuwasabha with the central grid at Dhankuta. Under this project one substation of 33/11 kV 1.5 MVA is under construction at Piluwa, Mamling VDC of Sankhuwasabha district.

Basantapur-Terhathum 33 kV Transmission Line Project: This 13 km long project started in FY 1999/00 and was completed in FY 2000/01 at a total cost of Rs. 8.5 million. This line

is aimed to connect the Terhathum district with the Central Grid.

Buipa-Okhaldhunga 33 kV Transmission Lines Project: This 33 km long project started in FY 1999/00 and is expected to be completed in FY 2003/04. The aim of this project is to connect Okhaldhunga district with the Central grid at Khotang district. Under this project two substations; one at Buipa, Khotang and the second one at Okhaldhunga shall be constructed.

Sitalpati-Musikot 33 kV Transmission Line Project: This 50 km long project started in FY 2000/01 and is expected to be completed by FY 2005/06. Under this project 2 substations, one at Sitalpati, Salyan and the other at Musikot, Rukum will be constructed. The aim of this project is to connect Rukum district with the Central grid from Salyan district.

Chhinchu-Rakam-Jajarkot 33 kV Transmission Line Project: This 70 km long project started in FY 2000/01 and is expected to be completed by FY 2005/06. Under this project one substations at Jajarkot is to be constructed. The main aim of this project is to connect Jajarkot district with the Central grid at Surkhet district.

Ilam-Phidim-Taplejung 33 kV transmission line Project: This 90 km long project started in FY 1999/00 and is expected to be completed by FY 2004/05 with two substations, one at Phidim, Panchthar and the other at Taplejung. The main aim of this project is to connect Panchthar and Taplejung with the Central grid at Ilam district.

Kailali-Kanchanpur Rural Electrification Project

As per the agreement signed between DANIDA and HMG/N in February, 2000, implementation of the Kailali-Kanchanpur Rural Electrification Project has reached the stage of "Review of Detail Engineering Design."

The works under the project includes construction of three new 33/11 kV substations, rehabilitation of two existing substations, construction of 600 km 11 kV overhead line and construction of 300 km 400/230 volt distribution line.

Once the project is completed, it will electrify 29 VDCs and 271 load centers providing electricity to 16,000 new consumers and will be managed by Independent User's Cooperative Group. The project period is for three and a half years.

Profit Center

NEA Distribution and Consumers Services has about 56 offices all over the country in order to provide quality service to its consumers and to take proper care of power distribution, operation and maintenance of the system. In the present context of the need for making these offices service-oriented and to operate NEA on a commercial basis to make it self-sustainable, 6 distribution centers (One from each DCS Regional office) are being operated as profit centers since the FY 2000/2001. NEA is considering to introduce the concept of profit centers to 9 other offices from the FY 2001/2002.

The objectives of the profit centers are: to check and control the losses, to increase the revenue and cash-flow, to minimize operation and maintenance expenses of offices, to further increase the efforts made so far in order to provide quality and reliable power supply services to its consumers, to reduce self-consumption of electricity in NEA offices, and to increase the level of services now being provided to NEA's consumers. The NEA profit centers are given below showing percentage of total revenue, percentage of total consumers and the losses in each of the centers.

District Distribution Profit Centers Project, a component of Rural Electrification and Distribution System Reinforcement Project funded by ADB is under implementation. The main activities of this project are to plan, design and implement programs to operate the distribution offices on the concept of profit centres. International consultants will be engaged to undertake this project.

The 9 distribution branches to be included in the Profit Centre in FY 2001/02 are Kathmandu East, Kathmandu West, Bhaktapur, Hetauda, Bharatpur, Janakpur, Dharan, Butwal and Bhairahawa.

Rural Electrification and Distribution System Reinforcement Project (REDSRP)

Rural Electrification and Distribution System Reinforcement Project (REDSRP), Jointly funded by ADB, HMG/N and NEA, will be implemented to extend electrification to rural areas and also to reinforce existing distribution system of NEA. The total cost is estimated to be US$ 35 million. The project has three major components. The Rural Electrification component covers 25 schemes of 22 districts of Eastern, Central and Western regions under which 240 VDCs are intended to be electrified. This includes construction of 18 km of 33 kV line, 1154 km of 11 kV line, 1663 km of

Profit Center Branch	% of revenue of NEA' Total	% of Consumer of NEA' Total	% of Loss
Kathmandu Mid Branch	12.34	5.65	12.09
Lalitpur Branch	3.51	4.01	41.07
Biratnagar Branch	6.09	2.23	16.78
Birgunj Branch	7.15	3.96	33.41
Pokhara Branch	3.96	4.06	11.52
Nepalgunj Branch	1.98	2.24	12.65
Total	**34.12**	**22.15**	

LV line, 694 distribution transformers and 9 new 33/11 kV area substations (28.5 MVA). The Distribution System Reinforcement Component covers addition, upgradation and rehabilitation of 173 km of 33 kV line, 998 km of 11 kV line, 545 km of LV line, 481 distribution transformers and 20 numbers of 33/11 kV area substations (57.5 MVA). The Distribution Systems for Isolated Power Project component covers procurement of identified sub projects by the regional distribution offices. The project aims to provide new connections to at least 154,294 consumers within its planned period.

Computerized Billing Project (Phase II)

Out of the 56 distribution and consumer service (DCS) branches and 63 sub-branches of NEA conducting manual billing and revenue collection activities, 15 branches located within and outside the Kathmandu Valley have been designated as Profit Centers. As a component of the Rural Electrification, Distribution and Transmission Project being financed by the Asian Development Bank the Computerized Billing Project will computerize the billing and revenue accounting system of these 15 larger DCS branch offices giving priority to these Profit Centers. The Bank has allocated a total of US$ 1.875 million (foreign component cost of US$ 1.25 million and local component cost of US$ 0.625 million) for this project.

Short-listing of consultants for the project is complete and dispatch of requests for proposals from these consultants awaits the effectiveness of the Bank's financial assistance. Updating of customer database is in progress.

Loss Reduction Project

Financed by ADB as a component of the loan to the Kaligandaki-A HEP, the Loss Reduction Project after it's initiation in FY 1995/96 has just completed its activities in the FY 2000/2001. The main objectives of this project were to design and implement a program to reduce the non-technical losses of NEA. The Consulting services for this project was conducted by the International consultant NRECA International Ltd. USA. The final report of the consulting services was submitted by the consultant and it was reviewed by NEA management. Procurement of materials and equipments like electronic meter (1200), ABC Cable (150 km), ACSR conductor for street lighting (500 km), CT/PT metering unit (75 sets), and photo voltaic switch (700), LT CT (1100 sets) have been done. The software for distribution planning and loss analysis have been installed and are in use.

Training Center Establishment Project

The Training Center Establishment Project was started in the year 1997 and has been completed during the FY 2000/01. All the construction works in the project have been carried out as per the master plan for developing NEA's own training institution with sufficient infrastructure facilities for conducting need-based training to its technical and non-technical employees. Under the project separate academic hall, administrative hall, cafeteria, hostels, staff quarters, water treatment plant and guard houses have been constructed. The academic building includes 22 classrooms, 2 large classrooms, 2 seminar halls, 2 computer rooms, 2 technical drawing rooms, 4 instructors' rooms, 6 syndicate rooms, 5 workshops, 4 electrical laboratories and 3 stores. The cafeteria and hostels have capacity of catering to 105 persons. During the FY 2000/01 construction of amphitheater, guard posts, grill works on academic building and quarters and stone protection walls were carried out. Tree plantations of 660 different species were done around the boundary wall periphery and on both sides of the internal roads of the center.

Licensing and Tax Implication for Existing NEA System

(resume)

A. **For Small Hydropower Projects 1000 kW or less**

- no license required
- no royalty
- no corporate income tax

B. **For Hydropower Plants greater than 1000 kW**

- **LICENSE**

  issued by MOWR March 20, 1995

  license period 50 years

- **ROYALTY**

  for first 15 years :

  NRs 100/ kW installed capacity/annum

  2% of energy sales

  after first 15 years :

  NRs 1000/kW installed capacity/annum

  10% of energy sales

- **CORPORATE INCOME TAX**

  15 year tax holiday thereon 10% less than normally levied

- **IMPORT FACILITIES**

  (equipment, machinery, tools and spares)

  1% customs duty on items not manufactured in Nepal;

  import license fee and sales tax exempted

- effective from the date of commercial operation

PROJECT STUDIES

Upper Tamakoshi (Rolwaling) HEP

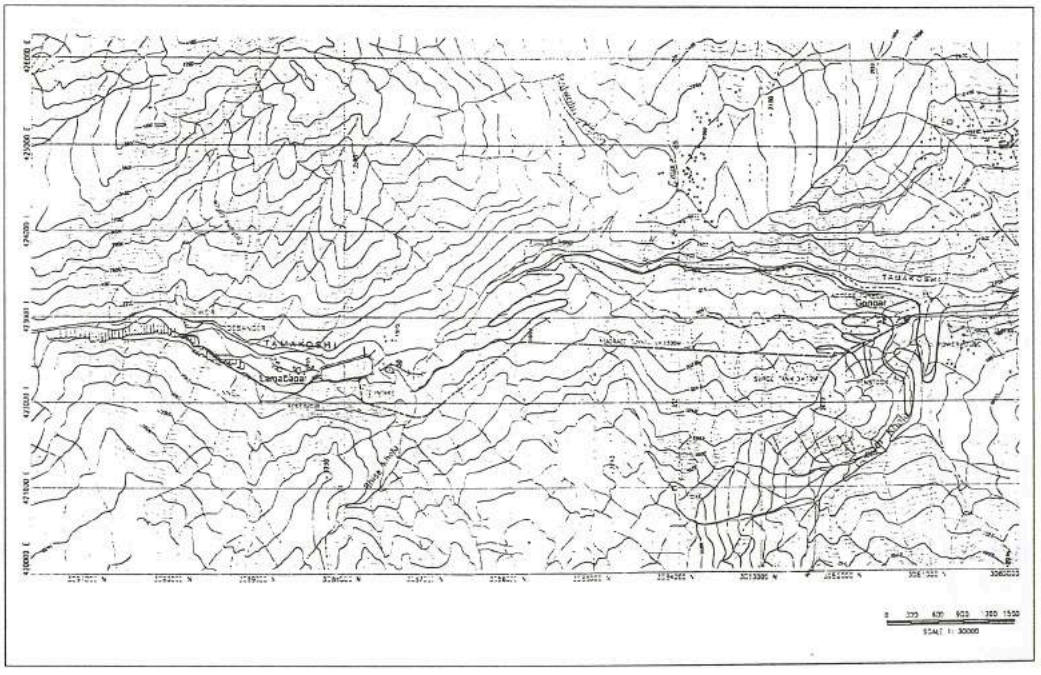
The 250 MW Upper Tamakoshi HEP is a peaking run-of-river scheme located on the Tamakoshi River in Dolakha district. The dam site of the project is located at Lamabagar village which is about 100 km east of Kathmandu, 8 km south of China border and 30 km north of the district headquarters Charikot.

