Nepal Electricity Authority

Fiscal Year 2001/02 – A Year in Review

Bhadra 2059 (August 2002)
Durbar Marg, Kathmandu

A YEAR IN REVIEW FY 01 02 A YEAR IN REVIEW

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Cover Photo : Dam Site of Kaligandaki 'A' HEP

NEPAL ELECTRICITY AUTHORITY
Head Office: Durbar Marg, Kathmandu, Nepal
Phone: +977-1-227725
Fax: +977-1-227035,266673
Email : neamd@mos.com.np
Webpage: www.nea.org.np

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MESSAGE
From The Chairman

I am happy to send this message for inclusion in this year's NEA's Annual Review-the publication of which coincides with the celebrations of seventeenth anniversary of NEA's operations.

At the outset, I must congratualate NEA for winding up its operations for this year with creditable performance and consumer appreciation. The year has been distinctively marked as a year when NEA resurfaced with a generation sufficiency in its system-relying almost entirely on the country's own hydropower resources. The healthy stream of projects that are coming on-line with the joint efforts of the private and public sectors have been instrumental in rescuing NEA from almost a decade of power shortage and the compelling recourse to unpopular "load shedding". This emerging situation of encouragement, besides providing a solution to our domestic demands, also opens up the prospects of entry into a much larger regional power market. This emanates in a period when the climate of investment in Nepal's hydropower is gaining interest from all sectors-including long-standing donors and the private sector. Such investment is necessary to expand NEA's services to a large segment of the country's population. The promulgation of the anti-theft act which will recognise theft of electricity as a crime against society will aid in improving NEA's financial performance in the future.

NEA is also presently in the crucial juncture of corporate development which must align with the policies of His Majesty's Governments on hydropower development. The Government's policy places considerable stress on the participation of the private sector in the development of hydropower in Nepal. This has been necessary to allow the government to divert its scarce resources to more pressing social services and poverty alleviation programs in the country. In order to attract the private investment there are fundamental reforms on market competition and regulatory control that need to be put in place. NEA, as the lead player in Nepal's power sector, has an important role in this scenario. As the single buyer of electricity generated by the private sector, NEA has the responsibility that must ensure its own financial health as well as maintain the sustenance of private sector interests.

The past year has seen the management of NEA making all efforts to bring about the desired reforms to meet the requirements that lie ahead. These have been introduced to induce a mechanism that will make it possible for NEA to perform effectively along lines of internal privatization. Introducing core units operating along lines of self-sustenance, independence and accountability along with the concepts of the profit and user-owned cooperatives in the distribution schemes form the essence of these reforms. It is hoped that these will be adequate to meet the contributions that are expected of NEA as a national utility that can perform in unison with the private sector.

In its quest towards development and industry, I must stress that NEA retain the appreciation of electricity as a nature-endowed resource must transcend political boundaries and provides to mankind a form of energy that is conducive to its sustainable existence for myriad milleniums to come. This means that NEA must be aware of our fragile environment and our rich cultural heritage that must co-exist with the development works. I believe that our rich hydropower resources can be developed as a form of clean energy that the entire world has been long awaiting.

To end my message, I wish to reiterate that in the environs of business, development and existance, the human resources of NEA have functioned as NEA's major strength. I wish to congratulate the staff of NEA of all levels for their sincere efforts to put forth a performance that is encouraging even in times of turbulence and turmoil in the country. I am confident that this capability will continue to improve in the years to come.

Bijay Gachhadar

Bijay Kumar Gachhadar

Minister for Water Resources and
Chairman, Nepal Electricity Authority

BOARD OF DIRECTORS

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Minister of
Water Resources.

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Ministry of Water Resources

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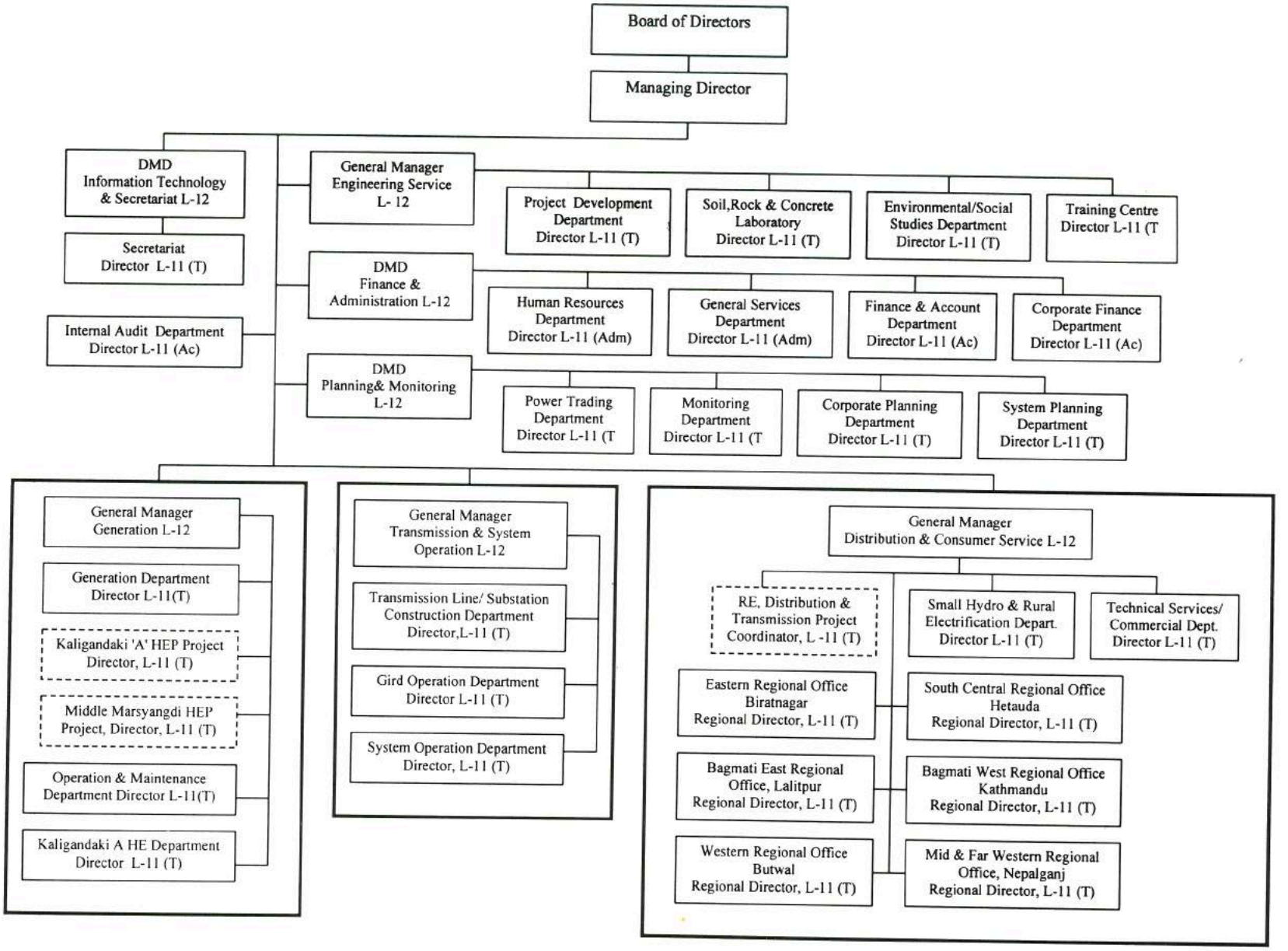
President FNCCI

Mr. M. B. Basnet

Member Secretary
Dr. Janak L. Karmacharya
Managing Director, NEA

CORPORATE STRUCTURE OF NEA



CHIEF EXECUTIVES

Mr. M. R. Upadhyay
General Manager
Distribution Consumer Services

Mr. D. B. Thapa
General Manager
Engineering Services

Mr. Govinda K.C.
General Manager
Generation

Mr. P.M.S. Pradhan
Deputy Managing Director
Planning & Monitoring

Mr. B. C. Thakuri
General Manager
Transmission & System Operation

Mr. D. R. Bhattarai
Deputy Managing Director
Finance & Administration

Mr. R. K. Bajracharya
Act. Deputy Managing Director
Information Technology & Secretariat

DIRECTORS & DEPARTMENT CHIEFS


Mr G. B. Shrestha


Mr B. R. Shrestha


Mr J. N. Nayak


Mr R. P. Shah


Mr S. P. Upadhyay


Mr S. B. Shrestha


Mr U. K. Shrestha


Mr A. B. Kshatry


Mr R. P. Adhikari


Mr L. M. Maskey


Mr U. Vaidya


Mr K.B. Shrestha


Mr J.R. Shrestha


Mr K. G. Shrestha


Mr S. P. J. Rana


Mr K.P. Upadhyay


Mr K.P. Koirala


Mr B. R. Regmi


Mr D. P. Upadhyay


Dr J. Jha


Mr S. B. Shrestha


Mr T. N. Thakur


Dr. S. N. Mishra


Mr M. P. Pradhan


Mr R. N. Pradhan


Mr S. R. Shrestha


Mr S. C. Jha


Mr R. Yadav


Mr B. B. Singh

MANAGING DIRECTOR'S REPORT

It gives me great pleasure to report on the activities of Nepal Electricity Authority (NEA) for the fiscal year 2001/02 (corresponding to the year 2058/59 of the Bickram Sambat). This is being reported on the occasion of the seventeenth anniversary of the organization which marks yet another year of its successful operations. There is no doubt that the year that has passed saw NEA's steadfast perseverance in maintaining the country's most essential service under hostile conditions of rampant destruction of its assets and operations resulting from an open state of insurgency that prevailed in the country.

NEA in Nepal's Power Sector

The world over, the power sector continued its evolution into one that would provide better services for the consumers in an environment of competition, transparency and choice. The progress made has been slow and steady and now involves almost all countries in the south Asia region.

The shape of the power sector that His Majesty's Government (HMG) intends to create was made manifest in its amendment to the Hydropower Development Policy. The Policy underscores the Government's view to promote private sector investment in the power sector and outlines a number of steps which must be in place to create the conducive environ. The path that NEA must adopt to remain as the national utility can be inferred from this document.

In parallel, NEA has been taking its own critical introspective reviews and based on such analysis of its performance, the shape of its future. In attempting any reform, NEA believes that it must pay heed to the strengths, weaknesses, opportunities and threats that characterize the organisation. In case of NEA, its human resources have been recognised as its major strength. The competency of its technical personnel is being increasingly acclaimed as second to none in the performance of generation, transmission and distribution functions in the environs being faced in the country. Weaknesses that impair NEA's performance take the shape of its relatively high tariff levels and the system losses that drain its revenue. Nepal's immense hydropower potential has been identified as the major opportunity that NEA needs to exploit in broadening the market that is developing in the domestic and regional areas. Threats are the non-availability of funds and country risks that NEA must confront in the expansion and delivery of its services.

Following from the systematic studies to bring about sustainable commercial orientation and efficiency in NEA's operations, steps were taken in the past year to put the recommendations into practice. The most noteworthy event that has put NEA on the mainstream of power sector reform has been introduction of a form of internal unbundling in NEA's organisational structure without changes in ownership patterns. Discrete entities of generation, transmission and distribution have been formed as core business groups in NEA and have been organised to undertake semi-autonomous functions with accountability through performance agreements with NEA's corporate offices. The core groups will carry on transactions within themselves through a system of transfer prices. Mechanisms have been built in to prevent the transfer of inefficiencies and liabilities between core units. On the other hand, several activities such as planning and monitoring, finance and

administration, information technology and engineering and consultancy services have been retained as central activities. Emphasis has been placed on adequate monitoring from the corporate offices of activities at all levels.

It is hoped that this system will function with success and establish itself as a form of reform that is more suitable for a small utility of a developing country like Nepal. We also hope that reform will enhance NEA's performance to operate in unison with private operators in the power sector and compete with them in the fields of generation and customer services.

Operational Status

On the operational side of the past financial year, the system peak of the interconnected system was recorded on December 12, 2001 at the level of 426 MW registering an 8.95 percent increase over the last winter's figure.

During the past financial year, the electrical energy available for use within the NEA system totaled 2087.61 GWh which was an increase of 219.19 GWh (11.23 percent) over the previous year's figure of 1868.42 GWh. This comprised of 1116.64 GWh obtained from NEA's hydro generation and 17.92 GWh from NEA's thermal generation. A total of 237.78 GWh was imported from Indian State Electricity Boards in accordance with the Power Exchange agreements and 715.27 GWh purchased from private generators.

Electricity sales totaled 1574.465 GWh an increase of about 167.338 GWh (11.89 percent) over last year's sales figure. Internal sales within Nepal increased to 1431.565 GWh and accounted for 90.92 percent of the total sales and registered an increase of 150.438 GWh (11.74percent) over the last year's figure. Exports to India increased to 142.90 GWh an increase of 16.90 GWh over last year.

Over the past financial year, the number of customers grew by an estimated 132186 (or 17.72 percent) over the previous year's figure to reach a total of 878178. The domestic category accounted for 95.7 percent of the total customer numbers, 36.69 percent of the sales and contributed to 37.57 percent of the revenue. The industrial category formed only2.28 percent of the total customers, but accounted for 37.99 percent of sales and contributed to 36.53 percent of the revenue. Non-commercial category constituted 0.9 percent of the customers, accounted for 5.12 percent of the sales and 7.50 percent of the revenue. Likewise, the commercial category constituted 0.55 percent of the total customers, accounted for 6.08 percent of the sales and provided 8.80 percent of the revenue.

Improving NEA's Financial Health

NEA's financial picture remained encouraging for another year. NEA's total revenue totaled Nrs. 10766.4 million, and increase of 22.99 percent over the figure for the precious year. NEA's net fixed assets increased to reach an estimated Nrs. 42.3246 Billion. Expenditure in operation and maintenance activities increased by 16.08 percent reaching a figure of NRs. 10137.9 million as compared to NRs. 8733.8 million of the previous year. On the overall, NEA registered a net profit before tax of NRs. 413.9 million as compared to a net loss before tax of NRs. 1.9 million in the previous year.

The past year also saw the initiation of steps to improve the financial performance of NEA in key sectors such as the improvement in the sale of its generated energy by prompting the domestic industry to use more electricity and to solicit the increase in the power export to India. Because of the large percent of NEA's revenue spent on the purchase of Independent Power Producer (IPP) power, studies were also initiated to revisit the power purchase agreements with IPPs and see if amendments based on mutually acceptable terms could be made to lessen their undesirable impact on NEA finances.

It was also evident that a healthy financial performance of NEA depended on readily accessible and accurate availability of its financial transactions. This called for the computerisation of its billing, inventory control and accounting systems. Steps were thus taken to achieve these software tools through a fast-track strategy. Improvement in NEA's performance also meant the prioritisation of activities in all core business in the process of budget preparation. To keep expenditures down, attempts were made to cut down costs in operation and maintenance. To improve NEA's receivables, dialogue was maintained with the municipalities of country in an attempt to redeem long-standing dues for the

use of electricity in streetlight applications. Success was attained in recouping some of these arrears though HMG intervention.

To improve our financial position, concerted efforts were made to take stern action against those charged on cases of theft and misuse of our supplies. NEA's efforts were bolstered by the enforcement of the Anti-theft Act that recognizes theft of electricity as a social crime that is punishable by law.

Status of Projects under Execution

In order to meet the demands of a growing consumer family, NEA continued to invest judiciously in development projects to strengthen and extend its generation, transmission, distribution and support capabilities.

Of foremost significance in project execution was the completion of the 144 MW Kali Gandaki A hydropower project which emerged as the largest hydropower project currently in operation in Nepal. The project commenced operations with the last of the three units starting generation on May 24, 2002. Generation from this project elevated NEA from a decade-long state of power deficiency to a state of adequacy even offering surplus export possibilities during the wet months. Equally important for meeting the demands of the near future, the construction of the 70 MW Middle Marsyangdi with grant financing from kfW commenced with project civil works and more work packages were tendered for implementation. Offering benefits in regional economic as well as system balance, the 30 MW Chameliya hydropower project, situated in the remote mid-west district of Darchula, saw another step towards implementation with the completion of its detailed engineering and the preparation of tender documents. The project now awaits appropriate financing to move ahead into the implementation phase.

A state-of-art addition to NEA's system control capabilities will be available in the near future with the completion of the new Load Dispatch Center (LDC). This center will be interlinked with all the major power stations and sub-stations through a SCADA system enabling system security, ready response to system disturbances, generation optimization and systematic supervision of system operations. The new LDC along with a sub-station extension at Balaju have been undertaken with a loan from KfW.

With generation attaining a level where limited export possibilities now became possible, the construction of three 132 kV exchange links with India in conformity with arrangements agreed in the India-Nepal Power Exchange committee assumed considerable importance. NEA stepped in to wholly finance the construction of one of the lines from Butwal to Sunauli on the Nepal-India border leaving India to continue the construction to Anandnagar in India. Another transmission line project calling out for urgent construction was the Birgunj corridor reinforcement project. This involved the construction of a 132 kV transmission line alongside an older 66 kV line which was already heavily overloaded in serving large industrial loads along the "Birgunj Corridor". Considering its potential to provide fast returns, the project was entirely financed through NEA/ HMG resources. A number of transmission line projects were also undertaken to provide better transmission performance by "hot" stringing a second circuit on towers that had provisions for such addition.

Adequacy of generation also meant the possibility of undertaking more extensive distribution schemes. After meeting stringent conditions imposed by the Asian Development Bank (ADB), the RE, Distribution and Transmission Project finally reached a financial close and commenced preliminary works. The project involves loan proceeds from ADB and OPEC in addition to local costs being borne by HMG/NEA. In addition to transmission and institutional support components, the major portion of the project will be dedicated to developing the distribution systems of NEA so as to meet the increased loads on the NEA system and distribute the additional power generated to 155,621 new households spread over 277 village development committees (VDC) and provide extensive system reinforcement to existing distribution. Another distribution project financed through a Danish grant and located in Kailali and Kanchanpur districts in far-west Nepal re-commenced project surveys after running on a delayed schedule owing to the necessity to review its design parameters. With financial resources contributed by HMG, NEA also continued to undertake a large number of distribution and rural

electrification projects some of these involving the construction of off-grid small hydropower projects.

