

CHAPTER 11

POWER

11.01 Energy is one of the inputs for both the economic development as well as over-all wellbeing of the people. Increase in power generation has cascading effect on all sectors, leading to increased growth, particularly in industry, agriculture and other ancillary trade and business activities. 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 the state power sector is to unbundle generation, distribution and transmission along with assured supply of power to the consumer at affordable rate. 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 was dissolved and two new Corporations, namely; (I) GRID Corporation of Orissa (GRIDCO), and (ii) Orissa Hydro Power Corporation (OHPC) were created 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 State Govt. have entrusted the trading work to the existing GRIDCO and have set up the Orissa Power Transmission Corporation Ltd. (OPTCL) on 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 disinvestment. The distribution business has been handed over to privately managed companies namely- WESCO, NESCO, SOUTHCO with effect from 1.4.1999 and CESCO from 1.9.1999 which is renamed as CESU recently.

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 peak demand is 2350 MW. Since a good number of steel and aluminum plants are likely to be established in the State and State Government is committed to electrify all the villages by the end of 2009, 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 3 MW 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) During 2006-07, the State's share in the total installed capacity of the State sector power projects was 2814.88 MW and that of generated power was 1542.67 MW, as against 1275.21 MW in 2005-06, showing an increase of about 20.97%. Out of 1542.67 MW power generated (State share) in 2006-07, 840.34 MW was from Hydro Power Projects and the balance 702.33 MW from Thermal Power Projects. While the power generation under Hydro Power Projects increased by 40.52% over the production in 2005-06, power generation in thermal power projects has been increased by 3.71% over 2005-06.

11.08 (ii) Besides, State's share in installed capacity of Central Sector projects was 739.01 MW. As against this, the Central Sector projects generated 485.32 MW of power for the State during 2006-07. Thus, during 2006-07, against the total installed capacity of 3553.89 MW, the State's share in power generation was 2027.99 MW, reflecting an increase of 12.68% over 2005-06.

11.09 The installed capacity of power from all sources & its availability in different years has been indicated in Table-11.1. Similarly, the installed capacity of different power projects in Orissa and State's share from the

power generation during 2004-05 to 2006-07 has been presented in Table-11.2.

11.10 In addition, State has also purchased 91.93 MW from different captive power plants installed in the State by different industries viz NALCO, ICCL, RSP, INDAL, NINL and NBFA (Meramundali) during 2006-07 against 62.60 MW purchased in 2005-06 which is presented at Table 11.3.

Table 11.1
Installed Capacity & Availability of Power from all Sources from 2002-03 to 2006-07.
(in MW)

Year	Installed capacity *	Availability of power from all sources	Percentage
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	5073.48	1862.35	36.71
2006-07	5278.89	2119.89	40.93

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

Source: OPTCL, Bhubaneswar

Table 11.2

Installed Capacity and Power Generation of different Power Projects in Orissa during 2004-05 & 2006-07.

(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		
					2004-05	2005-06	2006-07
A. STATE SECTOR							
a) Hydro Power Projects.							
i)	Hirakud Power System – I & II	347.50	100.00	347.50	91.72	98.35	91.56
ii)	Balimela H.E. Project	360.00	100.00	360.00	170.45	116.89	181.36
iii)	Rengali H.E. Project	250.00	100.00	250.00	83.48	76.11	74.06
iv)	Upper Kolab H.E. Project	320.00	100.00	320.00	98.94	69.78	114.47
v)	Upper Indrabati H.E. Project	600.00	100.00	600.00	322.65	199.91	339.57
vi)	Machhakunda H.E. Project	114.75	50.00	57.38	41.86	36.97	39.32
	Total (a)	1992.25		1934.88	809.11	598.01	840.34
b) Thermal Power Projects							
i)	Ib (I & II)	420.00	100.00	420.00	323.37	316.49	362.92
ii)	Talcher Thermal Power Station, Stage – I & II	460.00	100.00	460.00	326.45	360.71	339.41
	Total (b)	880.00		880.00	649.82	677.2	702.33
	Total A (a + b)	2872.25		2814.88	1458.93	1275.21	1542.67
B. CENTRAL SECTOR							
i)	Farakka, STPS (West Bengal)	1600.00	13.63	218.00	155.22	176.35	145.78
ii)	Kahalgaoon STPS (Bihar)	840.00	15.24	128.00	66.73	85.45	69.31
iii)	Talcher STPS I & II (Orissa)	1000.00	31.80	318.00	247.84	238.37	236.57
iv)	Chhuka Hydro power station (Bhutan)	270.00	15.19	41.01	27.71	24.47	29.68
v)	Tala HPS	680.00	5.00	34.00	0.00	0.00	3.98
	Total B	4390.00	-	739.01	497.50	524.64	485.32
	Total (A+B)	7262.25	-	3553.89	1956.43	1799.85	2027.99

Source: OPTCL, Bhubaneswar.

