

CHAPTER - XIII

POWER SECTOR REFORM IN ORISSA: A CASE STUDY IN RESTRUCTURING

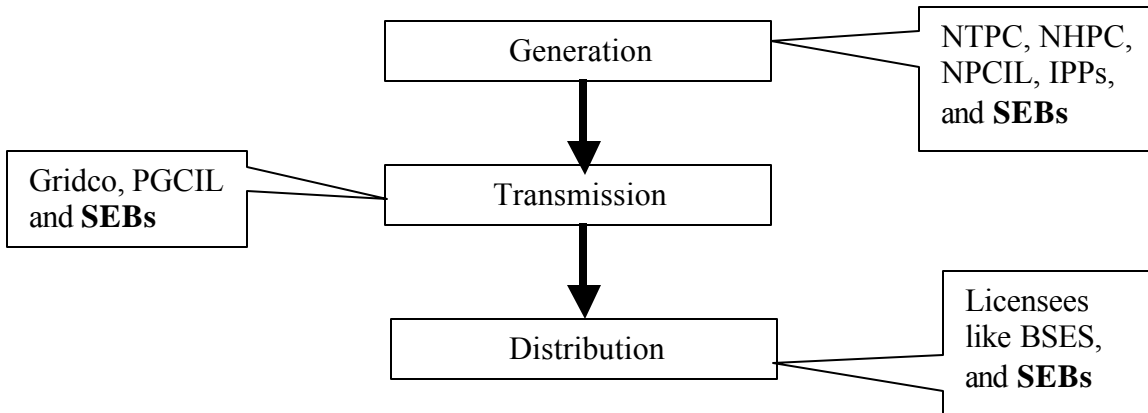
As per our Constitution, power industry is the combined responsibility of the Central Government and the State Governments. The ESA (Electricity Supply Act) envisaged three kinds of entities in the power-sector: State Electricity Boards (SEBs), generating companies, and licensees. SEBs are allowed to generate, transmit, and distribute electricity within a state; they enjoy all the powers of a licensee. They account for 65 per cent of the power generated in the country.

Generating companies are responsible for supplying power to the grid without the specific responsibility of retail distribution. Major players in this category are NTPC (National Thermal Power Corporation), NHPC (the Hydro-electric analogue of NTPC), and NPCIL (Nuclear Power Corporation of India Limited). Though ESA allowed only the governments to set up generating companies till 1991, thereafter it was de-reserved. Independent Power Producers (IPPs) now fall under this category.

Existing licensees are private-sector utilities licensed by a State Government for power generation, distribution, or both within a specified area. For example, Gujarat Industrial Power Corporation is only into generation and Central Electricity Supply Corporation (in Orissa) is confined to distribution, whereas Bombay Suburban Electric Supply Limited (BSES) and Tata Electric Company (TEC) are involved both in generation and distribution.

The interdependence among these players in the electricity sector can be gauged from the fact that their performances are closely linked. The industry value-chain is captured by Chart-1 below. (PGCIL is the Power Grid Corporation of India Limited.)

Chart - 1



Some instances of such interdependence are easy to find. High generation tariffs affects the performance of SEBs and transmission companies, just as MSEB (Maharashtra State Electricity Board) got badly affected by the high tariff imposed by Dabhol Power Company.

In Orissa, Grid Corporation of Orissa (Gridco) files its tariff proposal with Orissa Electricity Regulatory Commission (OERC), assuming that it would buy power from OHPC, OPGC (Orissa Power Generation Corporation), and EREB (the Eastern Grid) in a particular proportion (Table-13.1).

<u>Company</u>	<u>Per Unit Cost</u>	<u>% of Units</u>	<u>% of Rupees</u>
OHPC	Re.0.59	44	21
OPGC	Rs.1.61	20	26
EREB	Rs.2.03	16	26

If, however, OHPC, the lowest-cost supplier, fails to supply power at the assumed level, Gridco is forced to buy from the other two sources, increasing its cost and pulling down its bottom-line.

This interdependence also brings in problems specific to the power sector. Since IPPs and generating companies sell power to SEBs, they face accumulating burden of accounts-receivables as is depicted in Table-13.2. To cite a specific example, the recovery rate of NTPC has fallen from 90 per cent in 1996-97 to 84 per cent in 1999-00 (*Indian Express*, 16 December 2000).

<u>Company</u>	<u>Amount (Rs. Crores)</u>
NTPC	15,000
NHPC	3,534
PGCIL	1,430
DVC	2,081

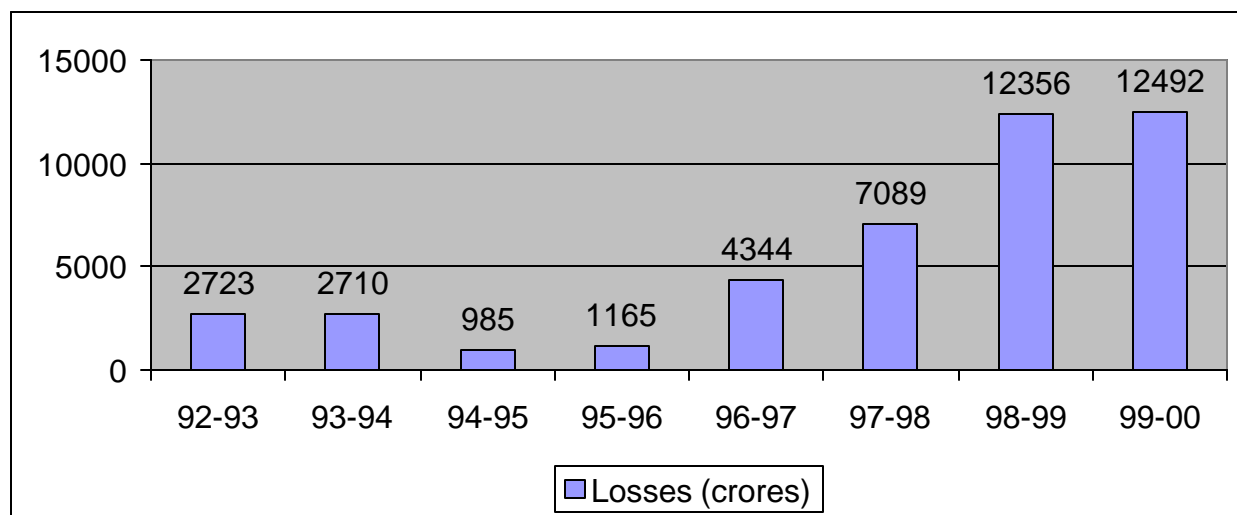
While most of the SEBs are incurring losses, their financiers like PFC (Power Finance Corporation) and REC (Rural Electrification Corporation) are earning profits. But, liquidity problem of the SEBs has aggravated the accounts-receivables problem of these financiers too. Even a single problematic player in the value-chain can kick off a chain reaction affecting virtually all the parties.

Since SEBs are the most important players in the value-chain, it is imperative to understand their strengths and weaknesses. That may give us an important insight into the necessity for reforms in the power sector.

PERFORMANCE OF SEBs

SEBs have done a reasonably good job in creating the generating capacity. The installed generating capacity was less than 10,000 MW (mega watt) in 1951, but had breached the 75,000 MW mark by 1995. The average annual growth rate, however, has fallen from 12.7 per cent in the 60s to 7.3 per cent in the 1990s (*Power Group of PwC: Indian Power Sector*).

Figure – 1



As Figure-2 above (based on data from *The Economic Times*, Calcutta, 18 December 2000) illustrates, the aggregate losses of SEBs more than quadrupled in the last eight years of the last decade. In fact, four of the eighteen major SEBs incurred a loss of Rs.1000 crore each in 1999-00.

Some of the reasons for such disastrous performance of SEBs are the increasing hiatus between the tariff and cost, sub-optimal capital structure, low plant load factor (PLF), high transmission and distribution (T&D) losses, and insufficient capital expenditure.

