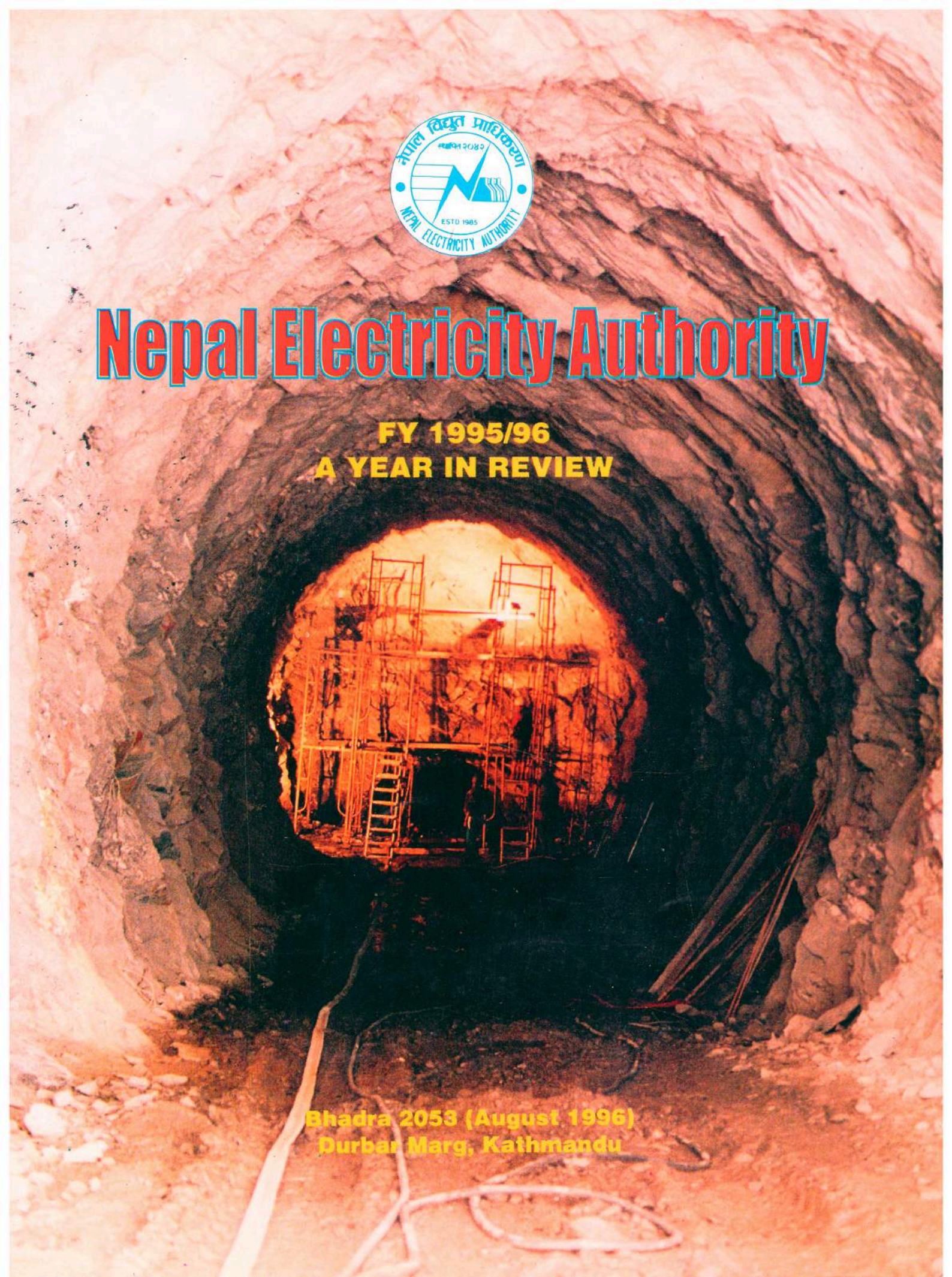


Nepal Electricity Authority

FY 1995/96
A YEAR IN REVIEW

Bhadra 2053 (August 1996)
Durbar Marg, Kathmandu

CONTENTS

Cover Photo : Access Tunnel of Chilime Hydroelectric Project

MESSAGE
From The Chairman

To serve the country and the consumer with dedication and zeal, to develop indigenous resources, to achieve greater efficiency, and to conduct its business in an open and transparent manner are the corner stones a public utility must build on. The utility must have the resolve to work under the constraints of resource scarcity by competing in a market place that grows keener by the day. Once obtained, the utility must obtain maximum benefits through the efficient use of the availed resources by using state-of-art techniques both in technology and management. Finally, a modern utility must be receptive to new concepts and must always orient itself correctly in terms of current trends.

Overviewing its performance along these perspectives, I believe that the Nepal Electricity Authority (NEA) must be complimented for taking pragmatic steps. NEA has now matured into an able utility with eleven years of experience behind it.

To meet its objectives, NEA has undertaken well planned activities in generation, transmission, distribution, electrification and institutional development. After the approval of loan financing by the Asian Development Bank, the 144 MW Kali Gandaki Project is now ready for the next stage of implementation. To promote private sector participation in the power sector, NEA has entered into its second power purchase agreement with the Bhote Koshi Power Co., a joint venture between promoters in Nepal and the United States. NEA has also assisted Himal Power Ltd. attain financial closure for the Khimti I Hydro Power Project, the first project developed by the private sector in Nepal. The Khimti I HEP is also one of the first hydropower projects in this part of world to achieve this stage of implementation for a private sector enterprise.

NEA has also completed the construction of the second 132 kV transmission line that links Nepal and India. The increased import that this has made possible has helped reduce "load shedding " and will pave the way for increased power exchanges with India in future. Apart from the generation aspects, NEA is aware of the immense challenge ahead in demands for rural electrification from a large percentage of the populace that does not enjoy the benefits of electricity. This is where NEA faces a delicate balance between operating along commercial lines and shouldering the social responsibility of providing service-oriented functions to its customers. NEA also faces the challenge of reducing losses and wastes in all their forms. NEA must formulate effective strategies to reduce transmission and distribution losses, so that it can serve its consumer without some benefiting at the cost of others. Similarly, NEA must adopt measures to meet the universal concerns for the environment and the country's social heritage.

NEA is pursuing improvements to its human resources and their effective utilization by adapting modern management practices. The exercise carried out to change the corporate structure is a step in this direction. In addition to these priority areas, NEA has shown maturity by shouldering its role in the international community by sponsoring the Third International Conference on Power Development in the Afro-Asian Region. The conference achieved remarkable success and NEA deserves to be congratulated for the undertaking.

Overall, I feel that NEA is performing better. This has been possible through the goodwill and support from domestic as well as international quarters. I wish to thank them all for wishing us well. With their positive support, NEA will attain even better heights of achievement in the years to come. To conclude, I wish to express my sincere thanks to the NEA Board Members and all the staff of NEA for their valuable contribution.

(Pashupati Shumshere JB Rana)

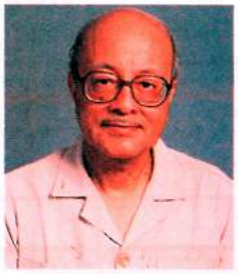
Minister for Water Resources

BOARD OF DIRECTORS

Chairman
Mr Pashupati Shumshere J.B. Rana
Hon'ble Minister for Water Resources

Dr D.N. Dhungel
Secretary
Ministry of Water Resources

Mr R.B. Bhattarai
Secretary
Ministry of Finance

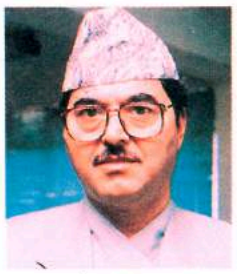


Mr Himalaya S.J.B. Rana
Thapathali

Mr M.L. Pradhan
Rt. Hon. Member
Raj Parisad

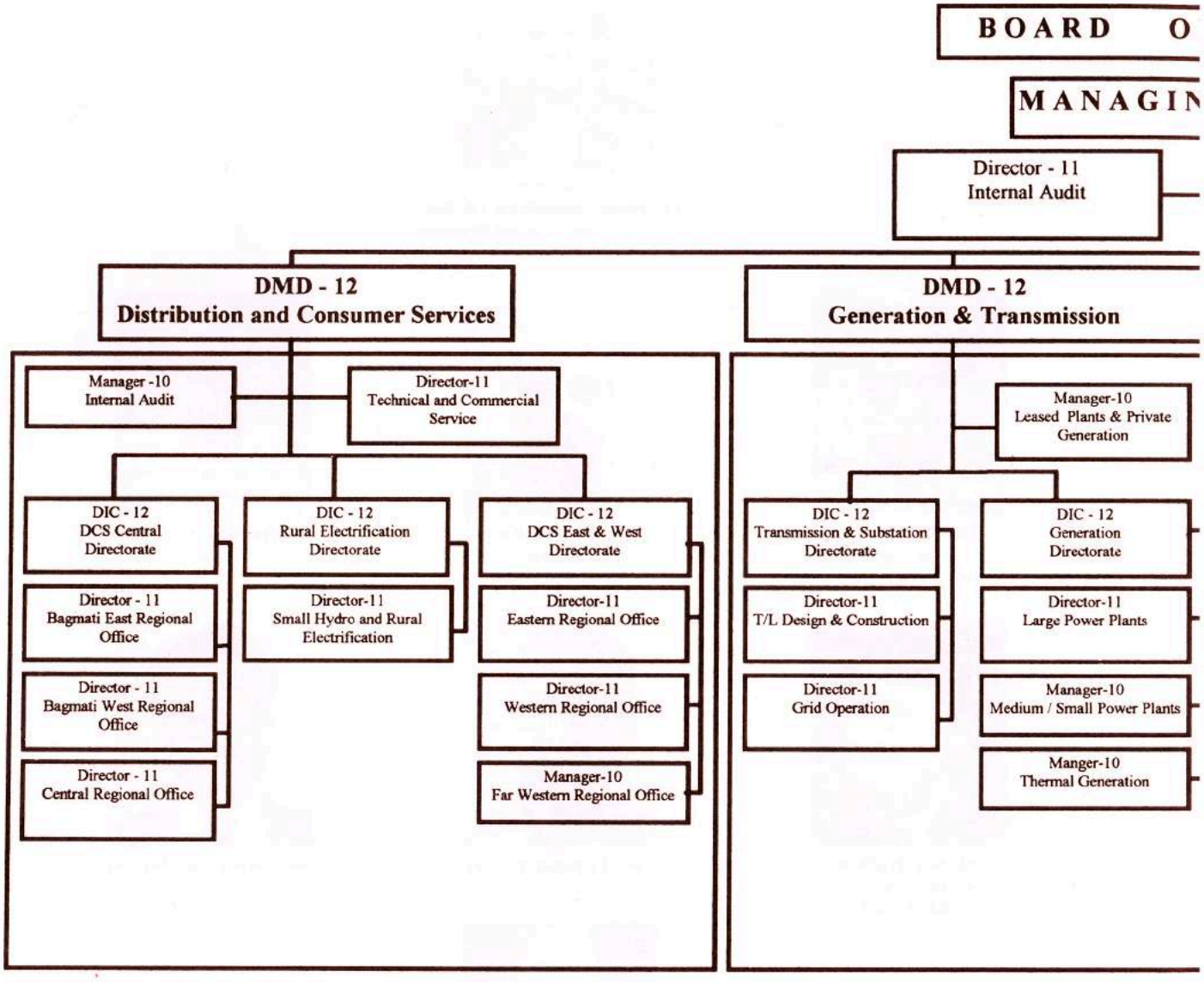
Mr. Pashupati P. Shah
Baneswor

Mr Vinaya Man Shrestha
Honorary Consul of Brazil



Member Secretary
Mr K.C. Thakur
Managing Director, NEA

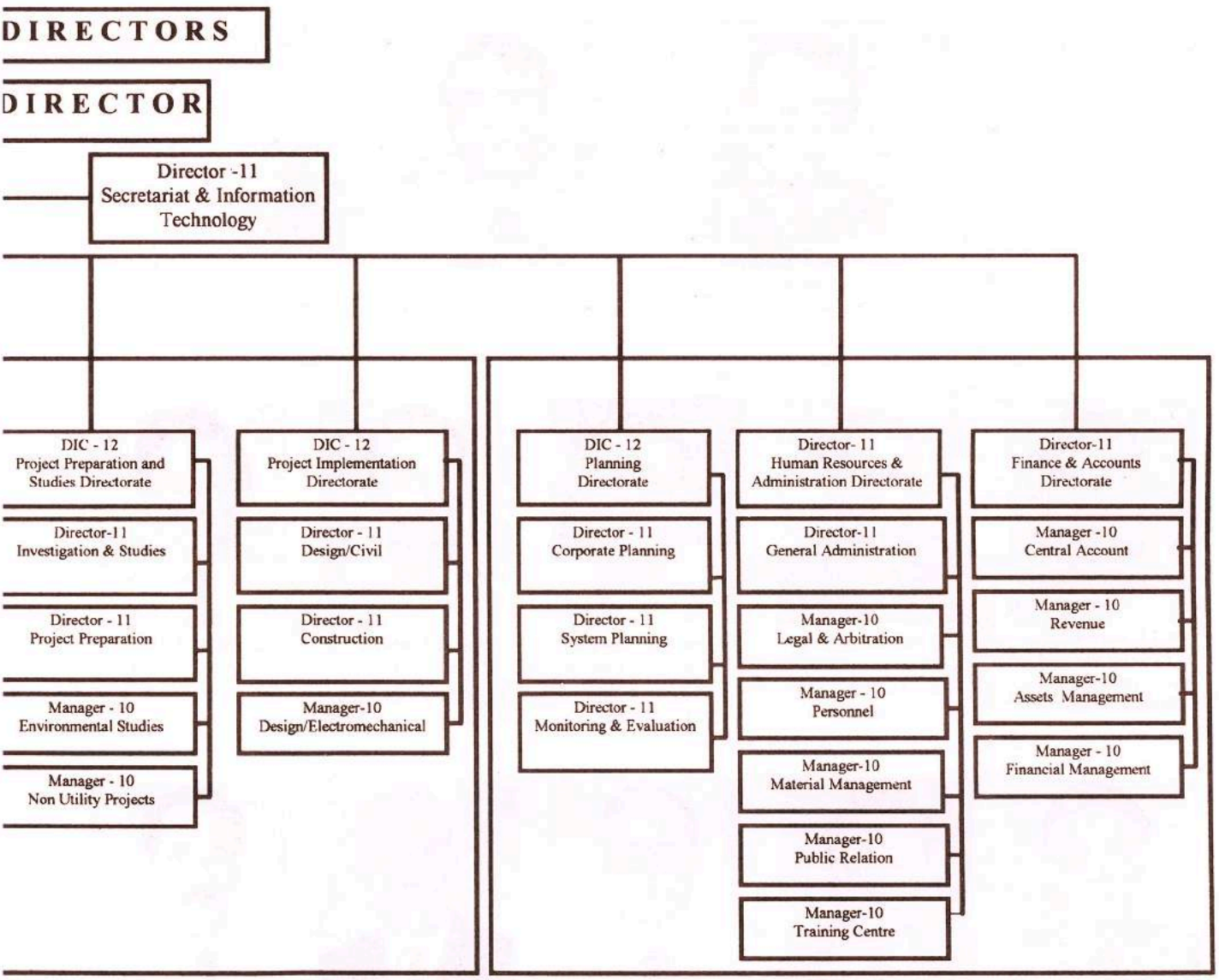
NEPAL ELECT



DISTRIBUTION & CONSUMER SERVICE **GENERATION & TRANSMISSION**

Note:
DMD = Deputy Managing Director
DIC = Director in Chief

CITY AUTHORITY



CHIEF EXECUTIVES

Mr R.B. Shrestha
Deputy Managing Director
Generation & Transmission

Mr R.S. Pandey
Deputy Managing Director
Distribution & Consumer Services

Dr J.L. Karmacharya
Director-in-Chief
Project Preparation & Studies Directorate

Mr B.B. Dhungana
Director-in-Chief
Rural Electrification Directorate

Mr B.B. Malla
Director-in-Chief
DCS East & West Directorate

Mr N.T. Bhutia
Director-in-Chief
Generation Directorate

Dr M. R. Tuladhar
Director-in-Chief
Planning Directorate

Mr G.M. Kadaria
Director-in-Chief
DCS Central Directorate

Mr Govinda K.C.
Act. Director-in-Chief
Project Implementation Directorate

Mr V.N. Uprety
Act. Director-in-Chief
Transmission & Substation Directorate

Mr O.M.S. Swar
Director
Human Resources & Administration Directorate

Mr U.K. Shrestha
Director
Finance & Accounts Directorate

DIRECTORS

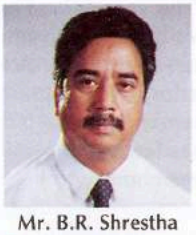

Dr. N. Kapali


Mr D.B. Thapa


Mr P.M.S. Pradhan


Mr G. B. Shrestha


Mr J.N. Nayak

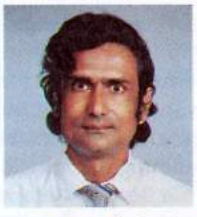

Mr. B.R. Shrestha


Mr. J.K. Pradhan


Mr. A.P. Rijal


Mr S.P. Upadhyaya


Mr M.R. Upadhyaya


Mr. B.C. Thakuri


Mr. M.P. Upadhyaya


Mr. M.P. Pyakuryal


Mr S.B. Shrestha


Mr. D.R. Bhattarai


Mr. R.P. Shah


Mr. M.S. Budiyal


Mr. D.P. Koirala


Mr. R.K. Bajracharya


Mr. A.B. Chhetri


Mr. B.R. Regmi


Mr. K. B. Shrestha


Mr. J.R. Shrestha

MANAGING DIRECTOR'S REPORT

It gives me great pleasure to report on the activities of Nepal Electricity Authority for the Financial Year 1995/96. The year marks the eleventh year of NEA's operations since its inception on August 16, 1985. Over its relatively short history, the year that has passed will be remembered as the year which yielded new hopes for a brighter future for NEA and for the country, as well.

Following the change in political leadership in the country during the past year, there was also a change in the NEA Board with the present Minister for Water Resources, Mr. Pashupati Shumshere J.B. Rana assuming the functions of the Chairman of the Board. We also were glad to have two new Members to the Board, namely, Mr. Pashupati Pratap Shah and Mr. Binay Man Shrestha.

The gloomy prospects of energy deficiency were still alive at the commencement of the year. It was evident from reflections in the media that our customers were apprehensive of what the future would hold for them. Our customers are growing up in an increasingly electricity dependent life-style. A power shortage would mean a reversal of popular trends. We, at the NEA, understood the implications. And we did not sit back. We accepted the challenge to rectify the situation by the turn of the century. We made efforts to push fast-track projects into action and put all our efforts in bringing on-line the Kali Gandaki A, the centrepiece of our hydropower strategy, at the commencement of the new millennium.

