

## The Development of the Power Sector in India: Issues and Prospects (ARI)

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**Theme:** The power sector in India is projected to grow rapidly over the next two decades and to be increasingly open to private sector participation, both domestic and foreign.

**Summary:** This ARI focuses on the electric power sector in India, which is projected to grow rapidly over the next two decades. In particular, it discusses policy developments in the sector, the sector-specific issues that still remain unresolved and its main prospects, stressing especially the opportunities for private sector participation, both domestic and foreign.

**Keywords:** India, power sector, policy, public investment, private sector participation.

**Analysis:** It is well accepted in Indian and international policy circles that bottlenecks in infrastructure in most subsectors –electric power, roads, ports, airports and sanitation–, with the possible exception of telecommunications, are acting as a serious impediment to rapid and sustained economic growth in India. The World Bank and the Indian Planning Commission have independently estimated that economic growth in India is on average between 1 and 3 percentage points lower than what it could have been if infrastructure bottlenecks were not as severe as they currently are.<sup>1</sup> Indeed, India seriously lags behind not just advanced OECD economies in infrastructure development, but even other developing countries of comparable size such as Brazil and China. The UPA government, currently in its second successive term, has prioritised the development of infrastructure in an aggressively drawn out plan stretching over the remainder of the Eleventh Five-Year Plan (2007-12) and the Twelfth Plan (2012-17). However, given the sheer size and diversity of the country and the extent of the catch-up, sustained policy commitment is required over the next two decades to bring India's infrastructure up to world class standards.

This paper focuses on the electric power sector in India, which is projected to grow rapidly over the next two decades. In particular, it discusses policy developments in the sector, especially since the passage of the landmark 'new' Electricity Act (2003), the sector-specific issues that still remain unresolved, primarily due to a combination of a complex

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<sup>1</sup> The Planning Commission has recommended spending between 10% and 15% of GDP over the next two decades on the development of infrastructure. This translates into US\$150 billion to US\$200 billion annually at current levels of GDP.

administrative structure and the reluctance of the State Electricity Boards (SEB, hereafter) to accede to a new policy framework that would dilute their unchallenged authority, and the contours of future development, especially the opportunities for private-sector participation, both domestic and foreign, in the development of the power sector in India.

### *Overview*

The power sector was understandably underdeveloped at the time of India's independence from the UK in 1947, both in terms of available capacity and per capita consumption. Development policy in India for nearly two decades after independence was inspired by the Soviet model of planned development, which had enabled the erstwhile Soviet Union to leapfrog the development process and transform itself from a predominantly agrarian nation to an industrialised country within the span of a generation. India's policy planners under the active stewardship of the first Prime Minister, Jawaharlal Nehru, shared a similar vision for India.

The development model adopted as a consequence was centred on the development of heavy industry, which was perceived to generate far deeper forward and backward linkages with the rest of the economy. Agriculture and the development of light industry (especially consumer durables) were not given the importance they deserved until much later in the early 1960s, when the shortcomings of the existing model became apparent. The importance of power generation was not lost on Indian planners, resulting in a concerted effort to increase generation, distribution and transmission capacity to power the industrial development programme. The power generation programme sought to exploit India's considerable endowments in coal and water resources.<sup>2</sup> Hydro power projects also served to irrigate vast stretches of farmland and assist in flood control, in addition to generating power.

The ownership structure of the power sector in India was also influenced by Soviet models, which posited government control of the core sectors of the economy ('commanding heights').<sup>3</sup> However, the administrative arrangement was decentralised in that power was decreed to be a 'concurrent' subject with federal and provincial governments having a say in the formulation and implementation of policy.<sup>4</sup> The Electricity Act (1948) was formulated to give direction to the development of the electric power industry and resulted in the creation of the Central Electricity Authority (CEA) to oversee this development. The Electricity Act, notably its emphasis on state control over the industry continued unchallenged till the 1980s, due to a combination of an ideological commitment to socialism (reinforced during the Indira Gandhi Administration) and the emergence of interest groups, especially the beneficiaries of huge power subsidies, who were predominantly part of a politician-bureaucrat-industrialist-rich farmer nexus.

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<sup>2</sup> India was the first country in Asia to initiate a fledgling nuclear programme in 1956, under the 'Atoms for Peace' programme, with Canadian assistance. This assistance programme continued until 1974 after which it was discontinued following India's first nuclear weapons test.

<sup>3</sup> There were pockets within India where the provision of power (mostly generation) was privately undertaken, the most notable exception being the city of Mumbai (then Bombay). Power was generated by the Tata Power Company (a private entity) but was distributed by the local government run Bombay Electric Supply and Transport Company (BEST). Other cities that privately provided power were Ahmedabad, Surat, Calcutta and recently parts of New Delhi.

