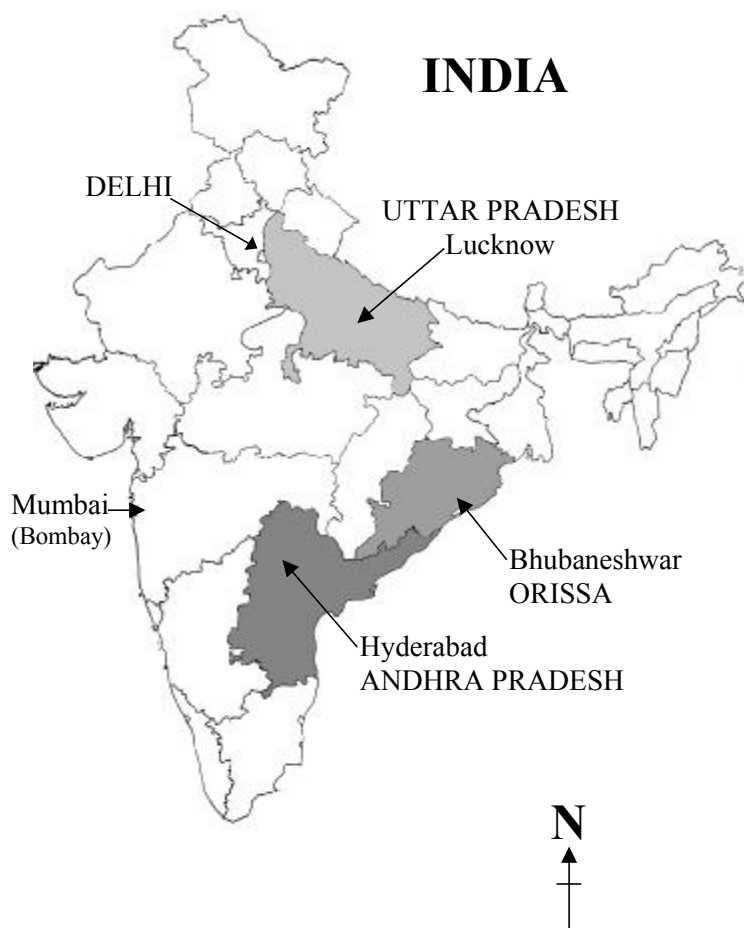


INDIA POWER SECTOR REFORMS UPDATE

Since 1990s, several countries have embarked on fundamental restructuring of the power sector. This restructuring typically involves moving from integrated, monopoly utility structure to competitive industry structure and shift from government / public owned utilities to private utilities. Several groups such as NGO's, Environmental Groups and utility workers' unions have pointed out severe and fundamental flaws and dangers in these restructuring efforts. Often one can find striking similarities in the restructuring path adopted by different countries, critique of the same by various groups as well as the implications of the same.

Further, main stream institutions such as multilateral institutions (the World Bank and other Bretton Woods Institutions), financial institutions and multinational companies have been able to learn from these developments across the globe and to evolve effective responses to these developments. Unfortunately, the civil society groups which are highly critical of these reform processes have little resources to keep track of developments around the globe and to learn from the same. India Power Sector Reforms Updates is an attempt to fill this gap.

This is a joint initiative of Prayas, an Indian NGO based in Pune, working on power sector issues for a decade and Public Services International (PSI) which is an international trade union federation, uniting public sector workers in more than 500 trade unions in over 140 countries. Our aim is to continuously monitor the developments in Indian power sector and communicate the same to wider audience of civil society groups and utility workers' unions around the world. Considering the limited resources of Prayas and PSI compared to the great diversity in power sector restructuring in different Indian states we will be concentrating on three Indian states of Orissa, Andhra Pradesh and Uttar Pradesh shown in the following map. These updates, tracking developments in these states will be published every quarter. Please direct your suggestions and comments to PSI at psiru@psiru.org.



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INDIA POWER SECTOR REFORMS UPDATE : ISSUE I

First issue of the Update is aimed at developing a base line information about the Indian power sector and the three focus states. Part I of the update gives an overview of the Indian Power Sector to facilitate better understanding of developments in the three states. Annexure I lists some websites giving useful information about the Indian power sector, which would be useful for further understanding and research of Indian power sector. Annexure II contains glossary of terms used in the updates. Parts II, III and IV of the update contain reports about the states of Orissa, Andhra Pradesh and Uttar Pradesh respectively. These parts have their own detailed Table of Contents, Data Tables and List of References. Reference number is given as part of the text, inside a square bracket. (For example: *OSEB has an installed capacity of 3456 MW [10,18].*)

Subsequent issues of the update will cover developments in these three states in the preceding quarter.

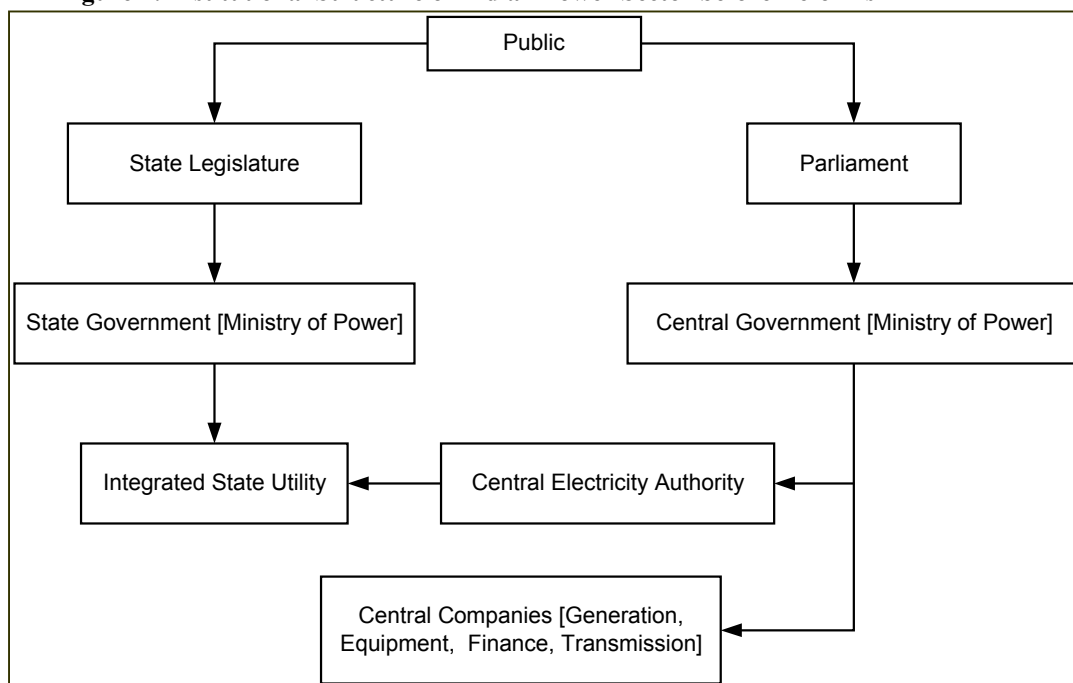
PART I: OVERVIEW OF THE POWER SECTOR IN INDIA

1. PRE-REFORM STRUCTURE

India is the second largest country in the world in terms of population (over 1 billion) and the seventh largest in terms of geographical area (3.3 million sq. km.). India achieved freedom from British colonial rule in 1947 and soon embarked on a massive infrastructure building exercise. Power (electricity), being one of the most critical infrastructures of the modern industrial economy, received high priority and resources (person power as well as financial). India has twenty eight states (apart from five union territories) and the constitution of India clearly demarcates authority and responsibilities of state governments and central (federal) government. As per the constitution, power sector is a joint responsibility of state and central government. Power sector is governed by three principle Acts namely - i) The Indian Electricity Act, 1910, ii) The Electricity (Supply) Act, 1948 and iii) The Electricity Regulatory Commissions Act, 1998. The Indian Electricity Act deals with functioning and regulation of the private licensees whereas the Indian Electricity (Supply) Act mainly deals with establishment and functioning of State government owned integrated monopoly utilities (within the state) called State Electricity Boards (SEBs). As explained later, the more recent Electricity Regulatory Commissions Act provides for establishment of state level and central level electricity regulatory commissions (ERCs) for regulating the functioning of private licensees as well as SEBs. Figure 1 depicts the institutional structure of the power sector in India before evolution of Independent Power Producers (IPPs) and independent regulatory commissions.

The Indian Electricity (Supply) Act led to evolution of state owned State Electricity Boards (SEBs), which were formed in 1960s and soon took over numerous small private generation and distribution utilities in the respective states. SEBs are integrated utilities with monopoly over generation, transmission and distribution of power within the state. Except few urban based private distribution licensees in cities like Mumbai, Kolkata and Ahmedabad, entire distribution is in the hands of SEBs. In late 1970s the central government established National Thermal Power Corporation (NTPC) for generation of power from large pit head coal thermal generating stations. Currently, NTPC accounts for around 25% of India's total installed capacity and sells power to various states utilities (i.e. SEBs). Apart from NTPC, the central government also established companies such as Bharat Heavy Electricals Limited (BHEL) and Power Grid Corporation of India (PGCIL) for manufacturing of electrical equipment (turbines, transformers, boilers, etc.) and for erection and maintenance of interstate transmission lines respectively. The central government also regulates investments in power sector through it's agencies such as the Central Electricity Authority (CEA), which was created as per the Indian Electricity (Supply) Act 1948. All generation or distribution scheme above a particular size requires approval of CEA¹.

¹ For example till 1991 any scheme involving capital expenditure above Rs. 250 Million (~ US \$ 5 million at current exchange rate) required approval from CEA for technical as well as economical aspects.

Figure 1: Institutional Structure of Indian Power Sector before Reforms

Till 1991, the power sector was mainly under the government ownership (> 95 % distribution and ~ 98% generation) under various states and central government owned utilities. Table 1 highlights the growth of Indian power sector since independence. The remarkable growth of physical infrastructure was facilitated by four main policies, viz. i) Centralised supply and grid expansion, ii) Large support from government budgets in the form of long term, concessional interest loans, iii) Development of the sector based on indigenous resources, and, iv) Cross- subsidy i.e. charging industrial and commercial consumers above the cost of supply and to charge agricultural and domestic consumers below cost of supply.

Table 1: Growth of Indian Power Sector

Parameter	Present Status	Growth since independence (times)
Installed Capacity (MW)	97,000	55
No. of Consumers (Million)	80	52
Agricultural Connections (Million)	13	580
T & D Network ('000 ckt. Km.)	600	175
Electrified Villages ('000)	500	165
Per Capita Consumption (kWh)	350	22

Note: Above numbers are indicative

Subsequent to opening up of the sector in 1991 the requirement of CEA approval has been gradually relaxed and currently only schemes of capital expenditure above US \$ 50 million (for MoU based projects) and above US\$ 200 million (for projects through international competitive bid route) require CEA approval.

2. INDEPENDENT POWER PRODUCERS (IPPs)

In 1991, in response to severe foreign exchange crisis and lack of capital for expanding power generation capacity the Central Government opened up power generation for foreign and Indian private investment. Government offered concessions such as 100% foreign ownership, long-term purchase agreement, and assured profits (as high as 32% post tax return on equity every year in the currency of investment). In the initial period state governments and SEBs were allowed to enter into negotiated contracts with IPPs without competitive bidding. Initial response to this was enormous. During the three year period when such non-competitive contracts were allowed, SEBs signed 243 contracts (MoUs) for the capacity addition of over 90,000 MW (more than the national installed capacity at that time), amounting to contracts of nearly 90 MW per working day². In their zeal to sign as many IPP contracts as possible states and SEBs virtually gave a go by to even elementary norms of power planning including proper demand forecasts and evolution of least cost plans based on comparative costing of different options for sites and fuels. Only a handful of these contracts are likely to result in actual capacity addition. After 1995 the Central Government enforced competitive bidding route for acquiring new capacity (i.e. IPPs). Some projects have gone ahead through this route too. As per the IPP Report 2001, published by Power Line Research, since the opening up in 1991, till now only 3,200 MW of IPPs have come on line and another 2,700 MW have achieved financial closure. These figures include the projects bid competitively.

Major reasons for this failure to add capacity was weak financial situation of SEBs and lack of demand. IPPs found it difficult to achieve financial closure due to lack of creditworthiness of the sole buyer i.e. SEBs. SEBs were making huge financial losses mainly due to huge transmission and distribution losses (including theft) and highly subsidised tariff to agricultural and domestic consumers. Some IPPs could progress beyond the initial stage due to credit enhancement through guarantees from state and central governments as well as allocation of escrow facility³.

3. UNBUNDLING, PRIVATISATION AND INDEPENDENT REGULATION

In mid 1990s, Orissa state on the eastern cost of India began a process of fundamental restructuring of the state power sector. Under the World Bank (WB) loan, the state decided to adopt - what is known as WB-Orissa model of reform. This consisted of a three pronged strategy of: i) Un-bundling the integrated utility in three separate sectors of generation, transmission and distribution, ii) Privatisation of generation and distribution companies and, iii) Establishment of independent regulatory commissions to regulate these utilities. Soon afterwards several other states such as Andhra Pradesh, Haryana, Uttar Pradesh, and Rajasthan also embarked on similar reforms and also availed loans from multilateral development banks such as the WB and Asian Development Bank. Later states of Karnataka and Delhi also joined the bandwagon.

The Electricity Regulatory Commissions Act, 1998 of the central government enabled states to establish independent regulatory commissions obviating the need for a state level legislation. Several states such as Maharashtra, Tamil Nadu and Punjab have established regulatory commissions under this central legislation⁴. These states have not adopted the WB model of unbundling and privatisation as yet.

² MoUs, i.e., Memorandums of Understanding are preliminary contracts, establishing the intent of setting up of the project by both parties, i.e., the SEBs and the private promoters. These are not strictly legally binding contracts but ensure for the parties some kind of "first preference" for project development. Though a number of such MoUs are signed, it is likely that only a handful of these will actually materialise. But considering the magnitude of these contracts, it is likely that, in many states, for many years to come, the projects initiated through MoU route will continue to dominate the new capacity addition.

³ Escrow facility is a special agreement through which IPPs get priority access to SEB revenue. Revenue from SEB customers is deposited in a separate bank account, which can be directly withdrawn by the IPP in case SEB fails to honor IPP payments.

⁴ These states were forced by a court order (for example in Maharashtra) or induced by loan conditions of the central government, for forming the regulatory commissions.

In August 2001, the central government has introduced a bill, 'The Electricity Bill 2001'. Once approved by the parliament it will be converted into an Act. The Electricity Bill 2001 would replace the above mentioned three existing electricity Acts. It provides for increased competition in the sector by facilitating open access to transmission and distribution grid, power trading, and also allowing setting up of captive (only for self use) power plants without any restriction. The states have been given liberty to either adopt the provisions of this new Act or enact separate reforms Act of its own. The impact of this new Act will be far-reaching and more fundamental.

4. MAJOR ISSUES IN THE INDIAN POWER SECTOR

Though the governments (central as well as state) are fast moving ahead with reforms on above lines many civil society groups and utility workers' unions have raised several objections to this path of reforms. These groups typically argue that the government has been mainly responsible for the poor state of power sector. A coalition of vested interests consisting of sections of politicians, SEB workers, private contractors and consumers gradually took over the control of the sector. These vested interests bled the sector for personal and political benefits at the cost of larger public interest and financial viability of the sector. These groups fear that the proposed privatisation and reforms would lead to further adverse impact on consumers and economy as these reforms offer increasing role for private sector and further erode the ability of consumers and people to control the affairs in the sector. The process of inviting IPP - that has been marred in controversies - on account of environmental impacts, violation of human rights and adverse economic impacts - is sighted as example in support of their argument.

As a result of IPP signing race in 1990s many states are now trapped in a peculiar situation. On one hand this rush for signing IPP contracts resulted in little action on improvements in T&D losses (including power theft) and power quality. T&D losses continue to hover in the range of 40 - 50% of power generation. On the other hand, already signed contracts with IPPs have led to high costs and in many cases a surplus of power or inappropriate project. Following parts of this report - focusing on three states of Orissa, Andhra Pradesh and Uttar Pradesh - narrate in more detail the status of reforms as well as lacuna in the same.

