CHAPTER 11

POWER

11.01 Energy otherwise known as power is one of the prime movers of any developed economy. Adequate and reliable availability of power is indispensable for sustained growth of the economy. The primary objectives in this sector are optimum utilisation of the power generated, substantial reduction of transmission and distribution losses, maximising generation from the existing capacity and further addition of units to generate more power for meeting the increasing demand for power over the coming years. Besides, optimum utilisation of existing capacity and generation from new units will undoubtedly enable the State to sell power outside the State and thereby earn substantial revenue.

11.02 The State of Orissa has the distinction of being the first State in the country for ushering in sweeping reforms in the power sector. The paramount objective of the reforms in power sector is to provide consumers with reasonably cheap, reliable and assured supply of power. In order to achieve this, the Orissa Electricity Reforms Act, 1995 was enacted and came into effect on 1st April, 1996. With the enactment of Orissa Electricity Reforms Act, 1995, the erstwhile Orissa State Electricity Board (OSEB) which was a monolithic organisation looking after generation, transmission and distribution of power was restructured and the function of OSEB were entrusted to two new Corporations namely (I) GRID Corporation of Orissa (GRIDCO) and (ii) Orissa Hydro Power Corporation (OHPC) on 1st April, 1996. The existing transmission and distribution system was entrusted to GRIDCO and all hydro power stations including projects under construction were transferred to OHPC. The Orissa Power Generation Corporation (OPGC), which was incorporated in 1984, is looking after the thermal power projects in the State.

The objectives of restructuring process are :

- To relieve Government from the burden of providing financial support to the power sector.
- To encourage private sector participation and
- To introduce efficiency and cost effectiveness in the sector.

11.03 The Orissa Electricity Reform Act, 1995 came in to force with effect from 1st April 1996. In order to achieve the desired objective of the reforms, under the Orissa Electricity Reforms Act, the Orissa Electricity Regulatory Commission (OERC) was established in April 1996. It has been entrusted with the responsibility of promoting efficiency and economy as well as protecting the interest of consumers. The Regulatory Commission determines the rates at which electricity shall be sold within the State. Public hearings are undertaken while determining power tariff.

11.04 As a part of ongoing reform process, Government of Orissa have disinvested 49% of its share in OPGC and realised Rs.603.00 crore through such dis-investment. The distribution business has been handed over to privately managed companies with effect from 1.4.1999 in respect of WESCO, NESCO, SOUTHCO and from 1.9.1999 in respect of CESCO. In order to review the impact of the Power Sector Reform and suggest midcourse correction, the state Government had constituted a committee of Independent experts headed by Sri S. Kanungo in May, 2001. The committee have already submitted their recommendations to the Government and the Government, after accepting the same have issued necessary notification accordingly.

11.05 The estimated demand for power in the State is on an average 1,500 MW and the average peak system demand is 2,000 MW. The demand for power during the Tenth Plan period will increase substantially. Therefore, it is proposed to meet this additional requirement through a series of measures which include creation of additional generating capacity, demand side management, reduction of transmission and distribution losses and renovation and modernisation of old units. A number of projects are in the pipeline to meet

the enhanced requirement of power. Those are Ib valley T.P.S. units 3,4,5 & 6 and Duburi T.P.S. The expected power generation from these projects will be 1,420 MW.

11.06 By the end of 2003-04, the State's share in the total installed capacity from the hydro power projects in the State sector was 1918.88 MW from which power generation was 684.21 MW. Similarly, the total installed capacity of the existing thermal power projects fully owned by the State was 880.00 MW with power generation of 584.84 MW. Thus the State's share in the total installed capacity in the State sector was 2798.88 MW which generated 1269.05 MW of power during 2003-04. In addition, Orissa's share of the installed capacity in the Central sector projects was 690.46 MW. These projects generated 481.34 MW of power for the State during 2003-04. Thus, the total installed capacity available for the State was 3489.34 MW, which generated 1750.39 MW of power for the State. During 2003-04, the State also purchased about 75.77 MW of power from captive power plants installed in the State by different industries such as NALCO, ICCL, RSP, INDAL and NINL (Duburi) with installed capacity of 1,326.00 MW.