But financial constraint still hold the key strings. Although hydropower projects (HEPs) such as the Puwa and Modi did lift off, some projects stalled under financing limitations. However, redress came with the optimistic attitude of Donor agencies to the development of power sector in Nepal. Finally, the year came to a pass with the much awaited news that the Kali Gandaki A HEP had received the green signal.

The Year in Summary:

During the past year, we completed some key strategic planning exercises including an investment plan based on a least cost generation expansion plan. Besides generation, the investment plan included required reinforcement and augmentation in transmission, distribution and grid facilities. The investment plan formed the basis for a study on electricity tariff, which ultimately led to the proposal for a tariff increase. The Tariff Fixation Commission (TFC) approved a tariff hike which went into effect with the billing for the month of Jestha, 2053 (May/June 1996). This increase in tariff will help us to meet the increasing operation and maintenance costs and the local component financing requirement of development projects.

Financing plans has been worked out for development projects up to the year 2003 to meet the projected load demand. It has also been noted that greater emphasis will need to be given to enhancement of transmission lines to cope with increased generation capacity. To chart out studies beyond 2003, we also started hydropower studies based on a newly institutionalised screening and ranking (S&R) procedure which evaluates hydropower projects in terms of their engineering and environmental attributes. It must be remembered that the absence of studied projects had led to the vaccuum in generation plans over the last decade a situation which is best never repeated.

In keeping with the Government's policy to encourage the participation of the private sector in the development of the power sector, NEA completed its obligations required for the financial closing of the 60 MW Khimti I HEP. Following close to the Khimti I HEP, the second private sector undertaking, namely the 36 MW Bhote Koshi HEP progressed satisfactorily. The Power Purchase Agreement (PPA) with NEA was signed in the early days of the new fiscal year.

We promoted the 20 MW Chilime HEP to be constructed and operated as a public limited company with share holdings from NEA, the domestic private sector and NEA' staff contributing from their Provident Fund.Measures are underway to mobilise financing from entrepreneurs more specifically, the country's major Commercial Banks and financial institutions. Favourable financing proposals to the tune of NRs.800 million are expected in the near future.

After many years of stalled generation increment, we increased our available energy and capacity. A generation addition came with the completion of the Trisuli-Devighat Upgrading Project which added 95.3 GWh (11 MW in terms of refurbished capacity) to the system in November 1995 by improving the dependable discharge through modifications in intake design of the Project. On the transmission side, we completed the construction of the Duhabi-Bhantabari 132kV transmission line and made possible an additional import capability of 30MW from Bihar State Electricity Board (BSEB). We even entered into agreement with major industries within the country for the use of their captive generation for peaking purposes during the dry winter months. With these capacity enhancements, added import from India and a very finely tuned study of despatching schedule, we successfully brought to an end the 'load shedding' that had been resorted to since the past few years. However, looking ahead in the generation picture we foresee a period of "load shedding" in the year 1996/97 limited to a few months the necessity arising from the need to undertake scheduled maintenence on the Kulekhani and Marsyangdi HEPs. In the event of such a contingency, we shall try our best to minimize the extent and period of load shedding by mobilising all measures at our disposal. We certainly believe our Customers will bear with us through this unavoidable circumstantces.

The completion of the Duhabi-Kataiya 132 kV transmission line and the additional quantum of import from India are very significant events in the chapters of India-Nepal Power Exchange and lays the precedence for further consideration in the future. The last inter-government Power Exchange Committee meeting introduced aspirations to increase the exchange level from 50 MW to 150 MW. We shall study the possibilities of such enhancements through the construction of more links with Indian utilities at 132 kV or higher.

Concerted efforts were made throughout the year to reduce system losses so as to achieve the targeted figure of 23 percent within the year 1996/97. We expect that losses will also decrease with the completion of projects such as the Seventh Power Project, the Power Sector Efficiency Project (PSEP) , the Kathmandu Valley Distribution Reinforcement Project, and the Computerised Billing Project plus NEA's recurring annual efforts in rehabilitation and distribution. As part of its non-technical loss reduction drive, NEA embarked on a media campaign through the press, the radio and the TV to bring about public awareness of the fact that unauthorised use of electricity is a public offence and involves considerable danger for the offender. The reduction and control of non-technical losses are to be undertaken as a specific project under an ADB loan assistance.

Concern for the environment and the fragile eco-balance, voiced by NGOs and INGOs, was prominent through the year. Our major concerns were directed towards the rehabilitation and resettlement aspects of the Kali Gandaki A HEP. A number of on-site public participation programs were organised to deliberate on the eco-sociological aspects. These were followed by similar programs at Kathmandu and interaction sessions with NGOs professing concern in the project's environmental performance. These programs were arranged to improve on NEA's transparency

in its dealing. In keeping with the concern for the environment, the proposed financing for the Kali Gandaki A HEP includes adequate amounts for environment related works and institutional development of the Environment Unit within NEA. To dissiminate project information in an organised way we have established a Public Information Centre for Kali Gandaki A in our headquarters at Kathmandu.

Besides the focus on Kali Gandaki A, we shall also use a portion of the revenue generated from hydropower project to carry out electrification schemes around power plants after their commissioning. These works will include measures to mitigate environment degradation and will thereby assist in the improvement of the environment situation.

A very proud occasion for NEA was the organisation of the Third International Conference on Power Development in Afro-Asian Countries which we organised in association with the International Association on Electricity Generation, Transmission and Distribution (Afro-Asian Region). The theme of this session was appropriately labelled Power Development Strategies for the Twenty-First Century. The Conference was attended by 329 participants and observers from 32 countries. Among the many VIPs attending the Conference were His Excellency, M. Maher Abaza, the Energy Minister of Egypt. His Excellency and I have been delegated the positions of President and Vice-President of the Association, respectively, for the period 1996-98. The next Conference of the Association is scheduled to be held in Cairo, Egypt.

Over the year, we tried to research the situation and obtain a pragmatic view of NEA's position in our society , in our economy and in the market. We needed to integrate NEA's operations into the nation's fast rising aspirations for sustainable development. With the increasing industrialisation in the country and the accelerated rate of urbanisation, NEA needed to acquire the creditworthiness and the confidence to run the nation's most vital economic sector along responsive, pro-active, management styles.

After extensive deliberations, we decided that an organisational restructuring would help in orienting NEA's functions to bring about the qualities required. The new organsation, which came to effect with the new financial year, divides NEA into four distinct functional sectors. The first Planning and General Management sector comprises of the units to cater to central level functions of (i) Planning, (ii) Finance and Accounts and (iii) Human Resources Administration. The second sector named Power Development comprises of (i) Project Preparation and Studies and (ii) Project Implementation. The third comprises of Generation and Transmission and the last, Distribution and Consumer Services (DCS).

The rationale behind the restructuring reflects our commitment to reduce losses by breaking up the work load of the DCS functions so that monitoring of losses activities can be taken up more intensely.Modification of the structure is also aimed to facilitate greater accountability and commercialisation. The structure now allows the DCS sector to purchase power from the Generation and Transmission sector. Within this sector, further accountability could be established between the Generation and Transmission Directorates.

I firmly believe my colleagues at NEA will use their capacities in the new structure to bolster NEA's efforts to achieve new levels of achievement.

Besides the reforms, we continued efforts to provide personnel with better career prospects by bringing about timely promotions and prompt recruitment in vacant positions, down the rungs of seniority.We have also continued to add to staff benefits and perks, even though these may not be to the extent desired. Professional training, seminars, workshops, conferences and academic studies to strengthen staff competency continued with almost 600 staff members availing some form of participation at home or abroad. To enhance personnel efficiency, a performance related incentive scheme has also been introduced.

Operational Performance:

Overall, the number of consumers served by NEA increased by approximately 8 percent and the service level (percent of the nation's population served) approached the 15 percent level. Achham was the new addition to the districts headquarters electrified, bringing the number to 70. Projects are at hand to bring electricity to the district headquarters of Dolpa, Kalikot, Lamjung, Khotang and Dailekh in the very near future.

During the past financial year, the electrical energy available for use within the NEA system totalled 1261.76 GWh which was an increase of 144.30 GWh (12.91 percent) over the previous year's figure of 1117.46 GWh. This comprised of 1074.27 GWh (85.14 percent) obtained from NEA's hydro generation and 36.56 GWh (2.90 percent) from NEA's thermal generation. A total of 150.95 GWh was purchased from other utilities; comprising of 70.94 GWh (5.62 percent) from electrical utilities in India and 80.01 GWh (6.34 percent) from BPC, in the Nepalese private sector.

Over the financial year, the system peak of the interconnected system was recorded on December 27, 1995 at the level of 275 MW. This was a 12.70 percent increase over 244 MW for the last winter (December 25, 1994).

Over the past financial year, the number of consumers grew by an estimated 36,236 (or 7.90 percent) over the previous year's figure to reach a total of 494,836. The domestic category accounted for 94.92 percent of the total consumer numbers, 35.54 percent of the sales and contributed to 36.54 percent of the revenue. The industrial category formed only 2.51 percent of the total consumers, but accounted for 37.83 percent of sales and contributed to 37.27 percent of the revenue. Non-commercial category constituted 1.60 percent of the consumers accounted for 5.98 percent of the sales and 8.24 percent of the revenue. Likewise, the commercial category constituted 0.48 percent of the total consumers, accounted for 6.57 percent of the sales and provided 9.03 percent of the revenue.

Electricity sales which totalled 937.494 GWh, was an increase of about 112.911 GWh (13.69 percent) over last year's sales figure. Internal sales within Nepal increased to 847.159 GWh and accounted for 90.36 percent of the total sales and registered an increase of 62.055 GWh (7.90 percent) over the last year's figures.

The financial picture remained encouraging for another year. NEA's total revenue totalled NRs. 3,927.20 million, an increase of about 13.4 percent over the figure for the previous year. The O&M expenses, meanwhile, totalled an estimated NRs. 3,187 million. The net profit before taxes is estimated to be NRs. 618.70 million. Also, last year, NEA paid in cash NRs. 1262.1 Million as interest on loans (including arrears) and NRs. 195.8 million in repayment of principal. In addition, NRs. 224.5 million was paid as income tax/royalty . The total paid to the Government Exchequer was thus NRs.1682.40 Million.

Development Efforts :

In order to meet the demands of the future, we identified essential areas of investment and linked these with our projected financial performance. Arising from the investment plan, we identified a number of projects which we must complete within stipulated time periods.

As stated above, the 144 MW Kali Gandaki-A hydropower project is our priority project to meet mid-term generation demands. From the studies conducted, this project has been established to have very attractive socio-economic and technical attributes. Being a run-of-river (ROR) with pondage type hydropower scheme, the project is expected to have very little environmental impact. Nevertheless, all environmental issues have been addressed in the Project. The Kali Gandaki A is expected to start generation by the year 2000.

HMGN and NEA are to jointly meet the local costs of the Kali Gandaki A project

while the foreign costs will be met through loan financing from the Asian Development Bank (ADB), Manila and Overseas Economic Co-operation Fund (OECF), Japan. Loan negotiations between HMGN/ NEA and ADB were successfully concluded in a meeting held from June 10-14, 1996 in Manila. ADB has since approved the loan financing for the project.

In the rural scene, the isolated 400 kW, Achham Small Hydropower Project was inaugurated by the Right Honourable Prime Minister, Sher Bahadur Deuba, on May 22, 1996. Our efforts to provide electricity to consumers in remote areas of the country continued with the construction of Small Hydropower Projects at Dolpa and Kalikot

Equal efforts were devoted to getting hydro-generation projects such as the Modi and Chilime HEPs off the ground and pressing on with the construction of the Puwa Khola HEP. The foundation stone for the 6.2 MW Puwa Khola HEP was laid by the Minister for Water Resources, Mr. Pashupati Shumshere J. B. Rana, on October 10, 1995. Puwa has earned the distinction of being a project attempted entirely with NEA expertise. Similarly, we were able to launch the 14MW Modi Khola HEP with a foundation ceremony performed by the Minister for Water Resources on May 17, 1996. Although initially targeted to be a private sector undertaking, the Project is now to be financed by HMG, NEA and South Korea.

The Seventh Power Project, jointly funded by HMGN, NEA and ADB continued its construction activities over two Phases. Phase I of the project is fast approaching completion while the second phase is targeted for completion latest by the end of 1997. In addition to rehabilitation and system strengthening works, Phase I will provide rural electrification of 513 villages spread over 10 districts to serve 83,500 new consumers, and Phase II will extend to 388 villages and benefit 85,103 new consumers. Other transmission line projects are also underway to link the district headquarters of the districts of Dailekh, Khotang, Ramechhap and Lamjung with the national grid.

The Kathmandu Valley HV Reinforcement Project, financed under an IDA loan assistance, faced some problems acquiring right -of-way and access for the transmission line in urban areas. However, we were able to charge the Bhaktapur sub-station and the Bhaktapur-Chapali line. The remaining components of the project are scheduled for completion in 1996/97 after the amicable settlement of legal issues.

In accordance with the Power Purchase Agreement with private sector promoters, we also hold the responsibility for evacuating power generated by Khimti I and Bhote Koshi HEPs. This power evacuation, which will originate at Khimti I, will pick up the Bhote Kosi power at Sunkoshi and link up with the grid at Balaju through Bhaktapur. Yet another link to a power plant we must construct is the 66 kV line to evacuate power generated by the Chilime HEP. The line will be linked with the national grid at Trishuli/Devighat sub-station.

The Government of Japan has been providing grant assistance for improving the power transmission and distribution system in Kathmandu Valley The project has greatly reduced voltage drops and line losses and improved the reliability of the power supply in the fast growing metropolis. Works under the final second stage of Phase II of the financing are to commence from July 1996 and be completed by March 1997.

Financed under a loan assistance from ADB, the pilot scheme of the Computerised Billing Project went into operation on October 18, 1995 at NEA's Kathmandu West Branch in Kalimati, serving about 22,000 customers with new computerised bills. We are proposing to go ahead with additional phases of the Project and computerise the billing activities in all major NEA branches.

Realising that our human resource is our most vital asset, we have not hesitated to improve and extend the facilities available in our Training Centre. Other institutional strengthening measures include introducing modern office equipment at our Headquarters at Kathmandu to enhance working conditions. We are also

progressing well with the establishment of a Central Workshop for major repair and maintenance of electrical and mechanical equipment.

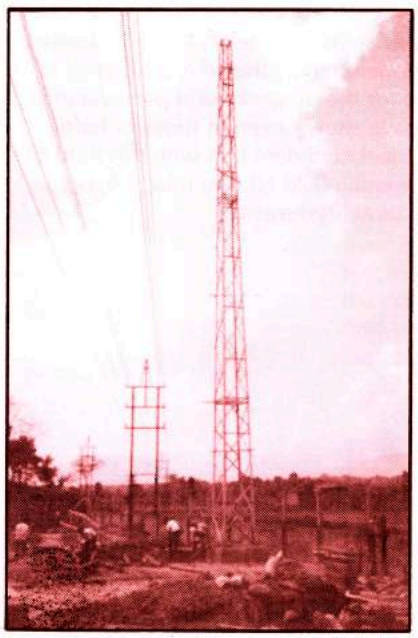
Acknowledgements :

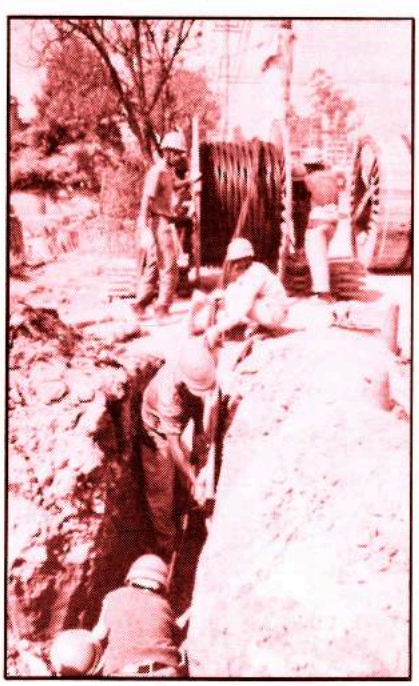
To end my report, I wish to thank His Majesty's Government for the continued encouragement and support we have received in the operation of NEA. I take opportunity to express my sincere thanks to the Chairman and members of the Board for guiding NEA along the path of sustainability and accountability. My sincere thanks also to our valued Customers who have always been the source of our enterprise and the Donor community who have assisted in many ways to achieve our targets.

Last, but not the least, I wish to thank all the members of the NEA staff, at all levels, for the diligence and perseverance they have shown even in times of hardship. I feel confident that with this kind of spirit we can lead NEA to much higher levels of achievement.

(Kirti Chand Thakur)
Managing Director
Nepal Electricity Authority

INTRODUCTION





Over NEA's relatively short history there has seldom been a year as eventful as the one that has passed. FY 1995/96 brought on events of joy and sorrow, challenge and suspense, success and failure. The events featured a wide variety of issues, some still new to NEA's experiences. Issues touched on the concepts of the environment, public interaction, regional exchange and commercialisation. Issues were rooted in the complexities of international financing and dwindling concessional financing. Issues called for the need to mobilise all resources available even in the nascent domestic financial market and push demand-side management. All these and more — bundled into an eventful year that will be remembered as the year of reckoning.

The year opened with the pain still fresh from the wounds caused by the withdrawal of financing from the Arun III HEP. NEA had promoted Arun III as the centrepiece of its hydrogene-ration strategy. But time was not there to waste on lamenting. An alternative strategy had to be formulated - fast. With a new century across the bend, something had to be done so that the problems would not spill into the next generation.

The awesome face of energy deficiency was still prominent at the start of the year. Efforts were made to push fast-track projects into the frontlines. But what options did one have without adequate finances? Though a few hydro-generation projects such as the Puwa and Modi did lift off, others strained in the mires of financing from the donors or the co-financers from the private sector

Relief and encouragement came from options such as regional import, captive generation and energy conservation combined with exacting exercise in load despatching. The efforts added happily to achieve a supply situation without 'load shedding'. Promoting the private sector in the development of hydro-power generation gained impetus and overcame hurdles. After a marathon exercise in promotion, Khimti I finally cleared the fences and Bhote Koshi was cleared for its last lap to finish. In the end, the flagging generation picture looked good. The concern was that a closer look should now be focused on the adequacies of transmission and distribution systems.

Relief also came with the optimistic attitude of Lending agencies to the development of the power sector. And last and not the least, there was an even more optimistic note that the Kali Gandaki A HEP - the new forerunner in NEA's race to meet the nation's demands for the next century - would get the green signal.