Under the ESA, an SEB is required to set tariff at a level sufficient to earn a 3 per cent return on net-fixed-assets. This low ROI (Return on Investment) is independent of the actual cost of financing new investments, thus not enabling the tariff to recover the cost, as is highlighted by Table-13.3 below.

Table-13.3

	92-93	93-94	94-95	95-96	96-97	97-98	98-99
Tariff as a % of Cost	82.2	78.3	78.3	76.1	77.4	80.1	78.8
Agl./Irr. Tariff as a % of Cost	12.6	12.0	11.5	10.6	10.2	12.3	12.2

Source: Annual Report on SEBs and Electricity Departments, Planning Commission (April-99).

As per Tata Energy Research Institute (TERI Energy Data Directory and Yearbook 1999-00, New Delhi), the average tariff for all-India was only 80 per cent of the average cost in 1998-99. About 30 per cent of electricity is supplied to agriculture (including lift-irrigation) at a tariff about 130 paise below cost per unit. Domestic sector gets 15 per cent of the electricity at around 65 paise below cost. Such cross-subsidies distort the demand for electricity by failing to convey its true cost to the consumers. In fact, many large consumers go in for their own generation through CPPs (Captive Power Plants), which, in turn, affects the SEB performance through decreases in HT (High Tension) and EHT (Extra High Tension) consumption.

Since very few SEBs could convince the governments to convert their loans into equity, many SEBs are financed entirely by interest-bearing-debt, which is increasing their burden over the years. Debt financing is provided through perpetual loans and guaranteed bonds from State Governments, loans from development financial institutions, and, to a lesser degree, short-term bank loans. Box-1 presents the typical capital-structure of an SEB.

<u>Box – 1</u>	
Net Worth	10%
State Guaranteed Bonds	20%
Loans from FIs	35%
Loans from State Govt.	35%

Each year, an SEB develops a capital-spending programme and obtains funding from financial institutions and through the budget process of the State Government concerned. Generally, funding is not arranged on a project-specific basis.

Whereas the private-sector has a PLF of 73 per cent, against the overall average of 63 per cent, the corresponding figure for SEBs is only a paltry 58 per cent. Even the IPPs have a PLF of around 69%. It has been argued that a high PLF is difficult to achieve in India, since the peak-timings vary across seasons, requiring generation to be harnessed towards that. Low PLF, on the other hand, pushes up SEBs' cost of power.

The TERI report cited above puts the average T&D loss across India at around 21 per cent in 1998-99. But, the actual figures for SEBs are quite high. In Orissa, the tariff proposals filed with the OERC (Orissa Electricity Regulatory Commission) by Gridco and the distribution companies assumes it to be 40-45 per cent. The actual loss is expected to be higher, around 55 per cent.

Such high figures are indicative of power theft, which takes different forms such as un-metered supply, unauthorized connections, wrong billing, and non-distribution of bills. These are non-technical losses, some of which are aided by low voltage transmission, which accounts for the biggest chunk of transmission in the country. High levels of technical losses, on the other hand, are largely driven by inadequate maintenance of and investment in the transmission and distribution systems.

In order to reduce the T&D loss and increase the generating capacity, there is need for substantial investment. CEA estimates that around Rs.600,000 crore investment is required for meeting the generation requirement and an equivalent amount for the T&D system to evacuate the power. The governments in the country, including the central one, lack such financial strength.

WHY REFORM?

The power sector in India has gone through zigzag changes in ownership structure over the years as is revealed by Box-2 below. It went from private sector to the public sector and then came back to the private sector. Initially, electricity supply was the domain of private parties,

who chose to supply only to urban centres and areas around them. These state of affairs continued till just after independence. But, in 1948, the Electricity Supply Act was enacted, leading to establishment of State Electricity Boards (SEBs). These SEBs took over the licensees operating in the private sector and enlarged the customer base by bringing in rural areas under their operation. Almost after three decades, the Government of India established entities like NTPC and NHPC, followed by PFC to supplement the budgetary resources of the Central Government. In 1989, NTPC was unbundled and its transmission assets were passed on to newly-created Power Grid Corporation, which was given the task of developing the regional and national grid.

Over the years, in contrast to the well-functioning central entities, the SEBs showed signs of sickness. Soon, it became necessary to reform these entities. Government chose the path of privatisation, attracting private capital to participate in power generation, transmission, and distribution. As an incentive to the private parties, the Government brought in some financial reforms. This consisted of temporary increase in maximum permissible debt-equity percentage for private parties to 400 per cent (later falling to 233 per cent), permission to foreign investors to hold up to 100 per cent of equity, and an increase in the cap on allowable ROR (rate-of-return) to 5 per cent above Bank Rate.

<u>Box – 2</u>
<p>1880: Supply of electricity began in India with a small hydroelectric plant in Darjeeling, operated by a private party</p> <p>1948: Electricity Supply Act was enacted by the Government of India, leading to establishment of State Electricity Boards, which took over the licensees operating in the private sector</p> <p>1991: Central Government instituted policy to attract private sector to participate in generation, transmission, and distribution of electricity, under license from State Governments.</p>

Other reforms on the administrative, legal, structural, and regulatory front were also brought in by shooting for faster clearance of projects, higher ceiling on investment without approval, breaking down SEBs into manageable entities, and setting up of regulatory mechanism to rationalize power tariff and promote efficient policies.

POWER SECTOR REFORM IN ORISSA

Orissa was the first State in the country to embark upon reforms in the power sector. Supported by both the World Bank and DFID, it went in for the full package: unbundling, corporatisation, and privatisation. Let us look at the genesis and the process of the reforms and identify the winners and losers and highlight the lessons learnt.

Genesis

Orissa State Electricity Board (OSEB) was established in 1961 to undertake generation, transmission, and distribution of electricity in the State. Over the years, OSEB's financial health deteriorated due to various factors. It survived due to subsidy from the State Government; in 1995-96, the State subsidy payable had gone into arrears totaling Rs.369 crore.

The gap between peak demand and supply had reached almost 45 per cent by 1993-94. Though, the consumer strength increased to more than ten lakhs, the overall financial performance deteriorated. Table-13.4 below shows the comparative position of OSEB for 1994-95.

Table - 13.4

	Return on Net Fixed Assets	Non Technical Losses	Debtors in Sales Months	Tariff as % of Cost	PLF	Customers per Employee
OSEB	-16.4%	27%	7.6	82.8%	34.9%	38
KEB	-11.83		6.1	87.8	53.1	153
WBSEB	-12.79		7.0	80.3	37.8	53
MSEB	4.74		4.6	99.6	56.5	93
TNEB	-0.08		1.6	97.2	48.3	99
RSEB	-16.2	7%	4.2	71.6	51.4	80
PSEB	-13.3		1.83	74	52.9	60

Source: Annual Reports of the respective SEBs.

Due to OSEB's overall pathetic performance, the Government of Orissa commenced, in 1993, an extensive reform programme of the electricity sector. The reform programme was intended at improving the quality of electricity supply and stimulate economic growth in the region.

