

CHAPTER 11

POWER

11.01 Energy is a prime mover of the economy. There is a positive correlation between consumption of energy and the degree of economic growth. Since energy is an essential input of all productive economic activities, the process of economic development inevitably demands increasing levels of energy consumption. Hence the primary objective of Government is to achieve self-sufficiency in the energy sector on a sustainable basis.

11.02 Orissa was the first State in the country towards introduction of sweeping reforms in the power sector. The main objective of the reforms in power sector was to provide consumers with reliable and assured supply of power at affordable rates. In order to achieve this, the Orissa Electricity Reforms Act, 1995 was effective from 1st April, 1996. With the enactment of the Act, the erstwhile Orissa State Electricity Board (OSEB) which was a monolithic organisation looking after generation, transmission and distribution of power was restructured and the functions 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 systems were entrusted to GRIDCO and all hydro power stations including projects under

construction were transferred to OHPC. Further, in consonance with the Electricity Act, 2003 enacted by Govt. of India, the transmission and trading of powers are required to be handled by separate organizations. Accordingly the State Govt. have entrusted the trading work to the existing GRIDCO and have set up the Orissa Power Transmission Corporation Ltd. (OPTCL) effective from 9th June, 2005 to undertake transmission of power. The Orissa Power Generation Corporation (OPGC), which was incorporated in 1984, is looking after the thermal power projects in the State.

11.03 The objectives of restructuring process are;

- ☞ *To supply quality and cheap power to the consumers.*
- ☞ *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.*

11.04 In order to achieve the prime objectives of the reform initiatives, 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 consumer. The Commission

also determines the power tariff on public hearing.

11.05 Government of Orissa as a part of the ongoing reform have disinvested 49% of its share in OPGC and realized Rs.603.00 crore through such dis-investment. The distribution business has been handed over to privately managed companies named WESCO, NESCO, SOUTHCO with effect from 1.4.1999 and CESCO from 1.9.1999.

11.06 Keeping pace with growth in major sectors, the demand for power is also increasing over the years. The estimated average demand for power in the State is 1,500 MW and average peak system demand is 2,000 MW. Since a good number of steel and aluminium plants are likely to be established in the State and State Government are committed to electrify all the villages by the end of 2010, the demand for power is likely to surge up substantially. Keeping this in view, the State Government have already taken up a series of measures for creation of additional generating capacity, demand side management, reduction of Transmission & Distribution(T&D) losses and modernization / renovation of old units. Among online projects, construction of two power houses & installation of 3MW generating units in each power house in Potteru Small Hydro Electric Project, extension of 7th & 8th units of Balimela Extension Power Project, renovation /

modernization of units-III to VI of Burla Power Station etc. have already been taken up and substantial power would be available after completion of these projects.

11.07 (i) The State's share in the total installed capacity of the State sector power projects was 2,816.48 MW and that of generated power was 1,275.21 MW during 2005-06 as against 1,458.93 MW in 2004-05 showing a decline of about 12.6%. Out of 1,275.21 MW power generated (State share) in 2005-06, 598.01 MW was from Hydro Power Projects and the balance 677.20 MW from Thermal Power Projects, while the power generation under Hydro Power Projects declined by 26.09% over the production in 2004-05, power generation in thermal power projects has been increased by 4.21% over 2004-05. (ii) Besides, State's share in installed capacity of Central Sector projects was 705.00 MW. As against this, the Central Sector projects generated 524.64 MW of power for the State during 2005-06. Thus, during 2005-06, against the total installed capacity of 3,521.48 MW, the State's share in power generation was 1,799.85 MW reflecting a decline of 8.0% over 2004-05. In addition, State has also purchased 62.60 MW from different captive power plants installed in the State by different industries viz NALCO, ICCL, RSP, INDAL, NINL and NBFA (Meramundali) during 2005-06 against 69.02 MW purchased in 2004-05 (Table 11.3).

11.08 The installed capacity of power from all sources & its availability in different years has been indicated in Table-11.1 and Fig 11.1. Similarly, the installed capacity of different power projects in Orissa and State's share from the power generation during 2003-04 to 2005-06 has been presented in Table-11.2.