NEA did well in terms of financial performance. But success seemed to mean more than just the finances. It became evident through the passage of the year that to provide sustainable, services NEA must integrate and balance out all aspects of its corporate strategy — human resources most importantly. All the bits and pieces must tie in to form an institution that is capable of spontaneously providing quality services to the nation and its customers. Towards the end of the year it seemed NEA had grown wiser and knew in what direction to go and how to go about it.

SECTORAL REVIEW

The Organisation and Management

The past fiscal year 1995/96 the country's political leadership change hands from the Government led by the United Marxist and Leninists (UML) to that of a Coalition Government comprising of the Nepali Congress, the Rastriya Prajatantra Party and the Sadbhawana Party. After the formation of the Coalition Government on September 12, 1995, and the expansion of the Cabinet of Ministers on September 22, 1996, the present Minister for Water Resources, Pashupati Sumshere Rana assumed the functions of Chairman, Nepal Electricity Authority, and presided over the first Board Meeting on October 29, 1995 - this being 204th. Meeting of the NEA Board. It will be recalled that Minister Rana has assumed the post of the Minister for Water Resources on two previous occasions: once during the formation years of NEA in 1985/86 and again for a brief period during the political transition period in 1990.

Towards the end of the financial year, in June 1996, there was a reshuffle in the Board of Directors with Mr. Pashupati Shah and Mr. Binay Shrestha (representing the power sector and the commercial sector) being nominated as Members to replace Mr. Balaram Pradhan and Mr. Deepak Bhattarai.

An event of significance to the management of NEA, was the appointment of Mr. Kirti Chand Thakur as the Managing Director for a period of two years on December 18, 1995. Mr. Thakur has a memorable record of service in the power sector, having spent many years of his service period in the former HMG, Electricity Department, during which time he also assumed the post of Project Director of the Kulekhani II HEP. Subsequently, Mr. Thakur held the position of Managing Director of NEA from July 1988 to September 1992.

Another very significant move to streamline NEA's management for better organisational adaptability to the increasing workload was the restructuring of its organisation approved by the NEA Board towards the end of the fiscal year. The new organisation is planned to come into effect from beginning of the new fiscal year. The rationale behind the restructuring is stated to be as follows:

- Rationalising of work load of Directorates to operate NEA more efficiently with better co-oedination;
- Modification of the structure that facilitates greater commercialisation of NEA's operation and privatisation of some NEA activities in the future;
- Pare staff positions where possible

Basically, the new organisation divides NEA into four distinct functional blocks. The first Planning and General Management block comprises of the units to cater to central level functions of Planning, Finance and Accounts and Human Resources and Administration . The second block named Power Development comprises of Project Preparation and Studies and Project Implementation. The third comprises of Generation and Transmission and the last, Distribution and Consumer Services. Major features of the new organisation include the increased management focus on DCS functions, inclusion of RE as a DCS function, and the merger of the former Construction Directorate functions into generation and transmission and power development blocks. The new organisation structure is shown in the chart attached to this review.

Administration and Human Resources Development

With an aim to boost personnel morale and efficiency by the timely delivery of administrative services, the

process of promoting personnel to vacant positions and filling up the remaining vacancies continued down the rungs of seniority (see insets). Because of the large number of personnel and applicants involved in the appointments to the lower levels, there was some delay in bringing forth some of the results. However, it is hoped that this will be cleared in the near future.

Personnel Status FY 95/96

Level	Tech.	Non-Tech	Total
MD	1	-	1
Special Class	1	-	1
DMD	2	-	2
12	6	-	6
11	21	2	23
10	37	5	42
9	62	8	70
8	97	34	131
7	201	44	245
6	52	55	107
5	465	360	825
4	659	729	1,388
3	961	616	1,577
2	922	156	1,878
1	992	882	1,874
Total	**4,479**	**2,891**	**7,370**

Other attractive perks which were added to improve prospects of a career in NEA included monetary allowances for office uniform, afternoon meals and residential electricity applicable to all levels of staff. Welcome administrative reforms also included increments in travel and daily allowances and a cash and shift increment. A total of 1701 employees benefited from staff loans from NEA resources categorised into loans equivalent to staff salary of 3 months, 6 months, 1 year, 5 year and 7 year. Attempts were made to enhance the medical check-up facilities provided to NEA staff by improving on the medical facilities and adding a day - clinic at the Central Office in addition to the one operational in the evenings. The last year 1,383 employees availed of the medical services. Similarly, 32 employees who had met with some form of accident benefited from accident insurance — the total claim amounting to NRs. 420,082. Completion of the personnel record compilation and the coming into effect of the agreement with Rastriya Beema Sansthan has brought into effect the scheme to insure the lives of all NEA employees. Insurance claims for seven employees who expired during the past year has been settled.

Staff Promotion FY 95/96

Level	Tech.	Non-Tech	Total
11	1	2	3
8	0	4	4
5	33	33	66
4	56	23	79
3	174	1	175
2	227	3	230
Total	**491**	**66**	**557**

Professional training, seminars, workshops, conferences and academic studies to strengthen staff competency continued with almost 600 staff members availing some form of training at home or abroad (see inset). Notable in the year's events was the training arranged on the subject of Finance for Non-Financial Executives in conjunction with Consultants. Apart from the academic aspects presented to NEA's executives, the training provided a broader external view of NEA's capability in the financial market.

Staff Recruitment FY 95/96

Level	Tech.	Non-Tech	Total
10	6	-	6
9	10	-	10
8	15	-	15
Total	**31**	**-**	**31**
Awaiting Results			
7	-	7	7
6	-	15	15
5	14	11	25
4	26	1	27
3	142	30	172
2	175	3	178
1	342	30	372
Total	**699**	**97**	**796**

Staff Training and Development FY 94/95

	In-country	Abroad
Higher studies	6	12
Seminars, Symposiums and Conferences	84	20
Training	90	85
In House Training	279	0
Others	0	24
Total	**459**	**141**

The Afro-Asian Conference

A very significant occasion that took on international colours was the organisation of the Third International Conference on Power Development in Afro-Asian Countries organised by the International Association on Electricity Generation, Transmission and Distribution (Afro-Asian Region) in association with NEA in Kathmandu from March 4-7, 1996. The theme of this session was Power Development Strategies for the Twenty-First Century. The seminar was attended by 329 participants and observers from 32 countries. The Conference was inaugurated by the Minister for Water Resources, Pashupati Sumshere Rana. Among the many VIPs attending the Conference was Mr. Jesus Fransisco, Vice President of the Governing Council and the Energy Minister of Egypt, His Excellency, M. Maher Abaza, who also presented a very foresighted paper on Pan-African-Asian-European Regional Electric Interconnection. Another very interesting presentation was on The Three Gorges Project by Mr. Cheng Shan, Executive Vice-

President of the Techncial Committee for China Yangtse Three Gorges Project Development Corporation. Keynote addresses on contemporary issues were also delivered by Mr. S.K.Malla, Chairman, Tariff Fixation Commission, Mr.Y.S.R. Prasad, Managing Director, Nuclear Power Corporation, India, Mr. Mohd. Annas Bin HJ Nor, Director General of Department of Electricity Supply, Malaysia, and Mr. C.V.J Varma, Member Secretary, Central Board of Irrigation and Power, India.

The Afro-Asian Conference

Mr. K.C.Thakur, the Managing Director, also held the responsibility of the Chairman of the Local Organising Committee which had nine sub-committees dealing with specific arrangements for the Conference. Mr. Thakur was also the Chairman of a Technical Session on Supplier Consumer Relations in the Market Economy.

Towards the end of the Conference, it was announced that H.E. M. Maher Abaza had assumed the position of the President of the Association in place of Dr. Tan Sri Ani Arope.

The Planning Directorate :

The Planning Directorate completed some key strategic exercises including an investment plan backed by a least cost generation expansion plan. The investment in added generation was also linked to required reinforcement and augmentation in transmission, distribution and grid facilities. Identification was also made of other supporting services such as the LDC, training centres, central workshops, small hydro projects, disaster prevention measures, etc.

The investment plan was used to study its impact on the tariff employing ruling covenants such as the self financing ratio (SFR) and rate-of-return (ROR) on equity. The studies were used to propose a tariff increase after a two-year lull. The Tariff Fixation Commission (TFC), after considerable deliberations, approved a tariff hike which went into effect with the billing for the month of Jestha, 2053 (May/June 1996). Major aspects of the new tariff are presented in a schedule in this Review. However, this decision was challenged by INGOs and NGOs and a case was filed in the Supreme Court against NEA, Ministry of Water Resources (MOWR) and the Tariff Fixation Commission (TFC).

As a regular annual exercise, the Planning Directorate also undertook the preparation of NEA's annual development budget for the FY 1996/97 incorporating contributions from the HMG and Donor institutions. Apart from the focus on the 144 MW Kali Gandaki A construction works, the budget also proposed some new works including preliminary engineering studies for the 43 MW Middle Marsyangdi HEP and the undertaking of the 20MW Modi Khola HEP with HMG equity financing and loan financing from South Korea's Economic Development Co-operation Fund (EDCF). Besides identifying the need to initiate reinforcement works on transmission and distribution systems after the completion of planned generation additions, the budget also makes provisions for taking up preliminary work for two small hydropower projects in the districts of Humla and Gumgadhi to replace the solar installations there.

The new FY 053/54 budget (see inset) totals NRs. 6,683,902,000 with HMG contributing 8.32 percent and NEA 15.42 percent. The remaining is met by 14.62 percent foreign grant and 61.64 percent concessional loan from international donor agencies. It must be noted that these estimates of expenditure are in addition to the estimates of NEA's own resources for capital and O&M works undertaken by NEA.

In keeping with the Government's policy to encourage the participation of the private sector in the development of the power sector, NEA responded by helping out Himal Power Ltd. (HPL) with the final documentation required for the financial closing of the Khimti I following HMG's approval of project loans. After considerable efforts, the financial closing of the Project occurred on June 26, 1996.

Development Budget for FY 1996/97

NEA Sector-wise Distribution :

Hydro Generation (New and refurbished)	41.54 %
Thermal generation	9.24 %
Transmission & Distribution	33.37 %
Institutional strengthening works	2.57 %
Hydro-generation studies	2.24 %
Others	11.04 %

Following close to the Khimti I HEP, the second private sector undertaking, namely the 36 MW Bhote Koshi HEP featured in the years activities with positive negotiations to reach a Power Purchase Agreement (PPA) with NEA. The Minutes of Agreement was signed

along with the Final Draft of the Negotiated PPA on February 29, 1996. Towards the end of the financial year, preparations were ongoing for the final signing of the PPA.

Finance

The financial picture remained encouraging for another year. Over the year NEA made cash payment of NRs. 1262.1 Million as interest on loans (including arrears) and NRs.195.8 million in repayment of principal. In addition, NRs. 224.5 million was paid as income tax. The total paid to the Government Exchequer was thus NRs.1682.4 Million.

The Finance Directorate also completed the special audit of the FY 1994/95 undertaken by Auditors, Price Waterhouse and BRS & Co. Likewise, the preliminary report on the statutory audit for the year 1994/95 was submitted by Auditors, B.K.Agrawal & Co.

In terms of the directives issued by the Public Accounts Committee, NEA also cleared about 32 percent of the Auditor's remarks for the Fiscal Year 1995 (Part I) and 26 percent of the remarks on Part II.

The past fiscal year, NEA's total revenue of NRs. 3,927.20 million showed an estimated increase of about NRs. 463.7 million or 13.39 percent over the previous year's figure. The total O&M expenses, on the other hand, is estimated at NRs. 3,187.00 million. Net profit before tax is estimated at NRs. 618.70 million.

Engineering

The actions in the Engineering Directorate for the year were concentrated in initiating studies of hydropower projects as well as in launching fast-track projects into their implementation orbits.

The studies on screening and ranking (S&R) which evaluates hydropower projects in terms of their engineering and environmental attributes is a new approach to preparing a pipeline of hydropower projects for future development. It must be remembered that the absence of studied projects has led to the vacuum in generation plans over the last ten years. The S&R studies are financed through a US$5 Million allocation from the PSEP Development Credit Agreement with the World Bank. The studies are being undertaken by NEA with Canadian International Water and Energy Consultants (CIWEC) as the Consultants.

Equal efforts were devoted to getting hydro-generation projects such as the Modi and Chilime HEPs off the ground and pressing on with the construction of the Puwa Khola HEP. The foundation stone for the Puwa Khola HEP was laid by the Minister for Water Resources, Mr. Pashupati Shumshere Rana, on October 10, 1995. Puwa has earned the distinction of being a project attempted entirely with NEA expertise. The 14MW Modi Khola HEP finally got off the ground with a foundation ceremony performed by the Minister for Water Resources, Mr Pashupati Shumshere Rana, in May 17, 1996. The project development strategy for the Modi HEP had long attempted to affiliate the private sector participation but without reaching the desired arrangements. Initial civil works commenced with entirely NEA financing. Loan financing from the South Korea's EDCF is expected for the electro-mechanical component. From FY 1996/97, budgetary estimates provide for HMG contribution for the project works.

The 20 MW Chilime HEP, considered as a very attractive project, continued with preliminary tunnelling works with NEA's sole financing. The Project is envisaged to operate as a public limited company with share contributions from NEA, the domestic private sector and NEA's staff holdings in their Provident Fund. The Chilime Power Co.Ltd was registered with the Department of Industries on October 31, 1995. Measures to mobilise financing from entrepreneurs, more specifically fourteen of the country's major Commercial Banks and financial institutions, called for additional studies from an Independent Engineer, CIWEC being later appointed for this work. A meeting of prospective investors, lead by the Himalayan Bank, was arranged to appraise the Banks of the project's plus-points in terms of investment opportunity.

NEA has attempted to undertake the development of the 14MW Upper Modi Khola as a joint venture with domestic or international investment. Solicitations were made to the private sector entrepreneurs for proposals to develop the project at a specific energy buy-back rate. Negotiations were initiated with the firm submitting the best evaluated proposal - a Chinese promoter, China Gezhowba Construction Group (CGCG). Negotiations have been delayed because of the need to review certain aspects of the feasibility study.

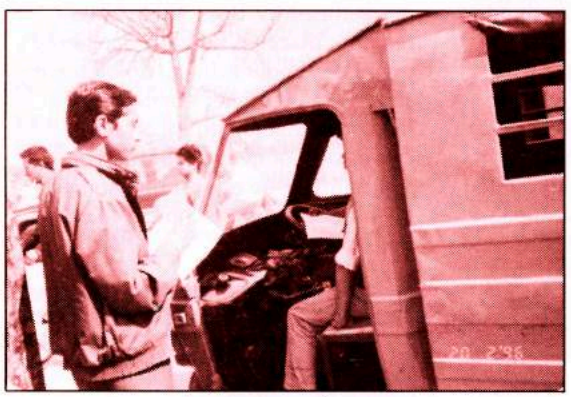
Environment

Domestic and international concern for the environment and the requirement for power sector projects to conform with environmental regulations made their presence felt throughout the year. The hydropower project and its the implications on sociological, economic and ecological impact on the project site continued to be the subject of intense public interest. Environment was also the theme of a very thought provoking workshop organised in Kathmandu , June 26-27, 1996, by WECS/TERI (Tata Energy Research Institute) on the subject, Managing the Environmental Impact in Water Resource Management.

Major environmental concerns were focused on the rehabilitation and resettlement aspects of the Kali

Gandaki A HEP. A number of on-site public participation programs were organised to deliberate on the eco-sociological aspects. These were followed by interaction sessions with NGOs professing concern in the project's environmental performance. The proposed loan financing for the Kali Gandaki A HEP has a component of approximately US$2.0M for environment related works and an additional technical assistance of US$0.534M for the institutional development of the environment unit in NEA.

Environmental studies this year were also undertaken for the Khimti-Bhaktapur-Balaju 132 kV transmission line, the Chilime HEP, and the multifuel addition at Duhabi. Monitoring of mitigation measures were continued for the Puwa and Modi HEPs. NEA's Environment Unit is also reviewing the status of families rehabilitated during the construction of the Marsyangdi HEP.



Interviewing smoky tempos

Generation and Transmission

Apart from the commissioning of the isolated, 400 kW, Achham SHP on December 26, 1995, (later inaugurated by the Prime Minister, Sher Bahadur Deuba, on May 22, 1996) the past financial year ended with no new generation facilities added within the NEA system. A welcome addition did occur with the completion of the Trisuli-Devighat Upgrading Project which added 95.3 GWh (11 MW in terms of refurbished capacity) to the system in November 1995 by improving the dependable discharge through modifications in intake design of the Project.

Captive generation available in large industries was also identified as source of peaking power. Initiated through the DCS Directorate, agreements were signed with 18 industries for the operation of their captive generation during peak load hours from 5 to 9 PM in the evenings during the five winter months. This provided NEA with about 2.07 GWh of additional energy and a capacity addition of approximately 6.5 MW.

NEA was also nominated as one of the Promoters of the Melamchi Diversion Scheme which is to run along private company lines with the formation of the Melamchi Water Company. NEA will own equity shares in the company and also purchase power through a PPA from the 15MW, 54 GWh hydropower project appended to the water supply project. Two small hydropower projects constructed within the framework of other sector projects were also proposed for transfer to NEA as equity transfers. These included the 3.152 MW low-head hydropower project in the Chatra Irrigation Canal, in Sunsari district, constructed by the Sunsari-Morang Irrigation Project and the 285 kW Saraudi SHP constructed by the Agriculture Development Project, at Tanahu.

On the transmission side, construction of the Duhabi-Bhantabari 132kV transmission line was completed on February 19, 1996, and resulted in an added import of up to 30MW from BSEB. The transmission line involved an interlink between the 132 kV sub-station at Duhabi in Nepal and one at Kataiya, within Indian territory. Another transmission line in the news was the Attariya-Dadeldhura-Dipayal 66 kV transmission line which was inaugurated by the Prime Minister, Sher Bahadur Deuba, on May 22, 1996. It will be recalled that the line was constructed with financial assistance from the French Government.

With these generation enhancements, added imports from India and a very finely tuned study of despatching schedule, the NEA system successfully brought to an end the 'load shedding' that had been resorted to since the past few years.

During the past financial year, the electrical energy available for use within the NEA system totalled 1261.76 GWh which was an increase of 144.30 GWh (12.91 percent) over the previous year's figure of 1117.46 GWh. This comprised of 1074.25 GWh (85.14 percent) obtained from NEA hydro generation and 36.56 GWh (2.90 percent) from NEA's thermal generation. A total of 150.95 GWh was purchased from other utilities comprising of 70.94 GWh (5.62 percent) from electrical utilities in India and 80.01 GWh (6.34 percent) from BPC in the Nepalese private sector.