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				
		2002-03	2003-04	2004-05	2005-06	2006-07
NALCO, Angul	960.0	46.8	57.0	46.1	36.8	48.1
ICCL, Choudwar	108.0	11.4	10.5	7.6	3.8	2.2
RSP, Rourkela	248.0	1.1	3.4	8.3	2.9	4.4
INDAL, Hirakud	67.5	0.9	0.2	0.0	7.0	3.5
NINL, Duburi	62.5	1.8	4.7	2.7	8.1	8.1
NBFA, Meramundali	30.0	-	-	4.3	4.0	2.4
MESCO (Duburi)	9.0	-	-	-	-	0.1
B.P.&S, Jharsuguda	100.0	-	-	-	-	13.3
Arati Steels	40.0	-	-	-	-	9.8
NALCO, Damanjodi	55.5	-	-	-	-	-
FACOR Bhadrak	21.0	-	-	-	-	-
IDCOL Baragarh	9.5	-	-	-	-	-
Kalinga iron, Berbil	12.0	-	-	-	-	-
OPM Brajarajnaragar	20.0	-	-	-	-	-
OTM Choudwar	5.2	-	-	-	-	-
PPL Paradeep	44.0	-	-	-	-	-
Ispat Alloy Balugaon	40.5	-	-	-	-	-
FCI Talcher	28.4	-	-	-	-	-
Total	1861.1	62.0	75.8	69.0	62.5	91.9

Source: GRIDCO / OPTCL, Bhubaneswar

11.11 Through some plants/factories such as FACOR, ISPAT ALLOYS, NALCO (Damanjodi), PPL, FCI, OPM etc. have their own captive power plants; they do not supply power to GRIDCO.

11.12 While the estimated demand for power increased from 1334 MW in 2001-02 to 1760 MW during 2006-07, the availability of power from various sources have also increased from 1423 MW to 2120 MW during the same period, showing an increase of about 48.98%. During 2006-07, 207 MW of surplus power was sold to other state/U.T. This surplus situation in the state is likely to be wiped out as the state is moving towards high industrialisation. Table-11.4 shows the demand and availability of power in the state from 2001-02 to 2006-07.

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	250
2006-07	1760	1543	485	92	2120	207

Source: GRIDCO, Bhubaneswar.

11.13 During 2005-06, about 1800 MW 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 have 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. Besides, state government are also giving emphasis on power generation through private sector (IPPs). As such a number of MOUs have been signed.

11.14 Year-wise expenditure since 2002-03 in the energy 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 2005-06, Rs.151.42 crore has been spent for energy sector, which comprises 5.4% of the total State plan expenditure. During 2006-07, the anticipated expenditure was about Rs.513.40 crore. The proposed outlay for Energy sector during 11th Plan period has been fixed at Rs.2875.47 crore, out of which Rs.935.02 crore has been proposed for 2007-08.

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
2002-03	323.32	2486.36	13.0
2003-04	429.62	2463.93	17.44
2004-05	192.09	2738.73	7.01
2005-06(P)	151.42	2818.82	5.4
2006-07(AE)	513.40	3630.51	14.14

AE : Anticipated Expenditure

P: Provisional

Source: Plan Document, 2007-12 & Orissa Budget at a Glance, 2007-08.

11.15 During 2006-07, there were about 24.27 lakh power consumers in the State of which 21.36 lakh (88.01%) were domestic consumers and 2.05 lakh (8.45%) were commercial consumers. Besides, out of total consumers, 39.06% consumers were under CESCO only. Further, it is also revealed that out of total 24.27 lakh consumers, 17.38 lakh (71.61%) were from rural Orissa, of which 92.52% were domestic consumers. Sector wise distribution of consumers is given in Table 11.6.