Table 11.1
Installed Capacity & Availability of Power from all Sources from 2001-02 to 2005-06.
(in MW)

Year	Installed capacity *	Availability of power from all sources	Percentage
2001-02	4621.00	1423.18	30.80
2002-03	4695.34	1371.42	29.21
2003-04	4815.34	1826.16	37.92
2004-05	4845.34	2025.45	41.80
2005-06	5060.48	1862.35	36.80

* Includes installed capacity of State sector projects share from Central Sector projects and CPPs from which the State purchased power.

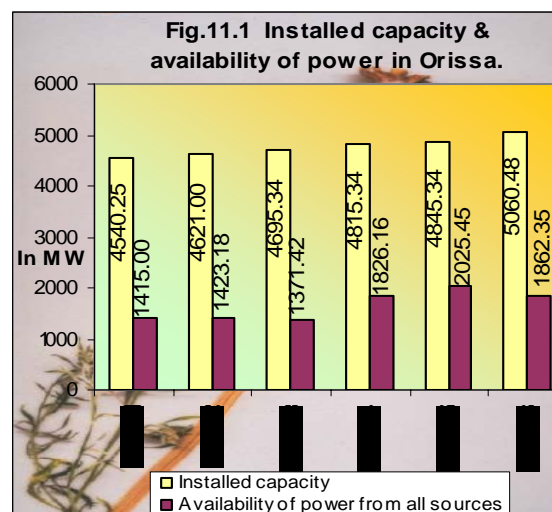


Table 11.2
Installed Capacity & Power Generation of different Power Projects in Orissa during 2003-04 to 2005-06.
(In MW)

Sl. No.	Power Projects	Installed capacity	State's share in installed capacity (%)	State's share in installed capacity	State's share in power generation		
					2003-04	2004-05	2005-06
A. STATE SECTOR							
a) Hydro Power Projects.							
i)	Hirakud Power System – I & II	349.10	100.00	349.10	102.87	91.73	98.35
ii)	Balimela H.E. Project	360.00	100.00	360.00	128.01	170.45	116.89
iii)	Rengali H.E. Project	250.00	100.00	250.00	117.47	83.48	76.11
iv)	Upper Kolab H.E. Project	320.00	100.00	320.00	72.70	98.94	69.78
v)	Upper Indrabati H.E. Project	600.00	100.00	600.00	240.85	322.65	199.91
vi)	Machhakunda H.E. Project	114.75	50.00	57.38	22.31	41.86	36.97
	Total (a)	1993.85		1936.48	684.21	809.11	598.01
b) Thermal Power Projects							
i)	Ib (I & II)	420.00	100.00	420.00	305.60	323.37	316.49
ii)	Talcher Thermal Power Station, Stage – I & II	460.00	100.00	460.00	279.24	326.45	360.71
	Total (b)	880.00		880.00	584.84	649.82	677.2
	Total A (a + b)	2873.85		2816.48	1269.05	1458.93	1275.21
B. CENTRAL SECTOR							
i)	Farakka, STPS (West Bengal)	1600.00	13.63	218.00	145.78	155.22	176.35
ii)	Kahalgaoon STPS (Bihar)	840.00	15.24	128.00	69.31	66.73	85.45
iii)	Talcher STPS I & II (Orissa)	3000.00	31.80	318.00	236.57	247.84	238.10
iv)	Chhuka Hydro power project (Bhutan)	270.00	15.19	41.00	29.68	27.71	24.74
	Total B	5710.00		705.00	481.34	497.50	524.64
	Total (A + B)	8583.85		3521.48	1750.39	1956.43	1799.85

Source: OPTCL, Bhubaneswar.

11.09 Installed capacity of different captive power plants owned by industrial units and located in Orissa, which supplied power to GRIDCO has been presented in Table 11.3. Some other plants/factories such as 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)

Captive Power Plant	Installed capacity	Power supplied to GRIDCO				
		2001-02	2002-03	2003-04	2004-05	2005-06
NALCO, Angul	960.0	39.7	46.8	57.0	46.1	36.8
ICCL, Choudwar	108.0	13.0	11.4	10.5	7.6	3.8
RSP, Rourkela	248.0	1.1	1.1	3.4	8.3	2.9
INDAL, Hirakud	167.5	1.2	0.9	0.2	0.01	6.9
NINL, Duburi	38.5	-	1.8	4.7	2.7	8.1
NBFA, Meramundali	30.0	-	-	-	4.3	4.0
Total	1552.0	54.9	62.0	75.8	69.0	62.5