Over the financial year, the system peak of the interconnected system was recorded on December 27, 1995 at 275 MW. This was 12.70 percent increase over the figure of 244 MW for the last winter (December 25, 1994).

Operations and Maintenance

A notable event in the O&M activities was the organisation of a symposium on the theme, Energy Management in the Present Context, held within the premises of the Trisuli HEP from December 4-6, 1995. Nineteen papers were presented over four sessions. Former Managing Director of NEA, Mr. Ajit Narayan Thapa was the chief guest for the occasion. The symposium had

participants from the Tribhuban University, RONAST, and Nepal Telecommunication Corporation besides those from organisations belonging to the power sector.

Some major works undertaken over the year included the successful repair and maintenance of Unit No.1 of Gandak Power House, Unit No. 2 of Panauti Power House, Unit No 3 of Sunkoshi Power House, the turbo-charger for the Duhabi multifuel, and machines and control gear of the Marsyangdi diesel centre — all the maintenance works being done by NEA technicians.

Another notable work was the cleaning and repair to damages resulting from the flood waters that entered the Phewa power house on September 17, 1995 covering all the machinery within with mud and sand. The water entry into the power house was the result of blockage to run-off water because of a land slide on the steep slopes along the penstock alignment following torrential rains the day before.

Repair works on power transformers, reactors, towers, tower foundations and circuit breakers at various places along NEA facilities also featured in the years activities. These helped NEA provide continued supply to its customers without extended outages.

Distribution and Consumer Services

Overall, the number of consumers served by NEA increased by approximate 8 percent and approached towards the 15 percent figure. With the completion of the Achham small hydropower project , the district of Achham was the new addition of districts to be electrified bringing the number to 70.

Construction of transmission lines to the districts of Dadeldhura, Doti and Pyuthan were completed bringing in the benefits of supply from the national grid in addition to existing supplies through small hydro and diesel plants. Of significance is the electrification of the sacred pilgrimage spot of Swargadwari in Pyuthan. By the end of the financial year, the few districts still not electrified by NEA comprised of : Khotang, Dailekh, Lamjung, Dolpa and Kalikot, Projects are at hand to bring electricity to the district headquarters of all these districts in the near future.

Over the past financial year, the number of consumers grew by an estimated 36,236 or 7.90 percent over the previous years figure to reach a total of 494,836. The Domestic category of consumers accounted for 94.92 percent of the total consumer numbers, 35.54 percent of the sales and contributed to 36.79 percent of the revenue. The industrial category consumers formed only 2.51 percent of the total number but consumed 37.83 percent of sales and accounted for 37.12 percent of the revenue. Non-commercial category constituted 1.60 percent of the consumers and accounted for 5.98 percent of the sales and 8.25 percent of the revenue. Likewise, the commercial category constituted 0.48 percent of the total number, consumed 6.57 percent of the sales and provided 9.06 percent of the revenue.

Electricity sales which totalled 937.494GWh was an increase of about 112.911 GWh (13.69 percent) over last year's sales figure. Internal sales within Nepal increased to 847.159 GWh and accounted for 90.36 percent of the total sales and registered an increase of 62.055 GWh (7.90 percent) over the last year's figures.

Despite concerted efforts through the years (see inset) system losses still remained the cause of considerable concern that was voiced by the local press and Donors. The DCS Directorate is of the opinion that technical losses will be reduced through ongoing projects such as the Seventh Power Project, the PSEP, the Kathmandu Valley Distribution Reinforcement Project, and the Computerised Billing Project plus NEA's recurring annual efforts in rehabilitation and distribution. As part of its non-technical loss reduction drive, NEA embarked on a media campaign through the press, the radio and the TV to bring about public awareness of the fact that unauthorised use of electricity is a public crime and involves considerable physical risk. In addition, the DCS Directorate has put forth a definite proposal for the reduction of non-technical losses. It is expected that ADB will support this program with concessional financing. It is noted that acts such as direct tapping of overhead LV lines, faulty meter reading, inaccessibility to consumer's premises, under-billing, un-metered supply, faulty meter connection in large consumers and incorrect disposition of cut-outs in the consumer meter box constitute some of the causes of non-technical losses.

Historical Account of Losses

Year	Loss	Remarks
1985/86	29.01	
1986/87	28.39	Loss reduction Project initiated
1987/88	24.89	
1988/89	25.01	
1989/90	28.03	Trade and transit impasse
1990/91	24.99	
1991/92	23.70	
1992/93	25.20	
1993/94	25.46	
1994/95	25.06	

The Private Sector and Independent Power Producers

June 26, 1996 finally saw the occurrence of the financial closing for the 60MW Khimti I HEP developed by Himal Power Ltd. (HPL), a Nepalese company with major shareholders

comprising of BPC, Statkraft s.f., ABB Energi a.s., and Kvaerner Energy a.s. Sale of interim energy prior to the Scheduled Completion Date also comprises a equity contribution in the project financing. Loan financing for the project originate from the ADB, IFC, NORAD and Eksportfinans, the first two Lenders also providing sub-ordinated loans. NORAD also has a grant component in the project and the Nordic Development Fund (NDF) has equity contribution in the form of Income Participation Certificates.

Major contractors in the Khimti I Project will be the joint venture between Statkraft ANLEGG and Himal Hydro Construction for the civil construction and engineering. ABB will be the contractor for the equipment supplier and installation. Project Management will be handled by a joint venture between Statkraft Engg a.s. and BPC. The engineering firm of Morrison and Knudsen has been appointed the Independent Engineer to the Project.

The Khimti I is slated for Commercial Operation Date of December 4, 1999. Power evacuation from the plant will be through a 132 kV transmission line routed through Sunkoshi to Bhaktapur, Chapali to terminate in the Balaju sub-station. NEA has the responsibility to construct this transmission line and purchase all power generated by the project through a PPA which was signed with NEA as an Amended and Restated Agreement on January 15, 1996.

The private sector development of the Bhote Koshi also followed close on the heels of Khimti I with the signing of the Final Negotiated Draft of the PPA. A private company called the Bhote Koshi Power Company was established on June 23, 1996 to develop and operate the company, the major shareholders being Himal International Power Co, Panda Nepal and Resource Development Consultants, Nepal, the latter two being subsidiaries of parent companies in the USA. The company intends to undertake the project with loan financing from International Finance Corporation (IFC), US Import-Export Bank and Overseas Private Investment Corporation. The Bhote Koshi is scheduled to come into commercial operation on July 1, 2000. Power generated by the Bhote Koshi HEP will be delivered at Sun Koshi sub-station after which further evacuation will be through the 132 kV line referred to in the Khimti I project. As for the Khimti I, NEA will purchase all energy generated by the projects through a PPA.

The 600 kW isolated SHP at Namche, Solukhumbu was inaugurated by the Minister for Water Resources, Mr. Pashupati Shumshere Rana, on October 9, 1995. Constructed with grant financing from the HMG and the Austrian Government, NEA was the implementing agent for the project. A private limited company named OKO Himal has since been formed to run the project on an autonomous basis. NEA holds equity shares in the company.

BPC strengthened their stand as the largest private enterprise in the private sector with the undertaking of the 60MW Khimti I Project. BPC underwent some major corporate changes after the transfer of United Mission's shares held in the Andhi Khola Project to HMG. However , BPC was given the responsibility to continue with the operation of the Andhi Khola and the Jhimruk HEPs. All of the Jhimruk generation and a major portion of the Andhi Khola generation is sold to NEA through PPAs (see inset)

Jhimruk and Andhi Khola Buy-Back Rates (Per Unit)

Jhimruk Energy :	
from January 1, 1995	NRs. 2.18
Andhi Khola Energy :	
(exclusive of royalty and taxes)	
i) FY 2047/48 & 048/49	NRs. 1.10
ii) FY 2049/50	NRs. 1.18
iii) FY 2050/51	NRs. 1.27
iv) FY 2051/52	NRs. 1.37
v) FY 2052/53	NRs. 1.47

Nepal-India Power Exchange

Following talks with the Bihar State Electricity Board (BSEB) in Patna by an NEA delegation led by the former Managing Director, Mr. S.B.Pun in September 18-20, 1995, and the completion of the Duhabi-Kataiya 132 kV transmission line, a very significant event in the chapters of India-Nepal Power Exchange occurred with an addition to the level of import from India. The additional 30MW available through this link helped in avoiding the resort to "load shedding" within the NEA system. Earlier NEA, with its own system in a condition of energy deficiency, had assisted BSEB with a short-term export close to 10 MW to cope with conditions following a major electrical failure in the BSEB electrical system.

Highlights of the Power Trade Agreement

i) any party (government, semi-government or private) may enter into a power trade agreement;

ii) the parties will have the mandate to set the agreement parameters including the tariff;

iii) respective governments will assist the parties to implement agreements in accordance with existing laws and regulations; and

iv) the parties will be granted all incentives and concessions of their respective countries.

A very significant event during the past year related to India-Nepal Power exchange involved the signing of the Power Trade Agreement in Bombay with features shown in the inset in the next page.

Donors

Despite the reported dearth of concessional financing and the onset of the resource crunch in the international finance market, there was healthy interest in NEA's power plans from Donors and Lending Agencies (see inset). Also, with the deferment of the Arun III HEP, financing commitments for the Project made by many Donor Agencies were diverted to alternative projects.

The ADB emerged as one of the major co-financer for the Kali Gandaki A HEP with a committed concessional loan of U$ 160M. In addition a Technical Assistance was piggy-backed to the loan to assist NEA undertake study exercises comprising of institutional strengthening for NEA's environment unit, and the undertaking of load forecasting, rural electrification and cost-based tariff studies. KfW opted to divert its financing to the Middle Marsyangdi HEP and enhancements to the Load Despatching Centre (LDC), in Kathmandu. The French Government was requested to finance some of the transmission lines required to reinforce the NEA system after the coming into line of the Kali Gandaki A. The World Bank chose to continue its interest in developing the power sector by proposing a Power Development Fund (PDF) which would mainly be a resource for private sector enterprises in the power sector. A financial agreement for a JICA grant to implement the last stage of the Kathmandu Valley Distribution Project was also completed during the fiscal year.

Public Relations

NEA continued to interact with the public and the media and thereby attain greater transparency in its activities. The activities were particularly evident in the proceedings for the Kali Gandaki A project. A large number of public hearings and interaction sessions were arranged at the site, in Syangja, and at Kathmandu. Response from the local community, the press, the NGOs and INGOs was very encouraging. A Project Information Centre for the Kali Gandaki A Project was established in NEA's headquarters to serve persons and institutions wishing to obtain greater information on the project.

The interest on NEA's activities was also manifest in the local papers and NEA's response to queries and comments posed by the press also showed healthy bilateral dialogue.

DONOR	AREAS OF INTEREST
ADB	Kali Gandaki "A", Seventh Power Project, Loss Reduction, Institutional strengthening of NEA's Environment Unit, System Planning Master Plan.
World Bank	Power Sector Efficiency Project, Computerisation of Consumer Billing (IDA), Introduction of Computerisation in Accounts, Computerisation of Material Management, Ranking and Screening Studies
KfW	Middle Marsyangdi, Load Despatching Centre, Marsyangdi Trifurcation Modifications.
OECF	Kali Gandaki A, Kulekhani Disaster Prevention II;
JICA	Kathmandu Valley Distribution.
Debt Relief Fund (DRF)	Modi HEP, Puwa HEP.
FINNIDA	Khimti I-Sun Koshi-Bharatpur-Balaju 132 kV TL; Duhabi Multifuel
Finnish Export Credit (FEC)	Duhabi Multifuel extension.
GtZ	Devighat-Dhading 33 kV TL, Small Hydro Master Plan,
ODA	Hetauda Diesel Refurbishment
Govt. of France	Transmission Line Reinforcements and RE
Nordic Development Fund	Duhabi Multifuel, Dumre-Besishahar 33 kV TL, High Voltage Spare Parts

Staff and Sports and Socials

Increase in the sports activities marked the years activities. Apart from sports items such as badminton, carom, chess and quiz contests undertaken as regular features in NEA's anniversary celebrations, an inter-office volley ball contest was organised in Nepalgunj to mark the Golden Jubilee Birthday Celebrations of His Majesty the King. Another sports event in which NEA won with flyig colours was the open volleyball tournament organised by Reiyukai at Dharan.

The combined efforts of three NEA units at Pokhara (Pokhara Section, Gagangouda Section and the Seti Hydropower Centre) also bagged a prize for the best float exhibited during a procession to mark the Golden Birthday Celebrations of His Majesty the King, at Pokhara.

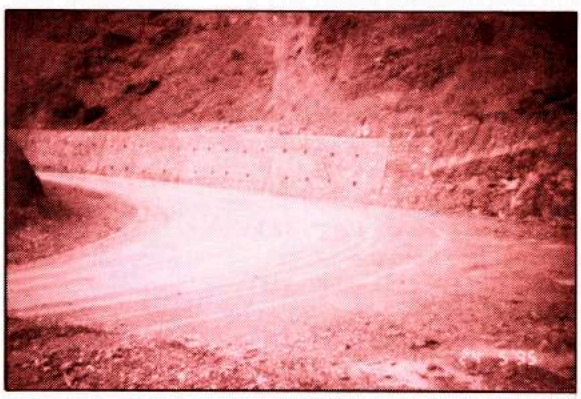
Response for blood donations from NEA staff showed encouraging trends with many staff members donating blood. In return, 84 staff members were provided blood through the Red Cross Society when in need for their medical treatment.

PROJECT HIGHLIGHTS

Kali Gandaki-A Hydropower Project

Treated as a priority project, the 144 MW Kali Gandaki-A hydropower project is located about 500 m down stream of the confluence of the Kali Gandaki and the Andhi Khola rivers in the western region of Nepal, and stretches mainly over Syangja district but also covers Palpa, Gulmi and Rupandehi districts.

The main components of the project include a 6 km long tunnel with a diameter of 7.4 m leading from the diversion weir to a surface powerhouse housing three



Kali Gandaki "A" access road

generating units to produce 144 MW and 840 GWh energy annually. The scheme is of the run-of-river type having a daily pondage with a peaking capacity for about six hours. The project is to be interconnected by 132 kV transmission line to the national grid at Butwal (47.8 km) and Pokhara (57.8 km). It is expected to start generation by July 2000.

The project is estimated to cost US$ 452.8 million at January 1996 price level. This cost includes IDC, physical contingency, price contingency and cost of environmental protection works.

From the studies conducted, this project has been established as very attractive economically, socially, technically and being a run-of-river type scheme it has relatively very little environmental effects, which can be mitigated to a large extent.

At present, a 28.5 km access road has been completed and all preliminary works such as tenders for civil works are almost complete. Bid documents for dam and desanding basin, main tunnel and power house have been received and evaluation of these bids are in progress.

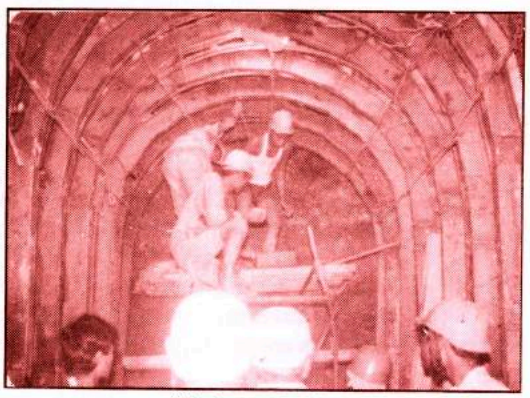
Project information centres have been set up at the project site and the main office in Kathmandu in order to maintain project transparency and several public meetings and discussions have been held. The first such meeting was held in Jaipate and Syangja Bazaar in March 1994 to inform and discuss with the local public about the project and its policy on land acquisition, land compensation and environmental issues. This was followed by another in March 1996. Also, from the beginning of 1996 several open house discussions have been convened in Kathmandu with the participation of various NGO's and voluntary organisations.

This project will be financed by HMGN/NEA and loan assistance from ADB and another donor agency. Loan negotiations between HMGN/NEA and ADB were successfully concluded in a meeting held during June 10-14, 1996 in Manila and the latter has committed to provide US$ 160 million at concessional interest rate. HMG is to finance US$ 32.8 million and NEA US$ 100 million.

Puwa Khola Hydropower Project

Funded jointly by HMGN and NEA, the 6.2 MW Puwa Khola HEP, with an average annual generation of 48 GWh, is the first hydropower project of that magnitude to be undertaken by NEA

utilising in-house expertise for detailed engineering designs and contract management. The scheme is located some 70 km from Charaali, Jhapa and comprises of a 30 m long, four meter high diversion weir, a



Working in the Tunnel

reservoir with 2000 cu.m. capacity and a 3.2 m long tunnel, which leads to the powerhouse situated about 700 m downstream of Rajduwali bridge on the Mai Khola. The power will be evacuated to Ilam through a five km long 33 kV transmission line, which will be interconnected with the national grid at Anarmani by another 33 kV line.

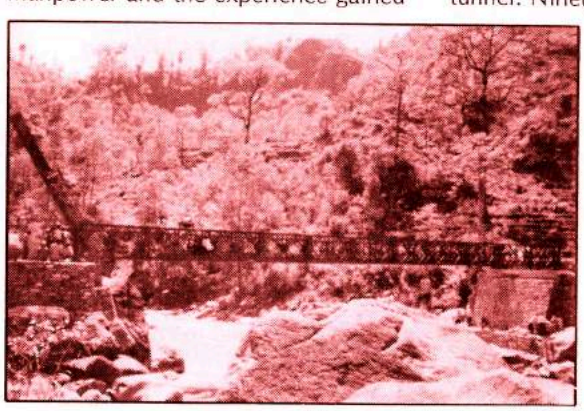
With all contracts awarded for civil and electro-mechanical works, the project is expected to commence generation by February 1998. The present total contract price puts the cost of the project at NRs. 500 million, about 100 million less than the initial estimate.

Modi Khola Hydropower Project

This project, with an installed capacity of 14 MW capable of producing an annual energy generation of 91 GWh, is located in between Betini and Patichaur of Tilahar and Deupar Village Development Committee (VDC)s of Parbat district, about 42 km. north-west of Pokhara on the Pokhara-Baglung highway. Its feasibility study was completed by NEA in 1992 and engineering services for detailed engineering were provided by a Korean Consultancy firm under an agreement with KOICA.

Among the main features, the scheme includes a 5.5 m high, 33 m long diversion weir, which diverts the water of the Modi Khola into a 100 m long desanding basin through a 250 m long underground box culvert. An open canal of 83 m length conveys the water to a regulating pondage of 26640 cu.m. capacity, which is connected to a semi-underground powerhouse through a 1888 m long headrace tunnel and a 143 m long steel penstock.

