

CHAPTER 1

INTRODUCTION

“It is estimated that for building over 100000 MW of additional power capacity and associated transmission & distribution infrastructure, nearly Rs.800000 crores of investments would be needed in the next decade. The investors have been wary of the sector due to lack of confidence in getting returns on their investments. The payment security measures taken till now have not yielded desired results. There is little doubt that resource generation within the sector through prompt and efficient collection of appropriate user charges from all the electricity consumers is the only long-term solution to attract investments in the sector. The sector has to be made financially strong from within in order to attract investments from outside.”

- 31st Report of Standing Committee on Energy (2002), MOP

1.1 Introduction

History of Electricity in India is 117 years old. Commercial supply commenced in 1899 (Calcutta), closely following the developed world (1880's in USA and Europe). Since independence, Indian power sector had an impressive growth. Starting with a meagre 1362 MW generating capacity in 1947, it has since developed into a 298 GW¹ system. Energy generation was 4073 GWh in 1947, the same stood at around 1107385.8 GWh² at the close of last fiscal year. Alongside, there has been a matching development in Transmission and Distribution network as well³.

¹ CEA – Executive Summary Power Sector, March 2016

² Ibid

³ Both functions relate to conveyance of electricity through network, but they have distinct definitions in Electricity Act 2003, the governing law for electricity in India.

India's thermal generation capacity is about 71% with Hydro at 14%, 13% Renewable and 2% Nuclear. Growth of generating capacity has largely been coal based. The country has now an integrated transmission grid running across Regions.

Figure 1-1: Installed Capacity – Type-wise (As on March 2016)⁴

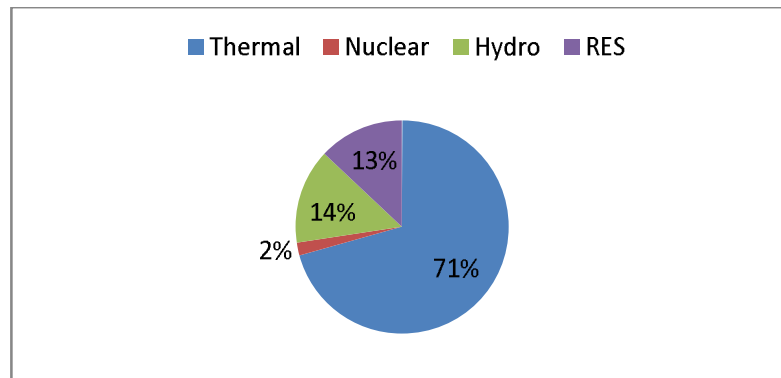
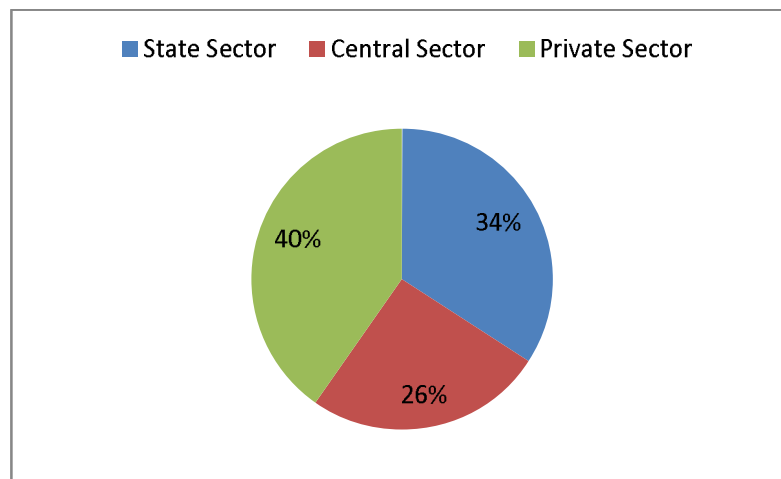


Figure 1-2 : Installed Capacity – Sector-wise (As on March 2016)



The Government sector still dominates with 60% contribution to installed capacity. Private sector contribution was not significant till the 7th Plan, but it is expected that they will propel capacity addition 12th Five Year Plan onwards.⁵ Since 1990's, Indian Government policies had a change from their

⁴ CEA, Executive Summary, Power Sector, March 2016

⁵ Discussion Document – Model Power Purchase Agreement, Public Private Partnership in Generation of Electricity, Govt. of India, 2013 states as follows:

earlier thrust on capacity addition by State sector power projects to new initiatives taken for inviting the private sector. These experiments of the 1990's, were not successful and therefore, New Act of 2003 put special focus on generation capacity addition and the freeing up of the generation sector. Simultaneously, the new Act also provided for market development in a time bound manner whereby upcoming generating companies could access wholesale and retail markets. The Government also assured fuel supply for new private sector power projects through policy documents. Coal is the principal raw material in India for thermal power generation and is largely State controlled. The Government sector behemoth Coal India Limited, which is the holding Company of a number of subsidiary companies, supplies about 80% coal in India.

