

Power

9.7 Power generation at 499.6 billion kWh in 2000-01 recorded a growth of 3.9 per cent. Power generation in April-December, 2001 at 383.2 billion kWh recorded a growth of 2.8 per cent over the generation during the corresponding period in 2000. Thermal and Nuclear generation grew by 3.5 per cent and 17.1 per cent respectively, while hydro generation decreased by 3.6 per cent (Table 9.2). Owing to heavy transmission and distribution (T&D) losses suffered by State Electricity Boards (SEBs), low user charges and operational and technical efficiencies. The power system in the country is experiencing great difficulty.

9.8 The installed capacity of power generation in the country as on March 31, 2001 was 101,630 MW of which 72 per cent was thermal power generation, 25 per cent was hydro (including wind), and 3 per cent was nuclear. Installed capacity crossed 102,907 MW as on October 31, 2001. The capacity addition in 2000-01 was 3776 MW against a target of 4000 MW. A capacity of 1375 MW has been added against a target of 3053 MW during April-October, 2001. Thermal plants at present account for 80 per cent of the total power generation, hydro electricity plants contribute 16 per cent and the nuclear plants account for the rest.

9.9 The Working Group on Power constituted by Planning Commission to formulate the 10th Five Year Plan has estimated a feasible capacity

addition of 47,000 MW during the 10th plan. This is made up of 24,405 MW in Central Sector, 12,033 MW in the State Sector and 10,501 MW in the Private Sector. The funds requirement for these investments would be of the order of Rs.5,66,000 crore.

9.10 The Plant Load Factor (PLF) is an important indicator of operational efficiency in thermal power plants. The average PLF in the Central Public Sector Undertakings (CPSUs) in the 2000-01 and during April-October, 2001 was appreciably higher than that achieved by the SEBs as a whole. Wide inter-state variations are noticed in the average PLF of thermal power plants. Plants in the southern and western regions have shown better performance. The average PLF for Eastern and Northeastern regions continues to be much lower than the All-India level. If the PLF for North East and Eastern states is excluded the PLF of SEBs is not very different from the central utilities (Table 9.3).

9.11 An Expert Group was set up under the Chairmanship of Shri Montek Singh Ahluwalia then member Planning Commission, to recommend one-time settlement of all power sector past dues to Central Power Sector Utilities (CPSUs) and dues from CPSUs to State Power Utilities. The recommendations of the Expert Group have been accepted with minor modification by High-Level group of Chief Ministers for implementation. (Box 9.3).

9.12 The restoration of the financial health of

TABLE 9.2
Trends in the Power Sector (utilities only)

	1999-00	2000-01*	April-December*		Change over previous year	
			2000	2001	2000-01	2001-02@
	(Billion KWH)		(Per cent)			
1 Power generation**	480.7	499.6	372.7	383.2	3.9	2.8
(i) Hydro-electric	80.6	74.5	59.8	57.6	-7.9	-3.6
(ii) Thermal	386.8	408.1	300.7	311.2	5.5	3.5
(iii) Nuclear	13.3	16.9	12.2	14.3	27.1	17.1
2 Plant load factor of thermal plants (per cent)	67.3	69.0	67.7	68.4	-	-

* Provisional. @ April-December.

** Excludes generation from captive & non-conventional power plants.

SEBs, and improvement in their operational performance continue to remain a critical issue in the power sector. Under Section 59 of the Electricity Supply Act, 1948, SEBs are required to achieve a rate of return (ROR) of not less than 3 per cent on their fixed assets in service, at the beginning of the year, after providing for interest and depreciation charges less consumers contribution. This provision has become operative from the accounting year 1985. Despite this in the following years there has been a continuing deterioration in the financial performance of SEBs. Managerial and financial inefficiencies in State sector utilities have adversely affected capacity addition and systems improvement. While the SEBs do not have enough resources to finance future programs, they are also unable to raise investible funds from alternative sources due to their poor financial and commercial performance. Also, the inability of SEBs to pay their dues, in full, to Central Power Utilities adversely affects the finances and investment plans of these CPSUs.