Source: GRIDCO / OPTCL, Bhubaneswar

11.10 The demand for power in the State shows an increasing trend over the years. In 2001-02 the demand for power was about 1334 MW which has been increased to 1649 MW by the end of 2005-06 showing an increase of about 23.6%. Against these demand, 1423 MW of power was available in the State in 2001-02, which was increased to 1862 MW in 2005-06, showing an increase of about 30.9% over the period. During 2005-06, 62.5 MW of power was purchased from different captive power plants while 243 MW

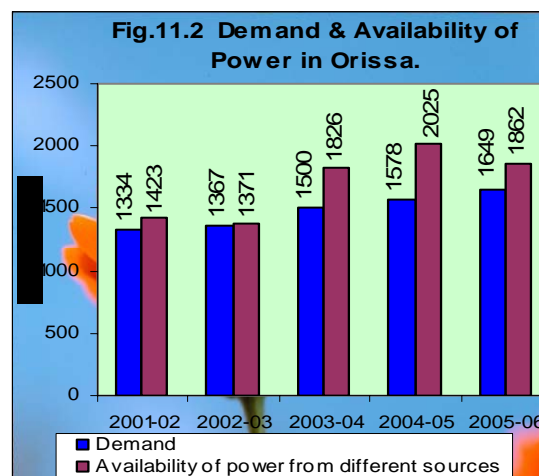
of power was sold to other States / Union territories. Table 11.4 and Fig. 11.2 shows the demand and availability of power in the State since 2001-02.

Table 11.4
Year-wise Demand & Availability of Power in Orissa.

(In MW)

Year	Demand (estimated)	Availability of power from different sources				Sold to other States / U.T.
		State sector	Central sector	Purchase from captive plants of the State	Total	
2001-02	1334	1271	98	54	1423	-
2002-03	1367	869	440	62	1371	-
2003-04	1500	1269	481	76	1826	-
2004-05	1578	1459	498	69	2025	517
2005-06	1649	1275	525	62	1862	243

Source: GRIDCO, Bhubaneswar.



11.11 During 2005-06, about 1800MW of power was available from the State sector as well as Central sector projects. In order to meet the increasing demand of power due to the establishment of large no. of industries, steps has to be taken effectively in advance. Accordingly, capacity up-gradation 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 Ib valley Thermal Power Station (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.

11.12 Year-wise expenditure since 2001-02 in the power sector in Orissa is presented in Table 11.5. Substantial increase in investment over the years reflects the priority accorded to the power sector by the Government. During the year 2004-05, Rs.269.87 crore has been spent for power and Renewable energy sector, which comprises 10.8% of the total State plan expenditure. During 2005-06, the anticipated expenditure was about Rs.796.32 crore.

Table 11.5

Year-wise Investment on Power and Renewable Energy in Orissa.

(Rs. in crore)

Year	Expenditure on power and Renewable energy	Total State Plan expenditure / Outlay	Col.(2) as percentage of Col.(3)
1	2	3	4
2001-02	347.70	2417.30	14.4
2002-03	323.32	2474.10	13.1
2003-04(P)	429.62	2436.60	17.6
2004-05(P)	269.87	2500.00	10.8
2005-06(AE)	796.32	3013.68	26.4