The new Act on electricity (The Electricity Act 2003) lays down important provisions like thrust on generation capacity addition through private investment.⁶ Following the new Act, large investment towards creating generation capacity has been made by private investors on the basis of Government assurance of coal supply and power market development. However, at a fairly late stage of investment, the developers now find that such keen assurances are unlikely to be honoured, putting the massive investments in jeopardy. Large finances have been lent out to these projects by banks and public financial institutions in India. Thus the issue poses serious question relating to public interest also.

To meet the infrastructure deficit, the Twelfth Five Year Plan envisages a renewed thrust on investment in infrastructure, with greater participation from the private sector. Of the projected investment in infrastructure, about 29 per cent is envisaged in the power sector, of which about 47% is expected from the private sector. Bulk of the private investment in power sector will be in the generation segment.

⁶ “De-licensing of generation as also grant of free permission of captive generation is one of the main features of the 2003 Act.” Supreme Court Order dated 6.5.2009 in Civil Appeal Nos.3510-3511 of 2008.

1.2 Business Problem

India had significant demand-supply gap in power. To address this gap, GOI invited major private sector participation for building up new capacity. Responding, major investment followed and large Private Power capacity is scheduled for commissioning in the 12th Five Year Plan itself. Such investments have already been made by Developers based on Central Government's assurance of

- (a) Fuel tie-up (raw material) for these plants
- and,
- (b) Providing access to retail market for power sale

At this advanced stage of construction, the assets now face the risk of being stranded because the much needed Government assurances are unlikely to materialise.

1.3 Topic and Purpose

In order to gain insight into Business Problem, Literature Review was carried out thoroughly. It was done in four broad categories as follows:

- i) Indian Power sector business framework (Wholesale & Retail) & investments made by Independent Power Producers (IPPs)
- ii) Coal Supply framework and uncertainties
- iii) Reform in power sector in India vis-à-vis international power sector reform
- iv) Investment appraisal and investment decision under uncertainty

Key words were selected appropriately to enable search process. Online data base, journals media reports, Rules, Regulation, Policies and judgements of Hon'ble Supreme Court, High Courts, Appellate Tribunals and Regulatory Commissions were studied to trace the background of Indian power sector since inception. A detailed review of the literature is presented under Chapter 2.

1.3.1 Indian Power Sector business framework

The first statute laying down the Indian Power Sector business framework was enacted in 1910, which led to Private Investments in the pre-Independence era. Post-Independence period accorded focus on development by private sector. Laws were remodelled thereafter from time to time. Until 1998, two statutes, primarily, governed electricity industry in India, viz. Indian Electricity Act, 1910⁷ and the Electricity (Supply) Act, 1948. These two Acts were amended several times over time, but the basic cornerstones and structure changed very little, until Electricity Regulatory Commissions Act 1998 brought in the concept of independent regulation through establishment of Regulatory Commissions. Electricity Act, 2003 followed it up by consolidating all electricity laws. It repealed earlier Acts and made sweeping structural changes laying special emphasis on generation capacity addition and sector efficiency. It also aimed at consumer protection in a big way through promotion of competition together with market development.⁸

State controlled growth in post-Independence Indian Power Sector, following creation of State Electricity Boards, led to a large scale

⁷ “Public distribution of electricity in India started in Calcutta, the then Capital of British India, in April 1899. In 1895, Kilburn & Co. Ltd. obtained a licence for generating and distributing electricity in Calcutta. For some reasons, the Company sold the licence to the Calcutta Electric Supply Corporation Limited in 1897, who set up a generating plant at Emambagh Lane (now known as Prinsep Street) and started its operation in April 1899. After the licence was given to Kilburn & Co. Ltd. the British Government felt that a law must be enacted to control this new and novel industrial activity, which would affect the interests of the public and the Government. The India Electricity Act, 1897 was therefore enacted. It is to be remembered that very few people in India and in Britain had knowledge about electrical engineering and technology, which was developing fast. Therefore, Government repealed the 1897 Act and enforced the Indian Electricity Act, 1903. Shortly thereafter the Indian Electricity Act, 1910 was enacted to keep pace with the developments in electrical engineering and technology, repealing the 1903 Act.”-A Handbook of The Law of Electricity in India by Santanu Chatterjee

⁸ “An Act to consolidate the laws relating to generation, transmission, distribution, trading and use of electricity and generally for taking measures conducive to development of electricity industry, promoting competition therein, protecting interest of consumers and supply of electricity to all areas, rationalization of electricity tariff, ensuring transparent policies regarding subsidies, promotion of efficient and environmentally benign policies, constitution of Central Electricity Authority, Regulatory Commissions and establishment of Appellate Tribunal and for matters connected therewith or incidental thereto.”(emphasis supplied)- The Electricity Act, 2003 - Preamble

expansion of the electricity grid reaching semi-urban and rural areas. However, simultaneously and progressively, the sector suffered from huge financial losses due to, among others, lack of commercial and populist Government decisions. Efforts by the Central Government to open up the sector to private capital in the generation segments in 1990's, as a corollary to the overall economic liberalization, did not meet with success.