Broad objectives of the reform programme were as follows:

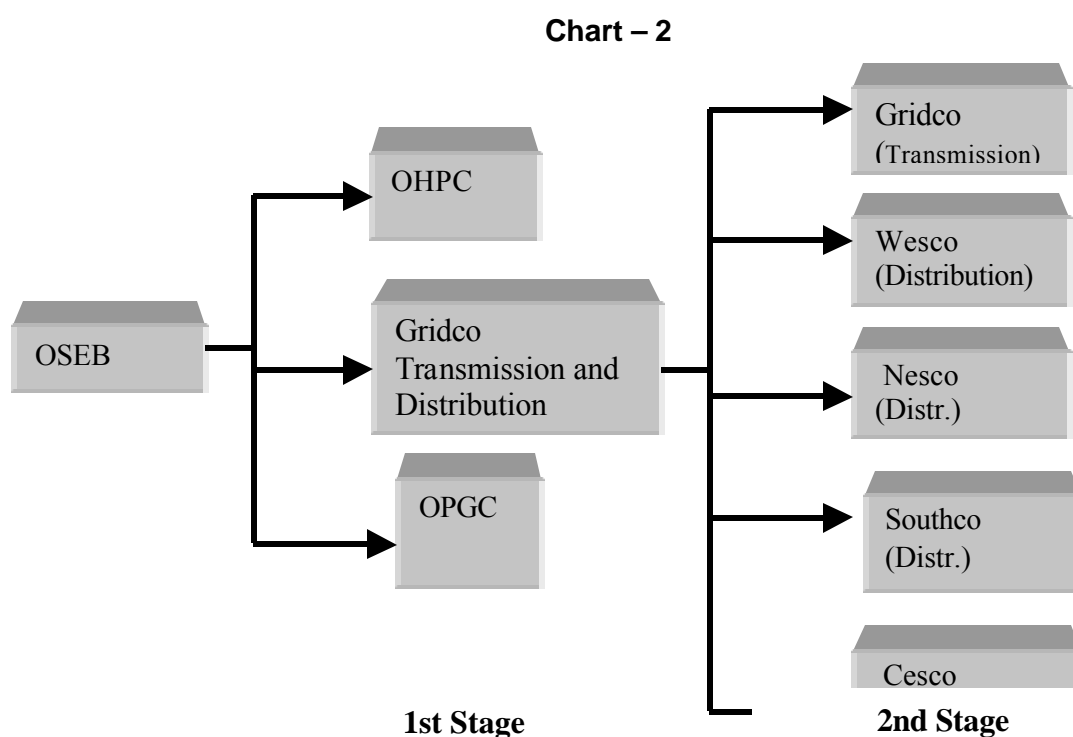
- To give the power sector autonomy by keeping it away from governmental control
- To attract large amounts of private finance into the power sector
- To introduce competition in the power sector

To achieve the above objectives, the Orissa Power Sector Reform Project was designed to undertake the following:

- To establish a separate act (The Orissa Electricity Reform Act)
- To un-bundle and corporatise OSEB
- To develop an autonomous power sector regulatory body
- To privatise the generation and distribution businesses

Process

The reforms process started with the enactment of The Orissa Electricity Reform Act in 1995. The Act was designed to address the fundamental issues responsible for the poor performance of the power sector in the State. The new legislation was aimed at restructuring the electricity industry, taking measures conducive to increasing the efficiency of generation, transmission, and distribution of electricity, opening avenues for private participation, and establishing a Regulatory Commission. The Act allowed for transfer of the assets, liabilities, staff, and statutory obligations of the OSEB to successor companies. Chart-2 below gives a pictorial representation of the change in the structure of the industry.



Some of the important steps taken after the enactment of the OER Act are as follows:

Unbundling and Corporatisation

Electricity business was divided into three separate activities: Generation, Transmission, and Distribution. The business of generating of hydel power was transferred to OHPC. The thermal power stations were transferred to the existing Orissa Power Generation Corporation (OPGC). The transmission and distribution businesses were transferred to Gridco. Though,

OHPC and Gridco began operation on 1 April 1996 as government owned entities, corporatisation agreements were signed with the Orissa Government. Under the agreement, Government reiterated its commitment to distance itself from their operation and management and to give them autonomy as commercial organisations. OHPC continues to be Government Company; Gridco, however, took long strides in the direction of full privatisation.

Institution Strengthening Project (ISP), the Preparatory stage for Privatisation

To ensure that privatisation leads to efficiency gains, Gridco had to bring changes in the internal environment variables like management, labour relations, and communication and reporting. Towards this end, Gridco initiated a comprehensive programme known as ISP to address many of its weaker areas. This programme was undertaken by the consultants.

Three important steps taken under ISP were as follows:

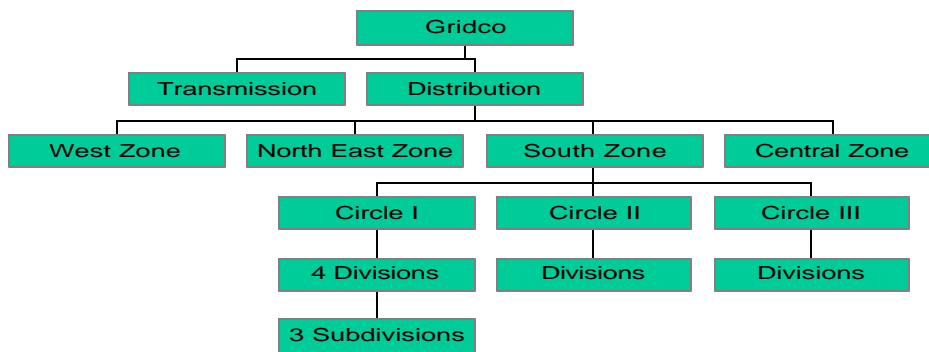
1. Introduction of Commercial Function at the Field Level

OSEB was managed principally by engineers, and it was standard practice for the engineers to undertake commercial, administration, and other non-engineering jobs. The management, thus, had a strong technical bias. One of the major organisational changes introduced during the ISP was therefore to bifurcate the field level activities into Commercial and Engineering. The commercial function comprised of Revenue Management, Accounting, Customer Management. The engineering function comprised of System Operation, Repairs and Maintenance, and other technical activities. Coupled with the bifurcation, commercial procedures were implemented. This small intervention improved the business environment at the division level.

2. Introduction of Profit Centre Accounting

Gridco was divided into Cost Centres and Profit Centres. Transmission divisions were treated as cost centres and distribution divisions as profit centres. To ensure proper control and reporting system, the entire distribution business was divided as shown below in Chart-3.

Chart - 3



Each distribution division was managed by a divisional manager (Executive Engineer) who reported to the circle manager (Superintending Engineer). The latter, in turn, reported to the Zonal General Manager (Chief Engineer), who reported to the Board of Directors at the corporate office. Each divisional manager was required to attend the monthly performance review meeting chaired by the CMD (Chairman-cum-Managing-Director) of Gridco.

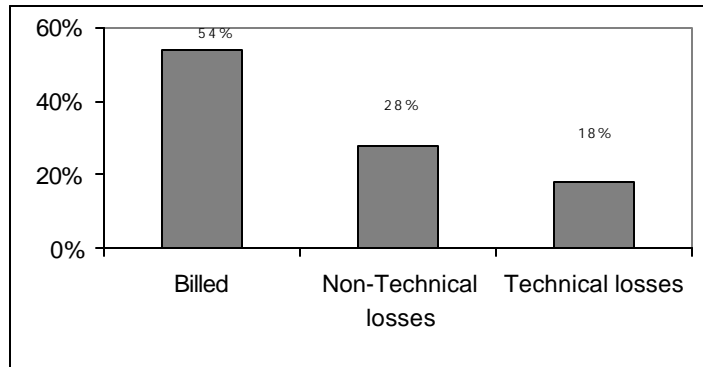
During these meetings, a detailed discussion on billing, distribution losses, collection, and other related matters used to take place and an action plan used to be prepared. This was a successful intervention during the pre-privatisation period, which helped in the following:

- Stressed the commercial aspect of the utility business,
- Developed interrelationship between technical and finance executives,
- Enabled the divisional managers to understand the financial implications of the various activities undertaken,
- Involved the field personnel in various managerial decisions, and
- Established an authentic database for important business parameters like billing, collection, T&D loss, etc. through a well-developed Management Accounting System.

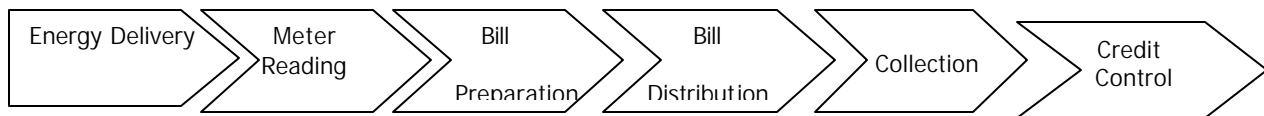
3. Introduction of Revenue Improvement Action Programme (RIAP)

This programme focused on the reduction of non-technical losses and concomitant improvement on the financial position of Gridco. One of the major contributions of RIAP was the quantification of the actual T&D losses. On the basis of field studies, the magnitude of non-technical loss and causes of the different types of losses were established. The energy lost and energy billed in the year 1996-97 was as given in Figure-2 below.

