Power Sector Reform Process in Haryana: A Review

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The process of power sector reform was initiated in India in the early 1990s. Haryana was the second state after Orissa to undertake power sector reforms under the overall supervision of the World Bank. The Haryana Electricity Reforms Act 1997 came into force with effect from 14 August 1998. Consequently, a number of structural changes were undertaken. In this paper, we have examined the experience of electricity sector reform process in the context of Haryana state. To provide perspective to the reform process, it will be useful to examine the technical and financial performance of the State Electricity Board before the restructuring was initiated.

This paper has been divided into five Sections. In Section 1, Technical Performance of the erstwhile Haryana State Electricity Board (HSEB) has been analysed since its formation in 1967 to 1998 when it was restructured under the reforms' programme. In Section 2, the Financial Performance of the erstwhile HSEB has been examined. Section 3 describes the salient features of the reform process. In Section 4, we shall evaluate the functioning and orders of the Haryana Regulatory Commission. In Section 5, we have drawn lessons from the reform process.

Section 1: Technical Performance of the Erstwhile HSEB

Haryana State came into existence with the reorganization of the former state of Punjab on November 1,1966. The Haryana state consists of 19 districts covering a geographical area of 44,212 square kilometers. Its total population at present is about two crores inhabiting 6759 villages and 81 towns and cities (1). Haryana is a small peasant proprietorship based economy. The HSEB was constituted by bifurcating the Punjab State Electricity Board (PSEB) in May 1967.

To meet the aspirations of the people in the newborn state, the State Government initiated a massive programme of rapid economic development. Incidentally, this period coincides with the launching of green revolution in the country and this region was one of the major beneficiaries in terms of resource devolution from the central government. As infrastructure is of key importance to accelerate the process of economic development, it was realized that power should be made available at a reasonable price. Plan expenditure incurred on energy sector is presented in Table 1. Almost whole of expenditure on energy sector was incurred on electric power sector development in Haryana. It may be noted that expenditure on energy sector ranged between 24.43 per cent and 38.39 per cent of the total plan expenditure under various five-year plans. In fact, proportion of resources allocated to power was highest in Fifth and Sixth Five Year Plans and next only to irrigation during Fourth, Seventh and Eighth five year plans.

Haryana State is acutely deficient in Commercial Energy Resource Endowment. It does not have coal or petroleum resources and it has very small hydropower potential. Therefore, it depends heavily on its coal based thermal power plants for which coal is transported over long distances. Haryana receives hydel power from Inter-State multipurpose hydro projects namely Bhakra Nangal Projects and Beas project which Haryana shares with other states. It also purchases power from various central and other state hydro and thermal power plants to meet additional demand for electricity.

Total installed generating capacity owned or shared by HSEB as on 31.3.1998 was 2392 MW (Table 2). HSEB's own generating system consisted of two thermal power stations: 165 MW (3*55MW) at Faridabad and 650 MW (4*110MW+1*210MW) at Panipat. It also owned one micro hydel project of 48 MW (6*8MW) at Western Yamuna Canal at Dadupur (Yamuna Nagar). Haryana is a partner in Bhakra and Beas Projects, which are controlled by Bhakra Beas Management Board (BBMB). In Bhakra system, its share was 477 MW and in Beas system 317 MW. Haryana has been allotted a share in power generating capacity in various central hydro and thermal projects in the northern region. Its share in central hydel projects was 204.30 MW and in central thermal projects, 408.20 MW. From the central projects, state purchases electricity at tariff rates determined by respective central power corporations, which manage the power stations.

Table 3 summarizes the pace of growth in the generating capacity, energy generated and other technical parameters during the period 1967-68 to 1997-98. It may be noted that total installed capacity increased at 8.99 percent per annum (from 383MW to 1173MW) between 1967-68 and 1980-81. It grew at relatively slow rate of 4.28 percent from 1980-81 to 1997-98. The annual growth during the entire period comes out to be 6.29 percent. Hydel generating capacity expanded at a slower rate of 3.74 percent in comparison to 15.99 percent registered by the thermal generating capacity. In fact Haryana's own hydel power potential was very small and the increase in Haryana's share was contributed by the central government projects located in the adjoining states. Over the period under consideration, thermal power generation registered a growth rate of 18.25 percent and hydel power 5.71 per cent making the overall growth rate in the electric energy generation 8.31 percent per annum. Eleven times increase in generation of electricity over a period of 30 years was quite a significant achievement.

During the period 1967-68 to 1997-98, simultaneous peak demand has grown at a rate of 9.89 percent per annum whereas energy sale increased at 9.76 percent which was made possible by 6.29 percent cumulative growth rate in the installed capacity along with a purchase of power from Central Sector and other State Electricity Boards. The State's own generating capacity failed to keep pace with the expansion of peak demand as well as energy demand, which resulted in acute shortage of power in the state. The last generating unit, which was added to its own generating capacity, was of 210 MW coal based thermal power generation unit at Panipat in 1989. During the past eleven years, there was no addition to the generating capacity though energy demand has increased at about 10 percent rate per annum. Haryana generated only one third of its total consumption, about one third was made available from its share in Bhakra Beas systems and the rest of the one third, it purchased from the Central Sector Power Companies. The overall energy shortage in the State was about 5 percent and peak power shortage is about 20 percent.

Transmission and distribution network in Haryana consists of 220 KV, 132 KV, 66 KV and 33 KV transmission and transformation systems, and 11 KV and LT distribution system. Up to 1979-80, HSEB did not own even a single 220 KV substation. However, by 1996-97 it owned 15 such stations connected by 907 Kilometers long transmission lines. During the period 1979-80 to 1996-97, all categories of transformation stations taken together increased from 191 to 402. 132 KV sub-stations increased from 28 to 71, 66 KV stations increased from 31 to 67 and 33 KV substations increased from 132 to 249. During the same period, total length of transmission lines increased from 4016 Km. to 8903 Km. registering a growth rate of 5.96 per cent per annum. Electric Power distribution System in Haryana consists of 11 KV and Low tension (LT) and distributions transformers. Immediately after Haryana came into existence in 1966, distribution network was expanded at a very impressive rate. In the period 1967-68 to 1980-81, LT lines, 11 KV lines and number of Transformers registered an annual growth rate of 14.66 percent, 12.29 percent and 13.41 percent respectively. These growth rates, declined to 2.59 percent, 2.40 percent and 6.86 percent in the period 1980-81 to 1997-98 (2). Obviously investment in distribution network was highly neglected in the second phase. Consequently, distribution system was overloaded. This resulted in low voltage and frequent burning and tripping of the transformers.

Agrarian transformation in Haryana during the green revolution period generated tremendous demand for power in agricultural sector. Haryana being close to Delhi, the national capital, industrialization and urbanization spread at relatively faster pace in areas located in the national capital region. Haryana agriculture is based on peasant proprietorship and therefore, increase in production and productivity in agriculture has enhanced the purchasing power of almost all the sections of the society which gave a boost to the commercial activities in the state. The accelerated growth in the wide range of economic activities was made possible by a very high growth in energy consumption by various categories of consumers.