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Annexure I: Some Useful Internet Resources for Information on Indian Power Sector

Prayas, Pune	www.prayas.pune.org
Ministry of Power	http://powermin.nic.in
Central Electricity Regulatory Commission	http://www.cercind.org
Central Electricity Authority	http://www.cea.nic.in
Orissa Electricity Regulatory Commission	http://www.orierc.org/
Andhra Pradesh Electricity Regulatory Commission	www.ercap.org
Uttar Pradesh Electricity Regulatory Commission	www.uperc.org
Orissa Government	www.orissagov.com
Andhra Pradesh Transmission Corporation	www.aptranscorp.com
Andhra Pradesh Generation Corporation	www.apgenco.com
National Thermal Power Corporation	www.ntpc.co.in
Powergrid Corporation of India	www.powergridindia.com
BSES Ltd.	www.bses.com
World Bank - India Power Projects	www.worldbank.org/projects
Asian Development Bank - India Power Projects	www.adb.org/India
Tata Energy Research Institute (TERI)	www.teriin.org
Power Line	www.indiapoweronline.com
Financial Express Newspaper	www.financialexpress.com
The Hindu Newspaper	www.hindugroup.net
Times of India Newspaper	www.timesofindia.com

Annexure II: Glossary of Terms

ADB	Asian Development Bank
AP	(The Indian state of) Andhra Pradesh
APERC	Andhra Pradesh Electricity Regulatory Commission
APSEB	Andhra Pradesh State Electricity Board
ARR	Annual Revenue Requirement
CCGT	Combined Cycle Gas Turbine (based power plant)
CEA	Central Electricity Authority
CERC	Central Electricity Regulatory Commission
CPP	Captive Power Project
CSIs	Civil Society Institutions
DFID	Department for International Development (of UK, called ODA before)
DISTCOM/ DISCOM	Distribution Company
DSM	Demand Side Management
EHV	Extra High Voltage
ERC Act	Electricity Regulatory Commissions Act (1998)
Financial Year	Indian Financial Year - 1 st April to 31 st March. Typically represented as FY 98-99 etc.
GENCO	Generation Company
GoI	Government of India
GoAP	Government of Andhra Pradesh
GoO	Government of Orissa
GoUP	Government of Uttar Pradesh
GRIDCO	Grid Corporation
HP	Horse Power (1 HP = 746 Watts)
HT	High Tension (or High Voltage)
HVDC	High Voltage Direct Current
Hz	Hertz
IDBI	Industrial Development Bank of India
IDFC	Infrastructure Development Finance Company Ltd
IPPs	Independent (Private) Power Producers
IPS	Irrigation Pump Sets
IRP	Integrated Resource Plan (usually implying a least-cost plan that takes an integrated view toward all energy options)
kCal	Kilo Calories
kg	Kilograms
kV	Kilo Volt
kVA	Kilo Volt Ampere
kW	Kilo Watt
kWh	Kilo Watt Hour
LNG	Liquefied Natural Gas
LT	Low Tension (or Low Voltage)
MDBs	Multilateral Development Banks (such as the WB and ADB)
MkCal	Million Kilo Calories
MoU	Memoranda of Understanding
MP	(The Indian state of) Madhya Pradesh
MU	Million Units (million kWh)
MW	Mega Watts
NGOs	Non-Government Organisations
NHPC	National Hydro Power Corporation
NPC	Nuclear Power Corporation
NTPC	National Thermal Power Corporation
ODA	Overseas Development Agency, UK (now called DFID)
OECD	Overseas Economic Corporation Fund of Japan
O&M	Operation & Maintenance
OSEB	Orissa State Electricity Board

PFC	Power Finance Corporation (a GoI-owned financing agency for the power sector)
PLF	Plant Load Factor (also called Capacity Utilisation Factor)
PSIRU	Public Services International Research Unit
R&M	Repair & Maintenance
RC	Regulatory Commission
REC	Rural Electrification Corporation, New Delhi
Rs	Rupees (Indian currency)
SAR	Staff Appraisal Report (the project appraisal document from the WB)
SEBs	State Electricity Boards (vertical monopoly power utility owned by the state government)
SERC	State Electricity Regulatory Commission
T&D	Transmission and Distribution
TEC	Techno Economic Clearance
TOD	Time-Of-Day
TRANSCO	Transmission Corporation
UP	(The Indian state of) Uttar Pradesh
UPSEB	UP State Electricity Board
WB	The World Bank group

PART II

ORISSA

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 - 2.3 Talcher Thermal station
 - 2.4 Independent Power Producers
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 - 3.2 Policy Statement
 - 3.3 Reform Act
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 - 3.5 Subsequent Developments
 - 3.6 Private Sector Participation
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 - 3.6.2 Generation
 - 3.6.3 Impact of Privatisation on GRIDCO
4. **Regulatory Process**
5. **Policy Interventions**

Annexure with Tables

References

1. ORISSA STATE

The state of Orissa in east India was constituted in 1936 (before independence) and currently has a population of nearly 32 million. Orissa is one of the poorest states in India. Most of the 'average' development indicators of Orissa are far below the national average. These include per capita income (US\$ 131 v/s national average of US\$ 260), population below the poverty line (49% v/s the national average of 36%), literacy (49% v/s 52%) and infant mortality rate. Economy is largely agriculture based with nearly three-fourth of the population dependent on it. State is rich in mineral resources and has nearly one-fourth of India's coal reserves. Orissa has the misfortune to be ravaged by natural calamities- droughts during summer and cyclones during the rainy season. Table -1 in Annexure gives a statistical overview comparing Orissa with all India in terms of population, area, per capita income, poverty level, literacy and electricity consumption.

Orissa is the 'pioneer' state in power sector reforms in India. Reforms were initiated in 1993 when the Congress party was in power. Subsequently, Biju Janata Dal, a state level party, has taken control, but the reform process has not changed course. With more than 6 years of reform experience, Orissa is the centre of attention for all power policy watchers in India.

2. DEVELOPMENT OF THE POWER SECTOR

2.1 ORISSA STATE ELECTRICITY BOARD

The key power utility in the state was Orissa State Electricity Board (OSEB). Similar to other SEBs in the country, OSEB had a monopoly in the power sector and functioned under the overall guidance of the state government, interacting with the central power agencies for planning and co-ordination. With head quarters in Bhubaneswar, OSEB is a part of the Eastern Regional Power grid, which is monitored from Calcutta. Before restructuring, OSEB controlled 100% power distribution and all the generation capacity in the state. Now the state owned OHPC has hydro plants and thermal generation is with OPGC in which AES corporation has 49% stake. Apart from the generating capacity of these (which add up to 2297 MW), OSEB has a share of 1158 MW capacity of the Central sector generating stations in the Eastern Region. Table below gives a summary of the power infrastructure in the state.

Power Infrastructure Summary [10,18]	
Total Installed Capacity (MW)	3456
Energy handled (MU)	11012
Consumers (Million)	1.4
Agricultural Consumers	75000
Villages Electrified	35190 (76%)
Per capita consumption (kWh,1999)	313
Employees	35000

Notes:

1. Installed capacity and Energy include imported power also
2. Employees in 2001 are spread over GRIDCO (5000), Distribution Companies (24000), OHPC (6000) and OPGC (700). Numbers are approximate.

Performance of OSEB has been poor compared to many other Boards in India. The PLF of thermal plants in 1990's was around 30% when the national average figure for PLF is about 67% and NTPC's figure is 83%. T&D losses were around 40%. Quite unlike other SEBs agricultural consumption in Orissa is around 6% compared to the national average of 32% or 40-50% as reported by many other states. Industrial consumption is high at 54% as compared to the national average of 30%. As a result of this the revenue pattern is highly skewed with industries accounting for 50% of revenue in year as compared to national average of 30%. The percentage of villages electrified at 76% is below the national average of 87%.

Generation capacity of OSEB is predominantly hydro based, which makes the cost of generation low. In 1999, the installed hydro capacity in Orissa was 75% of total compared to 24% all India (or 38% if one leaves out central sector and private generators). Energy generated from hydro stations in 1999 was 55% of total as compared to 18% all India (or 25% if one leaves out central sector and private generators). [18].

Financial performance of OSEB was satisfactory till mid 1990's. The Electricity Act, 1948 requires SEBs earn a minimum of 3% rate of return on net fixed assets in operation. State governments are required to provide necessary subsidy to the SEB in case it fails to earn this return. OSEB earned 3.5% rate of return in 1990 and 2.9% in 1995, of course with government support as subsidy of Rs. 260 M and 1610 M from the state government in the respective years. This represented 7% and 20% of the utility revenue (before accounting for subsidy) for the respective years [10]. OSEB had problems of high transmission losses and poor quality of power supply. High transmission & distribution losses, increasing in-efficiency in metering & collection and poor PLF of stations are some of the factors that have contributed to the deterioration of financial health. One of the major impacts of this worsening financial situation was OSEB's inability to raise finances for the required investments in generation and T&D. State government was also finding it increasingly difficult to provide the budgetary support to the OSEB. Table 2 in Annexure gives figures of revenue and expenses from 1991.

Government of Orissa and OSEB agreed on a power sector reform plan in Nov 1993. GoO set up a group to work out the details of the reform program. Grid Corporation of Orissa Ltd (GRIDCO) and Orissa Hydro Power Company Ltd (OHPC) were formed and incorporated under companies act in March 1995. After the Reform Act was made effective in Apr 1996, GRIDCO, OHPC and OPGC (see next section) took over the functions of OSEB.

2.2 ORISSA POWER GENERATION CORPORATION

Orissa Power Generation Corporation Limited (OPGC) was incorporated on November 14, 1984 under the Companies Act, 1956 to manage the thermal generation in Orissa. It set up Units 1&2 at Ib valley with an installed capacity of 420 MW. Initially the Government of Orissa (GoO) owned the entire share capital of the company. In Jan 1999 GoO has divested 49% of it's stake in favour of a private investor namely AES Corporation, USA. More details are given in Section 3.6.2.

2.3 TALCHER THERMAL STATION

Talcher thermal station was set up in 1960's by OSEB. This 460 MW thermal station had very low PLF of 30% and availability of 54% in 1996. The State assembly approved taking over of this station by NTPC (against the dues owned by the OSEB to NTPC) in June 1995 and it was taken over on 03 Jun 1995. The performance of the plant has significantly improved after the take over with PLF of 56% and availability of 83% in 1999.

2.4 INDEPENDENT POWER PRODUCERS

Subsequent to the opening up of power generation to private participation by central government in October 1991, many Independent Power Producer (IPP) projects were planned in Orissa as well. Norms were relaxed to attract private investment and the process involved signing a Memorandum of understanding with the state government. Currently 4 projects are planned using coal adding up a capacity of about 5000 MW. More details on IPPs are given in section 3.6.2.

3. MOVE TOWARDS WORLD BANK MODEL OF REFORMS

This section narrates the various developments that have led Orissa to adopt the World Bank model of reforms, i.e., unbundling, privatisation, and independent regulation.

3.1 REFORM PLAN

The reform process was initiated in Nov 1993, when the Government of Orissa (GoO) and the World Bank held discussions and finalised an agreement on power reforms. Chief Minister, Mr. Biju Patnaik conveyed GoO's commitment to power reforms to World Bank in Nov 1993. In Apr 1994, the reform program was formally approved by the state council of ministers. After elections, the state government changed in Mar 1995, with Mr. JB Patnaik of Congress party as the Chief Minister, but there was no change in the reform course. In April 1995, GoO released a policy statement on power reforms. Reform was planned in 3 phases:

Phase-1: (1992-95)

- a) Setting up Reform Implementation Organisation
- b) Unbundling of OSEB
- c) Finalising the reform program

Phase 2: (1995-97)

- a) Corporatisation of Generation and Transmission companies
- b) First steps towards privatisation of Distribution
- c) Reform Act, setting up Regulatory Commission
- d) Tariff reform

Phase 3: (1997-2002)

- a) Privatisation of Distribution
- b) Steps towards privatisation of Transmission
- c) Commercial operation of the power sector

The reform program was reviewed in Jan-March 1994 and endorsed by World Bank consultants after some modifications. In Orissa, there had been annual tariff adjustments from 1992, as part of a 5-year plan. Tariff increase by about 15% average was carried out in 1992, 1993, 1994 and 1995. From Apr 1992 to Nov 1995, a total tariff raise of 67% was implemented. Thus, in 1995, the tariff revenue was sufficient to cover the cost of OSEB's operations. GoO subsidy was required mainly to cover uncollected receivables and write-offs. The cross subsidy burden was also not very high, since the agricultural consumption was only about 6% [1,10]. It was perhaps the small size of the power sector, small agricultural consumption, low level of political mobilisation, minor national profile of Orissa and the Chief Minister's perception of the impending financial bankruptcy of OSEB that made Orissa the choice for the World Bank model of power reforms in India [22].

3.2 POLICY STATEMENT

Power Sector Development Policy of the Government of Orissa was issued on 20 April 1995. It begins by acknowledging the support from World Bank for the reform program. It outlines the framework for reform as the solution to the problems of the state power sector. *"As a pioneer among the states in India, the Government has embarked on a radical program of reform, to address the fundamental issues underlying poor performance. We have decided to restructure the state power sector and substantially privatise the power sector in Orissa, to make power supply more efficient and to be able to meet the investment needs of the sector. The Government's ultimate objective is to provide an appropriate policy environment for growth of the power sector and withdraw from it as an operator of facilities, having instead privately-managed utilities operating where feasible in a competitive environment under an appropriately regulated power market. Power sector industry and market structures being established under the reform program have been defined so as to facilitate the realisation of this ultimate objective. Significant private sector participation is to be achieved during the implementation of the proposed Bank loan which we are seeking to support our power sector reform program"* [1].

The document goes on to outline the actions already taken by the GoO for reform and gives commitments on the key performance indicators of reform (as listed in Table 5 in Annexure). The key principles of the reform program are explained under 5 sections:

- a) Restructuring of OSEB by Corporatisation and Commercialisation
- b) Privatisation - Hydro & Thermal Generation, Distribution and Grid operation
- c) Competition for new generation capacity additions
- d) Regulation separate from the Government
- e) Tariff reform at bulk, transmission and retail levels

All these are in line with the model of reforms proposed by the World Bank. Policy document assures the employees that personal policies and 'transition plan' (including reduction of staff through attrition, voluntary retirement scheme, transfers to other Government bodies) will be discussed with staff and implemented with 'legal and social responsibility to the rights and dignity of the affected staff'. It also goes on to pacify the employees with a grandly worded optimistic outlook. *"We also reiterate that the power sector in Orissa is poised for rapid expansion. Therefore the seemingly redundant staff may get adequate scope for being absorbed"*.

3.3 REFORM ACT

The state and the central government prepared a complete draft of the Act. An 'advance clearance' for this Act was issued by the Ministry of Home affairs, GoI in Nov 1995. (This facilitated fast approval by the President of India later). Act was passed in the Orissa legislature on 28 Nov 1995, was approved by the President in Jan 1996 and made effective on 01 Apr 1996.

Orissa Electricity Reform Act 1995 formalises the institutional structure of the sector after reforms. The Act is *"to provide for the restructuring of the electricity industry for the rationalisation of the generation, transmission, distribution and supply of electricity; for avenues for participation of private sector entrepreneurs in the, electricity industry; and generally for taking measures conducive to the, development and management of the electricity industry in the state in an efficient, economic and competitive manner including the constitution of an electricity regulatory commission for the state and for matters connected therewith or incidental thereto"*. (quoted from the Act). Act requires that the Regulatory Commission (RC) is put in place within 3 months and describes the procedure for selection of the RC. It describes the proceedings, powers and functions of the RC. The tariff setting procedure, licensing procedure and the transfer scheme to the new entities (GRIDCO and OHPC) are outlined.

The Orissa Electricity Regulatory Commission (OERC) was functioning in 'shadow mode' with 2 'shadow' commissioners identified by the GoO. After the reform act, the commission was constituted in Jun 1996 and started functioning from Aug 1996. These 'shadow' commissioners were not to be considered for permanent appointment due to age restrictions that resulted from central government review [10].

3.4 WORLD BANK LOAN

World Bank's involvement in Orissa power sector started in early 1980's with a Credit/Loan assistance (Cr1356- IN and Ln 2258-IN) for the upper Indravati multipurpose 600 MW hydro electric project. This project ran into problems with rehabilitation problems and delays. After progress reviews, bank cancelled the unused loan of US\$ 156 M in Dec 1991. The credit part was due to deplete in 1995 and progress of the Upper Indravati project was unclear. Meanwhile, Orissa government managed to tie up funds for this project. GoI and GoO requested World Bank to extend its credit till Jun 1995 and convert it to assistance for starting up the power sector reform program. The bank agreed this and further discussions helped to give structure to the reform program. Bank also helped GoO to raise finances from other national and international agencies. A US\$ 997 M loan scheme spread over 1997-2002 was worked out with World Bank contributing US\$ 350 M. The finalised loan agreement was signed by World Bank, GoI, GoO, and GRIDCO in Jul 1996.

Of the total US\$ 997 M loan, World Bank's contribution is US\$ 350 M (35%). GoO, Indian financial institutions and GRIDCO are to raise US\$ 292 M in Rupees, which works out to be 29% of the loan. The remaining 36% are to be raised by ADB and ODA. 64% of the amount is in Foreign currency. Comparing Tables 2 and 3, it can be seen that the average annual restructuring fund is nearly 60% of the annual revenue of the utility!. Table 3 in Annexure gives the financing plan and Table 4 the break-up of the loan amount into different project components.

The Staff Appraisal Report of the World Bank [10] gives the details of the project. There are 14 'key performance indicators' in the reform project identified by the Bank. 4 are one time and the others have annual targets. These are to be used to assess the progress of reforms in the reviews. Some important 'key performance indicators' with expected timeframes are captured in Table 5 in the Annexure. These include functioning of the OERC, steps towards privatising distribution, reducing T&D losses and improving financial performance of GRIDCO & OHPC.

3.5 SUBSEQUENT DEVELOPMENTS

Orissa Electricity Regulatory Commission (OERC) was operational with 3 members from Aug 1996. It has given 4 tariff orders and several regulations. Details of the activities of the OERC are given in section 4.

State sector is still the major generating utility in the state, having 54% of the installed capacity and 44% of the annual energy generation. Table 6 and 7 in Annexure give details of installed capacity and annual energy generation. Two projects of OHPC are in advanced stage- Balimela Power House extension (2 X 75 MW) and Upper Indravati Power station (2 X 150 MW). More Hydro projects are planned by OHPC in the joint sector to be commissioned in the 10th five-year plan. These include Hirakud (4 X 52), Chipilima (2 X 50 MW) and Sindol (Stages 1,2 & 3 with a total capacity of 320 MW). Private sector projects are in a fluid stage with many changes over the projected plans [7]. There have been some problems with OPGC which are described in Section 3.6.

GRIDCO is going ahead with its plans to augment the transmission & distribution network in terms of adding lines, substations and increasing transformer capacities. As part of the reform project, US\$ 599 M is allotted towards these projects. Around half of this amount is earmarked for transmission projects and the other half for distribution projects. A 10-year system planning exercise was carried out in 1996 with an objective to optimise the T&D network. This included augmenting transmission capacity to handle the power generation projections, improving the distribution system to reduce technical losses and measures to reduce commercial losses with extensive metering.

OSEB has a State Load Dispatch facility as part of the Eastern Regional system. As part of the World Bank funded Unified Load Dispatch project, Alstom is setting up a State Load Dispatch Centre for Orissa at Bhubaneswar. The communication network is also getting augmented as part of this project. This project has commenced in Apr 2001 and is expected to be completed in 2004.

An investment of US\$ 97 M is planned as part of the reform project for Demand Side Management (DSM) projects. Time of the Day tariff, end use efficiency improvement and publicity measures are planned. The projections are that a peak load reduction of 234 MW can be realised by implementing DSM measures for Domestic, Public lighting, Water pumping, Small & Medium Industries, Large industries and Irrigation consumers. Demonstration projects are planned. DSM component of the reform project is no doubt, commendable. But, after nearly 5 years into the reform project, there is criticism that DSM implementation is not much of a success- mainly due to the lack of commitment from the GRIDCO and DISTCOMs. It is also to be noted that nearly half the investment was allocated for Metering. [22].

Distribution has been privatised from September 1999 and has had many problems. These are covered in section 3.6.