Fig -2



This finding of high T&D losses against the reported 22 per cent figure in various forums and published sources was an eye opener to both the shareholders and the management. The programme established that, though the reduction of technical losses requires huge capital investment, the non-technical losses can be reduced without any major investment and capital outflows. Efforts were made to reduce the non-technical losses by managing the revenue-cycle efficiently, by understanding each of the following activities and identifying and addressing problem areas.



In the process, even before the privatisation, Gridco improved its performance in the following areas: (1) Regularisation of un-authorized connections, (2) Increase in bills based on actual meter reading, (3) Increase in billing as a percentage of input, (4) Increase in collection as a percentage of billing, and (5) Improvement in customer relationship. However, RIAP could not be extended to all the divisions of Gridco. As a result, the financial and operational performance of most of the divisions could not be improved.

Privatisation of Distribution Business

Since the weakest link in the industry value-chain is the distribution of power to the ultimate consumer, government decided to transfer this task to the private players.

The process started with so called “Management Contract System” before moving on to “Divestment”. In October 1996, Gridco entered into management contract with BSES, one of the leading private players of the industry. Under the contract, which was known as DOS (Distribution Operations Agreement), BSES was given the management of one of the four

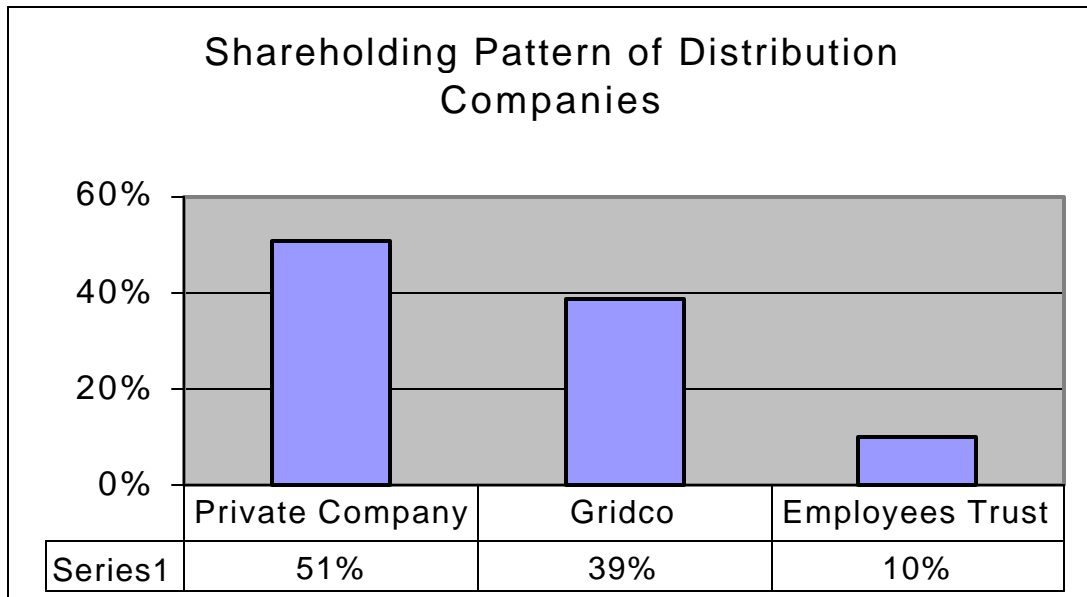
zones (Central Zone) in consideration of a fee plus incentives based upon measurable improvements in collections and metering. The experiment, however, failed, and Gridco revoked the contract in May 1997.

This experiment demonstrated that it was not possible to improve the performance of an organisation just by asking the private entrepreneurs to run the day-to-day operations without giving the overall control; the Government of Orissa, however, felt it necessary to transfer the control to private hands.

This propelled the Government of Orissa to later take the step of divesting its share in all the four distribution zones. Following were salient features of the privatisation process:

- The distribution zones were corporatised, which gave birth to Wesco, Nesco, Southco, and Cesco in November 1998 as 100 per cent subsidiaries of Gridco.
- As per the transfer scheme of the Government of Orissa, fixed assets and corresponding equity were transferred to the distribution companies. In doing so, a relatively clean balance sheet was established for each of these companies, albeit it had some negative effect on Gridco, as losses were not transferred.
- More than 50 parties (both national and international organisations) had shown interest in the initial stages of the process. Only twelve companies/JVs, however, submitted the required papers, of which eleven were pre-qualified by Gridco.
- To provide information about Gridco and the distribution companies, an Information Memorandum was provided to the interested parties. Gridco also appointed separate committees for the evaluation of the technical and financial bids.
- Only three bids were received for three companies, namely, Wesco, Nesco, and Southco. For Cesco, a second round of bidding was invited.
- The process ended by transferring Wesco, Nesco, and Southco to BSES and Cesco to AES and Jyothi Structures limited.
- The shareholding pattern of the distribution companies after the divestment stands as in Figure-3 below.

Figure – 3



RESTRUCTURING AND PRIVATISATION OF GENERATION

It is interesting to note that the power generation business of Orissa has seen all forms of reforms, namely, corporatisation, privatisation, and transfer from state enterprise to the central enterprise. By undertaking such diverse methods of restructuring, the Government of Orissa had demonstrated its commitment to reforms and in the process had raised much needed funds (and partially addressed the cash flow problem).

In 1995, the Talcher Thermal Power Station (TTPS) of OSEB was transferred to NTPC. The assets were transferred to Government of Orissa and then vested with NTPC by a special Act (TTPS Act 1994). NTPC paid a total of Rs.356 crore towards acquisition of assets with book-value of of Rs.139 crore.

In 1996, Government of Orissa transferred all the hydel generating stations of OSEB to a newly created entity called OHPC. The government had provided about Rs.2 billion for completing the Upper Indravati Hydro Project and was expecting to recover the same by privatising OHPC. However privatisation of OHPC required special consideration, as its generating plants are used for irrigation, power generation, and flood control. Moreover, OHPC is the largest supplier of power to Gridco, accounting for more than 40 per cent of the power purchased. At present, power is being sold to Gridco at very low price (54 paise).

In 1998, Government of Orissa divested 49 per cent of its stake in OPGC. Eight bidders (including four international companies) were short-listed. The stake was divested in favour of AES Corporation of the USA for a consideration of Rs.603 crore. The premium price received for OPGC was a result of the competitive process generated by International Competitive Bidding Process.

CREATION OF REGULATORY COMMISSION

One of the achievements of the Orissa Power Sector Reforms Project has been the creation of OERC. OERC was established in August 1996 as the first independent electricity regulatory body in India. Many of the responsibilities and powers vested earlier with the state government have been delegated to the commission.

Some of the key functions of OERC are as follows:

- To regulate generation, transmission, distribution, and supply of electricity in Orissa;
- To promote efficiency, economy, and safety in the transmission, distribution, and use of electricity in the State;
- To promote competitiveness and progressively involve the participation of the private sector, while ensuring a fair deal for consumers.

Thus, the Commission is expected to monitor performance of private utilities, assure them reasonable returns, and at the same time, act as a custodian of public interest. In other words, the Commission is required to balance the interests of the various stakeholders and, at the same time, promote efficiency, economy, and competition in the sector.

In the first four years of operations, OERC granted licenses for transmission and distribution of electricity in the State and facilitated the privatisation of distribution business. Tariff structure was rationalised and effort was to de-politicise the tariff setting. The Commission created mechanisms to streamline the operations of various players by creating grid code, billing procedures, complaint-handling procedures, and operating and security standards. It also issued orders related to consumer protection, captive power production, and third party sales, and scrutinised the power purchase agreements entered into by Gridco.