NEA was also the active participant of the USAID sponsored SARI/E program. Over the year NEA participated in 22 training programs, seminars, workshops, executive/peer exchange and biannual review programs which involved 48 senior officers of NEA. NEA also became the member of a new regional partnership in the field of Disaster and Security Preparedness and Response Partnership with the first meeting held in the USA in May 2002. A Trilateral Hydropower Partnership with a participation of NEA, National Hydropower Corporation of India and a US Utility yet to be identified has also been launched to provide cooperation in hydropower development.

The NEA-TACOMA Power-Wisconsin Electric Energy Partnership funded by USAID and managed by USEA came to a close with a Recognition Ceremony. The program held on February 28, 2002 in Kathmandu during the last visit of the US team to Nepal. The Chief Executive Officers of NEA, TACOMA Power, and Wisconsin Electric were felicitated for their contributions in making the partnership a success.

Planning and Future Perspective

With NEA's system configuration and its institutional form taking shape for a substantial change for the better, the need to plan ahead was given equal importance. A special activity undertaken in the past year was the preparation of Nepal's Tenth Five-Year Plan in which NEA assumes the role of a key player in the power sector. A forerunner plan entitled the Mid Term Expenditure Framework (MTEF) was also prepared with an accent on poverty alleviation in preparation for the Nepal Development Forum (NDF) which was held in Kathmandu in January 2002.

The generation capabilities within NEA assumed an encouraging picture with hydropower projects coming on stream as planned to meet the anticipated growth in domestic demand. Hydropower projects such as Middle Marsyangdi, Chameliya, Upper Karnali, Upper Tama Koshi and a number of other projects were identified in NEA's generation plan to cover the demands upto 2011. The resources to meet the massive development costs would be met through private sector participation or private-public enterprises. The increasing enthusiasm from the independent power producers (IPP) to participate in the development of hydropower generation in the framework of a limited domestic demand pressed home the message to look across the borders for a larger market to sell the accumulating generation potentials. There also emerged the necessity to trade system surplus that started to accrue in the system because of the lack of storage facilities in a highly season-sensitive energy output characteristic of NEA's generation projects.

Future planning of the transmission system will stress on capability of the grid to evacuate power from generation stations and transmitting them to load centers over the entire country. This will imply more extensive enhancement of voltage level as in the case of the 220 kV Hetauda-Bardghat section or the addition of second circuits where the tower configuration makes this possible. Interconnection links and their capability to transfer power to an immense market across the border will be considered in their different voltage level and system configurations depending on the amount of export that needed to be considered.

Resource Mobilisation

It is evident that NEA still requires immense investment for projects which are required to expand its services to the extensive unelectrified parts of the country and improve the quality of supply where electrification already exists. Working in resource-strapped conditions this often means the resort to Donors and Lenders for the required finances. Over the past year a number of financing proposals took shape in the project development.

Japan emerged as a foreunner in commitments through a variety of financing schemes that involves loans, grants, technical assistance, training and experts. Japan's major development agency, JICA, and development bank, the JBIC, sent teams to study the prospects of financing projects in Nepal and preliminary indications are that they will be willing to finance the construction of the Hetuada-Bardaghat 220 kV transmission line and the engineering of the Kulekhani III hydropower project which is presently being study to a feasibility level though another JICA

grant assistance. The Government of Japan also confirmed its commitment to go ahead with the implementation of the third phase of the Kathmandu Valley Master Plan with the undertaking of the K3 sub-station sited in the urban center of Kathmandu to cater to the rapidly rising load in the metropolis.

Norway through its development agency NORAD, expressed its interest in assisting NEA with the feasibility study of the Upper Tama Koshi Hydropower Project. NORAD also contemplates assistance for developing the Khimti-Dhalkebar 220 kV transmission line which will assist in better system balance in the eastern portions of the country. Possibility of French Government assistance for the study and development of 40 MW Upper Modi A hydropower project in western Nepal is being explored.

In order to address inbalance between seasonal demand and supply of electricity, the need for developing medium size storage project has been recognised. Efforts are now being made to mobilise financial resources for developing such a project.

Private Sector Participation

Independent Power Producers from the private sector remained an important part of the NEA's generation, contributing to almost 20 percent of the total installed capacity. Besides the Khimti I and Bhote Koshi hydropower projects which moved on to their second year of operations, the latest additions to the IPP projects to join the NEA grid were the 185 kW Syange and the 7.5 MW Indrawati III hydropower project which is expected to commence commercial operations in the near future. In addition, over a dozen small hydropower projects have been cleared to interconnect with the NEA grid and sell all their generation to NEA. These IPP projects are in various stages of progress.

In order to encourage local investment in smaller hydropower projects it will be recalled that NEA maintains a policy to buy upto 50 MW of power from IPP promoted projects in the range 1-10 MW at pre-determined tariff rates denominated in local currencies. In accordance with the NEA commitment to purchase total of upto 50MW of power from IPP-promoted small hydropower projects in the capacity range 1-10 MW, four power purchase agreements (PPAs) were signed with Molnia Power (P) Ltd., Sanima Hydropower (P) Ltd., Kantipur Hydropower (P) Ltd. and Unique Hydel Co. Ltd. for purchase of power from the 5MW Mailun Khola, 2.60 MW Sunkoshi, 10 MW Langtang Khola and 1 MW Baramchi small hydropower projects respectively.

Acknowledgements

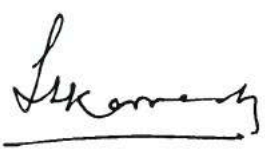
To conclude, I wish to take this opportunity to thank all those contributing to NEA's activies over the past year. I must stress that it is only through positive teamwork that a big organization like NEA can function and achieve results which require to be appreciated by the customers and the stakeholders of this organisation.

I wish to take this opportunity to thank His Majesty's Government of Nepal for their continued assistance in our operations and their contributions to our development activities. Thanks also to the donors and Development Banks that have made it possible for NEA to undertake the works for its development.

I must thank the staff of NEA at all levels of duty for their continued perseverance and support to the management. As I have alluded to in the early paragraphs of this report, the events of insurgency in the country have created a scenario that challenge the endurance of personnel to the limits. I wish to express my special thanks to those members of NEA's staff who have stood by in these times of trial.

Last but not the least, I also wish to assure our valued customers that NEA, with the new organisational set-up will function in a more effective and accountable way thereby ensuring quality electricity supply at a reasonable tariff.

Thank you.



(Dr. Janak Lal Karmacharya)
Managing Director

INTRODUCTION

Bhadra 1, 2059 (August 17, 2002) marks the beginning of NEA's eighteenth year of existence. Created under NEA Act 2041, NEA is a wholly HMG/N owned undertaking responsible for planning, construction, operation and maintenance of the power system throughout the kingdom of Nepal including power trading with India.

The past year was an eventful year for NEA. Some of the noteworthy events in the country's power sector were:

- HMG/N adopted the Hydropower Development Policy 2001. The policy sees a conducive environment for the healthy development of increased private sector investment in the country's power sector. The generation, transmission & its operation and distribution functions of NEA are to be separated and entrusted to different entities.
- Some major structural adjustments were made in NEA's organization. Four key functions of NEA namely: generation, transmission and system operation, distribution and engineering services were entrusted to separate General Managers with increased independence and are to be held accountable for the duties they discharge. A performance contract with each of the General Managers is in the offing to facilitate their functioning and to spell out NEA management's expectations from them. It is hoped that the new organizational set up of NEA will help in its smooth transition to different entities as per the Hydropower Development Policy 2001 and also realize the policy's objectives albeit on an interim basis.
- The Electricity Theft Control Act 2058, that treats electricity theft as a criminal offence, has been enacted and enforced. To operationalise this Act, its regulation is being drafted by HMG/N. It is anticipated that the Act together with its regulation will help in curbing electricity theft.
- Definite steps have been taken towards NEA's commercialization functions. NEA has designated fifteen of its distribution divisions as Profit Centres for their commercial operation and accountability. The Profit Centre Managers would have wide latitude in discharging their duties for better consumer services, curbing losses and improving overall performance.
- The year saw the commissioning by NEA the 144 MW Kali Gandaki 'A' Hydropower Project. The plant, biggest to date in the NEA system, would help in meeting the growing power needs of the country for the next couple of years.
- The construction of the 70 MW Middle Marsyangdi Hydropower Project is in good progress to ensure its commissioning well in time to meet the projected peak demand of FY 2004/05.
- The ADB funded Rural Electrification, Distribution and Transmission Project is now firmly in place for execution after the Bank finally declared its loan effectiveness. Although delayed by more than a year, the project will help in extending rural electrification and augmenting NEA's distribution and transmission facilities. NEA is committed to honour all its commitments made to ADB and other Donors.
- With the 144 MW Kali Gandaki 'A' Hydropower Project already in place, the supply position of NEA is considerably improved. To make use of surplus capacity, NEA is actively pursuing the implementation of three new 132 kV exchange links with India. The Power Exchange Committee between Nepal and India, had earlier agreed in principle to enhance the present power exchange level of 50 MW to 150 MW by building the three new 132 kV exchange links.
- The institutional capacity building of NEA is considerably improved from the USAID funded South Asia Regional Initiative / Energy and Partnership Programs.
- NEA is continuing its dialogues with the Donor communities for the implementation of different projects.

In the following pages of this Annual Review, an attempt has been made to prepare an easily comprehensible overview of significant events and developments of the past fiscal year. Schematics and graphical presentations have been included to give a visual display of the year's achievements.

SECTORAL REVIEW

NEA BOARD AND MANAGEMENT MATTERS

In the FY 2001/02 there were two changes in the Board of Directors of Nepal Electricity Authority (NEA). Mr. Mahesh Bahadur Basnet replaced Mr. Kishor Baskota as a member on November 9, 2001 and Dr. J. L. Karmacharya became new member secretary of NEA Board and Managing Director from April 24, 2002. The appointment of Dr. Karmacharya who had long experience of working in NEA was quite significant because immediately, after joining in NEA he endeavoured to revitalize NEA by restructuring the organization of NEA. Four major core sectors: Generation, Transmission & System Operation, Distribution & Consumer Services and Engineering Services were assigned to four General Managers with increased independence. With the new organizational set up, accountability will be established and help in improving organizational efficiency; liabilities and inefficiency of a Unit would not be reflected in any of the other units; and private sector participation in the country's power sector would be encouraged. The Managing Director is to be supported by three Deputy Managing Directors in discharging central function responsibilities of Planning & Monitoring, Finance & Administration and Information Technology & Secretariate. The new organizational set up of NEA will help in its smooth transition to different entities as per the Hydropower Development Policy 2001 of HMG/N. The NEA Board approved this revised organizational structure on June 3, 2002.

GENERATION

Under the new organisational set up, Generation will take over the ownership of all power stations of NEA for their operation and is also responsible for construction of new power stations. It will sell the power in bulk to Distribution & Consumer Services under a Power Purchase Agreement to be agreed upon between the two.

In the FY 2001/02 the total available energy recorded was 2087.61 GWh an increase of 219.19 GWh (11.73 % increase) when compared to the figure of 1868.42 GWh in FY 2000/01. The peak load recorded was 426 MW on December 12, 2001. Of the total available energy, hydropower generated by NEA contributed 1116.64 GWh (53.49 %), thermal 17.92 GWh (0.86 %), Import from India 237.78 GWh (11.39 %) and purchase from Nepal 715.27 GWh (34.26 %). The role of IPPs in the NEA power system is ever increasing, contributing more than a third of the total available energy in the NEA system.The performance of NEA's major generating stations are as follows:

Hydro Generation

Kulekhani I Hydropower station

Kulekhani I hydropower station generated 145.42 GWh in FY 2001/02. Overhauling of vertical water pump and greasing system and other minor maintenance works were carried out in the plant.

Kulekhani II Hydropower station

Kulekhani II hydropower station generated 65.69 GWh in FY 2001/02. Maintenance in cooling water pump, overhauling generator and exciter cleaning are the major works carried out in the plant.

Marsyangdi Hydropower station

In FY 2001/02 Marsyangadi hydropower station generated 386.13 GWh. Overhauling of Unit no. 3, runner replacement and maintenance on butterfly valve and cooling water system were carried out.

Trisuli Hydropower station

This hydropower station generated 128.24 GWh in the fiscal year 2001/02 against 141.56 GWh in the fiscal year 2000/01.In this fiscal year, Unit no. 1&2 of this power station have been rehabilitated along with the rehabilitation and repair works of 5 nos. out of 12 nos. of 6.6 kV SF_6 breakers which were lying damaged since last 3 years. 7 nos. of 11 kV Vaccum circuit breakers (VCB) were installed in the 6.6/11 kV sub-station for better and reliable distribution of electrical energy in the district. One no. of 4 MVA, 33 kV transformer from Banepa section was transported ,installed

and commissioned at Trisuli for better distribution. Trisuli –Chilime 66 kV transmission line was charged in 11 kV and power was supplied to the Chilime project for construction works.

Devighat Hydropower Station

This power house generated 92.02 GWh in the fiscal year 2001/02 against 96.06 GWh in the fiscal year 2000/01.One unit of this power house was rehabilitated along with the maintenance and repair work of the governor of Unit no.3. One repaired 6.6/66 kV power transformer was installed in the substation replacing 3 nos. of single phase transformer whereas one 6.6/66 kV power transformer which was burnt due to heavy electrical fault was replaced by 3 nos. of single phase transformer. 66 kV and 11 kV circuit breakers were also repaired and maintained.

Gandak Hydropower Station

This power station was generating power smoothly after all of its units were rehabilitated but in the fiscal year 2001/02 heavy oil leakage in the wicket gate servo motors of unit 1 and problems in the governor system of unit 2 caused major setback in the overall generating performance of this powerhouse. The repair and maintenance works of servo motor and replacement of governor and excitation systems shall be taken up in the coming fiscal year. The maintenance work of 132 kV circuit breaker was carried out along with replacement of 132 kV lightening arrestor.

Sunkoshi Hydropower Station

This powerhouse generated 50.82 GWh in the fiscal year 2001/02 against 54.28 GWh in the fiscal year 2000/01.The rehabilitation work of unit no.1 of this station was carried out successfully. Besides this ,the maintenance of breakers and control systems were also carried out along with the regular -maintenance of civil works.

Modi Khola Hydropower Station

This newly constructed power station came under this department in the middle of fiscal year 2000/01 .This powerhouse generated 41.45 GWh in the fiscal year 2000/01 and in the fiscal year 2001/02, it generated 51.17 GWh. This year a major damage in the intake portion was observed and accordingly the repair and maintenance work of this damage was taken up immediately.

Seti hydropower Station

This power house generated 8.04 GWh in the fiscal year 2001/02 against 8.79 GWh in the fiscal year 2000/01.The rehabilitation work of unit no.1 was carried out along with the repair and maintenance works of the control and protection systems successfully. The repair and maintenance of the head-works of this power station was taken up, even-though, it was the responsibility of the irrigation department.

Panauti Hydropower Station

This powerhouse generated 4.65 GWh in the fiscal year 2001/02. Unit no.2 of this powerhouse was rehabilitated along with the repair and maintenance of control and protection system. After the rehabilitation works, the powerhouse is able to generate upto 90% of its installed capacity.

Apart from the above hydropower stations, there are other four small hydropower stations under this department. They are Puwa Khola; Sundarijal; Chatara and Fewa. Except Chatara, all are running smoothly as per the availability of water and were maintained and repaired as per the maintenance schedule. The Chatara Hydropower Station needs major overhaul of its governor and excitation system. For this an expert from the manufacturer is required. Necessary action has been taken up and the expert is expected at site very soon.

Thermal Generation

Machines of Duhabi Multifuel, Hetauda and Marsyangdi Diesel Power Plants are in operating conditions. They are regularly test run, maintained and are planned for scheduled maintenance to keep them in good operating conditions.

The requirement for thermal generation has lately been minimal due to additions of number of new hydropower stations in the NEA system. The total thermal generation in FY 2001/02 was only 17.92 GWh out of which 13.66 GWh was generated by the 39 MW Duhabi Multifuel Power Plant. The role of thermal generating plants has lately been limited to as stand by due to surplus hydropower generation after the addition of 144 MW Kali Gandaki 'A' Hydropower Plant in the NEA system.

TRANSMISSION AND SYSTEM OPERATION

The Transmission and System Operation will take over the ownership of all High Voltage Transmission and Sub-station Network (66 kV and above). It is responsible for operation and management of the system and further development and expansion of HV Transmission network. It will wheel power from the point of generation to the bulk selling outlets. The wheeling charge will be as per the power wheeling charge agreement between the units of NEA. The Transmission and System Operation may also have the freedom, if necessary, to enter into agreement with the IPPs to wheel their generated power.

Grid Operation Department

The department is responsible for the construction, operation and maintenance of 66 kV and above voltage transmission line and sub-stations. The Grid Operation Department performed following major works in fiscal year 2001/02.

- 132 kV sub-station capacities were enhanced in Pokhara from 13.5 MVA to 22.5 MVA and in Bharatpur from 31 MVA to 55 MVA. Works are currently underway in Butwal and Anarmani Sub-Stations to up-grade their capacities from 20 MVA to 40 MVA and from 15 MVA to 22.5 MVA respectively.
- The displaced 6 MVA transformer in Pokhara sub-station was relocated to Bardghat Sub-Station. The displaced 12.5 MVA transformer in Bharatpur sub-station was relocated to Lahan sub-station. The other displaced 6.3 MVA transformer in Bharatpur sub-station will be relocated to Simara

Sub-Station. The 10 MVA transformer in Lahan sub-station was relocated to Dhalkebar sub-station.

- Six 132 kV Circuit Breakers were added at Attaria, Bharatpur and Bardghat Sub-Stations. New protection system was added in Attaria Sub-Station for the Lamki Feeder.
- Disturbance Recorder with Fault Locators were installed in 8 major Sub-Stations.
- This Department also repaired 10 MVA transformer at Dhalkebar and 5 MVA transformer at Bardghat and overhauled 6 MVA transformer at Syuichatar.
- Old Chinese make 11 kV switchgear were replaced with VCB indoor switchgear at Chanauta.
- Chinese 11 kV VCBs were replaced with new VCB panels at Lahan.