Consumption of electricity in Haryana grew at a quite high rate as is clear from Table 4. Total energy sale in the state grew at the rate of 12.66 percent per annum in the period 1967-68 to 1980-81 (first phase) and 7.18 percent during the period 1980-81 to 1998-99 (second phase). In the first phase, agricultural consumption registered highest growth rate of 18.03 per cent, which was reduced to 8.35 percent in the second phase resulting in overall growth over the whole period under consideration to be 12.30 percent, which is really very impressive. Domestic consumption also registered 15.25 percent and 12.88 percent growth rates in the first and second phase respectively. Electricity sale to industrial sector grew at 10.31 percent rate in first phase, which declined to 2.42 percent per annum in the second phase. Domestic, agricultural and industrial consumption account for about 90 percent of the total sale of electricity. However, significant differences in the growth rates of electricity sale to various consumers categories over time period under consideration has led to major changes in the relatives shares of electricity consumed by different categories of consumers. The share of domestic, industrial and agricultural consumers in 1966-67 were 6.61 percent, 62.70 percent and 20.36 percent which changes to 22.59 percent, 21.09 percent and 45.39 percent respectively in 1998-99. Large proportionate increase in sale of electricity to agricultural consumers is due to the preferential treatment given to agriculture with minimum cuts during the periods of shortage. Due to severe cuts and poor reliability in supply to industrial consumers during the period of scarcity,

industries have shifted more and more to the captive generation and consumption to ensure that their production does not suffer due to power cuts. This trend is wasteful and must be reversed.

Haryana has many significant achievements to its credit, as it was the first state in the country to achieve 100 per cent rural electrification by electrifying all the 6745 villages in the state in 1976-77. The per capita consumption of electricity in Haryana in 1996-97 was 504 units (Kwh) against the all India average of 334 units occupying fourth position after Punjab, Gujarat and Maharashtra states (3). Though the attainments in terms of physical expansion of the electric power system have been quite impressive, the technical performance of the system was a cause of worry. Overall capacity utilization of the thermal power plants as reflected by the plant load factors ranged between 32 per cent and 49 per cent (Table5) and plant availability was about 60 per cent, forced outages were about 30 per cent and the auxiliary consumption more than 10 per cent.

The transmission and distribution losses as a proportion of electric energy available for sale in Haryana has been presented in Table 6. Analysis of the estimates of T&D losses brings out a very erratic picture. In the initial years of the existence of the HSEB, T&D losses from 1968-69 to 1971-72 were in the range of 22% to 29%. In the period, 1972-73 to 1986-87, they declined to the range of 14% to 19%. Then in the next period from 1987-88 to 1994-95, the losses rose to the range of 24% to 28% and thereafter, during 1995-96 to 1997-98, losses further increased to the range of 31% to 34% (4). Low levels of T&D losses in the seventies may be because the T&D system was not overloaded and supply was metered. However, after 1977 when flat rate system for agricultural supply was introduced and metering was discontinued, agricultural consumption was an estimate based on certain norms regarding numbers of hours for which tube wells were operated and the sanctioned load etc. Soon, the management with the active connivance of the political bosses discovered that the account of agricultural consumption was a black box where its inefficiency, extent of pilferage of power etc. could be transferred without any accountability. Therefore, the estimates of T&D losses became a policy decision. Since early 1990s, it appears to be a conscious decision of the political leadership and the management to show much higher T&D losses including theft of power to provide legitimacy to reforms and privatization. All these indicators clearly establish that despite quite impressive expansion in the physical infrastructure, the technical performance of the thermal plants and T&D system was quite unsatisfactory.

We may conclude from the above analysis that the achievements in terms of expansion in generation, transmission and distribution systems as well as role of electric power in achieving high economic development have been quite impressive. However, the technical performance of HSEB was not satisfactory and demand for electricity continuously outstripped supply, which rendered the physical infrastructure inadequate making the existing system overloaded resulting in voltage fluctuations and poor quality of supply.

Section 2 : Financial Performance of HSEB

The financial position of the HSEB has been examined for the period 1990-91 to 1998-99. The two rates of return (ROR) on the average capital base have been computed: one taking subsidy provided by the State Government into consideration and the other without it as is given in Table 7. The ROR without taking into consideration subsidy from the state government ranged between –16.0 percent and –47.79 percent in the period under consideration. It may be noted that performance in terms of ROR consistently deteriorated from 1990-91 to 1997-98 as ROR declined from –15.76 % to 47.79 % except for 1994-95. The state government was expected to provide subvention to the State Electricity Board for supplying electricity at a price lower than the cost of supply at the consumer end. The Board charged lower tariff on the direction of the state government that wanted to achieve certain socio-economic or welfare objectives by making electricity available to certain consumer categories at prices less than the cost of supply. Even after taking subsidy given to HSEB in to consideration, ROR in 1990-91 to 1993-94 kept declining from –12.31% to –27.5%. In 1994-95 ROR was –0.80 percent and in the following two successive years 1995-96 and 1996-97 ROR was positive (2.6 percent and 0.41 percent respectively) as the State Government compensated the Board completely. It may be noted that commercial losses without subsidy kept increasing from Rs. 164.76 crore in 1990-91 to Rs. 725 crores in 1997-98. However, commercial losses after taking into account the subvention from the State government show a declining trend after 1993-94 as State Government subventions in 1993-94 was 60.0 crore and it was increased to Rs. 631.6 crore in 1996-97 (5).

The above analysis clearly brings out that though in principle the state is expected to compensate the SEBs for its meeting socio-economic commitments, the state government failed to discharge its responsibility to financially compensate the Electricity Board. Such an arbitrary interference also makes the management and administration complacent as well as despondent having little motivation or desire to improve administration or technical efficiency.

It will be quite insightful to examine pricing policy in relation to the financial performance of the HSEB. To examine the price policy of the HSEB in relation to the cost of Supplying power, separate analysis has been carried out for each consumer class with a view to determining the nature of relationship between the Average Revenue realised from various consumer categories within the state and average cost of supplying power. It will help us to bring out the extent to which energy sale to each consumer class involves profit earning or subsidization. The analysis is confined to the period 1985-86 to 1997-98.

Most of the State Electricity Boards follow average cost based pricing principle. The actual tariff is worked out by the application of certain rules of the thumb keeping an eye on the average cost of supply, the capacity of the consumers to bear the burden and certain other socio-economic considerations. The consumers have been grouped in to various categories on the basis of the nature of use and type of demand.

Along with other factors, the cost of power supply increases with increase in the geographical distance of the consumers from the power generating station due to increase in the transmission and distribution costs. However, in actual tariff

formulation these differences are ignored, as it is an accepted norm that every body in a region has a right to get supply at the same price if the nature of the load is the same. The price charged from high capacity demanding consumers is normally based on two-part tariff. One part is called 'demand charges' is related to the maximum demand or connected load of the consumers and the other is related to the amount of energy consumed on the kilo-watt-hour (unit) basis. From the small consumers, the price is charged on the basis of per unit of energy consumed. Another component of price charged is the electricity duty imposed by the state government.

The average revenue realized from the electricity sale within the state to various consumer categories and the average cost of electricity supply has been presented in Table 8. The analysis of results provides an interesting insight in to the dynamics of tariff making in Haryana over time. On technical grounds, the cost of electricity supply at the higher voltage is lower; the cost of electricity supply at the lower voltage levels is higher. Similarly, the cost of electricity supply in densely populated areas is lower than in the thinly populated areas as transmission and distribution costs and service charges per consumer will be lower. As per the pricing policy of the HSEB, various categories of consumers are charged tariff at different rates. This gets clearly reflected in the average revenue realized in a particular year from different consumer categories. Table 8 brings out that, normally, commercial consumers were charged tariff rates consistently at higher rates than the domestic consumers were. Similarly, big industrial (HT) consumers were charged at rates higher in comparison to the small and medium industrial consumers. Agricultural consumers were priced the lowest, though cost of supply is the highest. This implies that tariff rates do not have any systematic relationship with the cost of supply. Capacity to bear the cost and some other socio-economic & political considerations appear to have played dominant role in the tariff formation.