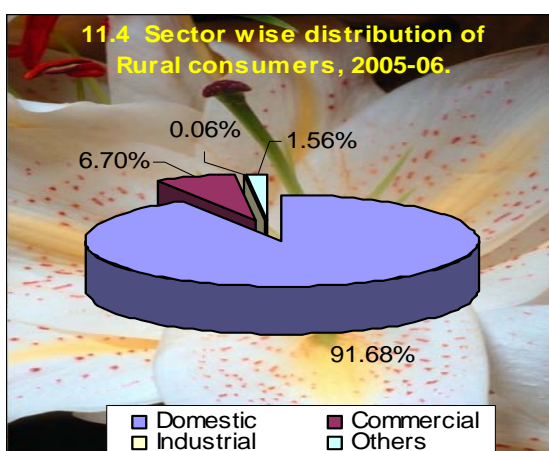
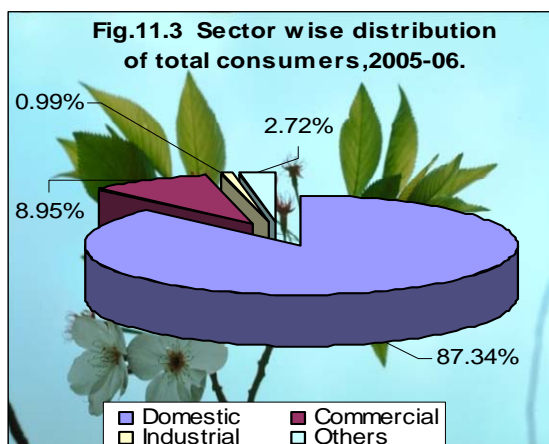
AE : Anticipated Expenditure
P: Provisional

11.13 During 2005-06, there were about 23.23 lakh power consumers in the State of which 20.29 lakh (87.34%) were domestic consumers and 2.08 lakh (8.95%) were commercial consumers. Besides, out of total consumers, 38.83% consumers were under CESCO only. Further, it is also revealed that out of total 23.23 lakh consumers, 15.38 lakh (66.21%) were from rural Orissa, of which 91.68% were domestic consumers. Sector wise distribution of consumers is given in Table 11.6, Fig.11.3 and Fig.11.4.

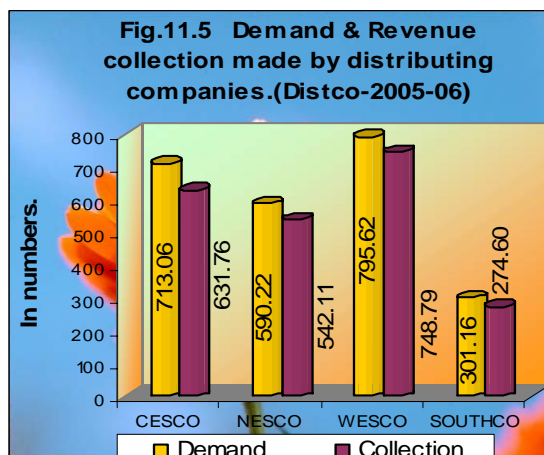
Table - 11.6
Sector wise distribution of consumer, 2005-06.

Sector	Consumers (in lakh nos.)						% of rural consumers to total consumers
	CESCO	NESCO	WESCO	SOUTHCO	Total	Rural consumers	
Domestic	7.84 (85.96)	4.37 (88.46)	3.89 (85.87)	4.19 (88.39)	20.29 (87.34)	14.10 (91.68)	69.49
Commercial	0.85 (9.32)	0.39 (7.89)	0.43 (9.49)	0.41 (8.64)	2.08 (8.95)	1.03 (6.69)	49.52
Industrial	0.09 (0.98)	0.05 (1.06)	0.06 (1.32)	0.04 (0.84)	0.24 (1.04)	0.01 (0.07)	4.17
Others	0.24 (2.63)	0.13 (2.64)	0.15 (3.32)	0.10 (2.11)	0.62 (2.67)	0.24 (1.56)	38.71
Total	9.02 (100.00)	4.94 (100.00)	4.53 (100.00)	4.74 (100.00)	23.23 (100.00)	15.38 (100.00)	66.21 (100.00)

Source: All the distributing Companies.



11.14 During the year 2005-06, the demand for collection of revenue from the consumers by the distributing companies (Fig.11.5) was stood at Rs.2400.06 crore, of which Rs.2197.26 crore (91.55%) have been collected during the year.



11.15 During the year 2004-05, the consumption of power in the State was 7598 MU, which has increased to 8144 MU by the end of 2005-06 registering an increase of about 7.2%. This happened due to growth of the industrial and railway sectors in the State. The consumption of power in the State in 2005-06 has increased by 33.73% over 2000-01. While consumption of power in industrial sector has increased by 50.31% over 2000-01, power consumption in Irrigation and Agricultural sector has declined by 26.34%. Similarly, while the percentage of power consumption in industrial sector comprises 43.06 % of the total power consumption in the State during 2000-01, it has increased to 48.39% during 2005-06. It may be mentioned here that the percentage of power consumed in domestic and commercial sectors to total power consumption made in 2000-01 was 35.68% and 9.00% which were declined to 30.49% and 6.85% during 2005-06. The consumption of power in large industries viz NALCO, RSP, HPCL, ICCL etc. have not been taken into account, as these industries are using the power generated from their own captive power plants. Table 11.7 & Fig.11.6 shows the year-wise power consumption by different sectors in Orissa from 2000-01 to 2005-06.