3.6 PRIVATE SECTOR PARTICIPATION

In Orissa, private sector involvement in the power sector is currently in the areas of distribution and generation. Transmission is with GRIDCO, owned by the GoO. As per the reform project, GRIDCO shares were to be listed in the market by Mar 2001 as a first step towards privatisation. Hydro generation is with OHPC, owned by GoO and OHPC shares were also to be listed by Mar 2001. Privatisation efforts in distribution and generation are given in the following sections.

3.6.1 Distribution

There were 10 distribution circles in OSEB. They were divided into 4 zones - Central, North Eastern, Southern and Western. These zones were subsequently converted to companies namely - Central Electricity Supply Company (CESCO, head quarters at Bhubaneswar), North Eastern Electricity Supply Company (NESCO, head quarters at Balasore), Southern Electricity Supply Company (SOUTHCO, head quarters at Behrampur) and Western Electricity Supply Company (WESCO, head quarters at Burla, Dt Sambalpur). As per the second transfer scheme, assets, liabilities, proceedings and personnel of GRIDCO were transferred to these respective companies in Nov 1998. Number of consumers and the energy sold by these companies in 2001 are given in the table below.

Name	Energy in MU 2001	Number of Consumers (Million)
CESCO	3939	0.68
NESCO	2381	0.29
SOUTHCO	1499	0.36
WESCO	2785	0.38
Total	10604	1.71

The first step in privatisation was the Distribution Operations Agreement (DOA) for CESCO with BSES in 1996-97 and the second step was privatisation of all the 4 companies.

a) Distribution Operation Agreement with BSES

Since the regulatory mechanism was not well established and there was very little experience of privatisation, short-term distribution operations agreement (DOA, also called Management Contract) path was taken up initially. Negotiations for DOA for Central zone (comprising of Bhubaneswar, Cuttack and Dhenkanal circles) were taken up with four companies in Feb 1995. In October 1996, Bombay Suburban Electricity Supply Company (BSES) was awarded the 3 year DOA for the Central Zone. BSES was responsible for distribution, maintenance and collection of dues. It was expected that this short-term agreement would develop to a long-term arrangement. Performance was to be reviewed every 6 months. BSES was not able to improve performance due to a variety of reasons - its inability to control the employees (who remained GRIDCO employees); government interference; limited management effort from BSES side etc. After about 6 months of operation, this DOA was terminated on 30 Apr 1997.

b) Privatisation of Distribution

After the DOA failed, GoO decided to privatise the 4 distribution zones. They were set up as distribution subsidiaries of GRIDCO. Through International Competitive bidding, offers were invited for 51% of the equity in these companies in early 1998. Only 3 of the 12 consortia that expressed interest finally participated in the bidding process. Three who participated were private Indian companies - BSES, Calcutta Electricity Supply Company (CESC) and Tata Electric Company (TEC). Only BSES and TEC submitted bids. BSES was awarded 3 companies, namely NESCO, SOUTHCO and WESCO in April 1999. BSES paid about Rs. 1.17 billion for this, against a face value of Rs. 876 M. TEC was selected for CESCO, but finally withdrew. After a re-bid, a joint venture between Jyoti Structures and AES Corporation (AES holds 95% stake in this JV) bought it in September 1999 for Rs. 410 M. In all the four companies BSES/AES holds 51%, GoO 39% and employees 10% stake.

It can be said that Orissa was able to beat the deadline (December 2000) set by the reform project for distribution privatisation. But one company (BSES) controlling 3 distribution companies and AES, which already had 49% stake in OPGC, controlling the 4th distribution company remained as aberrations to the paradigm of competition. Experiences of privatisation of distribution and impact on GRIDCO, the supplier of bulk power to distribution companies have not been very good so far as detailed below.

BSES with 3 companies ran a loss of about Rs. 2000 M at the end of first year of operation. The reasons were many: tariffs were fixed by OERC based on 35% T&D losses whereas the actual losses (as claimed by BSES) were 45-47%; targets of billings prepared by GRIDCO were too optimistic; it was not easy to change the operational culture etc. BSES is planning micro privatisation with involvement of village communities to improve distribution management. BSES is working to turn around the situation and Mr RV Shahi, Chairman, BSES is quite optimistic. *"... We found that out of a million consumers, almost 70% did not have energy meters or had defective meters. We launched a massive meter installation programme. .. By next year, hopefully, 100% metering will be in place..... The distribution loss has reduced from around 50% to around 44% in 1999-2000 and to around 42% in 2000-2001... I had felt that gestation period (for turnaround) would be about two to three years. But now I think a slightly longer gestation period, may be four to five years"* (Interview with Mr RV Shahi, Powerline, May 2001).

AES, which has been managing the CESCO, has had many more problems. There has been criticism on AES taking over a distribution company when it already had 49% stake in OPGC. CESCO covers eight coastal districts with majority domestic consumers. The small industry groups are theft prone. The T&D loss is the highest. It also covers the capital and important offices. Power supply to nearly 19,000 villages was effected in a super cyclone of October 1999. AES had committed to restore supply by 31 Mar 2000. OERC issued a show cause notice to CESCO on 01 May 2000 since it failed to meet the commitment. In its order dated 18 Jul 2001, OERC imposed a fine of Rs. 0.1 M on CESCO for failure to comply with the tariff order of 19 Jan 2001. Managing Director of CESCO (AES representative) resigned in Jul 2001 saying that *"it is impossible to do distribution business here"* and that he is *"frustrated with the current regulatory and contractual structure of the distribution system in Orissa"*. Following a petition by GRIDCO, in its order of 27 Aug 2001, OERC had to take a radical step and it appointed Mr SC Mahapatra, an IAS officer as the CEO and administrator (as per the reform act) of CESCO. This is the first instance of use of such strong regulatory powers in India. AES has said that there is too much interference by government in CESCO functioning and wishes to walk out of CESCO by end 2001, but GoO maintains that the contractual agreement requires AES to stay till 2002.

All the distribution companies feel that OERC is conservative with tariff hikes. In 2000-1, CESCO asked for an 18.8 % hike and was granted 9.6%, WESCO wanted 26%, but was granted 8.3%, NESCO wanted 37.7%, but was granted 11.6%, and SOUTHCO wanted 37.7%, but was granted 11.3%. GRIDCO had asked for 13% hike, but was granted only 9%.

3.6.2 Generation

The first event towards privatisation of the generation sector was with AES buying 49% stake in OPGC. Orissa Power Generation Corporation Limited (OPGC) was incorporated on November 14, 1984 under the Companies Act, 1956 to manage the thermal generation in Orissa. It set up Units 1&2 at Ib valley with an installed capacity of 420 MW. Initially the Government of Orissa (GoO) owned the entire share capital of the company. In Jan 1999 GoO has divested 49% of it's stake in favour of a private investor namely AES Corporation, USA. The main objectives of OPGC, as per the Memorandum and Articles of Association are establishing, operating and maintaining large thermal power generating stations independently and/or in the joint sector. As its maiden venture, the company has set up 2 thermal power plants with a capacity of 210 MW each in the IB valley area of Jharsuguda District in the State of Orissa. The project cost of the order of Rs.11350 million. It has also undertaken the construction of seven mini hydel stations having a total capacity of 5075 kW as a technological demonstration.

The management of the affairs of OPGC vests in the Board of Directors comprising six Directors. As per the shareholder's agreement with the private investor the Board will comprise of equal number of nominees

from both the parties. The Chairman and Director Finance are being nominated by Govt. of Orissa while the Managing Director and the Director Operation are being nominated by the private investor. Principal Secretary - Energy, GoO is the ex-officio Chairman of the Company. The day to day affairs of the Company are managed by the Managing Director, Director-Operation and the Director-Finance. OPGC recently had problems with GRIDCO, as was described in the next section.

500 MW Ib valley thermal project by AES was one of the first private power generation projects planned in India. It is one of the 8 'fast track' projects identified by the GoI. There are currently three generation projects planned in the private sector- called Independent Power Producers (IPP). All are coal based. Kalinga Power and Ib Valley projects have Techno Economic Clearance (TEC) from CEA. The third project at Hirma is a multi-state mega project with a capacity of 3960 MW. These are all expected to come on line in the next 5-10 years. Details of these projects are captured in Table 8 in the Annexure. Details include location, capacity, fuel, milestones and project partners in terms of finance, EPC and O&M.

3.6.3 Impact of privatisation on GRIDCO

GRIDCO's finances have taken a nosedive after unbundling and distribution privatisation. Some major reasons are:

- a) Liabilities of distribution companies were loaded to GRIDCO - Rs. 16000 M to GRIDCO and Rs. 6000 M for all 4 DISTCOMs
- b) Assets of GRIDCO were 'upvalued' (a book adjustment, as suggested by Reform Consultants) to match liabilities during unbundling. This has increased depreciation and all other factors that depend on the 'bloated' capital base.
- c) OHPC aligned tariff to the new asset base and 16% rate of return. Tariff to GRIDCO went up from Rs.0.1/kWh to Rs.0.49/kWh in April 1996
- d) OERC asked GRIDCO to meet T&D loss target of 35% when it was claimed to be around 50%. Tariffs were calculated based on these targets. Neither GRIDCO or the DISTCOMs were able to meet these targets
- e) OERC did not grant tariff hikes of 15-18% as planned in the SAR. Instead the tariff increases were 11%, 9.3% and 4.5 % respectively, in the first 3 years.
- f) Budgetary support from GoO by means of subsidy was cut off
- g) Central sector power was costly and GRIDCO had to purchase it

Thus the GoO owned GRIDCO is caught between the 'devil' (generating stations with high power purchase rate) and the 'deep sea' (DISTCOMs which could not streamline operations fast enough). The situation may get worse when the Availability Based Tariff (ABT) is enforced for Central Generating stations. GRIDCO will have to pay more to NTPC as capacity charges. All the four Distribution companies own GRIDCO Rs. 7.71 billion as on 31 Mar 2000. There is a running battle between AES and GRIDCO. GRIDCO owns Rs. 1.8 billion dues to OPGC (in which AES has 49% stake) and CESCO owns Rs. 1.6 billion to GRIDCO. AES had shut down OPGC plant for a week from 17 May 2001 in protest and GoO had threatened to invoke Essential Services Act against AES. AES resumed generation on 24 May after GoO agreed to pay the dues within 15 days. The reviewers of reform project (including World Bank) have pointed out this crisis of GRIDCO and GoO has been asked to take corrective steps. GoI has prepared a bail out package for GRIDCO which include securitisation of dues to Central generating stations, reduction of staff strength by 10% etc [19,23].

4. REGULATORY PROCESS

The Orissa Electricity Regulatory Commission was operational under Orissa Electricity Regulation Act 1995 in August 1996. OERC has been co-ordinating the regulatory process. It is a 3 member body selected by a committee constituted by the state government and consisting of a) Chairman of State Public Service Commission as the Chairman, b) Secretary in charge of Department of Energy, GoO as convenor and c) the Chairman of the CEA or any Member of CEA. Selection committee suggests two short-listed names for each post and the State government appoints one of them as the member. One of the three members shall be

designated as chairperson by the state government. One member is expected to be an electrical engineer with industry experience, at least one to have qualification and experience in economics, commerce, accountancy, law or administration or management. OERC has the powers of a Civil Court [9].

M/s S Som (Chairman), DK Roy and AR Mohanty were the first commissioners of the OERC. On resignation of Mr. Som, Mr SC Mahalik took over as chairman of the OERC on 16 Jun 1997. He was Secretary, Department of Posts, GoI. Mr. Mahalik retired on 23 Mar 2000. The current chairman Mr. DK Roy joined OERC on 01 Aug 1996, and took over from Mr. Mahalik. Mr. Roy is a retired Indian Revenue Service officer who has served as Chief Commissioner of Income Tax, Orissa. Mr. H Sahu, Member, joined on 06 May 2000, is an Electrical Engineer and was the Managing Director of OHPC. Currently OERC has only two members and there is a case pending in the Orissa High Court challenging the administrative procedure adopted for appointment of the third commissioner. OERC has staff strength of about 20 to support its functioning.

Since its inception, OERC has released several regulations and documents such as Business rules, Orissa Electricity grid code, Distribution code, Power supply standard, Compliant handling procedure, permission for third party sales, Permission for Ib Valley & Upper Indravati PPAs etc. OERC has issued licences to GRIDCO for bulk supply and Distribution Companies for retail supply.

OERC has issued four tariff orders so far. Work on tariff started with the first tariff petition for 1997-98 filed by GRIDCO. 41 objections were received by OERC and a public hearing was held on 21 Feb 1997. This was the first time that such a public hearing on tariff was being conducted in India. GRIDCO had asked for a tariff hike of 17.5% and had given itself a T&D loss reduction target from 47% to 42%. OERC's first tariff order allowed a tariff raise of 10.5%, asked GRIDCO to reduce T&D losses to 35% and suggested that merit order dispatch be followed. On 17 Aug 1998, OERC released a paper named 'Conceptual Issues in Electricity Tariff in Orissa'. The second tariff order was issued in Nov 1998 with an average tariff increase of 9% (GRIDCO's had requested for 13% hike). Public hearings were conducted from 13 Oct to 17 Oct 1998. Two orders were issued, one for bulk tariff and another for retail tariff. The third order was issued in Dec 1999, after distribution was privatised, and gave a tariff hike of 4%. Fourth tariff order was issued in Jan 2001 with 20% tariff hike for domestic and agricultural consumers with effect from 01 Feb 2001. This regular increase of tariff has sparked off protests in Orissa. (see section 5.2).

OERC has performed the difficult task of pioneering the reform process in India. There has been appreciation for laying down a framework and facilitating some amount of Transparency and Participation. There is criticism that RC gives too much emphasis to the tariff process and limits itself to regulation, thus considering the development of the power sector beyond its responsibility. Since GoO has also absolved itself of this responsibility since the start of reforms, this attitude of RC is not good for the state power sector [13]. There is also a concern that in the absence of an effective civic society participation, RC with enormous power and little public accountability may sabotage the reform objective [14].

There is a steering committee headed by the Chief Secretary to review the reform process. There is also an Implementation Task Force headed by the Principal Secretary (Energy) and a Reform Project Management Organisation (RPMO) headed by a Director General (Chief Engineer rank in Board) to assist the process

One of the hallmarks of the regulatory and reform process in Orissa has been the presence of a large number of consultants. They have been involved in policy formulation, analysis and stakeholder studies. It is to be noted that most of these consultants are multinational. A partial list is given in Table 9 in Annexure.

5. POLICY INTERVENTIONS

5.1 BEFORE REFORMS

Orissa is bracketed with Bihar, Madhya Pradesh, Rajasthan and Uttar Pradesh as one of the poorest and backward states of India. Orissa was a stronghold of the Congress party for many years till 1970's. Since then, Janata Party (and its variants) and Congress party have ruled the state. The current Chief Minister is from Biju Janata Dal, a state level party.

Policy interventions in Power sector have been mostly through the legislature, media or courts. They have been mostly on the issue of tariff. Before 1990s, OSEB had the monopoly in policy formulation and operation of the power sector. Policy interventions were through the elected representatives of the legislative assembly or through media. A hallmark of the pre-reform times was that the operation of the power sector was not at all transparent and it was very tough to get any information on the performance. A classic example is T&D loss: published figure of T&D loss was 23.5% in 1993 and 23.8% in 1994. It suddenly jumped to 46.9% in 1996, was reported at 50.4% in 1997, 49.2% in 1998 and 48.5% in 1999. It was clear that figures till 1994 were cooked up to "look reasonable". The reason for the sudden jump in one year was the pressure on the sector for change and transparency forced by the reform process.

5.2 POST REFORMS

The major public intervention on the reform issue has been the participation by some CSIs in the regulatory public hearings and some public protests. Orissa reform has attracted lot of media attention with many articles and studies. Most of them have been eager to support the process with few exceptions attempting an impartial critique.

Regulatory Interventions by CSIs

Regulatory interventions through public hearings and petitions have started with the formation of the OERC. There are many Civic Society Institutions (CSIs) like consumer organisations, mass organisations and other voluntary organisations active in the power sector. This include Orissa Consumers Association, Orissa Grahak Mohosanga, Orissa Gana Parishad, Confederation of Indian Industry (CII), Utkal Chamber of Commerce & Industry and few retired Engineers from the OSEB.

Public Protests

Engineers of OSEB were employees of GoO (and not of the EB as in other states) before reforms. The Orissa Engineers' Service Association (OEESA) which has about 1400 graduate engineers as members had approached the State Administrative Tribunal (SAT) against transfers to GRIDCO and OHPC. SAT dismissed this petition and OEESA filed an appeal in the Supreme Court, New Delhi. This was also dismissed and GoO went ahead with the employee transfer plan.

The recent tariff order of Jan 2001 has sparked public protests in Orissa. Congress party (which had initiated the reform process in the state) and the Left parties have been staging protests against tariff hikes and poor quality of power supply. At Bhubaneswar, protesters ransacked the CESCO/AES office. In the state assembly, members across parties have raised questions on reforms. The state energy minister admitted that mistakes have been made, but the way out is to rectify them, not do away with reform program. He also said that very little of the funds received from sale of OPGC to AES has been pumped back to power sector.

In the face of strong protests and media attention, GoO has recently appointed a 4-member committee to review reforms with a 3-month term to submit the report. Today there are concerns in every one's mind on the issues raised by the 'pioneer' reform program in India. It is important to learn from the Orissa reforms experience before massive efforts are made to replicate this model elsewhere.

ANNEXURE - TABLES

Table -1: Statistical Overview of Orissa [7,17]			
Item	Orissa	All India	ORISSA as a % of all India
Capital	Bhubaneswar	New Delhi	
Population (millions, 1991)	32	846	3.8
Area (1000 Square kms)	156	3287	4.7
Average Per capita Income (US \$/year, 97)	131	260	50
Percentage of population under poverty line	49	35.8	137
Percentage of population literate (91)	49	52	94
Per-capita consumption of electricity (kWh/year, 99)	313	338	132

Table 2: Finance [2,10,18]				
Year	Revenue	Operating Expenditure	Gap	Remarks
	Rs. Million	Rs. Million	Rs. Million	
1991	4175	3001	1174	Revenue includes subsidy of Rs.121 M
1995	9500	8372	1128	Revenue includes subsidy of Rs.1610 M
1999	15480	19100	-3620	This is GRIDCO's. No subsidy
2001	17810	18700	-890	This is GRIDCO's. No subsidy

Note : Year 2001 figures are for "remaining" GRIDCO (i.e. excluding the Distribution companies) and hence not directly comparable to other figures.