A comparison of the average revenue realized from the electricity sold within the state and the average cost of supply shows that over the period under consideration the overall average revenue increased from 41.70 paise per unit in 1985-86 to 187.36 paise per unit in 1997-98. The average cost of supply in the corresponding period increased from 71.57 paise per unit to 293.40 paise per unit respectively. It clearly brings out that, the price per unit of electricity sold did increase over time, but it was inadequate to meet the cost whereby the average revenue realized was consistently lower than the cost of supplying electricity though the shortfall did decline. There was not even a single year in which average revenue was higher than the average cost of electricity supply. Figures in the brackets are the average revenue as a proportion of the average cost of supplying electricity (AR/AC) in percentage terms. It shows that in 1985-86, average revenue was 58.3 per cent of the average cost. In the first half of 1990s, average revenue as a proportion of average cost of supply declined but since 1994-95, it consistently increased because of steep increase in tariff of commercial and industrial consumers. Average revenue realized from domestic consumers also increased significantly. Increase in tariff rates does not appear to have any logical relationship to the cost of supply to various consumer classes (6). The only criteria appear to be capacity to pay without much political fallout. This behavior pattern indicates that there is no economic rationality in the pricing policy. Tariff rates were revised when financial crisis reached a flash point, then the situation was allowed to drift for the next one or two years. As the tariff was a political decision dictated by the government, there did not appear to be any serious attempt to achieve the statutory

financial requirements or even the break-even point. The financial loss or surplus from the sale of electricity to various categories has been presented in Table 9. It clearly shows that revenue loss due to subsidized supply in 1985-86 was Rs.82.12 crores and it increased to Rs.874.5 crores in 1997-98.

Total quantum of subsidy to domestic consumers was Rs. 14.81 crore in 1985-86 and it kept increasing consistently over time up to 1993-94 when it rose to Rs. 136.67 crore. In 1994-95, it declined to Rs. 114.28 crores. Whereas in the following years it again shows an increasing trend and in 1997-98 it rose to Rs. 162.91. Commercial tariff consistently generated a surplus over a period of time. Industrial consumers were not subsidised and they significantly contributed to the surplus of the HSEB. Public lighting has also been consistently subsidized. Tariff of electricity supply to public works and sewerage was lower than the supply for public lighting up to 1990-91 and it was raised subsequently and becomes higher than the cost of supply, contributing to the surplus generation.

Analysis of pricing policy for tube well irrigation presents a very contrasting picture. Average revenue realised from agriculture consumers recovers only 20 percent of the cost of supply. As the total electricity consumption by agricultural ranged from 35 percent to 45 percent of the total sale within the state due to this the amount of subsidy increased from Rs. 70.54 crore in 1985-86 to Rs. 892.72 crore in 1997-98.

Above analysis of the financial performance of HSEB for the period of 1985-86 to 1997-98 brings out that the performance has been highly unsatisfactory. During this period, domestic consumers and irrigation pump sets were the two major groups of consumers who were being highly subsidised.

To rehabilitate the electric power system in Haryana, it required large amount of investment resources for renovation and modernization of exiting thermal power plant, to expand generating capacity, to expand transmission and distribution systems. As the required finances were not forthcoming, Haryana government decided to take a loan of $600 million from the World Bank and agreed to implement its terms and conditions.

Section 3: Salient Features of the Reforms Process

The reform process was initiated on the direction of the World Bank. International consultants were appointed who conducted restructuring studies. National Economic Research Associates, Inc (NERA) of U.S.A conducted the restructuring study for the Haryana Power Sector Restructuring Project in 1994. M/S Price-Waterhouse-Coopers conducted financial Restructuring Study and Asset Evaluation Study. M/S Aurther Andersen Consultants were engaged as Reforms Consultants for corporatisation, commercialization and privatization of distribution. These studies provided the time frame and basis for the reform process in the state.

The Haryana State Electricity Reform Bill, 1997 was moved in Haryana Legislative Assembly by the then Chief Minister Sh. Bansi Lal on 21 July and was passed on 22 July 1997. The Act provides for the constitution of an Electricity Regulatory Commission, restructuring of the electricity industry, rationalization of the generation, transmission, distribution and supply of electricity, avenues for participation of

private sector entrepreneurs in the electricity industry and generally for taking measures conducive to the development and management of the electricity industry in an efficient, economic and competitive manner and for matters connected therewith or incidental thereto (7).

The Haryana Electricity Regulatory Commission (HERC) shall act as the body which issues and enforces licenses, which balances the interests of the State, the consumers, the units involved in generation, transmission, distribution and supply of electricity and investors in the electricity industry; which monitors, controls and regulates the working of the units; which gathers information; which monitors price and quality of service; which prevents monopoly abuse; which regulates and adjudicates on the tariff and other related issues and also acts as a body to resolve or set up machinery to resolve speedily disputes between the licensees.

Overall, the State Government will do policy planning and co-ordination. The Transmission Company will undertake the technical co-ordination with the Central Electricity Authority, the State Government authorities in the State and regional in the centre. Generation function would vest in a Government corporation to be incorporated under the Companies Act, 1956. The distribution would be performed either by Government Corporation or Joint Venture Company (ies) licensed by the commission being set up under this Act.

The Haryana Electricity Reforms Act came into force w.e.f. 14.08.1998 and the process of restructuring the Haryana State Electricity Board was initiated the same day. The Haryana Electricity Regulatory Commission (HERC) was constituted and all the electricity generating functions were transferred to newly constituted Haryana Power Generation Corporation (HPGC). The Haryana Vidyut Prasaran Nigam Limited (HVPNL) was created to perform transmission and bulk supply functions. For distribution and retail supply two distribution companies namely, Uttar Haryana Bijli Vitran Nigam (UHBVN) and Dakshin Haryana Bijli Vitran Nigam (DHBVN) have been formed. The distribution companies are at present functioning as subsidiary companies of HVPNL and have applied to the HERC for separate licenses (details of the exact dates of the reforms process, process followed in constitution of the HERC, Boards of directors of various corporations and Commission Advisory Committee have been given in the Annexure).

At present, the state government as the sole shareholder owns all the generating companies, transmission and distribution companies. The Boards of directors of various corporations consist of official members only and the bureaucrats of Indian Administrative Services have been appointed as Managing Directors. The state government did make effort to invite some Independent Power Producers (IPP) and private distribution companies but no deal has been finalized as yet.

Section 4: Experience of Electricity Reform Process

The Haryana Electricity Regulatory Commission has issued guidelines as regards its conduct of business, tariff philosophy and guidelines for load forecast, resource plans and power procurement process. As per the Electricity Reforms Act 1997, the Transmission and Distribution Companies are required to file their Annual Revenue Requirement (ARR) and proposed tariff increases for the next financial year by 31

December of the current year to enable the Commission to pass order before the commencement of the next financial year. The Commission is expected to follow a transparent decision making process before passing its order. The Commission is required to hold public hearings and give opportunities to various stakeholders, the public (consumers) and the licensees to present their views. It will be quite insightful to examine various orders passed by the Regulatory Commission and their actual implementation.

A. HERC Order dated 4 February 1999 for Regular Licenses for Transmission & Bulk Supply and Distribution & Retail Supply

1. In pursuance of the Haryana State Electricity Reforms Act 1997, Haryana Vidyut Prasaran Nigam Limited (HVPNL) was incorporated as a government company under the Companies Act 1956 on 19.08.1997. The Government of Haryana holds all of its shares.

2. Government of Haryana issued two provisional licenses on 14.8.1998 under the Reforms Act to the HVPN for Transmission & Bulk Supply and Distribution & Retail Supply of electricity for a period of six months or up to the time the Commission communicates its decision regarding grant of regular license, whichever is earlier.