Table 11.1
Year-wise Installed Capacity and Availability of Power in Orissa from all Sources from 1999-00 to 2003-04

(in MW)

Sl. No	Year	Installed capacity *	Availability of power from all sources **	Percentage of (4) to (3)
1	2	3	4	5
1	1999-00	4540.25	1271.00	27.99
2	2000-01	4540.25	1415.00	31.17
3	2001-02	4621.00	1423.18	30.80
4	2002-03	4695.34	1371.42	29.21
5	2003-04	4815.34	1826.16	41.59

** Inclusive of installed capacity of State Sector Projects, CPPs and State share from Central Sector Projects. This excludes CPPs of different industries from which State is not purchasing any power.*

*** Availability of power from State sector projects, share from Central sector projects and purchase from different CPPs.*

11.07 Table 11.2 shows the installed capacity and power generation of different power projects in Orissa during the year 2003-04.

Table 11.2

Installed Capacity and Power Generation of different Power Projects in Orissa during 2003-04

(In MW)

Sl. No.	Power Projects	Installed capacity	State's share in installed capacity (%)	State's share in installed capacity	State's share in power generation
1	2	3	4	5	6
A.	**STATE SECTOR**				
a)	**Hydro Power Projects.**				
i)	Hirakud Power System – I & II	331.50	100.00	331.50	102.87
ii)	Balimela H.E. Project	360.00	100.00	360.00	128.01
iii)	Rengali H.E. Project	250.00	100.00	250.00	117.47
iv)	Upper Kolab H.E. Project	320.00	100.00	320.00	72.70
v)	Upper Indrabati H.E. Project	600.00	100.00	600.00	240.85
vi)	Machhakunda H.E. Project	114.75	50.00	57.38	22.31
	Total (a)	**1976.25**		**1918.88**	**684.21**
b)	**Thermal Power Projects**				
i)	Ib (I & II)	420.00	100.00	420.00	305.60
ii)	Talcher Thermal Power Station, Stage – I & II	460.00	100.00	460.00	279.24
	Total (b)	**880.00**		**880.00**	**584.84**
	Total A (a + b)	**2856.25**		**2798.88**	**1269.05**
B.	**CENTRAL SECTOR**				
i)	Farakka, STPS	1600.00	14.69	235.04	145.78
ii)	Kahalgaon STPS	840.00	9.40	78.96	69.31
iii)	Talcher STPS	1000.00	31.80	318.00	236.57
iv)	Chhuka Hydro power project	336.00	17.40	58.46	29.68
v)	Regional Pool	-	-	-	-
	Total B	**3776.00**		**690.46**	**481.34**
	Total (A + B)	**6632.25**		**3489.34**	**1750.39**

Source : GRIDCO, Bhubaneswar.
OHPC, Bhubaneswar

11.08 Table 11.3 indicates the installed capacity of captive power plants owned by industrial units and located in Orissa, which supplied power to GRIDCO. Some other industries like FACOR, ISPAT ALLOYS, NALCO, (Damanjodi) PPL, FCI, OPM etc. have their own captive power plants but they do not supply power to GRIDCO.