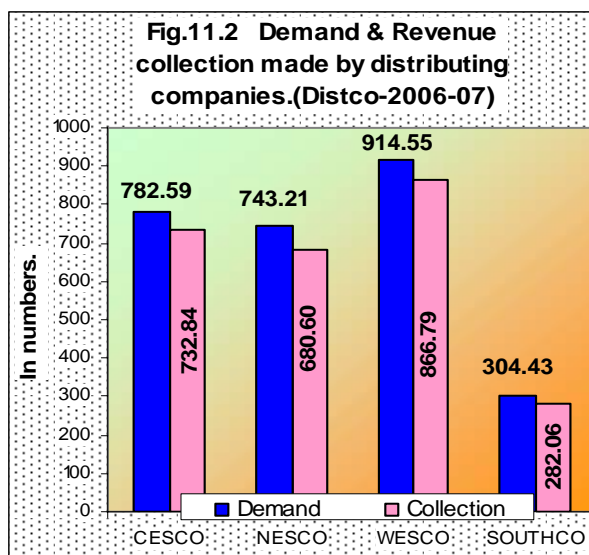
Table - 11.6

Sector wise distribution of consumer, 2006-07.

Sector	Consumers (in lakh nos.)						% of rural consumers to total consumers
	CESCO	NESCO	WESCO	SOUTHCO	Total	Rural consumers	
Domestic	8.32 (87.76)	4.57 (88.56)	4.06 (87.12)	4.41 (88.73)	21.36 (88.01)	16.08 (92.52)	75.28
Commercial	0.83 (8.76)	0.41 (7.95)	0.39 (8.37)	0.42 (8.45)	2.05 (8.45)	0.98 (5.64)	47.81
Industrial	0.09 (0.95)	0.05 (0.97)	0.06 (1.29)	0.03 (0.61)	0.23 (0.95)	0.01 (0.06)	4.35
Others	0.24 (2.53)	0.13 (2.52)	0.15 (3.22)	0.11 (2.21)	0.63 (2.59)	0.31 (1.78)	49.21
Total	9.48 (100.00)	5.16 (100.00)	4.66 (100.00)	4.97 (100.00)	24.27 (100.00)	17.38 (100.00)	71.61

Source: All the distributing Companies.

11.16 During the year 2006-07, the demand for collection of revenue from the consumers by the distributing companies (Fig.11.2) stood at Rs.2744.78 crore, of which Rs.2562.29 crore (93.35%) have been collected during the year.



11.17 During the year 2005-06, the consumption of power in the State was 8144 MU, which has increased to 9288 MU by the end of 2006-07 registering an increase of about 14.05%. This happened due to growth of the industrial and railway sectors in the State. Table 11.7 reflects the sector wise power consumption in the state since 2000-01. It is revealed from the above table that, though the power consumption in the state, showing an increasing trend, the percentage of power consumption in all the sector except industrial sector and railway showing a declining trend. During 2000-01, the percentage of power consumption in industrial and railway sector were 43.06% and 3.30% respectively which have increased to 53.48%

and 5.65% respectively by the end of 2006- 07.

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)
2006-07	9288 (100.00)	2525 (27.19)	640 (6.89)	4967 (53.48)	45 (0.48)	131 (1.41)	525 (5.65)	134 (1.44)	321 (3.46)

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)

11.18 The Orissa Power Generation Corporation Ltd. (OPGC) 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.

11.19 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 crore. It has also undertaken the construction of seven mini hydel stations having a total capacity of 5,075 KW as a technological demonstration. Mini hydel projects with a capacity of 1150 KW were commissioned in 1994. 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 AESOPGC Holding

(Incorporated in Mauritius) with 16.25% and 32.75% shareholding respectively.

11.20 OPGC has achieved the record Plant Load Factor (PLF) of 90.18% in 2006-07 as against 84.12% PLF in 2005-06 and previous highest record of 85.82% PLF in 1999-2000. Total turn over during 2005-06 was to the tune of Rs.439.81 crore with profit of Rs. 161.91 crore. OPGC has an exceptional track record of distributing profit to its equity holders. The records are as follows.

(Rs. in Cr.)