3. HVPNL applied to HERC for two separate licenses for transmission and distribution of electricity on 20.8.99. The Commission directed HVPN to publish notice of its applications in at least two successive issues of two Hindi and two English newspapers which was published on 2.09.98 and 3.09.98 inviting objections to the grant of licenses to HVPN within a period of three months of publication of notice. A draft Transmission & Bulk Supply license as well as a draft Distribution & Retail Supply license was submitted by HVPN to HERC on 14.10.98. Objections to the draft license were invited through newspaper notices dated 24th and 25 November 1998.

4. Seven organisations filed objections to the terms of the draft licenses to HVPN. Organisations were the Associations of Faridabad and Gurgaon industries and PHD Chamber of Commerce and Industry.

5. Hearings were held on 12th, 15th, 27th, & 28th of January 1999. In the hearings, HVPN and the intervenors made their submissions. The Commission observed that underlying concepts, roles of agents, process of regulation were not well understood by various stakeholders.

6. HVPN expressed its apprehensions regarding the role of Regulatory Commission in relation to various aspects of business. It was reluctant to provide accounting statements and Auditor's reports to any person. The Commission rejected the plea on the ground that the whole process must be transparent. HVPN repeatedly argued that certain conditions may not be made part of the license and may be placed in the guidelines. The Commission observed that the responsibility for providing a safe, economical and reliable electric service rests in the first instance on the licensee and the Commission was responsible for ensuring that the licensee is in a position to carry out its responsibilities.

The Commission insisted that interface metering must be installed for FY2000-01, for which company had enough time. The Commission clarified that phasing out of unjustified tariff differentials is a fundamental part of the regulatory reforms in the state.

7. The intervenors raised main issues regarding subsidisation of certain consumers and cross subsidisation. Industry representatives forcefully argued that no subsidy whatsoever is permissible, unless the state Government undertakes to reimburse the same within a fixed time frame (not exceeding 90 days). The Commission agreed that the same was the ultimate goal of the statute but it cannot be achieved overnight. Therefore, at present, it may be left to the discretion of the Commission.

   Intervenors also objected to cross subsidisation clause. The Commission rejected the plea on the ground that it was unpractical to eliminate cross subsidisation at the present stage.

   After listening to the arguments of all the parties, HERC issued License No.1 of 1999 to HVPN to carry on Transmission and Bulk Supply business and License No.2 of 1999 was issued to HVPN to carry on business of Distribution and Retail Supply in the state of Haryana.

B. HERC order dated 26.11.1999 on HVPNL ARR for Transmission and Bulk Supply Business for 1999-2000

1. To meet statutory requirement of filing ARR for 1999-2000 by 31December 1998, HVPNL submitted a composite application of ARR for its transmission and distribution business on 30 December 1998.

2. On 14 January 1999, the Commission observed that application for ARR was incomplete as it lacked required information and secondly, separate ARRs be filed for its Transmission & Bulk Supply and Distribution & Retail Supply Licenses that it holds. The Commission directed HVPNL to file revised ARRs within ten days. On HVPN's request time period was extended to March 15, 1999. HVPNL filed revised ARRs on March 19, 1999.

3. The Commission appreciated the problems of HVPNL but asked it to provide more information as the information supplied was just not adequate to fulfill its obligations under the Act i.e. to pass any order on ARR. HERC gave 30 days from April28, 1999 to the company to file supplementary information. HVPNL filed supplementary information on May 27,1999 which was still found wanting. The staff of the Commission organised a meeting with HVPNL staff on July 23,1999 to seek certain clarifications on information so far.

   It was noted that the transfer schemes were provisional (to be finalised up to 31 December 1998). Accounting data was provisional; it lacked segregation of accounts by business. Therefore, the whole exercise of ARR was a stopgap arrangement.

4. Though information was not adequate, the possibility of its better availability was dim, the Commission decided to proceed with organising public hearings on the ARR. Though notice of hearings was published in the newspapers on 9.9.1999, there was

little response. The staff of the HERC was allowed to be a party to the proceedings. Public hearing was held on October12, 1999.

5. The Commission observed that better methods for estimation of power supply and demand should be followed. It allowed 9.89 per cent transmission losses against HVPNL's 10.31 per cent for 1999-2000. The Commission expected that all the interface meters should be installed by 31 March 2000.

6. HVPN estimated average cost of supply to be Rs. 1.52 per unit. However, HERC allowed Rs.1.44 per unit for the ARR. The Commission allowed operation and maintenance cost as proposed by HVPNL except for the terminal benefits, which were proposed to be 20%, but the Commission allowed only 8.38 per cent. Depreciation was allowed @6.38 % on straight-line basis. Rate of Return on average capital base asked for by HVPNL was 10 %, the same was allowed. As per Schedule Six, company was entitled to 13% ROR, however, the company elected to adopt 10% ROR to keep tariff within reasonable limits.

7. The major difference between HVPNL and HERC was regarding treatment of terminal benefits, pension and provident fund liabilities. HSEB did not deposit any money in any separate account to pay for terminal benefits. HVPNL wanted a special provision of Rs. 248.17 million for pension fund liabilities. The commission did not allow it. Secondly, the commission viewed that PF liability and unfounded pension liability do not form part of the loans as defined in the sixth schedule. The commission rejected the claim of interest on it. The commission argued that it would not be fair to pass on the burden of provident fund money to the consumers through the revenue requirement.

8. The Commission did not allow any subsidy to transmission business. It allowed HVPNL Rs.2317 crores as ARR for the year 1999-2000 against the proposal of Rs.2488 crores (the actual figure was Rs. 1957.25 crores but it included aggregate subsidy of Rs.531.31 crores).

C. HERC Order on HVPNL's ARR for the Distribution and Retail Supply Business for FY 1999-2000

1. A combined hearing for Transmission & Bulk Business and Distribution & Retail Supply Business was submitted by the HVPNL. Revised application with supplementary information was filed on May 27,1999.

2. HVPNL stated that total system T&D losses were 33.25 percent and non-technical losses were approximately 47% of total losses. The Commission expressed serious concern over T&D losses and suggested that there was no alternative to metering all the supply. HVPNL stated that its first priority was to improve the quality of service and metering will come only next. The Commission expressed concern over lack of plan to install meters. It directed HVPNL that it should submit a plan for installing the meters for un-metered connections within one month of this order.

3. The Commission argued that unless agricultural consumption was metered, it would be difficult to determine the exact amount of subsidy to be paid by the Government of Haryana for agricultural consumption.

4. HVPNL proposed that transmission losses were 10.31 % and distribution losses were 20.69 %. However, Commission allowed 9.89% and 19.86% respectively for the ARR.

5. Emphasis of HERC was on installing meters; reduction in T & D loses. Regarding terminal benefits, PF and pension fund treatment, the commission took a similar view as in the case of transmission and Bulk supply business.

6. The licensee did not submit any tariff application. The commission recommended that the deficit, if any, in the business should be made good by the grant of subvention by the Government of Haryana.

D. HERC Order Dated 29.5.2000 on Review Petition of HVPNL (against 26.11.99 order of HERC) for Transmission & Bulk Supply Business for 1999-2000

HVPNL was the petitioner and Gurgaon Chamber of Commerce and Industry and PHD Chamber of Commerce and Industry were the intervenors.

1. HVPNL filed a review petition on 27.12.1999 seeking a review and reversal of certain findings and observations of HERC order dated 26.11.19999. Under the Act, review application should be filed within 30 days of the order, however, the delay was condoned. Supplementary submission was filed on 3.2.2000.

