

## Power

9.7 Power generation at 480.7 billion kWh in 1999-2000 recorded a growth of 7.2 per cent. The total generation of power in April-December, 2000 at 373 billion kWh recorded a growth of 4.7 per cent over the generation during the corresponding period in 1999. Thermal and Nuclear generation grew by 6.3 per cent and 27.1 per cent respectively while hydro generation decreased by 5.4 per cent (Table 9.2). Owing to heavy transmission and distribution (T&D) losses suffered by State Electricity Boards (SEBs), low user charges and other operational and technical inefficiencies, full benefits are not being derived from existing capacities.

9.8 The installed capacity of power generation in the country as on March 31, 2000 was 97,846 MW of which 72 per cent was accounted for by thermal power generation and 24 per cent by hydro generation, 3 per cent by nuclear and 1 per cent by wind. The installed capacity has crossed 1,00,136 MW as on December 31, 2000. The capacity addition in 1999-2000 was 4507 MW against a target of 4685 MW. A capacity of 2,175 MW has been added against a target of 2,225 MW during April-October, 2000. Thermal plants at present account for 80 per cent of the total power generation, hydro-electricity plants contribute 18 per cent and the nuclear plants account for the rest.

9.9 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 1999-2000 and during April-December, 2000 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 southern and western ones having better performance. In the recent years, the PLF of western region has also improved. The average PLF for Eastern and North-Eastern 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 the SEBs is not very different from the central utilities. (Table 9.3)

9.10 Restoration of the financial health of SEBs and improvement in their operation 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.

9.11 There is a continuing deterioration in the financial performance of SEBs. In 1993-96, there were 14 SEBs, out of 17 SEBs (including OrissaSEB) which had a positive ROR (including subsidy), in 1998-99, 10 SEBs out of 16 SEBs (excluding OrissaSEB) had a positive ROR (including subsidy). Further, only 3 SEBs (MSEB, TNEB and UPSEB) had a ROR of more than 3 per cent in 1998-99 (with subsidy). 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

**TABLE 9.2**  
**Trends in the Power Sector (utilities only)**

	1998-99	1999-00*	April - December*		Change over previous year	
			1999	2000	1999-00	2000-01@
			<i>(Billion Kwh)</i>		<i>(per cent)</i>	
1. Power generation	448.6	480.7	355.7	372.6	7.2	4.7
(i) Hydro-electric	82.8	80.6	63.2	59.8	-2.7	-5.4
(ii) Thermal	353.9	386.8	282.9	300.6	9.3	6.3
(iii) Nuclear	11.9	13.3	9.6	12.2	11.3	27.1
2. Plant load factor of thermal plants (per cent)	64.6	67.3	65.8	66.7	-	-
* Provisional.		@ April-December				
Note : These figures exclude captive power generation.						

**TABLE 9.3**  
**Thermal Plant Load Factor**

(Per cent.)

	1995-96	1996-97	1997-98	1998-99	1999-00*	April-December*		
						1999-00 Actual	2000-01 Target	2000-01 Actual
<b>I State Electricity Boards</b>	58.1	60.3	60.9	60.7	63.7	62.9	63.5	64.3
<b>II Central Sector</b>	71.0	71.0	70.4	71.1	73.6	70.2	66.0	72.2
<b>III Private Sector</b>	72.3	71.2	71.2	68.3	68.9	71.4	67.2	76.3
<b>IV Region</b>								
Northern	62.1	64.7	66.7	67.2	71.0	70.1	69.1	71.9
Western	68.1	70.2	70.3	70.5	72.3	70.6	70.4	72.3
Southern	74.7	75.8	77.1	75.4	79.6	77.4	76.4	79.6
Eastern	42.7	42.2	43.0	44.3	45.9	44.6	42.2	47.0
North Eastern	28.6	27.1	21.3	18.7	17.9	18.2	23.4	18.9
<b>All India</b>	<b>63.0</b>	<b>64.4</b>	<b>64.7</b>	<b>64.6</b>	<b>67.3</b>	<b>65.8</b>	<b>64.8</b>	<b>67.7</b>

\* Provisional

performance. Also, the inability of SEBs to pay their dues, in full, to Central Power Utilities adversely affect the finances and investment plants of these CPSUs.