9.13 Financial health of SEBs has been deteriorating over the years. In 1999-2000 only 7 SEBs had a positive ROR. The number of SEBs with a positive ROR of more than 3 per cent (without subsidy) has also fallen, in 1999-2000 only 2 SEBs (MSEB & TNEB) had a positive ROR of more than 3 per cent (without

subsidy). In order to improve the profitability and financial viability of SEBs we need to tackle the key issues such as curbing of T&D losses, tariff rationalization, reducing gap between cost of supply and revenue/ unit of electricity generated. All this will make electricity revenue generating, and it will then be possible to generate investment etc.

9.14 The SEBs, have continued to suffer from high T&D losses which were at 24.8 per cent in 1997-98, have increased to 25.6 per cent in 1998-99 (provisional). The T&D losses are due to a variety of reasons, viz., substantial energy sold at low voltage, sparsely distributed loads over large rural areas, inadequate investment in distribution system, improper billing, and high pilferage. The hidden gross subsidy for agriculture and domestic sectors has increased from Rs. 7,449 crore in 1991-92 to Rs. 34,428 crore in 2000-01 and is projected to go up further to Rs. 38,836 crore in 2002-03 (Table 9.4)

9.15 In 2000-01, the Government has initiated a new Plan Scheme namely the Accelerated Power Development Program (APDP) to provide financial assistance to the States for undertaking Renovation & Modernization Programs of Thermal and Hydro power stations and also for strengthening and improvement of Sub-transmission and Distribution network. Under this scheme, a focused investment program has been initiated in 63 identified distribution circles

TABLE 9.3
Thermal Plant Load Factor

	(Per cent)						
	1996-97	1997-98	1998-99	1999-00	2000-01*	April-December*	
						2001-02 Target	2001-02 Actual
I State Electricity Boards	60.3	60.9	60.7	64.3	64.3	66.4	65.1
II Central Sector	71.0	70.4	71.1	72.5	72.2	70.5	72.7
III Private Sector	71.2	71.2	68.3	68.9	76.4	73.1	77.2
IV Region							
Northern	64.7	66.7	67.2	71.0	72.0	72.8	73.9
Western	70.2	70.3	70.5	72.3	72.1	73.1	72.1
Southern	75.8	77.1	75.4	79.6	79.7	79.8	79.9
Eastern	42.2	43.0	44.3	46.1	47.0	46.5	48.0
North Eastern	27.1	21.3	18.7	18.3	18.2	23.2	17.0
All India	64.4	64.7	64.6	67.3	67.7	68.2	68.9
* Provisional							

BOX 9.3

Scheme for one-time settlement of SEB dues

A Conference of Chief Ministers/Power Ministers was held in March 2001 under the chairmanship of the Prime Minister. The Conference noted that the large amount of dues owed by the State Electricity Boards to the Central Power Sector undertakings (CPSUs) was a major impediment to power sector reforms and resolved that an Expert Group would be set up to recommend a one time settlement of power sector past dues to the CPSUs and the dues of the CPSUs to State Power Utilities. The Expert Group was set up under the Chairmanship of Shri Montek Singh Ahluwalia, then Member (Energy), Planning Commission. The Group submitted its report in May 2001. The Group proposed a scheme of settlement of outstanding dues linked to a mechanism that would ensure payment of current dues in the future. The recommendations of the Group, inter alia, included securitisation of the outstanding dues through bonds issued by the respective State Governments. These bonds would be tax-free bonds and would have a tenure of 15 years. The Group also proposed a 50 per cent waiver of the surcharge on outstanding surcharge as an incentive for the States to take up the scheme of securitisation. In addition, during the first 4 years from the commencement of the scheme, bi-annual cash incentives would be paid by the CPSUs equal to 2 per cent of the value of bonds. This would be linked to the States complying with the provisions of the scheme and reforms to be undertaken by the concerned State Government. The Empowered Group of Chief Ministers in its meeting held on July 6, 2001 accepted the recommendations of the Expert Group with minor modifications. These modifications included increase in waiver of surcharge from 50 to 60 per cent and incentives for a period of 4 years @ 4 per cent of the face value of the bonds for achievement of performance and milestones by the SEBs shall be increased from 6 per cent in the first year and 5 per cent in the second year. States have been requested to implement the scheme at the earliest by giving their consent for tripartite agreement. So far Andhra Pradesh and Jammu & Kashmir have conveyed their consent.

that would be developed as Centre of Excellence in the first phase of the APDP program. An amount of Rs.978 crore was provided to SEBs/ED during 2000-01. An amount of Rs.1,500 crore has been budgeted for release to States during 2001-02 under APDP, and proposals are under consideration for the sanction of funds.