The cost of the project is estimated at NRs. 1500 million. Civil works have been awarded and the Republic of Korea is expected to finance the electro-mechanical equipment and a 40 km long 132 kV transmission line from the powerhouse to the national grid at Pokhara. The project, scheduled to be commissioned by FY 2054/55, is being constructed by Nepalese manpower and the experience gained



Bailley Bridge Construction

from this project will enhance the capability of NEA in constructing future hydropower projects.

Chilime Hydropower Project

Located in Rasuwa district, this project is designed to produce 20 MW of power generating 137 GWh energy annually at an estimated cost of NRs. 1600 million. The project is planned to be constructed mobilising national financial resources, local technical manpower and financial contribution from NEA staffs.

A presentation program on the project was conducted in which 14 prominent local banks and financing agencies were invited. Response from all of them was very encouraging and Himalayan Bank Ltd. was elected as the lead bank to arrange the necessary loan for the project. All NEA staffs have also been requested to submit their share commitment against the proposed investment of 25% equity share. A public company under the name of "Chilime Hydropower Company Ltd." was registered on Kartik 14, 2052 and until the company functions, all related works are being undertaken by NEA.

All detailed designs of the project were completed using NEA's in-house expertise. These designs were reviewed and approved by the Consultants, CIWEC, with minor modifications in the power house and tunnel. Ninety-five meter of tunnel excavation has been completed and civil works for camp facilities and access road to the surge tank are to commence soon. The project is targeted for completion by the middle of 1998.

Dolpa Small Hydropower Project

Construction works on this project commenced from 1993/94. Located near Dunai, the district headquarters, the project utilises the water of the Jairi Khola

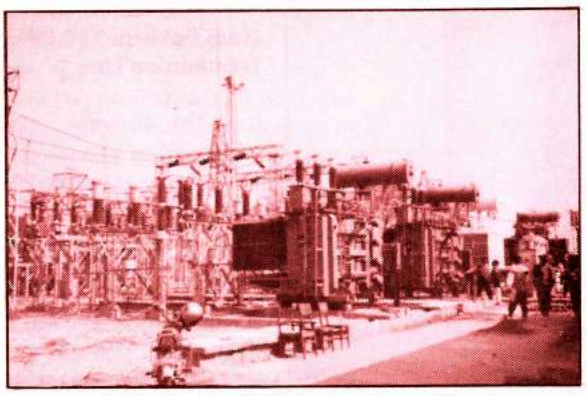
through a 1.1 km long canal to generate 200 kW of power, which will be distributed to 5000 consumers in Dunai, Shahartara and Jhupal regions through 30 km. of 11 and 10 km. of distribution lines. The project, which is being funded by HMGN, is estimated to cost NRs. 81.8 million.

Kalikot Small Hydropower Project

The construction of this project was launched in 1993/94 with financial assistance from HMGN. The scheme diverts the water of Sanigad river into 1.1 km headrace channel to generate 500 kW of power. The proposed 50 km of 11 kV lines and 22 km of 400 volt distribution lines will serve some 1000 households spread over 13 VDC's including Manma, the district headquarters, and adjoining villages of Khadachakra, Mehalmune, Mumra, Rakhu, Resilisipkam, Siuna and Phuket. The project is estimated to cost NRs. 70.4 million.

Seventh Power Project

The Seventh Power Project is being undertaken in two phases : Phase I covers (i) rural electrification of 513 villages spread over 10 districts to serve 83,500 new consumers, and rehabilitation of existing 11 kV and 400 volt distribution networks in Dharan, Birgunj, Hetauda, Butwal and Bhairhawa, (ii) construction of 276.6 km of 33 sub-transmission line and associated 12 new 33 kV substations along with rehabilitation of nine existing substations thereby increasing the substation capacity by 165 MVA (iii) construction of a prestressed concrete pole manufacturing plant at Amlekhgunj with an annual production capacity of 12,354 poles of various sizes.



Reinforcing the 66 kV sub-station at Birgunj

Phase II of the project comprises of (i) rural electrification of 22 districts embracing 388 villages. This will benefit 85,103 new consumers (ii) construction of 60 km. of 33 kV sub-transmission line and three new 33 kV substations, which will further augment the substation capacity by another 12.5 MVA.

The project cost, initially estimated at US$ 64 million, is being jointly met by HMGN/NEA and ADB. Phase I of the project is fast approaching completion while the second phase is targeted for completion latest by the end of 1997.

Kathmandu Valley HV Network Reinforcement Project

Financed under an IDA loan assistance, the project aims to improve the power system reliability, augment network capacity, improve technical and operational efficiency of the system and provide support for interconnection facilities at 132 and 66 kV levels mainly in the Kathmandu Valley.

The project scope includes construction of (i) indoor gas insulated substation and conventional outdoor 66 kV substations at Teku and Bhaktapur respectively along with extension and reinforcement of ten existing substations, which will add to the system 120 MVA transformation capacity (ii) 3.5 km of four circuit tower for 66 kV line between Siuchatar and Teku and 15 km of 132 kV double circuit between Bhaktapur and Chapali.

Acquiring right of way and access for the transmission line in urban areas have been a major stumbling block in the timely completion of the project. Court stay orders prohibiting such construction have compounded this problem. After a long delay, the project was able to charge the Bhaktapur substation and the Bhaktapur-Chapali line on July 15, 1996. The remaining components of the project are scheduled for completion in 1996/97.

Khimti Bhaktapur Balaju 132 kV Transmission Line

In accordance with the Power Purchase Agreement, the responsibility for evacuating power generated by Khimti Hydropower Project, being constructed in the private sector by Himal Power Ltd., lies with NEA. The main features of this project consist of a 45 km long single circuit 132 kV line from Khimti to Lamusangu, where a switching substation will be created to accommodate the incomer from Bhote Kosi hydropower project as well. Another 45 km long double circuit 132 kV line will connect this substation with a new 132/66 kV substation at Bhaktapur, which will be connected to the existing Balaju substation through a 15 km long single circuit 132 kV line using the existing towers between Bhaktapur and Chapali and the right of way presently used by the 66 kV Chapali-Balaju 66 kV line. This line will also serve to transmit the power generated by Bhote Kosi hydropower power, which is also to be constructed by the private sector.

Estimated to cost US$ 20.5 million, the project is to be built with financial assistance from the Government of Finland. Bids have been invi-

ted for the transmission line and the substations separately and the project is scheduled for commissioning in February 1999 prior to the commissioning of the Khimti power station.

Chilime Trishuli Devighat 66 kV Transmission Line Project

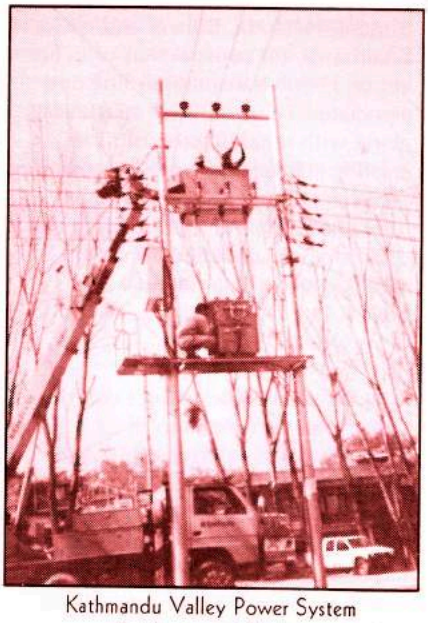
A 39 km. long 66 kV line is proposed for evacuating the 20 MW of power generated by the Chilime hydropower project. The line will be linked with the national grid at Trishuli substation, which will also be interconnected with Devighat substation. The project is estimated to cost NRs. 126 million and scheduled for completion by the middle of 1998. HMGN and NEA are to bear its entire cost.

Kathmandu Valley Power System Reinforcement Project

The Government of Japan has been providing grant assistance for the project with a view to improving the power transmission and distribution system in Kathmandu Valley. Phase I of the project was completed in March 1995 and the first stage of Phase II involving erection of 11 kV and 400 volt lines, distribution transformers, addition of four cubicles in Baneswor substation and construction of switching substation in Maharajgunj substation was completed in Febuarary 1996.

The project has greatly reduced voltage drop and line losses and improved the reliability of the power supply in addition to reducing the frequency of faults and tripping of the lines.

Works under the second stage of Phase II are to commence from July 1996 and be completed by March 1997. Apart from the distribution works, one 37.8 MVA 132/66 kV transformer will be installed at Siuchatar substation.

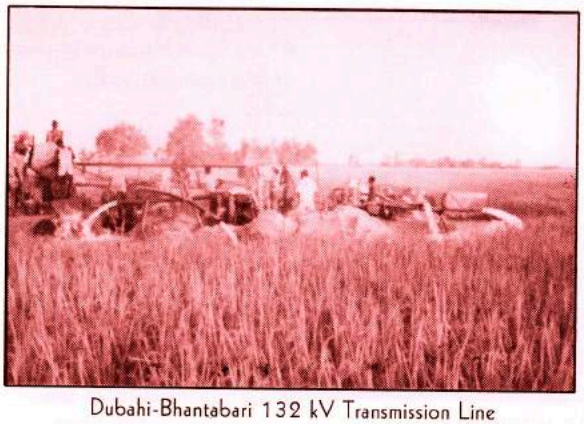


Kathmandu Valley Power System Reinforcement Project

Duhabi-Bhantabari 132 kV Transmission Line Project

The project, which is a part of the Power Sector Efficiency Project funded by IDA, was completed in January 1996. The project consists of stringing of 27 km of 132 kV second circuit from Duhabi substation to Kusaha and construction of 1.0 km of double circuit and 14 km of single circuit 132 kV line from Kusaha to Bhantabari on the Nepal India border.

With the completion of this line, NEA was able to import bulk power to relieve load shedding in 1996. At present, the quantum of import is limited to some 20 MW but a 10 MVAR capacitor is presently being installed at Duhabi substation to enhance the transfer capability of the line.



Dubahi-Bhantabari 132 kV Transmission Line

Dumre-Besisahar Rural Electrification Project

The project is financed under a loan assistance from the Nordic Development Fund. Estimated to cost NRs. 206 million, it is targeted for completion in the current fiscal year.

Construction of 33 kV transmission line and 1.6 MVA substation is complete and electricity is now available at Udipur, Lamjung. 70% of 11 kV and 80% of 400 volt distribution line is complete and electricity will be made available soon at Besisahar. The formulation of User Group is also underway.

Gaighat Diktel 33 kV Transmission Line

This scheme envisages the electrification of Diktel, district headquarter of Khotang, and its surrounding villages at an estimated cost of NRs. 48 million. Erection of steel telescopic poles along the 68 km route between the 33 kV substation of Jaljale and Diktel is complete and works on the line and substations are to continue in the current fiscal year.

Modi Pokhara 132 kV Transmission Line

This 40 km transmission line is designed to transmit 14 MW of power generated by Modi power station, which will be connected to the existing 132 kV Pokhara substation. To be funded under loan

assistance from Republic of Korea Government, the line will be completed by the middle of 1996.

Computerised Billing

Financed under a loan assistance from ADB, the pilot scheme of the Computerised Billing Project went into operation at NEA's Kathmandu West Branch in Kathmandu, serving about 22,000 customers with new computerised bills since October 18, 1995. The introduction of computerised billing has greatly facilitated revenue collection and checked demand for additional booking manpower to cope with increasing number of customers. Customers too have benefited from the system in numerous ways, the main ones being (i) they may pay at any payment counters (ii) any excess amount paid by them is automatically adjusted in the next month's bill (iii) rebate and penalty application periods do not vary between customers and (iv) bills are more informative.

Introducing Computers in Consumer Billing

The project, which was originally conceived for application in 29 branches of NEA, will now cover in addition 12 new branches and sub branches. Under the present proposal, Phase II and III of the project will cover 15 collection centres in Kathmandu Valley and 25 outside Kathmandu Valley respectively. IDA has been requested for the financing of the remaining phases of the project.

Sindhuli Ramechhap 33 kV Transmission line

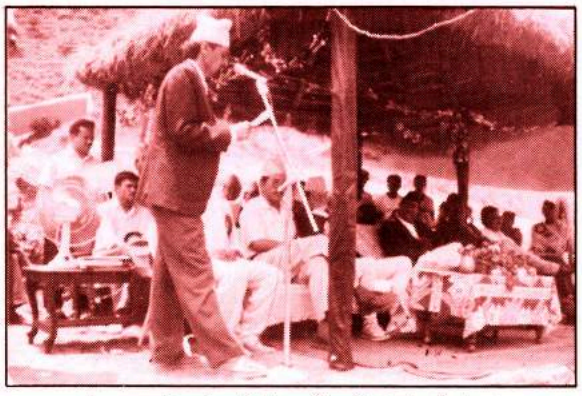
The scheme plans to electrify Ramechhap district headquarters and its neighbouring villages at an estimated cost of NRs. 17.7 million. Steel telescopic poles have already been erected along the 30 km route from Sindhuli substation to Manthali. In the current fiscal years, remaining works on the line and substation will be undertaken.

Surkhet Dailekh 33 kV Transmission Line

Under this scheme, a 33 km long 33 kV transmission line from Surkhet substation to Dailekh is to be built along with the electrification of Dailekh district headquarters and its surrounding villages. The project is targeted for completion by the end of the current fiscal year.

Achham Small Hydropower Project

After its entire weir structure was washed away by the floods of 1993, reconstruction of the project was completed in 2052/53 at a cost of NRs. 98 million. The power station was inaugurated by the Right Honourable Prime Minister Sher Bahadur Deuba on May 22, 1996.



Inaugurating the Achham Small Hydro Project

Although its present installed capacity is 400 kW, the scheme is designed for a capacity of 600 kW. A total of 330 consumers is presently being served in Mangalsen, Jamalgaon, Bayalpata, Riddikot and Sanphebagar through 20 km of 11 kV lines with a further potential to serve some 7000 consumers spread over remote villages of Achham district. It also provides water for irrigating 50 hectare of land. The survey works, detailed engineering design and construction of the entire project were undertaken by Nepalese technicians and contractors.

Attariya-Dadeldhura-Dipayal 66 kV Transmission Line

The project, completed at the end of 2051/52 at a cost of NRs. 270 million, was inaugurated by the Right Honourable Prime Minister Sher Bahadur Deuba on May 22, 1996. With the completion of this line, an estimated ten thousand consumers in this remote region have access to reliable and regular supply of electricity. The 106 km line is designed for 66 kV but is presently charged at 33 kV along with one 1.5 MVA, 33/11 kV substation at Dadeldhura and another 3 MVA substation at Dipayal. CEGELEC of France supplied towers and conductor for the line under grant assistance of FF 185 million from the Government of France while the construction and erection of the line was undertaken by the joint venture of Nepal Electrical Works and CCECC of China. Oriental Electrical Construction (Nepal) and PEC of Calcutta were the contractors for the construction of the substations. NEA handled the project design and contract management.

PROJECT STUDIES

Study of Medium Hydropower Project

The main objective of this project is to select the most suitable hydropower projects in the range of 10 to 300 MW from among those projects that have been identified to date for advancement to feasibility level. These projects along with other projects already at feasibility level but excluding committed projects will be included in generation planning studies.

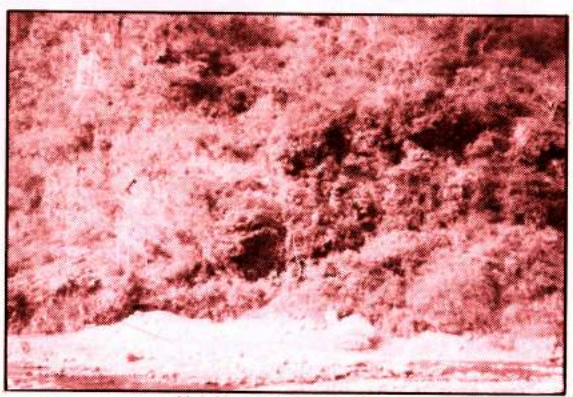
The study is to be conducted in three phases : (i) Screening and Ranking Study with techno-economic and environmental parameters (ii) feasibility study of seven most attractive projects and (iii) detailed design and preparation of tender documents of two projects recommended by generation expansion studies for system expansion.

An important part of the study is the public consultation and stake-holder participation. The overall objective of this consultation process is to build consensus on the projects to be recommended for further study. Apart from this, the study intends to use local consultants for feasibility studies of four medium projects.

The first inter-agency meeting of primary stake-holder was convened on June 17, 1996. The meeting mainly concentrated on the methodology and criteria for the study, which in turn will be applied for coarse and fine ranking of the projects. Using this methodology, a technical and environmental coarse ranking of projects and recommendations for fine screening report has been recently prepared by the Consultant, CIWEC for the second inter-agency co-ordination meeting to be held shortly. Out of 127 medium hydropower projects included in this study, 22 has been recommended for the fine screening study. The entire study is scheduled to be completed within 22 months from the commencement of the work i.e March 1996.

Kulekhani III Hydropower Project

According to the latest study conducted by NEA, this project will generate 14 MW of power with an annual energy generation of 40.82 GWh using the tail water of Kulekhani II and an additional discharge of Khani Khola river totalling 15 cumecs. The headrace tunnel has a length of 4.45 km and a 352 m long underground penstock leads to the surface power house which accommodates two units of turbo generators. Power evacuation will be made through a 500 m long 132 kV line connected to the national grid at Hetauda.



Kulekhani III Intake Site

Estimated to cost US$ 21.85 million, the project could provide the much needed peaking energy to the system by the year 1999. Mobilisation for construction works would be relatively easy and quick as infrastructure facilities such as road, camps and construction power already exist. NEA is planning to conduct detailed engineering study and undertake construction of adit tunnel in 1996/97.

Upper Modi Hydropower Project

This 14 MW project with an annual energy generation of 91.2 GWh is a run-of-river scheme with its headworks located about 6 km upstream from Nayapool in Kaski

district. Major structures consist of a diversion weir, intake, surface desander, a 3.2 km long headrace tunnel, surge tank, 263 m long penstock and a surface power house. The power generated will be transmitted to the national grid through a four km long 132 kV transmission line. The total cost of the project is estimated at US$ 28 million and negotiations are underway with private developers to construct the project jointly with NEA so as to complete it by 1999.

Chamelia Gad Hydropower Project

Two alterative proposals are considered under this project. The first proposal, which is designed with a 51 m high dam and a regulating pondage, has two alternative schemes with an installed capacity of 30 MW (176 GWh) and 28.5 MW (164 GWh), The second proposal, with a 10 m high diversion weir, also offers two alternative schemes, one with 16 MW (117 GWh) and the other with 14 MW (104 GWh). Among the four schemes, the 30 MW and the 16 MW schemes are more attractive, with the latter producing cheaper power and energy even though it produces lesser amount of firm energy. A 130 km long (132 kV for the 30 MW scheme and 66 kV for the 16 MW) transmission line is required to evacuate the power to the national grid at Attariya.