One of the important contributions of the reforms process was streamlining of the tariff setting process. Several steps were undertaken by the Commission to streamline the tariff-setting process and make it transparent by involving the public. According to the new process, Gridco has to file an application with the Commission for tariff hike at most once in a year. The tariff application should have the details of proposed tariff, expected revenue and expenses, capital base, and all such information. Gridco has to publish a notice in newspapers, inviting public comments and objections to its proposal. Any person can then raise objection within thirty days from the date of notice. Gridco has to reply to the objections and the person can send rejoinders. This process may take another thirty days. The Commission can take the help of outside professionals to review and investigate the data filed. After this, Commission conducts a 'public hearing', where it allows the public to raise questions and seek answers from Gridco. Based on the information available and the hearings, the Commission takes decision on the tariff-hike. The Commission has to complete the entire process within 90 days from the submission of all information. This comprehensive process provides an important mechanism to control Gridco and to restrain it from misusing its monopolistic position.

Orders issued by the Commission have made significant progress in reforming the electricity tariffs in the State. The Commission has been guided by the parameters prescribed by the The Electricity (Supply) Act 1948. The Act, however, allows the Commission to deviate from the prescribed parameters by giving justifications. The Act has been the basis for determining the revenue requirement of distribution licenses since its notification in 1948. One of the limitations of the Act is that it does not provide for incentive for efficient performance. One of the objectives of the reform was to address this limitation. The Regulatory Commission made an effort in this direction by introducing a hybrid tariff. Under this, it allowed Gridco to earn an enhanced rate of return as and when it reduces the T&D loss to 35 per cent or less. Moreover, it has made the tariff structure efficient by distributing risk among the various players in the industry. Separate tariff orders for bulk supply, transmission and distribution, and retails supply have been issued by the regulator. Some of the important features of these tariff orders are described below.

In its first tariff order OERC allowed an average increase of 10 per cent and initiated steps to reduce the cross-subsidisation. It is interesting to observe that Gridco's tariff proposal was

based on the expected T & D loss of around 46 per cent, whereas the Commission allowed only 35 per cent. As a result, Gridco continued to incur financial loss.

The second tariff order was a historic one. The tariff allowed once again 35 per cent of T&D loss and proposed an additional incentive of 1 per cent for every percentage-point reduction. For the first time, the tariff was unbundled on the basis of the activities of Gridco. The bulk supply tariff was segregated into demand and energy charges. Fixed charges in generation were recovered in the form of demand charges. Similarly, the retail tariff was un-bundled into a customer service charge, demand charge, and energy charge.

The third tariff order was made after privatisation of the distribution business. In the bulk supply tariff, the Commission allowed transmission loss of 4 per cent (against 5.3 per cent claimed by Gridco). It was important to note that average power purchase cost of 103 paise per unit was allowed (against 118 paise). This forced Gridco to undertake proper power purchase planning. Similarly, the Commission disallowed pass-through of interest on bonds issued in lieu of overdue payables to power suppliers, thus making it obligatory for Gridco to get Commission's approval for any financial restructuring proposal. A significant outcome of the order was that the Commission disallowed rural electrification works without adequate budgetary support from the Government of Orissa.

WINNERS AND LOSERS

Reform and privatisation changed the way one looked at electricity, from a universally available product to a commercial one. But, the moot question is, "Who gained and who lost?" Entities affected by the reform were the Government of Orissa, suppliers of power, investors, consumers, and the electricity sector as a whole. It would be interesting to check how each fared under the restructuring exercise.

Government

Government is major winner in this reform, which allowed it to reduce its exposure to this volatile sector at a time when its financial position was precarious. It realized Rs.159 crore by divesting 51 per cent of its stake in the distribution companies and around Rs.600 crore by divesting its stake in OPGC. It also got Rs.356 crore by selling TTPS (Talcher Thermal Power Station) to NTPC, which was adjusted against erstwhile OSEB's overdue payments to NTPC.

But, more important, the Government has already saved more than Rs.1200 till now by stopping subsidy to the electricity sector.

Suppliers of Power

One of the drivers of the reforms was the intention to reduce the financial burden on generators. It was expected that, after reforms, Gridco would make timely payments to OPGC, OHPC, and NTPC. However, it has not happened.

Investors

Table-13.5 below shows the parties who have acquired stakes in the newly formed distribution companies.

Table – 13.5

	New Investor	Stake acquired	Money paid (Rs. in crore)
Cesco	AES	51%	42.00
Wesco	BSES	51%	88.19
Nesco	BSES	51%	
Southco	BSES	51%	28.80

The balance-sheets of Gridco (which remained as a transmission company) and the four distribution companies highlight the benefit that has been extended to the investors. Common size balance sheet of these companies are as follows (please see Table-13.6 below).

Table-13.6

	Gridco	Cesco	Wesco	Nesco	Southco
<i>Total Funds</i>					
Capital and Reserves	20%	13	18	13%	13%
Accumulated Profit (- for Loss)	-26%	0	0	0	0
Long Term Loans	69%	48%	50%	50%	57%
Current Liabilities	37%	40%	33%	37%	30%
<i>Total Assets</i>					
Fixed Assets	61%	60%	67%	63%	70%
Current Assets	39%	40%	33%	37%	30%

Source: Based on the Government of Orissa Gazette.

It is interesting to note that the entire loss of transmission and distribution business was retained in the balance-sheet of Gridco, resulting in a negative book net-worth of Gridco; the distribution companies were not required to share it. Moreover, the capital structure of Gridco was also highly leveraged, with long-term loans accounting for 69 per cent of the total sources.

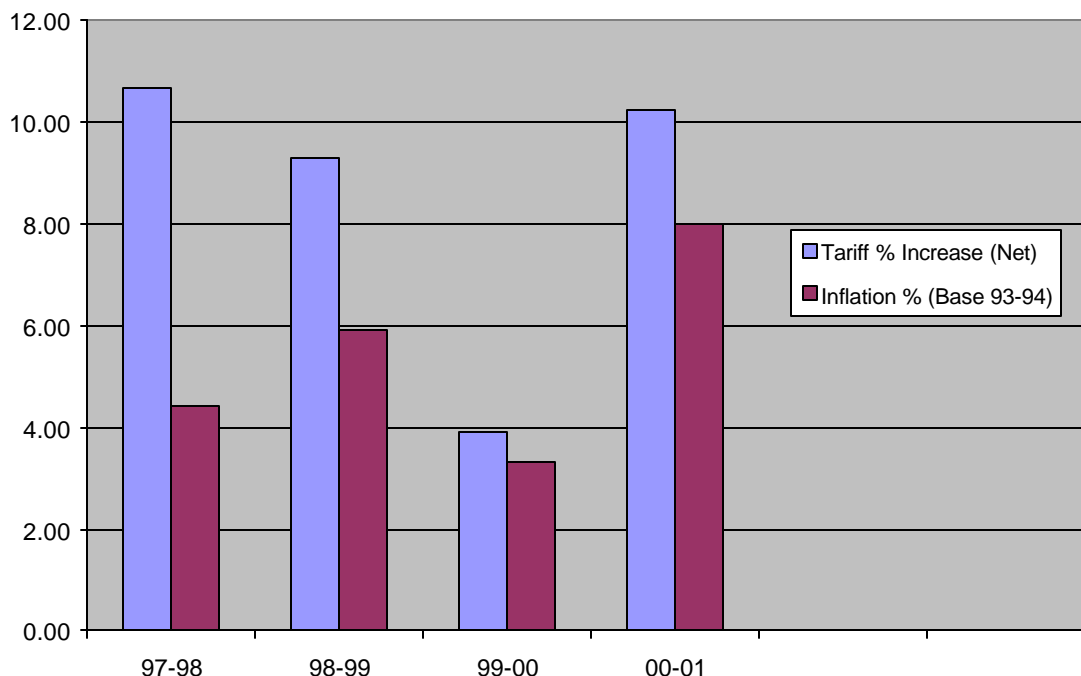
The lop-sided balance sheet created liquidity problems for Gridco, which, in turn, affected its suppliers. The generous balance-sheets doled out to distribution companies and the handing over of three companies to one player shows the Government's obsession with completing the privatisation process rather than reforming the sector.