9.16 The Government of India realized the need for a focused approach to address the issues afflicting states with special reference to their circumstances. The State Governments are thus being encouraged to sign Memoranda of Understanding (MOU) with the Government of India. So far 19 States (Karnataka, Uttar Pradesh, Madhya Pradesh, Gujarat, Haryana, Andhra Pradesh, Maharashtra, Rajasthan, Assam, Punjab, Uttaranchal, Himachal Pradesh, Jharkhand, West Bengal, Orissa, Chhattisgarh, Bihar, Kerala and Goa) have signed MOUs with the Government of India. The MOUs are broadly joint commitments of the State Government and the Government of India to undertake reforms in a time bound manner.

9.17 During 1999-00, All-India energy and peaking shortages were 6.2 per cent and 12.4 per cent respectively while in 2000-01 these were 7.8 per cent and 13 per cent respectively. Measures to promote conservation of energy have been taken both on the supply side and demand side. Keeping this in view the Government has enacted the Energy Conservation Act, 2001.

9.18 As nearly 75 per cent of the installed generating capacity is in the thermal sector, a number of steps have been taken to increase generation, improve the reliability, efficiency and safety as also reduce pollution in these plants. Special schemes have been devised to refurbish old plants to improve their performance. The ongoing 2nd phase of this program covers 44 old thermal power plants. This scheme envisages an additional generation 7,864 MU per annum from renovated units. Also, plants which are on the verge of retirement are being taken up for extension of their lives by induction of latest technology. The programme could not progress as planned mainly due to non-availability of

TABLE 9.4
Financial Performance of the State Power Sector

(Rs. Crore)				
	1991-92	2000-01*	2001-02 (RE)	2002-03 (AP)
A. Gross Subsidy involved				
(i) On account of sale of Electricity to:				
(a) Agriculture	5,938	24,074	25,571	26,959
(b) Domestic	1,310	9,968	10,894	11,651
(c) Inter-State Sales	201	386	247	226
Total	7,449	34,428	36,713	38,836
(ii) Subventions Received from State Govts.	2,045	8,820	10,099	7,981
(iii) Net Subsidy	5,404	25,607	26,613	30,855
(iv) Surplus Generated by sale to other sectors	2,173	3,435	3,615	7,499
(v) Uncovered Subsidy	3,231	22,172	22,999	23,356
B. Commercial Losses@				
(i) Commercial Losses (excluding subsidy)	4,117	25,395	27,306	24,321
(ii) Commercial Losses (including subsidy)	N.A	16,575	17,207	16,340
C. Revenue Mobilisation				
(i) Rate of Return (ROR) #	(-) 12.7	(-) 41.8	(-) 39.5	(-) 32.1
(ii) Additional Revenue Mobilisation from achieving				
(a) 3 per cent ROR	4,959	27,217	29,404	26,226
(b) from introducing 50 paise/ unit from Agriculture/Irrigation	2,176	1,638	1,350	1,330
RE: Revised Estimates. AP: Annual Plan Projection. # In per cent. *Provisional.				
@ Commercial losses are different from uncovered subsidy because they include financial results of other activities undertaken by the SEBs.				
Note: (i) The information relating to the subsidy for Agriculture, Domestic and Inter-State Sales for the years 2000-01, 2001-02 and 2002-03 in respect of Orissa is not available, as the distribution is entrusted to the Private Companies. The information regarding commercial losses pertains to GRIDCO only.				
(ii) Information in case of Andhra Pradesh, Haryana, Rajasthan, Uttar Pradesh and Karnataka states is relating to transmission and distribution companies set up after the reforms. In case of other states, the information pertains to SEBs.				
(iii) The estimates do not include information relating to Uttaranchal as these have not been furnished by the State.				

timely loan assistance and the weak financial condition of the SEBs/Utilities. During the 8th Plan i.e. up to March, 1997 about 50 per cent of the works could be completed on all India basis with an additional generation of 5,000 MU/year and of 300 MW capacity was achieved.