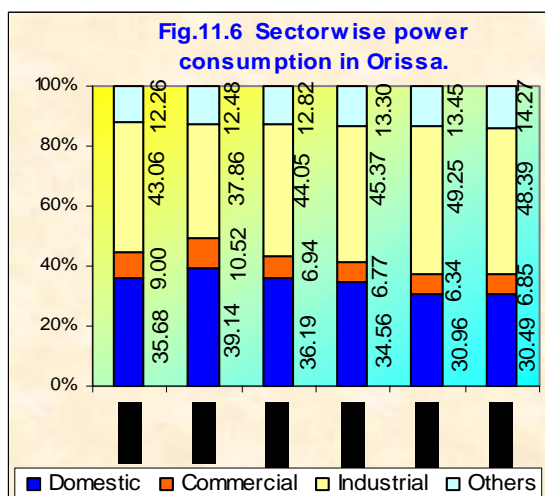
Table 11.7
Year-wise Power Consumption under different
Distributing Companies in Orissa.

(In MU)

Year	Total consumption	Consumption Sector							
		Domestic	Commercial	Industrial	Public lighting	Irrigation & agriculture	Railways	Public water works	Bulk supply & Others
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)	202 (3.32)
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)	187 (3.24)
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)	309 (4.58)
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)	366 (5.07)
2004-05	7598 (100.00)	2352 (30.96)	482 (6.34)	3742 (49.25)	41 (0.54)	147 (1.93)	355 (4.67)	126 (1.66)	353 (4.65)
2005-06	8144 (100.00)	2483 (30.49)	558 (6.85)	3941 (48.39)	55 (0.68)	137 (1.68)	384 (4.72)	129 (1.58)	457 (5.61)

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)

11.16 The Orissa Power Generation Corporation Limited (OPGCL) was incorporated in November, 1984 under the Companies Act, 1956 with the main objective

of establishing, operating and maintaining large thermal power generating stations independently or in the joint sector. During January, 1999, 49% of its stake was disinvested in favour of a strategic investor, namely AES Corporation, USA, as a part of reform in the energy sector taken up by Government of Orissa.

11.17 As its modern venture, the company has set up two thermal power plants of 210 MW each in IB valley area of Jharsuguda district with a project cost of Rs.1135.0 crore. It has also undertaken 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%. The other two share holders are AES India Pvt. Ltd and AES OPGC Holding (Incorporated in Mauritius) with 16.25% and 32.75% shareholding respectively. OPGC has achieved the record Plant Load Factor (PLF) of 86.04% for Ib Thermal Power Station in 2004-05 as against 81.50%PLF in 2003-04 and previous highest record of 85.82% PLF for 1999-2000. Total expenditure incurred during 2004-05 was to the tune of Rs.273.50 crore with profit of Rs. 153.37 crore. It has paid interim dividend amounting to Rs. 61.28 crore with 12.5% rate of dividend. (It has been proposed to set up two more units of 250 MW each which would be operationalised during 2008-09.)

ORISSA HYDRO POWER CORPORATION (OHPC)

11.18 Orissa Hydro Power Corporation (OHPC) was incorporated under Companies Act in April 1995 and started its commercial operation from 1st April, 1996. The installed capacity of different hydro power projects under OHPC in April 1996 was 1,272 MW, 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 (2 x 3 MW). Besides, OHPC has also taken-up renovation and modernization 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 has been proposed to be provided during the Tenth Plan (2002-07) for the purpose, out of which Rs.80.81 crore has been provided in the Annual Plan 2006-07. 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 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 2004-05 was Rs.244.73 crore. During 2004-05, OHPC has earned a net profit Rs. 66.63 crore as against Rs. 8.84 crore in 2003-04.