Consumers

Consumers can be divided into three broad category, namely, LT, HT, and EHT. As the reforms endeavour to reduce the cross-subsidization there is every possibility of the large consumers to benefit from the process. Consumers, irrespective of the category, benefit if the tariff reduces and the service improves. But, the tariff has already been revised four times. And, what is more important, the increase in tariff has far surpassed the rate of inflation, as depicted by Figure-4 below. Moreover, though the overall power available has increased over the years, the quality of service has not improved to the extent it was expected. Since the distribution companies have decided not to make any capital expenditure, the quality of the

service that was offered by them has been affected. Consumers clearly have, so far, borne the brunt of the reforms and privatisation.

Figure – 4



THE ELECTRICITY SECTOR OF ORISSA

The gains or losses of the sector can be analysed by studying reform’s impact on generation, transmission, and distribution as well as on the competitive structure of the sector.

Generation

There were both positive and negative influences on the generators. Some of them are as follows:

TTPS

In case of the TTPS, the operational parameters improved. For example, the PLF improved from around 30 per cent to 63 per cent. This, in turn, had a positive impact on the tariff, as it reduced from 167 paise to 120 paise per unit. The new management also initiated various steps to modernise the plant as well as to improve the environmental performance and the working and living condition of the employees.

OHPC

The entire power generated by OHPC is being supplied to Gridco. In fact, 30 per cent of the power purchased by Gridco is accounted for by OHPC; and it is the least cost source with a tariff of 49 paise per unit. Despite the low tariff, OHPC has earned profit since its inception. Even after three years of operations, OHPC continues to sell power on the basis of single part tariff.

Transmission

Gridco remained as a transmission company, overburdened with the entire accumulated loss of OSEB and a large chunk of its loans. Reforms brought in more woes for Gridco. Some of them are as follows:

- Losses have increased from Rs.50.50 crore (1991-92) to Rs.305.83 crore (1998-99)
- Outstanding loans increased from Rs.122.13 crore (31 Mar 1996) to Rs.2489 crore (31 Mar 2000). As a result, debt-to-equity-ratio moved from 4.84 to 7.36 during this period, against the acceptable ratio of 2.33.
- Dues outstanding to generators increased from Rs.358.85 crore (31 Mar 1996) to Rs.1222.61 crore (31 March 2000)
- Cost of power purchased increased without a corresponding increase in the bulk-supply tariff, since OERC approved only 4 per cent transmission-loss for 1999-2000 financial-year, against the proposed 5.51 per cent.
- Able to collect only 70 per cent of the bulk-supply tariff billed to the distribution companies. This led to a cash-deficit of Rs.66.5 crore (1999-00) and Rs.26 crore (2000-01) respectively for the last two years.

Distribution

Even after two years of reforms, the distribution companies' performances have not improved significantly. Some of the observations are as follows:

- Though billing as a percentage of input increased marginally during April-March 2000, it was still less than OERC's approved percentage of around 65 per cent. Overall billing was 56.8 per cent of the input in that year against 54.0 per cent in the previous year. So T&D loss remained in the range of 45-46 per cent, which is still considered to be very high.

- Gross margin (energy charges minus the cost of power purchased) increased from around 4 per cent (1998-99) to 17 per cent (1999-00).
- One of the important performance indicators of the distribution companies is 'Collection as % of Billing'. Overall collection has declined from around 70 per cent (1998-99) to 65 per cent (1999-00) for the LT and HT consumers.

Competition in the Sector

In place of an integrated government owned OSEB, today the power sector of Orissa has two major players, namely BSES and AES, in the distribution business. BSES controls two-thirds of total distribution business. AES is also in the generation business. AES is in a unique position of being supplier of power (with 49 per cent stake in OPGC) and a major customer (with 51% stake in Cesco). It can arm-twist Gridco and get a better deal. Will this usher in competition?

LESSONS LEARNT

At the time of initiating the reform process, it had been mentioned that, over the years, the role of the government would reduce, competition would increase, an independent regulator will regulate the sector, and all those would lead to a more satisfied consumer.

Even today, the top management is more concerned with the wishes and whims of the Government. Time and again, persons from the civil-services-cadre have been made the CEO of Gridco. Corporate governance continues to be a problem with former Gridco Chairman continuing in Gridco as non-executive directors, while also being in the boards of distribution companies, with things exacerbating when one of them became recently the OERC member. Another unresolved issue is the degree of regulators' independence. The regulator has been entrusted with the dual responsibilities of controlling monopoly and promoting competition. Though the OER Act contains provisions allowing the regulators to work in an independent manner, the Commission still has to take the approval of the Government for staff and budget. This lack of financial independence limits its autonomy.

Cross-holdings also create problems. BSES holds 51 per cent stake in three of the four distribution companies, and AES holds 51 per cent and 49 per cent stake respectively in one of the distribution companies and in OPGC, the major supplier of power. Even OERC does not

have necessary powers or monitoring mechanisms to prevent creation of indirect or direct monopolies.

AES, while acquiring the Government's stake in OPGC, insisted on the liquidation of Gridco's entire dues to OPGC as precondition. Moreover, OPGC has also entered into an escrow account with Gridco, and there is a possibility of revenue from Cesco being diverted to OPGC. Is this a by-product of the cross holding? The entire sector is in a dynamic situation, and the initial structure can change with passage of time. One such possibility is the further increase of the private players' stakes in the distribution or transmission business. Such changing patterns will increase the problems of most of the stakeholders, like customers, regulators, and suppliers. *Will these uncertainties make Orissa go the 'California' way ?*

Some of the specific lessons that the reforms taught us were as follows.

Strengthen, not just Un-bundle

Should other States rush and implement the Orissa model? Answer, of course, will not be an emphatic 'Yes'. If other States have to follow Orissa, it will be wiser for them to follow the Institution Strengthening Programme (ISP) component of the reforms process. Under ISP, an effort was made to improve the revenue cycle, professionalise the organisation, reduce non-technical losses, and empower the existing staff with the help of training and computerisation. In fact, it has been reported that, a mere 10 per cent cut in the actual transmission and distribution loss across all States could fetch the Boards an additional revenue of around Rs.12,000 crore (Financial Express, 14 Nov. 2001).

Streamline and Rationalise Tariff Setting Process

Before other States can emulate the Orissa model, it is necessary to remember that, in Orissa, agriculture accounts for less than 3 per cent of the total electricity consumption, whereas, in some States like AP and Haryana, the percentage is very high. Therefore, it is essential that the model tariff setting process of Orissa be experimented without going for the whole process of privatisation and an effort be made to rationalise the tariff structure. OERC, for instance, has initiated the process of involving the public in the tariff setting process. The experience gained can be used by other States.

Do Not Privatise Blindly

Change of ownership may sometimes lead to better performance, and sometimes worse. So, efforts should be made to change the ownership, if at all, wisely. It may not be necessary to burden the existing company with all the losses and create healthy balance sheets for divested businesses while scouting for a private party; Gridco retained in its own books about three times the quantum of liabilities passed on to the four distribution companies. It may be necessary to undertake a proper valuation of assets and create a reasonable balance sheet with an acceptable debt-equity ratio. If privatisation is expected to usher in competition, cross holdings should be avoided. Above all, it should be recognised that it is not privatisation, but better management, which can bring in efficiency.

POWER SECTOR IN ORISSA: POTENTIAL AND VISION 2010*

Power as the prime mover for growth is the most important infrastructural input for socio-economic development including agriculture and industry of any country. This has specific significance in respect of Orissa which has abundant natural resources like coal, bauxite, iron ore, dolomite etc. This provides ample scope and opportunity for exploitation of mineral resources providing input for large and power intensive industries. Such kind of utilisation raises per capita consumption of electricity which is considered a measure of yardstick of progress of any developing economy.

Sources and Means of Supply

The various sources of generation available to the State are the Hydro Generating Station owned by OHPC, the thermal generating stations owned by Talcher Thermal Power Station (NTPC) and Orissa Power Generation Corporation. In addition to these internal generations which are fully dedicated to the State, Orissa has an allocated share from central generating station (CGS) supplied through Eastern Regional Electricity Grid of which the State is a constituent. The capacities of the plants dedicated to Orissa along with their firm capacity and peak capacity as on 2000-01 is given in the Table 13.5.