System Operation Department

Load Dispatching

Load Dispatch Center, working round the clock, continued to keep the operation of the Integrated Nepal Power System (INPS) on the right track. The Center successfully performed their part of the responsibility in the testing and commissioning of Kali Gandaki 'A' Hydroelectric Project on time. The overstressed transmission lines coupled with the bottlenecks at several transmission links presented a new frontier of challenge in dispatching of this added capacity. To make matters worse, terrorist actions targeting vital transmission and generation facilities in different parts of the country led to varying degree of setbacks. However, the efforts put up by the Center and other wings of NEA during such time of distress helped in lessening the illeffects. The affected facilities were put back to operation one after the other by repairing the damages on war footing.

With Kali Gandaki 'A' on line, the demand–supply scenario has also undergone significant transformation – now the system endowed with summer-peaking capacity of 570 MW has about 450 MW of unconstrained summer demand to meet. In terms of energy, the summer time river-flow allow the system to generate more than 8000 MWh energy each day but the daily demand is yet to scale above 6000 MWh. If the demand growth continue to remain stagnant, excess energy will further increase as number of power purchase agreements are being signed.

DISTRIBUTION AND CONSUMER SERVICES

The Distribution and Consumer Services will take over the ownership of all Low Voltage Distribution Network (33 kV and below). It is responsible for operation and management of distribution network and its further development and expansion including rural electrification. It will purchase power in bulk from Generation and will sell it to all segments of consumers at a price fixed by the Tariff Fixation Commission.

The functions of 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 collections. These functions are being executed through its 2 Departments, 6 Regional Offices, 61 Branch Offices, 26 small hydro power plants of which 11 are leased and 2 solar power plants.

Distribution and Consumer Services (DCS) is one of the core activities of NEA. Supplying consumers with electric power and collecting revenue from them are the major responsibilities of DCS. Electricity has been extended to all the 75 districts headquarters. The Integrated Nepal Power System (INPS) covers 57 districts, 2 districts are supplied from solar power and the remaining 16 districts are supplied from isolated small hydropower plants. At present about 20 percent of the population is being supplied with electricity but the potential population coverage of the existing network is 32 percent.

Total number of consumers and energy sold in FY 2001/02 are 878,178 and 1574 GWh respectively. This is an increase of 17.72% and 11.89% respectively when compared to that of FY 2000/01. Total sales in Nepal was 1431 GWh and accounted for 91 % of the total sales. This is an increase of 150 GWh (11.7%) over the last fiscal year's figure. The revenue for FY 2001/02 is Rs.10,320.89 million which is about 23 % more than that of last fiscal year.

The domestic consumer category accounted for about 96 % of the total number of consumers, 36.60 % of sales and 37.57 % of revenue. The industrial consumer category accounted for only 2.28% of the total number of consumers but its contribution to sales and revenue are 38 % and 36.5 % respectively. The commercial consumer category accounted for only 0.55% of the total number of consumers but contributed 6 % of total sales and 8.8 % of total revenue respectively. Likewise, non-commercial consumers constitute 0.89 % of the total number of consumers, and accounted for 5.12 % of the sales and 7.5 % of the revenue.

NEA is striving to provide better service quality to its consumers. For maintaining cordial consumer relationships public awareness for timely payment of bills and issues like meter reading, loss reduction and safety are being disseminated through electronic media and newspapers.

Despite the concerted efforts to curb losses, it still remained a burning issue for NEA. To reduce losses, DCS has undertaken various measures like installation of aerial bundle cable (ABC) conductor, launching of public awareness program, regular inspection of big and medium consumers, correct metering system and introducing electronic meters. Yet it requires the continued and committed efforts from all walks of society to control the electricity losses. An Act to curb the unauthorized leakage of electricity has already been enacted and enforced, and the regulation thereof has been submitted to HMG for approval.

Performance Contract is to be entered into with each of the branch managers of the 15 Profit Centers from FY 2002/2003 for the commercial operation, better consumer services, improved efficiency, cost savings, increased revenue, accountability, institutional

strengthening and electricity loss reduction. The Profit Centers are: 1) Kathmandu Central, 2) Kathmandu East, 3) Kathmandu West, 4) Lalitpur, 5) Bhaktapur, 6) Birgunj 7) Hetauda, 8) Bharatpur, 9) Janakpur, 10) Biratnagar, 11) Dharan, 12) Pokhara, 13)Bahirahawa, 14) Butwal and 15) Nepalgunj.

Small Hydro and Rural Electrification Department

During FY 2001/02, normal activities of this department were seriously affected due to the prevalence of non-working atmosphere in the hilly and remote areas. Construction works of 33 kV transmission and 0.4 kV distribution lines in most of the districts remained suspended due to the security reason. Construction materials could not be transported to the site in some of the districts due to the non-availability of the transportation facilities.

Operation and maintenance activities of this department are limited in 34 districts of 12 zones of Nepal. The departmental functions are carried out by 7 branch offices and 26 offices of Small Hydropower Plants of which 11 have been leased to the private operators and 2 solar power generating plants.

The following Small Hydropower Plants have been damaged by terrorist and are not currently in operation:

i)	Jumla SHP	(200 kW)-	Leased Plant	damaged on 2059/01/11
ii)	Bajhang SHP	(200 kW) -	Leased Plant	damaged on 2059/01/07
iii)	Bhojpur SHP	(250 kW)-	Leased Plant	damaged on 2058/10/13
iv)	Khandbari SHP	(250 kW)-	Leased Plant	damaged on 2058/09/08
v)	Phidim SHP	(240 kW)-	Leased Plant	damaged on 2058/12/20
vi)	TaplejungSHP	(125 kW)-	Leased Plant	damaged on 2058/12/21
vii)	Acham SHP	(400 kW)-	NEA Mgmt	damaged on 2058/11/04
viii)	Okhaldhunga SHP	(125 kW)-	NEA Mgmt	damaged on 2058/12/15
ix)	Kalikot SHP	(500 kW)-	not damaged but not in operation due to un-accessibility	

ENGINEERING SERVICES

The Engineering Services will be responsible for all power development activities, directly or indirectly funded by NEA and HMG, ranging from preliminary studies to detail engineering design. It is to be developed into a commercial subsidiary company of NEA. It will carry out relevant jobs for NEA as well other agencies on commercial basis.

Soil, Rock and Concrete Laboratory, NEA

As per the present organizational set-up of NEA; the Soil, Rock and Concrete Laboratory (SRCL) reports to the General Manager, Engineering Services. Main scope of services include geological survey (geological mapping, geo-physical survey works, drilling), construction material investigation, hydro-sedimentological, in-situ & laboratory testing and geodetic investigation. Besides these, it has also been involved in environmental study and engineering design of different hydropower projects. This year the Laboratory provided its services mainly to NEA and few other external agencies. Major projects completed in the year 2001/02 are:

- Techno-Feasibility Study: Rural Electrification and Distribution System Reinforcement of eight districts,
- Kulekhani Storage and Project Identification: Sedimentation study of Kulekhani Storage, identification of different HE Projects,
- Galwa Gad SHP Project: Detail Engineering Design,
- Naumure Storage Project: Review Study,
- Madi Isaneshwar Storage Project: Feasibility Study Phase I
- Upper Seti Storage Project: Feasibility Study,
- Upper Tamakoshi (Rolwaling) Hydroelectric Project: Feasibility Study Phase I,
- Pancheshwar Multipurpose Project: Seismic refraction survey,
- Tatopani SHP Project: Post evaluation study,
- Design of NEA Block 'A' Building: Structural analysis/architectural design,
- Kulekhani III HE Project: Technical support & construction supervision of test adit,
- Ghami/Charang Khola SHP Project: Feasibility Study,
- Golplingtar Lift Irrigation Project: Techno-feasibility Study.
- Pancheshowar Multipurpose Project: Core Drilling at Purnagiri re-regulating dam site.

Other projects that are nearing completion are:

- Kankai Storage HE Project : Field works comprising of topographic survey, seismic refraction survey, surface geological mapping, core drilling works, hydrological survey and construction material survey have been completed. Design works and report preparation is in the final stage.
- Upper Tamakoshi HE Project : Topological survey of access road and bridges have almost been completed. Collection of base line information for EIA Study has been completed. Preparation of scoping document is presently under way.
- Madi Isaneshor Storage Project: Final Report is being prepared based on the additional information collected.
- Langtang Storage HE Projects: Field works comprising of topological survey, seismic refraction survey, hydrological survey have been completed. Design works is in the final stage.
- Review and Upgrading of Identification and Feasibility Study of Storage Projects : Data updating of 102 different projects (10-300 MW) have been prepared under this study.

- **Kulekhani Sedimentation Survey and Project Identification :** Sedimentation survey of Kulekhani Reservoir has been carried out with the report already submitted. Desk study and field visit of different hydropower projects are continuing as part of Project Identification Program.
- **Study of Transmission Line :** IEE Study of a part of a transmission line (re-aligned one) has been completed for Eastern Regional Office, DCS, NEA.
- **Hewa Khola HE Project :** Field study (topographic survey, hydrology, geological study) has been completed. Inception report has been submitted.
- **Thankot - Chapagaon 132 kV TL Project :** Detailed survey work of Thankot-Chapagaon 132 kV TL and its associated sub-stations has been completed.
- **Indrawati III HEP :** Sampling of concrete lining of tunnel alignment of Indrawati III HE Project has been completed and its report submitted.

Environmental Study has become one of the major activities of this Laboratory for the last couple of years. Presently it has been undertaking following projects :

- EIA Study of Butwal - Sunauli 132 kV TL Project
- EIA Study of Dhalkebar - Bhittamore 132 kV TL Project
- EIA Study of Parawanipur - Birgunj 132 kV TL Project

Environment and Social Studies Department

The current policies of HMG/N stress the importance of environmentally sound and sustainable development of power generation and transmission line projects. According to Environmental Protection Act, 1996 and the Environment Protection Rule-1997 (First Amendment 1999) hydropower projects above 1 MW (Initial Environmental Examination for 1-5 MW Projects and Environmental Impact Assessment for 5 MW & above Projects) are considered for the environmental study. Similarly in transmission line sector, 33 to 132 kV lines (IEE for 33 to 66 kV Transmission Line, Rural Electrification Scheme of 1-6 MVA and EIA for 132 kV Transmission Line) require environmental study. Besides these, NEA is also responsible to meet the environmental requirement of the donor agencies such as ADB, World Bank, KfW, JICA, etc. when executing projects funded by them.

Since the Environmental and Social Studies Department is the main wing of NEA for implementation of environmental and social studies, the following projects were implemented under the supervision and association of the Department in Fiscal Year 2001/02.

- Co-ordinate the works between the line agencies and Ministries for the approval of EIA/IEE documents.
- Finalize the agreement with GEOCE Consult (P) Ltd. to conduct the IEE study of Dhading – Nuwakot 33 kV sub-transmission line and 33/11 kV substation project.
- Get the approval of Middle Marsyangdi HEP EIA report from Ministry of Population and Environment (MoPE). The EIA report of Kulekhani III HEP and Upper Modi 'A' HEP is at the final stage of approval.
- Conduct fieldwork and prepare Scoping and Terms of Reference document for EIA of Rolwaling Hydroelectric Project in association with Soil Rock and Concrete Laboratory.
- Co-ordinate and supervise scoping exercise and TOR preparation work for the EIA study of by Kankai Storage HEP conducted by Nepal Consult (P) Ltd.
- Co-ordinate and supervise scoping exercise and TOR preparation work for the EIA study Kulekhani III 132 kV Transmission Line Project conducted by DIP Consult (P) Ltd.
- Co-ordinate and supervise scoping exercise and TOR preparation work for the EIA study of Chameliya Hydroelectric Project conducted by East Consult (P) Ltd.
- Follow up the work of previous years such as IEE studies for K .vre 33 kV Lalitpur 33 kV, Rural Electrification Scheme in 37 districts and EIA of Jagatpur-Madi 33 kV sub-tranmission line and Middle Marsyangdi – Lower Marsyangdi 132 kV Transmission Line Projects.

The following mitigation and monitoring programs were implemented by the Department in fiscal year 2001/02.

- Continue the manpower deputation to Kali Gandaki Environment Management and Monitoring Unit for the monitoring and implementation of mitigation measures.
- To minimize the impact of Middle Marsyangdi Hydroelectric Project on affected people and agriculture production, the detail design of Goplingtar Lift Irrigation Project has been completed.
- Review the Fish Hatchery operation and maintenance proposal submitted by Nepal Agriculture Research Council to Kali Gandaki 'A' Hydroelectric project. The proposal is approved by NEA and memorandum of agreement between NARC and NEA will be signed in near future.
- Provide manpower to Soil Rock and Concrete Laboratory NEA for the Environmental Auditing of Modi HEP.
- Celebrate the World Environment Day (June 5, 2002) and implementation program at NEA-Training Center compound Kharipati. About 300 plants of various species were planted.

NEA Training Center

The Training Center of NEA aims at providing need-based training to NEA's employees to enhance their performance and to make them capable to plan, implement, maintain and operate NEA's system. With the infrastructure facility already in place, the Center now hopes in producing more tangible outputs with

custom-designed training and managerial development programs. The Center is also conducting various types of training programs on commercial basis to the clients of NEA and other professionals of power sector.

The training programs conducted during the last fiscal year covered a wide spectrum of areas in Distribution, Transmission, Generation, Hydropower, Management, Information Technology and other areas of power utility business. A total of 794 NEA staff received training from the programs conducted by the Training Center.

Electro-Mechanical Division

In the fiscal year 2001/02, Electro-mechanical division was involved in the final testing of the Modi-Khola Hydro-electric Power Project (14.8 MW). Similarly this division is also functioning as the engineering consultant for the Chilime Hydroelectric Power Project (20 MW) that is presently under construction. This division prepared the tender document for the 132 kV transmission line and reviewed the electro mechanical tender document for the Chamelia Gad Hydro-Electric Power Project (30 MW). This division also reviewed the study of Kankai Hydroelectric Power Project (60 MW).

Concrete Pole Plant, Amalekhgunj

The Pre-stressed Concrete (PSC) Pole Plant was established in December, 1994 under the Seventh Power Project at Amalekhgunj, Bara district. It has the production capacity of 14,000 pieces of poles of different sizes.

The plant consists of the 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), 9 m. (10 sets) and 8 m. (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 tons.

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. The workshop has two sections: (1) Repair and maintenance of distribution transformers upto 500 kVA and (2) Operation and maintenance of heavy equipment.

Transformer Maintenance Section: This section 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 Section: This section 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 equipment of the workshop is available on hire basis to the contractors of projects associated with NEA as well as to various government and non-government organizations.

Project Identification Program

The Project Development Department of NEA has conducted various studies for identifying feasible hydropower projects in Nepal. In the fiscal year 2001/02, desk studies of eleven hydropower projects in Eastern, Western and Mid Western Development Regions of the country were carried out. Out of these eleven projects, three projects, namely, Upper Kali Gandaki, Upper Budhi Gandhaki and Deumai, have been studied at reconnaissance level. The main features of these three projects are presented in the table given below.

Name of the Project	Development Region	District	Installed Capacity (MW)	Design Discharge (m3/s)	Gross Head (m)	Annual Energy (GWh)	Type
Upper Kali Gandaki	Western	Myagdi	51.0	67.4	90	290.89	R-O-R
Upper Budhi Gandaki	Western	Gorkha	33.0	49.71	80	182.3	R-O-R
Deumai	Eastern	Ilam	10.5	7.90	160	60.0	R-O-R

PLANNING AND MONITORING

Planning and Monitoring is responsible for preparing expansion plans and monitoring of projects of NEA. It facilitates import and export of power as well as power trading in bulk from IPPs.

System Planning Department

As its regular proceedings, System Planning Department carried out generation expansion plans including the projects for which PPAs have been signed. Several different scenarios were studied. Transmission expansion plans were also carried out for the different generation expansion plans. This department also provides technical support to other departments of NEA for carrying out power system studies.

Corporate Planning Department

Activities at the Corporate Planning Department over the year comprised of regular features such as the preparation of the annual development budget and programs, liaison with HMG/N on issues of licenses and foreign aid proposals. A special activity undertaken in the past year was the preparation of Nepal's Tenth Five Year Plan. A forerunner plan entitled the Mid Term Expenditure Framework (MTEF) was also prepared with an accent on poverty alleviation in preparation for the Nepal Development Forum (NDF) which was held in Kathmandu in January 2002. The Department was also active in assisting with the formulation of the amendment to the Hydropower

Development Policy of HMG and the Rural Electrification concept paper.

Promotion of private sector investment in the power sector was another activity undertaken by the Department. in accordance with the NEA commitment to purchase total of upto 50 MW of power from IPP-promoted small hydropower projects in the capacity range 1-10 MW, four power purchase agreements (PPAs) were signed with: Molnia Power (P) Ltd., Sanima Hydropower (P) Ltd., Kantipur Hydropower (P) Ltd. and Unique Hydel Co. Ltd. for purchase of power from the 5 MW Mailun Khola, 2.60 MW Sunkoshi, 10 MW Langtang Khola and 1 MW Baramchi small hydropower projects respectively. The first IPP promoted small hydropower project, the 185 kW Syange Hydropower Project developed by Syange Hydropower Co. (P) Ltd. came into commercial operations on January 12, 2002.

NEA was also the active participant of the USAID sponsored SARI/E program. Over the year NEA participated in 22 training programs, seminars, workshops, executive/peer exchange and biannual review programs which involved 48 senior officers of NEA. A notable event was the participation in the South African Development Community (SADC) Energy Investment Conference in Victoria Falls, Zimbabwe, in September 2001. This gave an insight into the working of the South African Power Pool (SAPP) which is considered a success story in the realm of regional power exchange. NEA also became the member of a new regional partnership in the field of Disaster and Security Preparedness and response Partnership with the first meeting held in the USA in May 2002.

