



India Power Summit 2006

Theme Paper
on
Power of Money

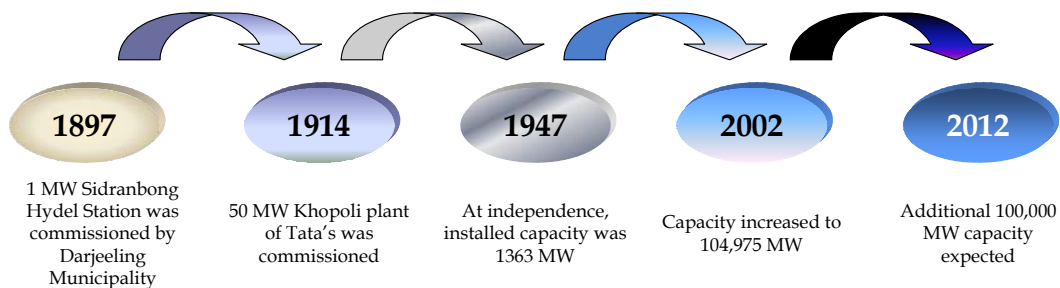


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1 INTRODUCTION

Electricity is an essential input in the economy and an efficient and competitive power sector is vital to a country's development. Electricity is the fulcrum of economic development in any country. Commencing with a meager installed capacity of around 1350 MW during the year of national independence in 1947, the Indian power sector has made substantial growth over the last six decades and the installed capacity at the end of Ninth Five Year Plan increased to 1,05,000 MW.

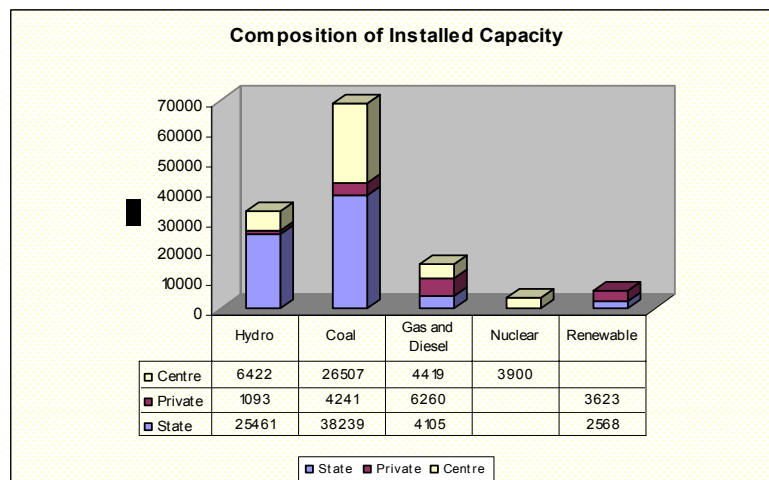


Growth of Electricity Generation Capacity

1.1 Installed Capacity

The current installed capacity in India is around 1,26,800 MW (as on July 31, 2006). Out of the total installed generation capacity, 55.48% is owned by the States, 32.52% by the Centre and 12% by the Private Sector. The composition of fuel wise and ownership wise current installed capacity is as follows:

Figure 1.1 : Composition of Installed Capacity

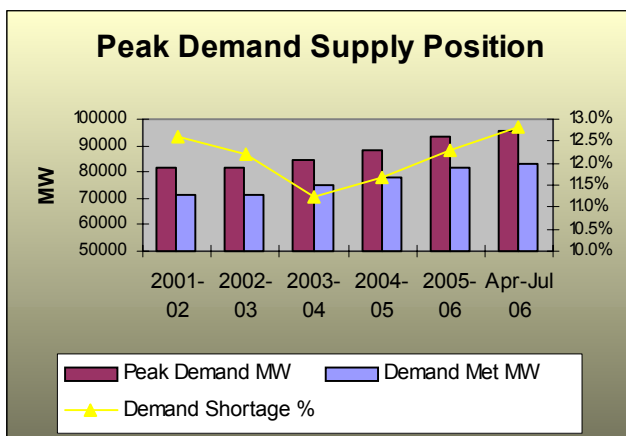


Source : ABPS Research

1.2 Demand Supply Position

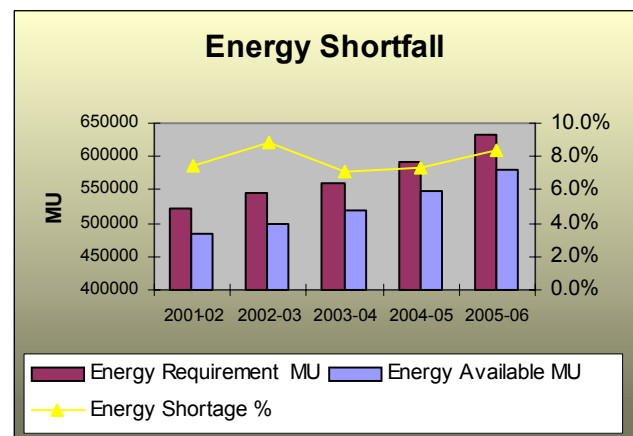
However, the installed generation capacity is inadequate to meet the increasing demand and currently the country is facing energy shortage of around 8.7% and peak shortage of about 12.8% (for the period April to July 2006). In the period 2001-02 to 2005-06, the demand for electricity increased at a CAGR of 4.86%. The demand supply position over the last five years and for the first four months of 2006-07 (April to July 2006) and energy shortfall during the last five years is as follows:

Figure 1.2 : Peak Demand Supply Position



Source : ABPS Research

Figure 1.2 : Energy Shortfall Position



Source : ABPS Research

1.3 Objectives

With a targeted annual GDP growth of around 7 to 8 percent and an estimated energy elasticity of 0.8, the energy requirements of the country are expected to grow at 5.6-6.4% per annum over the next few years. Currently, India has one of the lowest per-capita consumption of electricity in the world and roughly 50% of India's households do not have access to electricity today. India has set itself an ambitious target of more than doubling per-capita electricity consumption and ensuring electricity for all by 2012 for which capacity addition of around 1,00,000 MW had been planned during the period 2002-2012, i.e., Ninth and Tenth Five Year Plan Periods.