On 15th March, 2001 NEA received the license to conduct the feasibility study of the project which is to be carried out in two phases. The feasibility study (Phase-I) of the project was completed in July, 2001.

According to the feasibility study of the project, the proposed headworks site lies on the river valley situated at an elevation of 1970 m.a.s.l. in the Lamabagar village, Dolakha district. The catchment area of the project is 1587 sq. km of which 1261 sq. km lies in Tibet (China). The crest of ogee shaped weir is 80 m long and 13 m above the foundation level. The proposed desanding basin is on the right bank of the river and is a double bay Dufour type each of which are 14 m wide and 146 m long designed to settle particles larger than 0.2 mm.

The regulating pond is designed for a storage capacity of 0.35 million m3 for peaking power supply of minimum 5 hours a day during lowest flow period of the year. The headrace tunnel is about 6288 m long with a finished diameter of 5.0 m for a design discharge of 39.35 m3/s. At the end of the headrace tunnel an orifice type surge tank of 12 m diameter and 42 m height has been designed. After the surge tank water will flow through an inclined 1331 m long penstock. The underground powerhouse is equipped with four units each capable of generating 62.5 MW of electrical power. After power generation the water will flow to Tamakoshi river via a 1450 m long tailrace tunnel. The generated power will be trans-mitted to the national grid to Dhalkebar substation by a double circuit 220 kV transmission line.

This peaking run-of-river scheme with a net head of 753 m and design discharge of 39.35 m3/s will generate 1573 GWh energy annually. The total project cost is estimated to be US$ 268



million which includes 100 km, double circuit 220 kV transmission line and 70 km access road. The economic and financial analysis shows that the benefit cost ratio is 2.96 and the IRR is 26.49 %.

As the project is located in a remote area and it is a peaking run-of-river scheme, the environmental impacts of the project will be minimal and no environmental damage is expected. Plans are to complete the feasibility study Phase-I and detail design of the access road in the year 2002. Provided that the construction of the access road could start in year 2003 and the construction of the main civil works could start in year 2005 then, the project could generate power by the end of year 2008.

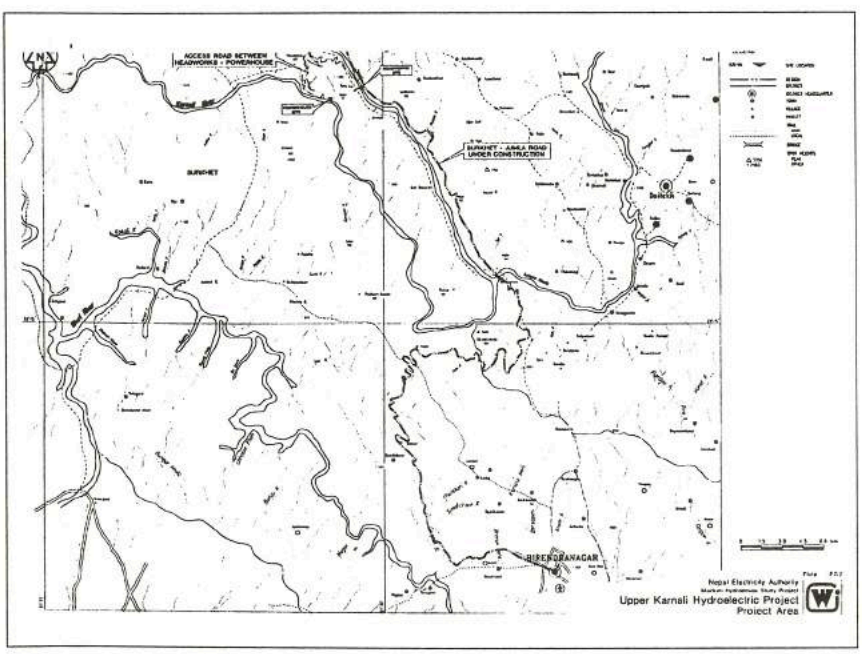
Upper Karnali HEP

The feasibility study of the Upper Karnali HEP was completed by NEA/ CIWEC in June 1998. The Project is one of the most attractive run-of-river diversion schemes studied so far, with a daily peaking capacity and high firm energy.

The project is located on the Karnali river bend forming the boundary of the Mid Western and Far Western development regions. The project site is approximately 90 km from Birendranagar the regional headquarters of Surkhet district. An all weather road from Birendranagar to Jumla is under construction and will pass immediately by the headworks of the project. All the project facilities such as headworks, tunnel and powerhouse will be located in the districts Surkhet, Dailekh and Achham.

The Upper Karnali Project is proposed upstream of the Karnali Chisapani Project in the Karnali river and the catchment area at the project intake site is 20,120 sq. km. The mean annual flow estimated at the headwork is 500 m3/s. The installed capacity of the project is 300 MW having an average annual energy of 1915 GWh with a firm energy of 1568 GWh.

An Memorandum of Understanding (MOU) was signed between HMG/N, Ministry of Water Resources and Delta Pacific Consortium Pte. Ltd. Singapore for the development of Upper Karnali Hydroelectric Project on August, 2000. Later HMG/N decided to change the responsibility of Delta Pacific Consortium to Elysee Frontiere Company and form a joint venture company (JVCO) with NEA as per the MOU signed between HMG/N and Delta Pacific Consortium on October 3, 2000. A joint venture company JVCO "Elysee NEA Upper Karnali Hydroelectric Power Limited (ENUKHPL)" was formed on January 8, 2001 for the development of the project. In this regard the survey license possessed by NEA was transferred in the name of the joint venture company (ENUKHPL) on March 15, 2001 with the condition that the update feasibility and PPA for the project be completed before applying for the generation license within 6 months from the issuance of the survey license. An MOU was signed between Ministry of Water Resources and JVCO (ENUKHPL) for the appointment of an international consultant to update the feasibility study and carry out any additional studies (detail design) for the construction of the project on May 11, 2001. The JVCO (ENUKHPL) signed an MOU with the international consultant CIWEC, Canada for the feasibility study of the project on May 15, 2001. The preliminary work for the update feasibility study of the project has already been started by the consultant CIWEC immediately after signing the MOU with the JVCO (ENUKHPL).



Kankai Storage HEP

Kankai Storage Hydroelectric Project is located in the south-eastern part of Nepal in the district of Ilam. The feasibility study of the project was carried out by the consultant M/S Salzgitter Consult GMBH under the technical assistance from GTZ, Germany in the year 1978. As per the feasibility study, the capacity of the project was fixed as 38 MW. Further feasibility study in the year 1985 by EdF of France revealed that the installed capacity may be upgraded up to 60 MW.

The Project is a reservoir type hydropower project with a catchment area of 1190 km2 having an installed capacity of 60 MW and a total average annual energy generation of about 200 GWh.

In view of the present requirement for the peak power demand in the

Integrated Nepal Power System, Civil Design Department of NEA is going to review and upgrade the feasibility study of Kankai Storage Hydroelectric Project in FY 2001/02.

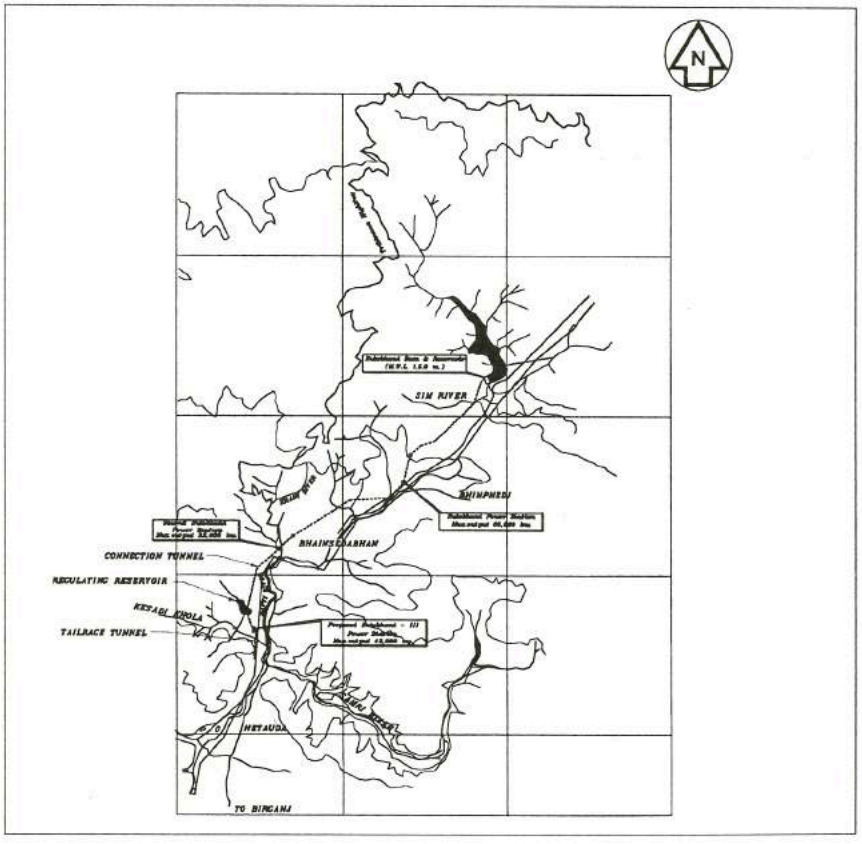
Kulekhani-III HEP

Kulekhani-III HEP, is a peaking power station located 115 km southwest of Kathmandu. It lies at Bhainse VDC of Makawanpur district on the right bank of Rapti river which is situated near the Hetauda-Bhainse road.