Development of this project would not only be instrumental in harnessing the hydropower potential of Western Nepal but also lead to economic development of the region as well. Survey of the transmission line from Balanch to Dadeldhura was completed in the last fiscal year and the construction of a 21 km long access road from Gokule to the project site is planned to be constructed in the current fiscal year.

Andhi Khola Hydropower Project

With the increasing demand in the peak power and energy, the need for another storage plant has been felt very strongly. The pre-feasibility study of this project was taken up in 1995 and preparations are being made to take it through the first phase of the feasibility level. In the pre-feasibility study, the project has a capacity of 141 MW for an optimum dam height of 178 m and a rated head of 299 m, which would generate 660 GWh annually. The live storage is estimated to be 257 cu.m. At this stage of the study, it is estimated to cost US$ 507 million at the 1996 price level. An attractive feature is that the infrastructure built for the Kali Gandaki-A project can be utilised for this project as well.

Middle Marsyangdi Hydropower Project

This 42 MW project was identified and studied to the feasibility level by NEA in 1994. The updating of this study and preparation for detailed engineering design will be taken up in the current fiscal year for subsequent implementation with financial assistance from the German Government.

Project Identification Programme

Desk Studies of ten Medium Scale Hydroelectric Projects and Reconnaissance Study of eight were completed in fiscal year 2052/53 under the Project Identification Programme. The reconnaissance studied projects are :

1. Suni Gad (5MW) and Budhi Ganga (25 MW) in the Far Western Development Region,
2. Rahughat (18 MW), Bhurungdi (7 MW) and Madi (16 MW) in the Western Development Region.
3. Sankhuwa (13 MW), Mewa (25 MW), Mai Loop (option - I: 45 MW and option - II : 72 MW) in the Eastern Development Region.

Among the studied projects Mai Loop Hydroelectric project is a storage project and the others are run-of-river type projects.

Licensing and Tax Implication for Existing NEA System

(resume)

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

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

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

- **LICENSE**

  issued by MOWR March 20, 1995

  license period 50 years

- **ROYALTY**

  for first 15 years :

  NRs 100/ kW installed capacity/annum

  2% of energy sales

  after first 15 years :

  NRs 1000/kW installed capacity/annum

  10% of energy sales

- **CORPORATE INCOME TAX**

  15 year tax holiday thereon 10% less than normally levied

- **IMPORT FACILITIES**

  (equipment, machinery, tools and spares)

  1% customs duty on items not manufactured in Nepal;

  import license fee and sales tax exempted

- effective from the date of commercial operation

BALANCE SHEET AS OF JULY 15

in million NRs

EQUITY AND LIABILITIES	1995*	1994	1993	1992	1991	1990	1989	1988
Equity								
Share Capital	1,000.00	1,000.0	1,000.0	1,000.0	1,000.0	1,000.0	1,000.0	1,000.0
Share Allotment Suspense	7,122.9	5,796.7	5,190.6	3,956.8	3,916.8	3,146.4	2,502.6	2,615.3
Capital Reserve	147.9	137.6	120.9	88.3	67.6	56.8	44.9	35.2
Reserves & Surplus	(319.5)	(346.0)	(444.6)	(550.8)	(500.3)	(75.6)	39.5	36.1
Revaluation Surplus	14,286.1	14,238.3	13,988.0	13,421.7	12,369.4	12,065.3	11,091.5	–
Insurance Fund	80.0	–	–	-	–	–	–	–
Total Equity	**22,317.4**	**20,826.6**	**19,854.9**	**17,916.0**	**16,853.5**	**16,192.9**	**14,678.5**	**3,686.6**
Long-Lterm Liabilities								
Long-Term Loan	13,367.2	12,880.6	11,649.5	10,070.4	8,812.3	2,422.8	1,890.2	1,541.7
Total Long-Term Liabilities	13,367.2	12,880.6	11,649.5	10.070.4	8,812.3	2,422.8	1,890.2	1,541.7
Current Liabilities & Provisions								
Deposit from Customers	90.5	36.0	42.4	25.5	24.8	20.4	12.4	13.6
Other Deposit	235.0	183.2	84.5	42.5	21.3	14.7	11.9	7.8
Creditors for Goods	28.9	5.9	11.2	12.8	10.3	11.6	19.1	30.9
Other Creditors	22.6	31.1	16.8	40.3	59.4	36.3	2.2	1.8
Payable to Others for power purchase	8.3	11.6	4.6	18.4	106.6	136.8	126.3	78.1
Payable to HMG for Interest	407.8	270.0	224.5	21.4	192.7	198.9	143.1	78.8
Payable to HMG for Other	263.2	182.2	124.9	31.5	73.3	-	-	-
Provision for Bonus	16.6	11.9	6.4	2.4	2.4	3.3	4.8	4.8
Provision for Gratuity & Pension	140.3	140.3	140.3	140.3	140.3	140.3	112.7	86.5
Provision for Medical Facilities	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
Wealth Tax	14.5	11.5	8.5	2.5	–	–	–	–
Provision for Tax	34.4	34.5	7.2	7.2	7.2	28.4	35.0	35.8
Project Accounts Payable	–	–	–	–	–	–	28.4	6.0
Payable to HMG for Power	–	–	–	–	83.5	83.5	–	–
Payable to HMG	–	464.6	46.9	48.6	44.8	45.7	9.5	–
Royalty Payable	358.0	–	–	–	–	–	–	–
Total Current Liabilities & Provisions	**1,654.2**	**1,416.9**	**752.3**	**427.5**	**800.7**	**754.0**	**539.5**	**378.2**
Branch Reconciliation	–	–	34.9	52.7	71.7	19.0	–	–
TOTAL LIABILITIES AND EQUITY	**37,338.8**	**35,124.1**	**32,291.6**	**28,466.6**	**26,538.2**	**19,388.7**	**17,108.2**	**5,606.5**

* *Subject to final audit*

BALANCE SHEET AS OF JULY 15

in million NRs

ASSETS	1995*	1994	1993	1992	1991	1990	1989	1988
Fixed assets								
Land	665.3	636.4	611.4	578.9	537.6	499.9	478.4	46.1
Buildings	755.1	646.4	601.3	573.7	535.0	451.7	433.6	169.8
Hydraulic Plant & Machinery	15,951.7	15,802.5	15,490.0	15,171.2	14,568.0	9,872.3	9,617.0	2,587.1
Internal Combustion P & M	716.9	737.2	752.0	175.6	178.4	177.6	185.5	52.0
Solar Power Plant	39.0	40.5	41.9	43.3	45.1	46.2	32.8	-
Transmission Line	3,024.9	2,704.6	1,815.0	1,825.8	1,797.6	1,696.4	1,717.5	993.2
Substation	2,959.5	3,038.4	2,414.2	2,436.4	2,404.5	2,408.4	2,434.4	-
Distribution Line	3,983.4	3,042.6	2,244.0	2,226.5	2,142.8	1,479.2	652.0	409.3
Meter & Metering Equipment	112.5	97.4	59.7	56.3	50.4	40.6	30.9	22.2
Consumer Service	42.8	48.4	50.3	52.7	52.9	51.9	46.8	42.1
Public Lighting	16.3	14.4	15.0	15.5	15.9	16.3	15.4	14.8
Tools and Instrument	12.4	7.6	5.2	5.4	5.3	5.4	6.2	3.3
Vehicles	85.4	37.9	10.8	8.9	18.9	26.9	27.4	22.3
Furniture & Office Equipment	46.4	39.8	14.8	13.9	14.0	12.3	13.8	9.5
Miscellaneous	2.0	0.4	0.2	0.3	0.3	0.2	0.1	0.2
Total Fixed Assets	**28,413.6**	**26,894.5**	**24,126.2**	**23,184.6**	**22,366.7**	**16,785.3**	**15,691.8**	**4,371.8**
Other Assets								
Capital Works in Progress	5,229.1	5,439.3	6,250.1	3,816.4	2,890.0	1,498.4	778.7	723.2
Investment in Securities	30.5	356.7	79.0	30.4	8.1	8.1	4.1	4.2
Total Other Assets	**5,259.6**	**5,796.0**	**6,329.1**	**3,846.8**	**2,898.1**	**1506.5**	**782.8**	**727.4**
Deferred Expenditure	588.5	98.6	108.6	121.0	169.8	226.3	-	-
Intern Unit Balance (Net)	144.5	143.7	-	-	-	-	-	-
Current Assets								
Inventories	429.1	340.4	289.5	270.4	250.8	217.0	198.3	141.1
Accounts Receivable	682.6	569.9	474.8	576.0	556.1	357.0	285.5	239.9
Advances Recoverable	471.7	149.8	145.8	113.8	122.2	154.2	74.1	69.7
Cash & Bank	1,349.2	1,131.2	817.6	354.0	174.5	142.4	75.7	56.6
Total Current Assets	**2,932.6**	**2,191.3**	**1,727.7**	**1,314.2**	**1,103.6**	**870.6**	**633.6**	**507.3**
TOTAL ASSETS	**37,338.8**	**35,124.1**	**32,291.6**	**28,466.6**	**26,538.2**	**19,388.7**	**17,108.2**	**5,606.5**

* *Subject to final audit*

PROFIT & LOSS FOR THE YEAR ENDED JULY 15

in million NRs

Particulars	1996**	1995*	1994	1993	1992	1991	1990	1989	1988
A. Revenue									
Net Sale of Electricity	3,697.2	3,218.5	2437.4	1,786.8	1,440.4	960.9	760.1	690.3	551.5
Income from Other Services	100.0	99.9	13.8	8.6	5.6	18.2	15.9	16.8	11.8
Interest & Other Income	130.0	145.1	160.5	109.0	68.2	13.5	9.4	3.6	4.2
Total-A	**3,927.2**	**3,463.5**	**2,611.7**	**1,904.4**	**1,514.2**	**992.6**	**785.4**	**711.9**	**567.5**
B. Operation & Maintenance Expenditure									
Operation & Maintenance & General Expenses	984.2	838.3	697.1	604.8	499.3	379.7	291.0	284.8	206.4
Power Purchase	438.7	340.0	214.1	162.1	111.3	50.5	171.5	138.8	63.8
Provision for Expenses	4.1	7.7	8.5	7.0	8.7	–	48.8	26.2	26.8
Bad debts written off	–	–	–	–	–	–	0.3	0.2	–
Royalty	200.0	186.8	–	–	–	–	0.3	0.2	–
Depreciation	1,400.0	1,296.0	1,202.4	1,026.0	953.6	879.7	683.9	578.7	134.7
Deferred Expenditure Written off	160.0	162.0	66.5	53.6	45.1	56.6	56.6	–	–
Total-B	**3,187.0**	**2,830.8**	**2,188.6**	**1,853.5**	**1,618.0**	**1,366.5**	**1,252.1**	**1028.7**	**431.7**
C. Net Operating Surplus (Deficit) (A-B)	**740.20**	**632.7**	**423.1**	**50.9**	**(103.8)**	**(373.9)**	**(466.7)**	**(316.8)**	**135.8**
Loss of Capital Assets	–	–	**35.8**	–	–	–	–	–	–
Interest on Long-Term Loans	**821.5**	**797.0**	**716.6**	**625.5**	**632.2**	**635.1**	**129.0**	**130.3**	**125.8**
Profit and (Loss) Prior Year's income & Expenses Adjustment	**(81.3)**	**(164.2)**	**(329.3)**	**(574.6)**	**(736.0)**	**(1009.)**	**595.7**	**(447.1)**	**10.0**
Prior year Income / Expenses Adjustment	**(160.0)**	**(397.0)**	**(411.7)**	**(48.8)**	**75.6**	**15.4**	**(41.4)**	**33.3**	**(1.8)**
Profit & (Loss) after Prior Year Adjustment	**(241.3)**	**(561.4)**	**(741.0)**	**(623.4)**	**(660.4)**	**(993.6)**	**(637.1)**	**(413.8)**	**8.2**
Transfer from Revaluation Surplus	**880.0**	**671.6**	**869.2**	**729.6**	**610.0**	**568.9**	**522.0**	**424.2**	–
Excess Provision Corporate Tax written back (1993-94)	–	**10.4**	–	–	–	–	–	–	–
Transfer to Insurance Fund written back (1993-94)	**20.0**	**80.0**	–	–	–	–	–	–	–
Net Profit (Loss) Before Tax	**618.7**	**110.2**	**128.2**	**106.2**	**(50.4)**	**(424.7)**	**(115.1)**	**10.4**	**8.2**
Interest Tax	–	**3.9**	2.4	–	–	–	–	–	–
Corporate Tax	–	10.4	**27.2**	–	–	–	–	**7.0**	**13.8**
Net Profit/(Loss) after Tax	**618.7**	**26.4**	**98.6**	**106.2**	**(50.4)**	**(424.7)**	**(115.1)**	**3.4**	**(5.6)**

* *Subject to final audit* ** *Provisional Figures*

HIGHLIGHTS OF 1995/96

Description	1996*	1995	Increase/Decrease Amount	Percent
Total Revenue (M. NRs)	3,927.2	3,463.5	463.7	13.39
Net Sale of Electricity (M. NRs)	3,697.2	3,218.5	478.7	14.87
Income from Other Services (M. NRs)	230.0	245.0	(15.0)	(6.12)
Operating Expenses,				
Including Depreciation (M. NRs)	3,187.0	2,830.8	356.2	12.58
Depreciation (M. NRs) + +	1,400.0	1,296.0	104.0	8.02
Net Income, after interest befor tax (M. NRs)	618.7	110.2	508.5	461.43
Interest on Long-Terms Loans (M. NRs)	821.5	797.0	24.5	3.07
Long-Term Loans (M. NRs)	15,609.0	13,367.2	2,241.8	16.77
Net Fixed Assets (M. NRs)	30,785.9	28,413.6	2,372.3	8.35
Number of Customers	494,836	458,600	36,236	7.90
Total Sales Of Electricity (GWh)	937.494	824.583	112.911	13.69
Internal Sale (GWh)	847.159	785.104	62.055	7.90
Average Customer's Consumption (KWh)+	1712.02	1711.98	0.04	0.00
Average Price Of Electricity (NRs/KWh)+	4.36	4.10	0.26	6.34
Peak Load Interconnected System (MW)	275.0	244.0	31.0	12.70
Total Available Electric Energy (GWh)	1261.76	1117.46	144.30	12.91
Hydro Generation (GWh)	1074.25	848.74	225.51	26.57
Purchased Energy (GWh) India	70.94	113.84	(42.90)	(37.68)
BPC	80.01	73.96	6.05	8.18
Exported Energy (GWh)	90.34	39.48	50.86	128.82
Thermal Generation (GWh)	36.56	80.92	(44.36)	(54.82)
Net System Losses (Percentage)	24.55	25.06	-	(0.51)

Note:

* Figures for 1996 are provisional.

\+ Internal

\+ + On revalued assets

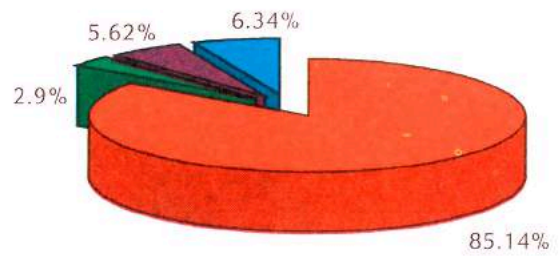
TARIFF RATES

(effective from May 14, 1996)

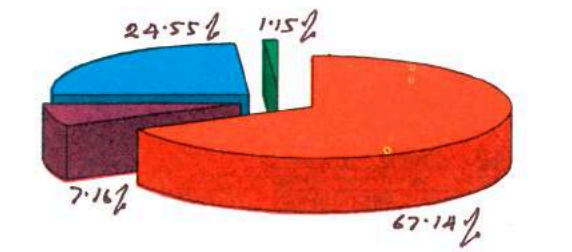
CATEGORY A : DOMESTIC CONSUMERS			
A.1	Minimum Monthly Charges:	**Minimum Charge**	**Exempt**
	METER CAPACITY	**(NRs)**	**(KWh)**
	Upto 5 ampere	60.00	20
	6-30 ampere	160.00	40
	31-60 ampere	360.00	80
	Three phase supply	960.00	200
A.2	Energy charge:		
	Upto 20 units	Rs. 3.00 per unit	
	21-250 units	Rs.5.00 per unit	
	Over 251 units	Rs. 7.75per unit	
CATEGORY B : TEMPLES			
	Energy charge	Rs. 3.60 per unit	
CATEGORY C : INDUSTRIAL			
	Sub-category	**Demand fee (Rs/kVA)**	**Energy charge (Rs./unit)**
C.1	Low voltage (400/230 volt)		
	Rural and cottage	20.00	4.00
	Small industry	40.00	4.90
C.2	Medium voltage (11 & 33kV)	84.00	4.40
C.3	High voltage (66 kV and above)	76.00	3.50
CATEGORY D : COMMERCIAL			
D.1	Low voltage (400/230 volt)	100.00	5.80
D.2	Medium voltage (11 & 33 kV)	96.00	5.70
CATEGORY E : NON-COMMERCIAL			
E.1	Low voltage (400/230 volt)	68.00	5.80
E.2	Medium voltage (11 & 33 kV)	76.00	5.70
CATEGORY F : IRRIGATION			
F.1	Low voltage (400/230 volt)		
	Upto 10 KVA	12.00	2.75
	Above 10 KVA	16.00	3.05
F.2	Medium voltage (11 & 33 kV)	20.00	3.05
CATEGORY G : WATER SUPPLY			
G.1	Low voltage (400/230 volt)	60.00	3.00
G.2	Medium voltage (11 & 33 kV)	64.00	2.95
CATEGORY H : TRANSPORTATION			
H.1	Medium voltage (11 & 33 kV)	76.00	3.10
CATEGORY I : STREET LIGHTS			
I.1	Street lights with meter	–	3.60
I.2	Without meter	1300.00	–
CATEGORY J : TEMPORARY SUPPLY			
J.1	With meter	–	9.30