Table 3 : ORISSA Power Restructuring Project- Financing Plan 1997-2002 [10]					
Source	Amount (US\$M)			% of Total	Remarks
	Local	Foreign	Total		
Orissa Government	25.6	0.0	25.6	2.6	
ADB	0.0	56.8	56.8	5.7	Routed through PFC
ODA	65.1	45.0	110.1	11.0	Grant, mainly for Technical Assistance
Other	233.0	0.0	233.0	23.4	Indian financial institutions like PFC, IDBI, GIC, LIC
Internal	33.8	188.1	221.9	22.2	To be raised by GRIDCO
IBRD (WB)	0.0	350.0	350.0	35.1	
Total	357.5	639.7	997.2	100.0	

Table 4: Project Components [10]			
Component	Cost - US \$M	% of Total Cost	Remarks
Transmission & Distribution system	599.2	60.1	Lines, Substations
Demand Side Management	96.8	9.7	
Technical Assistance	44.0	4.4	Consultancy studies for reforms
Contingencies	208.0	20.9	Quite high!
Interest during construction	49.2	4.9	
Total	997.2	100.0	

Table 5: Key Performance Indicators [1,10]		
Indicator	Time Frame	Remarks
Reform Act and functioning RC	Act in Apr 96, RC in Jun 96	
Preparation of staff transfer plan and relocating staff from OSEB	31 Mar 1997	
GRIDCO to take over Transmission & Distribution from OSEB	Apr 1996	
OHPC to take over Hydro stations from OSEB	Apr 1996	
Set up 4 Distribution Zones		
DOA for one Distribution zone	1996-1999	Central Zone with BSES from Sep 96. Contract terminated by GRIDCO in Apr 1997.
Set up 4 Distribution Companies and privatise them	31 Dec 2000	Subsidiary companies set up in Apr 1997. Privatised by Sep 1999
GRIDCO and OHPC to list Shares in stock market	31 Mar 2001.	Listing shares is the first step towards divestment. GoO plans to divest about 10% equity to employees.
Return on equity for OHPC	16% (1998-2002)	This has hiked OHPC tariff resulting in adverse impact on GRIDCO performance
Return on equity for GRIDCO	10% (1998) to 16% (from 1999)	
Loss reduction targets for GRIDCO	40 % (1997) to 22% (2002)	Targets not met till date
DSM disbursement - yearly targets for GRIDCO	5% (1997) to 100% (2002)	
Tariff adjustment every year by RC	1997-2002	Orders issued in: Mar 97, Nov 98, Dec 99, Jan 01

Table 6: Installed Capacity 2001 [7,19]				
Name	Capacity MW	Capacity MW	% of Total	Remarks
OHPC - Hydro	1877			Including share from Machkund
ORISSA Sate Sector - Total		1877	54.0	
Central Sector - Thermal - NTPC	1092			Share from Talcher, Kaniha, Farakka, Kahalgaon
Central Sector- Hydro- NHPC	66			Share from Chukha, Rangit
Central Sector - Total		1158	33.5	
Private Sector - Thermal - OPGC - AES		420	12.5	Ib valley station
Others- Captive	100	100.0		Committed share from 725 MW industrial captive
Others - Wind		1.5		
Grand Total		3556.5	100.0	

Notes:

1. In addition, there is an estimated captive power capacity of 1632 MW
2. Peak load met was 1850 MW in 2000

Table 7: Annual Energy Generation in 2001 & Cost [7]				
Name	Generation - MU	Generation - MU	% of Total Generation	Average Cost of generation Rs/kWh
OHPC - Hydro	4811			
ORISSA Sate Sector - Total		4811	43.7	0.50
Central Sector - Thermal - NTPC	2632			1.58
Central Sector- Hydro- NHPC	147			1.51
Central Sector - Total		2779	25.2	
Private Sector - Thermal - OPGC - AES	2659	2659	24.2	1.53
Others - Captive		763	6.9	0.94
Total		11012	100.0	

Notes:

1. Energy values and cost are as approved by OERC, in its tariff order, Jan 2001

Table 8: IPPs - Key Information [12,16]												
Name	Location	Cap acity MW	Fuel	Milestones				Cost Rs M	Equity Plan	EPC Contra ct	O&M Contra ct	Remarks
				TEC	PPA	Financi al closure	Com miss ioni ng					
Kalinga Power	Duburi	500	Coal	Apr 99	Oct 97	Not done	No	21910	Public Power International	Foster Wheeler , Parsons	No	PPA to be re-negotiated. Not much progress
Hirma	Hirma	3960	Coal	No	No	Not done	No	225000	Mirant Corporation, , Reliance	No	No	One of the multi-state Mega projects. BSES may replace Reliance
Ib Valley Extension	Banharpalli	500	Coal	Feb 99	Sep 00	Not done	2004	24830	AES Transpower	No	No	Fast Track project. Extension of existing project.

Table 9: Consultants in Reform [10,19]		
S.No	Name	Scope of Work
1	ECC, USA	Engaged by WB to review reform proposals, 1994
2	KPMG - UK	WB funded. Consortium led by KPMG. Reform Consultant- Management, Financial, Economic, legal, regulatory, power and environmental aspects. 1994-96 (see 3-6 below)
3	Cameron Mckenna, UK	- do -. Legal
4	NERA, UK & USA	- do -. Economic and Regulatory
5	Monenco Agra, Canada	- do -. Engineering & system studies, sales projections
6	DCL, India	- do -. Environment
7	Price Waterhouse, UK	ODA funded. Group led by Price Waterhouse. Institution building. 1995-99 (see 8-9 below)
8	Merz and McLellan, UK	- do -. Project Management
9	Northern Electric Company, UK.	- do -. Core skill training
10	Powergrid Corporation, India	Project management, 1996
11	Dishergarh Power supply company	Training, 1996
12	NIFES (UK), SAIC (USA), SRCI (USA), 3EC (India), ICICI, India	Demand Side Management, 1996
13	XIM, Bhubaneswar	Socio-economic survey, 1996-7; Consultants to BSES for distribution micro privatisation, 1999
14	BZW, CSFB, DKB	Privatisation, raising funds, 1998
15	TERI, India	GRIDCO tariff filing, 1997-98
16	Lovelock and Lewis	Value GRIDCO assets, 1998

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PART III

ANDHRA PRADESH

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1 ANDHRA PRADESH STATE

The state of Andhra Pradesh was formed on 01 November 1956. Andhra Pradesh (AP) is one of the 4 major southern states in India with a population of nearly 70 million. Most of the 'average' development indicators of AP are below the national average. This includes per capita income (US\$ 219 v/s national average of US\$ 260), literacy (45% Vs 52%) and infant mortality rate. Agriculture accounts for nearly half the state's income and supports nearly three-fourth the population. State tops in rice and tobacco production and ranks fourth in industrial investments. From the mid 90's, there has been a thrust to develop the Information Technology (IT) industry in the state with Hyderabad, the capital becoming one of the major IT destinations in India. Table -1 in Annexure gives a statistical overview comparing AP with all India in terms of population, area, per capita income, poverty level, literacy and electricity consumption.

AP has taken up the AP economic restructuring program from mid 90's with active assistance from World Bank and other international lending agencies. This program covers infrastructure sectors namely power, irrigation, road transport, ports, education and health. With this program, there is a marked shift in the development perspective with increased emphasis on market economy (as opposed to the earlier welfare economy) and the state starting to reduce its role in these sectors. In industry & World Bank circles, AP is described as a 'leading reform state' in India and the current Chief Minister Mr. Chandra Babu Naidu is described as the 'most dynamic and visionary' Chief Minister.

2. DEVELOPMENT OF THE POWER SECTOR

2.1 AP STATE ELECTRICITY BOARD

The key power utility in the state, Andhra Pradesh State Electricity Board (APSEB) was formed on 01 April 1959. Similar to other SEBs in the country, APSEB had a monopoly in the power sector and functioned under the overall guidance of the state government, interacting with the central power agencies for planning and co-ordination. With head quarters in Hyderabad, APSEB is a part of the Southern Regional Power grid, which is monitored from Bangalore, capital of the neighbouring Karnataka state. APSEB controls 100% power distribution and around 73% of the generation capacity in the state. Apart from its own generation capacity of 5612 MW, APSEB draws from 885 MW capacity of the Central sector generating stations and around 940 MW of IPP & other private sector plants. Table below shows the growth in power infrastructure in the state.

Power Infrastructure Summary [1, 10,13,23]		
	1961	2001
Total Installed Capacity MW	213	7709
Energy handled MU	784	46806
Consumers Million	0.27	11.0
Agricultural Consumers Million	0.18	1.9
Villages Electrified	2680 (10%)	26289(100%, from 1990)
Per capita consumption	19	404(1999)
Employees	50000 (1980)	75000

Tables 2 to 6 in Annexure gives more details on growth of generation capacity, energy generation, transmission capacity, distribution system and consumer wise energy sales.

On many technical aspects, APSEB enjoyed a good reputation amongst the other utilities in India. For example, the PLF of state owned generating stations in AP was 83.2% in 2000, much higher than the national average of 67% or the NTPC figure of 80.4%. Vijayawada Thermal Power Station (VTPS), one of the thermal stations, received the productivity award for the 17th time in 2000 (PLF of 86.9%) and Rayalseema Thermal Power Plant (RSTPP) the incentive award for the third time in 2000 (PLF of 94.9%).

Other aspects of good performance include fast erection of power stations, and low employee/consumer ratio [1,10,13]. Though APSEB's performance on generation side was far better compared to other SEBs, performance on distribution and financial aspects proved to be very poor.

Like many other SEBs, APSEB also had problems of mounting negatives in the balance sheet, high transmission losses and poor quality of power supply. The Electricity Act, 1948 requires SEBs earn a minimum of 3% rate of return on net fixed assets in operation. State governments are required to provide necessary subsidy to the SEB in case it fails to earn this return. APSEB was a financially healthy utility till 1992. From 1993, it has failed to achieve the rate of return and state government subsidy has been growing from Rs. 9440 M in 1995 to Rs. 16260 M in 2000. High transmission & distribution losses, increasing inefficiency in metering & collection, very low tariff to agricultural consumers and high cost of power from private generators are some of the factors that have contributed to the deterioration of financial health. One of the major impacts of this worsening financial situation was APSEB's inability to raise finances for the required investments in generation and T&D. As a result AP faced severe power shortages and poor quality of power supply. Installed generation capacity in the state sector increased by 70% in the period 1981 - 1991 where as it increased only by 45% in 1991 - 2001. In this whole period, demand continued to grow at compounded annual growth rate of 7-8%. This, combined with inadequate Transmission & Distribution infrastructure resulted in poor quality of supply and low reliability. Table 7 in Annexure gives figures of revenue and expenses from 1981.

2.2 RURAL ELECTRIC SUPPLY CO-OPERATIVES

Rural Electric Supply Co-operatives (RESCOs) were set up by APSEB to handle distribution management in rural areas. APSEB sells power to RESCO at High Tension level, at subsidised rates. The rate of sale was Rs.0.30/unit in 2001 when the cost of supply is estimated to be nearly Rs.2.20/unit. 9 RESCOs handle nearly 0.4 million LT consumers (3.5% of the total LT consumers in AP in 1999). APSEB energy sale to all 9 RESCOs was 1107 MU in 2001 which is about 4% of the total sales, but revenue from RESCOs was only 0.6% of the total revenue [15]. This has been in principle a good idea, but many of the RESCOs have been reporting losses due to poor management, despite the highly subsidised bulk supply. A summary of the RESCOs is given in Table 8 in Annexure.

2.3 JOINT SECTOR GAS POWER GENERATION

AP Gas Power Corporation Limited (APGPCL) was set up in 1988 to implement the gas based power project at Vijjeswaram. APSEB and selected 32 HT consumers (10 public sector and 22 private) held the equity in the ratio of power allotted to them. To begin with, APSEB's share was 27%. These plants were set up in 1990's. Starting from December 1990, 5 gas-based units have been commissioned at Vijjeswaram with a total installed capacity of 272.5 MW. Details are given in Table 9 in Annexure.

2.4 INDEPENDENT POWER PRODUCERS

Subsequent to the opening up of power generation to private participation by central government in October 1991, many Independent Power Producer (IPP) projects were planned in Andhra Pradesh as well. Norms were relaxed to attract private investment and the process involved signing a Memorandum of understanding with the state government. MOUs to set up nearly 119 projects with a capacity of 7841 MW (about 1 - 1.5 times the installed generation capacity!) were signed in a short time. This process was a non-transparent one and quite rushed and even preliminary power planning procedures were given a go by. For example in February 1995, the government / APSEB signed over a dozen MoUs for IPPs in just one night ! Only reason for such a rush was to beat the dead line set up by the central government and to avoid competitive bidding. The entire process was so irregular that the then Energy Secretary of the State, Dr. E. A.S. Sarma who had opposed such irrational decision had to relinquish his post. But this initial enthusiasm did not last and many projects did not take off. Competitive bidding procedure was adopted for many subsequent projects. One of the first IPP to come on stream in India was the GVK combined cycle plant at Jegurupadu commissioned in July 1996. Today, there are 3 major gas based IPPs with a total installed capacity of 779 MW and many wind, small hydro & non-conventional energy plants in the private sector which add up to a capacity of 161 MW. More details on IPPs are given in section 3.5.

3. MOVE TOWARDS WORLD BANK MODEL OF REFORMS

This section narrates the various developments that have led AP to adopt the World Bank model of reforms, i.e., privatisation, unbundling and independent regulation.

3.1 POLICY REVIEW COMMITTEE

The first major policy review on the functioning of the Board was done by the High Power Committee (HPC) set up in January 1995 by the state government. The committee was headed by Mr. Hiten Bhaya, a former member of the Planning Commission, and had M/s D Sankaraguruswamy, MC Mahapatra, N Tata Rao, TL Sankar and K Balarama Reddi as members. The last 3 had worked as chairmen of the APSEB. The committee submitted its report in June 1995 with several recommendations for re-vitalising the AP power sector. Main thrust of the report was to restructure the sector while retaining state ownership. The recommendations of the committee are given below [2].

- a) Strategy to meet demand: Expedite ongoing projects, permit captive generation by large consumers, increase PLF in existing plants, reduce losses, encourage private generation, encourage co-generation and non-conventional generation.
- b) Restructure APSEB: Restructure on a functional basis to make it three wholly owned subsidiaries, namely, Andhra Pradesh Power Corporation (APPC), Andhra Pradesh Transmission Corporation (APTC) and five Zonal Distribution Companies (ZDCs). They will function as commercial entities. APSEB will function like a holding company and will have overall planning, advisory and co-ordination role.
- c) Privatised Distribution: Work towards privatisation of ZDC operation. If need be, start with management contract followed by leasing or hiring. Privatisation should be through a building process.
- d) Tariff: Work towards a rational tariff which will cover costs, promote development of this sector, reduce wastage and yield reasonable rate of return on equity.
- e) Regulatory Commission: Set up an autonomous judicial regulatory commission. Duties will be to promote efficiency in generation, transmission, distribution, promote competition, advise government on policy matters, collect and publish information and fix tariff. The four member commission shall have one judge (who will be the chairman), one electrical engineer, one financial expert and one economist with knowledge of the industry.

3.2 WORLD BANK REPORT - AP: AGENDA FOR ECONOMIC REFORMS

The current Chief Minister took office in September 1995. This marked a change from the welfare mantle of the earlier government (led by Mr. NT Rama Rao) to a 'reformist development' path. Many subsidy and welfare schemes were dropped (subsidised rice, prohibition) and the World Bank was approached for a reform package. One of the responses to these developments was a comprehensive report by the World Bank titled 'Andhra Pradesh: Agenda for Economic Reforms' which was released on 16th January 1997. The report states that AP's development has been below its potential. One of the main reasons for this is the State's inability to deliver essential infrastructure and social services. It calls for a re-orientation and reduction of welfare programmes and improving of the infrastructure sector policies. Sectors covered under this report are power, irrigation, roads, ports, education and health.

In the area of power sector, the WB report starts by pointing out some of the "shortcomings" of the earlier High Power Committee Report. They are:

- a) Keeping APSEB as a holding company will undermine the reform process
- b) Role of Regulatory Commission has to be broader - not limited to setting tariffs
- c) Legislation is needed to unbundle APSEB
- d) HPC's suggestion do not result in competition in generation

Considering all these, the WB report states that [3], "if tariffs reflect costs & efficiency and are determined by an independent regulatory body, and distribution is privatised to reduce revenue leakage & improve

collection - capital markets and private developers will react positively. To establish credibility, the initial policy measures have to be bold, making a sharp break with the past, and explicitly endorsed by the government". The thrust of the report is towards privatisation and globalisation of the sector with minimal role for the state. The three objectives of the proposed re-structuring identified by the report are:

- a) Improve APSEB's finance: Increase agricultural tariff to at least Rs. 0.50/unit, adjust other tariffs to cover costs, improve metering, implement loss reduction & revenue enhancement measures
- b) Reduce power gap: Assess the feasibility of mini plants and short gestation projects, remove Transmission & Distribution bottlenecks.
- c) Restore credit worthiness of the sector: Restructure consistent with privatisation of distribution and private sector participation in generation, corporatise to avoid government interference, establish an independent regulatory commission.

3.3 POLICY STATEMENT, REFORM ACT AND WORLD BANK LOAN

Within 6 months of the World Bank report, on 14 Jun 1997, government of AP released a Power sector policy statement indicating proposed policy and structural changes in the power sector. The policy statement went along the lines of the World Bank report and made similar recommendations.

In line with the policy statement, the Andhra Pradesh Electricity Reform bill was prepared. This bill was introduced on 27 April 1998 and sailed through all the motions in one day and was passed on 28 April. The bill faced severe opposition from general public, APSEB workers' unions and opposition members in the legislature. In an unprecedented move, the entire opposition party members were suspended from the assembly and the bill was passed. This act was notified on 29 Oct 1998 to be in effect from 01 Feb 99.