Kulekhani-III HEP primarily utilizes the tail water from Kulekhani-II (13.3 m3/s). A discharge of 1.5 m3/s from Khani khola shall be added to it. With the help of a 3.4 km long connecting tunnel a total discharge of 14.8 m3/s shall be conveyed to Yangrang Khola reservoir. In addition, Yangrang Khola river discharge (0.5 m3/s) shall be added to it. A 45 m high regulating dam across Yangrang Khola will be constructed to create a regulating reservoir of about 0.5 million m3. This water shall be taken to an underground powerhouse through a 350 m long headrace tunnel of 4.5 m diameter to generate 42 MW of power for 4 hours peaking. The water shall be discharged into the Rapti Khola through a 2.10 km long tailrace tunnel of diameter 4.5 m. The annual energy generation of this project shall be 50 GWh.

For the investigation purpose various works have been completed at the expense of His Majesty's Government and NEA. These works include core drilling and seismic refraction survey at tailrace site, topographic survey of the whole project area and test adit (420 m) at different locations. The Environment Impact Assessment (EIA) study of the project has been completed and has been forwarded for approval. For the geological investigation of the underground powerhouse, the construction of the test adit is going on and about 300 m (out of 500 m) long test adit has already been completed. The geological investigations of the remaining portion of the test adit and four of the test chambers of the powerhouse and drop shaft locations, will be completed by the end of November 2001. The EIA study of the transmission line will be carried out in this year.

The estimated cost of the project is about US$ 53.0 million. A Minute of Meeting between NEA and the preparatory team of Japan International Cooperation Agency (JICA) was signed for the upgraded feasibility study of the Kulekhani III Hydroelectric Project on May 17, 2001 at the NEA Head Office, Kathmandu. According to that Minute of Meeting, the upgrading feasibility study of the project will commence in November 2001 and be completed by the end of December, 2002 under the financial and technical grant aid of JICA.



Seti Storage Project

This project located in Tanahu district was identified as one of the promising schemes in the fine screening phase of storage project study. NEA is conducting feasibility study of this scheme which would have an installed capacity between 107 and 137 MW. A roller compacted concrete dam has been proposed in the gorge section of Seti river about 3 km upstream of Damauli. The dam height will be approximately 135 m. The project has been optimized for 6 hour daily peaking operation during dry months. Sediment flushing outlets will be provided in the lower level of the dam in-order to effectively utilize the storage volume. Sloping intake has been envisaged for the offtake of design discharge. The underground powerhouse and transformer gallery are located just downstream of the dam site on the right bank. An alternative project layout with 1.8 km long headrace tunnel and shaft type powerhouse has also been studied. But underground powerhouse layout near the dam has been identified

to be economically more attractive than the shaft powerhouse alternative. This project will require only about 4 km of access road and can be commissioned in six years. Specific energy cost of the project is about 3.5 cents/kWh.

Madi Ishaneshwor Storage Project

NEA is currently undertaking the first phase of the feasibility study of this project which comprises of field investigations and alternative studies. Madi storage project is located in Lamjung district and the dam site is just below the confluence of Madi and Seti rivers. The scheme would have an installed capacity of 96 MW in toe powerhouse option or 106 MW in the tunnel option. A roller compacted concrete dam has been identified as an alternative to rockfill dam proposed in the earlier study. The dam site is located about 20 km north of Damauli. An access road of only 3 km would be required from the nearest roadhead at Bhorletar. The design discharge based on 6 hour daily peaking during winter is 145 cumecs. In order to effectively utilize the storage volume of the reservoir, sediment flushing outlets will be provided in the dam itself. The toe powerhouse alternative will have a waterways length of about 300 m and powerhouse will be near to the toe of dam on the left bank. The alternative project layout will have a 1.8 km long headrace tunnel and 280 m long penstock tunnel. Gross head for the two alternatives are 131.5 m and 144 m respectively. Annual energy generation is estimated at 409 and 453 GWh respectively for the two alternatives. Plant capacity optimization and feasibility level design will be carried out in FY 2001/02.

Naumure Storage Project

A pre-feasibility study of this storage project located in Pyuthan district was carried out in 1990. NEA has recently made a review study of this project which will have a 169 m high rockfill dam. The reservoir will have a gross storage volume of about 810 million m3 out of which live storage will be 351 million m3. The powerhouse will have an installed capacity of 207 MW and annual energy generation is estimated to be 844 GWh. Apart from the underground powerhouse envisaged earlier in the pre-feasibility study, a shaft powerhouse alternative has also been identified in the review study. An access road of 18 km would be required and the 220 kV transmission line up to Bharatpur will have a length of 220 km. Total project cost is estimated at US$ 324 million. It is also possible to have re-regulation of the flow from this storage project that could be utilized for additional power generation and provide irrigation in the downstream areas.

A modest sized peaking run of river development is also possible as an alternative to this storage scheme. The headworks in that case would be about 4 km north west of the proposed dam site which would provide with a natural head of about 40 m. Installed capacity of such a scheme would be approximately 25 MW.

Reconnaissance of Hewa Khola HEP

Hewa Khola HEP with an installed capacity of 21 MW was recommended for further preliminary investigations. After the completion of the preliminary study of this project, the capacity of the Hewa HEP was fixed at 13 MW with a gross head of 215 m. and discharge of 7.2 m3/s at 45% dependable flow and 2.1 m3/s at 95% dependable flow. The intake site is proposed near Tunupa village of the Bharapa VDC of Panchthar district. The powerhouse site is proposed on the right bank of the Hewa Khola near Raigaun village. A 3,500 m long headrace tunnel along with 300 m long penstock feeds the water into two turbines of capacity 6.5 MW each. This scheme utilizing a gross head of 215 m, produces an average annual energy of 68.2 GWh with firm energy of 27 GWh. An 8 km long 132 kV transmission line is required in order to evacuate the power to Kabeli-A HEP (30 MW). The total project cost is estimated at US$ 25.64 million.

Economic internal rate of return of the project is 15% and the benefit cost ratio is 1.54. The project site will be accessible by the existing Phidim-Taplejung (Mechi Highway) road. The length of access road to project site is about 7 km.

Hewa Khola has a series of potential sites for cascade hydropower development.

Distribution Network Development Project

The project has completed the techno-feasibility study for Rural Electrification and Distribution System Reinforcement (RE/DSR) schemes of 19 districts of Far Western, Mid Western, Western and Central Regions of Nepal under HMG/ NEA financing. The total cost estimate for the implementation of RE/DSR schemes of all the following districts is US$ 136 million (1998 cost). These districts are Darchula, Baitadi, Dadeldhura, Doti, Achham, Dailekh, Surkhet, Bardia, Banke, Salyan, Rolpa, Dang and Pyuthan from the Far and Mid Western Regions, Baglung, Parbat and Syanja from the Western Region and Lalitpur, Bhaktapur and Kavrepalanchowk from the Central Region. More in-depth studies are necessary before implementing the schemes. The project has thus initiated the detail engineering design of Lalitpur, Bhaktapur and Kavrepalanchowk districts and Initial Environmental Examination (IEE) of Lalitpur and Kavrepalanchowk districts with funding from HMG and NEA. The World Bank is requested for financing the RE/DSR scheme implementation of Lalitpur, Bhaktapur Nuwakot and Kavrepalanchowk districts. NEA now possesses the Techno-Feasibility Study Report for RE/DSR of 47 different districts.

HIGHLIGHTS OF 2000/01

Description	2001*	2000	Increase/Decrease Amount	Percent
Total Revenue Net (M. NRs)	8901.2	7212.4	1688.8	23.42
Net Sale of Electricity (M. NRs)	8339.8	6856.0	1483.8	21.64
Income from Other Services (M. NRs)	561.4	356.4	205.0	57.52
Operating Expenses,				
Including Depreciation (M. NRs)	8255.3	5925.0	2330.3	39.33
Depreciation (M. NRs) ++	1998.9	1878.9	120.0	6.39
Net Income, after interest befor tax (M. NRs)	409.2	756.5	(-)347.3	(-)45.91
Interest on Long-Terms Loans (M. NRs)	1306.7	1244.3	62.4	5.01
Long-Term Loans (M. NRs)	37255.7	30155.7	7100.0	23.54
Net Fixed Assets (M. NRs)	39075.8	35195.7	3880.1	11.02
Number of Customers	765,397	673,979	91418	13.56
Total Sales Of Electricity (GWh)	1407.127	1269.274	137.853	10.86
Internal Sale (GWh)	1281.127	1174.274	106.853	9.10
Average Consumer's Consumption (KWh)+	1673.81	1742.31	(-)68.5	(-)3.93
Average Price Of Electricity (NRs/KWh)+	6.28	5.70	0.58	10.18
Peak Load Interconnected System (MW)	391.0	351.9	39.1	11.11
Total Available Electric Energy (GWh)	1868.42	1701.45	166.97	9.81
Hydro Generation (GWh)	1113.36	1233.22	(-)119.86	(-)9.72
Purchased Energy (GWh) India	226.54	232.20	(-)5.66	(-)2.44
Nepal	501.38	169.30	332.08	196.15
Exported Energy (GWh)	126.00	95.00	31.00	32.63
Thermal Generation (GWh)	27.14	66.73	(-)39.59	(-)59.33
Internal consumption (Gwh)	20.37	25.52	(-)5.15	(-)20.18
Net System Losses (Percentage)	23.60	23.90	(-)0.30	(-)1.26

Note:

* Provisional figures; subject to final audit.