2. Review requested was in relation to the following issues:
   - § Treatment of retirement benefits (PF and Pension Funds)
   - § Transmission losses
   - § Treatment of shared fixed generation assets
   - § Treatment of stores, cash & bank balance

3. HVPNL proposed Rs.145 millions for terminal benefits. HERC allowed only Rs.60.64 millions. HERC argued that HVPNL calculations of terminal benefits at 20% of basic salary and D.A. were arbitrary. However, for this ARR, the actual amount required by the petitioner was allowed. Commission allowed special appropriation to discharge pension liabilities. Thus, in the review order, terminal benefits were raised to Rs. 641.99 million. However, it included special provision which was asked for in the first ARR of Rs.248.17

   After all the arguments, the Commission allowed revised approval of Rs.23491.31 million, an increase of Rs 33 crores over the previous order.

   As the company did not propose any tariff increase, it was assumed that the revenue requirement would be equal to the revenue realised.

E. HVPNL Application for ARR and Tariff Revision for its Transmission & Bulk Supply and Distribution & Retail Supply Business for FY 2000-01

HVPNL submitted application for its ARR for 2000-01 for T&BS and D&RS business on 31.12.99 to the HERC. The HERC on 4 February 2000 asked for additional information within three weeks. Supplement to ARR was submitted on 25

February 2000. HERC again wrote to HVPNL on 21 June 2000 that it will not be possible to process the ARRs unless the following conditions are satisfied:

1. HVPNL conforms to the directions given in the ARR review order of 29May 2000 for the year 1999-2000.

2. HPVNL must file bulk supply tariff application separately to enable the Commission to determine expected revenue to be earned by the licensee.

HVPNL submitted modified ARRs for its transmission and distribution business and proposed tariff for 2000-01 on 30.6.2000. HERC held three hearings on 27 September, 19 November and 2 October 2000.

Highlights of the Application

HVPNL assumed transmission and distribution losses to be 33% (transmission losses to be 8% and distribution losses to be 25%) in its calculations of revenue requirement. The HERC believed the figures to be inflated and directed the HVPNL to take T&D losses to be 25 % (8.31% for transmission business and 16.69 % for distribution business) in its revenue calculations.

1. In the modified application, HVPNL has taken transmission losses to be 8% and distribution losses to be 16.69%. However, it underlined that the actual losses will be much higher though it has agreed to file ARR as per the directions of the HERC.

2. For Repair and Maintenance (R&M) cost applicable to D&RS business, the actual costs were allowed by the commission for the FY1999-2000. However, for 2000-01, Commission allowed only 3% of the Gross Fixed Assets. The HVPNL in its initial application had assumed R&M cost to be 3.5%.

3. Reasonable return has been taken to be 10% on the net worth of the distribution assets of the distribution companies, namely, Uttar Haryana Bijli Vitran Nigam Limited and Dakshin Haryana Bijli Vitran Nigam Limited.

4. Government of Haryana indicated that it would pay Rs.4226 millions towards subsidy. HVPNL proposed that might be allowed to its distribution companies in such a way that without unbearable losses, the companies could carry on their business and also ensure that same tariff structure remains applicable to the whole State of Haryana. The UHBVN was allocated Rs.3243 millions and the DHBVN has been allocated Rs. 987 millions.

5. Though separate ARRs were filed for both the distribution companies, separate accounts of the companies were not firm and tentative in character.

Analysis of the application brings out that the transmission and distribution companies always have a tendency to exaggerate their revenue requirements. T&D loss figures used in calculations are guesswork. Proposed subsidy by the State government has no relationship with the actual additional cost which the distribution companies will have to bear because of low tariff for agricultural sector supply on the

direction of the State government which it should in fact bear if the company is to run with a commercial outlook

F. An Analysis and Evaluation of the HERC Orders dated 14 December & 22 December 2000 regarding ARR & Tariff for FY 2000-01

As the information supplies by the HVPNL was not adequate the Commission directed the Transmission and Distribution companies to submit additional information three times. Though the quantity and quality of information was not up to the mark to evaluate the technical and financial performance precisely, the process did bring out the gaps in the information that needed to be bridged. The Commission did allow waivers in the supply of information this time and directed the companies to submit all the required information while filing ARRs for the next financial year.

Some of the findings of the Commission are very illuminating:

The exact amount of power received from BBMB power station was not known as the HVPNL (also erstwhile HSEB) did not have metering arrangement at receiving points in Haryana. In the absence of interface meters at the transmission and distribution interface, it is not possible to know the actual level of transmission losses. As supply is mostly unmetered, HVPNL has estimated that free supply to its employees and offices & own works may be 63.55 Million Units (MU), which is not metered. About 80% of agricultural supply is unmetered and is supplied at a flat rate. In such a situation evaluation of technical performance is not possible. The HERC had directed HVPNL in November 1999 that it must install meters at transmission and distribution interface and it promised to do the needful by December 2000. However, it failed to honour its commitment and asked for an extension up to June 2001.The HERC reluctantly agreed and directed the HPVNL to complete interface metering by 31 July 2001 positively or it will attract some punishment. The Commission has directed HVPN and its subsidiaries to replace all defective meters by 31July 2001. Government of Haryana has accepted the Minimum Action Plan and has committed to meter all agricultural pump set connections by the end of 2001.

Metering is the foremost task to ensure transparency in the system's functioning In the absence of metering, estimation of T&D losses to say the least has become a policy decision on the part of management that at times appears to be scandalous. Before reform process was initiated, the general tendency on the part of management was to underestimate T&D losses and to transfer the losses including pilferage of power to the agricultural consumption account which served double purpose: political leadership could project that it is supplying 40-45 per cent of the total supply to the agricultural sector and thereby it was pro-kisan and at the same time it was quite handy for the management to conceal their inefficiency and evade accountability.

As a result of such an active connivance among the vested interests, up to early 1990s, the HSEB used to project that its T&D losses were about 20 %. Then to provide legitimacy to reform process and to discredit the existing institutional set up the management and the political leadership informed the people that T&D losses have increased to about 35% and reforms were inevitable to improve technical performance and to escape from financial bankruptcy. No questions were asked or accountability fixed for the previous mess. While passing orders on ARR for 1999-2000, the HERC

reluctantly allowed 36.56% T&D losses for financial calculations. However, it directed HVPN to reduce them to 24.69 % including distribution losses of 16.69%. During 2000-01 T&D losses did not show any decline. The Commission has estimated that T&D losses in Haryana were 40,76 % out of which 7.76% were transmission losses and 35.77% were the distribution losses. To bring to an end the game of your guess against my guess, statutory metering and monitoring of power is indispensable. Society must act as a watchdogs otherwise the vested interests shall scuttle this plan of action or at least delay it as far as possible.

There are some other startling facts that need to be highlighted. Arrears of receivables (dues) on 148.98 when HSEB was restructured were Rs.758.64 crores and by 31.3.2000, arrears increased to Rs. 986. 50 crores. This shows that the performance of HVPNL for the first 19 months of restructuring in fact deteriorated and added to the unrecovered dues by Rs. 227.87 crores which is an increase of 30 %! What is no less intriguing is that unpaid dues of government offices were Rs. 132.77 crores out of a total of Rs.986.50 crores. Obviously, such a performance in collection indicates deteriorating efficiency in collection of dues that poses a serious threat to the financial viability of the distribution licensee.

HVPNL has estimated that free supply was 63.55 MU out of which 21.79 MU was the supply to its offices and other work places and the rest 41.76MU was supplies free to its employees. The HERC estimated that in case of distribution companies, these concessions amount to 16% of the total Administration & General expenditure and 5.7% of the basic salaries of the employees respectively. Any concession given must be transparent and its implications defendable. A very alarming finding of the Commission appears to be that the load factor of small (LT) industrial consumers is abnormally low which implies that they use electricity on the average 2.06 hours per day. It signals a case for large-scale pilferage of power. The Commission has rightly recommended that meters of all LT industries may be got checked by some independent agency in order to plug leakage of substantial revenue, which appears to be taking place.