* Based on a vision document prepared by the Dept. of Energy, Govt. of Orissa in order to put the power sector reform in perspective.

Table – 13.5

Category	Installed Capacity (MW)	Firm Capacity (MW)	Peak Capacity (MW)
Hydro	1896	682	1470
Thermal	880	515	722
Share of CGS	690	415	460
Total	3466	1612	2652

Interconnection with other zones

The Eastern Regional Electricity Board performs the role of coordinating system of its constituents preparing the generation schedule to match the load generation output and utilising the interstate transmission system for evacuation of power from zone to zone. Regular monitoring is made by coordinated approach to meet certain operational, standards continuously and economically.

The grid network is also utilised by the existing Captive Power Stations in the State for the purpose of despatching their generation to the Captive Plants, which are located away from the generating plants. Major Captive Power Plants like that of NALCO, RSP, ICCL (Chowdar), INDAL (Hirakud) are connected to the EHT system. The Captive Power Plants are also connected to the EHT network for drawing power for the purpose of black start up after a total shutdown/breakdown. Some time industries with CPPs also draw operational power due to low generation in CPPs.

The sub-transmission and distribution system comprises of 33 KV, 11 KV and LT lines which are spread throughout the State for meeting the needs of the consumers. The extent of transmission, sub-transmission and distribution network as on 31st of March 2002 is given the table below :

Table – 13.6

Transmission Lines (CKT-KM)		Distribution lines (CKT-KM)	
4000 KV Lines	241.5	33 KV lines	9155.6
220 KV Lines	4474	11 KV lines	48850.60
132 KV Lines	4651	LT lines	54107.78

Thermal Power Generation in Orissa

According to the Annual Report 1995-96 of the Ministry of Coal, Government of India, the coal reserves of Orissa is 46,722 million tonnes out of 2,01,953 million tones estimated for the whole country. Around 85 per cent of the coal reserves in the country are in the non-cooking coal category. The non-cooking coal has ash content of 30-50 per cent with considerable amount of extraneous content.

The deposit of coal in Orissa is mostly concentrated in Talcher and Ib Valley area, which is around 23 per cent of the entire coal potential in the country. This can sustain the power generation of the State as well as a source of power supply to the rest of the country. The aspects related to thermal generation are as follows.

1. availability of power grade coal and feasibility of its transportation
2. availability of sources of water
3. availability of land for power plant, township and ash disposal
4. the geological suitability of sites, soil conditions and amenability to floods
5. environmental considerations
6. evacuation of power to load centre

The generation potential for the coal reserve could be gauged from the fact that a 300 MW thermal plant running at PLF of 75 per cent consumes around 13 million tones of coal per annum. Therefore, the coal deposit in Orissa can sustain 100,000 MW of generation for a period of 100 years.

Table-13.7

State Thermal	Installed Capacity	Firm Power
TTPs	460	255
OPGC	420	260
Central Thermal	Orissa Share	
Farakka (1600MW)	235	143
Kahalgaon (840MW)	135	82
Kaniha Stage-I (2*500 MW)	262	160
Total Thermal	1512	900

In addition to this major CPPs like National Aluminium Company, Rourkela Steel Plant, Indian Charge Chrome Ltd, Chowdar, Ferroo Alloys Corporation, Bhadrak and other Captive Power Plants have total installed capacity of 1380 MW. The CEA with the approval of Central Government have published a document viz. fuel of India where the broad scenario of power generation by 2012 has been brought out which indicates the following thermal power stations for consideration in the State of Orissa (Table-13.8)

Table-13.8

Name of Proposed Power Stations	Installed Capacity	Year of Completion (proposed)
Hirma Power Project developed CEPA	6x660MW=3960 MW (stage-I) 6x660MW=3960 MW (stage-I)	2002-07 2007-12
AES Ib Valley Unit 5 & 6	2x250 MW=500 MW	2002-07
OPGC Unit – 3 & 4	2x210 MW=420 MW	2002-07
Duburi KPCL0	2x250 MW=500 MW	2002-07
Naraj	2x250 MW=500 MW	2002-07
NTPC, Kalimela	2x500 MW=1000 MW 2x500 MW=1000 MW	2002-07 2007-12
Total	11,840 MW	

The addition of these mega power station will not only meet the requirement of the State but shall be a source of the power starved State of the other region.

Hydro Potential

Among the states of the Eastern Region Orissa is favourably placed as far as the hydro resources are concerned (Table-13.9).

Table – 13.9

State Hydro-electricity Project	Installed Capacity	Firm Power
Hirakud	331.5	134
Balimela	360	135
Rengali	250	60
Upper Kolab	320	95
Indravati	600	224
Machkund (Orissa share)	34.43	34
Total Hydro	1895.93	682

The future planning involves installation of new hydel projects to meet the future demands of the State and this is given below (Table-13.10).

Table – 13.10

Balimela	150 MW
Hirakud-B (4x52 MW)	208 MW
Chipilima-13 (4x50 MW)	200 MW
Sindol-I (5x20 MW)	100 MW
Sindol-II (5x20 MW)	100 MW
Sindol-III (2x60 MW)	120 MW
Balimela Dam Toe (2x30 MW) 50% Orissa share	60 MW
Total	938 MW

In addition to this there is also scope of development a number of small, mini and micro hydel power stations to the extent of 200 MW among with the following are worth mentioning.

1. Samal Barrage - 180MW
2. Jalput Dam Toe - 18 MW (50 % Orissa share)
3. Harabhangi - 24 MW
4. Salandi - 6 MW
5. Bargarh canal - 6 MW
6. Lower Machkund - 25 MW
7. Lower Kolab - 20 MW

Perspective Transmission Plan

A report on the Perspective Transmission Plan 2011-12 was prepared by the Central Electricity Authority in June 1999 and released by the Hon'ble Minister of Power on the 1st October 1999. A number of transmission layouts have been proposed corresponding to the two generation scenarios considered in the Report, so that, at an appropriate time in the future, with the uncertainty in generation capacity addition reduced, and with the views of important power sector agencies available, a nationally agreed direction for the development of the National Grid would be formulated, from amongst the indicated and other options. Certain issues which

pertain to generation and transmission system development in the 2011-12 time frame have been highlighted in the Perspective Transmission Plan 2011-12, and in relation to these issues, a number of options are still open. Regional level consultations and national level consultations are proposed to be held so that a nationally agreed direction for the development of the National Grid could be formulated.

Approaches to the Perspective Transmission Plan

The basic approach to the Perspective Transmission Plan 2011-12 has been that the country as a whole would be treated as one spatial unit for planning with free flow of power across regional boundaries or state boundaries. The generational schemes would be developed keeping in view the suitability of generation sites and the preferences expressed by the promoters, in particular the Independent Power Producers. The identification of the bulk transmission corridors has been done in such way that even if there are changes with regard to the exact location of certain large thermal power stations, a transmission corridor would not be changed altogether. With this end in view, power in the exporting regions has been sought to be pooled at a few locations and then transmitted by extra high voltage AC or High Voltage Direct Current (HVDC) transmission lines of high capacity to the importing region and then depooled in the importing region for transmission to smaller load centres.

The bulk power transmission system associated with mega power projects has been sought to be integrated with the bulk power transmission system for inter-regional power transfers. In this way the right of way requirements have been sought to be conserved.

Power Exchange Scenarios

Two power exchange scenarios have been considered in the Perspective Transmission Plan 2011-12 upto 10500 MW flow from one region to another has been considered. These exchanges are based on the generating capacity projected for 2011-12. Mostly Northern region will have deficit of power which will be largely met from thermal generating stations planned in Orissa.

There are two generation scenarios for 2011-12, and the ratio of hydroelectric capacity to thermal (including nuclear) capacity in one is different from the corresponding ratio in the other. In Generation Scenario-I, 69,359 MW hydroelectric capacity and 1,71,563 MW thermal

(including nuclear) capacity have been considered. In Generation Scenario-II, the capacities considered are 77,948 MW and 1,62,935 MW respectively.