2 PROPOSED CAPACITY ADDITION AND INVESTMENTS REQUIREMENT

2.1 Proposed Capacity Addition

For achieving the objective of ensuring electricity for all by 2012, it is essential to analyse the proposed generation capacity additions including Ultra Mega Power Projects and the extent of investments required for strengthening and augmentation of transmission and distribution networks.

Out of total capacity addition of around 1,00,000 MW during the period 2002-2012, Ministry of Power has planned a capacity addition of 41,110 MW during the Tenth Five Year Plan and balance 59,000 MW during the Eleventh Five Year Plan Period. Out of total planned capacity addition of around 41000 MW during the Tenth Plan, the share of Central Sector is 22,832 MW, share of State Sector is 11,157 MW and that of the Private Sector is 7,121 MW. Out of total planned capacity addition of around 59000 MW during the Tenth Plan, the share of Central Sector is 31,500 MW, share of State Sector is 12,500 MW and that of the Private Sector is 15,000MW.

With these targets, proposed capacity addition per annum works out to 8,200 MW and 11,800 MW during the Tenth and Eleventh Plan, respectively. In addition to this, 3100 MW and 6900 MW capacity is expected from the non-conventional sources of energy such as wind, co-generation, solar etc. during the Tenth and Eleventh Plan Period, respectively.

The achievement of targeted capacity addition requires the development of large capacity projects at the national level to meet the requirements of a number of States. Recognizing the fact that economies of scale leading to cheaper power can be secured through development of large size power projects, Ministry of Power, CEA, and Power Finance Corporation are working together for development of **ultra mega power projects** to be awarded under tariff based competitive bidding route. These projects will be awarded to developers on Build, Own, Operate (BOO) basis. The Ultra Mega Power Projects, each with a capacity of 4000 MW, would also have scope for further expansion.

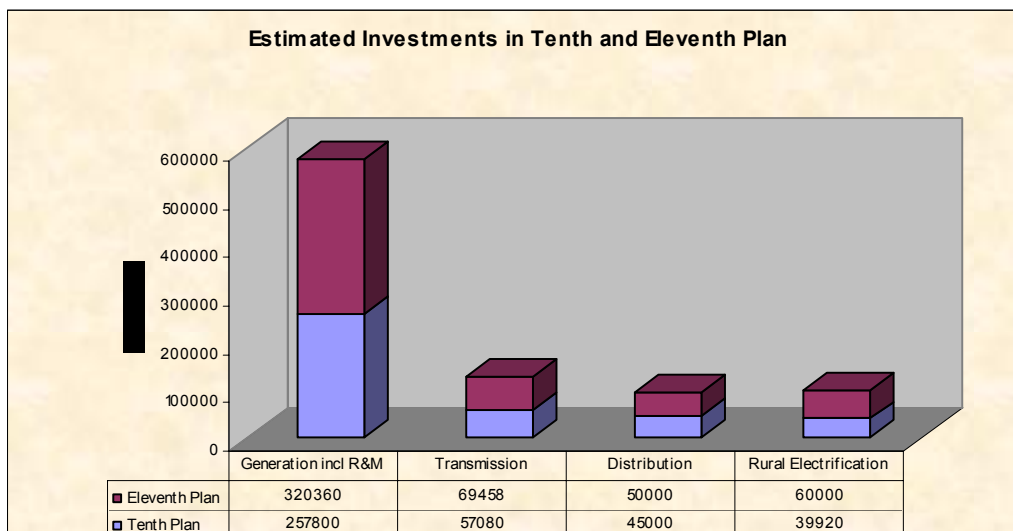
To meet the overall objective, apart from addition of generation capacity, the transmission and distribution networks also needs to be strengthened and augmented to facilitate the evacuation of power and distribution of power.

2.2 Estimated Investments

To meet the overall objective, the total investments required in the Power Sector during Tenth and Eleventh Plan Period has been estimated as Rs 9,00,000 Crore with investment of Rs 4,00,000 Crore in Tenth Plan Period and Rs 5,00,000 Crore during the Eleventh Plan Period. The estimated investment in the five Ultra Mega Power Projects is of the order of Rs 1,00,000 Crore which forms part of the total estimated investments in the Sector.

Out of the total planned investments over the Tenth and Eleventh Plan Period, the maximum quantum of investment to the extent of 61% is estimated towards generation capacity addition. The composition of estimated investments required in various sub-sectors of the power sector during Tenth and Eleventh Plan is given in the following Figure:

Figure 2.1: Estimated Investments



Source: Kohli Committee Report and ABPS Research

The estimated investments of Rs 9,00,000 Crore does not include the projected investments toward non-conventional energy projects, which has been estimated as



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around Rs 17,000 Crore and Rs 43,000 Crore during the Tenth and Eleventh Plan respectively.

In addition to the funds requirement for capital investments, an additional fund requirement of around Rs 1,00,000 Crore has been estimated during Tenth and Eleventh Plan Period towards the transition period of reforms and restructuring of State Power Sector Utilities (SPUs) to take care of past liabilities of SPUs, Working Capital, Employee Terminal Benefits and Cash Losses.

Thus, total funds required for the Power Sector including investments in non-conventional energy sources and towards transition support financing during the Tenth and Eleventh Plan Period are of the order of Rs 10,60,000 Crore.

To ensure estimated investment of Rs 17,000 Crore and Rs 43,000 Crore during the Tenth and Eleventh Plan respectively in non-conventional energy, innovative financing and market mechanisms for promoting renewable energy projects need to be explored. As per the EA, 2003 most of the SERCs have specified a percentage of total energy procured by the Distribution Licensee to be purchased from renewable energy sources. Since, the potential of renewable energy sources depends of vagaries of nature and therefore varies from State to State, it is essential to develop mechanisms which would operate beyond boundaries of the State.

Such new and innovative mechanisms that can be explored for attracting investment in renewable energy sector include Production Tax Credit (PTC) and Renewable Energy Certificate (REC).

Production Tax Credit (PTC) envisages movement of incentive from being investment based to production based. PTC envisages that the RE project developer would be entitled to receive tax credit certificate for every unit of generation from RE project. In this way, RE projects gets incentive only if the project produces RE power. The rate of tax credit is predetermined and set by the Central Government periodically. RE project developer may use PTC certificates to set off his own tax liability or may sell it in the market, thereby allowing purchaser to set off his tax liability. This would enable market for renewable energy projects could be expanded by making IPP model viable for investments in RE projects.