Soon after the reform act, the World Bank released its Project Appraisal Document (PAD) for the AP Power Sector Restructuring Project (APSRP) in Jan 1999. The PAD reflects several conditionalities laid down by the World Bank. Running parallel to the AP economic restructuring project covering many other infrastructure sectors funded by World Bank & other agencies (national and international), APSRP has a 10 year project duration, starting from February 1999. The Adaptable Program Loan (APL) scheme is planned in 5 stages, APL-1 to APL-5. The total loan amount is US\$ 4460 M with World Bank contributing 22% of the amount. Interestingly, World Bank's contribution is 36% in APL-1 and goes down to 13% in APL-5. The other international lending agencies include DFID and OECF. The Indian agencies include Government of Andhra Pradesh, PFC and REC. At each stage, some conditions have to be satisfied so that the utility becomes eligible for the next stage loan. These include privatisation of distribution & generation, average annual tariff hikes of 15-20%, implementing cost based tariff and reducing government subsidy to zero. The project is highly capital intensive. Details of the loan amount, funding agencies, dates and conditions are given in Table 10 and project components of APL-1 are given in Table 11 in Annexure.

3.4 DEVELOPMENTS SUBSEQUENT TO THE REFORM ACT

AP Electricity Regulatory Commission (APERC) was set up with 3 members on 31 Mar 1999. Details of the activities of the APERC is given in section 4. APSEB was unbundled into APGENCO and APTRANSCO in Feb 1999. In April 2000, APTRANSCO was further unbundled to APTRANSCO, managing the transmission system and four Distribution Companies (DISCOMs) managing distribution. These companies are Central Power Distribution Power Company of Andhra Pradesh Limited (APCPDCL) with head quarters at Hyderabad, Eastern Power Distribution Power Company of Andhra Pradesh Limited (APEPDCL) with head quarters at Vishakapatnam, Northern Power Distribution Power Company of Andhra Pradesh Limited (APNPDCL) with head quarters at Warrangal and Southern Power Distribution Power Company of Andhra Pradesh Limited (APSPDCL) with head quarters at Tirupathi. As a step towards privatisation, these DISCOMs have been issued independent licences for distribution in April 2001. In March 2001, state government has signed a MoU with the Ministry of Power, Government of India on reform and restructuring which has the road map for reform, plans for tariff rationalisation, metering and maintaining grid discipline.

APGENCO is still the major generating utility in the state, having 73% of the installed capacity and 62% of the annual energy generation. Table 12 and 13 in Annexure give details of installed capacity and annual energy generation. APGENCO has many projects under implementation and planning stages. Some are new projects and some are Renovation projects. Table 14 in Annexure gives the details.

In the central sector, NTPC is executing a thermal project at Simhadri with a capacity of 1000 MW. Private sector projects are in a fluid stage with many changes over the projected plans. The current installed capacity is 940 MW and there is a plan to add about 3000-4000 MW capacity in the next 5 years. Contribution to the energy production from private producers has been increasing in the past 5 years. Power purchase cost from these plants has been higher than that from state or central plants.

APTRANSCO has plans to augment the transmission network in terms of adding EHT lines and increasing transformer capacities. As part of the World Bank funded project, US\$ 70 M is allotted towards these projects. POWERGRID, which has 400 kV lines and inter-regional tie systems catering to Andhra Pradesh, also has projects to augment the EHT network. As part of the World Bank funded Unified Load Dispatch project, GE- Harris is setting up a State Load Dispatch Centre for AP at Hyderabad. The communication network is also getting augmented as part of this project.

An investment of US\$103 M is planned as part of the first phase of reform project in the Distribution area to strengthen the distribution system, providing single-phase transformers and installing VHF based communication system. A SCADA system is being implemented in the city of Hyderabad with ODA assistance. ABB is implementing this project which will link up all the distribution substations to a monitoring centre. In addition to this, the Metering system improvement project plans an investment of US\$ 65 M. This involves Electronic Tri-vector meters for industrial services, boundary metering between APGENCO, TRANSCO and DISCOMs, metering at 33 kV substations and at Distribution Transformers supplying agricultural loads.

3.5 PRIVATE SECTOR PARTICIPATION

In Andhra Pradesh, private sector involvement in the power sector is right now limited to Generation. As per the reform project time table, 30% of the distribution system is expected to have private sector participation by 2002 and 100% by 2007. Shares of APGENCO are to be listed in the market by 2004 and APTRANSCO by 2006. The rest of this section gives details of the private sector participation in generation. Generation projects from the private sector can be classified under the following heads:

- a) Major Projects
- b) Short Gestation Projects
- c) Mini Power Plants
- d) Mini Hydel Plants
- e) Wind based Projects
- f) Bio-mass based Projects

Major projects include three of the five 'fast track' projects (identified by the government of India) namely GVK, Spectrum and Hinduja Power. GVK and Spectrum projects are already in operation. Both have been criticised for inflated costs and have had adverse reports from the Comptroller and Audit General of India. In case of Spectrum project, there is an ongoing court battle between the promoters of the project. There are some projects, which have received TEC from CEA and reached financial closure - two major milestones for an IPP project. Some are in preliminary stages.

Short gestation projects use Naphtha or Gas as fuel and have short implementation period (2-3 years). They were taken up under International Competitive bidding, originally with Naphtha and later permitted to switch over to Natural Gas since Naphtha was too costly. There are 5 such projects in AP namely:

- a) LANCO, Kondapally, 355 MW
- b) Gautami, Peddapuram, 692 MW (after Gautami and NCC Power merged)
- c) BSES Andhra, Peddapuram, 220 MW

- d) Ispat Power, Vemagiri, 492 MW
- e) Konaseema, Kakinada, 445 MW

Major projects and the short gestation projects are better known as IPP (Independent Power Producer) projects. Details of these IPP projects are given in 2 tables in Annexure. Table 15 gives the key information about location, capacity, fuel, milestones and project partners in terms of finance, EPC and O&M. Table 16 gives the tariff information. [16,10,12,19]. One of the recent developments in this area is a Memorandum of Association signed on 10 Aug 2001 between the Government of AP, PFC and IDBI. As per this, 6 IPP projects (BPL, Vemagiri, GVK Phase II, Gautami, Konaseema and BSES Andhra) will benefit by the new mechanism for financial closure without escrow cover. (Deccan Chronicle, 11 Aug 2001).

Mini Power Plants (MPP) were proposed in August 1995, after the state government conducted a review of the power situation. It was felt that MPPs with about 30 MW capacity, costing less than Rs. 300 M and with implementation period of 12-18 months would be a fast solution to the shortage of generation capacity. MPPs were to use residual industrial fuels - Gas, Naphtha, Furnace Oil or LSHS. The MPPs would be essentially be group captive, dedicated power stations to supply power to identified consumers who entered into agreement with the developers of mini power plants. Such power plants would be best suited to serve customers with a dedicated distribution system preferably over small compact areas. 32 projects were planned in 1995, with a total capacity of 1025 MW. On 22 Jun 1998, permission to 12 projects was cancelled. These projects have not been commissioned as per the planned schedules. There is also the debate of third party sales by MPPs. MPPs wished to use APTRANSCO grid to sell power to consumers spread over the state. After a public hearing, APERC has ruled that third party sales will not be allowed and MPPs function to meet the stated objectives, i.e. cater to the identified group of consumers [1,19].

Mini hydel, Wind based and Biomass plants were also planned in the private sector. 92 mini hydel projects with capacities ranging from 0.25 MW to 20 MW and adding to a total capacity of 244 MW have been planned. As of March 2001, only about 34 MW capacity has been commissioned. Wind based projects have been planned in Ramagiri, Singanamala, Beemunipatanam and Tallimadugula. 43 projects with capacities ranging from 1 MW to 18 MW and with a total capacity of 61 MW have been planned. 33 Biomass based projects with capacities ranging from 0.42 MW to 14 MW also have been planned. Some are co-generation projects in Sugar mills. The total capacity adds up to 210 MW [1].

4. REGULATORY PROCESS

Andhra Pradesh Regulatory Commission was formed on 31 March 1999. APERC has been co-ordinating the regulatory process. It is a 3 member body selected by a committee consisting of a) a retired Chief Justice of any high court or a retired judge of the Supreme court, b) Chief Secretary of the Government of AP and c) the Chairman of the CEA. Secretary of the state Energy department will be the convenor. Selection committee suggests two short-listed names for each post and the State government appoints one of them as the member. One of the members shall be designated as chairman by the state government. One member is expected to be a graduate electrical engineer with industry experience, and two members are expected to have graduate qualification with experience in any of the disciplines like law, economics, commerce, finance, accountancy or administration. APERC has the powers of a Civil Court [4].

The current chairman Mr. GP Rao is a retired IAS officer who has served as secretary to Government of India. Mr. D Lakshminarayana, Member, was the Chief Commissioner of Income Tax, AP. Mr. AV Subba Rao, Member, was a Member, APSEB. APERC has a staff strength of nearly 60, which is quite high compared to the other RC's in India.

Since its inception, APERC has released several regulations and documents such as Business rules, Standards of performance Practice guidelines and Consumer's right to information. APERC has issued licences to APTRANSCO for bulk supply, DISCOMs for retail supply and the RESCOs for retail supply.

APERC has issued two tariff orders so far. Work on tariff started with a tariff philosophy working paper prepared in 1999 as one of the first acts of APERC. This paper is essentially a textbook approach to power tariff explaining the various approaches to tariff such as performance based tariff, cost based tariff etc. There is not much correlation to ground reality with calculations of impact of tariff change on different consumer categories etc. Public meetings were organised on this paper in 3 cities in November 1999. The next major activity in Tariff was the first tariff hearings. In April 2000, APTRANSCO submitted the Annual Revenue Requirement (ARR) documents, suggesting 22% tariff hike. APERC invited public comments and consultations were held in April (78 organisations) and May 2000 (26 organisations). There was severe criticism on the way these hearings were held. Limited number of people were allowed, press was not permitted and public participation was NIL. Thus, this process was quite non-transparent and non-participatory. APERC gave the first tariff order in May 2000 proposing a tariff hike by 20% and after a few days, reduced the hike to 15%. A massive public protest followed this tariff order which is described in section 5. Towards the second Tariff order, in January 2001, APTRANSCO and the DISCOMs filed the ARR for the year 2001-2. Public hearings were held in 26 Feb 2001 at Tirupathi and from 01-08 March 2001 at Hyderabad on the 89 submissions made to the RC. These hearings were public with participation of press and public. There was a feeling that RC could have taken a stronger stand with APTRANSCO and the DISCOMs on some contentious issues like estimating agricultural consumption, high commercial losses, power purchase charges and RC directives not met by APTRANSCO. The second Tariff order was issued dated 24 March 2001 with a very nominal tariff hike.

APERC has issued orders on regulation of third party sale of power by power plants and on incentives for non-conventional energy project developers. In Jul- Aug 2001, it has held public hearing on the PPA for the BPL Ramagundam coal based project to explore the possibility of reducing the foreign exchange component and to examine the feasibility of allowing 16% rate of return. It has given a consultancy order to CPRI, Bangalore to estimate technical losses in AP Power transmission system.

The regulatory process in AP is marred in controversy and legal battles. In less than three years of its existence, over three dozen cases have been filed in the AP High court with APERC as one of the respondents. Most are from the industry and some from public organisations. Most of the filed cases are pending and there have been no court order as yet over-ruling any order of the commission.

There is a steering committee headed by the Chief Secretary to review the reform process. There is also a Task Force headed by the Principal Secretary (Energy) and a Reform Project Management Group headed by a Chief Engineer (Reform) to assist the process

One of the hallmarks of the regulatory and reform process in AP has been the presence of a large number of consultants. They have been involved in policy formulation, analysis and stake holder studies. It is to be noted that most of these consultants are multinational. A partial list is given in Table 18 [8,20,22] in Annexure.

5. POLICY INTERVENTIONS

5.1 BEFORE REFORMS

Andhra Pradesh has a long history of public intervention in affairs of the state. There was spirited participation in the independence movement, a violent mass struggle against the oppressive rule of the Nizams, a spirited mass movement spearheaded by women against the liquor policy of the government and alcoholism in 1992 and many struggles on the issue of land reforms. Congress party ruled the state till 1983, when Telugu Desam Party (TDP) a newly formed state level party won the elections. TDP has been in power in state since then except for a 5-year break between 1989 and 1994.

Policy interventions in Power sector have been mostly through the legislature, media or courts. They have been mostly on the issue of tariff. Before 1990s, APSEB had the monopoly in policy formulation and operation of the power sector. Policy interventions were through the elected representatives of the legislative assembly or through media. The strong lobby of farmers was responsible for doing away with metering of agricultural loads in 1980s. The tariff was modified to be on a per HP basis, at that time

reflecting the cost of units consumed and fixed at Rs. 50/HP in 1983. Many major hydro projects in the state had problems of Relief & Rehabilitation and some organisations did attempt to get a fair deal to the displaced population. A hallmark of the pre-reform times was that the operation of the power sector was not at all transparent and it was very tough to get any information on the performance. A classic example is T&D loss: published figure of T&D loss was 22% in 1981, went down gradually to 18.9% in 1996 and then suddenly jumped to 32% in 1997. It was clear that figures from 1981 to 1996 were cooked up to satisfy the funding agencies. The reason for the sudden jump in one year was the pressure on the sector for change and transparency forced by the reform process. Of course, some role may be played by the utility's interest in getting higher losses accepted by the regulatory commission since it makes their task of improving performance in the near future a bit easier!

5.2 POST REFORMS

Since 1990's, there has been consistent opposition to the non-transparent process of introducing private generation. Media has highlighted the possible irregularities in the PPAs and the MOUs. Participation of employees, CSIs and public in the power sector issues has increased.

Employees

Employee unions had agitated against the government reform plan at different stages of the process. The first phase of agitation was in 1995 when a Joint Council of Action (JCA) was formed to oppose the reform plan. JCA consisted of all unions including APSEB Engineers association (APSEB EA), APSEB Assistant Engineers Association (APSEB AEA), AP Power Diploma Engineers Association and the unions of the workmen namely union number 1104 (All India Trade Union Congress - AITUC), 327 (Indian National trade Union Congress- INTUC) and United Electricity Employees Union (Centre of Indian Trade Unions - CITU). All these unions and the Association of Account officers etc organised a rally in March 1995 opposing the reform plan.

The second phase of Employees' agitation started after the High Power Committee report in June 1995. Mr. Naidu had become the Chief Minister and reform process was on. A strike notice was given in July 1997 with a plan for a token strike on 18-19 August. Only the AITUC union went on strike where as the others withdrew because of internal differences. When the reform bill was introduced in April 1998, the AITUC union again went on strike. Entire power supply in the state was severely affected. As a result the government of Andhra Pradesh (GoAP) brought in army and other para-military forces to operate the power plants and distribution system and also to bring back striking workers. GoAP also invoked Essential Services Maintenance Act (ESMA), which empowers government to take stern measures to maintain essential services and to ban protests and strikes. Using such measures the strike was suppressed and was subsequently withdrawn after 3 days. At the same time the Government entered into tri-partite agreements with the workers unions and Engineers' association. These put the employees' seal on the reform process while assuring them that there would be no change in service conditions, retirement benefits will be protected etc.

The third phase started with active participation of the APSEB Engineers Association. APSEB EA conducted a study of the Orissa reform process and started an agitation against the proposed reform program. Another strike call given for 16 May 1998 was withdrawn for lack of support. A signature campaign was organised targeting 1 lakh (0.1 million) signatures and helped to reach out to the public. When the tariff hike was announced in June 2000, many political parties became active in the agitation and the front line role of employees came down [21].

Regulatory Interventions by CSIs

Regulatory interventions through public hearings and petitions have started with the formation of the APERC. There are many Civic Society Institutions (CSIs) like consumer organisations, mass organisations and other voluntary organisations active in the power sector.

People's Monitoring Group on Electricity Regulation (PMGER) was formed in November 1999 and has emerged as one of the active groups with participation from farmer's organisations, environmentalists, journalists and academicians. PMGER has actively participated in the public hearings and played a catalyst role to involve different stakeholder organisations in regulatory intervention. Through seminars, papers and articles, it has helped to improve the quality of regulatory interventions.

Loksatta is an active organisation working for democratisation of public institutions. It has formed Citizens Organisation for Regulated Electricity (CORE). CORE has some senior retired government officials also as its members. CORE has released and circulated a document describing the state of the power sector. This document - "Electricity Sector- People's charter of demands" has been very sharp in criticising some of the reform policies and has suggested alternative models. The basic thrust is towards better management of the sector with participation of 'citizen-owners'. In the area of distribution, CORE submits that DISCOMs are huge, each spread over 5-6 districts and each with assets worth about 10,000-20,000 Million Rupees. (This is the published figure of the RC. Figure given by CORE is Rs. 70,000 M). Only big global players may take up stakes in DISCOMs when they are privatised, and they may not understand the local complexities. Thus, it is not sure if the distribution system operation would improve. Instead of this, CORE suggests that small private entrepreneurs, with the participation of employees could be asked to take over management of the 1800 odd 33 kV substations. This would be a decentralisation of distribution, with the management aware of the local conditions, motivated to perform and having a long term commitment to operate the system efficiently [9]. As a pilot study, CORE had also taken up a few distribution substations for study to bring out the management problems responsible for poor functioning of the power utility. CORE has been participating in public hearings and using the media to spread information on the reform process.

Farmers' organisations, Employee organisations, Press and few committed retired bureaucrats have also significantly contributed to the regulatory process. This has been through participation in public hearings, writing articles and publishing books. There have been many pamphlets and one comprehensive book on the power reforms [21]. One of the senior retired bureaucrats had filed a Public Interest Litigation (PIL) in the High Court on the subject of low frequency operation of the grid and resulting inefficiencies. In January 2001, the High Court has asked a 4-member committee of experts to suggest measures to improve generation and transmission of electricity. Participation by industry associations have been mostly confined to protecting their own interests. Academia and professional bodies (Institution of Engineers - India, Institution of Electrical and Electronics Engineers (IEEE, which is based in USA), etc) have not been involved to any significant extent as yet.

Public Protests

A mass protest took place after the first tariff hike was announced by the RC in June 2000. Congress and 9 Left parties who constitute the opposition group in the state legislature led this protest. There were meetings, rallies, call to boycott paying of power bills and boycott of electricity (voluntary switching off lights for few hours at night). Members of the assembly went on an 11-day hunger strike in August. A big rally was called in Hyderabad on 28 August 2000 to march towards the Legislature assembly. There was police lathi charge, use of water cannons and firing in which 3 persons died. There was a state-wide strike on 29 August 2000 and a demonstration in New Delhi. Protests were held when the World Bank president visited Hyderabad in September 2000.