The HERC's arguments to enhance tariff for domestic consumers seems to defy any socio-economic rationality. HVPNL had proposed that tariff be raised by 11 paise from 191 paise per unit to 202 paise per unit. However, the Commission has ordered three slab based tariff: for the first 40 units consumption @ 260 paise per unit, for the next 260 units at 360 paise per unit and for consumption above 300 units @ 425paise per unit. The rationale provided by the Commission is that its cost of service study shows that the cost of supply to domestic consumers was 451paise per unit. The Commission has not been fair to the domestic consumers, as while computing cost of service, average T&D losses assumed were 40.76 % out of which transmission losses were 7.76% and distribution system losses were 35.77%. While filing ARR, the Commission had asked the HVPN to make its calculations taking distribution losses to be of the order of 16.69%. This means that genuine domestic consumers have been penalized and asked to pay for the pilferage of the order of 15% to 20%. At the top of it, the HERC has argued that domestic consumers are being still subsidized by 85 paise per unit as the average revenue realization from the new tariff will be 312 paise per unit against the cost of 451 paise per unit. The arguments of the Commission are not fair. The tariff rates for commercial consumers have been kept unchanged at 419

paise per unit. For HT industrial consumers, tariff has been reduced as they get supply at higher voltage for which cost of supply is lower.

For metered supply to agricultural sector, the Commission has accepted the proposal of the licensee to allow a tariff increase of 12 paise per unit whereas for flat rates supply, the Commission has accepted the Government of Haryana's request to reduce the tariff rates due to drought situation in lieu of which the government has agreed to provide an additional subsidy of Rs.413 crores in addition to the already committed subvention of Rs.412 crores. We think it is fair enough so long as it does not adversely affect the finances of the licensee.

The approved ARR for the distribution business for FY 2000-01 was Rs.3730.44 crores and new tariff was estimated to fetch Rs. 2738.11 crores over the full one-year leaving a gap of Rs. 992.33 crores (only three months of FY2000-01 were left when order was implemented). It is estimated that for FY2000-01, gap between allowed ARR and revenue realized through new tariff will be Rs. 1292 crores. After taking in to account the government subsidy for concessional supply to agricultural sector of Rs.613.08 crores and deferred liability of Rs.156.22 crores, the deficit of Rs.432 crores still remains uncovered. Rs. 259.2 crores was allowed as deferred cost for which borrowings are allowed and the licensee has been asked to make up Rs.172.8 crores though efficiency gains. The Commission has allowed the HVPNL to borrow from the market but this will add to the interest liabilities for which genuine consumers will have to pay in future. This expedient option is not justified beyond a point.

Section 5: Lessons from the Regulatory Experience

On the basis of above analysis of the physical and financial performance of the erstwhile Haryana State Electricity Board since its inception in 1967 to 1998 when it was restructured and there after, of the regulatory process in Haryana, following lessons may be drawn:

1. Despite impressive expansion in the physical infrastructure of the electric power system in Haryana, its technical and financial performance was unsatisfactory. The HSEB was run like a state government department and all decisions were dictated by the state bureaucracy on the direction of the political leadership without any transparency and accountability. Obviously, the Board did not have commercial outlook and its performance was poor.

2. Analysis of the ARRs and Tariff applications of the transmission and distribution companies for 1999-2000 and 2000-01 brings out that:

   To improve technical efficiency of the transmission and distribution systems, energy audit is a must, for which all the electricity supply at transmission as well as distribution ends must be metered. This is a precondition to identify system inefficiencies and also, pilferage of power.

   Data management system of the transmission as well as distribution companies is found wanting for proper economic analysis of the financial management of the companies. The HERC had to order repeatedly to provide required information to

evaluate revenue requirement and tariff proposals. Obviously, the companies inherited a data management system from the Haryana State Electricity Board, which did not meet the requirements of proper economic analysis. With the existing database, even average cost of supply at various consumer ends at different voltages cannot be computed. Therefore, tariff rates based on any rational pricing policy could not be worked out. Tariff structure remains ad-hoc and arbitrary.

It has been reported that there is lot of resistance from the consumers who get unmetered supply and the employees to meter the supply. It is obvious as people have developed vested interests in the existing system and metering will make them accountable. This resistance has to be overcome by persuasion, by isolating and exposing the habitual offenders and by social marketing techniques.

3. The management of the transmission as well as distribution companies are yet to change their mindset and develop a professional and commercial outlook.

4. The composition of the Boards of Directors of various Generation, Transmission and Distribution companies shows that they still remain under the effective control of the state bureaucracy, which has commitment to the government and not to the company. Management professionals with technical knowledge should be appointed chief executives and the management must be provided required autonomy. The chief executive must be made accountable for the performance of the company.

5. Haryana does not have any significant private power generating company (IPP) and the present political leadership appears to be reluctant to privatize distribution. In fact, it has created a deadlock with the World Bank, which has withheld the next trench of the committed loan. This can prove to be a blessing in disguise provided the state government ensures that the restructured companies function efficiently ensuring transparency and accountability in their operations. This is not an impossible task. State Governments must learn from efficiently run central public sector enterprises. Now, it is being reported that adequate financial resources are available from the national financial institutions and there is no need to go for tied borrowings. But it must be ensured that borrowings will be used for investment and not for current consumption which political expediency always warrants.

6. We believe that if the restructured generation, transmission and distribution companies are allowed to function efficiently in a transparent manner by the accountable professional management under the overall supervision of the State Regulatory Commission which ensures that government takes full responsibility for payment of subvention for subsidized supply to any consumer class on socio-economic considerations, there will be no need for privatization. If pilferage of power is eliminated, system is run efficiently, the present cost of supply will fall and at the existing tariff rates, the electricity companies will be in a position to generate sufficient surplus to earn the statutory 3% rate of return, which will generate resources to meet the investment requirements of the system. If credibility of the companies is ensured, finances should not be a problem. For this, national consensus should be evolved that management and pricing policy of the electricity companies will be depoliticised and the companies will be allowed to operate with a commercial outlook. Privatisation per se will not solve the problem, especially under existing political and economic environment and social ethics. The danger is that expected

efficiency gains from privatization become victims of scandals and we are left with exploitative monopolies, which will be a worse scenario than even the present one.

7. The Haryana Electricity Regulatory Commission's role and efforts to make functioning of the transmission and distribution companies transparent are laudable. Whether the regulatory commissions are being established because of external pressures or otherwise, their establishment was a historic necessity. However, if the commission consists of competent people and its autonomy is ensured, it can go a long way to ensue efficiency in the functioning of the electric power industry and to protect the interests of various stakeholders. Here the role and commitment of the government becomes a critical factor. No institution like Electricity Regulatory Commission will be in a position to withstand pressures on its own. The success of the commission in bringing about transparency and accountability will not only depend on the legal authority vested in the members of the commission but also on the vigilance and effectiveness of intervention of various social groups. The consumer interest groups will have to act as watchdogs and actively participate in the regulatory process. The new structure is fragile and needs to be nurtured otherwise there is every danger of vested interests taking over which will be worse than cure.