\+ Internal

++ On revalued assets

BALANCE SHEET AS OF JULY 15

in million NRs

EQUITY AND LIABILITIES	2000	1999	1998	1997	1996	1995	1994	1993	1992
Equity									
Share Capital	1000.0	1000.0	1000.0	1000.0	1000.0	1000.0	1000.0	1000.0	1000.0
Share Allotment Suspense	13634.0	12365.8	11324.3	9952.6	8231.6	7122.9	5796.7	5190.6	3956.8
Capital Reserve	170.7	158.8	158.8	158.8	158.6	147.9	137.6	120.9	88.3
Reserves & Surplus	1230.7	1065.5	1200.0	1046.5	359.0	(319.5)	(346.0)	(444.6)	(550.8)
Revaluation Surplus	10108.2	10656.0	11965.6	13421.4	14799.3	14286.1	14238.3	13988.0	13421.7
Insurance Fund	180.0	160.0	140.0	120.00	100.0	80.0	0	0	0
Total Equity	**26323.6**	**25406.1**	**25788.8**	**25699.3**	**24648.5**	**22317.4**	**20826.6**	**19854.9**	**17916.0**
Long-Term Liabilities									
Long-Term Loan	30155.7	23824.3	20848.4	17403.2	14900.4	13367.2	12880.6	11649.5	10070.4
Total Long-Term Liabilities	**30155.7**	**23824.3**	**20848.4**	**17403.2**	**14900.4**	**13367.2**	**12880.6**	**11649.5**	**10070.4**
Current Liabilities & Provisions									
Deposit from Customers	107.0	76.6	59.5	76.8	61.6	90.5	36.0	42.4	25.5
Other Deposit	1057.7	784.8	677.5	407.7	359.3	235.0	183.2	84.5	42.5
Creditors for Goods	116.1	9.4	49.3	32.4	15.7	28.9	5.9	11.2	12.8
Other Creditors	186.8	266.1	201.6	429.1	26.1	22.6	31.1	16.8	40.3
Payable to Others for power purchase	1363.5	707.9	377.6	4.3	6.6	8.3	11.6	4.6	18.4
Payable to HMG for Interest (Other)	481.2	777.5	877.1	647.6	319.0	407.8	270.0	224.5	21.4
Payable to HMG for Other (int)	535.9	975.1	914.4	440.4	102	263.2	648.8	171.8	80.1
Royalty Payable	640.3	752.1	398.7	473.8	585.0	358.0	–	–	–
Provision for Bonus	30.6	40.9	39.4	38.1	31.5	16.6	11.9	6.4	2.4
Provision for Gratuity & Pension	276.4	140.3	140.3	140.3	140.3	140.3	140.3	140.3	140.3
Provision for Medical Facilities	20.7	20.7	20.7	20.7	20.7	20.7	20.7	20.7	20.7
Provision for Accumulated Leave	13.4	13.4	13.4	13.4	13.4	13.4	13.4	13.4	13.4
Provision for Wealth Tax	–	–	28.5	22.5	17.5	14.5	11.5	8.5	2.5
Provision for Income Tax	647.6	221.5	207.0	178.1	104.8	34.4	34.5	7.2	7.2
Total Current Liabilities & Provisions	**5477.2**	**4786.3**	**4005.0**	**2925.2**	**1803.7**	**1654.2**	**1416.9**	**752.3**	**427.5**
Inter Unit Balance (Net)	–	–	–	–	–	–	34.9	52.7	71.7
TOTAL LIABILITIES AND EQUITY	**61956.5**	**54016.7**	**50642.2**	**46027.7**	**41352.5**	**37338.8**	**35124.1**	**32291.6**	**28466.6**

BALANCE SHEET AS OF JULY 15

in million NRs

ASSETS	2000	1999	1998	1997	1996	1995	1994	1993	1992
Fixed assets									
Land	860.8	768.1	727.0	696.1	706.0	665.3	636.4	611.4	578.9
Buildings	1257.9	932.4	885.5	789.7	798.8	755.1	646.4	601.3	573.7
Hydraulic Plant & Machinery	16668.7	16439.9	16619.5	16180.3	16174.1	15951.7	15802.5	15490.0	15171.2
Internal Combustion P & M	1430.5	1524.4	594.1	651.0	708.0	716.9	737.2	752.0	175.6
Solar Power Plant	31.9	33.3	34.7	36.2	37.6	39.0	40.5	41.9	43.3
Transmission Line	3808.3	2713.2	2656.0	2837.9	3057.3	3024.9	2704.6	1815.0	1825.8
Substation	3393.8	2914.6	2432.9	2651.5	2901.0	2959.5	3038.4	2414.2	2436.4
Distribution Line	7362.5	5555.9	5630.6	4535.0	4750.1	3983.4	3042.6	2244.0	2226.5
Meter & Metering Equipment	92.2	83.3	89.4	85.8	100.3	112.5	97.4	59.7	56.3
Consumer Service	19.3	20.5	25.6	31.2	37.0	42.8	48.4	50.3	52.7
Public Lighting	32.1	22.6	18.1	17.5	16.3	16.3	14.4	15.0	15.5
Tools and Instrument	37.0	38.4	20.2	17.0	13.3	12.4	7.6	5.2	5.4
Vehicles	108.0	93.0	80.5	55.8	92.4	85.4	37.9	10.8	8.9
Furniture & Office Equipment	91.2	81.9	76.0	46.3	43.4	46.4	39.8	14.8	13.9
Miscellaneous	1.5	1.3	1.2	2.1	3.0	2.0	0.4	0.2	0.3
Total Fixed Assets	**35195.7**	**31222.8**	**29891.3**	**28633.4**	**29438.3**	**28413.6**	**26894.5**	**24126.2**	**23184.6**
Other Assets									
Capital Works in Progress	18947.1	16542.7	14179.0	11974.6	7362.7	5229.1	5439.3	6250.1	3816.4
Investment in Securities	521.1	326.1	247.7	150.6	54.0	30.5	356.7	79.0	30.4
Total Other Assets	**19468.2**	**16868.8**	**14426.7**	**12125.2**	**7416.7**	**5259.6**	**5796.0**	**6329.1**	**3846.8**
Deferred Expenditure	**1302.8**	**615.0**	**443.3**	**267.3**	**410.8**	**588.5**	**98.6**	**108.6**	**121.0**
Inter Unit Balance (Net)	**228.7**	**256.9**	**188.7**	**133.2**	**335.7**	**144.5**	**143.7**	–	–
Current Assets									
Inventories	982.3	740.0	914.9	804.0	617.9	429.1	340.4	289.5	270.4
Accounts Receivable	1525.5	1530.9	1435.4	1209.1	1,040.0	682.6	569.9	474.8	576.0
Advances Recoverable	1932.0	1634.2	1709.6	1329.0	848.4	471.7	149.8	145.8	113.8
Cash & Bank	1321.3	1148.1	1632.3	1526.5	1244.7	1349.2	1131.2	817.6	354.0
Total Current Assets	**5761.1**	**5053.2**	**5692.2**	**4868.6**	**3751.0**	**2932.6**	**2191.3**	**1727.7**	**1314.2**
TOTAL ASSETS	**61956.5**	**54016.7**	**50642.2**	**46027.7**	**41352.5**	**37338.8**	**35124.1**	**32291.6**	**28466.6**

PROFIT & LOSS FOR THE YEAR ENDED JULY 15

in million NRs

Particulars	2001*	2000	1999	1998	1997	1996	1995	1994	1993	1992
A. Revenue										
Net Sale of Electricity	8339.8	6856.0	5396.8	5082.5	4767.3	3728.9	3218.5	2437.4	1786.8	1440.4
Income from Other Services	290.0	188.8	180.6	157.6	135.0	111.2	99.9	13.8	8.6	5.6
Interest & Other Income	271.4	167.6	205.3	192.6	181.3	172.0	145.1	160.5	109.0	68.2
Total-A	**8901.2**	**7212.4**	**5782.7**	**5432.7**	**5083.6**	**4012.1**	**3463.5**	**2611.7**	**1904.4**	**1514.2**
B. Operation & Maintenance Expenditure										
Operation & Maintenance & General Expenses	2047.4	1752.0	1724.7	1554.5	1049.4	942.0	838.3	697.1	604.8	499.3
Power Purchase	3348.9	1151.3	867.0	845.6	659.5	359.6	340.0	214.1	162.1	111.3
Provision for Expenses	35.9	177.2	164.0	105.5	80.5	45.9	7.7	8.5	7.0	8.7
Bad debts written off		–	–	–	–	–	–	–	–	–
Royalty	574.2	524.8	423.4	348.9	268.8	227.0	186.8	–	–	–
Depreciation	1998.9	1878.9	1995.5	1541.4	1482.2	1455.3	1296.0	1202.4	1026.0	953.6
Deferred Expenditure Written off	250.0	440.8	236.8	270.1	188.7	204.4	162.0	66.5	53.6	45.1
Total-B	**8255.3**	**5925.0**	**5138.5**	**4666.0**	**3729.1**	**3234.2**	**2830.8**	**2188.6**	**1853.5**	**1618.0**
C. Net Operating Surplus (Deficit) (A-B)	**645.9**	**1287.4**	**644.2**	**766.7**	**1354.5**	**777.9**	**632.7**	**423.1**	**50.9**	**(103.8)**
Loss of Capital Assets	–	–	–	–	–	–	35.8	–	–	–
Interest on Long-Term Loans	(1306.7)	(1244.3)	(1141.3)	(1317.2)	(1207.5)	(813.5)	(797.0)	(716.6)	(625.5)	(632.2)
Profit and (Loss) before Prior Year's income & Expenses Adjustment	(660.8)	43.1	(562.3)	(550.5)	147.0	(35.5)	(164.2)	(329.3)	(574.6)	(736.0)
Prior year Income / Expenses Adjustment	(50.0)	(216.7)	(79.3)	(91.7)	(176.6)	(99.0)	(397.0)	(411.7)	(48.8)	75.6
Profit & (Loss) after Prior Year Adjustment	(710.8)	(173.6)	(428.7)	(642.2)	(29.6)	(134.5)	(561.4)	(741.0)	(623.4)	(660.4)
Transfer from Revaluation Surplus	1120.0	930.1	1019.1	844.7	883.3	907.5	671.6	869.2	729.6	610.0
Excess Provision Corporate Tax written back (1993-94)		–	–	–	–	–	10.4	–	–	–
Net Profit (Loss) Before Tax	**409.2**	**756.5**	**589.9**	**202.5**	**853.7**	**773.0**	**120.7**	**128.2**	**106.2**	**(50.4)**
Interest Tax	–	–	3.5	5.0	5.0	7.7	3.9	2.4	–	–
Corporate Tax	100.0	571.4	260.0	23.8	141.3	66.7	10.4	27.2	–	–
Net Profit/(Loss) after Tax	**309.2**	**185.1**	**356.0**	**173.7**	**707.4**	**698.6**	**106.4**	**98.6**	**106.2**	**(50.4)**
Transfer to Insurance Fund	20.0	20.0	20.0	20.0	20.0	20.0	80.0	–	–	–
Net Profit/(Loss) after Appropriation	**289.2**	**165.1**	**336.0**	**153.7**	**687.4**	**678.6**	**26.4**	**98.6**	**106.2**	**(50.4)**