The NEA-TACOMA Power-Wisconsin Electric Energy Partnership funded by USAID and managed by USEA came to a close with a Recognition Ceremony. The program was held on February 28, 2002 in Kathmandu during the last visit of the US team to Nepal. It was well attended by senior figures in US and Nepal government including the Minister for Water Resources Hon. Mr. Gachhadar, and the Ambassador of the United States of America, Mr. Michael Malinowski, and the Mission Director of USAID Mission in Nepal, Ms. Joanne Hale, Mr. B.B. Malla, the former Managing Director of NEA, Mr. David Ward of TACOMA Power, Mr. Larry Bruneel of Wisconsin Electric were felicitated for their efforts in making the partnership a success. In total, the program involved three exchange visits each to the USA and Nepal. A dozen person - visits from NEA benefited from visits to USA. In addition, a larger cross-section of the NEA staff interacted with visiting US utility executives and experts and established lines of communication for further queries and exchange of notes. Preparations are currently under way to commence a new phase to the Energy Partnership Program.

Nepal-India Power Exchange Transmission Lines

The power exchange between India and Nepal is presently in the range of 50 MW. Considering the growth of power demand both in Nepal and India and the prospect of long term availability of dependable power, specially from hydro power stations in Nepal, the Power Exchange Committee has agreed in principle to enhance the present exchange level to 150 MW and to construct adequate facilities enabling transactions at the proposed level.

In accordance with the agreement reached, the joint - technical committee, which was set up to identify possible exchange links, has recommended three new 132 kV interconnections to be taken up for construction. As with the existing systems, these new lines will operate in isolated modes only. As per the understanding, each country will be responsible for the construction of the facilities lying within their territory. The three new 132 kV interconnections recommended for construction are :

- Butwal - Anandanagar
- Birgunj - Motihari
- Dhalkebar - Sitamarhi

FINANCE AND ADMINISTRATION

Finance and Administration is responsible for financial management, auditing, funding central account and administration of NEA.

Finance and Accounts

NEA's financial performance remained encouraging for FY 2001/02. NEA's total revenue increased by NRS 2012.5 million (23% increase) to reach a figure of NRS 10766.4 million as compared to NRS 8753.9 million in the previous year. NEA's revalued assets increased to 42374.6 million as compared to NRS 37103.7 million in the previous FY 2000/01. Expenditure in operation and maintenance have increased by 16.08% reaching a figure of NRS 10137.9 million as compared to NRS. 8733.8 million in fiscal year 2000/01. Overall, NEA registered a net profit before tax of 413.9 million as compared to net loss before tax to 1.9 million in FY 2000/01.

In FY 2001/02, NEA has invested NRS.6378.0 million in capital works and projects, the funding of which comprised of NRS. 1002.3 equity, NRS. 4873.5 million from borrowing and the rest (502.2 million) from NEA's own resources. By the end of FY 2001/02 NEA's total borrowing stood at NRS. 41581.0 million.

The financial audit for FY 2000/01 was completed within eight and half months of the end of the fiscal year. The audit for the year 2000/01 was undertaken by auditors M/S Price Waterhouse, India CSC &Co of Nepal. For the financial audit of F/Y 2001/02 auditor M/S T.R.Upadhyay & CO., Nepal have been appointed. Tax returns for the F/Y 1994/95, 1995/96 and 1996/97 have been filed with the Inland Revenue Office and the tax auditing for the FY 1997/98, 1998/99, 1999/00 and 2000/01 are in process.

Human Resources Department

The Human Resources Department has been entrusted with the following functions under NEA's present Corporate Structure:

1. Manpower planning
2. Staffing
3. Training and development
4. Career management
5. Employees record keeping

6. Staff welfare
7. Disciplinary actions
8. Administrative management

The total approved positions at the end of FY 2001/02 is 10,073; of which a total of 9,790 staff are presently employed.

During the year under review; 297 were appointed at different levels, 159 staffs retired, 36 staffs resigned and 45 staffs died. The recruitment process of appointing 922 new staffs in different positions is still on-going. Under disciplinary actions, 14 staffs have been cautioned.

A total of 109 staffs received training abroad whereas the number of staffs receiving training from different organizations in Nepal is 62.

Staff Training Fiscal Year 2001/02	
Abroad	109
Higher Studies	2
Training	66
Seminar, Workshop etc.	24
Inspection	17
Nepal	62
Higher Studies	8
Training	25
Seminar, Workshop etc.	29

Legal Aspects of NEA

The Legal and Arbitration division of NEA is performing all the legal activities of NEA. It provides legal advice to the management of NEA as well as to different offices of NEA. The division is also involved during negotiations for power purchase and contract agreements with different companies. The division is also defending cases through NEA's legal advisors in the different courts of the kingdom of Nepal for disputes in which NEA is a party.

In the FY 2001/02 out of a total of 80 cases; NEA won 21, lost 6 and the remaining 53 cases are sub judice. Cases are related mostly to the misuse of electricity, land acquisition, employees service termination, staff promotion, etc. Some of the disputes related to Contracts of projects under construction are being resolved through arbitration.

The *Electricity Theft Control Act 2058* has already been enacted and enforced. Its regulation is in the process of being approved. It is anticipated that the *Electricity Theft Control Act 2058* together with its regulation will help in controlling electricity theft.

INFORMATION TECHNOLOGY

Information Technology is responsible for developing and supporting computer system in NEA and helps in the enhancement of their use.

The NEA management has adopted the policy of making significant use of information technology (IT) for the improvement of corporate governance and to improve organizational efficiency. IT is expected to maintain transparency and disclose all financial and non-financial related information in an easily accessible and understood manner. These features of IT help to improve corporate governance. They also help to improve efficiency because performance can be measured and compared objectively. Establishment of accountability and ease of evaluation are expected to improve organizational productivity.

To achieve these objectives, a network connecting computers at NEA central office and some regional offices has been completed. Works are currently underway to expand this network to connect 80 budget centers of NEA. This computer network will be used to prepare MIS reports; and to implement the computerized accounting and inventory systems of NEA. From FY 2002/03 MIS reports shall be prepared on the monthly basis using the MIS computer software which has already been tested.

The computerized billing system of Kathmandu West division which was implemented as a pilot scheme has been successfully replicated in Kirtipur, Birgunj, Biratnagar and Bhairahawa DCS branch offices. The preparatory work for computerized billing in Janakpur and Nepalgunj branch offices is also almost complete and will be functional within a few months.

Internal Audit

Last year, the internal audit department introduced revenue auditing and accounting software which was developed with the help of local consultant. This is found to be very useful to consumer accounting and revenue auditing. This package covers 12 branches and covers all the branches in the far western region. It accounts for 1,65,581 consumers which is about 19 % of the total number of consumers of NEA. With the introduction of this software, the performance of revenue section has improved remarkably.

Word/ Excel training was given to 403 ledger clerks and supervisory training for 14 personnels.

Internal audit was carried out in 38 branches in FY 2001/02 and audit observation is also sent to the concerned branches for necessary action and prompt reply.

High level audit report monitoring committee is formed for the purpose of maintaining financial discipline at the recommendation of internal audit department.

Present Manpower Strength in NEA Fiscal Year 2001/02

Level	Service	Approved Position			Existing Situation			
		Regular	Pool	Total	Permanent	Contract	Daily Wages	Total
Officer	Technical	1015	0	1015	653	190	7	850
	Administration	408	0	408	305	10	0	315
	Total	1423	0	1423	958	200	7	1165
Assistant	Technical	5296	173	5469	4105	571	740	5416
	Administration	2888	293	3181	2481	324	404	3209
	Total	8184	466	8650	6586	895	1144	8625
	Grand Total	**9607**	**466**	**10073**	**7544**	**1095**	**1151**	**9790**

PROJECT HIGHLIGHTS

Kali Gandaki 'A' Hydroelectric Project

Construction works of this Project has been completed and the Project has already started feeding power to the national grid.

On January 9, 2002, Honorable Minister of Water Resources Bijaya Kumar Gachchhadar initiated the impounding of reservoir for wet testing of intake and water conveyance system. The initial test run of first unit (Unit No. 3) was successfully carried out on March 7, 2002. Along with reliability testing, power generation was initiated from the first second and the third unit on March 31, April 19 and May 24, 2002 respectively.

The Project has to face considerable opposition from the local residents in transmission line works in Pokhara sector giving rise to delays. However, a solution was negotiated and works on 13 towers along with associated optical fiber works were finally carried out.

Kali Gandaki 'A' Hydroelectric Project located about 180 km west of Kathmandu, is a run-of-river scheme with 6 hours daily peaking capability and 144 MW as installed capacity. The Project is expected to generate in average 842 GWh of energy each year.

The Project is spread over Syangja, Gulmi, Parbat, Palpa, Kaski and Rupandehi districts, but the main component of the Project is located in Syangja district. The Project includes a 100 m long and 43 m high concrete gravity diversion dam, open surface desander basin, 6 km long tunnel of 7.4 meter diameter and a surface powerhouse. The tunnel shortcuts the 45 km long natural loop of the Kali Gandaki river to gain a net head of 115 m. A pressured flow of 141 m^3/s feeds three Francis turbines in the powerhouse. Power generated is transmitted through 66 km long single circuit 132 kV transmission line to Pokhara and 40 km long double circuit 132 kV transmission line to Butwal Substation.

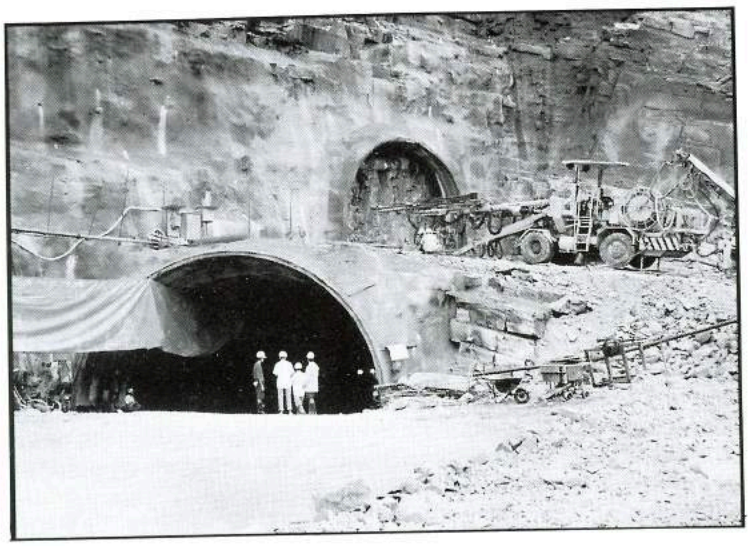
Consulting services for the Project was provided by Morrision Knudsen International Inc. in association with Norconsult International and IVO International. Civil works and hydraulic steel works were contracted to Impregilo SpA and Noell Stahl respectively. A joint venture of Mitsui, Toshiba and Alstom was contracted for electrical equipment. Similarly, a joint venture of Mitsui and Toshiba was the mechanical contractor. Transmission lines and substations works were carried out by Tata Marubeni Joint Venture.

Middle Marsyangdi Hydroelectric Project

Middle Marsyangdi Hydroelectric Project is a daily pondage run-of-river scheme with an installed capacity of 70 MW and an average annual energy generation of 398 GWh. This Project is being funded by KfW (Germany) HMG/N and NEA. The estimated cost of the Project is about 13.65 billion rupees (US $ 190 million).

The Project site is about 170 km west of Kathmandu, in Lamjung District. The dam site of the Project is located at a narrow gorge of Marsyangdi river near Phaliasangu in between Udipur VDC and Chiti VDC and the powerhouse site is at the right bank of the Marsyangdi river at Siudibar, Bhote Odar VDC. The Project utilizes a gross head of 110 m and discharge of 80 m^3/s in driving two Francis turbines of 36 MW capacity each. The Project has a peaking capability of 5 hours even during the dry season. The major components of the Project are: 62 m high 95 m long combined concrete gravity and rockfill dam with concrete spillway capacity of 4270 m^3/s, 3 numbers of 12 m x 19.5 m spillway gates, a 1.6 million m^3 capacity peaking reservoir, three numbers of underground desanding caverns (15 m x 100 m x 25.1 m each) with two basins in each cavern to flush 95% of 0.2 mm particle size by vertical flushing (BIERI) system, 5.4m diameter 5210 m long concrete lined power tunnel, 20 m diameter 45 m high surge tank, a 450 m long penstock, a surface powerhouse and a 41 km long single circuit 132 kV transmission line.

The detailed design and construction supervision of the Project is being done by Fichtner Joint Venture. The Environmental Impact Assessment report was prepared by environmental consultant TAEC-NESS Joint Venture as per the new environmental act and regulation and the



same consultant is monitoring the mitigation plan during the construction.

The construction of the Project has commenced from June 25, 2001. The civil works contractor Dywidag-Dragados-CWE JV is presently carrying out site installation works, access road works, excavation works for dam, intake and powerhouse, and tunneling works for diversion and adits. NEA/Engineers camp facilities works is the responsibility of Tundi-Lama JV and is almost at the completion stage. VOITH SIEMENS Hydropower Genera-tion GmbH & Co. and ALSTOM Energie-technik GmbH are the contractors for mechanical equipment works and GIS switchyard works, respectively and these contractors are at the stage of producing shop drawings and manufacturing of components. The electrical equipment works has recently been awarded to ALSTOM Power Generation AG, Mannheim, Germany. Tender is being called for transmission line works. The total construction work is planned to be completed within 43 months from the commencement date.

The Project has already acquired about 24.41 ha (480 ropanies) of land at dam site, Phaliasangu and about 11.19 ha (220 ropanies) of land at powerhouse site, Siudibar. Beside these, the Project has also acquired 2.03 ha (40 ropanies) of land necessary for resettlement at Udipur, 3.66 ha (72 ropanies) at Phedikuna for NEA/Engineer's Camp and about 0.92 ha (18 ropanies) of land at Bhote Odar for Bhakti Namuna Higher Secondary School. As part of resettlement and mitigation program, the Project has carried out income generation oriented training program and community awareness program focused on public health and traffic safety to the members of the Project affected families and the local people of the Project area.

Recent visits of KfW mission ('Conflict Reduction Appraisal') and Panel of Environment Experts (PoE) to the Project site has resulted in a concept of Neighborhood Support Program. The main objective of this program is to promote the level of understanding between local people and the Project and to provide tangible benefits to the local people and the area. The program will get underway once the Neighborhood Support Program Office (NSPO) is established at the site.

Chameliya Hydroelectric Project

Chameliya Hydroelectric Project is a medium sized (30 MW) peaking run-of-river plant with 6 hours daily peaking capacity. The Project utilizes the water from Chameliya River, a tributary of Mahakali River. The Project site is located in Darchula district of far western development region of Nepal, which is about 950 km from Kathmandu and 18 km north east of Gokule, the nearest road head on Baitadi-Darchula road. The detailed field investigation for conceptual design was carried out by Civil Design Department, in association with Soil, Rock and Concrete Laboratory (SRCL), NEA. The detailed design and preparation of tender documents were carried out by a consortium of Korean Consultants (Hyundai Engineering Co., and Korea International Cooperation Agency (KOICA) in collaboration with NEA.

The main features of the Project are 54 high concrete gravity dam with two 13.5 meter high radial gates, underground desander with 2 basins, 4067 m long headrace tunnel, 49.8 m high restricted orifice type surge tank, 461 m long penstock and semi-underground powerhouse with two units of 15.3 MW vertical shaft Francis turbines. The Project will generate 184.21 GWh energy annually. The power will be evacuated through 131 km long 132 kV transmission line to Attariya substation at Kailali district.

Out of 18 km long access road, earth work and structural work of 17 km portion has been completed. Also, span Bailey Bridge on Chameliya River spanning 40 m, and R.C.C. Bridge on Agari Khola spanning 22.5 m have been completed. Construction works of remaining portion of access road, concrete bridge on Ghatte Gad and a steel truss bridge over Chameliya River at Balanch are under progress. Two buildings have also been constructed at powerhouse site.

Total cost of the Project is estimated to be US$ 74.897 million. The Project is envisaged for implementation under co-financing from HMG/N, NEA and other donor agencies.

Nepal-India Power Exchange Transmission Lines

Presently, power is being exchanged between Nepal and India in the range of 50 MW. Considering the growth of power demand in India and the prospect of long-term availability of dependable power in Nepal, the Power Exchange Committee has agreed in principle to increase the present exchange level to 150 MW and to construct adequate

facilities for effecting the exchange at the proposed level.

In accordance with the agreement, the joint-technical committee, set up to identify possible exchange links, has recommended three new 132 kV interconnections, namely, Butwal-Sunauli, Parwanipur-Birgunj and Dhalkebar-Bhittamod Transmission Lines. As with the existing systems, these new lines will operate in isolated modes only. As per the understanding, each country will be responsible for the construction of the facilities within their territory.

Butwal-Sunauli 132 kV Transmission Line Project

Contract for the construction of this 23 km long double circuit transmission line, including for extension of two line bays, was awarded to a company from P.R. China at the end of the last fiscal year. Funded jointly by HMG/N and NEA, the Project is estimated to cost US$ 1.8 million and is scheduled for completion in fiscal year 2003/04. In order to complete the exchange link, this line needs be connected to the substation in Anandnagar (India) by constructing another 45 km long transmission line on the other side of the border.

Butwal substation is the main outlet for power generated by the Kali Gandaki 'A' hydro power station. With the recent commissioning of this power station, the Project has assumed added significance, as it will enable transmission of Kali Gandaki 'A' power directly to India. It may even be possible to dedicate some of the generating units of Kali Gandaki 'A' power station to the Indian system.

Parwanipur-Birgunj 132 kV Transmission Line Project

Under this Project, a new 15 km long double circuit transmission line will be constructed between Parwanipur substation (being built under a separate project) and Birgunj. Initially only one circuit will be strung. The construction of the line, along with the two associated line bays at Parwanipur substation is expected to cost US$ 1.85 million. Another 45 km long line segment needs to be built in India to link to substation in Motihari, India.

Dhalkebar-Bhittamod 132 kV Transmission Line Project

The main components of this link are (i) construction of about 45 km long double circuit line from Dhalkebar substation to Bhittamod at Indo-Nepal border and (ii) extension of two line bays at Dhalkebar substation. The Project is estimated to cost US$ 6.18 million. About 45 km of transmission line needs to be constructed on the other side of the border to connect the line to the substation at Sitamadhi, India. Considering the proximity of this exchange link with the planned hydropower generating stations along Tamakoshi, Arun, Tamor and other rivers in eastern Nepal, this link will prove very beneficial in boosting power export to India.