Table 11.3

Major Industries having Captive Power Plants and Power supplied to GRIDCO in Orissa

(in MW)

Sl No.	Captive Power Plant	Installed capacity	Power supplied to GRIDCO		
			2001-02	2002-03	2003-04
1	2	3	4	5	6
1.	NALCO, Angul	840.00	39.70	46.79	57.01
2.	ICCL, Choudwar	108.00	12.96	11.41	10.45
3.	RSP, Rourkela	248.00	1.07	1.05	3.39
4.	INDAL, Hirakud	67.50	1.15	0.90	0.19
5.	NINL , Duburi	62.50	-	1.82	4.73
	Total	1326.00	54.88	61.97	75.77

Source : GRIDCO, Bhubaneswar

11.09 The demand for power in the State has been growing up steadily due to increasing industrialisation, urbanisation and rural electrification. The estimated demand for power has increased from 1,270 MW during 1999-00 to 1,500 MW during 2003-04, registering an increase of 18.11 % over the period. Table 11.4 shows the demand and availability of power from different sources in Orissa from 1999-00 to 2003-04.

Table 11.4

Year-wise Demand and Availability of Power in Orissa over the Period from 1999-00 to 2003-04

(In MW)

Sl. No	Year	Demand (estimated)	Availability of power from different sources			
			State sector	Central sector	Purchase from captive plants of the State	Total
1	2	3	4	5	6	7
1	1999-00	1270	1095	102	74	1271
2	2000-01	1376	1100	273	42	1415
3	2001-02	1334	1271	98	54	1423
4	2002-03	1367	869	440	62	1371
5	2003-04	1500	1269	481	76	1826

Source : GRIDCO, Bhubaneswar

11.10 During the year 2003-04, the State sector projects and Central sector projects together have made available about 1,750 MW of power to the State. In order to meet effectively the increasing demand in future, further capacity addition would be necessary.

Accordingly, capacity upgradation for generation of additional power has been planned which involves completion of the ongoing projects as well as implementation of new projects. Such projects are lb valley T.P.S. units 3,4,5 & 6 (920 MW), Duburi T.P.S. (500 MW), Upper Indravati Hydro Electric Project (600 MW), Balimela HEP units 7 & 8 (150 MW), Potteru Small HEP (6 MW), renovation and modernisation of Burla Power Station and Chiplima Power Station etc.

11.11 Table 11.5 presents year-wise expenditure in the power sector in Orissa since 1999-00. Substantial increase in investment over the years reflects the priority accorded to the power sector by the Government. During the year 2003-04, the expenditure for Energy was about Rs.572.3 crore which is about 21.0% of the total State plan expenditure.

Table 11.5

Year-wise Investment on Power and Renewable Energy in Orissa

(Rs. in crore)

Sl. No.	Year	Expenditure on power and Renewable energy	Total State Plan expenditure / Outlay	Col.(3) as percentage of Col.(4)
1	2	3	4	5
1	1999-00	256.4	2484.0	10.3
2	2000-01	361.2	2562.1	14.1
3	2001-02	347.7	2417.3	14.4
4	2002-03	323.0	2474.1	13.1
5	2003-04(AE)	572.3	2714.5	21.0

AE : Anticipated Expenditure
P.O : Proposed Outlay
Source : Annual Plan , 2003 - 04

11.12 Power consumption in the State has gone up from 5,603 MU during the year 1999-00 to 7,208 MU during 2003-04. This is mainly due to increase in consumption of power by the industry sector and domestic sector. The energy consumption in the domestic sector has increased by 2.05 % over the previous year while consumption in the industrial sector has increased by 10.06 % during the same period. The total energy consumption of the industrial sector during 2002-03 was 2,971 MU which increased to 3270 MU during 2003-04 excluding power consumption by industries like NALCO, RSP, HPCL, ICCL etc. as these industries are using the power generated from their own captive power plants. The consumption of power by different sectors from 1999-00 to 2003-04 with percentage to total consumption has been presented in Table 11.6.