9.12 The SEBs, have continued to suffer from high T&D losses which stood at 25 per cent in 1997-98, have increased to 26 per cent in 1998-99. 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 systems, improper billing and high pilferage.

9.13 The net subsidy after accounting for amounts received from State Governments, was Rs.5,404 crore in 1991-92 which has gone up to Rs.22,876 crore in 1999-2000. The hidden subsidy for agriculture and domestic sectors has increased from Rs.7,449 crore in 1991-92 (accounting for 1.1 per cent of GDP) to Rs.3,814

crore in 1999-2000 (accounting for 1.7 per cent of GDP). It is projected to go up further to Rs.41,238. crore in 2001-2002. (Table 9.4) The gross subsidy of the State power sectors as a per centage of gross fiscal deficit of state Governments was about 36 per cent in 1999-2000.

9.14 The Ministry of Power has signed a Memorandum of Agreement (MOA) with each of the State of Karnataka, Uttar Pradesh, Madhya Pradesh, to chart out the programs and agreements for power sector reforms in these three States. These MOAs envisage unbundling of transmission and distribution and privatization of distribution in a time bound manner, 100 per cent electrification of villages, energy audit at all levels, full support to the regulatory commission etc. In reciprocation, the Government of India has committed to provide

### BOX 9.3

#### Reforms and Restructuring

- Reforms and restructuring in the power sector of the country has become irreversible. The States of Orissa, Harayana, Andhra Pradesh, Uttar Pradesh, Karnataka, Delhi and Rajasthan have enacted their Electricity Reforms Acts. Madhya Pradesh Legislative Assembly has passed Electricity Reforms Bill. Gujarat has also drafted Reforms Bill.
- The SERCs of Orissa, Andhra Pradesh, Uttar Pradesh, Maharashtra, Rajasthan, Haryana and Gujarat have issued tariff orders.
- With effect from September 11, 2000 sub-section (2) of Section 43 A of the Electricity (Supply) Act, 1948 stands omitted in respect of the States of Andhra Pradesh, Karnataka, Uttar Pradesh, West Bengal, Madhya Pradesh and Delhi and thus effectively transferring the tariff fixation powers to the SERCs. This clause has earlier been deleted in respect of Orissa and Haryana.
- CERC has finalized the Indian Electricity Grid Code.
- Electricity Bill has been prepared. The draft bill has yet to be introduced in the Parliament.

**TABLE 9.4**  
**Financial Performance of the State Power Sector**

(Rs. Crore)				
	1991-92	1999-00*	2000-01 (RE)	2001-02 (AP)
<b>A. Gross Subsidy involved</b>				
(i) On account of sale of Electricity to:				
(a) Agriculture	5938	24178	26301	29461
(b) Domestic	1310	9174	9528	11267
(c) Inter-State Sales	201	462	489	510
<b>Total</b>	<b>7449</b>	<b>33814</b>	<b>36319</b>	<b>41238</b>
(ii) Subventions Received from State Govts.	2045	10938	7492	8370
(iii) Net Subsidy	5404	22876	28827	32868
(iv) Surplus Generated by sale to other sectors	2173	4242	5130	5526
(v) Uncovered Subsidy	3231	18634	23697	27342
<b>B. Commercial Losses @</b>	<b>4117</b>	<b>24920</b>	<b>24237</b>	<b>28445</b>
<b>C. Revenue Mobilisation</b>				
(i) Rate of Return (ROR) #	(-) 12.7	(-) 41.2	(-) 37.9	(-)38.2
(ii) Additional Revenue Mobilisation for achieving				
(a) 3 per cent ROR	4959	26595	25984	30280
(b) From introducing 50 paise/unit from Agriculture/Irrigation	2176	2430	1972	1840
<p><b>RE : Revised Estimates.      AP : Annual Plan Projections.      # In per cent.      *Provisional</b></p> <p><b>@ Commercial losses are different from uncovered subsidy because they include financial results of other activities undertaken by the SEBs.</b></p> <p><b>Note: (i) The information relating to the subsidy for Agriculture, Domestic and Inter-State Sales for the years 1999-2000, 2000-01 and 2001-02 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.</b></p> <p><b>(ii) Information in case of Andhra Pradesh, Haryana, Rajasthan, Utter Pradesh and Karnataka states is related to transmission and distribution companies set up after the reforms. In case of other states, the information pertains to SEBs.</b></p>				