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Similarly, Renewable Energy Certificate (REC) mechanism envisages creation of competitive market for renewable energy generation. In this mechanism, Renewable Energy Projects are issued RE certificates (tradable certificates) based on the energy generation which is by an accredited agency. These RECs could be procured by any person who is either under obligation to purchase RE power under Section 86 (1)(e) or by any person who wishes to purchase RE energy. This mechanism provides an easy way for commercial settlement of numerous transactions with respect to Renewable Purchase Obligation.

As regards to transition support required, Clause 8.2.2(a) of National Tariff Policy Stipulates that the opening balances of uncovered gap must be covered through transition financing arrangement or capital restructuring. N.K. Singh Committee Report on 'Power Sector Investment and Reforms' suggested that to meet the transition support requirement, States may need to explore other financing options such as funding from multilateral agencies, proceeds from divestments of assets of Utilities, additional market borrowings, etc. As per Kohli Committee Report, these funds requirements are expected to be met by Grants from Central Government as well as State Government and restructuring support from multilateral bodies such as World Bank, DFID, etc.



3 ACHIEVEMENTS AND PROGRESS MADE

3.1 Planned vs Actual Capacity Addition

While assessing future plans and investments required, it is necessary to review the planned and actual investments in the sector over the last decade or so to identify the critical lessons learnt. A review of planned and actual capacity addition during the Eighth and Ninth Five Year Plan does not reveal very encouraging results. On overall basis, during the eighth and ninth Five Year Plan, the actual addition to the total installed capacity was only around 16,400 MW and 19,015 MW, as against the planned capacity addition of around 30,500 MW and 40,000 MW, respectively. Thus, the average capacity addition works out to 3280 MW per year and 3803 MW per year during the Eighth and Ninth Five Year Plan, respectively. The summary of sector wise capacity addition during the Ninth Plan Period was as follows:

Table 3.1: Planned vs. Actual Capacity Addition during Ninth Plan Period

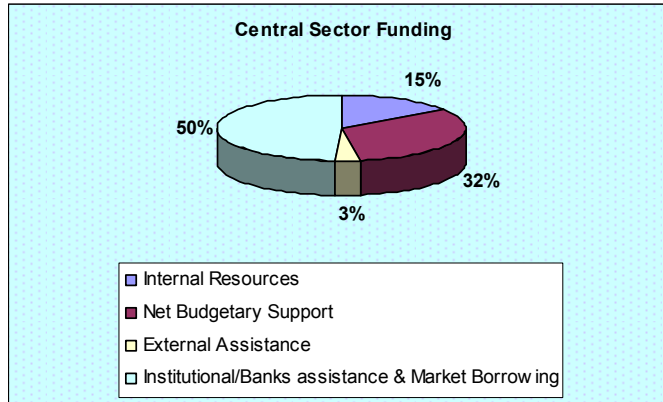
Sector/ Type	Central		State		Private		Total	
	Target	Achievement	Target	Achievement	Target	Achievement	Target	Achievement
Hydro	3,455	540	5,815	3,912	550	86	9,820	4,538
Nuclear	880	880	0	0	0	0	880	880
Thermal	7,574	3,084	4,933	5,538	17,039	4,975	29,546	13,597
Total	11,909	4,504	10,748	9,450	17,589	5,061	40,246	19,015
% Achieved		37.82%		87.92%		28.77%		47.25%

Source: Planning Commission Annual Report on the Working of SEBs

3.2 Investments in Sector during Ninth Plan

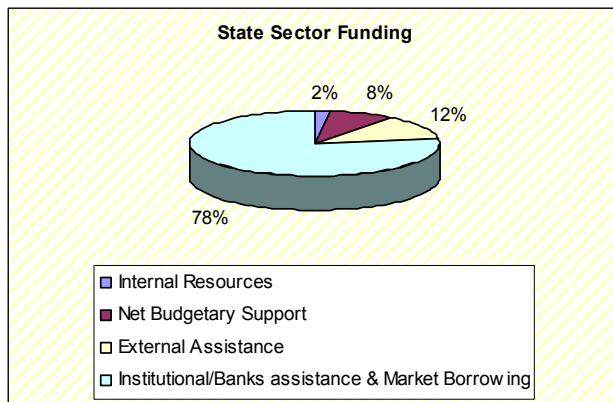
The actual investments made by Central and State Sector in the Ninth Plan Period are around Rs 44,600 Crore and Rs 67,300 Crore, respectively. Out of the total investments made by Central and State Sector in Ninth Plan, around 51% of investments were made in Generation including R&M programmes, around 35% investments were made in Transmission and Distribution and balance 14% investments were made in Rural Electrification and other Miscellaneous Expenditure. The source of funding for investments made in power sector by Central and State Sector during Ninth Plan Period are as follows:

Figure 3.1 : Central Sector Funding Pattern in Ninth Plan



Source: Kohli Committee Report and ABPS Research

Figure 3.2 : State Sector Funding Pattern in Ninth Plan



Source : Kohli Committee Report and ABPS Research

As observed, the funding from Institutions/Banks and market borrowings contributed the maximum towards the State and Central Sector investments. The net budgetary support provided by Government was around Rs 14400 Crore for Central Sector and Rs 5600 Crore for State Sector, with a total net budgetary support of around Rs 20,000 Crore.