Even though all these did not help to roll back the tariff, it has helped to make power one of the key political issues in AP. Power was an important issue in elections (Loksabha in Sep-Oct 1999, Local bodies in Jul 2001, assembly by-elections in September 2001) and is a subject of debate in many political forums. Tariff hearing in 2001 was much more participative and the tariff hike marginal. It can also be said that major steps like privatisation of distribution or finalisation of PPAs are given much more attention and thought by all the concerned players. In Andhra Pradesh, there is a wide spread concern on the possible bad fall-outs of privatisation, on the impact of large scale entry of multinationals in equipment manufacturing, consultancy & project execution, on the large loans that have to be repaid and on possible tariff shocks. In AP, the debate on power sector is linked to the similar trends in other infrastructure sectors, since the reform process is guided by similar policies.

ANNEXURE - TABLES

Table -1: Statistical Overview of Andhra Pradesh [1,17,23]			
Item	Andhra Pradesh	All India	AP as a % of all India
Capital	Hyderabad	New Delhi	
Population (millions, 1991)	66	846	7.8
Area (1000 Square kms)	275	3287	8.4
Average Per capita Income (US \$/year, 97)	219	260	84
Percentage of population under poverty line	22.2	35.8	62
Percentage of population literate (91)	45	52	87
Per-capita consumption of electricity (kWh/year, 99)	404	338	121

Table -2: Generation- Installed capacity & Connected Load [1]						
Year	State Owned - MW		Central Share- MW	Private - MW	Total - MW	Conne cted Load- MW
	Hydro	Thermal				
1961	124	89	-	-	213	
1971	268	337	-	-	605	
1981	1038	1260	-	-	2298	4483
1991	2452	*1679	762	-	4893	10414
1999	2659	**3225	885	563	7330	17785

Notes:

1. Central share is the share of power from the Central sector generating plants in southern region. Plants included are NTPC, Ramagundem, NLC at Neyveli and NPC, Kalpakkam.
2. *: Includes 66 MW capacity of the AP Gas Power Corporation. A joint sector corporation
3. **: Includes 272 MW of the AP Gas Power Corporation
4. Compounded Annual Growth Rate of connected load is about 8% in 70's, 8.8% in 80's and 7% in 90's.
5. In addition to this, there is an estimated captive power generation capacity of 948 MW (1999)
6. The peak load met in 1961 was 146 MW; in 1999 was 6480 MW.

Table -3: Generation- Energy [1]					
Year	State Owned - MU		Central Share-MU	Private - MU	Total - MU
	Hydro	Thermal			
1961	610	174	-	-	784
1974	910	2196	-	-	3106
1985	6716	5835	-	834	13385
1991	10017	8102	2725	-	20844
1999	7189	*21633	6921	3094	38838

Notes:

1. Central share is the share of power from the Central sector generating plants in southern region. Plants included are NTPC, Ramagundem, NLC at Neyveli and NPC, Kalpakkam.
2. *: Includes 1799 MU of the AP Gas Power Corporation
3. In addition to this, there is estimated to be a captive power generation of 4338 MU (1999)

Table 4: Transmission Capacity [1,18]								
Year	400 kV		220 kV		132 kV		66 kV	
	Sub-stations	Circuit kms	Sub-stations	Circuit kms	Sub-stations	Circuit kms	Sub-stations	Circuit kms
1961	-	-	-	-	6	NA	24	NA
1971	-	-	6	1144	21	2473	34	2743
1980	-	-	11	2428	38	4231	35	2623
1991	-	-	27	4987	108	7612	14	1570
1999	6	1000	56	8192	164	10590	4	186

Notes:

1. 400 kV system belongs to POWERGRID. State sector also has been setting up 400 kV system from 2000 (46 circuit kms set up by Mar 2000) and has plans to expand the 400 kV network.
2. There are inter-state tie lines to Tamil Nadu and Karnataka- two neighbouring states, which also form part of the Southern Regional grid. Links are also there to Madhya Pradesh (part of Western Region) and Orissa (Eastern Region). There are HVDC links to Eastern Region and Western region.
3. From the table, it can be seen that 66 kV system is getting phased out.

Table 5: Distribution Capacity [1]						
Year	33 kV		11 kV	LT (415 V)	Distribution Transformers	Consumers (Million)
	Sub-stations	Circuit kms	Circuit kms	Circuit kms		
1961	65	2883	11917	13738	4667	0.27
1971	248	6620	42879	65805	22549	1.42
1981	376	10188	62427	107681	34701	2.20
1991	986	19064	123460	285110	88054	6.80
1999	1593	27258	160198	412235	171766	11.00

Table 6: Energy and Personnel [1,10]									
Year	Domestic		Agriculture		Industry		Loss	Total	Personnel
	MU	%	MU	%	MU	%	%	MU	Million
1971	179	5.8	394	12.7	1613	52.0	29.0	3106	NA
1981	546	7.9	915	13.2	2966	42.9	22.0	6915	NA
1991	2079	10.3	6285	31.1	5715	28.3	19.7	20233	0.066
1999	5090	13.2	9554	24.7	5786	14.9	38.0	38720	0.075

Notes:

1. In addition to three consumer categories - Domestic, Agriculture and Industry- some energy is sold to other states.
2. % is taken on the total MU, which is the energy generated and handled by the system- not sold.
3. Loss % was 35.4 for 2001 and is expected to be 32.3 % for 2002.
4. From 1999, APSEB personnel have been distributed in Generation, Transmission and Distribution companies. Personnel from Private generating stations have not been accounted for.

Table 7: Finance [1,10,15]					
Year	Revenue	Operating Expenditure	Gap	Subsidy	Remarks
	Rs. Million	Rs. Million	Rs. Million	Rs. Million	
1981	2046	2046	0	0	
1991	12631	12207	424	386	Plough back
1999	46288	70449	-24161	21915	Losses start from 1995
2001	58443	86437	-27994	16267	

Note: In 2001, for APTRANSCO, Power purchase was 82% of the expenditure, O&M was 8% and Interest & others was 10%.

Table 8: Rural Electric Supply Co-operatives [1]		
S.No	Name	Number of LT Consumers
1	Sircilla	142847
2	Rayachoti	34769
3	Anakapally	49360
4	Kuppam	44699
5	Cheepurupally	17142
6	Sanjay (Jogipet)	30124
7	Kadiri East	19655
8	Kadiri West	20334
9	Atmakur	25919
	Total	383849
	Total LT consumers in AP	10968327

Table 9: Gas based Generation in joint sector [1]			
Plant	Unit	Capacity (MW)	Commissioning Date
Vijjeswram Stage 1	1	33	02 Dec 1990
Vijjeswram Stage 1	2	33	12 Mar 1991
Vijjeswram Stage 1	3	34	17 Mar 1992
Vijjeswram Stage 2	1	112.5	31 Mar 1997
Vijjeswram Stage 2	2	60	23 Dec 1997
Total		272.5	

Table 10 : AP Power Restructuring Project [5]						
Name	Financing Plan (US\$M)			Implementation Plan		Conditions
	IBRD	Others	Total	Start Date	Close Date	
APL 1	210	366	576	Feb 99	Feb 03	a) Reform Act effective b) RC Functional c) APGENCO and APTRANSCO operational d) Tariff Submissions made e) Corporatisation agreements reached
APL2	100	188	288	Mar 00	2003-04	a) At least one/two of the DISCOMS converted to JVs with private sector participation b) Tariff hike to average 12 - 15% in 2001-04! c) Agriculture tariff at half the cost to serve by 2003
APL3	250	697	947	2000-01	2005-06	a) One/two more DISCOMS converted to JVs with private sector participation b) APGENCO shares listed in the stock market
APL4	250	961	1211	2002-03	2007-08	a) Entire Distribution business privatised b) APTRANSCO shares listed in the stock market
APL5	190	1248	1438	2004-05	2008-09	a) Subsidies to be made to 0% by 2007 b) Generation to be privatised to the extent of 30% by 2007 c) Agriculture tariff at cost to serve by 2007
Total	1000	3460	4460			

Table 11: Project Components of APL-1 [5]			
Component	Cost - US \$M	% of Total Cost	Remarks
Transmission system	70	25	EHT Lines, Substations
Distribution System	103	37	Lines, Substations, Communication system
Metering	65	23	Electronic meters for industry, Energy audit and Agricultural DT's; computers; spot billing
Unallocated	11	4	For unanticipated needs
Technical assistance	32	11	Consultancy studies for reforms
Total	281	100	

Table 12: Installed Capacity [14]				
Name	Capacity MW	Capacity MW	% of Total	Remarks
APGENCO- Hydro	2657		(47)	
APGENCO- Thermal	2953		(53)	
APGENCO- Wind	2			
APGENCO - Total		5612	73.0	
Joint Sector - Gas		272	3.5	Two Gas based plants
Central Sector Share		885	11.5	NTPC (580), MAP(28), NLC(277)
Private - Wind	65			
Private- GVK (Gas)	216			
Private- Spectrum (Gas)	208			
Private- Kondapally (Gas)	355			Started with Naphtha. Gas by mid 2001.
Private- Mini Hydro	34			
Private- Co-generation (RCL)	41			
Private - Bio-gas/Bagasse	21			
Private Total		940	12.0	
Grand Total		7709	100.0	

Table 13: Annual Energy Generation 2001 [13]			
Name	Generation - MU	Generation - MU	% of Total Generation
APGENCO - Hydro	7161		(25)
APGENCO - Thermal	21934		(75)
APGENCO - Total		29096	62
Joint Sector - Gas		1978	4
Central Sector		8292	18
Private Sector		7440	16
Total		46806	100

Table 14: Plans of APGENCO [10]				
Name	Units	Capacity MW	Commissioning plan	Remarks
New Projects				
Srisaillam Left Bank Hydro	6 X 150	900	Mar 2001- 2003	OECD funded, pumped storage, on an existing dam
Rayalseema Stage II Thermal	2 X 210	420	Apr 2001- 2004	ZMEC, Chinese government company on BT basis
VTPS Stage IV Thermal		660	NA	KFW, Germany, is keen
Jurala Hydro	6 X 36.9	221	NA	Foreign Investors keen
Renovation Projects				
KTPS B & C Thermal	4 X 110	440	2001 - 2002	Capacity to become 460 MW, PLF from 60 to 80%, Life extension by 20 years
Machkund, TB Hydro		84	NA	
VTPS Stage I Thermal		220	NA	
KTPS - A Thermal	4 X 60	240	NA	

Table 15: IPPs - Key Information [12,16]												
Name	Location	Cap acity MW	Fuel	Milestones				Cost Rs M	Equity Plan	EPC Contra ct	O&M Contra ct	Remarks
				TEC	PPA	Financi al closure	Comm issioni ng					
GVK Phase I	Jagurupadu	235	Gas	Nov 93	Apr 96	Sep 96	Jul 96	10025	GVK, CMS Energy, APSEB, IFC, AIF, Weintage	ABB	CMS Energy	Loan from IFC, IDBI
Spectrum I	Kakinada	208	Gas	Mar 94	Jun 93, Jan 96		Jan 97	9000	Bambino, Spectrum, Rolls Royce, NTPC, Fis	Parsons Power, Westing house, Rolls Royce	Parsons Power, Westing house, Rolls Royce	Loans from IDBI and SBI
Hinduja	Vishakapatanam	1040	Coal	Jul 96	Apr 98	Not done	No	50000	Hindujas, International Power(UK)	Sumitomo, Hitachi	International Power	Foreign funds from ECGD, UK & OND, Belgium. Rupee from IDBI, IFCI, SBI & Canara Bank. Project may be dropped.
LANCO	Kondapally	355	Gas	Jan 98	Mar 97	Dec 98	Jul 00	11970	LANCO, Eastern Generation(UK), CDC(UK), Hanjung (Korea)	Hanjung	Eastern Generation	Foreign from Korean Exim Bank, Rupee from Indian Fis
Gautami	Peddapuram	598	Gas	No	No	No	No	13000	Meytas Infra, IJM (Malaysia), Unocal, Nagarjuna	No	No	Two phases 464 + 133.9 MW

Table 15: IPPs - Key Information [12,16] - Continued												
Name	Location	Capacity MW	Fuel	Milestones								
				TEC	PPA	Financial closure	Commissioning	Cost Rs M	Equity Plan	EPC Contract	O&M Contract	Remarks
Ispat Power	Vemagiri	492	Gas	Jan 99	Mar 97	No	No	17110	Overseas Investment, International Investment and Ispat Energy Holdings - Mauritius	ZTPC (China)	No	No
Konaseema	Kakinada	445	Gas	No	Mar 97	No	No	3800	Konaseema, Engineering Power System, Oakwell Power	No	No	No
BPL	Ramagundam	520	Coal	Jun 97	Oct 94, Jan 99	No	No	27340	BPL, Marubeni(Japan), JBIC, Electric Power Development Corp(Japan)	Marubeni	Electric Power Devp Corp	
BBI	Krishnapatanam	520	Coal	Jun 98	Jul 99	No	No	22200	BBI, Pennsylvania Power & Light (US), Montana Power (US)	Duke/Fluor Daniel	No	
GVK	Krishnapatanam	520	Coal	No	Nov 94	No	No	20000	GVK	Korea Heavy Industries (Hanjung)	No	

Table 15: IPPs - Key Information [12,16] Continued												
Name	Location	Capacity MW	Fuel	Milestones								
				TEC	PPA	Financial closure	Commissioning	Cost Rs M	Equity Plan	EPC Contract	O&M Contract	Remarks
GVK Phase II	Jegurupadu	440	Gas	No	No	No	No	7000	GVK	Korea Heavy Industries (Hanjung)	No	
Kakinada Indian Oil	Kakinada	1000	Gas	No	No	No	No	70000	Indian Oil, Petronas (Malaysia), Coconada (Singapore), British Petroleum?	No	No	

Table 16: IPPs and Others- Tariff - 2001-2 [15]					
Name	Location	Capacity MW	Fixed Cost Rs/Unit	Variable Cost Rs/Unit	Total Cost Rs/Unit
GVK Phase I	Jagurupadu	235	1.52	0.85	2.35
Spectrum I	Kakinada	208	1.61	0.84	2.45
Hinduja	Vishakapatana m	1040	-	-	-
LANCO Naphtha/Gas	Kondapally	355	1.22/1.22	2.82/0.92	3.44/2.14
Gautami	Peddapuram	598	0.98	1.00	1.98
BSES Andhra OC/CC	Peddapuram	220	0.99/0.99	0.80/1.13	1.79/2.12
Ispat Power	Vemagiri	492	0.98	1.00	1.98
Konaseema	Kakinada	445	0.98	1.00	1.98
BPL	Ramagundam	520			
BBI	Krishnapatanam	520	-	-	-
GVK	Krishnapatanam	520	-	-	-
GVK Phase II	Jegurupadu	440	0.98	1.00	1.98
Kakinada Indian Oil	Kakinada	1000	-	-	-
APGENCO - Coal			0.7	1.07	1.77
NTPC- SR Coal			0.58	0.85	1.43
NTPC-ER Coal					2.10
NLC - Lignite					1.55
MAP- Nuclear					2.02
Gridco					2.28
VSP					2.00

Table 17: Consultants in Reform		
S.No	Name	Scope of Work
1	ICICI, SNC, PWC, Jardine Fleming	Phase I of the reform process - reform act, unbundling etc
2	ICICI	Financial restructuring and Financial plans
3	CIDA, Canada	Load Forecast, Planning, DSM, Re-configuration of distribution zones, Tariff design
4	SNC Lavalin Canada	Sub-consultants to CIDA, short term planning, grid code
5	PWC	Transfer scheme for assets, liabilities, personnel etc. Analysis of PPAs between APGENCO & APTRANSCO.
6	NERA	Assist the APERC
7	Jardine Fleming	Joint Venture formation for DISCOMs
8	Arthur Anderson	Final transfer of personnel, HRD & MIS issues, second transfer scheme of assets from TRANSCO to DISCOMs.
9	Indica Research, Calcutta	Stake holder study
10	TARU, Hyderabad	Stake Holder study- social analysis
11	CPRI Bangalore	Assist APERC to calculate Power losses in the AP Transmission system.

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PART IV UTTAR PRADESH

1. Uttar Pradesh State

2. Development of the Power Sector

2.1 Uttar Pradesh State Electricity Board

2.2 Privatisation of Distribution

2.3 Independent Power Producers

3. Towards the World Bank Model of Reforms

3.1 Policy Review Committee

3.2 Policy Statement and the Reform Act

3.2.1 Policy Statement

3.2.2 Reform Act

3.3 The World Bank Loan

3.4 Subsequent Developments

3.5 Private Sector Participation

3.5.1 Distribution

3.5.2 Generation

4. Regulatory Process

5. Policy Interventions

Annexure with Tables

References

1. UTTAR PRADESH STATE

The state of Uttar Pradesh (UP) in north India is first in terms of population and fourth in terms of area in India. The name Uttar Pradesh was given in January 1950. With a population of nearly 160 million, UP is one of the poorest states in India. Most of the 'average' development indicators of UP are far below the national average. This includes per capita income (US\$ 142 vs national average of US\$ 260), literacy (42% vs 52%) and infant mortality rate. Economy is largely agriculture based. UP is the largest producer of food grains and oil seeds in the country. Table -1 in Annexure gives a statistical overview comparing UP with all India in terms of population, area, per capita income, poverty level, literacy and electricity consumption.

UP is politically an important state with the largest number of representatives to the national parliament. Nearly all the Prime Ministers of the country (including the present one) have hailed from UP. Recently, a new state called Uttaranchal was carved out of UP with the hill districts in the northwest part. Since very little desegregated information is available for the bifurcated state, this report will be considering the undivided state of UP.

2. DEVELOPMENT OF THE POWER SECTOR

2.1 UP STATE ELECTRICITY BOARD

The key power utility in the state, Uttar Pradesh State Electricity Board (UPSEB) was formed in 1959. Similar to other SEBs in the country, UPSEB had a monopoly in the power sector and functioned under the overall guidance of the state government, interacting with the central power agencies for planning and co-ordination. With head quarters in Lucknow, UPSEB is a part of the Northern Regional Power grid, which is monitored from New Delhi. UPSEB controls nearly 100% power distribution and around 67% of the generation capacity in the state. Apart from its own generation capacity of 5613 MW, UPSEB has a share of 2812 MW capacity from the Central sector generating stations. Table below shows the growth in power infrastructure in the state.