technical and financial support, *inter-alia*, for reduction in T&D losses, strengthening and improving the transmission network, rural electrification program, structural adjustment, new generating capacity and allocation of additional power to these states from central generating stations.

9.15 During 1998-99 All-India energy and peaking shortages were 5.9 per cent and 13.9 per cent respectively while in 1999-2000 these were 6.2 per cent and 12.4 per cent respectively. Measures to promote conservation of energy have been taken both on the supply side and demand side. Energy Conservation Bill, 2000, which envisages for providing for efficient use of energy and its conservation was introduced in the Lok Sabha in the Budget Session of Parliament in 2000.

9.16 Since about 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 renovate/modernize, refurbish old plants to improve their performance. The on-going IInd phase of this programme covers 44 old power plants. This scheme envisages an additional generation of 7,864 MU per annum from renovated units. Also plants that are on the verge of retirement are being taken up for extension of their lives by induction of latest technology.

9.17 There is tremendous scope for energy conservation in agriculture and industrial sector. There is energy saving potential in pumping systems— industrial pumps, agricultural pumps, water supply pumps, sewage treatment pumps and vacuum pumps. The schemes for energy savings in pumping systems are capital intensive. Efforts are being made to create an awareness about energy conservation potential by better house keeping, proper maintenance, and better controls of instruments & adaptation of latest technologies. Efforts are also being made to popularize use of energy efficient

lighting devices like Compact Fluorescent Lamps (CLFs), electronic ballasts, etc.

9.18 During 1998-99, Government of India announced a policy on Hydro-Power Development with a view to exploiting the vast hydropower potential available in the country at a faster rate. Various steps have been taken during subsequent years 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 Central Electricity Authority (CEA) for hydro power projects on MOU route has been enhanced and notified, a mechanism to cover geological risks has been evolved and small hydro projects upto 25 MW capacity have been transferred to the Ministry of Non-Conventional Energy Sources. As against the existing hydel capacity of 2,644 MW under the Central Sector, Government has sanctioned 6 hydroelectric projects with a capacity of 1,265 MW for commissioning during the 10th Five-Year plan.

9.19 Government of India has formulated the revised mega power policy. The main objective of the revised mega power policy is setting up of mega power projects to generate power at the lowest possible tariff by utilizing economies of scale and setting up of such plants at pitheads, in the hydel or coastal areas so that it can act as catalyst for the reforms in the beneficiary States.

9.20 Since the entry of private sector in power generation, Central Electricity Authority (CEA) has accorded Techno-Economic Clearance (TEC) to 57 private sector power projects amounting to around 29,375 MW. Out of these, during the current financial year, one project aggregating to a capacity of 330 MW has been accorded TEC up to November, 2000. 24 private sector power generation projects (some of which do not require TEC of CEA) with a total capacity of about 5,200 MW have been commissioned. During the financial year 2000-01, 2 projects for 378 MW capacity have been commissioned. 18 projects (including some which do not require TEC of CEA) with a total capacity of around 5,400 MW are under construction.