Year	Dividends	Total	Govt.of Orissa	AES
2002-03	30%	147.07	75.00	72.07
2003-04	23%	112.75	57.50	55.25
2004-05	24%	117.65	60.00	57.65
2005-06	24%	117.65	60.00	57.65

11.21 OPGC has received many awards and distinctions for plant performance, effective pollution control measures and better safety performance. For outstanding achievement in environment management ITPS has been selected for Greentech Environmental Excellence Gold Award in Thermal Power Sector for the year 2003-04, 2004-05 and 2005-06. ITPS has been certified with ISO 14001, OSHAS 18001 and also received inter alia State Best Safety Award in 2006 from Directorate of Factories and Boilers, Government of Orissa.

ORISSA HYDRO POWER CORPORATION (OHPC)

11.22 The Orissa Hydro Power Corporation was registered under the Companies Act in

21.04.95 and was functioning w.e.f. 1st April, 1996. In pursuance of the Orissa Electricity Reform Act, 1995, all hydel power projects of the state have been transferred to this corporation for operation and maintenance. OHPC has also taken up the execution and completion of Upper Indravati Hydel Project and Potteru Small Hydro Electric Project. Besides, it has taken up renovation and modernization of old Hydel Power Station at Hiradkud and Chipilima and expansion of Balimela power Station by two more units of 75 MW each. An amount of Rs.248.00 crore has been proposed to be provided in the 11th Five Year Plan which includes Rs.121.00 crore for 2007-08 for OHPC projects.

GRID CORPORATION OF ORISSA (GRIDCO)

11.23 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. (OPTCL) with effect from 9th June, 2005. While GRIDCO was vested with trading and bulk supply license by OERC, OPTCL is the sole licensee for inter-State Power Transmission and wheeling of electricity. It also controls the State Load Despatch Centre activities for grid operation in the State.

11.24 GRIDCO purchases power from various sources like OHPC, OPGC, NTPC and CPPs in the State. It also receives State share from Central Sector Power Stations viz. Farakka, Kahalgaon, 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 2006-07, GRIDCO sold 207 MW of power to other States / U.Ts as against 250 MW power sold in 2005-06.

11.25 OPTCL constructed major lines and substations to upgrade the existing system with an aim to provide quality and uninterrupted power supply by availing loan from World Bank. After closing of loan, OPTCL is completing the unfinished projects from its own resources.

ACCELERATED POWER DEVELOPMENT & REFORM PROGRAMME (APDRP)

11.26 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 of transformer and energy auditing and accounting. Seven numbers of projects of the 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 2006, an amount of Rs.74.02 crore was 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. A provision of Rs. 426.92 crore and Rs.67.20 crore has been kept in the Eleventh Five Year Plan and the Annual Plan, 2007-08 respectively for the programme.

RAJEEV GANDHI GRAMEEN VIDYUTIKARAN YOJANA (RGGVY) Under Bharat Nirman

11.27 Under Rajeev Gandhi Grameen Vidyutikaran Yojana, every village is to be provided with electricity by 2009 and each house hold by 2012. The main objective of the scheme is :-

- i) *Providing access to electricity to all households in the state in the next five years*
- ii) *Electricity to all villages and habitations.*
- iii) *To provide electricity connection to each BPL families free of charge through creation of Rural Electricity Distribution Backbone with at least one 33/11 KV (or 66 KV) substation in each block, village electrification infrastructure with at least one distribution transformer in each village / habitations.*

11.28 Ninety (90%) percent capital subsidy would be provided by Government of India for overall cost of the projects under the scheme. In October, 2005, quadripartite agreement has been signed with the CPSUs (NTDC, PGCIL, NHPC etc.) and State Power Utilities (CESU, NESCO, WESCO, and SOUTHCO). Baseline data for all the districts have been collected and handed over to CPSUs for preparation of Detailed Project Reports (DPRs). DPR in respect of three district viz. Anugul, Nayagarh and Jajpur have been accorded final sanction. According to survey, Rs.4000 crore will be required under the scheme for electrification of about 18189 C.C. villages and 38710 habitations.

RURAL ELECTRIFICATION

11.29 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 2009 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.

11.30 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.

Table 11.8
Census Certified Villages
Electrified as on 31.03.2006.

DISTRIBUTIN COMPANIES	No. of villages as per 1991 census	No. of villages electrified as on 31.3.05	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.

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