Thankot-Bhaktapur 132 kV Transmission Line Project

Once completed, this 26-km long 132 kV transmission line from Thankot to Bhaktapur will finally close the 132 kV ring main in the Kathmandu Valley. The line comprises of double circuit towers but only one circuit will be strung under this Project. The Project also includes one switching station at Thankot, which will be converted to a full-fledged 220 kV substation by the end of this decade. During the same period another 132 kV substation will be constructed at Harisiddi. This Project also covers upgrading of Balaju and Bhaktapur substations. These reinforcements will not only cater to the growing demand in the valley but also reduce system losses and improve quality and reliability of the supply in the area.

The Project is estimated to cost US$ 15 million. ADB will bear the foreign currency component of this cost while HMG/N and NEA will contribute the local component. The expected completion period for the Project is three years. At present, NEA is in the process of selecting consultants.

Hetauda-Dhalkebar & Butwal-Bardghat 132 kV Transmission Line Project

This Project, scheduled to be completed in fiscal year 2002/2003, will greatly relieve the bottleneck being felt in the evacuation of power generated from Kali Gandaki 'A' power station. This line will also help in correcting the voltage at Duhabi substation in the east.

The Project comprises of stringing of 174 km single circuit lines onto the empty side of existing double circuit towers using hot line erection method. Except for a 7-km stretch of the line, the erection works have already been completed. At present, extension of associated line bays is in progress at the four substations. Funded jointly by HMG/N and NEA, the Project is estimated to cost US$ 3.8 million.

Birgunj Corridor Reinforcement Project

Under this Project, two 132 kv substations will be built, one at Pathlaiya and the other at Parwanipur. These substations will be linked by a 20 km long double circuit 132 kV transmission line. Parwanipur substation is scheduled to be completed in the fiscal year 2003/04. Once completed, this line will supplement the existing 66 kV lines, which presently serve the industrial belt in the Birgunj corridor. Presently, power supply in this region is being constrained by the overloading of the 66 kV lines giving rise to serious voltage problems. This Project will not only cure the existing transmission problem in the corridor, but will also facilitate exchange of power between Nepal and India through the planned Parwanipur-Birgunj Transmission Line Project.

The Project is estimated to cost US$ 4.75 million which will be met jointly by HMG/N and NEA.

Panchkhal Substation Project

Under this Project, the existing 66 kV Panchkhal substation will be replaced with a new substation to facilitate evacuation of power from Indrawati Hydro-

electric Project being executed under private ownership. This Project will also greatly benefit the surrounding area in terms of improvement in supply quality, reliability and higher substation capacity for future electrification around the area. The Project is estimated to cost US$ 1.03 million which will be funded jointly by HMG/N and NEA.

Modikhola Substation Extension Project

This Project aims at improvement of quality and reliability of supply in the region covered by the existing 33 kV line between Pokhara and Baglung. Under this Project, a 132/33 kV substation will be built at Modikhola power station. Funded jointly by HMG/N and NEA, the Project is estimated to cost around US$ 255,000. The Project is scheduled for commissioning by the end of the fiscal year 2002/03.

K-3 Substation Project

In the early nineties, a team of experts from JICA had proposed a 66 kV substation at the heart of Kathmandu city as a part of the master plan for reinforcement and improvement of transmission and distribution system in the Kathmandu Valley. At present, the supply in this region is mainly through low capacity 11 kV feeders, which have been under heavy stress due to overloading. The proposed 66 kV substation will not only relieve these stresses and reduce system loss but also help improve reliability and quality of supply in the area. Furthermore, such substation will also help in accommodating the increasing demand in the area.

Under this Project, a new 66/11 kV substation with 36 MVA capacity will be constructed which will be linked to the existing Teku substation through a 3.5 km long 66 kV double circuit underground cables. Several 11 kV feeders will be drawn from this substation to interlink the existing distribution network in Kathmandu city area. HMG/N has requested the Government of Japan for financial assistance to the tune of 1600 million Yen for this Project.

Hetauda-Bardghat 220 kV Transmission Line Project

NEA plans to construct its first 220 kV transmission line parallel to the existing 132 kV line from Hetauda to Bardaghat. The proposed line will also form a segment of the 220 kV national grid that is being envisaged under future generation plans that include Upper Karnali and West Seti in the far western region and Arun in the eastern region of the country.

The main features of this Project are (i) construction of 152 km double circuit 220 kV line with single circuit stringing using duplex Bison conductors and. charged initially at 132 kV, and (ii) installation of two 132 kV line bays at Hetauda and Bardghat substations. The estimated cost of this Project is US$ 29 million.

Khimti-Dhalkebar 220 kV Transmission Line Project

This Project once completed, will transmit power from the Khimti 1 power station to the eastern region via the Dhalkebar substation thereby improving the voltage profile in the eastern region. Besides, this Project will also facilitate export of power to India via Bhittamod exchange point.

Under this Project, a 75 km long 220 kV double circuit line will be constructed from Khimti 1 power station to Dhalkebar substation. Initially, only one circuit will be strung and it will be charged at 132 kV till Upper Tamakoshi power station comes into operation. The Project is estimated to cost about US$ 23 million.

Transmission Development

This project component will strengthen the transmission system in Kathmandu valley. It includes:

- The expansion of existing 132 kV sub-stations at Bhaktapur and Balaju.
- Construction of 26 km 132 kV Matatirtha-Chapagaun-Bhaktapur line thereby completing the 132 kV ring in Kathmandu valley.
- Construction of a new switching station at Matatiratha and a new sub-station at Harisiddhi.

LDC and Balaju Substation Extension Project

Balaju Substation Extension part of the Project has already been completed in June 2001. This has greatly facilitated the evacuation of power generated from Khimti 1 and Bhotekoshi power stations.

Civil construction works of Load Dispatch Center Master Station building at Syuchatar has been completed and installation of facilities and control equipments are at the final stage of completion. The new Master Station will be interlinked with all the major power stations and substations in the country through SCADA system enabling efficient and systematic supervision of system operation. Adaptation works at various outstations required for this purpose are in progress. Improved system security, quick response to disturbances, reduction in transmission loses, optimization of generation with better hydro-thermal coordination– these are some of the benefits that will accrue to the organization once the LDC Project is completed and commissioned.

Small Hydro and Rural Electrification Projects

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

- **Heldung Small Hydropower Project (Jumla):**
  The tender for engineering, procurement and construction (EPC) on turnkey basis has been awarded to RPP Enterprises. The work of the project started in FY 2001/02 and L.C. for electromechanical work has already been opened. The project is expected to be completed in FY 2004/05 at a cost of nearly Rs. 129 million.

- **Gamgad Small hydropower Project (Mugu):**
  The tender for engineering, procurement and construction (EPC) on turnkey basis has been awarded to Global Construction Company, Chitawan. The work of the project started in FY 2001/02 and L.C. for electromechanical work has already been opened. The project is expected to be completed in FY 2004/05 at a cost of nearly Rs. 161 million.

- **Sindhuwa-Khandbari 33 kV Transmission Line Project:**
  This project started in FY 1997/98. Till now 45 km of 33 kV transmission line, 25 km of 11 & 0.4 kV composite distribution line and nearly 98% work of 1.5 MVA 33/11 kV substation have been completed. The project is expected to be completed in FY 2002/03 at a cost of nearly Rs. 70.4 million.

- **Bulpa – Okhaldhunga 33 kV Transmission Line Project:**
  Poles for 15 km of the transmission line have been erected and L.C. for the supply of 33 kV line materials has been opened. This 29 km long 33 kV transmission line project started in FY 1999/00 and is expected to be completed in FY 2004/05. The project is estimated to cost Rs. 104.7 million.

- **Illam –Fidim- Taplejung 33 kV Transmission Line Project:**
  The tender for supply and construction of this transmission line project on a turnkey basis was finalized in FY 2001/02. This 90 km long 33 kV transmission line project started in FY 1999/00 and is expected to be completed by 2004/05 at an estimated cost of Rs. 144.5 million.

- **Sheetalpati- Mushikot 33 kV Transmission Line Project:**
  The tender for supply and construction of this transmission line project on a turnkey basis was finalized in FY 2001/02. This 50 km long 33 kV transmission line project started in FY 2001/02 and is expected to be completed by 2005/06 at an estimated cost of Rs. 142.5 million.

- **Chinchu-Rakam-Jajarkot 33 kV Transmission Line project:**
  The tender for supply and construction of this transmission line project on a turnkey basis was finalized in FY 2001/02. This 70 km long 33 kV transmission line project started in FY 2001/02 and is expected to be completed by 2005/06 at an estimated cost of Rs. 147.6 million.

- **Ghorahi-Halleri-Rolpa 33 kV Transmission Line Project:**
  The tender for supply and construction of this transmission line project on a turnkey basis was finalized in FY 2001/02. The project consisting of 45 km 33 kV transmission line and 100 km of 11 & 0.4 kV composite distribution line was started in FY 2001/02. It is expected to be completed by FY 2005/06 at an estimated cost of Rs. 142.5 million.

- **Tatopani-Larjung-Muktinath 33 kV Transmission Line Project:**
  This project is expected to be completed in the coming fiscal year at an estimated cost of Rs. 7.5 million.

- **Udipur-Beshishahar-Manang 33 kV Transmission Line Project:**
  This 81 km long transmission line project started in FY 2001/02 and is expected to be completed by FY 2003/04 at an estimated cost of Rs. 80 million. In FY 2001/02, transmission line materials were purchased for the project.

- **Dadeldhura-Baitadi 33 kV Transmission Line Project:**
  This 8 km long transmission line project started in FY 2001/02 and is expected to be completed by FY 2003/04 at an estimated cost of Rs. 32.1 million. In FY 2001/02, transmission line materials were purchased for the project.

- **Rasuwaghat-Khotang 33/11 kV Sub-station Project:**
  This project started in FY 2001/02 and is expected to be completed in FY 2005/06 at an estimated cost of Rs. 89 million. Transmission and distribution line materials were purchased and land for the sub-station was decided in FY 2001/02. Under this project, one 1.5 MVA 33/11 kV substaion at Lichkiramche VDC (near Rasuaghat) of Khotang district, 12 km 33 kV transmission line and 90 km 11 & 0.4 kV composite distribution line will be constructed.

- **Budar 33/11 kV Sub-station Project:**
  The construction of this 1.5 MVA 33/11 kV sub-station started in FY 2000/01 and is nearing completion. The cost of the project is estimated to be Rs. 20.7 million. The sub-station will be charged in FY 2002/03.

- **Jiri-Khimti 33/11 kV Sub-station Project:**
  This project started in FY 2001/02 and is expected to be completed in FY 2003/04. The project is estimated to cost Rs. 25 million.

- **Small Hydropower Master Plan:**
  To assess the potential of small hydropower projects, the Small Hydropower Master Plan (SHMP) Project was initiated in 1990. Under this project, following are the major works in FY 2001/02.

  a) Inventory study of Charang Khola (170 kW), Ghami Khola (930 kW), Arung Khola (700 kW) and Gadsera Gad (1200 kW) were completed.

  b) Feasibility study of Ghami Khola (990 kW) was completed.

  c) Feasibility study of Sarada Khola (2100 kW) was started.

  d) Detailed design of Inwa Khola (2700 kW) was started.

- **Misc. Rural Electrification**
  The Rural Electrfication Programme has been implemented in 2001/02 through the construction of nearly 117 km of transmission and distribution lines in 42 Himalayan districts

Mid and Far Western Rural Electrification Project

This Rural Electrification Project covers Surkhet, Dailekh, Achham, Doti, Dadeldhura, Darchula, Baitadi and

Bajhang districts of mid and far western development regions of Nepal. The Swedish Government, through the Swedish International Development Co-operation Agency (SIDA), has shown keen interest to finance the project. The total cost estimate of the project is about 18.7 million U.S. Dollar. For the preparation of Project Document and other support services for the project, a Swedish consultant has recently been appointed.

Distribution Network Development Project

The Distribution Network Development Project, financed by HMG and NEA, has undertaken the techno-feasibility studies for Rural Electrification and Distribution System Reinforcement (RE/DSR) in 19 districts of Far Western, Mid Western, Western and Central Regions of Nepal. The project has also completed the Initial Environmental Examination (IEE) of Lalitpur and Kavrepalanchok districts and detail engineering design for RE/DSR of Lalitpur, Bhaktapur and Kavrepalanchowk districts. The World Bank is being approached for funding the RE/DSR schemes in Lalitpur, Bhaktapur Nuwakot, Dhading and Kavrepalanchowk districts.

Kailali- Kanchanpur Rural Electrification Project

The Kailali- Kanchanpur Rural Electrification Project is being implemented with the support from DANIDA. Review of Detail Engineering Design of the project has been completed and floating of tender for the construction of the project is expected in August 2002.

The project includes construction of three new 33/11 kV sub-stations, rehabilitation of two existing sub-stations, construction of 501 km of 11 kV overhead line and construction of 1270 km of 400/230 volt distribution line.

Once the project is completed, it will electrify 29 VDCs and 375 load centers providing electricity to 30,000 new consumers. The project on completion will be managed by Independent User's Cooperative Group. The project completion period is slated for three and half years.

Rural Electrification, Distribution and Transmission Project

This project is being implemented with the funding from ADB, OPEC Fund, HMG/N and NEA.

The main objectives of the project are to: (i) extend the NEA distribution system in rural areas so as to provide service to more rural communities and improve rural living standards and economic development, (ii) develop distribution and transmission systems of NEA so as to meet the increased loads on NEA's power system and distribute the additional power generated by new projects and (iii) improve NEA's operating efficiency and reduce losses.

The Project consists of the following components:

- **Rural Electrification and Distribution System Reinforcement**
  This project component has two major scope of work: a) Rural Electrification and b) Distribution System Reinforcement.

  The physical size of RE includes:

  - 277 village development committees to be electrified
  - 155,621 rural households to be electrified
  - 8 new area substations (33 kV)
  - 528 distribution transformers
  - 1010 kilometers of 11 kV lines and 69 km of 33 kV lines
  - 1425 km of low voltage lines.

  The distribution system reinforcement program includes:

  - 6 new substations (33 kV) and upgrading 9 other area substations and rehabilitation of 12 substations (33 kV)
  - 15 km of new 33 kV lines and 849 km of new or upgraded 11 kV line
  - replacement of 503 new distribution transformers
  - 544 km of new or replaced low voltage line.

- **Computerized Billing Systems**
  Under this project component, NEA will implement the Computerized Billing Systems in 15 largest DCS offices.

- **Other Institutional Strengthening**
  This project component consists of two parts: a) Fixed Assets Revaluation and b) Distribution District Profit Center.

  Under the Fixed Assets Revaluation, consulting services will be provided to strengthen NEA's institutional capacity for re-valuing its fixed assets. It includes establishing a computer based fixed assets register, formulating an improved accounting procedures to resolve issues raised by NEA's external auditors relating to revaluation of its fixed assets and inventories; and designing an appropriate formula for the annual revaluation of fixed assets on an interim basis.

  Under the Distribution District Profit Center, consulting services will be provided to assist NEA to finalize the design and implementation of a program for the establishment of Distribution District Profit Center in its 15 branch offices. The main objectives of the program are to: (i) establish the commer-cial basis and orientation for NEA's distribution operations with responsibility accounting, improve distribution efficiency and reduce cost; (ii) reduce overall cost of distribution , increase net annual profit of each distribution center and establish an employee incentive program to share a reasonable proportion of increased net annual profit among the distribution center employees; (iii) reduce technical and non-technical losses; (iv) reduce internal electricity consumption; (v) increase revenue collection rate to at least 95% of sales and reduce accounts receivable; (vi) improve the quality of consumer services; and (vii) prepare norms and standards for number of staff, vehicle, etc. required to run the profit center on the basis of consumers, areas, revenue, etc.

PROJECT STUDIES

Hewa Khola HEP

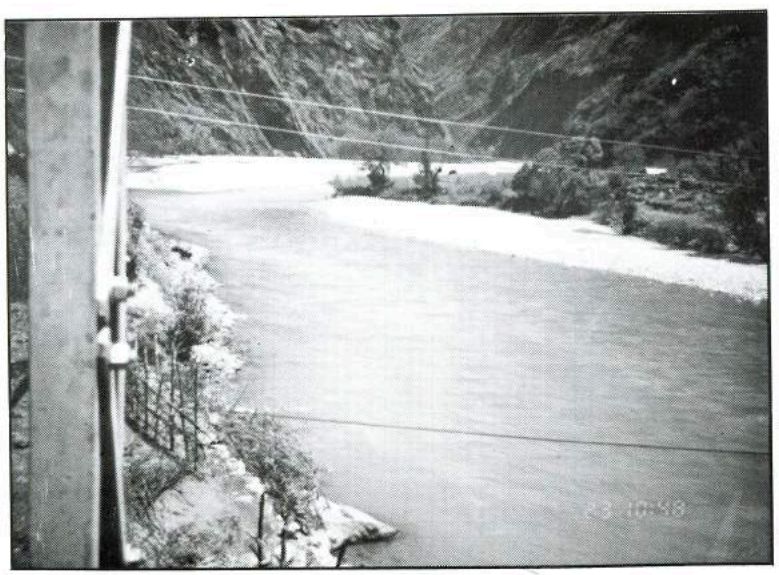
This project was identified in fiscal year 1999/00. Hewa Khola is an important tributary of Tamor river in Koshi Basin. The project site is located about 27 km north of Phidim Bazar in Panchthar district. The first phase of project feasibility study is currently in progress.

Capacity of the project will be between 10 to 15 MW. The project will comprise of: 5 meter high weir with 30 meter wide spillway, 6 meter wide undersluice, 65 meter long desanding basin, and 3 km long tunnel. To evacuate the power generated from this project, a 10 km long 132 kV transmission line will be built connecting this project with the proposed Kabeli 'A' HEP.

Upper Tamakoshi (Rolwaling) HEP

Upper Tamakoshi Hydroelectric Project located at Lamabagar village of Dolkha district near the Nepal-China Border, is a peaking run-of-river power project. Feasibility study of this project is being carried out in two phases, of which the first phase was completed in July 2001. The first phase study showed that this project will have 250 MW as installed capacity, and will generate 1570 GWh of energy annually.