Table 11.6

Year-wise Power Consumption by different Sectors in Orissa
From 1999-00 to 2003-04

(In MU)

Sl. No.	Year	Total consump-tion (in MU)	Consumption for different purposes								
			Dome-stic	Comm-ercial	Indus-trial	Public lighting	Irrigation and agrl.	Rail ways	Public water works	Bulk supply	Others
1	2	3	4	5	6	7	8	9	10	11	12
1	1999-00	5603 (100.00)	2039 (36.39)	406 (7.25)	2284 (40.76)	41 (0.74)	217 (3.87)	176 (3.14)	103 (1.84)	22 (0.39)	315 (5.62)
2	2000-01	6090 (100.00)	2173 (35.68)	548 (9.00)	2622 (43.06)	41 (0.67)	186 (3.05)	201 (3.30)	117 (1.92)	89 (1.46)	113 (1.86)
3	2001-02	5769 (100.00)	2258 (39.14)	607 (10.52)	2184 (37.86)	38 (0.66)	162 (2.81)	213 (3.69)	120 (2.08)	87 (1.51)	100 (1.73)
4	2002-03	6745 (100.00)	2441 (36.19)	468 (6.94)	2971 (44.05)	37 (0.55)	139 (2.06)	263 (3.90)	117 (1.73)	49 (0.73)	260 (3.85)
5	2003-04	7208 (100.00)	2491 (34.56)	488 (6.77)	3270 (45.37)	39 (0.54)	133 (1.84)	302 (4.19)	120 (1.66)	55 (0.76)	311 (4.31)

N. B : Figure in bracket indicates percentage to total consumption

Source : CESCO, Bhubaneswar, SOUTHCO, Berhampur,
NESCO, Balasore and WESCO, Sambalpur.

ORISSA POWER GENERATION CORPORATION (OPGC)

11.13 Orissa Power Generation Corporation Limited (OPGCL) was incorporated on November,1984 under the Companies Act, 1956 with the main objective of establishing, operating and maintaining large thermal power generating stations independently and / or in the joint sector. During January 1999, 49% of it's stake was divested in favour of a strategic investor, namely AES Corporation, USA as a part of reform in the energy sector taken up by the Government of Orissa.

11.14 As its maiden venture, the company has setup two thermal power plant of 210 MW each in IB vally area of Jharsuguda district with a project cost of Rs.1135.0 crore. It has also under taken the construction of seven mini Hydel stations having a total capacity of 5,075 KW as a technological demonstration. The share capital of OPGC is Rs.490.22 crore, out of which the share of Government of Orissa is 51% with 25,00,109 shares amounting to

Rs.250.01 crore. The other two share holders are AES India Pvt. ltd and AES OPGC Holding (incorporate in Mauritius) whose percentage of share and no. of share are 16.25% with 7,96,178 shares and 32.75% with 16,05,887 shares respectively . The turn over and net profit of OPGC during 2003-04 was Rs.422.0 crore and Rs.149.25 crore respectively. It has been proposed to expand two more units of ITPS of 250 MW each. The feasibility / commercial viability of expansion projects are being examined. OPGC has received various awards including Meritorious Productivity Award for the year 1999-00.

ORISSA HYDRO POWER CORPORATION (OHPC)

11.15 Orissa Hydro Power Corporation (OHPC) was incorporated under Companies Act in April 1995 and started its commercial operation from 1st April' 1996. Under the Electricity Reform Act, Government of Orissa have transferred all the existing and ongoing hydro power projects to OHPC for operation and maintenance. At the time of transfer of assets in April' 96, the installed capacity of different hydro power projects under OHPC was 1,272 MW which increased to 1,919 MW by the end of March, 2004 with average annual generation capacity of 6,000 MU and peak capability of 1,700 MW. The Corporation has taken up the execution and completion of two ongoing projects viz. Upper Indravati Hydel Project (4x150MW) and Potteru Small Hydro Electricity Project (2x3MW). Besides, OHPC has also undertaken the renovation and modernisation of old Hydro Power Station at Hirakud and Chiplima and expansion of Balimela Power Station by two more units of 75 MW each. An amount of Rs.550.08 crore is proposed to be provided during the Tenth Plan 2002-07 for the purpose out of which Rs.100.37 crore has been provided in the Annual Plan 2004-05. Besides, four hydro projects i.e. Lower Kolab project on river Sabari, Tikarpada project on river Mahanadi, Naraj project on river Mahanadi and Ballijori project on river Baitarani aggregating to 1,188 MW capacity in the State of Orissa have been included under 50,000 MW Hydro Power Initiative launched by Hon'ble Prime Minister of India. The cumulative profit of the Corporation up to 2003-04 was Rs.185.68 crore. During 2003-04, the corporation earned a profit of Rs.5.70 crore while it made a loss of Rs.41.92 crore during 2002-03.