9.19 During the 9th Plan, 150 thermal units with an aggregate capacity of 2,168 MW are covered under R&M and 28 thermal units (1910 MW) have been planned for LE works at 41 power stations. EL works on 16 units (1080 MW) have been completed and works on 12 units (850 MW derated) are under progress.

9.20 There is tremendous scope for energy conservation through efficiency in various sectors of the economy. Energy conservation

efficiency provides the least cost and environmental friendly option for capacity creation in the shortest time frame. Energy efficiency assumes further importance as one unit of energy saved at consumption avoids 3 units of fresh capacity addition. Keeping this in view, Government has enacted the Energy Conservation Act, 2001 which would provide an institutional mechanism and help in developing the much needed delivery mechanism for large-scale penetration of energy efficiency in the country. The Act aims at establishment of the Bureau of Energy Efficiency, which would inter-alia coordinate with energy users and endeavor to utilize resources and infrastructure by networking with other agencies.

BOX 9.4

Status of Power Sector Reforms in India

Creation of Electricity Regulatory Commissions

The Central Electricity Regulatory Commission formed under the provisions of Electricity Regulatory Commissions Act, 1998 has been made fully functional. The Commission has passed orders on Availability Based Tariff and has also brought out terms and conditions for determination of tariff. Eighteen states including, Orissa, Haryana, Andhra Pradesh, Uttar Pradesh, Karnataka, West Bengal, Tamil Nadu, Punjab, Delhi, Gujarat, Madhya Pradesh, Arunachal Pradesh, Maharashtra, Rajasthan, Himachal Pradesh, Assam and Chhattisgarh have either constituted or notified the constitution of SERC. SERCs of Orissa, Andhra Pradesh, Uttar Pradesh, Maharashtra, Gujarat, Haryana, Karnataka, Rajasthan, Delhi and MP have issued tariff orders.

State Reforms Acts

Orissa, Haryana, Andhra Pradesh, Uttar Pradesh, Karnataka, Rajasthan, Madhya Pradesh and Delhi have enacted their State Electricity Reforms Acts which provide, inter-alia, for unbundling/corporatisation of SEBs, setting up of SERCs, etc. The SEBs of Orissa, Haryana, Andhra Pradesh, Karnataka, Uttar Pradesh and Rajasthan have been unbundled/corporatised.

9.21 Government is implementing the Energy Conservation Award Scheme since 1990 to motivate industrial units in the following sectors viz, aluminum, cement, ceramics, chemicals, chlor alkali, edible oil/ vanaspati, fertilizers, integrated steel plants, pulp & paper, petrochemicals, refineries, textiles, mini steel, sugar & glass which consume a major portion of commercial energy used in the industrial sector of the country. The Award scheme has helped motivated the units to undertake serious efforts in saving energy and environment.

9.22 The Government of India accords high priority to exploit the balance hydroelectric potential as per the Policy announced in 1998-99. Various steps have been taken thereafter on the measures envisaged in the policy to provide incentives to hydro power projects e.g. tariff for hydro projects has been rationalized, procedures for transfer of techno-economic clearance have been simplified, the ceiling limits for techno-economic clearance by CEA of hydro projects on MOU has been enhanced and notified, a mechanism to cover geological risks has been evolved and small hydro projects upto 25 MW capacity has been transferred to the Ministry of non-conventional energy sources (MNES). With a view to reducing the time and cost over-run of hydro projects, Government has introduced a three-stage process for development of new Hydro Electricity Projects (HEPs) in the Central

Sector. The Ministry of Environment and Forests (MOEF) has also simplified the procedure for according site clearance in two stages. A special Accelerated Power Development Program has been launched for renovation, modernization and upgrading activities of hydro stations. CERC has allowed a surcharge at the rate of 5 per cent to NHPC for the purpose of addition of capacity.

