

## CHAPTER 2

### REVIEW OF LITERATURE

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With the background established in chapter 1 an attempt has been made to study the impact of Power Sector reforms and privatization of electricity distribution focusing on quality of service. The literature in this regard has been reviewed as follows:

The enactment of the Electricity Act,2003(EA-2003) is a milestone in the development of Power sector and aims at inter-alia, supply of electricity to all citizens at reasonable tariff, provision of transparent subsidies, restructuring etc. The following are the studies/reports undertaken on power sector reforms and restructuring process.

1. **Fevzi Saffet**<sup>1</sup> emphasizes in his paper that “The primary benefits expected from electricity sector reform and privatization has been determined as follows:
  - Decreasing of costs through effective and efficient operation of electricity generation and distribution assets,
  - Increasing the supply quality and supply security in the electricity sector,
  - Decreasing the technical losses in distribution sub-sector to the level in OECD countries and prevention of theft (non-technical losses),
  - Ensuring that the required rehabilitation and expansion investments are performed by the private sector without creating any liabilities on the public institutions, and
  - Transferring to consumers the benefits obtained through competition in generation, trade of electricity, and regulation of quality of service.”
2. **Satu Viljainen**<sup>2</sup> stated in his report that “The mere focus on costs, however, is not a sustainable approach in the long run because it puts quality of monopoly services at risk. In the electricity distribution sector in particular, the quality issue is of high relevance, since the electricity distribution networks

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<sup>1</sup> Privatisation of the Electricity Distribution Business and its Importance for Turkey, September 2000, Fevzi Saffet Bora

<sup>2</sup> Developments of Economic Regulation in the Electricity Distribution Sector – An Overview of European Experiences by Satu Viljainen

constitute a vital part of society's basic infrastructure and modern societies are becoming more and more intolerable to interruptions to electricity supply. Quality concerns give rise to targeted incentive schemes that focus on the reliability of the electricity distribution networks, i.e. the number and duration of interruptions, and later also on voltage characteristics. Performance studies play an essential role in setting company-specific targets for both cost-efficiency and power-quality improvements".

3. **Stephen Thomas and David Hall**<sup>3</sup> states that "The restructuring of the electricity industry should be subject to public interest considerations. There needs to be regulatory machinery which can limit market forces and commercial considerations by reference to public interest issues (i.e. not just competition policy). The EU's liberalization regime allows such conditions to be imposed. The regulator should enforce these conditions, even though it involves limiting the management of the companies."

4. **Jagdish Sagar**<sup>4</sup> in his paper depicts the experience of the power sector reform in Delhi. Rise in population led to increase in power consumption, in this midst, the experiences of the implementation of the power sector in Delhi and the results are construed.

5. **Prayas Energy Group**<sup>5</sup> has mentioned in their report (2005); "As the SEBs situation was deteriorating the power sector in Delhi was restructured fundamentally in 2002. After un-bundling, three distribution companies were created and privatized. This report focuses on the performance of privatized distribution companies and the regulatory process in first three years of the post-privatization period. The report is based on rigorous analysis of various regulatory filings and orders such as tariff submissions and tariff orders. Report covers analysis of issues such as aggregate technical and commercial losses, capital expenditure, revenue and consumption data claimed by distribution companies, quality of service and the regulatory approach and orders.

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<sup>3</sup> Restructuring and Outsourcing of Electricity Distribution in EU, Stephen Thomas and David Hall, University of Greenwich

<sup>4</sup> Power Sector Reforms in Delhi: The Experience so far ... Jagdish Sagar

<sup>5</sup> Quality of Service of Distribution Utilities – Need for End to End Commitment: The Study of Prayas Energy Group (October 2005).

During the 1990s in particular DESU / DVB suffered a very poor public image for its quality of service, consumer relations and commercial performance. As in other State Electricity Boards, human resources and financial management were weak and not oriented towards commercial performance. It gives an overview of the QoS process consisting of the Grievance Redressal Forum, Ombudsman and Standards of Performance regulations. Details of the QoS process in the state of Andhra Pradesh as a case study was given, followed by a comparative study of 11 states. The report makes many suggestions to make this process more effective in laying down a system of quantifying, monitoring and providing avenues for consumer intervention in the QoS of the utility.