GRID CORPORATION OF ORISSA (GRIDCO)

11.16 With the reform introduced in energy sector, GRIDCO has been vested with this transmission and bulk supply business as per the license granted by OERC with effect from April,1996. GRIDCO purchases power from various sources like OHPC/OPGC/ NTPC and CPPs in the State. During 2003-04, the purchase of power was to the extent of

15,997.18 MU. GRIDCO also receives States' share from Central Sector Power stations of Farakka, Kahalgaon, Kaniha and Chukha of NTPC through EREB system. For upgrading the existing system with an aim to provide quality power, GRIDCO has commissioned 5 lines aggregating 91.763 Kms and one auto transformer at Bidanasi during 2003-04 by availing finance from other than World Bank. Besides, six lines aggregating 51.00 Kms and four substations with 2 X 20 MVA capacity each have also been commissioned during 2003-04 with World Bank finance.

11.17 GRIDCO was also involved in trading of surplus power in ABT regime which was implemented in the Eastern region w.e.f. 1st April,2003. The main objective of ABT is to encourage Central Sector Generating Stations to maximize their availability of energy. This is based on unscheduled inter charge, where-in the tariff is fixed on the prevailing frequency. Though the agreement executed by GRIDCO with PTC has expired, still it is trading through PTC on the basis of old agreement to trade its surplus power in NR/SR/WR. ER/WR/NR are remaining in synchronous with one frequency.

LOAN TO GRIDCO / DISTCOs FOR UPGRADATION OF TRANSMISSION AND DISTRIBUTION SYSTEM AND PROCUREMENT OF METERS (EAP)

11.18 World Bank had sanctioned US $ 350 million for up gradation of transmission and distribution system and for replacement of defective energy meters under Orissa Power Sector Reform and Restructuring Project. Subsequently, this amount has been scaled down to US $ 290 million. Out of sanctioned amount US $ 90.71 million is meant for up gradation of the transmission system and US $ 114.00 million is meant for up gradation of the distribution system. The amount would be distributed over a period of seven years from 1996-97 to 2002-03. A sum of Rs.747.42 crore has been spent by different DISTCOs by 2002. World Bank has extended the closing date of loan up to June, 2004. It is proposed to provide Rs.89.72 crore during 2004-05 for distribution among GRIDCO and DISTCOs. During the Tenth Five Year Plan (2002–07), it has been proposed to avail Rs.855.97 crore for EAP schemes from World Bank.

11.19 The existing transmission system in Orissa comprising 400 KV lines, 220 KV lines and 132 KV lines is overloaded and over-stretched. A number of new lines and sub-stations are planned to be constructed and upgraded under this scheme.

The important schemes are as under :

i. Evacuation line linking Theruvalli and Bhanjanagar to Upper Indravati Hydro Electric Project.

ii. A 400 KV DC line from the Ib Thermal Station to Meramundali for evacuation of power from the additional units of OPGC.

iii. A 400 KV DC line from the Super Thermal Power Station, Kaniha to Meramundali.

iv. 220 KV Double Circuit Line from Duburi to Paradeep.

v. 220 KV Double Circuit line connecting Theruvali-Chhatrapur- Bhubaneswar.

11.20 Till 31.03.2000, 5.22 lakh meters were reported defective and 3.49 lakh were reported as un-metered consumers. It is therefore, an urgent need to replace defective meters as well as providing meters to the consumers who are still without meters. Out of 21.04 lakh consumers, 17.07 lakh consumers have been provided with corrective/new meters by end of 2003. It is proposed to continue this work during 2004-05.