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

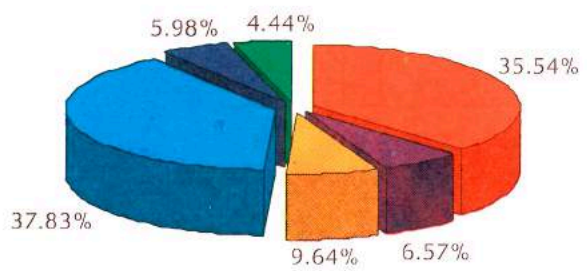
AVAILABILITY FY1996



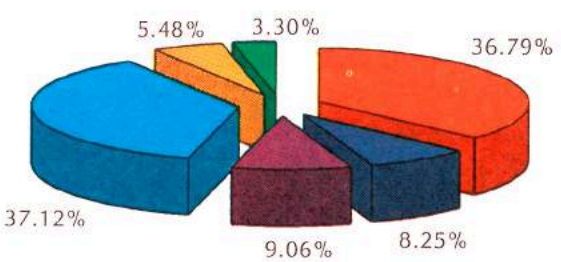
UTILIZATION FY1996



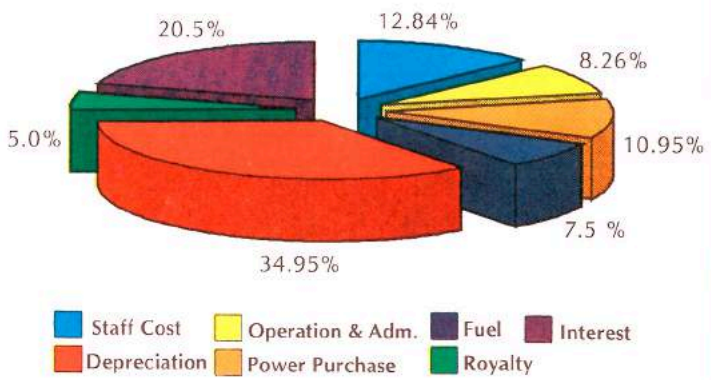
SALES FY1996



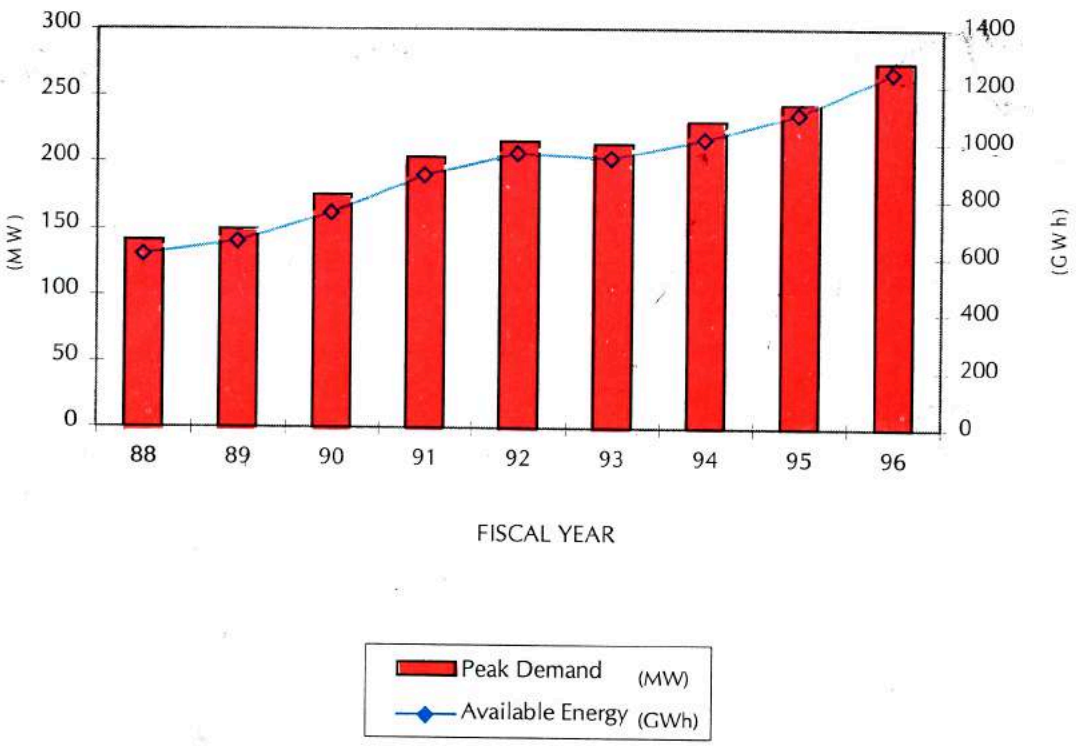
REVENUE FY1996



EXPENDITURE FY1996



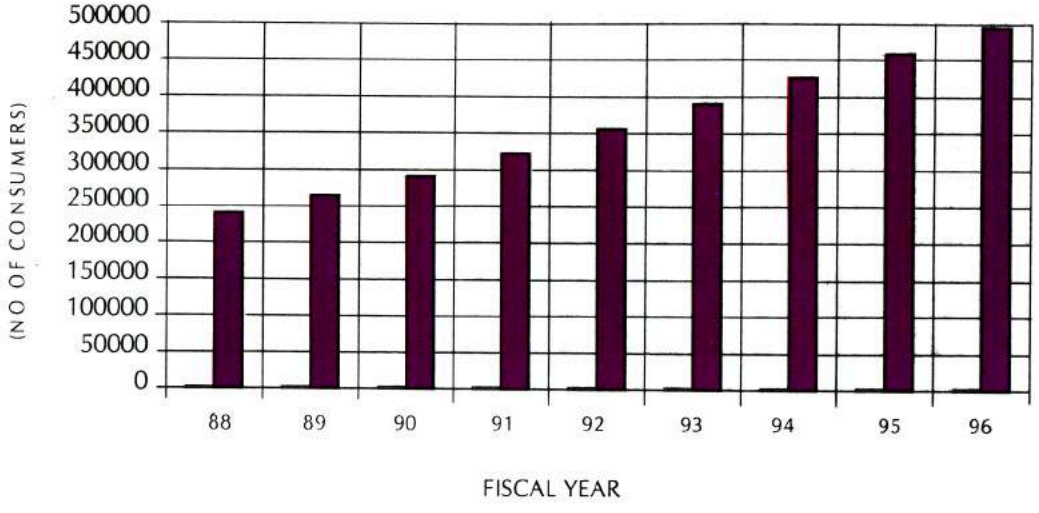
TOTAL AVAILABLE ENERGY AND PEAK DEMAND



Particulars	1988	1989	1990	1991	1992	1993	1994	1995**	1996***
Peak Demand (MW)*	141.000	150.000	176.000	204.000	216.000	214.04	231.0	244.0	275.0
Available Energy (GWh)	628.500	672.300	773.842	906.283	981.105	963.314	1030.89	1,117.46	1261.76
1. Hydro	560.200	558.300	712.312	870.203	869.980	804.050	835.48	848.74	1074.25
2. Diesel	-	-	0.858	0.800	31.540	47.290	62.20	80.92	36.56
3. Purchase from	68.300	114.00	60.672	35.280	79.585	111.974	133.21	187.80	150.95
(a) India	68.300	114.00	60.672	33.700	54.938	82.223	102.77	113.84	70.94
(b) Butwal Power Co.	-	-	-	1.580	24.647	29.7511	30.44	73.96	80.01

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

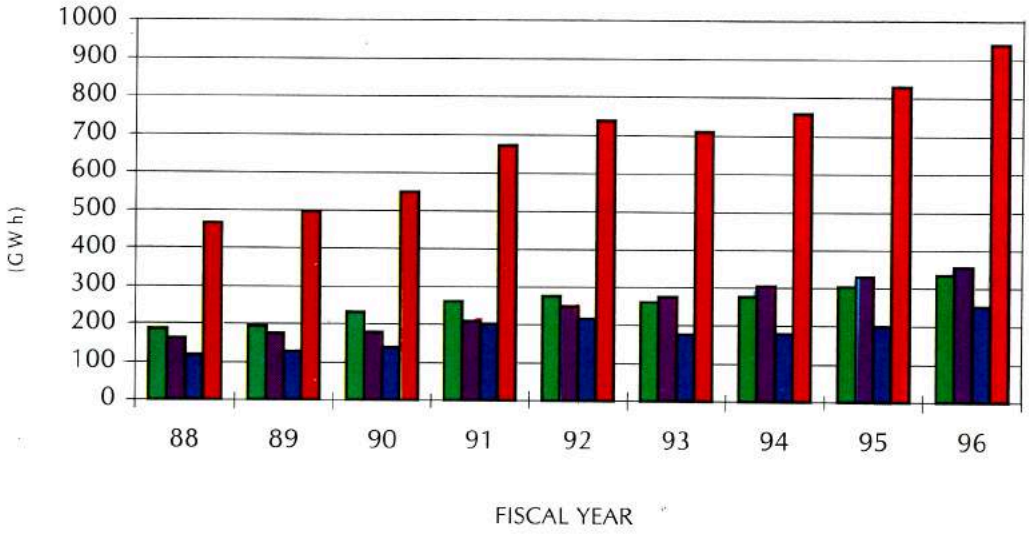
GROWTH OF CONSUMERS



Particulars	1988	1989	1990	1991	1992	1993	1994	1995	1996*
Domestic	2,30,178	2,51,758	2,74,921	3,04,480	3,37,715	3,71,975	4,04,452	4,36,631	4,69,684
Non-Commercial	2,403	3,477	4,506	5,633	6,065	6,340	6,321	6,365	7,893
Commercial	641	1,678	1,758	1,827	1,378	1,536	1,848	2,008	2,385
Industrial	6,181	6,769	7,482	8,382	9,113	9,595	10,737	11,480	12,402
Water Supply	77	105	112	119	124	131	155	166	203
Irrigation	311	343	382	420	512	463	590	630	677
Street Light	1,474	385	517	532	547	367	375	420	552
Temporary Supply	145	104	123	136	191	183	188	189	189
Transport	8	9	9	9	8	8	15	8	8
Temple	59	152	205	247	335	398	525	698	838
Total (Internal Sales)	2,41,477	2,64,780	2,90,015	3,21,785	3,55,988	3,90,996	4,25,206	4,58,595	4,94,831
Bulk Supply (India)	2	4	4	5	5	4	5	5	5
Grand Total	**2,41,479**	**2,64,784**	**2,90,019**	**3,21,790**	**3,55,953**	**3,91,000**	**4,25,211**	**4,58,600**	**4,94,836**

Note :- * Provisional figures

ELECTRICITY SALES

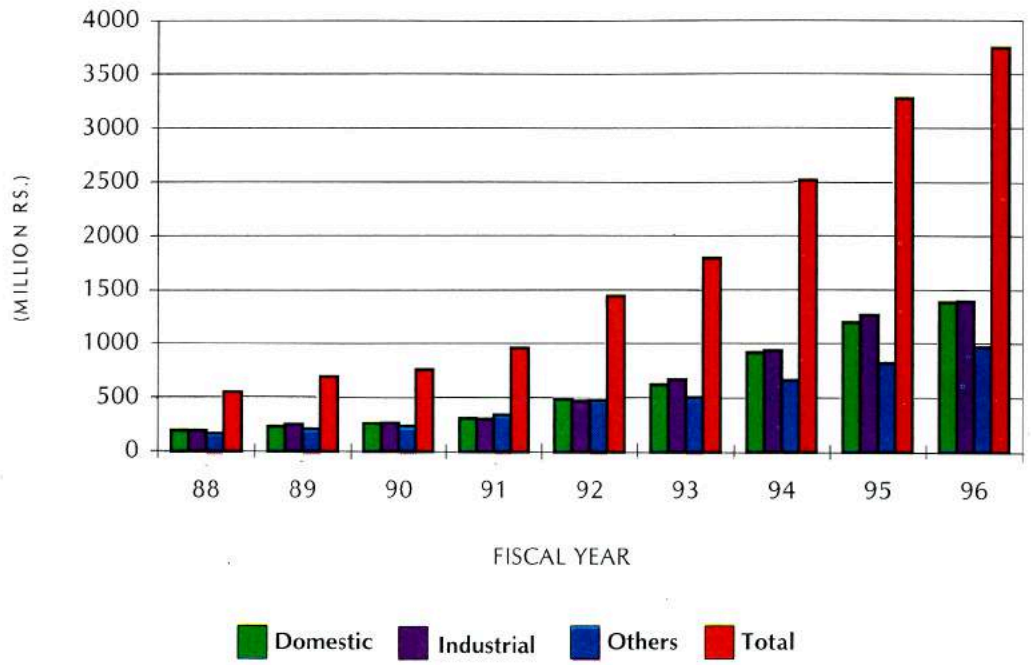


(in GWh)

Category	1988	1989	1990	1991	1992	1993	1994	1995*	1996**
Domestic	185.746	193.308	231.396	261.399	275.248	259.833	275.050	301.610	333.204
Non-Commercial	52.358	48.059	47.433	46.230	46.684	47.607	47.148	53.225	56.076
Commercial	25.401	30.778	33.712	36.640	45.200	47.607	48.988	58.574	61.609
Industrial	161.577	175.262	178.321	206.881	246.374	273.753	303.991	328.315	354.633
Water Supply & Irrigation	16.374	22.970	23.893	27.682	27.705	24.113	19.401	27.636	21.348
Street Light	6.163	5.091	7.295	7.308	7.802	8.068	8.857	12.173	16.718
Temporary Supply	0.705	0.677	0.403	0.428	1.003	0.924	0.561	1.225	0.906
Transport	0.763	2.287	2.060	1.825	1.506	1.395	1.338	1.455	1.441
Temple	0.005	0.109	0.270	0.369	0.419	0.460	0.658	0.891	1.224
Total (Internal Sales)	449.092	478.541	524.782	588.760	651.941	663.248	705.992	785.104	847.159
Bulk Supply	16.053	17.596	23.287	80.640	85.411	46.137	50.514	39.479	90.335
Grand Total	**465.145**	**496.137**	**548.069**	**669.400**	**737.352**	**709.385**	**756.506**	**824.583**	**937.494**

Note :- * Subject to final audit ** Provisional figures

REVENUE



(in million Rs)

Category	1988	1989	1990	1991	1992	1993	1994	1995*	1996**
Domestic	191.205	230.184	259.417	311.686	490.642	621.398	916.332	1,195.389	1,380.576
Non-Commercial	79.852	88.853	90.553	91.708	140.909	181.076	219.807	284.478	309.777
Commercial	41.792	59.920	67.792	75.634	136.319	186.005	235.781	310.911	339.899
Industrial	193.840	254.518	267.254	307.005	473.082	669.244	936.901	1,260.125	1,393.118
Water Supply & Irrigation	22.437	24.284	26.433	27.530	31.406	36.194	39.526	70.091	56.799
Street Light	7.121	6.388	8.832	8.767	15.629	16.949	27.625	41.835	52.307
Temporary Supply	1.863	2.449	1.454	1.483	3.980	4.880	3.699	6.886	6.947
Transport	1.591	2.022	1.809	2.138	2.429	2.118	2.985	3.993	3.741
Temple	0.007	0.113	0.381	0.182	0.441	0.693	1.480	3.320	3.954
Total (Internal Sales)	539.708	668.731	723.925	826.135	1,294.837	1,718.557	2,384.136	3,177.028	3547.118
Bulk Supply (India)	12.009	23.076	36.738	135.064	145.783	75.462	91.364	97.566	205.529
Gross Revenue	**551.717**	**691.807**	**760.663**	**961.199**	**1,440.620**	**1,794.019**	**2,475.500**	**3,274.594**	**3,752.647**

Note :- * Subject to final audit
** Provisional figures

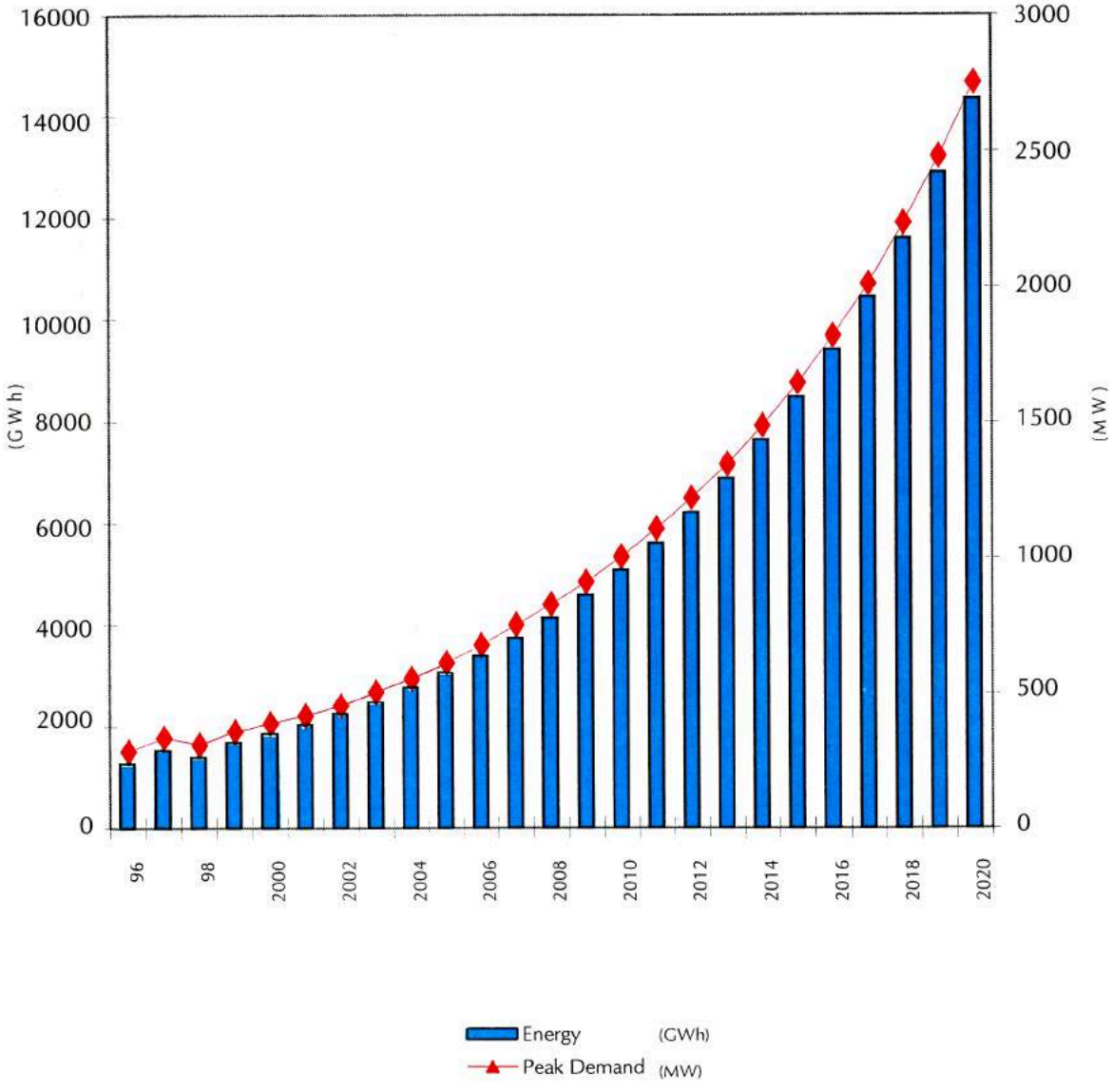
LOAD FORECAST *

for Integrated Nepal Power System (INPS)