Considering the private sector investment of around Rs 23,000 Crore in the power sector during the Ninth Plan period, **the total investments in the power sector during the Ninth Plan Period works out to around Rs 1,35,000 Crore.** The total private sector investment comprised Rs 7000 Crore of equity investment and around Rs 16000 Crore

of debt. Thus, the total investments in the sector during Ninth Plan Period were funded as follows:

- 5.2% (Rs 7000 Crore) through equity investments by private investors
- 66.7% (around Rs 90,000 Crore) through Institutions/Banks assistance and market borrowings
- 14.8% (around Rs 20,000 Crore) through net budgetary support
- 7.3% (around Rs 9,900 Crore) through external assistance
- 6.3% (around Rs 8,500 Crore) through internal resources of Central and State Sector

3.3 Review of Progress Made in Tenth Plan

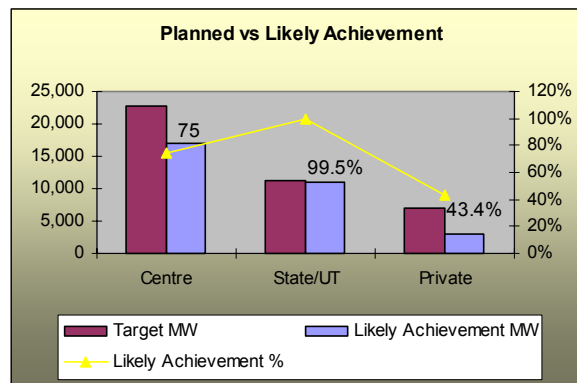
3.3.1 Likely Capacity Addition

As against the plan target of 41,110 MW of capacity addition, the likely capacity addition during the Tenth Plan is estimated at around 31,290 MW, with a shortfall of around 23.9%. The likely capacity addition includes 4293 MW of capacity that was not part of original Tenth Plan target and if the unplanned capacity is excluded, the shortfall would increase to around 34.4%. The sector wise target and likely achievement is as follows:

Sector Wise Likely Achievements

- Central Sector is likely to achieve 75% of target capacity addition
- State Sector is almost likely to achieve target capacity
- The maximum shortfall of around 56.4% is likely in capacity addition by Private Sector

Figure 3.3 : Planned vs likely Achievement in Ninth Plan



Source : ABPS Research

The likely shortfall in capacity addition in the case of hydel and thermal plants is estimated to be around 25%, while the planned capacity addition of around 1300 MW in case of nuclear stations is likely to be achieved. The Tenth Plan envisaged around 9.6% of capacity addition using the more efficient super critical 660 MW modules,



however, the use of the larger and more efficient units have been shifted to Eleventh Plan.

3.3.2 Financial Performance

The approved outlay for the power sector is Rs 2,70,276 Crore, comprising Rs 1,77,050 Crore for the Central Sector and Rs 93,226 Crore for the State Sector. The year-wise actual and expected achievement during the Tenth Plan by Central and State Sector is given in following Table:

Table 3.2: Overview of Approved Outlay and likely expenditure during Tenth Plan (Rs Crore)

Sl.	Year	Central	State	Total
1	Tenth Plan approved Outlay	177,050	93,226	2,70,276
2	2002-03	10,601	14,339	24,940
3	2003-04	13,526	14,528	28,054
4	2004-05	15,947	15,076	31,023
5	2005-06	23,028	15,794	38,822
6	2006-07 (Likely)	51,269	16,546	67,815
7	Likely investment during Tenth Plan	1,14,371	76,283	1,90,654
	(%) utilization	64.60%	81.83%	70.54%

Source: Planning Commission

The total likely investments by Central and State Sector is around 64.60% and 81.83%, respectively, of the approved outlay with total likely investment of around 70.54% of total approved outlay.

3.3.3 Targets and Likely Achievements under Renewable Energy Projects

With respect to targets for renewable energy projects, wind energy is likely to exceed the targets and has already achieved the capacity addition of around 1967 MW equivalent to 131% of the target of 1500 MW during the Tenth Plan. Small Hydro and Biomass Cogeneration are also likely to achieve the Targets. The likely achievement in respect of major renewable energy programmes during the Tenth Plan are given in following Table:



Table 3.3: Likely Achievement of Renewable Energy Programs (MW)

Sl. No.	Description	Wind Power	Small Hydro	Biomass Cogen	Biomass Gasification	Solar Power	Energy from Waste
1	Tenth Plan Target	1500.0	600.0	700.0	50.0	145.0	80.0
2	Actual achievement in first 3 years	1967.6	266.7	368.2	15.3	23	23.4
3	Likely achievement in last two years	1050.0	335.0	360.0	30.0	0.0	25.0
4	Likely achievement during Tenth Plan	3017.6	601.7	728.2	45.3	2.3	48.4
	Likely Achievement in %	201.17%	100.28%	104.03%	90.50%	1.59%	60.50%

Source : Planning Commission

3.3.4 Investments made under APDRP

The Accelerated Power Development and Reform Programme (APDRP) was aimed at supporting distribution reforms in the States through investments and incentives for achieving desired outcomes. Under the investment component, projects worth Rs. 17,612 Crore had been sanctioned till March 15, 2005. All of these projects were designed to reduce the AT&C losses through strengthening of the sub-transmission and distribution system. While the total investment needs for projects in special category States were to be met by the Government of India, the non-special category States were required to fund 50 per cent of the approved project outlay through counterpart funding arranged by the State Governments. A broad summary of the progress made with respect to APDRP investments is summarised in the following Table:

Table 3.4: Planned and Actual Investment under APDRP Scheme (Rs Crore)

Sl. No.	Category of states	Project outlay	Component to be funded by GoI	Amount actually released by GOI	Counterpart funds provided by States	Total utilisation (Actual Investment)	% Utilisation
1	Non-special	15039	7520	3570	2637	5287	35%
2	Special	2573	2573	943	-	481	19%
	Total	17612	10093	4513	2637	5768	33%

Source: Planning Commission

The actual investment achieved under APDRP scheme is to the extent of 33% of planned investments only, which reveals that despite recognising the criticality of the



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distribution sector for the efficiency of power sector, actual investments in the distribution sector remain low.

3.3.5 Key Issues

The analysis of targets envisaged for Tenth and Eleventh Plan, review of actual achievement with respect to planned targets in Ninth Five Year Plan and review of actual progress made during Tenth Plan raises the following key issues:

- Significant shortfalls in achieving Plan targets for capacity addition during Eighth and Ninth Plan
- Likely shortfall of generation capacity of around 10,000 MW in Tenth Plan. Will it be possible to achieve the likely shortfall of generation capacity of around 10,000 MW in Tenth Plan during Eleventh Plan alongwith planned capacity addition of 59,000 MW in Eleventh Plan?
- The estimated investments during Tenth Plan Period (Rs 4,00,000 Crore) are around 3 times the actual investment achieved during Ninth Plan Period (Rs 1,35,000 Crore) and estimated investments during Eleventh Plan Period (Rs 5,00,000 Crore) are around 4 times the actual investments during Ninth Plan Period.
- The annual generation capacity addition planned during Tenth and Eleventh Plan is 8200 MW and 11800 MW respectively as against the actual capacity addition of 3280 MW and 3803 MW per year during the Eighth and Ninth Five Year Plan, respectively
- Whether the investments planned in Transmission and Distribution are adequate, considering the extent of generation capacity addition planned?
- What needs to be done to achieve the planned capacity addition and estimated investments in the sector?