6. **M Agarwal, I Alexander and B Tenenbaum**<sup>6</sup> paper takes a close look at the July 2002 privatization of the electricity distribution system in Delhi. The paper's emphasis was on the process of privatization and how this affected by the accompanying regulatory system. It describes key features of the Delhi privatizations and contrasts the Delhi privatizations with the 1999 Orissa privatizations – India's only prior example of state-wide electricity distribution privatization.

7. **Prayas Pune Group (2003)**<sup>7</sup> has stated in their report that "attempts to shed light on one crucial area in the Indian power sector that has remained completely neglected even after so much debate on the privatization of power sector, viz., assessment of the performance of existing private distribution companies. It presents comparative analysis of the performance of six private distribution utilities, viz., Tata Power Company, BSES, Calcutta Electricity Supply Company, Surat Electric Company, Ahmedabad Electric Company and NOIDA Power Corporation. As an indicative exercise, comparable data of two public utilities, viz., (BEST, Mumbai) and Pune Urban Zone of MSEB are also presented. Based on this comparison, 'first-cut' observations about the performance of these utilities were drawn regarding five aspects, namely,

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<sup>6</sup> Electricity Discom Privatizations: Some Observations and Recommendations for Future Privatizations, M Agarwal, I Alexander, B Tenenbaum

<sup>7</sup> Performance of Private Electricity Distribution Utilities in India: Need for in-Depth Review and Benchmarking, Prayas Pune Group, 2003

T&D losses, receivables, manpower, distribution investments, and distribution cost. It was analysed that even private utilities were not be free from the menace of large-scale commercial losses. The capital investments as well as the 'Distribution Costs' of these utilities show a large variation. The report also highlights need for conducting in-depth performance review of the existing private distribution utilities. Such an analysis would offer valuable lessons to ensure that the new structure being adopted would be better than the regulatory and legislative framework designed few decades back. It would also help better understand the issues likely to be faced by regulators and consumers in future. The study also identifies important aspects that should be covered in an in-depth performance review of private distribution utilities.”

8. **Niranjan Swain, J P Singh and Deepak Kumar**<sup>8</sup> stated that “The inhibitors to growth in power sector were many—small and big but the main roadblock in the growth path was Government Policy, which made it difficult or rather impossible for a private player to enter. This further aggravated the problem that Indian entrepreneurs didn’t have enough knowledge and experience in developing power projects. To worsen the scenario, the SEBs and other Government Agencies became financially weak to propel any future expansion or growth in the sector. Electricity Act, 2003 was a major step in solving the above underlying problems of the power sector. A whole new system was evolved where private players were invited to be an active participant. The system demanded financial, political and other infrastructural growth—with major requirement in roads and communication. Some of the bold steps taken in the Act were moving generation and distribution out of ‘License Raj’ regime, opening access to national grid and demolishing the ‘Single Buyer’ model. The failure of the huge federal structure and the changing global scenario have forced Government to think of ways to revive this fundamental infrastructure sector.”

9. **R.V. Shahi**<sup>9</sup> in his paper emphasized that reforms must focus on controlling the aggregate technical and commercial losses of the state transmission and distribution utilities. This is essential to creating a

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<sup>8</sup> Analysis of Power Sector in India: A Structural Perspective Niranjan Swain, J P Singh and Deepak Kumar

<sup>9</sup> India’s Strategy toward Energy Development and Energy Security R.V. Shahi

financially robust power sector in each state. Only financially healthy state power distribution utilities can provide the needed comfort on payment security to attract private investment in the power sector at internationally competitive tariffs.