One of the important parameters on the basis of which the national power highways for bulk inter-regional transfer would be identified is the expected quantum of inter-regional power exchange. Therefore, in the light of reviews of generating capacity expansion plans and power surveys, the projections for installed generating capacity in the various regions, the load projections in the various regions, and the corresponding quota of power exchange between the regions are required to be reviewed in the light of new developments.

Generating Capacity in the Southern Region and the Talcher-Kolar High Voltage Direct Current Bipole

The surplus power in the Southern Region in the various despatches under the two generation scenarios has been taken to be between 1000 MW, and 6000 MW, as indicated in the preceding section. This projection is based on the expectations that a number of generating stations would be constructed in the Southern Region based on imported coal /LNG both under station/Central Sector and by Independent Power Producers. At present there is a huge shortage of electrical energy in the Southern Region and the Talcher Stage-II (4 x 500 MW) project in the Eastern Region has been dedicated to the Southern Region with power transfer planned on the Talcher - Kolar High Voltage Direct Current (HVDC) bipole of 2000 MW capacity.

Power Evacuation from Hirma

For power evacuation from the Hirma project of Consolidated Electric Power Asia (CEPA), the HVDC transmission option to the Northern Region has been considered in four of the five transmission layouts. The capacity of the HVDC links has been considered as 2 x 3000 MW bipoles in two of the layouts and 2 x 2700 MW bipoles in the other two layouts. In one transmission layout, the 765 KV AC transmission option has been considered and the transmission requirements for evacuating power from Hirma have been integrated with the transmission requirements for other power transfers from the Western Region to the Northern Region. In this layout 765 KV lines have been proposed to cater to the overall requirements, covering Hirma power and transfer of regional surplus power.

Targeted Reduction in T & D Losses

In 1996-97 the T & D loss levels were 51 per cent which has been brought down to 45 per cent by 2001-02. However, aggressive steps like 100 per cent metering of consumer, feeder and LV side transformer are being taken to reduce the present loss level to an accepted level of 21 per cent by 2006-07. The present consumer strength in the State is about 20 lakhs with a consumption of 12,000 MU.

The privatised DISTCOs shall conformed to unambiguous target of loss reduction, billing and collection efficiency and maintain appropriate standard of performance to meet the power quality standard.

Energy Conservation, Demand Side Management, Loss Reduction and Energy Audit

Infrastructure industry like power is highly capital intensive. The investment cost can be substantially reduced by resorting to energy conservation measures, following demand side management and reducing loss in transmission and distribution through appropriate legal, technical and managerial approaches. A unit of energy saved is equivalent to a saving in cost of a unit generation.

The need of the hour is energy efficiency to save power by cutting wasteful consumptions in homes, offices, factories and fields. By saving in use of power the country and the State can save in consumption of coal and save investment required for creation of infrastructure facilities for power and coal. The Government will conscientiously follow and implement energy audit to attain the objective of efficient utilisation of energy resources.

It is estimated 25 per cent to 30 per cent energy saving can be achieved through power supply/ demand side management. By reducing the T & D loss to 21 per cent from the existing 45 per cent saving 24 per cent power will also be achieved. Thus in total a substantial saving of about 50 per cent would be achieved through supply/ demand side management and system loss reduction. To that extent addition of new generation capacity could be avoided.

Capital Investment

The total estimated addition in generation both hydro and thermal upto the year 2012 is around 12748 MW comprising of 11840 MW thermal and 908 MW of hydro generation. It will require an estimated investment of Rs.1,14,732 crore upto 2012 calculated at an installed cost of Rs.4.5 crore per MW and an equal amount for transmission and distribution. This takes into consideration an export of 10,000 MW of power to the States outside Orissa.

Rural Electrification

The rural electrification works may be completed by the end of the 10th Plan i.e. by the year 2007. Full coverage of the household may be targeted by the year 2012 as resolved in the Chief Minister/Power Minister's Conference on 3rd March 2001.

The total number of revenue villages is 46,989, out of which 37,036 have been declared as electrified leaving balance of 9953 villages yet to be electrified.

- (a) **Off grid supply** : Out of this around 5000 number of villages will have to be covered under non-conventional means as existing line and number of substation for this remote villages may not be feasible due to long length of lines, forestry and undulating terrain.
- (b) For achieving 100 per cent village electrification the rest of the villages will be covered through conventional means of electrification.
- (c) **Kutir Jyoti** : Till now Orissa had provided power supply to the Scheduled Caste and Scheduled Tribe households through Kutir Jyoti scheme to 103650 consumers. It is estimated that Kutir Jyoti connections will have to be given to around 6 lakh beneficiaries.
- (d) The existing villages where power supply is available suffer from low voltage, overloading of the existing transformers and long LT lines leading to frequent interruption of power supply, accidents involving human life and cattle during storm or flood. This problem will be addressed by providing additional transformers in these villages and upgrading existing lines for stability of power supply.
- (e) **System Improvement Programme**: Villages electrification, hamlets, households, Kutir Jyoti and providing L. I. points will increase the energy demand on the System Orissa. A number of 132/33 KV substation and also 33/11 KV

primary substation are under construction at the level to meet the enhanced load demand.

Long-term Planning

The distribution of primary commercial energy resources is quite skewed. Eastern region accounts for 70 per cent of the total coal reserve in the country and similarly 70 per cent of hydro power potential is located in Northern and North-Eastern region put together.

There are two computer model studies available with CEA for carrying out generation expansions and planning exercises – Electric Generation Expansion Analysis System (EGAS) and Integrated System Planning (ISPLAN) based on deterministic approach. The optimal and economic use of resources is found to generate power at pit heads and transport large blocks of power through EHV lines to load centres.

The load is substantial in Northern and Western Regions to which power is to be fed by EHV lines.

Orissa has the potential of exporting 10000 MW to other Regions of the country by 2012.

CONCLUSION AND FUTURE PERFORMANCE OF REFORM IN THE STATE

The final phase of reform in the power sector involves separation of wire business, supply business and load despatch function of Gridco to separate business activities. For competition in power market multi-buyer model will be introduced giving the DISTCOs the choice of purchase of power from the generators. Likewise, the consumers at appropriate time may be given the choice of their supplier of electricity. To make the future tariffs more predicible and also to bring in efficiency in functioning of DISTCOs a long term tariff strategy will be adopted with the approval of OERC. In the latter stage equity of wire business will be disbursed in favour of PSIT.

According to the 16th Electrical Power Survey published by CEA the energy requirement of the peak load for Orissa has been estimated as under (Table-13.11).

Table – 13.11

Year	Energy (MU)	Peak Load (MW)
2001-02	14002	2317
2006-07	18278	3024
2011-12	23741	3928

The existing generation capacity, transmission and distribution network requires continuous upgradation for assuring qualitative and reliable supply of power at an affordable price which requires proper load forecast, timely planning and execution. In that context, a long term power planning is very significant so that an economically backward State like Orissa does not fall back in attaining the required GDP. The Central Electricity Authority has been formulating long-term perspective power plans for the entire country, which contains an appropriate direction for the future power development in the State. The CEA has carried out detail system planning studies for the 9th, 10th and 11th five-year plans. The 16th Electric Power Survey (EPS) has been reviewing the demand projections upto the year 2004-05 and assess the electricity demand upto the year 2015-16. The CEA has also worked out the requirement of installed capacity for meeting the “Power on Demand by 2012”. In that context the requirement of generation and transmission for the purpose of planning upto the year 2012 is very significant. The CEA has considered the following issues for setting plan objective and targets.

- Accepted level of reliability
- Options for power development including their technological, economic, environmental and ecological aspects as well as the global trend of fuel availability and pricing trend
- Demand and supply side management options
- Policy of the Government
- Power Development in Orissa

Needless to say, Orissa is strategically located with facilities of inter connection to Eastern, North-eastern, Southern and Western Zones of the country through extra high voltage transmission network. Besides it is the power house of India with a coal deposit to generate 1,00,000 MW of power for a 100 years. This needs exploitation for benefit of the State and the country.