GRID CORPORATION OF ORISSA (GRIDCO)

11.19 The reform process in power sector was first adopted in Orissa with effect from 1st April, 1996. After introduction of reform process, GRIDCO has been vested with the transmission and bulk supply business. As per license agreement by OERC, GRIDCO was further bifurcated into two companies viz (i) Grid Corporation of Orissa Ltd. and (ii) Orissa Power Transmission Corporation Ltd. with effect from 9th June, 2005. While GRIDCO was vested with trading and bulk supply license by OERC, OPTCL is the sole license for inter State Power Transmission

and wheeling of electricity. It also controls the State Load Dispatch Centre activities for grid operation in the State.

11.20 GRIDCO purchases power from various sources like OHPC, OPGC, NTPC and CPPs in the State. It also receive State share from Central Sector Power Stations viz. Farakka, Kahalgoan, Kaniha etc. through EREB system. GRIDCO is also involved in trading of surplus power in ABT regime which was implemented in the Eastern region with effect from 01.04.2003. During 2005-06, GRIDCO sold 243 MW of power to other States / U.Ts as against 517 MW power sold in 2004-05.

ACCELERATED POWER DEVELOPMENT & REFORM PROGRAMME (APDRP)

11.21 Govt. of Orissa have signed a MoU with Govt. of India to implement the Accelerated Power Development & Reform Programme (APDRP) in the State. The private Distribution Companies are the implementing agencies for APDRP in the State for which they have entered into MOA with Govt. of Orissa for on-lending the APDRP assistance. The objectives of the programme are improvements of financial viability through loss reduction, improved consumer service and reliable and quality supply of power. It envisages metering of feeder, distribution transformer and energy auditing and accounting. Seven numbers of projects of our State with estimated cost of Rs.592.22 crore

have been approved by Govt. of India for implementation under this programme. As on 31st March 2005, an amount of Rs.74.02 crore were received from Govt. of India and the same amount has already been utilized by DISTCOs for metering, replacement of distribution transformers and conductors, up-gradation of lines and sub-stations etc.

RURAL ELECTRIFICATION

11.22 Government of India are committed to electrify all the villages of the country by providing Additional Central Assistance to the States. Government of Orissa are committed to electrify all the villages in the State by 2007 and each household by 2012 as per MoU signed with Govt. of India. A State Level Monitoring Committee has been constituted under the Chairmanship of Development Commissioner to formulate broad policy guidelines regarding the manner in which the rural electrification work shall be carried out and to monitor its execution. The Engineer-in-Chief (Electricity) Orissa has been declared as Nodal Officer to monitor and review the rural electrification works.

11.23 As per 1991 population census the State had 46,989 inhabited villages, of which 37,744 villages were electrified by the end of March, 2005. Out of these 37,744 villages, 10,558 villages were electrified by CESCO, 9,456 villages by NESCO, 8,475 villages by WESCO and 9,255 villages by SOUTHCO. During 2005-06, 300 villages have been

electrified by these distributing companies, raising the number of villages electrified to 38,044. It has been programmed to electrify about 4,646 numbers of Census Certified Villages / Hamlets/ Dalit Basties / de-electrified villages during 2005-06 & 2006-07 involving an estimated expenditure of Rs.120.00 crore. An amount of Rs.66.00 crore has been proposed in the Annual Plan, 2006-07 towards rural electrification through Distribution Companies under conventional sources. Table 11.8 shows the villages electrified by different distributing companies in Orissa as on 31.3.2006.

11.24 District-wise and distribution company-wise information during 2005-06 is enclosed in Annexure-11.1

Table 11.8
Census Certified Villages
Electrified as on 31.03.2006.

DISTRIBUTING COMPANIES	No. of villages as per 1991 census	No. of villages electrified as on 31.3.06	No. of villages electrified during 2005-06	Total no. of villages electrified as on 31.3.06	Balance to be electrified
CECSO	11615	10558	49	10607	1008
NESCO	11155	9456	68	9524	1631
WESCO	10442	8475	75	8550	1892
SOUTHCO	13777	9255	108	9363	4414
TOTAL	46989	37744	300	38044	8945

Source: CESCO-Bhubaneswar, NESCO-Balesore, WESCO-Sambalpur, SOUTHCO-Berhampur.