* *Provisional Figures; subject to final audit.*

TARIFF RATES

(Effective from the Billing of September 17, 2001)

1 : DOMESTIC CONSUMERS

A Minimum Monthly Charge: METER CAPACITY	Minimum Charge (NRs.)	Exempt (KWh)
Upto 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:

Upto 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 Meter Rs. 5.10 per unit

B Without 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 (11kV)	190.00	5.90
C Medium voltage (33kV)	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 voltaghe (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 : TRANSPORT		
A. Medium voltage (11 kV)	180.00	4.30
B. Medium voltage (33 kV)	180.00	4.25

TIME OF DAY (TOD) TARIFF RATES

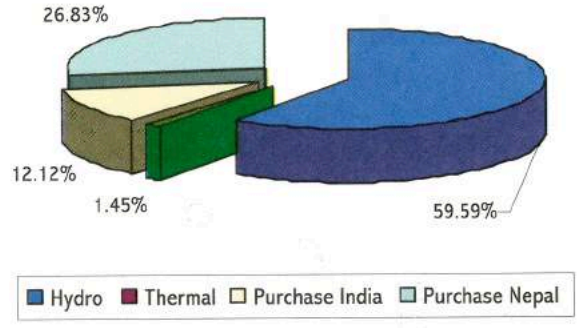
Consumer Category & Supply level	Monthly Demand Charge (Rs/kVA)	Energy charge (Rs/unit)		
		Peak Time 18.00-23.00	Off-Peak 23.00-6.00	Normal 6.00-18.00
A. High voltage (66 kV & above)				
1. Industrial	175.00	5.20	3.15	4.55
B. Medium voltage (33 kV)				
1. Industrial	190.00	6.55	4.00	5.75
2. Commercial	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. Transport	180.00	4.70	2.95	4.15
7. Street Light	52.00	5.70	1.90	2.85
C. Medium volatage (11kV)				
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. Transport	180.00	4.80	3.00	4.25
7. Street Light	52.00	6.00	2.00	3.00

Note : a) If demand meter reads kilowatts (kW) then kVA = kW/0.8

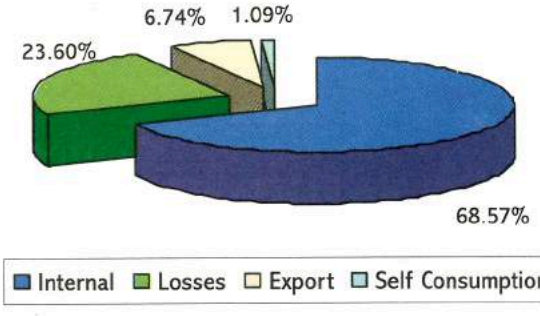
b) 10% discount in the total bill amount will be given to the HMG/N approved Industrial District

c) 25% discount in the total bill amount will be given to HMG Hospitals and Health Center (except residential complex)