Power Infrastructure Summary [1, 10,13,14]		
	1961	2001
Total Installed Capacity MW	290	8425*
Energy handled MU	18167(1993)	41817*
Consumers Million	5.27(1993)	8.71
Agricultural Consumers Million	0.76(1993)	0.82+
Villages Electrified	1082(1%)	89117 (80%)**
Per capita consumption	131(1986)	196(1999)
Employees	98809(1993)	88100++
* Includes import		
+ Estimate. In addition, about 0.4 M diesel pump sets are in operation in UP [5]		
** As per CEA definition (No. of villages electrified with L.T. mains was 211 in 1961 and 63280 in 2001)		
++ No. of employees in ex-UPSEB (UPPCL + UPRVUNL + UPJVNL)		

Tables 2 to 6 in Annexure gives more details on growth of generation capacity, energy generation, transmission capacity, distribution system and consumer wise energy sales.

Performance of UPSEB has been poor compared to many other Boards in India. At nearly 50%, PLF of the state sector thermal plants has been one of the lowest. The national average figure for PLF is about 67% and NTPC's figure is 83%. Forced outages of thermal stations in 2000 was 25.6% against a national average of 13%. The per-capita electricity consumption is below national average. Growth in generation capacity in the state sector has been slow and nearly 33% of the capacity is in the central sector, which accounts for nearly half the energy generation. Performance of UPSEB in transmission & distribution areas

has also been poor. T&D losses are high at about 40%, bill collection efficiency is about 78% and uncollected revenue arrears as a percentage of annual sales revenue was 80% against a national figure of 34% [5].

Like many other SEBs, UPSEB also had problems of mounting negatives in the balance sheet, high transmission losses and poor quality of power supply. The Electricity Act, 1948 requires SEBs to earn a minimum of 3% rate of return on net fixed assets in operation. State governments are required to provide necessary subsidy to the SEB in case it fails to earn this return. UPSEB was a financially healthy utility until early 1970s. From mid 1970s, it has failed to achieve the rate of return. Its annual operating loss was Rs. 4380 M in 1989 and Rs. 1747 M in 1999, despite an increase in Governmental subsidies and grants from less than Rs. 8000 M in 1989 to over Rs. 21500 M in 1999. Rapidly increasing depreciation expense, high transmission & distribution losses, increasing in-efficiency in metering & collection, very low tariff to agricultural consumers, over-reporting of agriculture consumption and high cost of power from central generating stations are some of the factors that have contributed to the deterioration of financial health. One of the major impacts of this worsening financial situation was UPSEB's inability to raise finances for the required investments in generation and T&D. As a result UP faced severe power shortages and poor quality of power supply. Installed generation capacity in the state sector increased by over 3600 MW in the period 1981 -1991 where as it increased only by about 1400 MW in 1991 - 2001. In this whole period, demand continued to grow at compounded annual growth rate of 5-7%. This combined with inadequate Transmission & Distribution infrastructure resulted in poor quality of supply and low reliability. Table 7 in Annexure gives figures of revenue and expenses for some years from 1991.

2.2 PRIVATISATION OF DISTRIBUTION

Plans for privatisation of distribution started in early 1990's. Distribution in a small region in western part of the state North Okhla Industrial Development Agency (NOIDA) was privatised in 1994. NOIDA Power Corporation Limited (NPCL) owned by the Goenka group was given distribution rights. Another attempt to privatise distribution has been in the city of Kanpur. Kanpur Electricity Supply Authority (KESA) was set up as a part of UPSEB, but with special status in terms of administrative policies. As part of the Electricity reforms act, KESA was converted into a corporation, Kanpur Electric Supply Corporation (KESCO), a 100% subsidiary of UPPCL and responsible for distribution of supply in the city of Kanpur. This was done in Jan 2001, but KESCO has not yet been privatised. More details on this are given in section 3.5.1.

2.3 INDEPENDENT POWER PRODUCERS

Subsequent to the opening up of power generation to private participation by central government in October 1991, many Independent Power Producer (IPP) projects were planned in Uttar Pradesh as well. Norms were relaxed to attract private investment and the process involved signing a Memorandum of understanding with the state government. Projects were planned using coal, hydropower and naphtha. There are plans to add up a capacity of 3200 MW from over a dozen projects, but none have even taken off so far. More details on IPPs are given in section 3.5.

3. MOVE TOWARDS WORLD BANK MODEL OF REFORMS

This section narrates the various developments that have led UP to adopt the World Bank model of reforms, i.e., unbundling privatisation and independent regulation.

3.1 POLICY REVIEW COMMITTEE

In early 1990's, the UP government appointed M/s Putnam, Hayes and Bartlett Inc, of UK as consultants to analyse UPSEB performance and suggest improvements. The World Bank supported this study. The key findings of this study were:

- a) Technical capability of UPSEB is good
- b) There is high political interference in the functioning of UPSEB
- c) High subsidies, low tariffs, high T&D losses and poor bill collection are the causes for financial losses

- d) Causes for poor efficiency of UPSEB are bad financial policies, poor service quality, over staffing and political interference

Study recommended trifurcating of the board into three entities - thermal generation, hydro generation and transmission & distribution. State government privatised distribution activity in NOIDA immediately after this study.

In January 1998, the Supreme Court of India appointed a High Power Committee (HPC) headed by an ex-Cabinet secretary to look into the problems of UPSEB. HPC submitted a report in May 1999 and highlighted political interference as the primary factor responsible for the dismal state of affairs of UPSEB. Corrupt practices leading to theft of power, ad-hoc transfers and promotions and low employee morale were also highlighted. HPC also suggested reforms along the lines of the earlier study by the M/s Putnam Hayes and Bartlett.

3.2 POLICY STATEMENT AND REFORM ACT

3.2.1 Policy Statement

In January 1999, state government released a policy statement on power. It highlighted the problems of power shortage and poor quality of supply. The primary cause identified for this is the lack of investments to meet the capital requirements. It said that state will need an additional generation capacity of 14,500 MW (twice the existing capacity!) by 2011 to meet the demand and an investment of Rs. 690 billion is needed to cater to this. In order to raise this kind of money, credit worthiness of UPSEB has to be restored and restructuring the board, facilitating a regulatory commission and initiating steps towards privatisation can do this. Reforms are to be taken up in three phases.

Phase-1:

- Corporatise Thermal, Hydro and Transmission & Distribution entities
- Facilitate functioning of Regulatory Commission (commission was set up already)
- All new generation projects will be in the private sector

Phase 2:

- Stream line privatised operation of NPCL (distribution company for NOIDA)
- Initiate privatisation of distribution in Moradabad, Kanpur and Agra zones

Phase 3:

- Horizontally divide generation corporations to smaller companies, power station wise
- Create separate corporations for Transmission and Distribution
- Divide Transmission corporation into GRIDCO to own & manage grid and UP Power Corporation to manage system co-ordination & market making
- Divide Distribution corporation into smaller companies and privatise distribution in 6-8 years

The policy statement wants retail tariffs to be rationalised to allow cost recovery. It assures the employees that there will be no retrenchment and that service conditions would be protected. One can clearly see that government made no attempt to understand the real causes of the ills and produced a policy statement that has all the words of the World Bank prescription for power reforms in India.

3.2.2 Reform Act

UP Reform Act was prepared in mid 1999 and passed in the assembly in September 99. After the required formalities, the act became effective on 14 Jan 2000. UPSEB was restructured into 4 new corporations, namely:

- a) UP Jal Vidyut Nigam Limited (UPJVNL) for the Hydro generating stations
- b) UP Rajya Vidyut Utpadan Nigam Limited (UPRVUNL) for the Thermal generating stations

- c) UP Power Corporation Limited (UPPCL) for Transmission & Distribution
- d) Kanpur Electricity Supply Corporation (KESCO) for distribution in Kanpur city

The UP Electricity Regulatory Commission was already constituted on 10 Sep 1998 under the Central Electricity Regulatory Commissions Act, 1998. Once the state act was in force, the UPERC was re-notified under this act on 14 Jan 2000.

There was a massive strike by the Board employees opposing the reform act, which was suppressed. This is discussed in section 5.

3.3 WORLD BANK LOAN

World Bank's Country Assistance Strategy (CAS) of late has been to focus on states that have chosen to embark on comprehensive program of economic reforms. Andhra Pradesh was the first state that World Bank 'partnered' as per this strategy. Uttar Pradesh is the second [9]. The loan scheme is quite similar to the one advanced to Andhra Pradesh. Considering the 'uncertainties in the political situation in UP', World Bank has not used the APL instrument used in AP and Haryana or the single large loan used in Orissa. Instead, a small loan of US\$ 150 M is given by World Bank with many key performance indicators, which will be used to 'assess' the reform process. This loan agreement was finalised in March 2000.

The total project amount is US\$ 236 M with World Bank contributing 63.5% of the amount. There is a small contribution of US\$ 0.2 M from Agency for International Development (AID) and the rest of the amount is to be raised by the state government in local currency. This loan is to be used for very capital intensive projects for improvement of the transmission & distribution system, metering and technical assistance. A sum of US\$ 5 M is set aside for a Voluntary Retirement Scheme. Details of financing and project components are given in Table 8 & 9 in Annexure.

There are several 'key performance indicators' identified by the Bank. These are to be used to assess the progress of reforms in the reviews. The Project Appraisal Document of the World Bank [9] says that lessons learned in Orissa, Haryana and Andhra Pradesh (were Bank funded Power reform projects are in progress) are to be used while defining the reform project and the performance indicators. There is emphasis on the legal, financial & institutional aspects; restructuring the sector to increase the irreversibility; changing ownership of the distribution business to restore financial viability. Performance indicators are captured in Table 10 in the Annexure. These include functioning of the UPERC, steps towards privatising distribution, improving revenue collection and improving the quality of power supply. It can be clearly seen from the table that the pace of improvement demanded from UP power sector by the WB is far more gradual than what it required from Orissa or AP. This could be partly because of the WB waking up to the reality.

3.4 SUBSEQUENT DEVELOPMENTS

UP Electricity Regulatory Commission (UPERC) has been operational with 3 members. It has given 2 tariff orders and several regulations. Details of the activities of the UPERC are given in section 4. There has not been much progress in further unbundling or privatisation of the sector. The state government has signed a MoU with the Ministry of Power, Government of India on reform and restructuring.

State sector is still the major generating utility in the state, having 67% of the installed capacity and 53% of the annual energy generation. Table 11 and 12 in Annexure give details of installed capacity and annual energy generation. State does not plan to take up any more generation projects. One of the thermal projects, Tanda was transferred to NTPC in Jan 2000 (just before the state RC act came to force) against the outstanding dues. This 440 MW plant (operating at a PLF of 22% in 1999) was transferred at Rs. 10,000 M, with a condition that UPPCL would purchase all the power from it, at the rate of Rs. 3.75/unit. There has been criticism that the conditions of this transfer have been to the disadvantage of UPPCL.

In the central sector, NTPC (10 stations) , NHPC (4 stations) and NPC (2 stations) stations in the region provide a proportional share of their generation capacity to UP. Private sector projects are in a fluid stage with many changes over the projected plans. There are currently no working projects.

UPPCL has plans to augment the transmission network in terms of adding EHT lines and increasing transformer capacities. As part of the World Bank funded project, US\$ 83 M is allotted towards these projects. The first 800 kV transmission system in the country is under construction in UP. POWERGRID, which has 400 kV lines and inter-regional tie systems catering to Uttar Pradesh, also has projects to augment the EHT network. As part of the World Bank funded Unified Load Dispatch project, Alstom is setting up a State Load Dispatch Centre for UP at Lucknow. The communication network is also getting augmented as part of this project.

An investment of US\$ 66 M is planned as part of the reform project in the Distribution area to strengthen the distribution system. Out of this, US\$ 26 M is for improving the distribution system in the capital city of Lucknow. BSES is the consultant for this project, which involves addition of substations, distribution transformers, laying underground cables for reliable LT distribution and providing 11 kV capacitors. The rest of the amount is to be used for improving the 33 kV, 11 kV and LT system in towns. It is proposed to take up rural distribution improvement projects with separate funding with Rural Electrification Corporation (REC).

In addition to this, the Metering system improvement project plans an investment of US\$ 58 M. This involves Electronic Tri-vector meters for industrial services, boundary metering between new companies and metering all residential consumers in Lucknow & Ghaziabad city.

3.5 PRIVATE SECTOR PARTICIPATION

In Uttar Pradesh, private sector involvement in the power sector is in the areas of distribution and generation. There is already a private distribution company working in NOIDA from 1994. There are plans to privatise distribution of more cities. As per the reform plan, a comprehensive strategy for privatisation was to be finalised by Dec 2000, distribution companies to be established by Jun 2001 and privatisation to begin after Jun 2001 [9]. Things are behind schedule now. In the generation area, many Independent Power Producer (IPP) projects are planned.

3.5.1 Distribution

Plans for privatisation of distribution started in early 1990's. Distribution in a small region in western part of the state North Okhla Industrial Development Agency (NOIDA) was privatised in 1994. It has some very ideal characteristics of a distribution area - 77% of the consumers in NOIDA are industries and rest is domestic. NOIDA is a well planned industrial and residential township unlike many Indian old towns. NOIDA Power Corporation Limited (NPCL) owned by the Goenka group was given distribution rights. UPSEB was to sell power at Rs. 1.39/kWh to NPCL whereas the average price of power in NOIDA area was Rs. 1.60/kWh. This implies a loss to UPSEB and therefore there have been several attempts to revise the bulk supply tariff to NPCL. An arbitration committee set up for review of this tariff suggested Rs.1.59/kWh, which was rejected by NPCL. Another revaluation was done and the figure changed to Rs 1.41/kWh, which too was not agreeable. In 1999, the third committee headed by Mr. Beg reviewed and suggested Rs. 1.63/kWh. NPCL contested this in the Lucknow High Court, which referred the case to UPERC. UPERC has not sorted out this issue and even in the latest tariff order dated 01 Sep 2002.

As per the tariff filings of this year, UPPCL has projected 175 MU supply to NPCL in 2002 and a bulk supply tariff of Rs. 3.69/unit as the price. This is based on a base tariff of Rs.1.63/unit in 1994 and considering the further tariff hikes. Using a penalty clause in the original agreement which allows the utility to charge double the bulk supply rate, UPPCL has demanded that the rate be double this, that is Rs. 7.38/unit! Regulatory commission has modified the demand projection to 166 MU and suggested continuing the rate at Rs. 2.72/unit till further orders are given [5]. This privatisation effort of a small urban industrial area has resulted in a loss of more than Rs. 1500 Million to UPSEB. [12].

Another attempt to privatise distribution has been in the city of Kanpur. Kanpur Electricity Supply Authority (KESA) was set up as a part of UPSEB, but with special status in terms of administrative policies. In 1999, SBI Caps was appointed consultants towards privatising KESA. As part of the Electricity reforms act, KESA was converted into a corporation, Kanpur Electric Supply Corporation (KESCO), a 100% subsidiary of UPPCL and responsible for distribution of supply in the city of Kanpur. Bids for taking up majority stake in KESCO were invited in early 1999 even though KESCO was set up only in Jan 2000. Four companies had shown interest, namely BSES, CESC, L&T with AES and TEC. The bid submission date was extended many times and finally in Jul 00, only CESC turned in a bid which it later withdrew. Thus, privatisation of KESCO has still not happened. The demand by KESCO is expected to be 2400 MU in 2002 and the provisional bulk supply tariff rate fixed by RC in 2002 is Rs. 1.95/kWh.

3.5.2 Generation

Generation projects from the private sector (called Independent Power Producer (IPP) projects) can be classified under the following heads:

- a) Hydro Projects
- b) Coal based Thermal Projects
- c) Naphtha based Projects
- d) Mini Hydel Plants

There are two hydro projects, both of them with Techno Economic Clearance (TEC) from CEA. There are 2 coal based thermal projects, one having the TEC. There are 6 projects proposed with Naphtha as fuel and few mini hydel projects. Progress on all these projects has been slow and even today there is no project operational and none with a committed date of commissioning.

Key information on these IPP projects is given in 2 tables in Annexure, Table 13. Details include location, capacity, fuel, milestones and project partners in terms of finance, EPC and O&M.

4. REGULATORY PROCESS

The UP Electricity Regulatory Commission was constituted on 10 Sep 1998 under the Central Electricity Regulatory Commissions Act, 1998. The state act was passed in 1999. Once the state act was in force, the UPERC was re-notified under this act on 14 Jan 2000. UPERC has been co-ordinating the regulatory process. It is a 3 member body selected by a committee constituted by the state government and consisting of a) a retired judge of the high court - chairman, b) Chief Secretary of the Government of UP and c) the Chairman of the CEA or his nominee. Selection committee suggests two short-listed names for each post and the State government appoints one of them as the member. One of the three members shall be designated as chairperson by the state government. One member is expected to be a graduate electrical engineer with industry experience, second to be a graduate with administrative experience and third a graduate with experience in any of the disciplines like law, economics, commerce, accountancy or management. UPERC has the powers of a Civil Court [8].

The current chairman of UPERC, Mr. JL Bajaj joined on 12 Jun 99, is a retired IAS officer who has served as Chairman, Pay committee of UP. Mr. SC Dhingra, Member, joined on 12 Feb 99, is a fellow member of Institute of Cost and Works Accounts (ICWA) and was Director (Finance) with PFC. Mr. Arun Sarkar, Member, joined on 15 Feb 99, was a Member- Secretary, NEREB.

Since its inception, UPERC has released several regulations and documents such as Business rules, UP Electricity grid code, Fees & Fine regulations, Appointment of Consultant regulations and Electricity Advisory committee regulations. UPERC has issued licences to UPPCL for bulk supply and KESCO for retail supply.

UPERC has issued two tariff orders so far. Work on tariff started with a paper named 'Issues in Tariff setting'. This paper was circulated and discussed in 5 open sessions held at Lucknow, NOIDA, Meerut,

Varanasi and Gorakhpur in Dec 99. The next major activity in Tariff was the first tariff order. On 31 Dec 1999, UPSEB submitted the tariff proposal to UPERC. RC asked for some clarifications and asked the Board to resubmit. The Board was unbundled in Jan 2000 and UPPCL submitted a revised tariff proposal on 15 Feb 2000. RC pointed out many shortcomings in the proposal and asked for clarifications. UPPCL had suggested a tariff hike of 48% to cover the revenue gap. GoUP announced a subsidy support of Rs. 8000 M and gave policy direction to UPPCL to reduce T&D loss by 5% (from 41.55 % to 36.55%) and improve revenue collection by 5% (from 82% to 87%). Incorporating this and other inputs from the RC, UPPCL submitted another revised proposal on 4 May 2000 suggesting a tariff hike of 25% to cover the revenue gap. Public hearings were held in Agra, Lucknow, Ghaziabad, Dehradun, and Kanpur in June 2000. Consumer groups, industries, industry groups and some stakeholders organisations participated in these hearings. In the tariff order dated 27 Jul 2000, RC gave efficiency improvement targets to UPPCL from 2001 to 2006 announced two part tariff for all metered consumers and gave an average tariff hike of 10% [3].