4 PRIVATE SECTOR PARTICIPATION

4.1 Private Sector Participation in Generation

In 1991, the Electricity (Supply) Act, 1948 was amended, which permitted private sector investment in the power sector, especially in generation. The basic aim of the amendment was to attract investment for capacity addition to meet the prevailing and future demand and supply gap. The amendment was supported with the policy notification in March 1992 stipulating Return on Equity of 16% and incentive scheme based on capacity utilization.

The response to the policy initiative at that time was overwhelming and around 250 MoUs were signed between SEBs and the private developers for capacity addition of over 78,000 MW (more than the national installed capacity at that time). Around 20 major domestic private sector players and 25 global players which included AES, Enron, GEC Alsthom, EDF France, Cogentrix, China Light and Power, etc., evinced keen interest in the sector. The Government also declared eight of the most promising projects as "fast track" and offered expedited clearance procedures, as well as provided government counter-guarantees and escrow accounts against non-payment of dues by SEBs.

However, the actual capacity addition by private investors in the generation sector over the past 14 years is not very encouraging. Only few of these contracts, i.e., MoUs resulted in actual capacity addition. After the initial euphoria, due to SEB's poor financial condition and poor track record of payment obligations to its suppliers and creditors and no counter guarantees being provided after the initial eight projects, the private sector players slowly withdrew from the power sector. Out of total IPP planned capacity of around 30,000 MW (Projects that were given techno economic clearance by CEA), the actual capacity addition has been only around 7700 MW and another around 4000 MW is under commissioning.

Despite the potential in Indian power sector, investors have been wary of the regulatory complexities and the risks involved in the sector such as poor creditworthiness of SEBs/State Distribution Utilities, and poor payment track record, etc. These are primary reasons for non-materialisation of planned capacity addition through IPP mode. Some of the key reasons attributable to non materialisation of planned investments by Private Sector can be summarised as follows:



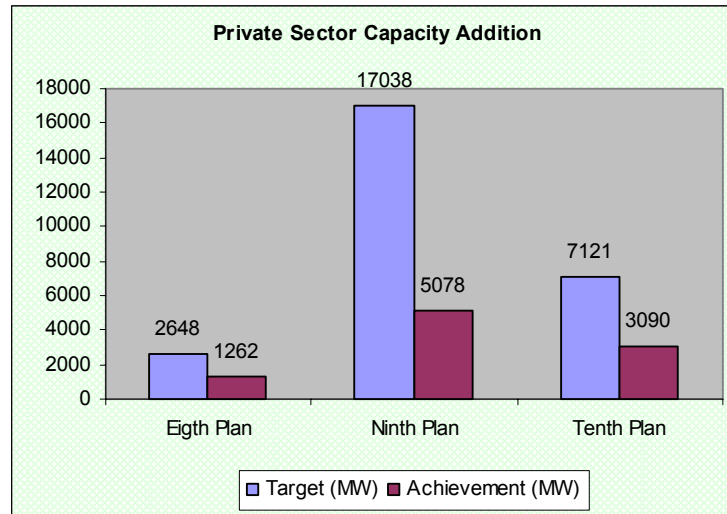
Table 4.1: Key Reasons for Non Materialisation of Planned Investments

Factor	Reasons
Poor Creditworthiness of SEBs and Inadequate Security Mechanisms	<ul style="list-style-type: none">➤ Poor creditworthiness of SEBs➤ Failure to provide adequate security mechanism as agreed in the PPA➤ Most of the States promised escrow without due diligence. Their estimates of escrowable capacity were not accepted by the Indian financial institutions. To make matters worse, institutions like PFC and SBI already had first charge on receivables
Contracts Execution	<ul style="list-style-type: none">➤ Delay in Execution of Key Project Contracts such as PPA, Fuel Supply Agreement and Fuel Transportation Agreement acceptable to all parties➤ Protracted negotiations on fuel prices, liquidated charges/ damages, risk covering clauses, etc.
Fuel Parameters	<ul style="list-style-type: none">➤ High cost of naphtha and other liquid fuels made the SEBs reluctant to buy power from such projects➤ Non- availability of gas in sufficient quantity
Regulatory Risk	<ul style="list-style-type: none">➤ Re-opening of PPAs
Other Factors	<ul style="list-style-type: none">➤ Public Interest Litigations➤ Failure by IPPs to bring in equity upfront as required by Lenders

Planned vs Actual Capacity Addition by Private Sector

The plan wise capacity addition target and actual capacity addition achieved by Private Sector is as follows:

Figure 4.1: Planned vs Actual Capacity Addition by Private Sector



Source : ABPS Research

The Government had placed great hope on the private sector investments in the power sector during Ninth Plan; however, with the failure of the private sector to achieve the set targets in the Ninth Plan, the Government reduced the target for capacity addition by private sector during the Tenth Plan. During the Tenth Plan, the likely expected capacity addition by private sector is around 3090 MW as against the target of 7121 MW. The targeted capacity addition by private sector during the Eleventh Plan is 15000 MW.

In terms of investments by private sector in generation, the total completed cost of the Independent Power Projects is around Rs 31000 Crore and considering the Debt: Equity Ratio of 70:30, the equity investments made by the private investors in the IPPs works out to around Rs 9300 Crore.

4.2 Private Sector Participation in Transmission

Government of India issued guidelines for private sector participation in transmission sector in January 2000 permitting two distinct routes for private sector participation in transmission:

- Joint Venture (JV) Route, wherein the CTU/STU shall own at least 26% equity and the balance shall be contributed by the Joint Venture Partner



- Independent Private Transmission Company (IPTC) Route, wherein 100 percent equity shall be owned by the private entity.