The project will include headwork, regulating pond, headrace tunnel, surge shaft, penstock, underground powerhouse and tailrace outlet, in addition to a 100 km long 220 kV transmission line to evacuate the power to Dhalkebar substation. headwork is proposed at the river valley in Lamabagar village. Desanding basin will consist of a double bay Doufour Type, each 14m wide and 146m long and is designed to settle suspended sediment particles larger than 0.2 mm in size. Regulating pond with a storage capacity of 0.35 million cubic meters will supply the designed discharge for 6 hours during lean flow period of the year. Headrace tunnel will be 6.1 km long and of 5m diameter. Surge tank of diameter 12m will be 44.5 m high and will be of restricted orifice type. Two penstock pipes each 1152 m long will lead the high pressure discharge into four 62.5 MW-Pelton turbines in the underground power station. A D-shaped tailrace outlet tunnel of 1.425 km length will release the discharge back to Tamakoshi river.



Inventory of the Medium Sized Storage Projects

NEA is currently undertaking an inventory study of medium sized storage projects in Nepal. This study which is a progeny of Coarse Screening and Ranking Study carried out earlier in 1999/00 by NEA, covers a total of 94 projects, of which. 41 are in Eastern region, 27 in Central region and remaining 26 in Western region. Based on the available information, a number of promising storage projects have been identified. These include Kali Gandaki–Modi Storage Project (112 MW) in Baglung District, Nalsyaugad (256 MW) in Jajarkot District, Barbung (123 MW) in Dolpa District and Lower Daraudi (125 MW) in Gorkha District. The projects have been ranked based on the technical, environmental, financial and economic parameters. The technical parameters include requirement for the access road, transmission line, storage volume, hydrological and geological risks. Environmental parameters include the number of the affected families, submerged agriculture and forest areas and infrastructures to be affected by the creation of the reservoir. Financial parameters pertain to the risks associated with capital outlay required for the given capacity of the scheme. All the projects have been optimized at preliminary level for 6 hours daily peaking operation during dry season.

Langtang Storage Project

Langtang Storage Project situated in Rasuwa district was identified in 1999 as a very high head (1500m) scheme during the Identification & Feasibility Study of storage project. However, at present, both of storage and Peaking Run of River schemes are under considerations.

The dam site is located at Ghodatabela, around 18 km away from Syafrubesi (Rasuwa) which is the nearest road-head. Two underground power-house options have been identified. The first one is located at the left bank of Bhote Koshi river at Syafrubesi while the second option is located about 1.5 km west of Sherpagaun. Gross head of the later option is 195 m less than that of the first alternative. Main features of the storage scheme are a 105 m high dam, 8.7 km long headrace tunnel, drop shaft in five cascades and 2.7 km long pressure tunnel, underground powerhouse & 70 km long 220 KV transmission line.

Underground powerhouse will accommodate four Pelton turbines each with a capacity of 54.5 MW.

The Peaking run of river scheme is designed for an installed capacity of 175 MW with 6-hour daily peaking. The headwork for such a scheme would be a low weir of about 15 m height. This river has very low sediment yield and relatively high firm flow. These characteristics of the river together with the high natural head could enable the project to produce electricity at low costs.

Madi Ishaneshwor Storage Project

Madi-Ishaneshwor Storage Project was selected for feasibility study based on the results of Fine Screening & Ranking of storage projects in 1999. The project site is accessible by 30 km earthen road from Damauli Bazaar. The dam site is located 3 km northwest of Bhorletar, just

downstream of Madi and Seti rivers confluence. The project comprises of 137.5 m high RCC dam and 188 m long steel penstock of 4.1 m diameter. The surface powerhouse which will be built near the toe of dam will be equipped with two vertical Francis turbine/ generators each of 43 MW capacity. Gross head of the scheme is 125 m and design discharge is 129 cumecs. Annual energy production is estimated at 363GWh. The power will be evacuated by the 25.5 km long 132 kV transmission line to the existing Damauli Substation. The project is estimated to cost US$ 164.6 million.

Review of Kankai Storage Project

Proposed Kankai Storage Project situated in Ilam district was first identified in 1965. The project was again studied and reviewed by different agencies in 1978 and 1985. The later study resulted in a multipurpose project with an installed generating capacity of 60 to 90 MW. NEA is currently undertaking review study of the project. Major structures of the project comprises of 95 m high dam, 222 m long headrace tunnel, 115 m long surface penstock and surface power-house with 2 units of Francis turbines. Topographic mapping and drilling works have been carried out at the project site. A 5-km long 132 kV transmission line will connect the project with the grid. The dam height and plant capacity will be optimized keeping in mind the system requirement, topographic condition and environmental impacts of the project. This multipurpose project is envisaged to provide irrigation facility to 16,000 hectares of farmland.

Kulekhani - III HEP

Kulekhani-III Hydroelectric Project, located about 115 km southwest of Kathmandu at Bhainse VDC of Makawanpur district will be a peaking power station primarily driven by the tail water discharge from Kulekhani-II power station. A discharge of 1.5 cubic meter per sec from Khani Khola will be added onto the 13.3 cumecs of discharge coming off Kulekhani-II tailrace. A 3.4 km long tunnel will carry the aggregate discharge to 45 m high regulating dam built across Yangrang Khola. Addition of 0.5 cumecs of flow from Yangrang Khola will further boost the discharge to 15.3 cumecs which will be carried through 35 m long and 4.5 m wide headrace tunnel to underground Kulekhani-III power station. The power station will have a capacity of generating 42 MW of power for 4 hours and 50 GWh of energy annually. The regulating pond will have the capacity to hold 0.5 cubic meter of water. A 500 m long 132 kV transmission line will connect this power station to Kulekhani-II power station. The project is estimated to cost US$ 53 million.

Various works including core drilling, topographic survey, etc. have been completed as part of investigation, the cost of which was jointly borne by HMG/

N and NEA. EIA study has also been approved for the project.

As per the understanding reached with JICA in November 2001, a team of experts is undertaking upgrading of the feasibility study, which is slated for completion by December 2002.

HIGHLIGHTS OF FY 2001/02

Description	2002*	2001	Increase/Decrease Amount	Percent
Total Revenue Net (M. NRs)	10766.4	8753.9	2012.5	22.99
Net Sale of Electricity (M. NRs)	10096.4	8160.8	1935.6	23.72
Income from Other Services (M. NRs)	670.0	593.1	76.9	12.96
Operating Expenses, Including Depreciation (M. NRs)	10137.9	8733.8	1404.1	16.08
Depreciation (M. NRs) + +	2200.0	1993.9	206.1	10.34
Net Income, after interest befor tax (M. NRs)	413.9	(-)1.9	415.8	218.84
Interest on Long-Terms Loans (M. NRs)	1164.6	1188.2	(-)23.6	(-)1.99
Long-Term Loans (M. NRs)	41581.0	36707.5	4873.5	13.28
Net Fixed Assets (M. NRs)	42374.6	37103.7	5270.9	14.21
Number of Customers	878,178	745,992	132186	17.72
Total Sales Of Electricity (GWh)	1574.465	1407.127	167.338	11.89
Internal Sale (GWh)	1431.565	1281.127	150.438	11.74
Average Consumer's Consumption (KWh) +	1630.162	1717.358	(-)87.195	(-)6.67
Average Price Of Electricity (NRs/KWh) +	6.81	6.23	0.58	9.31
Peak Load Interconnected System (MW)	426.0	391.0	35.0	8.95
Total Available Electric Energy (GWh)	2087.61	1868.42	219.19	11.73
Hydro Generation (GWh)	1116.64	1113.36	3.28	0.29
Purchased Energy (GWh) India	237.78	226.54	11.24	4.96
Nepal	715.27	501.38	213.89	42.66
Exported Energy (GWh)	142.90	126.00	16.9	13.41
Thermal Generation (GWh)	17.92	27.14	(-)9.22	(-)33.97
Self consumption (Gwh)	23.82	20.37	3.45	16.94
Net System Losses (Percentage)	23.44	23.60	(-)0.16	(-)0.68

Note:

* Provisional figures; subject to final audit.

\+ Internal

\+ + On revalued assets

BALANCE SHEET AS OF JULY 15

in million NRs

EQUITY AND LIABILITIES	2001	2000	1999	1998	1997	1996	1995	1994	1993
Equity									
Share Capital	1000.0	1000.0	1000.0	1000.0	1000.0	1000.0	1000.0	1000.0	1000.0
Share Allotment Suspense	14360.3	13634.0	12365.8	11324.3	9952.6	8231.6	7122.9	5796.7	5190.6
Capital Reserve	179.2	170.7	158.8	158.8	158.8	158.6	147.9	137.6	120.9
Reserves & Surplus	1159.6	1230.7	1065.5	1200.0	1046.5	359.0	(319.5)	(346.0)	(444.6)
Revaluation Surplus	8953.9	10108.2	10656.0	11965.6	13421.4	14799.3	14286.1	14238.3	13988.0
Insurance Fund	200.0	180.0	160.0	140.0	120.00	100.0	80.0	0	0
Total Equity	**25853.0**	**26323.6**	**25406.1**	**25788.8**	**25699.3**	**24648.5**	**22317.4**	**20826.6**	**19854.9**
Long-Term Liabilities									
Long-Term Loan	36707.5	30155.7	23824.3	20848.4	17403.2	14900.4	13367.2	12880.6	11649.5
Total Long-Term Liabilities	**36707.5**	**30155.7**	**23824.3**	**20848.4**	**17403.2**	**14900.4**	**13367.2**	**12880.6**	**11649.5**
Current Liabilities & Provisions									
Deposit from Customers	93.6	107.0	76.6	59.5	76.8	61.6	90.5	36.0	42.4
Other Deposit	986.6	1057.7	784.8	677.5	407.7	359.3	235.0	183.2	84.5
Creditors for Goods	87.3	116.1	9.4	49.3	32.4	15.7	28.9	5.9	11.2
Other Creditors	121.2	186.8	266.1	201.6	429.1	26.1	22.6	31.1	16.8
Payable to Others for power purchase	1511.7	1363.5	707.9	377.6	4.3	6.6	8.3	11.6	4.6
Payable to HMG for Interest (Other)	419.8	481.2	777.5	877.1	647.6	319.0	407.8	270.0	224.5
Payable to HMG for Other (int)	812.6	535.9	975.1	914.4	440.4	102	263.2	648.8	171.8
Royalty Payable	838.1	640.3	752.1	398.7	473.8	585.0	358.0	–	–
Temporary Bank Loan	200.0	–	–	–	–	–	–	–	–
Provision for Interest Tax	13.6	–	–	–	–	–	–	–	–
Provision for Bonus	30.1	30.6	40.9	39.4	38.1	31.5	16.6	11.9	6.4
Provision for Gratuity & Pension	313.4	276.4	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	0.20	–	–	28.5	22.5	17.5	14.5	11.5	8.5
Provision for Income Tax	651.5	647.6	221.5	207.0	178.1	104.8	34.4	34.5	7.2
Total Current Liabilities & Provisions	**6113.8**	**5477.2**	**4786.3**	**4005.0**	**2925.2**	**1803.7**	**1654.2**	**1416.9**	**752.3**
Inter Unit Balance (Net)	–	–	–	–	–	–	–	34.9	52.7
TOTAL LIABILITIES AND EQUITY	**68674.3**	**61956.5**	**54016.7**	**50642.2**	**46027.7**	**41352.5**	**37338.8**	**35124.1**	**32291.6**

BALANCE SHEET AS OF JULY 15

in million NRs

ASSETS	2001	2000	1999	1998	1997	1996	1995	1994	1993
Fixed assets									
Land	897.7	860.8	768.1	727.0	696.1	706.0	665.3	636.4	611.4
Buildings	1667.7	1257.9	932.4	885.5	789.7	798.8	755.1	646.4	601.3
Hydraulic Plant & Machinery	17658.1	16668.7	16439.9	16619.5	16180.3	16174.1	15951.7	15802.5	15490.0
Internal Combustion P & M	1464.1	1430.5	1524.4	594.1	651.0	708.0	716.9	737.2	752.0
Solar Power Plant	30.6	31.9	33.3	34.7	36.2	37.6	39.0	40.5	41.9
Transmission Line	4111.0	3808.3	2713.2	2656.0	2837.9	3057.3	3024.9	2704.6	1815.0
Substation	3178.7	3393.8	2914.6	2432.9	2651.5	2901.0	2959.5	3038.4	2414.2
Distribution Line	7639.5	7362.5	5555.9	5630.6	4535.0	4750.1	3983.4	3042.6	2244.0
Meter & Metering Equipment	112.3	92.2	83.3	89.4	85.8	100.3	112.5	97.4	59.7
Consumer Service	18.8	19.3	20.5	25.6	31.2	37.0	42.8	48.4	50.3
Public Lighting	33.4	32.1	22.6	18.1	17.5	16.3	16.3	14.4	15.0
Tools and Instrument	49.5	37.0	38.4	20.2	17.0	13.3	12.4	7.6	5.2
Vehicles	105.0	108.0	93.0	80.5	55.8	92.4	85.4	37.9	10.8
Furniture & Office Equipment	133.6	91.2	81.9	76.0	46.3	43.4	46.4	39.8	14.8
Miscellaneous	3.7	1.5	1.3	1.2	2.1	3.0	2.0	0.4	0.2
Total Fixed Assets	**37103.7**	**35195.7**	**31222.8**	**29891.3**	**28633.4**	**29438.3**	**28413.6**	**26894.5**	**24126.2**
Other Assets									
Capital Works in Progress	23640.4	18947.1	16542.7	14179.0	11974.6	7362.7	5229.1	5439.3	6250.1
Investment in Securities	517.1	521.1	326.1	247.7	150.6	54.0	30.5	356.7	79.0
Total Other Assets	**24157.5**	**19468.2**	**16868.8**	**14426.7**	**12125.2**	**7416.7**	**5259.6**	**5796.0**	**6329.1**
Deferred Expenditure	**978.6**	**1302.8**	**615.0**	**443.3**	**267.3**	**410.8**	**588.5**	**98.6**	**108.6**
Inter Unit Balance (Net)	**120.9**	**228.7**	**256.9**	**188.7**	**133.2**	**335.7**	**144.5**	**143.7**	**–**
Current Assets									
Inventories	960.9	982.3	740.0	914.9	804.0	617.9	429.1	340.4	289.5
Accounts Receivable	1678.5	1525.5	1530.9	1435.4	1209.1	1,040.0	682.6	569.9	474.8
Advances Recoverable	2634.9	1932.0	1634.2	1709.6	1329.0	848.4	471.7	149.8	145.8
Cash & Bank	1039.3	1321.3	1148.1	1632.3	1526.5	1244.7	1349.2	1131.2	817.6
Total Current Assets	**6313.5**	**5761.1**	**5053.2**	**5692.2**	**4868.6**	**3751.0**	**2932.6**	**2191.3**	**1727.7**
TOTAL ASSETS	**68674.3**	**61956.5**	**54016.7**	**50642.2**	**46027.7**	**41352.5**	**37338.8**	**35124.1**	**32291.6**

PROFIT & LOSS FOR THE YEAR ENDED JULY 15

in million NRs

Particulars	2002*	2001	2000	1999	1998	1997	1996	1995	1994	1993
A. Revenue										
Net Sale of Electricity	10096.4	8160.8	6856.0	5396.7	5082.5	4767.3	3728.9	3218.5	2437.4	1786.8
Income from Other Services	550.0	239.8	188.8	180.6	157.6	135.0	111.2	99.9	13.8	8.6
Interest & Other Income	120.0	353.3	167.6	204.1	192.6	181.3	172.0	145.1	160.5	109.0
Total-A	**10766.4**	**8753.9**	**7212.4**	**5781.4**	**5432.7**	**5083.6**	**4012.1**	**3463.5**	**2611.7**	**1904.4**
B. Operation & Maintenance Expenditure										
Operation & Maintenance & General Expenses	2200.0	2102.1	1752.0	1724.7	1554.5	1049.4	942.0	838.3	697.1	604.8
Power Purchase	4692.0	3348.9	1151.3	867.0	845.6	659.5	359.6	340.0	214.1	162.1
Provision for Expenses	20.0	299.3	177.2	164.9	105.5	80.5	45.9	7.7	8.5	7.0
Bad debts written off	–	–	–	–	–	–	–	–	–	–
Royalty	603.5	562.7	524.8	423.4	348.9	268.8	227.0	186.8	–	–
Depreciation	2200.0	1993.9	1878.9	1995.5	1541.4	1482.2	1455.3	1296.0	1202.4	1026.0
Deferred Expenditure Written off	422.4	426.9	440.8	236.8	270.1	188.7	204.4	162.0	66.5	53.6
Total-B	**10137.9**	**8733.8**	**5925.0**	**5412.3**	**4666.0**	**3729.1**	**3234.2**	**2830.8**	**2188.6**	**1853.5**
C. Net Operating Surplus (Deficit) (A-B)	**628.5**	**20.1**	**1287.4**	**369.1**	**766.7**	**1354.5**	**777.9**	**632.7**	**423.1**	**50.9**
Loss of Capital Assets	–	–	–	–	–	–	–	35.8	–	–
Interest on Long-Term Loans	(1164.6)	(1188.2)	(1244.3)	(1141.3)	(1317.2)	(1207.5)	(813.5)	(797.0)	(716.6)	(625.5)
Profit and (Loss) before Prior Year's income & Expenses Adjustment	(536.1)	(1168.1)	43.1	(772.9)	(550.5)	147.0	(35.5)	(164.2)	(329.3)	(574.6)
Prior year Income / Expenses Adjustment	(50.0)	291.6	(216.7)	(79.3)	(91.7)	(176.6)	(99.0)	(397.0)	(411.7)	(48.8)
Profit & (Loss) after Prior Year Adjustment	(586.1)	(876.5)	(173.6)	(851.5)	(642.2)	(29.6)	(134.5)	(561.4)	(741.0)	(623.4)
Transfer from Revaluation Surplus	1000.0	874.6	930.1	1019.1	844.7	883.3	907.5	671.6	869.2	729.6
Excess Provision Corporate Tax written back (1993-94)	–	–	–	–	–	–	–	10.4	–	–
Net Profit (Loss) Before Tax	**413.9**	**(1.9)**	**756.5**	**167.6**	**202.5**	**853.7**	**773.0**	**120.7**	**128.2**	**106.2**
Interest Tax	–	–	–	3.5	5.0	5.0	7.7	3.9	2.4	–
Corporate Tax	(103.5)	(49.1)	571.4	260.0	23.8	141.3	66.7	10.4	27.2	–
Net Profit/(Loss) after Tax	**310.4**	**(51.0)**	**185.1**	**(95.9)**	**173.7**	**707.4**	**698.6**	**106.4**	**98.6**	**106.2**
Transfer to Insurance Fund	(20.0)	(20.0)	20.0	20.0	20.0	20.0	20.0	80.0	–	–
Net Profit/(Loss) after Appropriation	**290.4**	**(71.0)**	**165.1**	**115.9**	**153.7**	**687.4**	**678.6**	**26.4**	**98.6**	**106.2**