9.23 In the year 2001-02 upto December 31, 2001 Central Electricity Authority (CEA) has accorded Techno Economic Clearance (TEC) to a capacity of 3,727 MW in the Central Sector, 70 MW in the Private Sector, and 357 MW in the State Sector. 3,075 Kms circuits of transmission system projects have also been given TEC by CEA. Since the entry of private sector in power generation, Central Electricity Authority (CEA) has accorded TEC to private sector power projects having a capacity around 29,615 MW. Out of these, during the current financial year, one project aggregating to a capacity of 70 MW has been accorded TEC up to November 2001. 30 private sector power generation projects (some of which do not require TEC of CEA) with a total capacity of about 6,300 MW have been commissioned. During the current financial year 2001-02, a capacity of around 750 MW has been commissioned from 4 projects. 16 projects (including some which do not require TEC of CEA) with a total capacity of around 5,300 MW are under construction.

9.24 Fifty-five hydro schemes with an aggregate capacity of 9,653 MW were identified for renovation, modernization and uprating works at an estimated cost of Rs.1,493 crore to give a benefit of 2,531 MW/7,181 MUs. Out of these 55 schemes, RM&U work on 27 hydro schemes with an aggregate installed capacity of 6,511 MW have been completed and expected benefits to be accrued are 1498 MW/3586 MUs respectively. A National Perspective Plan has been formulated to cover 80 hydro R&M schemes having an aggregate installed capacity of 12,328 MW for execution under Phase II programme. The total capital requirement during 9th, 10th and 11th Plan for RM&U and LE of hydro power stations is Rs.4,660 crore, which could accrue a benefit of 7,751 MW. There are 38 ongoing schemes, which are under different stages of implementation.

9.25 A draft Captive Power Policy had been prepared which broadly outlines the guidelines for approval, conditions for usage of captive power, wheeling charges, pricing of power sold to grid and billing methods etc.

9.26 The Government has set an objective of providing 'Power for All by 2012' and has

launched a "Mission 2012 – Power for All" in this direction. A comprehensive Blueprint for Power Sector Development has been prepared outlining the problems and suggesting integrated solution and strategies for achieving the objective of Power for All.

9.27 The primary resources for electrical power generation being unevenly disposed in the country, bulk transmission of electrical power over long distance becomes necessary for supplying the loads. The country's power system has been organized into 5 Regional Grids, each of which is well integrated, and now with a view to deriving further economies, and increasing reliability, strong interconnections between the Regional grids are planned thus creating a strong National grid. It is anticipated that this would be accomplished in a phased manner and by the end of the 11th Five Year Plan (2011-12) a strong National grid will exist in the country.

9.28 The Electricity Bill 2001 has been introduced in Parliament in August 2001. The Bill seeks to replace the three existing Acts, viz., the Indian Electricity Act, 1910, the Electricity (Supply) Act, 1948 and the Electricity Regulatory Commissions Act, 1998 (Box 9.5).

BOX 9.5
The Electricity Bill 2001

- The Central Government to prepare a National Electricity Policy in consultation with State Governments.
- A Thrust to complete rural electrification and provide for management of rural distribution by Panchayats, Cooperative Societies, non-Government organizations, franchisees etc.
- Generation to be delicensed and captive generation to be freely permitted. Hydro projects would, however, need approval of the state governments and clearance from the Central Electricity Authority.
- Transmission Utility at the Central as well as State level, to be a Government company – with responsibility for planned and coordinated development of transmission network. Provision for private transmission licensees.
- Open access in transmission from the outset with provision for surcharge for taking care of current level of cross subsidy with the surcharge being gradually phased out.
- Distribution licensees would be free to undertake generation and generating companies would be free to take up distribution licensees.
- The State Electricity Regulatory Commission is a mandatory requirement.
- Provision for license free generation and distribution in the rural areas.
- The SERCs may permit open access in distribution in phased with surcharge for current level of cross subsidy to be gradually phased out along with cross subsidies and obligation to supply.
- Provision for payment of subsidy through budget.
- For rural and remote areas stand alone systems for generation and distribution would be permitted.
- Trading as a distinct activity is being recognized with the safeguard of the Regulatory Commissions being authorized to fix ceilings on trading margins, if necessary.
- The State Governments have flexibility to unbundle the SEBs or continue with them as distribution licensees and State Transmission Utility.
- The Bill does not prescribe any model reform, instead provides flexibility to the State Government to choose the model suiting to their conditions.
- Metering of all electricity supplied made mandatory.
- An Appellate Tribunal to hear appeals against the decision of CERC and SERCs.
- Provisions relating to theft of electricity made more stringent.