As a pilot project on JV route, M/s Tata Power has been selected by POWERGRID as its JV partner through International Competitive bidding for execution of specific transmission lines with the estimated cost of around Rs 1610 Crore associated with Tala Hydro Electric Project and East-North inter-connection and Northern Region Transmission System. This project has received excellent response from International Funding Institutes like IFC and ADB as well as from Indian Financial Institutions like IDFC, SBI.

Success achieved under JV route of private participation has encouraged POWERGRID to identify two more projects namely; transmission system associated with Koldam and Parbati HEPs estimated to cost about Rs. 655 Crore. Encouraged by the response received, POWERGRID have embarked upon the process of selection of JV partner for implementing the transmission lines covered under the project named WR System Strengthening Scheme - II.

The Ministry of Power has issued guidelines for tariff based bidding for transmission projects to facilitate establishment of projects, which will be around 100% owned by private entities. The private sector participation under IPTC route in case of 400 kV Bina-Nagda-Dehgam double circuit line is under advance stage of tendering.

4.3 Private Sector Participation in Distribution

Some of the Private players in distribution sector existed before SEBs was created for supply of electricity. These Utilities include Reliance Energy Limited (REL), Tata Power Company (TPC), Torrent Power SEC, Torrent Power AEC, CESC, Dishergarh Power and Durgapur Project Limited.

Electricity, being a concurrent subject, supply and distribution of electricity in a State is within the purview of the State Government and hence the decision to privatize the existing distribution business rests with the State Government.

The State of Orissa took the lead in the country to privatize the distribution business. The majority stake (51%) in four Distribution Companies was divested through competitive bidding process in 1999. Due to inadequate competition, BSES Limited acquired 51% stake in three DISCOMs – WESCO, NESCO and SOUTHCO, at a total



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value of Rs 117 Crore and AES of USA acquired 51% stake in CESCO at a value of Rs 78 Crore. However, due to several reasons including unrealistic T&D loss targets, regulatory uncertainty, inadequate tariff revisions, non-deployment of adequate staff, lack of Government Support, the DISCOMs during the initial years after privatization could not perform well and AES exited out of CESCO in 2003. The recent attempt of re-sale of CESCO recently has also failed and the DISCOM is now managed by Administrator. The other three DISCOMs are facing similar problems and recently Appellate Tribunal of Electricity has appointed two Special Officers for managing the affairs of the DISCOMs.

The next instance of privatization of distribution business happened in Delhi in 2002. During the initial phase of privatization process, 31 parties expressed interest, however, only 7 parties participated in the first stage of bidding process (Qualification Stage). Out of the 7 parties, six parties were qualified to participate in second stage of bidding process, however, only 2 parties submitted the final bids and after successful negotiations, BSES Limited acquired two DISCOMs with an initial investment of around Rs 294 Crore and Tata Power acquired the third DISCOM with an initial investment of around Rs 188 Crore.

4.4 Equity Investment by Private Sector Investors

In terms of investments by private sector in generation, the total cost of the Independent Power Projects commissioned is approximately Rs 31000 Crore and considering the Debt : Equity Ratio of 70:30, the equity investments made by the private investors in the IPPS works out to around Rs 9300 Crore.

In transmission, the extent of equity investment by private sector investor is to the extent of around Rs 250 Crore (Tala Transmission Project). In distribution segment, the equity investments made by private investors towards acquisition of 51% of Distribution Companies in the States of Orissa and Delhi works out to around Rs 680 Crore.

Thus, the total fresh equity investments by private sector in IPPs, Transmission JV and acquisition of distribution companies works out to be around Rs 10230 Crore. Apart from these investments, the private sector has invested equity in various renewable energy projects, and existing private distribution entities in generation and distribution sector have also invested equity in their projects. The total equity



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investments in the sector by private sector players during the Ninth Plan is around Rs 7000 Crore.

As per the Kohli Committee Report on Financing of Power Sector during Tenth and Eleventh Plan, the projected equity investment by private sector during Tenth and Eleventh Plan is around Rs 13,500 Crore and Rs 25,800 Crore, respectively.

4.5 Developments in Private Sector Participation post EA, 2003

The Electricity Act, 2003 has created a conducive environment for investments in all segments of the power industry, both for public sector and private sector and has led to revival of interest of private sector investors in the sector. Inter-Institutional Group (IIG) set up under the Chairmanship of Secretary-Power has been instrumental in achieving recent financial closures of the private power generation projects.

A number of private power generation projects are now being proposed in various States. Since January 2004, twelve private projects of capacity over 4331 MW achieved financial closure and several other thermal and hydel projects are being actively monitored for financial closure by the Ministry of Power, Government of India. The competitive bidding guidelines for procurement of power have already been issued by the Ministry of Power. Further, the Ministry of Power has also issued guidelines for tariff based bidding for transmission projects.

The recent initiative of development of Ultra Mega Power Projects through private sector participation has received encouraging response from the private sector players and the pre bid conference on Ultra Mega Power Project was attended by about 35 private players including overseas investors. The Private Sector Players, which have evinced interest in Ultra Mega Power Projects, are as follows:



Figure 4.2: Domestic and Foreign Players interested in UMPPs

Domestic Players	Foreign Players (includes Equipment Suppliers)
NTPC	AES
Tata Power	China Light and Power
Reliance Energy	Siemens
Aditya Birla Power	ABB
Lanco Group	Alsthom
GMR Group	Mitsui
GVK Group	SNC Lavalin
Essar Group	Sumitomo Corporation
Jindal Steel and Power	Duncan
Videocon Group	Globeleq Singapore
Jaiprakash Group	
Sterlite	
L&T	

Source: ABPS Research

4.6 Key Issues

The pattern of private sector investments in the sector since 1991 and in the recent past raises the following key issues:

- Only around 7700 MW capacity has been added by private sector and another 4000 MW is in commissioning stage as against the MoUs signed for 78000 MW and Techno Economic clearance issued for 30000 MW
- Likely shortfall of 56.4% in generation capacity by private sector during Tenth Plan
- The estimated capacity addition during Eleventh Plan by Private Sector is around twice the capacity added by Private Sector in last 14 years. Whether the planned capacity addition from private sector will materialise this time?
- The projected equity investments by private sector during Tenth Plan Period (Rs 13,500 Crore) is around twice the equity investment during Ninth Plan Period (Rs 7,000 Crore) and projected equity investments during Eleventh Plan



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Period (Rs 25,800 Crore) is around 3.5 times the actual equity investments during Ninth Plan Period.