SHARE CAPITAL INVESTMENT IN GRIDCO (EAP)

11.21 The Department For International Development (DFID) of the British Government has sanctioned 65 million pounds for consultancy support and repair and maintenance work under the Orissa Power Sector Reform and Restructuring Project. Out of the total amount, a sum of 34.69 million pounds is meant for consultancy support which is paid directly by DFID to the consultants, namely Price Water House.

DISTRIBUTION COMPANIES

11.22 The entire distribution of power purchased by GRIDCO has been transferred to four distribution companies namely (i) Central Electricity Supply Company of Orissa Ltd. (CESCO), (ii) North–Eastern Electricity Supply Company of Orissa Ltd. (NESCO), (iii) Western Electricity Supply Company of Orissa Ltd. (WESCO) and (iv) Southern Electricity Supply Company of Orissa Ltd. (SOUTHCO). Out of the above four distribution companies, M/S BSES Ltd. took over operational control of three distribution companies (WESCO,

NESCO & SOUTHCO) from 1st April 1999 while M/S AES Ltd. took over the fourth distribution company CESCO from 1st September, 1999. An IAS officer has been appointed as Chief Executive Officer in August'2001 for smooth management of CESCO. The performance of WESCO, NESCO and SOUTHCO is being monitored both by the Department and OERC.

PRIVATE SECTOR POWER PROJECTS

11.23 Government have accorded very high priority to private sector investment for power generation. Accordingly it has been planned to add additional generating capacity by supporting two thermal power projects in the private sector: (I) AES Ib Valley Corporation Units V & VI (500 MW) and (ii) Kalinga Power Corporation Ltd. (KPCL) Units I & II at Duburi (500 MW). Two mega projects, one by Consolidated Electric Power Asia (CEPA) at Hirma (4320 MW) and another by NTPC at Talcher (2000 MW) are also on the anvil.

RURAL ELECTRIFICATION

Village Electrification

11.24 Government of India have set a target for electrification of all the villages of the country by March, 2007. To achieve this objective, Rural Electrification has been given a boost by including it as one of the components of Prime Minister's Gramodaya Yojana (PMGY) from the year 2001 – 02. Under this Yojana, Government of India provides financial assistance to the State in the form of Additional Central Assistance. A State Level Monitoring Committee has been constituted by the Govt. of Orissa under the Chairmanship of Development Commissioner as per the guidelines issued by Ministry of Power, Govt. of India to formulate broad policy guidelines regarding the manner in which the rural electrification work shall be carried out and to monitor its execution. Besides, District Level Committees have been constituted with Collectors as Chairman to identify the villages to be electrified and to tackle the field level issues relating to rural electrification. The Engineer in Chief (Electricity), Orissa has been declared as Nodal Officer to monitor and review the rural electrification works.

11.25 The State have 46,989 inhabited villages out of which 38,258 villages were electrified by the end of 2003-04, representing a coverage of 81.42%. About 8,731 villages were to be electrified both through conventional and non-conventional sources. As per the

reports of the private distribution companies 208 villages have been electrified during 2003-04 as against 271 villages electrified in 2002-03. Government of Orissa is committed to electrify all the villages in the State by March, 2007 as per the MOU signed with Govt. of India in June, 2001 and has undertaken a massive programme of Rural electrification during the current year. The thrust of the programme has been to cover the villages through LT-Less line, LW-Less transformers at optimum locations to eliminate theft of power by hooking. An amount of Rs.373.09 crore has been provided in the Tenth Five Year Plan (2002-07) towards R.E. subsidy to electrify the left out villages. The rural electrification works are being taken up by the four distribution companies in the State i.e. CESCO, NESCO, WESCO and SOUTHCO with provision of subsidy made by the State Government.

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