Haryana Electricity Reform: Chronology of Important Events

Event	***Date***
Haryana Electricity Reform Bill passed by Haryana Assembly	22.07.1997
Reform Bill Received the Assent of the President of India	20.02.1998
Gazette Notification of the Haryana Electricity Reform Act	10.03.1998
Haryana Electricity Reforms Act came into Force Haryana Electricity Regulatory Commission (HERC) & Two Corporations (HPGC and HVPNL) were created	14.08.1998
HERC issued two licenses to HVPNL to carry out Transmission and Bulk Supply (License 1 of 1999) and Distribution and Retail Supply (License 2 of 1999)	04.02.1999
By the second transfer scheme, transmission business and distribution were separated HVPNL was retained as transmission company while two distribution companies were created, namely i) Uttar Haryana Bijli Vitran Nigam Limited (UHBVN) ii) Dakshin Haryana Bijli Vitran Nigam (DHBVN)	01.07.1999
HERC issued two separate licenses to HVPN to carry on distribution business on Behalf of the two distribution companies namely UHBVN & DHBVN	21.04.1999
Both distribution companies applied for grant of independent regular license Application of both the distribution companies for grant of independent regular license is pending with Haryana Electricity Regulatory Commission.	20.07.1999.
HERC order on Annual Revenue Requirement for FY1999-2000 of HVPNL for the Transmission and Distribution Business:	26.11.1999
HERC order on Review Petition on ARR for FY 1999-2000	29.5.2000
HVPNL Application regarding ARR for FY 2000-01 for Transmission And Distribution Business	31.12.1999
HVPNL Supplementary application regarding ARR for FY2000-01	25.02.2000
HVPNL modified ARR for FY2000-01	30.06.2000
HERC held public hearings on	27/09; 19/10; & 2 / 11 2000
Order on ARR and Tariff for 2000-01 was issued	14 & 22/12/ 2000

Footnotes (and References)

1. Economic and Statistical Organisation, (2000): Statistical Abstract of Haryana 1998-99, Planning Department, and Government of Haryana.

2. Based on information collected from various Annual Administration Reports of the Haryana State Electricity Board.

3. Ministry of Finance (2001): Economic Survey 2000-01

4. T&D losses data for various years is collected from the Annual Statement of Accounts and Annual Administration Reports for various years published by HSEB.

5. Planning Commission (2000): Annual Report on the Working of State Electricity Boards and Electricity Departments

6. Electricity is supplied to various categories of consumers at different voltages. Higher the voltage of supply, lower will be the cost of supply. HSEB does not calculate cost of supply at various voltages. Here, comparison has been made with the average cost of supply of the whole system.

7. Haryana Government Gazette (Extraordinary), March 10,1998: THE HARYANA ELECTRICITY REFORM ACT, 1997

Analysis in Sections 4 & 5 is based on various documents published by the Haryana Electricity Regulatory Commission given bellow.

§ Order dated 04.02.1999 granting licenses for Transmission & Bulk Supply and Distribution & Retail Supply Business
§ Order dated 21.04.1999 allowing HVPN to carry on business of Distribution & Retail Supply Business
§ Review Petition Order dated 29.05.2000 in respect of ARR filing by HVPN for the Transmission and Bulk Supply
§ Order dated 27.07.2000 passed on application for Fuel Surcharge Adjustment for the Financial Year 2000-2001
§ Order dated 14.12.2000 on Annual Revenue Requirement for Transmission & Bulk Supply
§ Order dated 22.12.2000 on Annual Revenue Requirement for Distribution & Retail Supply Business and Distribution & Retail Supply Tariff
§ HERC CONSULTATION PAPER-II: ISSUES OF TARIFF PHILOSOPHY, 1999
§ Guidelines for Filing of Annual Revenue Reports, 4 December 1998
§ Guideline No.3 Commission Advisory Council
§ Guidelines for load forecast, Resource Plan, and Power Procurement Process, July 12,1999
§ Conduct of Business Regulation
§ Transmission and Distribution License
§ Distribution and Retail Supply License
§ Tariff Regulations
§ Fines and Charges Regulations
§ Code of Practice on The Payment of Electricity Bills and Procedures for Disconnecting Consumers for Non-payment
§ Complaints Handling Procedure Relating to Distribution and Retail Supply

Table 1: Haryana: Plan Expenditure on Energy Sector (Rs. in cores)

S.No.	Particulars	Total Plan Expenditure	Expenditure on Energy	% Energy Expend (4/3)% (percent)
1	2	3	4	5
1.	4th Five Year Plan (1969-74)	358.26	87.53	24.43
2.	5th Five Year Plan (1974-79)	677.34	260.01	38.39
3.	Annual Plan (1979-80)	202.95	56.40	27.79
4.	6th Five Year Plan (1980-85)	15995.47	491.62	30.81
5.	7th Five Year Plan (1985-90)	2510.64	639.03	25.45
6.	Annual Plan (1990-91)	615.02	155.92	25.35
7.	Annul Plan (1991-92)	699.39	182.97	36.16
8.	8th Five Year Plan (1992-97)	4889.89	1197.68	24.49
9.	9th Five Year Plan (1997-2002)	11600.0	3305.00	28.49

(Source: Statistical Abstract of Haryana: Various Issues)

Table 2: Generating Capacity as on 31.03.1998

S.No.	**Name of the Power Station**	**Total installed capacity (MW)**	**Haryana's Share (MW)**
A.	Hydro:		
	i) Bhakra Nangal Complex	1405.30	477.00
	ii) Dear Power House	990	317.00
	iii) Pong Power House	360	60.00
	iv) Central Hydro Project	2002.2	204.30
	Total (A)	4757.50	1058.30
B.	Steam:		
	i) Central Thermal Power Stations	5772.27	408.20
	ii)I.P. Station Ext. at Delhi	187.50	62.50
	Total (B)	5959.77	470.70
C.	HSEB own Projects:		
	WYC Hydel(MW)	48.00	48.00
	Aridabad Thermal	165.00	165.00
	2x55 MW unit I&I 1x55 MW unit III	}	
	Panipat thermal power station	650.00	650
	2x100 MW Stage I 2x110 MW Stage II 1x210 MW Stage III		
	Total (c)	863.00	863
	Grand Total (A+B+C)	11580.27	2392.00

(Source: HSEB: Annual Statement of Accounts 1997-98)

Table 3: HSEB: Salient Features of Power System

(Figures in the bracket are of %)

S.No.	Particulars	1967-68	1980-81	1997-98	Annual Compound Growth Rates		
					1967-68 to 1980-81	1980-81 to 1997-98	1967-68 to 1997-98
1.	Installed Capacity (MW)						
	a) Hydro	368(96.08)	696 (59.34)	1106.3 (46.25)	5.02	2.76	3.74
	b) Thermal	15(03.92)	477 (40.66)	1285.70 (53.75)	30.49	6.00	15.99
	Total	383 (100)	1173(100)	2392 (100)	8.99	4.28	6.29
2.	Actual Generation (MU)						
	a) Hydro	624.05(96.14)	2460(69.18)	3297.06 (46.29)	11.12	1.74	5.71
	b) Thermal	25.01 (03.86)	1096(30.82)	3826.22 (53.71)	33.74	7.63	18.25
	Total	649.60(100)	3556(100)	7123.28 (100)	13.97	4.17	8.31
3.	Connected load (M.W)	446.70	2358	6939.00	13.65	6.55	9.57
4.	Simultaneous Max. Demand (MW)	134	779	2272	14.50	6.49	9.89
5.	Power Available for Sale (MU)	649.64	4184.0	13303.06	15.40	7.04	10.58
6.	Energy Sale (MU)	542.92	3391.0	8864.44	15.13	5.82	9.76
7.	T & D losses (MU) percentage (%)	106.78(16.42)	793.00(18.9)	4438.62(33.36)			
8.	LT and 11 KV Lines (Circuit kms)						
	a) L.T. Lines	9796	66493	105266	14.66	2.59	7.70
	b) 11 KV lines	7089	35939	55059	12.29	2.40	6.62
	c) No. Of transformers	5390	31385	103678	13.41	6.86	9.68
9.	Total No. Of Connections	311914	1093630	3422926	10.13	6.20	7.78

Source: HSEB: Annual Statements of Accounts: Various years.