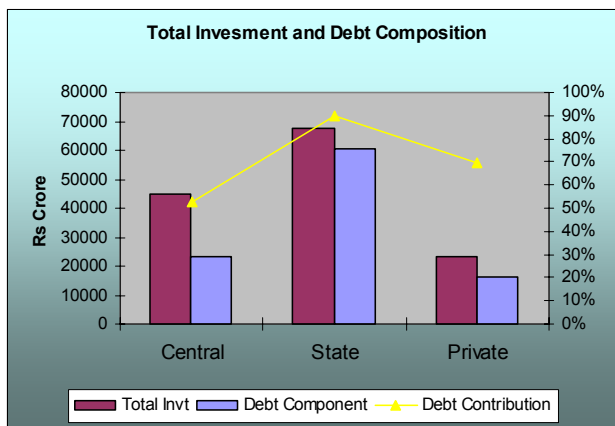
- Inadequate Competition in Distribution Privatisation. Although EA Act, 2003 allows parallel licensing, there has been no instance of any investment made till date. What needs to be done to attract more players for Distribution Privatisation and new investments ?
- What comfort has been given to private investors to mitigate the risks of poor financial health of SEBs/State Utilities?
- What are the key factors that can contribute for achieving planned private sector investments this time?

5 DEBT CONTRIBUTION AND LENDERS PERSPECTIVE

5.1 Debt Contribution

The Lenders have been playing a very crucial role in financing of various projects in the sector over a period of time. Out of the total investment of around Rs 1,35,000 Crore in the Sector during the Ninth Plan period, the investment from debt component comprised around 74% of the total investment. The contribution from Financial Institutions (FIs), Banks and markets borrowings was around Rs 90,000 Crore and external agencies contributed around Rs 9900 Crore. The composition of debt contribution in State, Central and Private sector investments during Ninth Plan Period is as follows:

Figure 5.1: Debt Composition in Total Investment



Source: ABPS Research

The contribution of debt to total investments was maximum in the State sector investments to the extent of 82%, while for central sector, it was just 52% of investments.

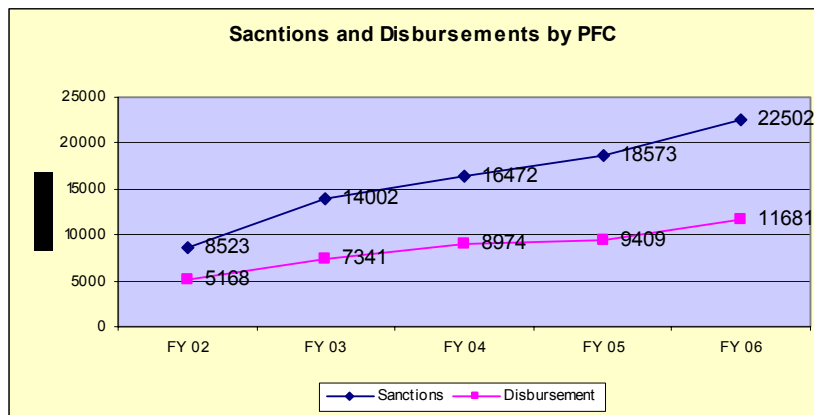
As per the Kohli Committee Report on Financing of Power Sector during Tenth and Eleventh Plan, the Debt Support required for achieving the overall investment objectives is estimated at Rs 2,80,000 Crore and Rs 3,50,000 Crore, respectively.

5.2 Sector Specific Institutions

Power Finance Corporation

The Power Finance Corporation acts as a Development Financial Institution dedicated to funding and development of power and allied sectors. The loans sanctioned by PFC and the loans disbursed during the last five years is summarised below:

Figure 5.2 : Sanctions and Disbursements by PFC



Source: PFC

The loans sanctioned by PFC have increased from Rs 8523 Crore in FY 02 to Rs 22502 Crore at a CAGR of 27% and disbursements have increased from Rs 5168 Crore to Rs 11681 Crore at a CAGR of 23%.

During the Ninth Five Plan Period, PFC made a disbursement of around Rs 16,000 Crore which contributes to around 13.5% of total debt contribution. PFC has proposed total funding support of Rs 43,000 Crore and Rs 1,15,000 Crore in Tenth and Eleventh Plan, respectively. The actual disbursements made by PFC during the first four years of Tenth Plan period is around Rs 37,000 Crore.

Rural Electrification Corporation (REC)

REC has sanctioned loans to the extent of Rs 21,843 Crore during the Ninth Plan and the actual disbursement by REC during Ninth Plan was Rs 15179 Crore. REC has projected disbursement of Rs 40,000 Crore in Tenth Plan. Earlier, REC was providing loans only for schemes related to rural electrification, however, REC has also started providing loans for Generation projects including IPPs.



Indian Renewable Energy Development Agency (IREDA)

IREDA is a Public Limited Government Company established in 1987, under the administrative control of Ministry of Non-Conventional Energy Sources (MNES), to promote, develop and extend financial assistance for renewable energy and energy efficiency/conservation projects. The cumulative loans sanctioned by IREDA till March 31, 2006 are worth Rs 7450 Crore while cumulative disbursed by IREDA till March 31, 2006 stands at Rs 4000 Crore.

5.3 Other Sources of Debt

Financial Institutions and Banks

The All India Financial Institutions (AIFIs) include IDBI, ICICI, IFCI, IIBI and the insurance companies - LIC and GIC. The financing limits adopted by AIFIs for any specific sector is 15% of outstanding assets and the exposure of AIFIs to the infrastructure sector is about 8.9% of total assets, with the maximum exposure to power sector of the order of 79.4% of investment in the infrastructure sector.

The Domestic Banks generally adopt a ceiling of 7% of deposits for the infrastructure structure and till FY 2002, the power sector used to receive a share of around 48%-50% of funds being lent to infrastructure sector.