10. **Anil K Upadhyay**<sup>10</sup> brought out some important issues crippling the distribution sector. They are:

- The distribution sector is in a pathetic condition with around 40-45% T&D losses. A significant part of T&D losses are 'non-technical'.
- Private Utilities in Bombay and Calcutta were performing far better than the SEBs and hence privatisation was thought as a remedy.
- Employee resistance is one of the major issues. All the states undertaking restructuring have faced agitation by SEB employees. But when confronted with political determination of the state government they have finally yielded.
- Rural electricity supply in India it is a major component. It is also a major political issue. The states and areas with a very large share of rural and agricultural consumption will need special mechanisms.
- The need for subsidy for agriculture and small poor consumers is well recognised. But whether it is supplied publicly or privately, there is an urgent need to make it more targeted and limited.
- One problem in rural supply, even at a heavily subsidized tariff, is billing and collection in far-flung areas. A private enterprise will do better but problems will also remain with this mode. Some kind of consolidated supply at one point and collection will have to be planned. Panchayats and rural co-operatives can be important institutions in this area.
- A concern frequently expressed is about the capacity and willingness of the people to pay for electricity. There is a feeling that they have been spoiled too much in the SEB system. Political populism has created an environment of uneconomic tariff and non-payment. Unfortunately, the Indian power sector has become trapped in a vicious circle of low tariffs, poor recovery and poor quality of service .

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<sup>10</sup> Power Sector Reforms Indian Experience and Global Trends by Anil K Upadhyay

11. **K. P. Kannan & N. Vijayamohanan Pillai**<sup>11</sup> states that "The patronizing policies of the State resulted in excessive employment, especially at the non-technical, administrative level, involving unwarranted cost increases and in irrational pricing practices for subsidized power sales, irrespective of considerations of costs, leading to substantial losses. The whole system could be spared from such avoidable chaos, if the Government interference were kept to a minimum and the SEBs were let to function as autonomous commercial-cum-service corporations, as required by the E(S) Act.

The utter negligence and neglect of the means to ensure minimum T & D losses has been contaminated fallout of the Government sponsored inefficiency. Unmetered drawal of electricity is rampant in several urban areas, in connivance with the board staff, or by errant consumers enjoying protective patronage.

The attraction of soft loans offered ( by institutional lenders including the World Bank) as a package with reforms and of the selling out of public sector assets have cornered and captured the political theory of corruption that governs the prodigal governments."

12. **Rajesh Gangakhedkar**<sup>12</sup> emphasized that "The distribution sector which was the most neglected entity in power <sup>12</sup>sector has got a boost with APDRP. Known as APDRP in its previous avatar .APDRP is a six level intervention strategy in various distribution circles of the states, which is gaining strength with every passing year. Its note worthy achievements are greater loss reduction and improvement in consumer services. It has created a favorable impact on state power utilities, by acting as a motive for pursuing reforms."

13. **Rahul Tongia**<sup>13</sup> stated that "There has been a large variation in the performance of the states and reforms alone do not indicate success in terms of loss reduction or efficiency. The main factor in explaining outcomes is the ability of the state governments to implement reform (or operational

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<sup>11</sup> Plight of the Power Sector in India: SEBs and their Saga of Inefficiency by K.P. Kannan and N.Vijayamohanan Pillai

<sup>12</sup> Enhancing Global Competitiveness by Reforming Power Sector - A Case Study of India by Rajesh Gangakhedkar

<sup>13</sup> The Political Economy of Indian Power Sector Reforms by Rahul Tongia

improvement) plans and the strength of their institutions. Governments with weak institutions have performed poorly even when they had ambitious reform plans—as in Orissa. Governments with strong institutions and sustained commitment to reform (e.g., Andhra Pradesh and now Delhi) have fared much better.

Unfortunately, the reforms fail to address fundamental issues. The average tariff remains far lower than the average cost to the utility, and any reasonable estimate for the improvement in recovery of billed tariffs and reduction in losses alone will not align revenues with costs. Tariffs must rise, and not simply for the industrial and commercial users who have been the financial lifeline for the SEBs. In recent years, regulators have resisted large increases for such users, and the new Electricity Act (2003) makes it easier for them to “exit” the system through greater use of captive power. Central and State regulators operate with a clear mandate to rationalize tariffs, but political interference, system inefficiency, and consumer inability to pay hamper their efforts.”