Table 4: Electricity Consumption in Haryana: Relative Shares & Growth Rates
(In Lakh Units) and (Figures in bracket are of %)

S. No.	Consumer Class	1967-68 Period I	1980-81 Period II	1998-99 Period III	Annual Compound Growth Rates		
					Period I	Period II	Period III
1.	Domestic	358.78 (6.61)	2271.95 (8.89)	20107.16 (22.59)	15.25	12.88	13.87
2.	Commercial	242.87 (4.47)	729.54 (2.85)	3511.19 (3.95)	8.82	9.12	9.00
3.	Industrial	3408.10 (62.70)	12202.01 (47.74)	18770.41(21. 09)	10.31	2.42	5.66
4.	Agricultural	1105.42 (20.36)	9537.7 (37.32)	40396.58(45. 39)	18.03	8.35	12.30
5.	Public lighting	32.27 (0.59)	73.8 (0.29)	300.45 (0.34)	6.57	8.11	7.46
6.	Public Works	34.91 (0.64)	186.04 (0.73)	2385.18 (2.68)	13.74	15.23	14.60
7.	Office/Work shops	39.31 (0.72)	64.61 (0.25)	506.58 (0.57)	3.92	12.12	8.60
8.	Bulk	207.51 (3.82)	491.70 (1.52)	3021.54 (3.40)	6.86	10.61	9.02
9.	Total	5429.17 (100.0)	25557.18 (100.00)	88999.09 (100)	12.66	7.18	9.44

Note: *Figures in Parentheses are relative shares of various consumer classes in electricity consumption in a particular year.*
Sources: Data collected from statistical Abstract of Haryana 1998-99.

Table 5: HSEB: Plant Load Factor

Years	PTPS	FTPS	Haryana State	India
1980-81	32.60	30.00	32.30	41.60
1985-86	44.14	26.05	32.00	52.40
1990-91	-	-	34.50	53.09
1995-96	39.70	55.15	42.50	63.00
1996-97	48.36	44.92	47.70	64.4%
1997-98	50.38	44.41	49.40	64.7%
1998-99 (Up to 14.8.98)	40.27	52.93	48.80	64.6%

Source: *i) HSEB: Annual Statements of Accounts- various issues*
ii) Planning Commission, April, 2000

Table 6: Transmission and Distribution Losses as a Proportion of Energy Available for Sale

Sr.No.	Period	Range in percent
1.	1968-69 To 1971-72	22% to 29%
2.	1972-73 To 1986-87	14% to 19%
3.	1987-88 to 1994-95	24% to 28%
4.	1995-96 to 1997-98	31% to 34%

Sources: *Statistical Abstract of Haryana 1995-96, pp.428-29 & Planning Commission- April 2000. P.66*

Table 7: Financial Performance of HSEB

S. No.	**Particulars**	**1990-91**	**1991-92**	**1992-93**	**1993-94**	**1994-95**	**1995-96**	**1996-97**	**1997-98 (Prov.)**	**1998-99 (RE)**
1.	ROR without subsidy (%)	-15.96	-19.24	-26.1	-31.2	-27.90	-31.80	.38.35	-47.79	-33.27
2.	ROR with subsidy (%)	-12.31	-16.44	-23.8	-27.5	-0.80	2.60	0.41	-2.02	-10.52
3.	Commercial losses without subsidy (in crore Rupees)	-164.76	-275.38	-403.6	-506.9	-468	-554	-625	-725	-532
4.	Commercial losses with subsidy (Rs. Crores)	-128.71	-235.35	-368.4	-446.9	-13	46	7	-32	-168
5.	State Subsidy (Rs. Crore)	36.05	40.03	35.2	60.00	455	599.7	631.6	732.4	364

Source: HSEB: i) Annual Statement of Accounts various years.
ii) Planning Commission: Annual Report on the working of State Electricity Board and ED, April 2000.

Table 8: Consumer Class-Wise Average Revenue and Average Cost of Supply (Paise Per Unit)

S. No	Description	1985-86	1990-91	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98
1.	Domestic	41.10 (57.4)	61.09 (58.91)	67.80 (58.7)	70.11 (52.2)	76.91 (46.6)	100.48 (56.0)	133.46 (63.95)	169.00 (67.63)	203.95 (69.51)
2.	Commercial	62.89 (87.9)	133.05 (128.41)	139.5 (120.8)	149.61 (111.3)	175.05 (106.0)	209.99 (116.97)	253.24 (121.35)	300.45 (121.69)	338.27 (115.29)
3.	Small Power/ Law & Medium	48.96 (68.4)	113.69 (109.7)	129.52 (112.2)	149.85 (111.5)	170.68 (103.4)	207.42 (115.53)	256.58 (122.95)	326.40 (130.62)	381.59 (153.00)
4.	Industrial HT	77.44 (108.2)	142.93 (137.91)	162.32 (140.6)	179.27 (133.4)	206.18 (124.9)	227.89 (126.94)	270.38 (162.68)	317.41 (127.02)	368.09 (125.46)
5.	Public Lighting	63.18 (88.3)	98.21 (94.7)	109.53 (94.9)	105.25 (178.3)	105.27 (63.7)	168.17 (93.67)	191.66 (129.56)	248.87 (99.59)	344.49 (117.41)
6.	Irrigation	19.95 (27.9)	20.51 (19.8)	16.18 (14.0)	21.97 (16.3)	28.98 (17.6)	45.38 (25.28)	51.93 (24.88)	52.41 (20.97)	61.08 (20.82)
7.	Public Work	48.96 (64.4)	102.98 (99.3)	130.39 (112.9)	144.10 (107.2)	164.8 (88.8)	198.04 (110.31)	266.31 (127.61)	310.38 (124.20)	356.90 (121.64)
8.	Average Revenue from sale with state	41.70 (58.3)	66.63 (64.3)	66.13 (57.4)	72.54 (54.0)	83.34 (50.5)	110.81 (61.72)	132.76 (63.62)	155.28 (62.14)	187.36 (63.86)
9.	Average cost of supply	71.57	103.66	115.47	134.40	165.10	179.53	208.69	249.89	293.40

Note: Figure in brackets represents average per unit revenue as a percentage of average unit cost of electricity supply in a particular year.
Source: HSEB Annual Statement of Accounts 1985-86 to 1999-2000.

Table 9: Consumer Class-Wise Surplus/Subsidy *(Rs. in crore)*

S. No.	Particulars	1985-86	1990-91	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98
1.	Domestic	-14.81	-48.46	-61.58	-95.51	-136.67	-114.28	-123.17	-145.13	-162.91
2.	Non-Domestic/Co-mmercial	-0.64	+5.14	+4.91	+3.45	+2.21	+7.32	+11.48	+14.57	+14.20
3.	Small Power Low & Medium Power	-5.59 -1.29	+4.80	+7.029	+8.31	+5.05	+15.38	+26.30	+42.88	+52.00
4.	HT Industrial	+5.29	+49.74	+59.37	+61.77	+49.79	+65.27	+90.54	+93.63	+100.41
5.	Public Lighting	-0.126	-0.128	-0.154	-1.072	-2.91	-0.45	-.68	-0.37	+1.60
6.	Irrigation	-70.54	-225.48	-350.72	-456.77	-538.91	-492.55	-612	-806.53	-892.77
7.	Public Work & Sewerage	N.A.	-30.057	+1.45	+1.17	-0.048	+2.98	+10	+12.01	+13.38
8.	Total Surplus/loss	-82.12	-214.45	-339.70	-478.65	-620.89	-516.33	-597.53	-788.6	-874.5

Source: Computed from data collected from various issues of HSEB: Annual Statement of Account

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