Year	Energy (GWH)	Growth (%)	Peak (MW)	Growth (%)
1996	1272	9.3	281	8.9
1997	1392	9.4	303	7.8
1998	1530	9.9	328	8.3
1999	1688	10.3	354	7.9
2000	1860	10.2	383	8.2
2001	2047	10.1	413	7.8
2002	2261	10.5	452	9.4
2003	2500	10.6	498	10.2
2004	2767	10.7	549	10.2
2005	3065	10.8	610	11.1
2006	3392	10.7	676	10.8
2007	3757	10.8	748	10.7
2008	4153	10.5	824	10.2
2009	4593	10.6	909	10.3
2010	5081	10.6	1002	10.2
2011	5617	10.5	1104	10.2
2012	6216	10.7	1215	10.1
2013	6879	10.7	1340	10.3
2014	7641	11.0	1483	10.7
2015	8487	11.1	1642	10.7
2016	9427	11.1	1815	10.5
2017	10471	11.1	2009	10.7
2018	11632	11.1	2232	11.1
2019	12921	11.1	2479	11.1
2020	14353	11.1	2749	10.9
Average Growth		10.6		9.9

* Supply Constrained Load Forecast

LOAD FORECAST



LEGEND FOR POWER DEVELOPMENT OF NEPAL

MAJOR HYDRO PROJECT

EXISTING

1. PANAUTI	2,400	KW
2. TRISULI	21,000	"
3. SUNKOSI	10,050	"
4. GANDAK	15,000	"
5. KULEKHANI NO. 1	60,000	"
6. DEVIGHAT	14,100	"
7. KULEKHANI NO. 2	32,000	"
8. MARSYANGDI	69,000	"
9. ANDHI KHOLA (BPC)	5,100	"
10. JHIMRUK PIUTHAN	12,300	KW
TOTAL	**240,950**	**KW**

UNDER CONSTRUCTION

11. PUWA KHOLA	6,200	KW
12. KHIMTI KHOLA (HPL)	60,000	KW
13. MODI KHOLA	14,000	KW
14. CHILIME	20,000	KW
15. KALI GANDAKI "A"	144,000	KW
16. BHOTEKOSHI	36,000	KW
TOTAL	**280,200**	**KW**

PLANNED & PROPOSED

17. MIDDLE MARSYANGDI	43,000	KW
18. SETI (WEST)	360,000	"
19. ARUN 3	402,000	"
20. BUDHI GANDAKI	600,000	"
21. KALI GANDAKI No 2	660,000	"
22. LOWER ARUN	308,000	"
23. UPPER ARUN	335,000	"
24. KARNALI (Chisapani)	10,800,000	"
25. UPPER KARNALI	240,000	"
26. CHAMELIA	30,000	"
27. PANCHESHWAR (Mahakai)	6,480,000	"
TOTAL	**20,258,000**	**KW**

SMALL HYDRO PROJECT

EXISTING

1. PHARPING***	500	KW
2. SUNDARIJAL	640	"
3. PHEWA (Pokhara)	1,088	"
4. DHANKUTA	240	"
5. TINAU (BUTWAL)	1,024	"
6. JHUPRA (Surkhet)	345	"
7. BAGLUNG	200	"
8. DOTI	200	"
9. PHIDIM	240	"
10. GORKHE	64	"
11. JOMSOM**	240	"
12. JUMLA	200	"
13. DHADING	32	"
14. SYANGHJA	80	"
15. SETI (POKHARA)	1,500	"
16. HELAMBU	50	"
17. SALLERI (SCECO)*	400	"
18. DARCHULA (I) & (II)**	300	"
19. CHAME	45	"
20. TAPLE JUNG	125	"
21. MANANG	80	"
22. CHAURJHARI	150	"
23. SYARPUDAHA	200	"
24. KHANDBARI **	250	"
25. TERHATHUM	100	"
26. BHOJPUR **	250	"
27. RAMECHHAP	150	"
28. BAJURA	200	"
29. BAJHANG	200	"
30. ARUGHAT (GORKHA)	150	"
31. TATOPANI / MYAGDI (I+II)	2,000	"
32. OKHALDHUNGA	125	"
33. RUPALGAD	100	"
34. SURNAIYAGAD	200	"
35. NAMCHE*	600	'
36. ACHHAM	400	"
TOTAL	**12,668**	**KW**

UNDER CONSTRUCTION

37. MANMA KALIKOT	500	KW
38. DOLPA	160	"
TOTAL	**660**	**KW**

PLANNED & PROPOSED

39. DAILEKH	300	KW
40. LAMANGTHAN	65	"
41. KHOTANG	2,300	"
42. GAMGAD	200	"
43. HELDUNG	250	"
TOTAL	**3,115**	**KW**

DIESEL POWER STATIONS

EXISTING

1. MAHENDRA	1,728	KW
2. BIRATNAGAR	1,028	"
3. HETAUDA	15,960	"
4. MARSYANGDI	2,250	"
5. DUHABI MULTIFUEL	26,000	"
6. ILAM	200	"
7. SALYAN	100	"
TOTAL	**47,266**	**KW**

SOLAR POWER STATIONS

EXISTING

1. SIMIKOT	50	KW
2. GAMGADHI	50	"
3. KODARI TATOPANI	30	"
TOTAL	**130**	**KW**

TRANSMISSION LINE LENGTH

1. 132 K. V. Single Circuit	1,178	KM
2. 132 K. V. Double Circuit	27	KM
3. 66 K. V. Single Circuit	179	KM
4. 66 K. V. Double Circuit	153	KM
5. 33 K.V. Single Circuit	1,216	KM

SUB-STATION CAPACITY

132/11	KVA	-	28.5 MVA
132/33	KVA	-	145.0 MVA
132/66	KVA	-	102.8 MVA
66/11	KVA	-	193.3 MVA
66/33	KVA	-	12.5 MVA
132/33/11	KVA	-	10.0 MVA
TOTAL			**492.1 MVA**

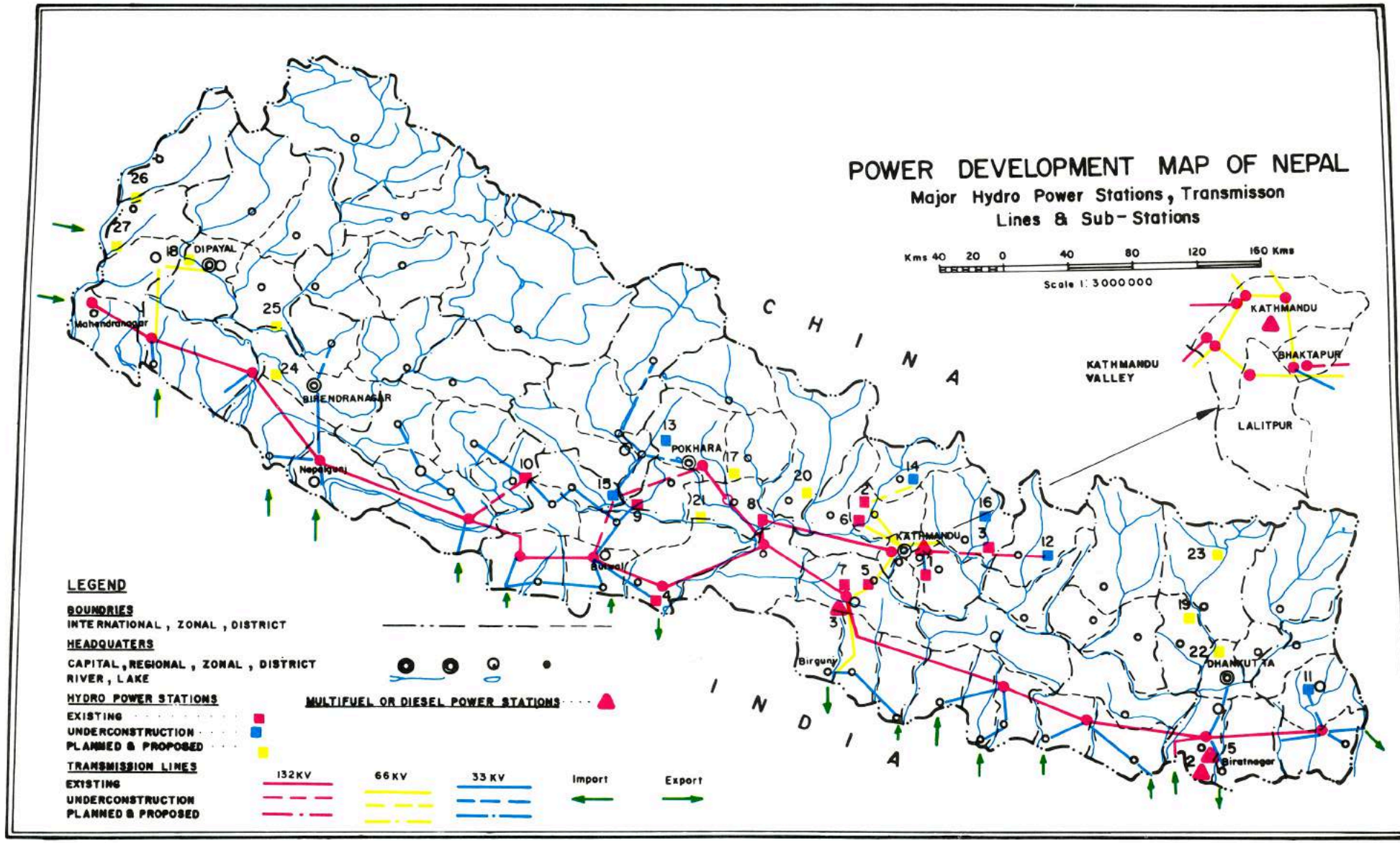
NOTE

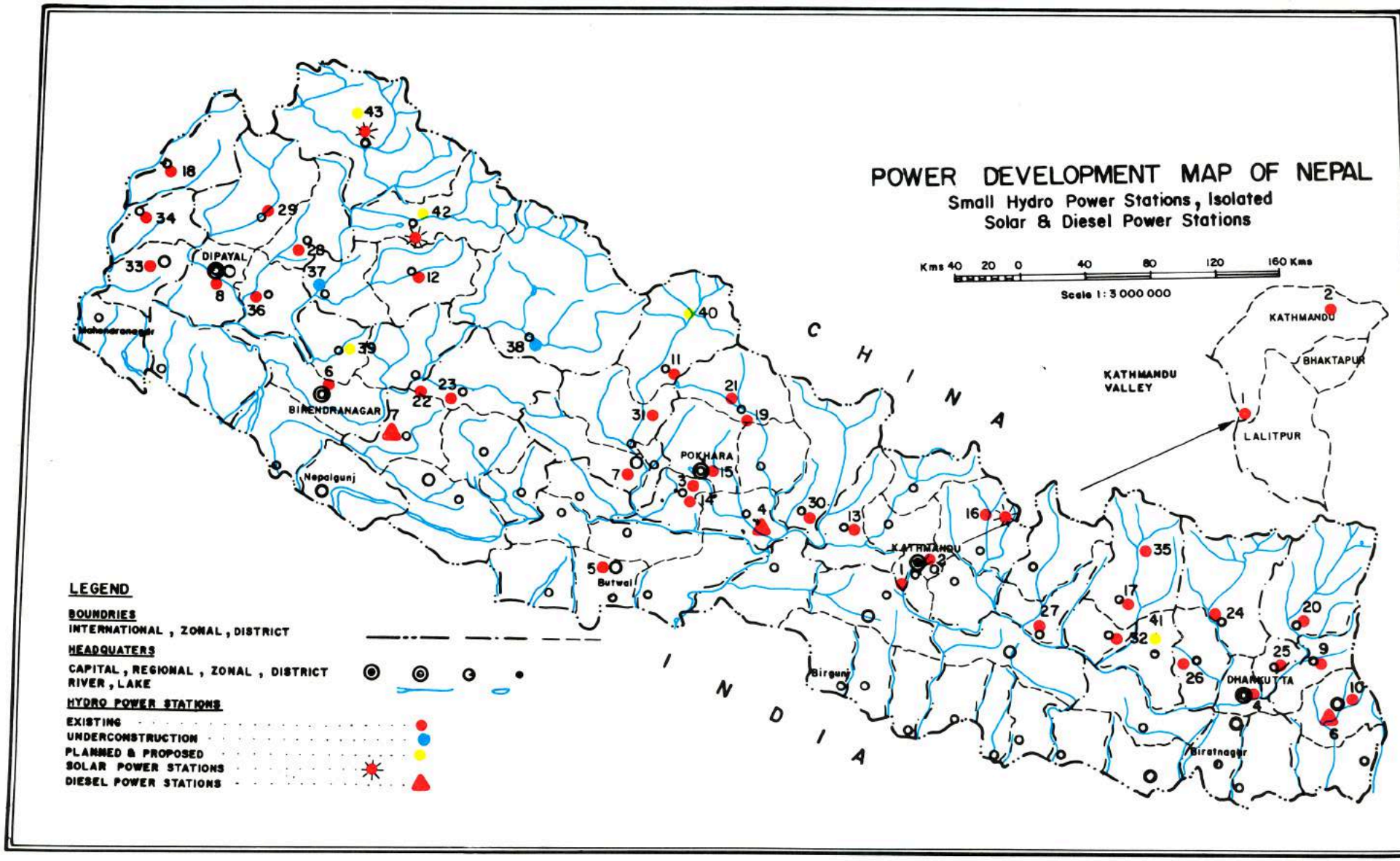
* Private and others

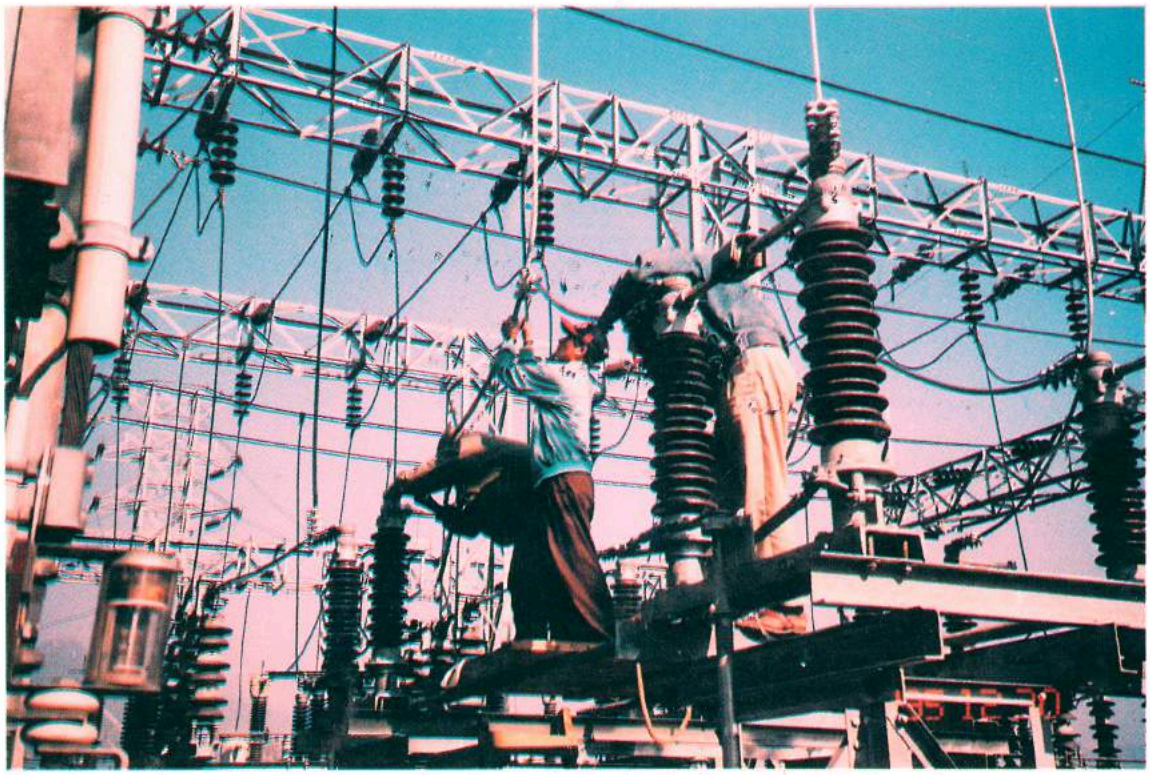
** Leased to the private sector

*** Not in normal operation

Installed capacity in Nepal Electricity Authority : 282,614 MW
(Excluding private & others)


POWER DEVELOPMENT MAP OF NEPAL
Major Hydro Power Stations, Transmisson Lines & Sub-Stations
Kms 40 20 0 40 80 120 160 Kms
Scale 1: 3000000
CHINA
INDIA
KATHMANDU VALLEY
KATHMANDU
BHAKTAPUR
LALITPUR
DIPAYAL
Mahendranagar
BIRENDRANAGAR
Nepalgunj
POKHARA
Butwal
Birgunj
DHANKUTA
Biratnagar
LEGEND
BOUNDRIES
INTERNATIONAL, ZONAL, DISTRICT
HEADQUATERS
CAPITAL, REGIONAL, ZONAL, DISTRICT
RIVER, LAKE
HYDRO POWER STATIONS
EXISTING
UNDERCONSTRUCTION
PLANNED & PROPOSED
MULTIFUEL OR DIESEL POWER STATIONS
TRANSMISSION LINES
EXISTING
UNDERCONSTRUCTION
PLANNED & PROPOSED
132KV
66KV
33 KV
Import
Export


POWER DEVELOPMENT MAP OF NEPAL
Small Hydro Power Stations, Isolated
Solar & Diesel Power Stations
Kms 40 20 0 40 80 120 160 Kms
Scale 1 : 3 000 000
CHINA
INDIA
KATHMANDU VALLEY
KATHMANDU
BHAKTAPUR
LALITPUR
DIPAYAL
BIRENDRANAGAR
Nepalgunj
POKHARA
Butwal
Birgunj
DHANKUTTA
Biratnagar
LEGEND
BOUNDRIES
INTERNATIONAL , ZONAL , DISTRICT
HEADQUATERS
CAPITAL , REGIONAL , ZONAL , DISTRICT
RIVER , LAKE
HYDRO POWER STATIONS
EXISTING
UNDERCONSTRUCTION
PLANNED & PROPOSED
SOLAR POWER STATIONS
DIESEL POWER STATIONS



Installation of outdoor equipment in Siuchatar Substation

Installation work of 66 KV GIS in Teku Substation

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