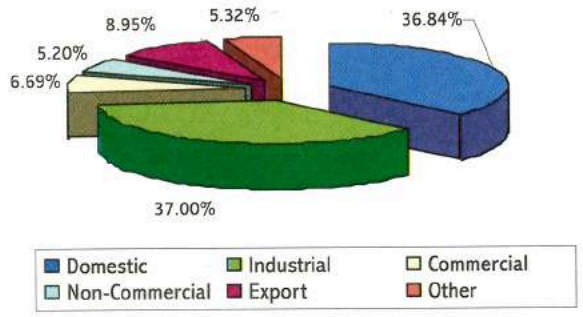
AVAILABILITY FY2001



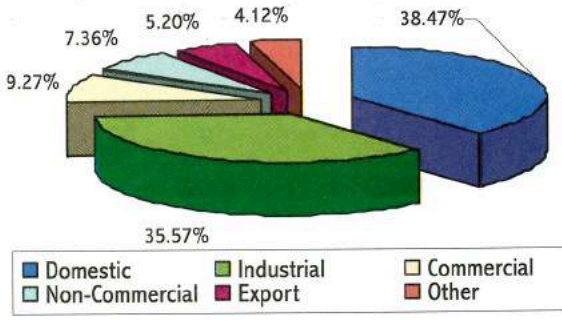
UTILIZATION FY2001



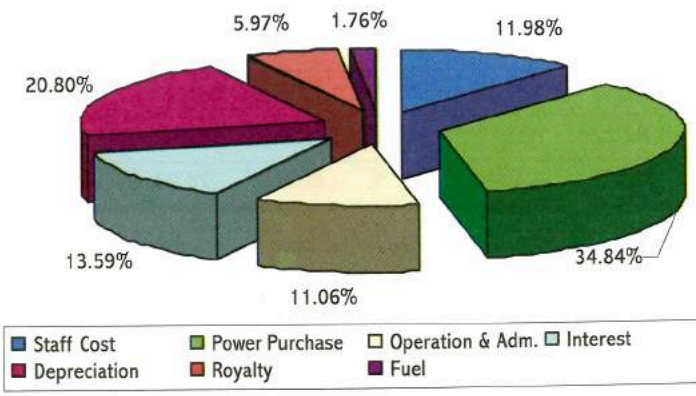
SALES FY2001



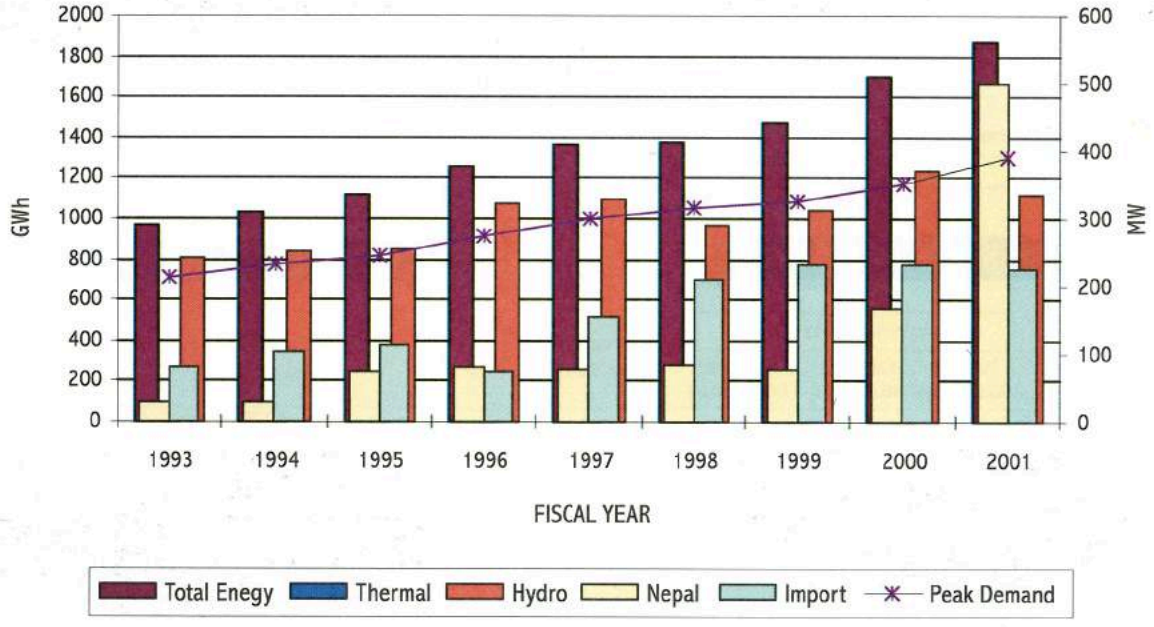
REVENUE FY2001



EXPENDITURE FY2001



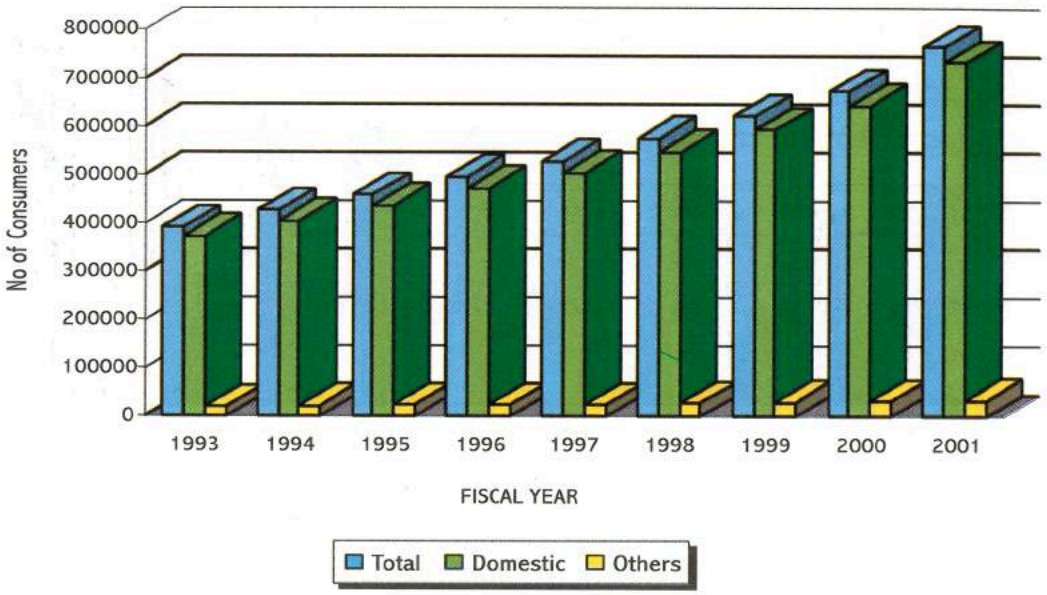
TOTAL ENERGY AVAILABLE AND PEAK DEMAND



Particulars	1993	1994	1995	1996	1997	1998	1999	2000	2001*
Peak Demand (MW)*	214.04	231.0	244.0	275.0	300.11	317.00	326.4	351.9	391.0
Available Energy (GWh)	963.31	1030.89	1,117.46	1,261.96	1,368.58	1,373.17	1475.00	1701.45	1868.42
1. Hydro	804.05	835.48	848.74	1,072.75	1,096.64	971.96	1046.51	1233.22	1113.36
2. Diesel	47.29	62.20	80.92	36.64	39.73	107.45	118.82	66.73	27.14
3. Purchase from	111.97	133.21	187.80	153.57	232.21	293.76	309.67	401.50	727.93
(a) India	82.22	102.77	113.84	72.96	153.98	210.29	232.39	232.20	226.54
(b) Nepal	29.75	30.44	73.96	80.61	78.23	83.47	77.28	169.30	501.38

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

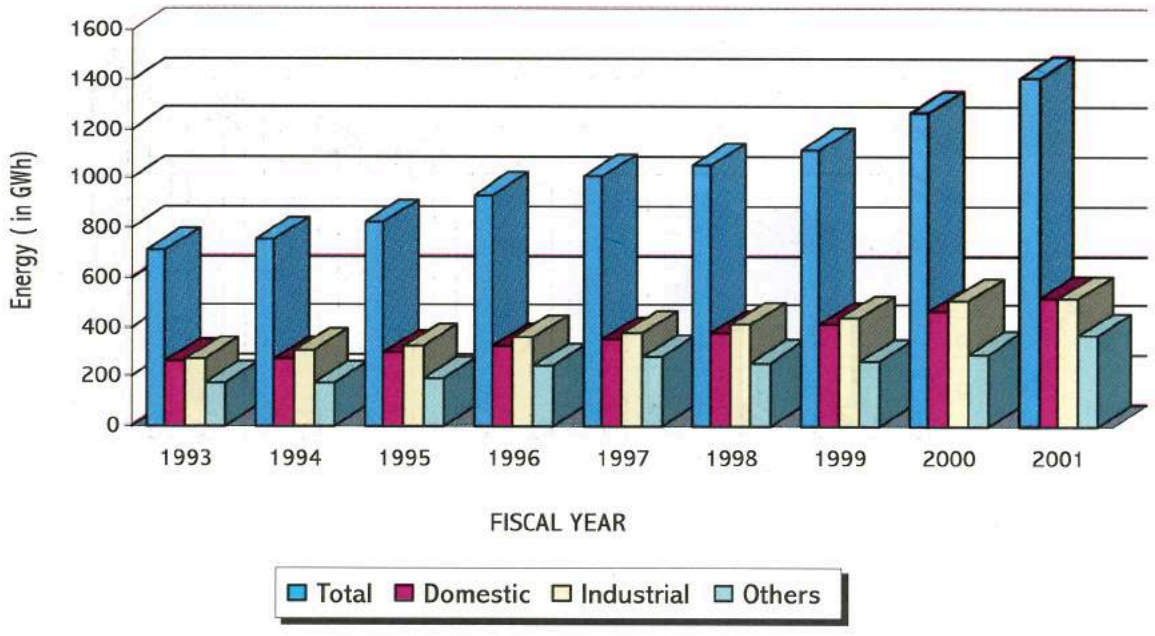
GROWTH OF CONSUMERS



Particulars	1993	1994	1995	1996	1997	1998	1999	2000	2001*
Domestic	3,71,975	4,04,452	4,36,631	4,71,599	503,330	548,110	593,468	643,314	731,990
Non-Commercial	6,340	6,321	6,369	6,548	6338	7,192	7,654	7,815	8,250
Commercial	1,536	1,848	2,008	2,162	2441	2,637	2,948	3,096	3,450
Industrial	9,595	10,737	11,480	12,329	12928	14,062	14,996	16,179	17,650
Water Supply	131	155	166	177	190	205	215	232	250
Irrigation	463	590	630	712	713	776	876	967	1,050
Street Light	367	375	420	456	482	683	842	932	1,020
Temporary Supply	183	188	189	187	155	175	207	144	180
Transport	8	15	8	8	8	12	21	47	52
Temple	398	525	698	782	867	992	1,131	1,248	1,500
Total (Internal Sales)	3,90,996	4,25,206	4,58,599	4,94,960	527,452	574,844	622,358	673,974	765,392
Bulk Supply (India)	5	4	5	5	5	5	5	5	5
Grand Total	**3,91,001**	**4,25,211**	**4,58,604**	**4,94,965**	**5,27,457**	**574,849**	**622,363**	**673,979**	**765,397**

Note :- * Provisional figures; subject to final audit.

ELECTRICITY SALES

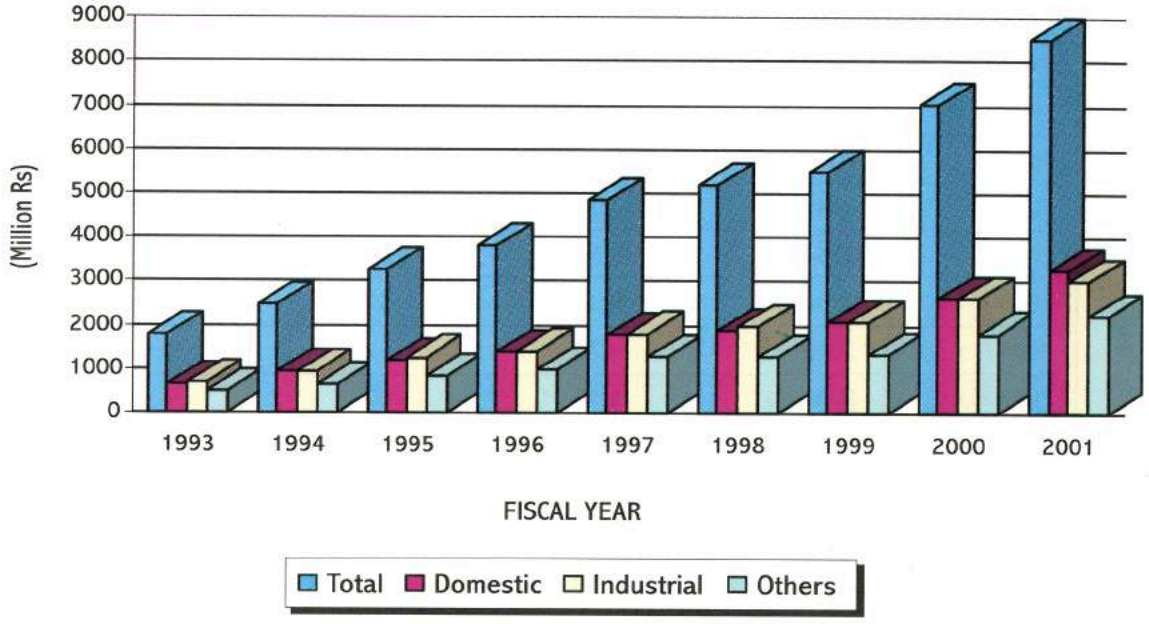


(in GWh)

Category	1993	1994	1995	1996	1997	1998	1999	2000	2001*
Domestic	259.833	275.050	301.611	328.730	355.118	378.778	410.566	467.049	518.360
Non-Commercial	47.607	47.148	53.225	53.464	57.991	60.227	62.931	63.592	73.157
Commercial	47.607	48.988	58.574	62.916	67.606	71.471	77.343	81.822	94.166
Industrial	273.753	303.991	328.316	358.672	376.742	413.738	440.996	508.357	520.634
Water Supply & Irrigation	24.113	19.401	27.636	25.091	27.978	29.045	22.831	15.742	28.600
Street Light	8.068	8.857	12.173	16.720	20.929	26.585	29.405	31.741	36.981
Temporary Supply	0.924	0.561	1.225	1.154	0.844	0.711	0.766	0.927	0.826
Transport	1.395	1.338	1.455	1.432	1.483	1.663	2.598	2.678	5.892
Temple	0.460	0.658	0.892	1.503	1.691	1.801	1.982	2.366	2.511
Total (Internal Sales)	663.248	705.992	785.108	849.682	910.382	984.019	1.049.418	1174.274	1281.127
Bulk Supply (India)	46.137	50.514	39.479	87.014	100.218	67.410	64.158	95.000	126.000
Grand Total	**709.385**	**756.506**	**824.587**	**936.696**	**1010.600**	**1051.429**	**1113.576**	**1269.274**	**1407.127**

Note :- * Provisional figures; subject to final audit.