Federal Government policies in early 1990s ushered in the concept of Independent Power Producers (IPPs) in India. (Ministry of Power, 1991). IPPs belong to the private sector selling bulk power to the grid, SEBs or the Distribution Company as the case may be.

An Investment Promotion Cell (IPC) was created in the year 1991 under Ministry of Power (MOP) for facilitating private sector investment in electricity sector. Initially, investments started coming in from mid-'90s. But they became soon matters of major controversy. Also, the basic model of attracting investment in generation sector without re-organising the business framework was found flawed by investors and experts. This needed a thorough remodelling on legal and business framework to follow and a new consolidated statute on electricity sector was brought in 2003. The new Act in 2003 encouraged segregation of functions viz. Generation, Transmission and Distribution. Transfer Schemes were accordingly drawn by many States for achieving unbundling and corporatization of State Electricity Boards into separate functional bodies. With renewed vigour the federal government stepped up its attention towards private investment in generation sector with specific assurance being provided to the developers regarding market development and coal supply.

1.3.2 Coal supply framework

Coal mining is still largely a Government play. Coal supply to upcoming power plant gets finalized through “coal linkages” granted by an Inter-ministerial Committee. The new law, (The Coal Mines (Special Provisions) Act, 2015) provides for future commercial mining by agencies other than CIL and SECL. Demand exceeds supply and the gap is bridged by coal import. From 1970’s mining of coal by end-user Indian private companies like iron and steel production, generation of power, and cement production was allowed in phases.

Between 1993 and 2011 about 214 blocks were allocated for captive production for specified end-uses. In 2012 a Public Interest Litigation was moved before Supreme Court alleging irregularities in the procedure for awarding these blocks. Supreme Court after hearing the case deallocated all such blocks in September 2014. Following deallocation of coal blocks by Supreme Court, new law (The Coal Mines (Special Provisions) Act, 2015) has been framed to institutionalize the award process of coal mines through a mix of auction route (for all) and allotment route (Government companies).

Currently, GOI is experimenting with major changes in policies/procedures of coal supply and coal block allocation.

1.3.3 Reform in power sector in India vis-à-vis international power sector

International experience

International power sector reform covered a large geographical spread across continents and a time period of about 25 years starting from early 1980s (Joskow 2008). Initiatives were built around three cornerstones:

1. Separation of natural monopoly from potentially competitive segment. Network business (Carriage) was considered as natural monopoly while the supply side (Content) was a candidate for competition.
2. Bringing in private capital – private ownership – for management efficiency.
3. Creation of independent regulatory bodies for balancing the need of consumers and developers.

Many reforming countries, however, did not pursue all the three objectives together. But at least two were common in all.

Chile was the pioneer in reform (1982) (Nepal & Jamasb, 2013). Electricity Reform models across countries targeted progressive transition to retail competition in the long run (Deloitte Touche Tomatsu Emerging Markets Ltd., 2004), with various countries sequencing intermediate steps according to their own model.

Indian experience:

India has seen the following initiatives on reform so far:

- i) Comprehensive Law for electricity sector liberalisation being in place
- ii) Functional Regulatory Commissions at the Central and State levels
- iii) Unbundling of the main segments – Genco, Transco and Discom and Corporatization of State-owned enterprises
- iv) Generation Delicensed - Introduction of private independent power producers (IPPs)
- v) Establishment of wholesale spot electricity market (2 power exchanges) and introduction of Traders
- vi) Actions to improve Discoms' financials
- vii) Large investments made by the IPPs (currently under stress)

While wholesale market has been functional for last 8 years, retail market is practically non-existent.

Cumulative loss of Indian Discoms stand at a staggering Rs.4,00,000 Cr. **Ujwal DISCOM Assurance Yojana** (UDAY) is a financial turnaround and revival package conceptualised with the intent to find a permanent solution to the ailing distribution segment.

1.3.4 Investment appraisal and investment decision under uncertainty

Research in corporate investment decisions (Nagar, IJBIT, October 2011-March 2012) has taken multidisciplinary perspectives primarily in three areas - finance, management accounting and strategic management. The financial perspective has relied on building sophisticated models for valuing investments based on traditional discounting flow methods, while strategic perspective has focused on market opportunities and firm's competitive advantages. Traditional valuation methods have shown limitations in estimating the discount rate, project's future cash-flows, the cross-sectional links between projects and most importantly, the linkage between today's investments and firm's future investment opportunities.