Towards the second tariff order, UPPCL submitted the tariff proposal on 22 Jan 2001. NPCL and KESCO also submitted proposals. Public hearings were held in NOIDA and Lucknow in Feb 2001. RC pointed out many gaps in the tariff proposal. GoUP announced a subsidy of Rs. 9500 M and gave policy direction to UPPCL to reduce loss to 36.5% and improve collection efficiency to 84%. UPPCL was asked to resubmit the proposal, which it did on 01 Jun 2001. Public hearings were held in 6 places from June to August 2001. A total of 84 organisations/individuals had filed objections to the proposal. In its order dated 01 Sept 2001, RC has severely criticised UPPCL for its poor performance and given multi-year targets from 2001 to 2006 for energy inputs, sale, T&D loss, collection efficiency etc. It asked UPPCL to explore the possibility of kVAh based tariff for some HV consumers. RC allowed a modest tariff hike of 4% and asked UPPCL to improve performance. The new tariff is to be effective from September 1, and not April 1, as requested by UPPCL. This order does not cover NPCL and KESCO. Orders on these two distribution companies will be issued later.

The tariff order 2002 is quite exhaustive and analyses the problems of UPPCL with great detail. In the chapter titled "What is to be Done", gives several suggestions to improve matters. To quote: "*.. State owned utilities do not easily respond to regulatory carrots and sticks. Redefining organisational and individual goals, and ensuring evaluation of individuals on that basis, to ensure that their objectives are in line with the prudent objectives set out by the regulators, would go a long way in overcoming this problem. This needs to be done by UPPCL. In the present system prudent actions by employees bring no reward, while imprudent actions invite no punishment. In fact in a distorted system imprudent actions almost become a pre-requisite for rewards by way of promotions and key assignments The State government must also set an example for all stakeholders by demonstrating its good intentions and support for reforms, through concrete action. Non payment of electricity dues by the Government on a regular basis, and power theft by Government departments does not set a good example for other stake holders*" [Reference number 5, Chapter 8].

UPERC has issued regulations like Conduct of Business rules, Fees & Fines regulation, Appointment of Consultant regulation and Electricity Advisory Committee regulation. RC publishes Power Diary giving an overall situation of the power issues in the state.

There is a steering committee headed by the Chief Secretary to review the reform process. There is also an Implementation Task Force headed by the Principal Secretary (Energy) and a Reform Project Management Organisation (RPMO) headed by a Director General (Chief Engineer rank in Board) to assist the process

One of the hallmarks of the regulatory and reform process in UP has been the presence of a large number of consultants. They have been involved in policy formulation, analysis and stakeholder studies. It is to be noted that most of these consultants are multinational. A partial list is given in Table 14 in Annexure.

5. POLICY INTERVENTIONS

5.1 BEFORE REFORMS

Uttar Pradesh is bracketed with Bihar, Madhya Pradesh, Rajasthan and Orissa as one of the poorest and backward states of India. There have been many national leaders from this state, but the socio-economic indicators have remained poor. UP was a stronghold of the Congress party for many years till 1970's. Since then, other parties like Janata Party (and its variants) and BJP have ruled the state. The current Chief Minister is from BJP and the term of this government is ending this year.

Policy interventions in Power sector have been mostly through the legislature, media or courts. They have been mostly on the issue of tariff. Before 1990s, UPSEB had the monopoly in policy formulation and operation of the power sector. Policy interventions were through the elected representatives of the legislative assembly or through media. The strong lobby of farmers was responsible for doing away with metering of agricultural loads in 1980s. A hallmark of the pre-reform times was that the operation of the power sector was not at all transparent and it was very tough to get any information on the performance. A classic example is T&D loss: published figure of T&D loss was 26.4% in 1989, remained in that range and was 26.8 in 1999. It suddenly jumped to 41.5% in 2000, was reported at 39.4% in 2001 and the target set for 2002 is 36.5% [5]. It was clear that figures till 2000 were cooked up to satisfy the funding agencies. The reason for the sudden jump in one year was the pressure on the sector for change and transparency forced by the reform process.

5.2 POST REFORMS

The major public intervention on the reform issue has been the strike by the employees in Jan 2000. There has been participation by some CSIs in the regulatory public hearings.

Employees

Employees have been concerned about the uncertain status of their General Provident Fund (GPF) and Pension Fund. This fund, amounting to about Rs. 30000 M was to be used by the Board to give retirement benefits. It was known that the Board had used this fund for new investments on fixed assets. (This is actually illegal !). It was not clear how the new successor corporations would create such a huge fund. As nearly half the employees were to retire by 2004, the concern amongst the employees was quite high. GoUP or UPERC gave no satisfactory clarifications on this subject.

Employee unions had agitated against the government reform plan in 1999 when the reform act was passed. GoUP had invoked Essential Security Maintenance Act, declared the strike illegal and called in the Army. This strike ended after 2 days.

On 14 Jan 2000, the reform act was made effective and the Electricity Board unbundled. All employees except the shift workers went on strike the same day. Nearly 80% of the employees joined the strike. GoUP invoked ESMA, arrested union leaders, dismissed many of them and even started fresh recruitment. On 24 Jan 2000, a one-day token strike was held by electricity workers and engineers across India to express solidarity with the agitating employees. Four major central trade unions (across the political lines)- AITUC, BMS, CITU and HMS came together to express solidarity. On 25 Jan 2000, the strike was withdrawn with employees accepting unbundling of the Board. GoUP agreed to defer privatisation (which was to begin with KESCO), agreed to discuss the service conditions and review the unbundling after one year. It also agreed to pay Rs. 10000 M to the GPF before 30 Apr 2000 and to pay the remaining part of GPF and Pension Fund subsequently.

Regulatory Interventions by CSIs

Regulatory interventions through public hearings and petitions have started with the formation of the UPERC. There are many Civic Society Institutions (CSIs) like consumer organisations, mass organisations and other voluntary organisations active in the power sector. Most petitions being pursued by these

organisations are narrow in scope and normally cater to specific concerns of a small segment of stakeholders rather than to broader, long-term and more significant concerns that affect large populations of consumers and employees in the state.

Public Protests

Largest protest against ongoing power reforms implementation in UP was in form of 11-day strike of the majority of employees of ex-UPSEB. The employees have not put up any further significant protest after that strike ended on 25th Jan 2000. There was a one-day strike after that by employees of the Panki power plant. The employees remain utterly divided due to conflicting short-term interests and hold of different trade unions belonging to political parties. Some employee associations and CSIs are pursuing petitions in the high court on specific issues like service regulations, performance of distribution and billing functions on the organization, etc. Besides these, there is no major organised protest by the public. In fact, the perception among the general public is largely that of indifference or in favour of reforms process, devoid of any appreciation of concerns of the employees, implication of reforms process for future tariffs, etc.

ANNEXURE - TABLES

Table -1: Statistical Overview of Uttar Pradesh [1,2,5,9,14]			
Item	Uttar Pradesh	All India	UP as a % of all India
Capital	Lucknow	New Delhi	
Population (millions, 1991)	139	846	16.4
Area (1000 Square kms)	294	3287	8.9
Average Per capita Income (US \$/year, 97)	142	260	55
Percentage of population under poverty line	41	35.8	115
Percentage of population literate (91)	42	52	81
Per-capita consumption of electricity (kWh/year, 1999)	196	338	57

Table -2: Generation- Installed capacity & Connected Load [1]						
Year	State Owned - MW		Central Share- MW	Private – MW	Total - MW	Conne cted Load- MW
	Hydro	Thermal				
1961	NA	NA	-	-	290	NA
1971	NA	NA	-	-	1310	NA
1981	1212	2558	-	-	3770	5664
1991	1433	3554	762	-	7084	10576
1999	1501	4564	885	563	8234	17785
NA: Not available						

Notes:

1. Central share is the share of power from the Central sector generating plants in the northern region. Plants included are of NTPC, NHPC and NPC.
2. Compounded Annual Growth Rate of connected load is about 6.5% in 80's and 5.3% in 90's.
3. In addition to this, there is an estimated captive power generation capacity of 1275 MW (2000)
4. The peak load met in Apr-Jul 2001 period was 6149 MW.

Table -3: Generation- Energy [1]				
Year	State Owned - MU		Central Share – MU	Total – MU
	Hydro	Thermal		
1961	NA	NA	NA	NA
1976	3832	5798	725	9748
1985	4597	7629	3791	14966
1991	5554	12630	11923	28563
1999	6196	18742	15914	38985

Notes:

1. Central share is the share of power from the Central sector generating plants in northern region. Plants included are of NTPC, NHPC and NPC.
2. In addition to this, there is contribution from the captive power generation

Table 4: Transmission Capacity [1,18]								
Year	400 kV		220 kV		132 kV		66 kV	
	Sub-stations	Circuit kms	Sub-stations	Circuit kms	Sub-stations	Circuit kms	Sub-stations	Circuit kms
1961	-	NA	-	NA	6	NA	24	NA
1971	-	NA	6	NA	21	NA	34	NA
1980	NA	1157	11	3416	38	8023	35	3005
1991	NA	1877	27	5539	108	9856	14	3027
1999	6	2819	56	6131	164	10453	4	3139

Notes:

1. 400 kV system belongs to POWERGRID and State sector.
2. There are tie lines to neighbouring states and an HVDC link from Rihand to Delhi.
3. From the table, it can be seen that 66 kV system is getting phased out.

Table 5: Distribution Capacity [1]						
Year	44, 37.5 & 33 kV		11, 6.6 & 3.3 kV	LT (415 V)	Distribution Transformers	Consumers (Million)
	Sub-stations	Circuit kms	Circuit kms	Circuit kms		
1961	65	2883	11917	13738	4667	0.27
1971	248	6620	42879	65805	22549	1.42
1981	376	20550	130351	107681	34701	2.20
1991	986	23605	175437	285110	88054	4.80
1999	1593	27258	194216	412235	171766	8.50

Notes:

1. 1961 and 1971 figures are approximate.

Table 6: Energy and Personnel [1,14]									
Year	Domestic		Agriculture		Industry		Loss	Total	Personnel
	MU	%	MU	%	MU	%	%	MU	Million
1971	179	5.8	394	12.7	1613	52.0	29.0	3106	NA
1981	909	10.5	2818	32.6	4007	46.3	22.0	8654	NA
1991	4051	19.0	8194	38.4	5833	30.4	19.7	21348	0.100
1999	8057	28.3	9982	35.0	5901	20.7	38.0	28524	0.086

Notes:

1. Figures for 1971 are approximate.
2. % is taken on the total MU, which is the energy generated and handled by the system- not sold.
3. Loss % was 39.4 for 2001 and target set for 2002 is 36.5 % [5]
4. From 2000, UPSEB personnel have been distributed in Generation, Transmission and Distribution companies.

Table 7: Finance [1,10,15]					
Year	Revenue	Operating Expenditure	Gap	Subsidy	Remarks
	Rs. Million	Rs. Million	Rs. Million	Rs. Million	
1991	18322	25080	-6758	7833	
1999	56347	73817	-17470	21576	
2001	66070	88510	-22440	7900	GoUP gave 2400 M as subsidy and rest as equity
2002	71480	81960	-10480	8500	

Notes:

1. In 2001, Power purchase was 69% of the expenditure, O&M was 2.7% , Employee cost 14% and Interest & depreciation was 4.7% for UPPCL.
2. Figures for 2002 are as approved by UPERC in its tariff order

Table 8 : UP Power Restructuring Project- Financing Plan 2000-4 [9]					
Source	Amount (US\$M)			% of Total	Remarks
	Local	Foreign	Total		
Local Government	85.8	0.0	85.8	36.4	
IBRD (WB)	31.2	118.8	150.0	63.5	Disbursed over the four year period
USAID	0.0	0.2	0.2	0.1	
Total	117.0	119.0	236.0		

Table 9: Project Components [9]			
Component	Cost - US \$M	% of Total Cost	Remarks
Transmission system	83	35	EHT Lines, Substations
Distribution System	66	28	Lines, Substations, Communication system
Metering	58	25	Electronic meters for industry, boundary metering, all residential in Lucknow & Ghaziabad
Technical Assistance	8	3.4	Consultancy studies for reforms
Voluntary Retirement Scheme	5	2.1	Details to be worked out
Interest during construction	16	6.8	
Total	236	100	

Table 10: Performance Indicators for Restructuring Project [5,9]		
Indicator	Time Frame	Remarks
UPERC fully functional	Apr 2001	Set up as per Central act in 1999 and then continued functioning as per state act from 14 Jan 2000
New Distribution companies formed and licences issued	Jun 2001	Not done
Financial Restructuring Plan	Dec 2001	
Tariff adjustments	Every Year, Tariff filing by Dec 31, Order by Mar 31	Two tariff orders issued, one in Sep 2000, second in Sep 01
Comprehensive distribution privatisation strategy - prepared and approved by UPPCL and State government	Dec 2000	
Improvement of bill collection from non-government agencies (% of current year's sales)	2001- 82% 2002- 83% 2003- 85% 2004- 88%	
Improvement of bill collection from government departments (% of current year's sales)	2001- 90% 2002- 92% 2003- 95% 2004- 98%	
Increase in number of consumers billed in Lucknow and Ghaziabad, compared to Mar 2000	Jun 2002 - 10% Dec 2003- 20%	To be seen
Reduction in Forced Interruptions in the distribution system	Jun 2002 - 25%	To be measured randomly at substations which are being rehabilitated
UPPCL return on equity	2002 to 2004- cover operating costs and interest 2005 - 9% 2006 - 16% 2009 - 16%	

Table 11: Installed Capacity 2001 [5,7]				
Name	Capacity MW	Capacity MW	% of Total	Remarks
UPJVM - Hydro	1511		(27)	
UPRVUN- Thermal	4102		(73)	
UP Sate Sector - Total		5613	67	
Central Sector Thermal - NTPC	2567			Share from 10 stations
Central Sector Hydro - NHPC	201			Share from 4 stations
Central Sector Nuclear- NPC	44			Share from 2 stations
Central Sector - Total		2812	33	
Co-generation				
Private Sector				
Grand Total		8425		

Table 12: Annual Energy Generation in 2001 & Cost [4,5]				
Name	Generation - MU	Generation – MU	% of Total Generation	Average Cost of generation Rs/kWh
UPJVN - Hydro	4954		(22)	0.37
UPRVUN - Thermal	17254		(78)	1.36
UP State - Total		22208	53.0	
Central Sector Thermal - NTPC	17031			1.56
Central Sector Hydro - NHPC	965			1.88
Central Sector Nuclear- NPC	662			2.57
Central Sector - Total		18658	44.5	
Co-generation		206	0.5	
Others		745	2.0	
Total		41817	100.0	

Table 13: IPPs - Key Information [12,16]												
Name	Location	Cap acity MW	Fuel	Milestones				Cost Rs M	Equity Plan	EPC Contra ct	O&M Contra ct	Remarks
				TEC	PPA	Financi al closure	Comm issioni ng					
Visnuprayag	Vishnuprayag	400	Hydr o	Jun 97	Sep 96	Not done	No	16800	Jaiprakash	Jaiprakash, others	No	One of the seven Hydro projects short listed for sovereign guarantees by central government
Srinagar Hydro	Garhwal	330	Hydr o	Jun 00	Aug 98	Not done	2005	17000	Duncan Industries, Synergetics Inc (Voith Siemens group)	Shortlisted	No	Offered to private sector by UPSEB. Escrow received from UP.
Rosa TPP	Shahjahanpur	567	Coal	Sep 97	Sep 98	Not done	2004	29060	Birla, CLP-Power International, PowerGen	L&T-Foster Wheeler, GE, Sargent & Lundy	No	Escrow circles allocated in Aug 00.
Jawaharpur TPP	Etah	800	Coal	No	Jul 96	No	No	44700	Canasia Power, (subsidiary of Pacific Electric Power), Hyundai	Hyundai Heavy Industries	No	No progress last one year
Controls Energy	Saharanpur	100	Nap htha	Not required	No	No	No		Controls Energy, UPSEB	No	No	Project on a BOO basis. No progress

Table 13: IPPs - Key Information [12,16] - Continued												
Name	Location	Capacity MW	Fuel	Milestones								
				TEC	PPA	Financial closure	Commissioning	Cost Rs M	Equity Plan	EPC Contract	O&M Contract	Remarks
Ghaziabad Power	Gautam Budha Nagar	100	Naphtha	Not required	No	No	No	4000	RPG Group			No progress. Fuel may change to LSHS
Ginni Filements	Lucknow	100	Naphtha	Not required	Jul 99	No	No	3500	Jaipuria group			No progress
Modi Mirrless	Ghaziabad	100	Naphtha	Not required	Jul 99	No	No	3500	Modi Rubber			No progress
UP Power Partners	Chandausi	100	Naphtha	Not required	No	No	No	4000	UP Power partners (Desein)			No progress
Wasan Power	Kosi Kalan	355	Naphtha	No	No	No	No	10000	Wasan, Enserch International	Westing house		No progress

Table 14: Consultants in Reform [6,9,12]		
S.No	Name	Scope of Work
1	Putnam Hayes & Bartlett	For restructuring power sector, 1994-95
2	Ewbank Preece	Long Term Investment Study, 1994-96
3	Touche Ross; East Midland Electricity; Hunton & Williams	Reform & restructuring, 1994
4	Tata Economic Consultancy Services	Asset valuation
5	ICICI	Financial Restructuring.
6	Local firms	Communication on reforms to people, employees
7	USAID	Technical support to the UPERC
8	IIM, Lucknow	Organisational structure of UPERC
9	BSES, Lucknow	Improvement of Lucknow Distribution system
10	Pricewaterhouse Coopers	Financial, institutional and technical aspects of reform implementation, from March 2000
11	Premier Energy Technologies Pvt Ltd	Preparation of System improvement schemes for distribution in 4 districts
12	Local firms- to be finalised	Estimation of energy loss

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