* *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

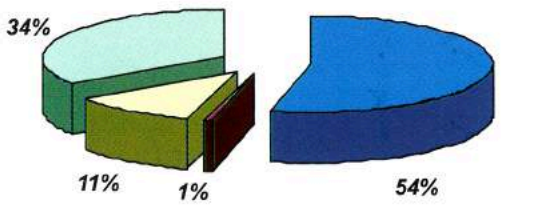
Consumer Category & Supply level	Monthly Demand Charge (Rs/kVA)	Energy charge (Rs/unit)		
		Peak Time 18.00-23.00	Off-Peak 23.00-6.00	Normal 6.00-18.00
A. High voltage (66 kV & above)				
1. Industrial	175.00	5.20	3.15	4.55
B. Medium voltage (33 kV)				
1. Industrial	190.00	6.55	4.00	5.75
2. Commercial	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

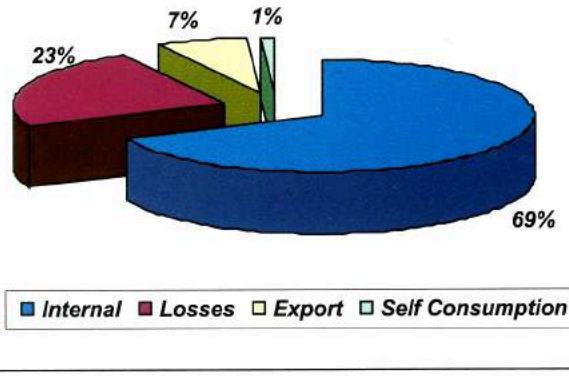
b) 10% discount in the total bill amount will be given to the HMG/N approved Industrial District

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

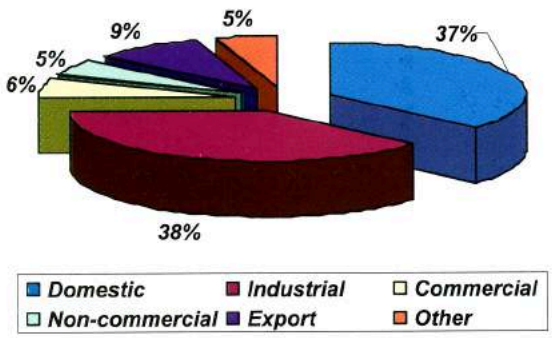
AVAILABILITY FY2002



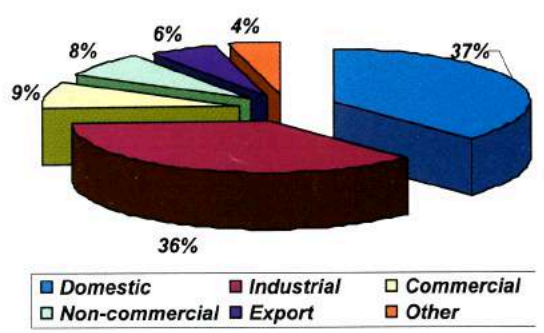
UTILIZATION FY2002



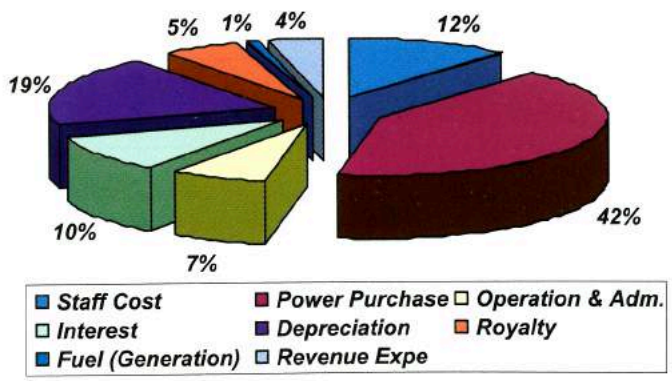
SALES FY2002



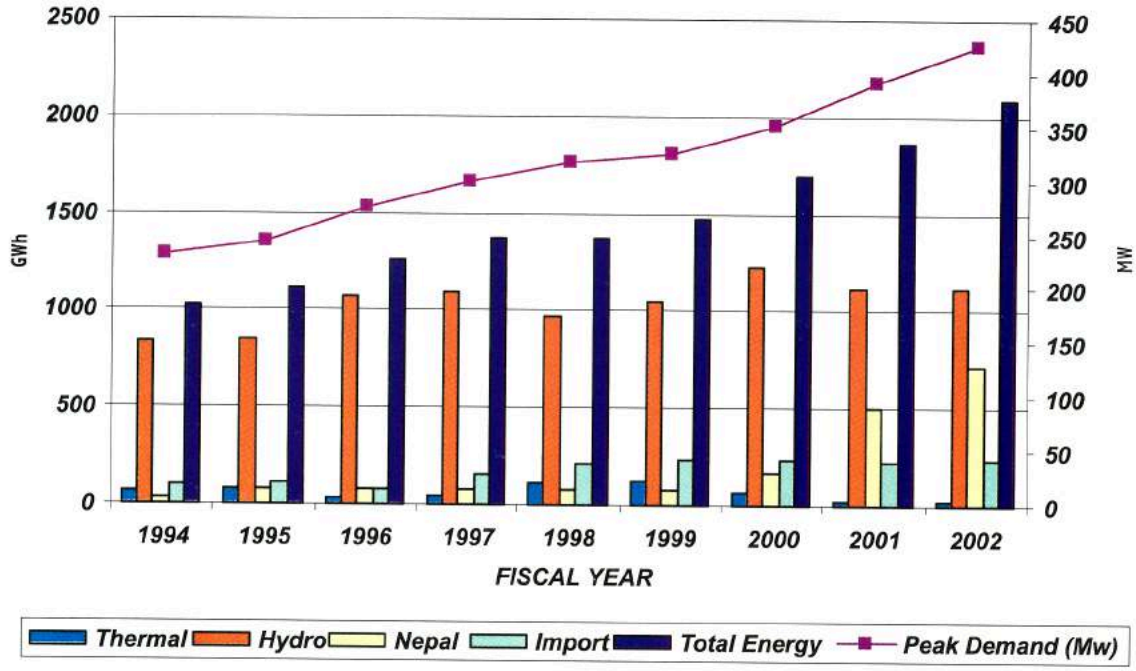
REVENUE FY2002



EXPENDITURE FY2002



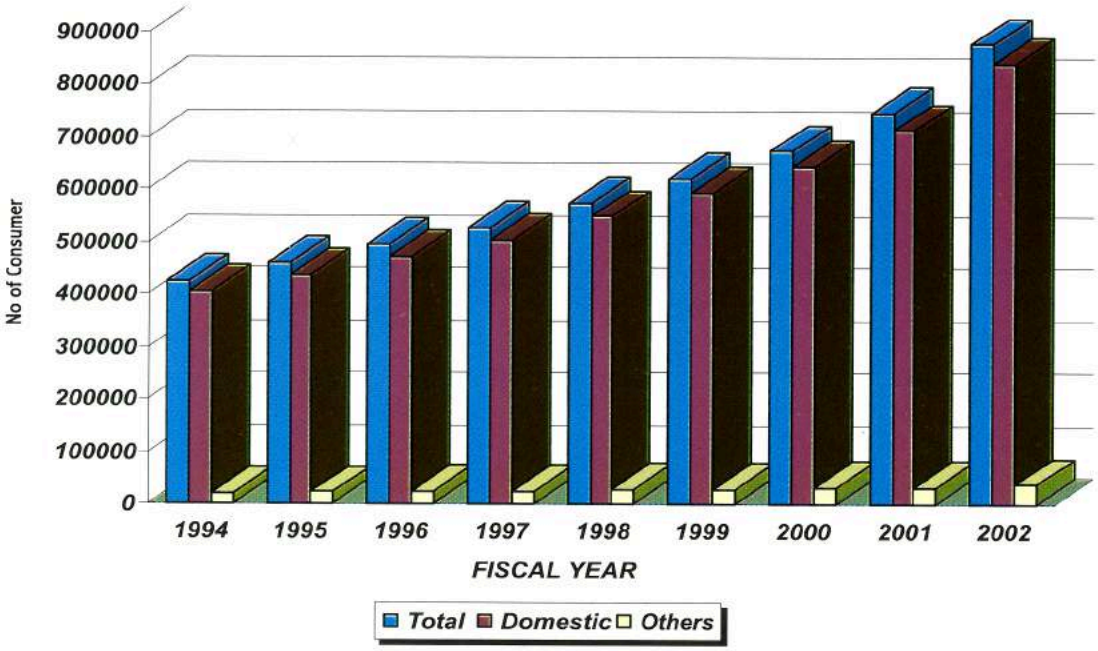
TOTAL ENERGY AVAILABLE AND PEAK DEMAND



Particulars	1994	1995	1996	1997	1998	1999	2000	2001	2002*
Peak Demand (MW)*	231.0	244.0	275.0	300.11	317.00	326.4	351.9	391.0	426.0
Available Energy (GWh)	1030.89	1,117.46	1,261.96	1,368.58	1,373.17	1475.00	1701.45	1868.42	2087.61
1. Hydro	835.48	848.74	1,072.75	1,096.64	971.96	1046.51	1233.22	1113.36	1116.64
2. Diesel	62.20	80.92	36.64	39.73	107.45	118.82	66.73	27.14	17.92
3. Purchase from	133.21	187.80	153.57	232.21	293.76	309.67	401.50	727.93	953.05
(a) India	102.77	113.84	72.96	153.98	210.29	232.39	232.20	226.54	237.78
(b) Nepal	30.44	73.96	80.61	78.23	83.47	77.28	169.30	501.38	715.27

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

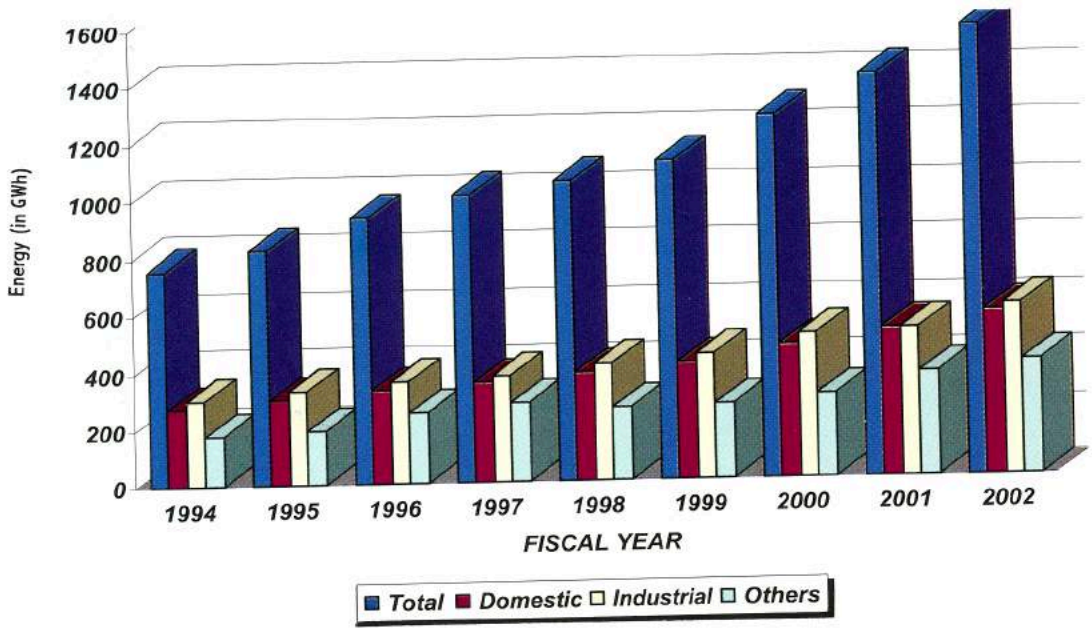
GROWTH OF CONSUMERS



Particulars	1994	1995	1996	1997	1998	1999	2000	2001	2002*
Domestic	4,04,452	4,36,631	4,71,599	503,330	548,110	593,468	643,314	713,307	840,400
Non-Commercial	6,321	6,369	6,548	6338	7,192	7,654	7,815	7,643	7,800
Commercial	1,848	2,008	2,162	2441	2,637	2,948	3,096	3,386	4,800
Industrial	10,737	11,480	12,329	12928	14,062	14,996	16,179	17,701	20,000
Water Supply	155	166	177	190	205	215	232	236	320
Irrigation	590	630	712	713	776	876	967	1,083	1,600
Street Light	375	420	456	482	683	842	932	1,012	1,200
Temporary Supply	188	189	187	155	175	207	144	141	80
Transport	15	8	8	8	12	21	47	37	72
Temple	525	698	782	867	992	1,131	1,248	1,441	1,900
Community Sales **	–	–	–	–	–	–	–	–	1
Total (Internal Sales)	4,25,206	4,58,599	4,94,960	527,452	574,844	622,358	673,974	745,987	878,173
Bulk Supply (India)	4	5	5	5	5	5	5	5	5
Grand Total	**4,25,211**	**4,58,604**	**4,94,965**	**5,27,457**	**574,849**	**622,363**	**673,979**	**745,992**	**878,178**

Note :- * Provisional figures; subject to final audit.
** This community sales incorporates 7,200 consumers.

ELECTRICITY SALES

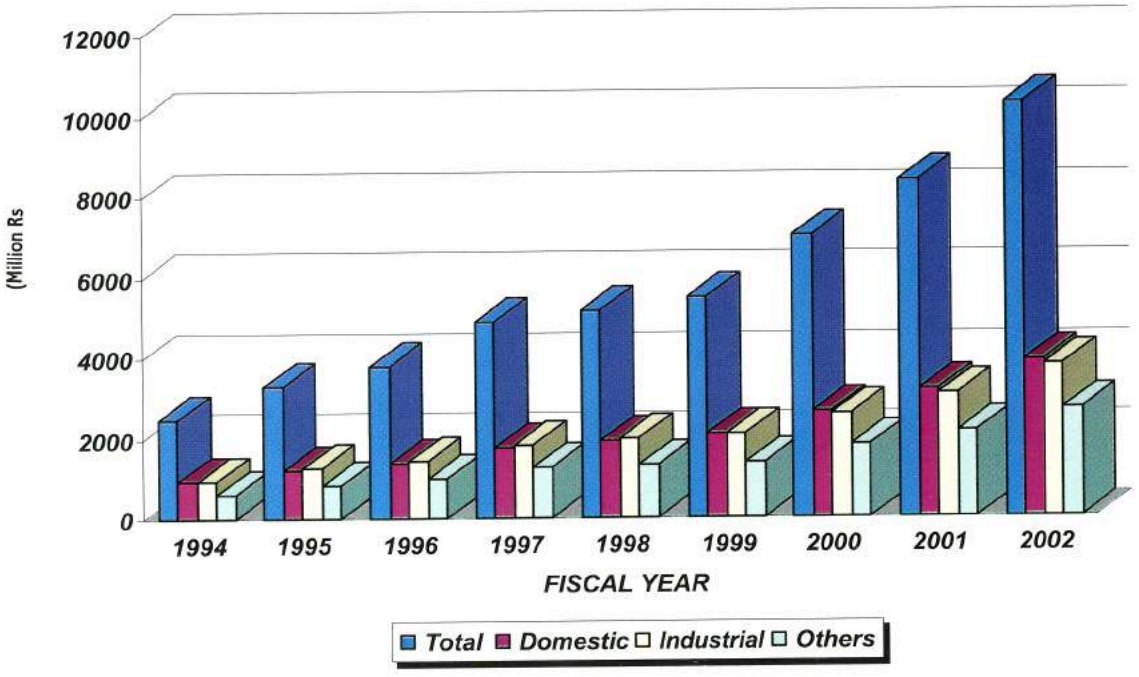


(in GWh)

Category	1994	1995	1996	1997	1998	1999	2000	2001	2002*
Domestic	275.050	301.611	328.730	355.118	378.778	410.566	467.049	518.360	576.500
Non-Commercial	47.148	53.225	53.464	57.991	60.227	62.931	63.592	73.157	80.470
Commercial	48.988	58.574	62.916	67.606	71.471	77.343	81.822	94.166	95.500
Industrial	303.991	328.316	358.672	376.742	413.738	440.996	508.357	520.634	597.000
Water Supply & Irrigation	19.401	27.636	25.091	27.978	29.045	22.831	15.742	28.600	31.200
Street Light	8.857	12.173	16.720	20.929	26.585	29.405	31.741	36.981	38.600
Temporary Supply	0.561	1.225	1.154	0.844	0.711	0.766	0.927	0.826	0.300
Transport	1.338	1.455	1.432	1.483	1.663	2.598	2.678	5.892	6.000
Temple	0.658	0.892	1.503	1.691	1.801	1.982	2.366	2.511	2.500
Community Sale	–	–	–	–	–	–	–	–	3.495
Total (Internal Sales)	705.992	785.108	849.682	910.382	984.019	1.049.418	1174.274	1281.127	1431.565
Bulk Supply (India)	50.514	39.479	87.014	100.218	67.410	64.158	95.000	126.000	142.900
Grand Total	**756.506**	**824.587**	**936.696**	**1010.600**	**1051.429**	**1113.576**	**1269.274**	**1407.127**	**1574.465**

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

REVENUE



(in million Rs)