REVENUE



(in million Rs)

Category	1993	1994	1995	1996	1997	1998	1999	2000	2001*
Domestic	621.398	916.332	1,195.389	1,379.456	1769.839	1895.845	2056.045	2622.033	3265.668
Non-Commercial	181.076	219.807	284.478	307.246	386.359	405.142	419.580	527.399	624.761
Commercial	186.005	235.781	310.911	349.628	446.964	477.044	515.722	661.578	787.228
Industrial	669.244	936.901	1,260.125	1,406.731	1801.576	1973.372	2093.878	2599.337	3019.677
Water Supply & Irrigation	36.194	39.526	70.091	68.400	95.701	100.277	78.144	95.654	130.702
Street Light	16.949	27.625	41.835	53.042	80.111	101.977	111.369	149.945	170.133
Temporary Supply	4.880	3.699	6.886	11.840	7.991	7.170	7.057	13.393	9.912
Transport	2.118	2.985	3.993	4.198	6.090	6.511	9.457	18.311	27.692
Temple	0.693	1.480	3.320	4.556	6.208	6.711	7.416	9.704	11.551
Total (Internal Sales)	1,718.557	2,384.136	3,177.028	3,585.097	4600.839	4974.049	5298.670	6697.354	8047.324
Bulk Supply (India)	75.462	91.364	97.566	206.720	249.292	199.915	198.151	327.804	441.000
Gross Revenue	**1,794.019**	**2,475.500**	**3,274.594**	**3,791.817**	**4850.131**	**5173.964**	**5496.821**	**7025.158**	**8488.324**

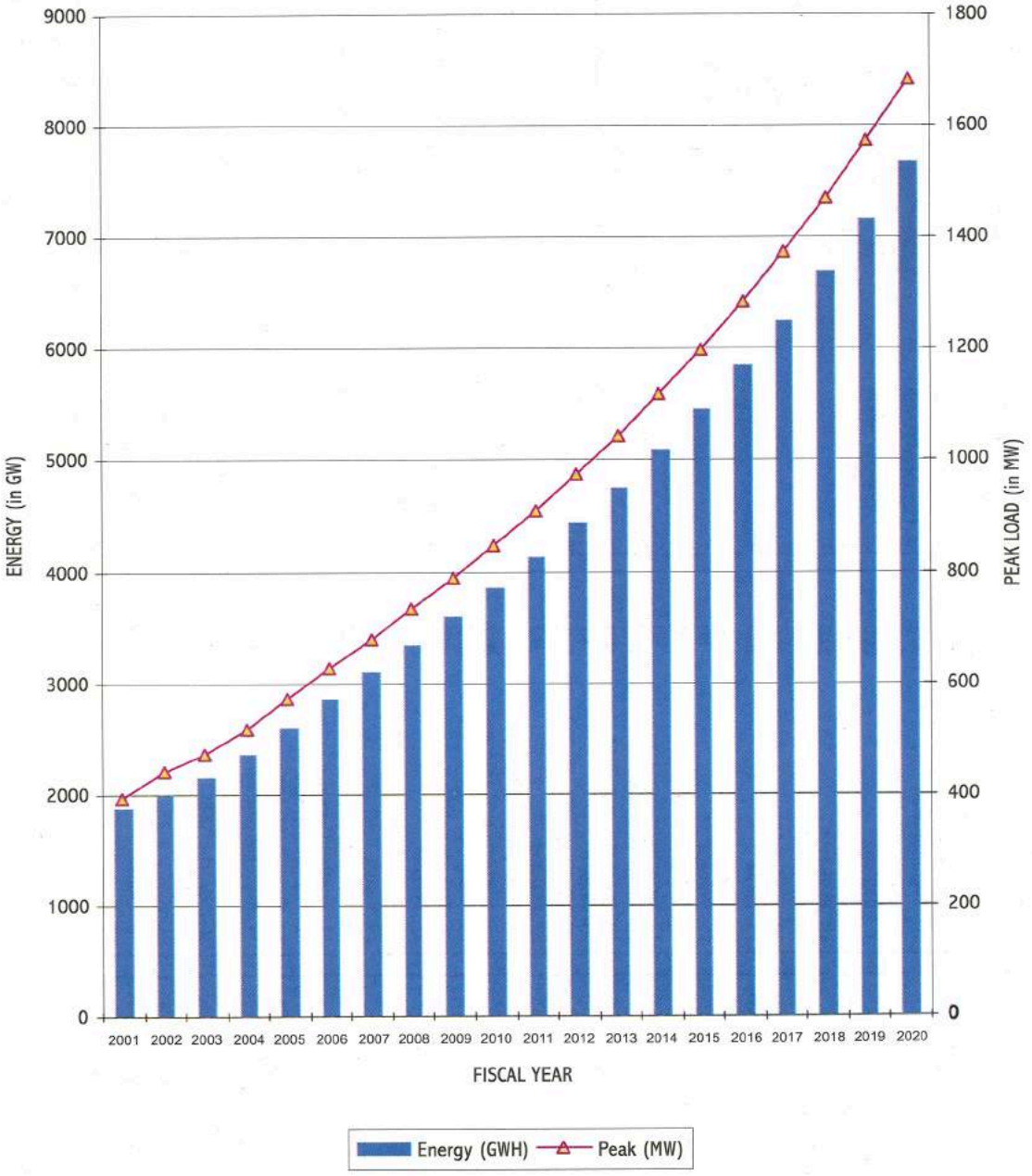
Note :- * Provisional figures; subject to final audit.
The Revenue figures do not include rebate and penalty

LOAD FORECAST

for Integrated Nepal Power System (INPS)

Year	Energy (GWH)	Growth (%)	Peak (MW)	Growth (%)
2001	1868.42	–	391	
2002	2004	7.25	440	12.53
2003	2149	7.24	472	7.27
2004	2354	9.54	517	9.53
2005	2598	10.37	570	10.25
2006	2850	9.70	625	9.65
2007	3094	8.56	679	8.64
2008	3343	8.05	734	8.10
2009	3591	7.42	788	7.36
2010	3855	7.35	846	7.36
2011	4135	7.26	908	7.33
2012	4434	7.23	974	7.27
2013	4753	7.19	1044	7.19
2014	5093	7.15	1118	7.09
2015	5456	7.13	1198	7.16
2016	5843	7.09	1283	7.10
2017	6255	7.05	1373	7.01
2018	6696	7.05	1470	7.06
2019	7166	7.02	1573	7.01
2020	7668	7.01	1683	7.00
Average Growth		7.71		7.99

LOAD FORECAST



LEGEND FOR POWER DEVELOPMENT OF NEPAL

MAJOR HYDRO PROJECT

Existing

1. Trisuli	24,000	kW
2. Sunkosi	10,050	"
3. Gandak	15,000	"
4. Kulekhani No. 1	60,000	"
5. Devighat	14,100	"
6. Kulekhani No. 2	32,000	"
7. Marsyangdi	75,000	"
8. Puwa Khola	6,200	"
9. Modi Khola	14,800	"
Total	**251,150**	"

Under Construction

1. Kali Gandaki "A"	144,000	kW
2. Middle Marsyangdi	70,000	kW
Total	**214,000**	**kW**

Planned & Proposed

1. Seti (West)	750,000	kW
2. ARUN 3	402,000	"
3. Budhi Gandaki	600,000	"
4. Kali Gandaki No 2	660,000	"
5. Lower Arun	308,000	"
6. Upper Arun	335,000	"
7. Karnali (Chisapani)	10,800,000	"
8. Upper Karnali	300,000	"
9. Chamelia	30,000	"
10. Pancheshwar	6,480,000	"
11. Thulo dhunga	25,000	"
12. Tamur/Mewa	100,000	"
13. Dudh Koshi (Storage)	300,000	"
14. Budhi Ganga	20,000	"
15. Rahughat Khola	27,000	"
16. Likhu-4	40,000	"
17. Kabeli "A"	30,000	"
18. Upper Marsyangdi "A"	121,000	"
19. Kulekhani No. 3	42,000	"
20. Andhi Khola (Storage)	180,000	"
21. Khimti II	27,000	"
22. Langtang Khola(Storage)	218,000	"
23. Madi Ishaneshwar(Storage)	106,000	"
24. Seti (Storage)	122,000	"
25. Kankai (Storage)	60,000	"
26. Upper Tama Koshi	250,000	"
Total	**22,333,000**	**KW**

DIESEL POWER STATIONS

Existing

1. Mahendra	1,728	KW
2. Biratnagar	1,028	"
3. Hetauda	12,750	"
4. Marsyangdi	2,250	"
5. Duhabi Multifuel-1	26,000	"
5. Duhabi Multifuel-2	13,000	"
Total	**56,756**	**KW**

SMALL HYDRO PROJECT

Existing

1. Pharping***	500	kW
2. Panauti	2,400	"
3. Sundarijal	640	"
4. Phewa (Pokhara)	1,088	"
5. Dhankuta	240	"
6. Tinau (Butwal)	1,024	"
7. Jhupra (Surkhet)	345	"
8. Baglung	200	"
9. Doti	200	"
10. Phidim**	240	"
11. Gorkhe(Ilam)	64	"
12. Jomsom**	240	"
13. Jumla**	200	"
14. Dhading	32	"
15. Syangja***	80	"
16. Seti (Pokhara)	1,500	"
17. Helambu	50	"
18. Salleri (Sceco)#	400	"
19. Darchula (I) & (II)**	300	"
20. Chame	45	"
21. Taplejung**	125	"
22. Manang	80	"
23. Chaurjhari** (Rukum)	150	"
24. Syarpudaha** (Rukum)	200	"
25. Khandbari **	250	"
26. Terhathum**	100	"
27. Bhojpur **	250	"
28. Ramechhap	150	"
29. Bajura	200	"
30. Bajhang**	200	"
31. Arughat Gorkha	150	"
32. Tatopani/Myagdi (i+II)	2,000	"
33. Okhaldhunga**	125	"
34. Rupalgad (Dadeldhura)	100	"
35. Surnaiyagad (Baitadi)	200	"
36. Namche*(KBC)#	600	"
37. Achham	400	"
38. Dolpa	200	"
39. Chatara	3,200	"
40. Kalikot	500	"
Total	**18,968**	"

UNDER CONSTRUCTION

39. Gamgad	400	kW
40. Heldung	500	"
Total	**900**	**kW**

PLANNED & PROPOSED

1. Rawakhola (Khotang)	2,300	kW
2. Molungkhola (Okhaldhunga)	1,200	"
3. Naugargad (Darchula)	1,800	"
4. Gandigad (Doti)	1,800	"
5. Phoigad (Dolpa)	150	"
6. Kolti (Bajura)	150	"
	Total 7,400	**kW**