During the Ninth Plan, the estimated disbursements from Financial Institutions and Banks contributed to disbursement of around Rs 45000 Crore to the Sector. However, with the institutions like IDBI, ICICI and IFCI close to reaching prudential norms for investments in the power sector and with conversion of some of Institutions such as ICICI, IDBI into universal banks, the availability of funds for power sector is likely to get affected.

External Assistance through Multilateral Credits

Various multilateral funding agencies such as World Bank, ADB, DFID, etc. are actively participating in investment and reform programs through the Central Government and State Governments. The current policy of the multilateral agencies is to offer 20 year funding for power projects or borrowings at LIBOR linked rates. The total multilateral credit received by power sector during Ninth Plan is around US \$ 2 Billion (around Rs 9,000 Crore).



5.4 Lenders Criteria for Funding

The broad criteria adopted by Lenders for appraisal of investments in generation projects include:

- Justification of Project with respect to Demand Supply Position
- Overall Competitiveness of Project in terms of Tariff
- Projected Variable Cost of Generation (with respect to fuel prices) in terms of Merit Order Stack of respective State
- Promoters Capabilities to execute the Project including Promoter's track record in execution of capital intensive infrastructure projects
- Financial Viability of the Project in terms of Project IRR and other Financial Ratios
- Payment Security Mechanism available to Project
- Appropriate mitigation of risks

The risks involved towards investment in power sector and the risk mitigation measures available to mitigate those risks are discussed in next Section of the Paper

5.5 Key Issues

The analysis of projected Debt Contribution during Tenth and Eleventh Plan raises following issues:

- The projected Debt Contribution to the Sector during Tenth Plan Period (Rs 2,80,000 Crore) is around 3 times the debt contribution during Ninth Plan Period (Rs 90,000 Crore) and projected debt contribution during Eleventh Plan Period (Rs 3,50,000 Crore) is around 4 times the actual equity investments during Ninth Plan Period.
- Exposure of Multilateral Agencies for funding towards power sector in India is quite low. What needs to be done for getting more contribution from multilateral agencies?
- Some of the Financial Institutions are reaching their prudential norms of funding to power sector and with conversion of Institutions into Banks, the funding to power sector is likely to get affected. How can the mobilisation of funds from institutions like LIC, GIC and UTI be increased?



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- Which other sources of funds needs to be tapped for achieving the planned investments?
 - Whether non-recourse finance (Project Finance) will be able to support the projected investments by Private Sector and to what extent the promoters will have to adopt limited recourse finance route by providing balance sheet support?



6 RISK ANALYSIS FOR INVESTMENTS IN SECTOR

6.1.1 Typical Risk Factors in Power Sector

Infrastructure projects are more vulnerable to risks as compared to conventional projects due to lumpy nature of the investment. The risks associated with a power project can be examined with respect to its life cycle such as the pre-construction risk, construction risk and risk associated with the operation of the power project. The key risk factors at each stage of the project are as follows:

Figure 6.1 Risk Factors

Risk factors	- Delay in finalisation of Project contracts & approvals	- Delay in project completion	- Plant under performance
	- Delay in achieving financial closure	- Land availability	- Off-taker risk
	- Cost over-run	- Rehabilitation & resettlement policy	- Price & payment risk
	- Force majeure	- Force Majeure risk	
	Pre-construction risk	Construction risk	Operation risk

6.1.2 Risk Factors affecting investments

The major risk factor, which affected the private sector investments in the Power Sector, is the poor creditworthiness of SEBs/State Distribution Utilities. To mitigate the payment risk, several payment security mechanisms have been discussed in the past. Earlier, the payment security mechanism offered had three-tiers comprising Letter of Credit, Escrow Mechanism and Govt. Guarantee. Though the SEBs had agreed to provide Escrow Arrangement, the estimates of their escrowable capacity were not accepted by the Indian financial institutions and hence the SEBs could not provide the Payment Security Mechanism agreed in the PPAs. Subsequently, the payment security mechanism linked to reforms milestones was planned, but the same could not materialize due to slow progress of reforms in Distribution Sector. Apart from the payment risk, the other key risk factors which affected the investments in the



sector include delay in implementation of Contracts, Regulatory Uncertainty with respect to re-opening of PPAs, Fuel Risks, etc.

6.1.3 Mitigation of Risks

The recent developments in the sector with enactment of Electricity Act, 2003 including the notification of National Electricity Policy, National Tariff Policy, and Competitive Bidding Guidelines for Private Sector investments in Generation and Transmission sector, have attempted to mitigate some of the risks to certain extent. The risks mitigation measures proposed now with respect to risk factors which affected the investments in the sector in the past are as follows:

Table 6.1: Past Concerns and Mitigation Measures

Risk Factors (Past Concerns)	Mitigation Measures
Delays in Project Implementation	<ul style="list-style-type: none">➤ SPVs has been created for implementation of Ultra Mega Power Projects to ensure initial requirements of sanctions and securing clearances➤ Ministry of Power is coordinating with concerned ministries/agencies for facilitating the development of UMPPs
Poor financial health of the State owned distribution utilities	<ul style="list-style-type: none">➤ Payment security mechanisms proposed for UMPPs consists of Letter of Credit, Escrow Mechanism and Direct Supply to HT consumers to be agreed upfront
Regulatory Risk	<ul style="list-style-type: none">➤ Electricity Act 2003➤ Tariff Regulations specifying the Terms and Conditions for determination of Tariff➤ National Tariff Policy➤ Procurement of Power by Distribution Utilities through Tariff based competitive bidding
Fuel Risks	<ul style="list-style-type: none">➤ Focus on Coal based projects➤ Captive Mining in case of domestic coal based UMPPs
Price Risk	<ul style="list-style-type: none">➤ Competitive Tariff Structure



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6.1.4 Key Issues

- The improvement in financial health of State Distribution Utilities still remains a concern due to slow pace of reforms in Distribution.
- To what extent has the escrowable Capacity of Distribution Utilities improved and whether the Escrow Mechanism will work this time?
- How can the fuel price risk be mitigated considering the high volatility of imported fuel?
- How can regulatory certainty for investments planned under a policy regime be ensured?