14. **Navroz K. Dubash**<sup>14</sup> in his study tried to answer the question ‘How can the process of reforming the electricity sector support rather than hinder promotion of sustainable development outcomes?’ To answer the central question, each country study ( including India) asks:

- What were the drivers of reform in the electricity sector?
- What political interests were at stake in reform of the sector, and how did they shape the reform process?
- What role did the World Bank and other international donor agencies play in electricity sector reforms?
- How and by whom were social and environmental concerns addressed in the process of designing electricity reforms, and with what outcomes?

The study of Indian Electricity sector concludes as below

“In India, concerns over the financial state of the sector dominated reform design. In 1991, the government provided incentives for electricity generation to stave off a balance-of-payments crisis.

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<sup>14</sup> Power Politics by Navroz Dubash

The effort to attract private capital not only failed to increase capacity as planned, but also locked the sector into adverse financial and institutional arrangements. The World Bank played a central role in initiating a second stage of state-level reforms beginning in 1996 to address the fundamental problem of inadequate revenue flow in the sector. State-level reforms have produced mixed results at best. Privatization efforts have been fraught with difficulty. Where utilities have been privatized, the change has not produced expected gains. Efforts at promoting public benefits—such as energy efficiency at the state level and incentives for renewable energy sources—have been relatively few and have suffered from a lack of political commitment.”

The important conclusions from the study of reforms globally are:

- Electricity reforms are driven by economic and financial concerns, and by donor conditionalities.
- Closed political processes and politically powerful groups constrain attention to sustainable development objectives.
- Donor agencies have initiated reforms and advocated attention to environmental concerns, but have been hampered by past reputation and a perception of favoring private interests.
- To be effective, public benefits need to be factored into reform design early and backed by political commitment.

And the recommendations were:

- Frame reforms around the goals to be achieved in the sector.
- Structure finance around reform goals, rather than reform goals around finance.
- Support reform processes with a system of sound governance.
- Build political strategies to support attention to a public benefits agenda.

15. **Kaisa Tahvanainen, Satu Viljainen and Samuli Honkapuro**<sup>15</sup> in their paper on Quality of Service and regulation stated that “The regulator of the

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<sup>15</sup> Quality Regulation in Electricity Distribution Business by Kaisa Tahvanainen, Satu Viljaine and Samuli Honkapuro



electricity sector has to ensure that the distribution companies operate in efficient manner. Efficient operation often means reducing costs. The regulator then has to ensure that the quality of electricity does not decrease. This can be done by implementing quality regulation.

There are different aspects of quality regulation. It can comprise from quality of service, quality of voltage or continuity of supply aspects. Continuity of supply can be perceived as an important aspect, because the need to secure the continuity of electricity distribution is vital to the modern life. This can be done through various incentive systems. The regulator can set a penalty or a reward to the companies according to their performance against the desired performance level. Performance is usually measured as electricity distribution interruption time and frequency. The quality aspect in regulation can also be implemented in efficiency benchmarking. By doing so, the efficiency requirement also includes incentives of some kind to quality improvements.”

16. **Anoop Singh**<sup>16</sup> concludes that “While the main objective of the power sector reform in developed countries has been to enhance competition in the sector, the need to improve financial state and to attract private investment to the power sector, has been the main driving force for undertaking reform in India. This has so far included functional separation of generation, T&D, setting up of federal and state regulatory commissions and selective privatisation of distribution segments in a few states. Regulatory changes have been able to bring about tariff rationalization, and transparency and consumer participation in the regulatory process.

The improvement of distribution segments is the key to long-term sustained growth of the power sector. This would significantly depend on decoupling the power sector from politics. Efforts must flow to address the issues that relate to the distribution segment along with ensuring competition in the unbundled segments of the sector, especially for bulk power. Gradual reduction in the cross-subsidy burden on the sector and improvement in operational and commercial efficiency, including reduction in T&D losses, would help improve the financial condition of the Indian power sector. However, transition

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<sup>16</sup> Power Sector Reform in India: Current Issues and Prospects by Anoop Singh

management may prove to be the most difficult task while trying to balance the commercial goals and social obligations facing the sector. This requires balancing commercial prudence at one end and the social acceptability of the reform at the other, which is linked to the political fallout of the reform process.”