This has led to lack of reconciliation across different streams in arriving at investment decision analysis with strategic side relying more on qualitative assessments instead of financial valuation techniques, while financial side not able to arrive at the real investment value through their traditional quantitative models. The studies recognized the need to extend financial theory that could evaluate that additional value, closer to strategic value of any investment, for better synchronization across different levels of investment decision making.

An investment appraisal criteria generally used by developers can be classified into two types – non-discounting criteria and discounting criteria. NPV, cost benefit ratio, IRR represent the discounting criteria which is more used. Apart from the above criteria, a comparatively new theory has emerged as Real Option Theory which deals with options to

modify projects under uncertainty. Typically the options include expansion option, waiting option, moth balling option, shrinking option, abandoning option, output mix design option etc.

1.4 Problem Statement

Indian power sector has seen major policy changes in past few years. Significant private investment in power generation is on the verge of getting stranded as a result of unprecedented changes in raw material and retail market transaction charge fixation policies. No specific academic literature is available to quantify the impact of such major policy reversal and analyse the way forward in tackling the problem of creation of stranded assets. To summarise, there are broad research gaps as mentioned below:

- 1) Implication of change of fuel policy on project viability of IPPs is not known
- 2) Implication of barriers in retail market on project viability of IPPs is not known
- 3) Overall viability of IPPs in the present scenario of likely stranding is not known
- 4) How policy uncertainty during ongoing project stage be part of investment appraisal to evaluate various options?
- 5) What would be the best course of action now to mainstream the assets under distress?

To summarise, the Problem Statement is:

Studies relating to burning viability issues for high value and large scale private investments recently made in the post reform Indian power generation industry which are on the verge of getting stranded today because of Government assurances not having been kept, are absent together with any analysis how to mainstream these assets.

1.5 Motivation for Research

A sizeable generating capacity, now under advanced stage of construction is not likely to be able to push power into the system because of unfavourable economics relating to change in policy on market and raw material input.

Power plants are highly capital intensive and have long gestation period. These were built based on Government assurances which were not met. Substantial public money has gone in to finance these projects.

India can ill afford stranding of such power plants. What would be the best course of action now?

1.6 Outline of the study

India is encouraging private participation in many fields including power sector. Economic growth hinges critically on the investment and performance of Power sector. Private sector plays a key role apart from bringing in capital which lends efficient management.

Policy consistency is important for developers for taking investment decisions. The current situation evidently is pointing towards policy flip flops relating to key cornerstones of investment decision for coal based thermal power plants – fuel supply and power market development. Effect of the policy flip flop requires in-depth study. This is particularly so because thermal power plants are highly capital intensive and substantial public funds are also involved in terms of loans for the projects.

This thesis did a comprehensive literature review to understand Indian power sector, coal sector, law and policies, business framework and the background of such huge investments in the context of international power sector reform.

In the course of the study, interviews were taken of policy-makers, bankers, CEOs, developers – experts who are stalwarts in their own field. These interviews forms the core of qualitative methodology adopted. Their responses were duly considered and appropriately charted to bring out underlying relevant themes. This was followed up with quantitative analysis on viability issues covering transactional costs involved.

1.7 Structure of Thesis [Organisation of the Report]

Chapter 1: Introduction: This chapter sets the context of research.

Chapter 2: This chapter presents through literature survey, an Overview of Power Sector and Coal Sector framework in India, Reforms brought in by the Government in India along with Reforms as experienced in international power sector, power and coal industry structure. Also traces genesis of Uncertainty currently being experienced by IPPs in India.

Chapter 3: Lays down framework of research methodology / design. Also indicates sources of data and tools used for analyses

Chapter 4 : This section presents an in-depth analysis of Indian Power Sector together with the current issues and sets the context for the Data Analysis.

Chapter 5: Portrays how investment decisions are taken by Independent Power Producers in India together with the Appraisal criteria used. It also elucidates the current uncertainties faced by them.

Chapter 6: It presents viability of IPP projects under current uncertainties with special focus on implication of fuel policy change and barriers present in retail market which are standing in the way of market access by the said IPPs.

Chapter 7: This deals with the last part of Data Analysis. Analyses mainstreaming options and suggests issue-wise /stakeholder-wise

Chapter 8: This section suggests Issue-wise and Stakeholder-wise recommendations to address the problems of potential stranding of thermal assets. Concludes the research and attempts to capture theoretical contribution of this research along with its limitations and future scope for such study.

1.8 Concluding Remarks

This chapter introduces the context, burning business issues and framework for this research. Huge investments, recently made by private sector developers in building up large coal based thermal assets, face the risk of stranding unless immediate actions are taken to resolve the issues standing in the way of mainstreaming them.