Category	1994	1995	1996	1997	1998	1999	2000	2001	2002*
Domestic	916.332	1,195.389	1,379.456	1769.839	1895.845	2056.045	2622.033	3161.376	3878.066
Non-Commercial	219.807	284.478	307.246	386.359	405.142	419.580	527.399	835.784	773.639
Commercial	235.781	310.911	349.628	446.964	477.044	515.722	661.578	555.619	908.122
Industrial	936.901	1,260.125	1,406.731	1801.576	1973.372	2093.878	2599.337	3086.098	3771.019
Water Supply & Irrigation	39.526	70.091	68.400	95.701	100.277	78.144	95.654	120.899	151.181
Street Light	27.625	41.835	53.042	80.111	101.977	111.369	149.945	176.054	204.250
Temporary Supply	3.699	6.886	11.840	7.991	7.170	7.057	13.393	6.765	4.049
Transport	2.985	3.993	4.198	6.090	6.511	9.457	18.311	27.734	31.149
Temple	1.480	3.320	4.556	6.208	6.711	7.416	9.704	11.447	12.692
Community Sale	–	–	–	–	–	–	–	–	12.233
Total(Internal Sales)	2,384.136	3,177.028	3,585.097	4600.839	4974.049	5298.670	6697.354	7981.776	9746.400
Bulk Supply (India)	91.364	97.566	206.720	249.292	199.915	198.151	327.804	396.056	574.493
Gross Revenue	**2,475.500**	**3,274.594**	**3,791.817**	**4850.131**	**5173.964**	**5496.821**	**7025.158**	**8377.832**	**10320.893**

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

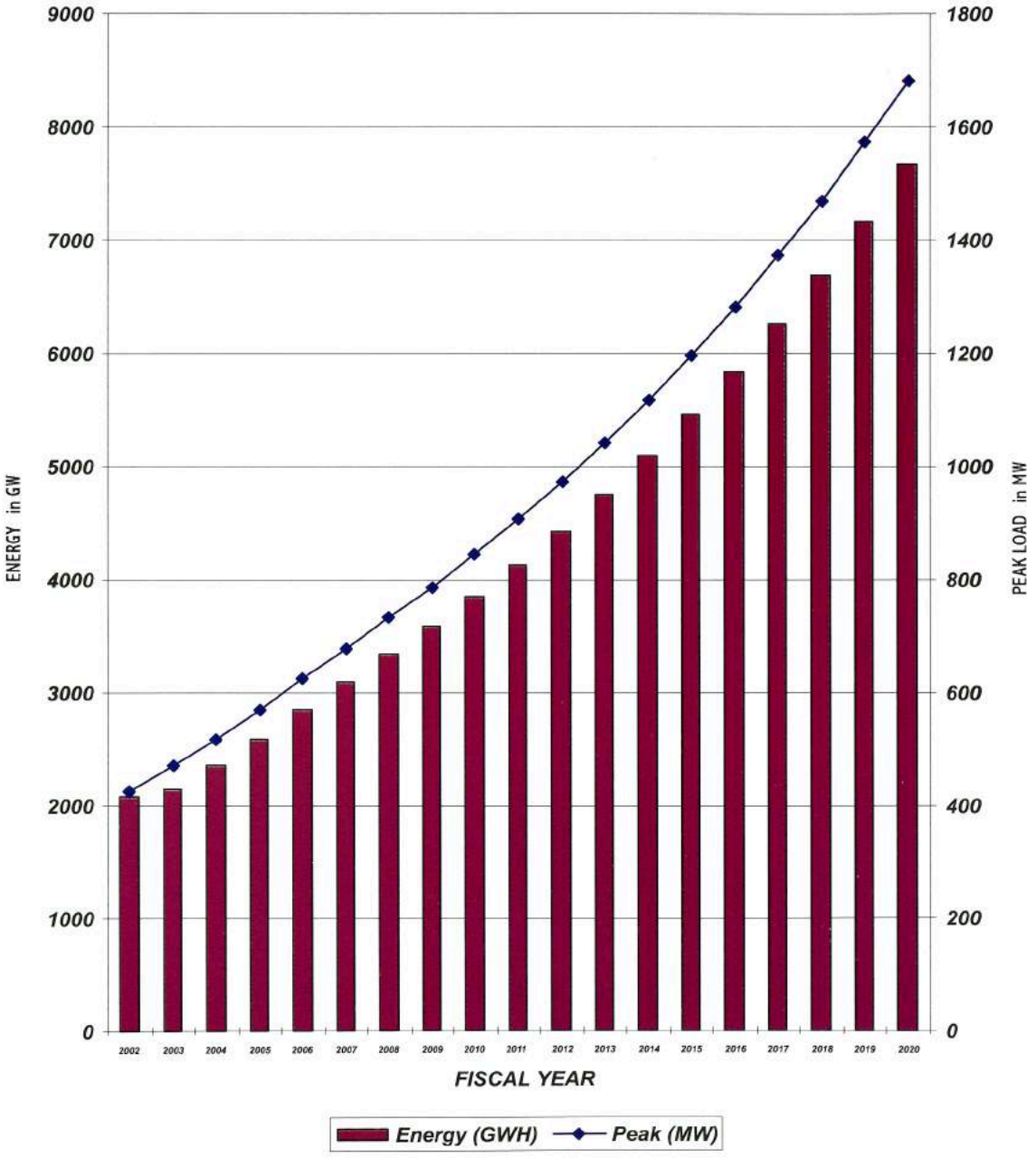
LOAD FORECAST

for Integrated Nepal Power System (INPS)

Year	Energy (GWH)	Growth (%)	Peak (MW)	Growth (%)
2002*	2087.61	–	426.0	–
2003	2149		472	
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		7.50		7.93

* Actual

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	"
10. Kali Gandaki "A"	144,000	"
Total	**395,150**	kW

Under Construction

1. Middle Marsyangdi	70,000	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)	86,000	"
24. Seti (Storage)	122,000	"
25. Kankai (Storage)	60,000	"
26. Upper Tama Koshi	250,000	"
Total	**22,313,000**	**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**

POWERPURCHASEDAGREEMENTSIGNED

EXISTING

1. Andhi Khola (BPC)	5,100	KW
2. Jhimruk (BPC)	12,300	"
3. KhimtiKhola (HPL)	60,000	"
4. Bhotekosi (BKPC)	36,000	"
5.Sange Khola(Sange HP)	183	"
	Total 113,583	**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. Phema Khola (Khoranga HP)	995	"
6. Sunkoshi Small (SanimaHP)	2,600	"
7. Langtang (KantipurHP)	10,000	"
8. Baramchi (Unique Hydel)	999	"
	Total 28,954	**kW**

SOLAR POWER STATIONS

EXISTING

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

TRANSMISSION LINE LENGTH

1. 132 kV Single Circuit	1132.00	KM
2. 132 kV Double Circuit	412.10	KM
3. 66 kV Single Circuit	231.46	KM
4. 66 kV Double Circuit	161.30	KM
5. 66&132 kV Double Circuit	22.00	KM
6. 66 kV Four Circuit	3.37	KM
7. 33 kV Single Circuit	2362.00	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

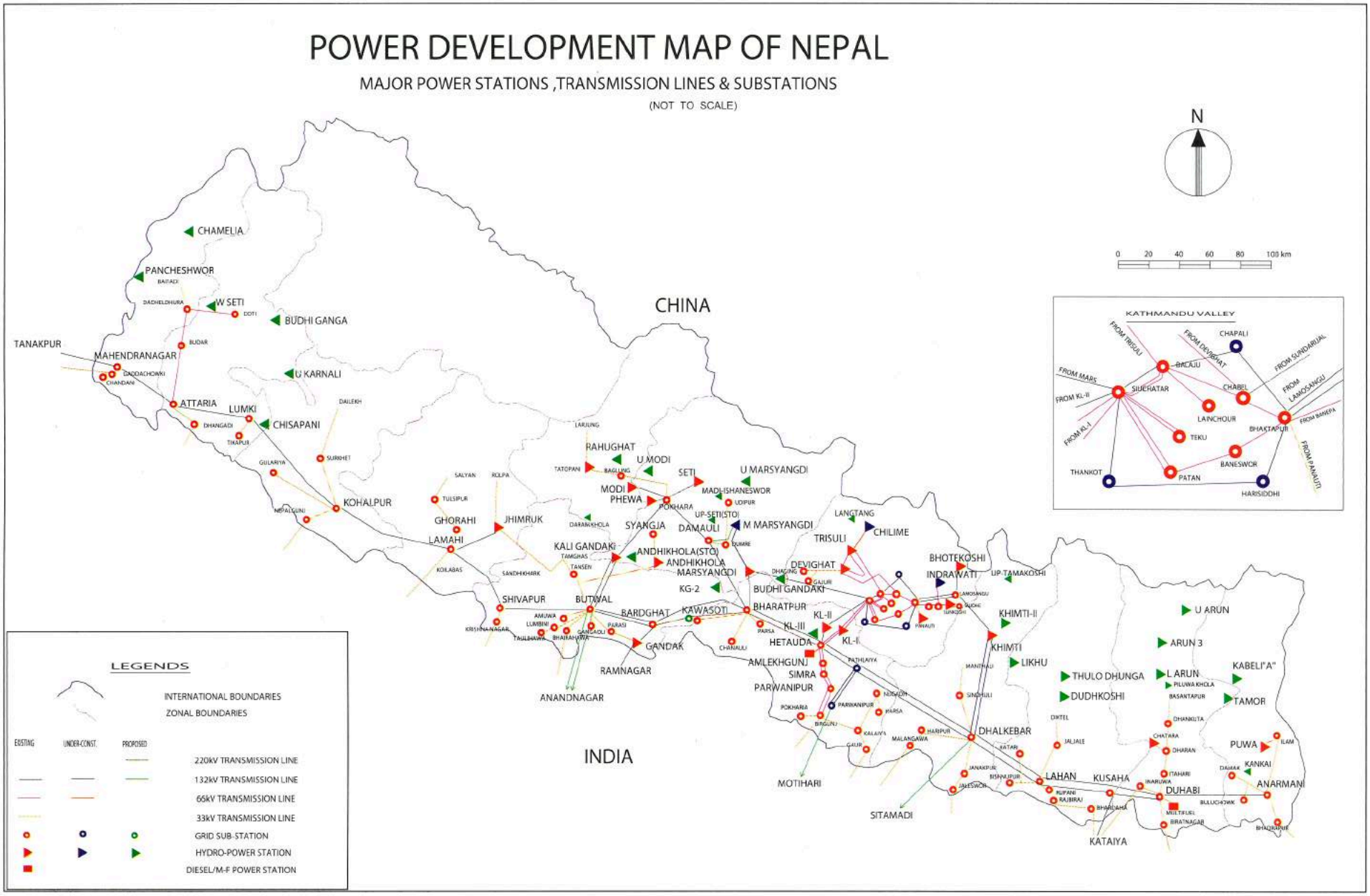
Installed Capacity in Nepal Electricity Authority (including private & others): 584,557 MW

IN REVIEW A YEAR 2010 A YEAR IN REVIEW

POWER DEVELOPMENT MAP OF NEPAL

MAJOR POWER STATIONS ,TRANSMISSION LINES & SUBSTATIONS

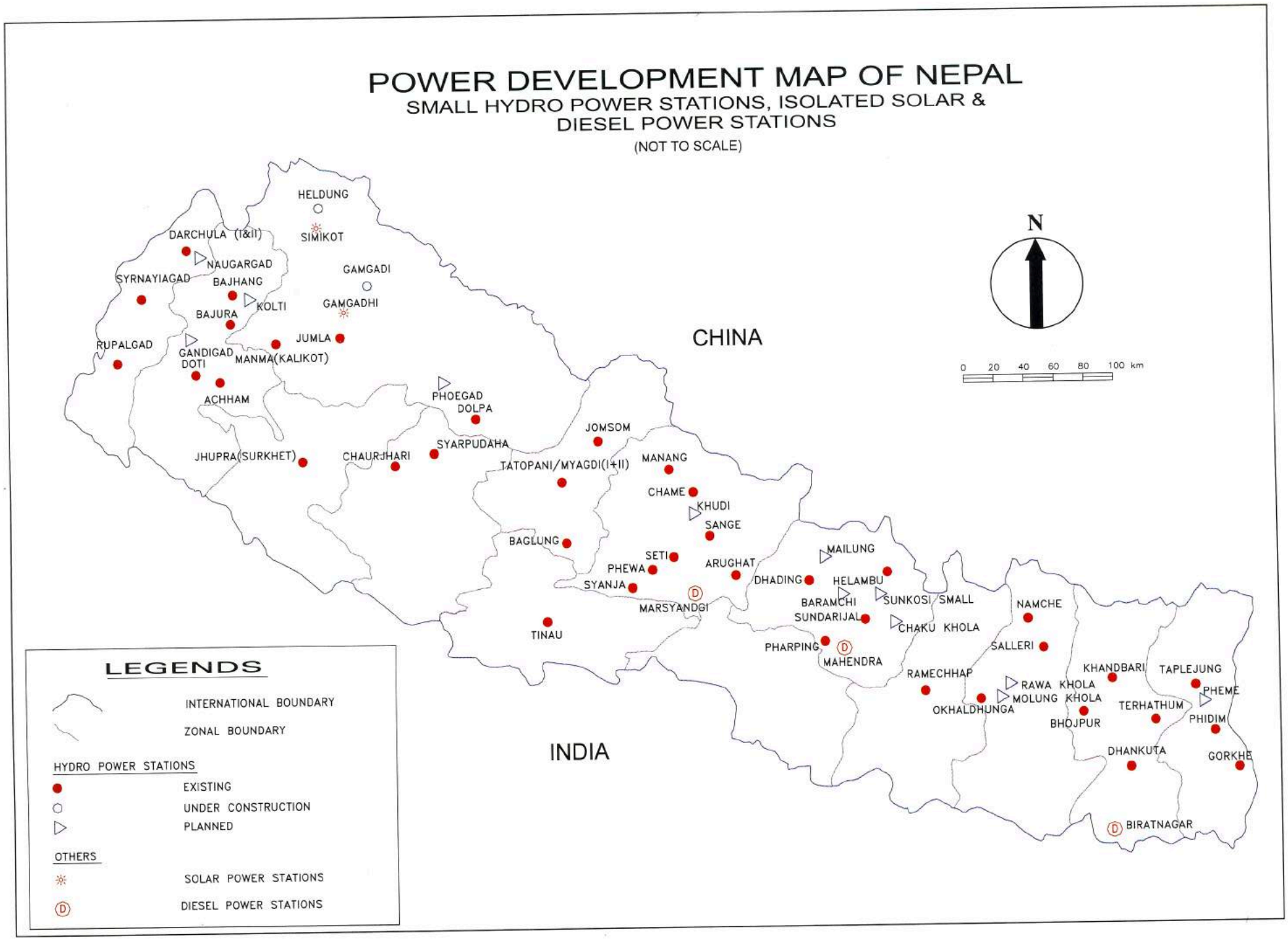
(NOT TO SCALE)



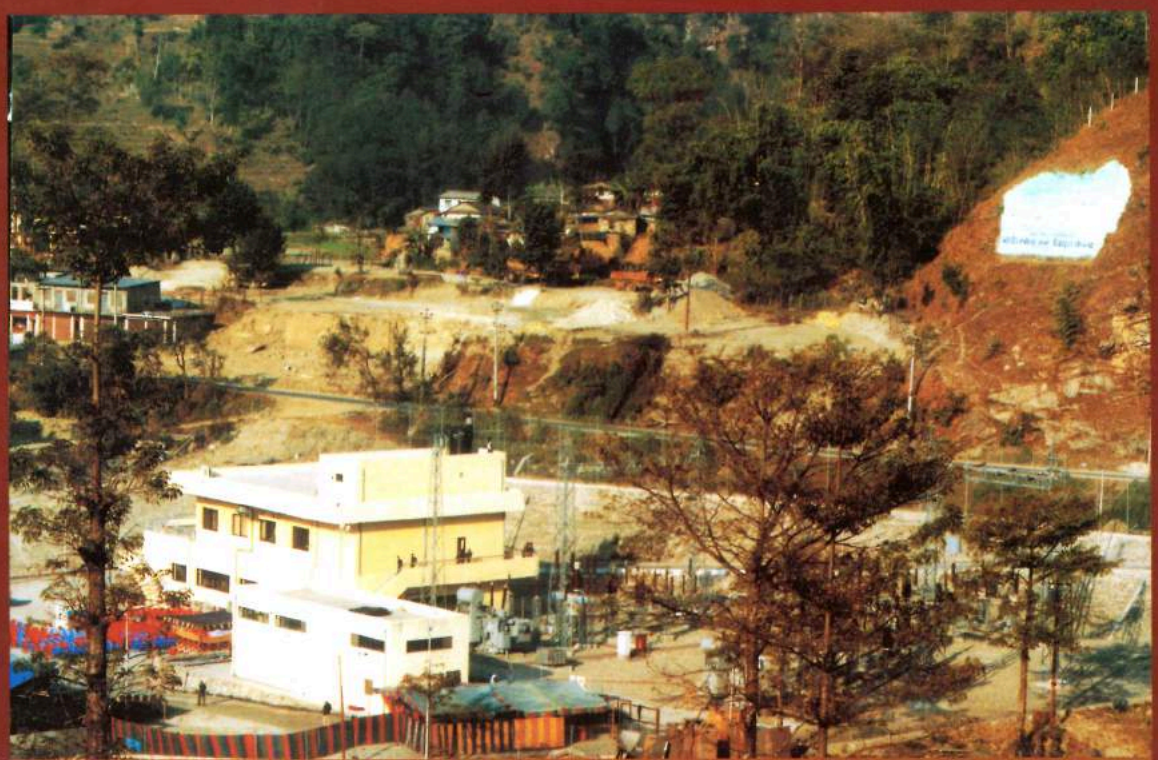
POWER DEVELOPMENT MAP OF NEPAL

SMALL HYDRO POWER STATIONS, ISOLATED SOLAR & DIESEL POWER STATIONS

(NOT TO SCALE)



Middle Marsyangdi Power House: Site-Excavation



Modi Khola Power House

Layout, Design and Printing: Modern Printing Press. P.O. Box: 10629
Tel: 253195, Fax: 230498. Email: modprint@infoclub.com.np