17. **Pierre Audinet**<sup>17</sup> in his paper came up with the following suggestions to improve the efficiency of distribution business:

- State governments should promote and foster payment for electricity by all customers.
- Legal action must be taken at the state level to prevent theft so that electricity suppliers have increased assurance that all customers will pay.
- Tariff should be designed to recover costs on the basis of the electricity which is sold and paid for only, separating the cost of stolen electricity from the tariff structure. Otherwise, paying customers end up being burdened with the costs of nonpaying customers. To avoid such a difficulty, the unit price should perhaps be capped temporarily.
- Subsidy reform will undoubtedly result in tariff increases. To gain acceptance from consumers, the increases should be accompanied by significant improvements in the reliability, quality and accessibility of electricity supply. Restoring the investment capability of SEBs – or their unbundled sub-divisions – should be a priority. An active communications programme to explain the rationale behind subsidy reform and market pricing must accompany the reform.
- Cost-based electricity pricing needs to be implemented for all users. This requires an accurate data collection system and information on costs. If policy-makers find it appropriate to maintain partial subsidies for a particular category of consumers, the mechanism should be transparent and carefully monitored. The subsidy should also be allocated directly from the state budget to avoid burdening the utilities. It should expire within a set time frame. Access to electricity for low-income households should be carried out through direct support, or by mechanisms such as lifeline rates.

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<sup>17</sup> Electricity Prices in India by Pierre Audinet

- Demand-side management and load management should be more actively pursued at the state levels for all sectors, particularly industry and agriculture, to reduce peak-supply shortages and increase the cost-efficiency of the system. For such measures to be successful, metering and pricing policies based on daily demand profiles should be implemented.

18. **Peter M. Lamb**<sup>18</sup> states that without comprehensive reforms, the private sector will increasingly choose to deal only with itself, taking advantage of the increased ability to sell to private off-takers but leaving the most power hungry regions and needy customers, such as farmers, without the capacity additions they too require. As policymakers, technocrats and investors continue to experiment with IPPs in India, it is hoped that the private sector will take the steps required to become increasingly competitive on cost, and state utilities and governments will proceed with the difficult reforms necessary to carry out their service obligations to Indian consumers on a sustainable basis.

In India, some actions to be undertaken in the power sector may turn profitable. PLF improvement and non technical losses reduction at least may be worth with present tariffs, and could provide margins for an increase of 17% of the energy level. These actions, even more, do not need unpopular measures such as non technical losses reduction or tariff increase. More precisely, it may be so for public sector, if able to turn from its former objectives and to manage a public reform, or for private sector, if enough guarantees are given to him. All this without charging more the public budgets. The actual question then is to understand why these actions are not done. One part of the answer might come from the general way SEBs are operated, based on self-enforcing political executive instructions, absence of focus on costs and budgets in actual decision-making, absence of properly designed information system.

As far as tariff increase and non technical losses elimination are concerned, if combined, they can generate up to 22,900 crores a year in present conditions. Provided a part of that is actually reached, it could be used to reduce SEBs

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<sup>18</sup> The Indian Electricity Market: Country Study and Investment Context by Peter M. Lamb

commercial deficits, and therefore public subsidies. This addresses redistributive issues and implies political decisions. After this level of 17% increase in generation, to repay investments at 16%, a tariff increase is inevitable in order to avoid to charge the burden of public finance.

19. **Joel Ruet**<sup>19</sup> on pre- EA 2003 scenario concludes that “In India, some actions to be undertaken in the power sector may turn profitable. PLF improvement and non technical losses reduction at least may be worth with present tariffs, and could provide margins for an increase of 17% of the energy level. These actions, even more, do not need unpopular measures such as non technical losses reduction or tariff increase. More precisely, it may be so for public sector, if able to turn from its former objectives and to manage a public reform, or for private sector, if enough guarantees are given to him. All this without charging more the public budgets. The actual question then is to understand why these actions are not done. One part of the answer might come from the general way SEBs are operated, based on self-enforcing political executive instructions, absence of focus on costs and budgets in actual decision-making, absence of properly designed information system.

The above studies/reports have been reviewed in this regard.

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<sup>19</sup> Investment Profitability in Bridging the Power Gap in India by Joel Ruet