INDEPENDENT POWER PRODUCERS

EXISTING

1. Andhi Khola (BPC)	5,100	KW
2. Jhimruk (BPC)	12,300	"
3. KhimtiKhola (HPL)	60,000	"
4. Bhotekosi (BKPC)	36,000	"
	Total 113,400	**kW**

UNDER CONSTRUCTION

1. Chilime (CPC)	20,000	kW
2. Indrawati (NHPC)	7,500	"
3. Upper Modi (Gitec)	14,000	"
4. Piluwa Khola(AVHP)	3,000	"
	Total 44,500	**kW**

PRELIMINARY WORKS IN PROGRESS

1. Chaku Khola (APCo)	910	kW
2. Khudi (Khudi HP)	3,450	"
3. Mailung (MPC)	5,000	"
4. Daram Khola (GHP)	5,000	"
5. Sange Khola(Sange HP)	100	"
6. Phema Khola (Khoranga HP)	995	"
Total	**15,455**	**kW**

SOLAR POWER STATIONS

EXISTING

1. SIMIKOT	50	KW
2. GAMGADHI	50	"
TOTAL	**100**	**KW**

TRANSMISSION LINE LENGTH

1. 132 kV Single Circuit	1,040.00	KM
2. 132 kV Double Circuit	366.60	KM
3. 66 kV Single Circuit	204.76	KM
4. 66 kV Double Circuit	161.30	KM
5. 66&132 kV Double Circuit	22.00	KM
6. 66 kV Four Circuit	2.50	KM
7. 33 kV Single Circuit	1,535.70	KM

SUB-STATION CAPACITY

132/11	kV	-	28.50 MVA
132/33	kV	-	220.00 MVA
132/66	kV	-	220.10 MVA
66/11	kV	-	324.00 MVA
66/33	kV	-	25.00 MVA
TOTAL			**817.60 MVA**

NOTE

* Private & Others

** Leased to the private sector

*** Not in normal operation

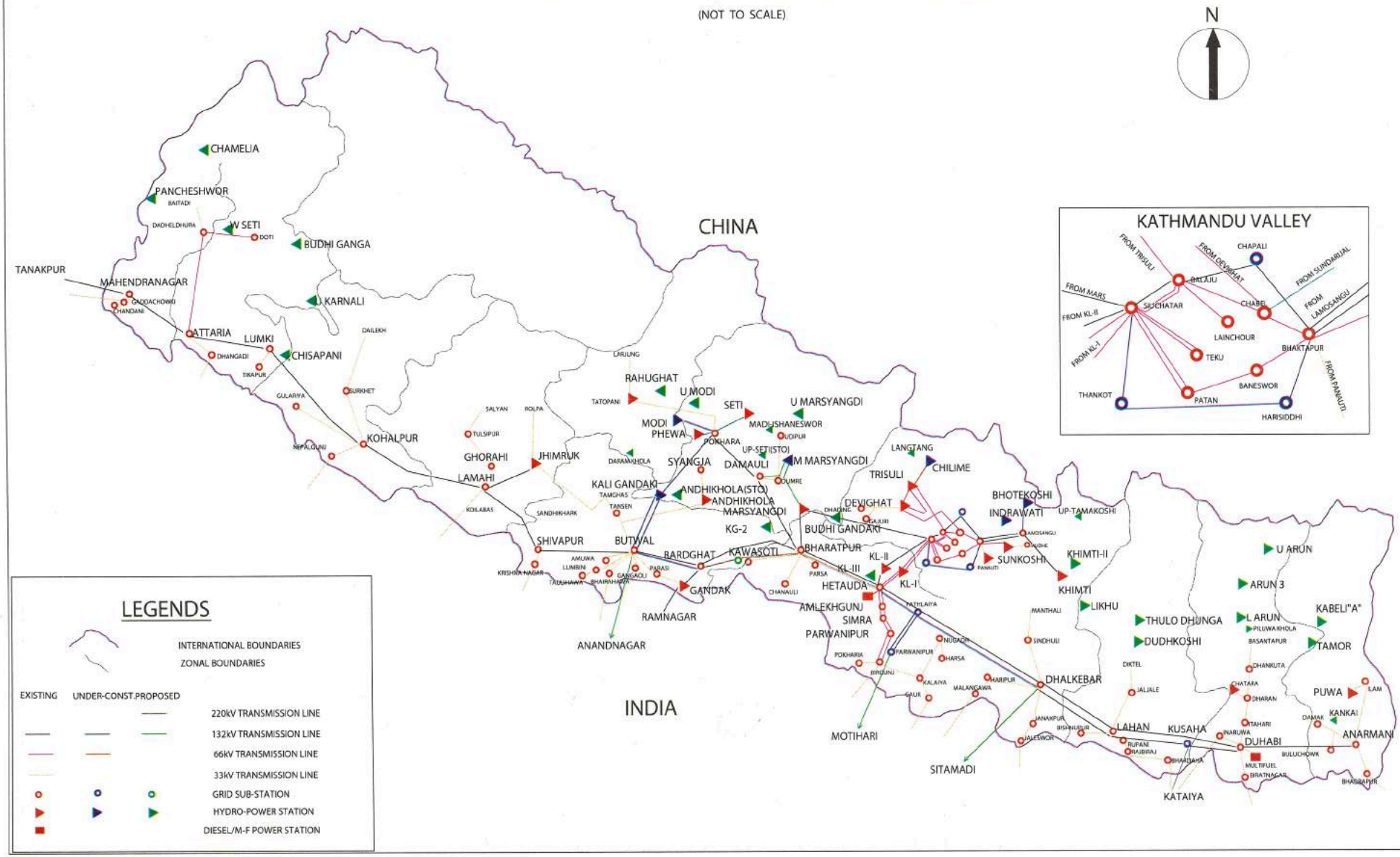
Installed Capacity in Nepal Electricity Authority System : 440.374 MW
(including private & others)

IN REVIEW A YEAR

POWER DEVELOPMENT MAP OF NEPAL

MAJOR POWER STATIONS ,TRANSMISSION LINES & SUBSTATIONS

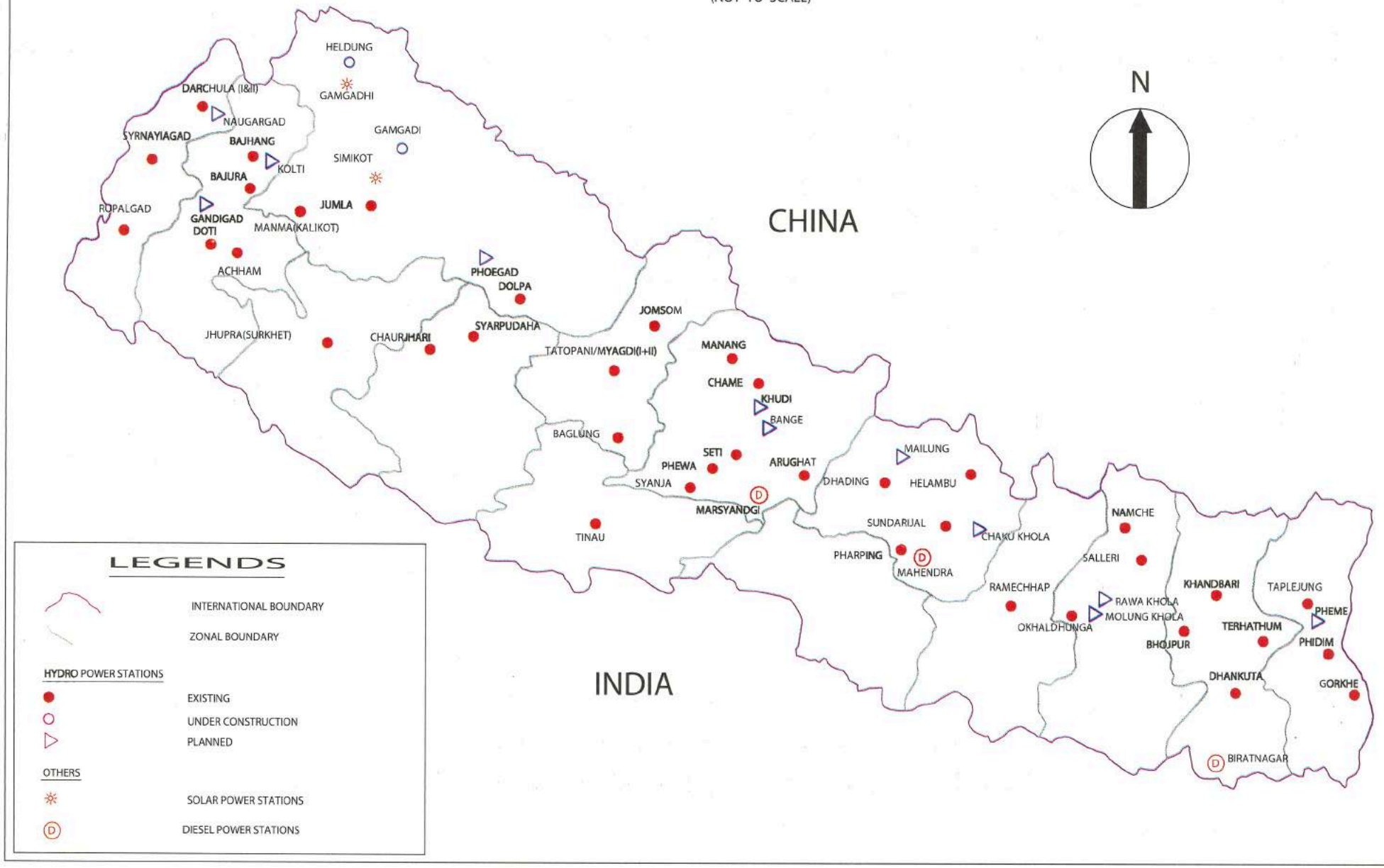
(NOT TO SCALE)



POWER DEVELOPMENT MAP OF NEPAL

SMALL HYDRO POWER STATIONS, ISOLATED SOLAR & DIESEL POWER STATIONS

(NOT TO SCALE)



Modi Khola Power House

Concrete Pole Plant, Amlekhganj

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