<sup>4</sup> The tremendous variation in state policies is a cause of increasing frustration among private sector players, which in some ways has deterred participation. The amendments to the Electricity Act aim to reduce these discrepancies, while still allowing states the autonomy to formulate state specific policies. The enormity of the effort for a country as diverse as India needs no further elaboration.

The first signs of change in the policy regime with regard to the power sector emerged in the early 1980s, ironically under the stewardship of Indira Gandhi. The result was the acceptance that private sector participation would have to be encouraged if India was to stave off a serious power crisis that not only dampened India's growth prospects, but actually threatened to cripple the economy. This process of liberalisation gained further momentum in the mid 1980s under the leadership of Rajiv Gandhi, whose vision for India's development was driven by rapid assimilation of modern technology, which required the dismantling of administrative controls over the economy, widely viewed as obsolete.

It is not particularly well known that in India, reforms in the power sector were actually initiated *before* those in the telecom sector. If progress in the subsequent implementation of power sector reforms has not been as smooth as with telecom, it is largely for reasons discussed above. The most visible manifestation of the new liberalised environment during the 1980s was the invitation to foreign power producers (called Independent Power Producers –IPP–) to set up power plants in the country. The arrangement was for the IPPs to sell power to the State Electricity Boards (SEBs) at a unit price adjusted for cost of capital and exchange rate risks, especially since much of the fuel used was to be imported. The two companies most visibly involved in this effort were Cogentrix, a California based company and the now defunct Enron Corporation. Enron withdrew amidst accusations of price gouging and unfair practices to coerce the then state government of Maharashtra to accede to the unit price of power it was charging, which was calculated to be far above the global average.<sup>5</sup>

The controversy that led to Enron's exit from India did retard India's progress in attracting foreign investment to its power sector. Some of these misgivings still persist, especially for generation companies, despite the extensive liberalisation of the power sector that has been enacted by the most recent Electricity Act. The National Democratic Alliance (NDA) which governed India between 1999 and 2004 can be credited with taking the first aggressive steps towards revamping the infrastructure sector in India, though it could be argued that the parlous state of India's infrastructure makes it hard to see how any government could have acted differently. The NDA was a coalition of political parties from the extreme left to the extreme right and it is heartening to note that there is multi-partisan agreement that the development of world-class infrastructure across subsectors is a national priority.<sup>6</sup> A positive consequence of this convergence is an explosive growth in private sector interest (both domestic and foreign) in India's power sector growth story.

#### *Recent Policy Changes and Implications: The Electricity Act (2003)*

As discussed in the preceding section, the power sector in India could best be described as characterised by policy stasis between 1947 and the mid 1980s. Even the decision to invite IPPs to set up power plants in India was done on an ad-hoc and case-by case basis and was not part of any comprehensive policy shift. Progress in opening up the power sector to private investment, especially Foreign Direct Investment (FDI), was also

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<sup>5</sup> Plans are afoot to revive the generation of power from the plant by augmenting the infrastructure already set in place in the mid 1990s, through a consortium of Indian and foreign firms. Operational details at this point are hazy.

<sup>6</sup> Some left-wing political parties have criticized the recent infrastructure development drive as being too 'urban centric' in that it largely ignores rural geographies which are in critical need of infrastructure development. Recent governments are addressing this problem with the initiation of programmes such as the Prime Minister's Rural Road Scheme to develop rural road infrastructure and the formation of dedicated companies like the Rural Electrification Corporation (REC), a listed company on the Bombay Stock Exchange.

retarded by the Enron episode and the experience of other less-known IPPs during the early 1990s. Policy planners agreed that a legalised framework was needed to invigorate growth and investment in the power sector.

The (new) Electricity Act (2003) was a landmark policy document in that it provided the first legislative framework to revamp the legal and regulatory framework governing the power sector. It signalled a new openness to reform and a desire to accelerate sector reform in an effort to harmonise the operations of various agencies in the sector. The legislation is incremental, given the enormity of the task at hand and hence remains a work in progress. However, its importance in laying the foundation for rapid growth of the power sector in India cannot be minimised.

The salient features of the Electricity Act are as follows:

- 'Unbundling' of the generation, distribution and transmission sector.
- Complete liberalisation of the generation sector to allow private sector participation.
- Removal of FDI limits on generating companies and capital equipment manufacturing companies, with the result that 100% equity participation is permitted.
- Permitting 'open access' whereby consumers above 1 MW of power could choose their own suppliers and power producers were allowed to sell beyond provincial markets in an effort to create a nation-wide market for power.
- Permitting 'merchant sales' whereby power producers could sell excess power over and above what was contracted to SEBs, at market determined rates.
- Regularising the supply chain, especially for coal, whereby thermal power producers could enter into binding long term arrangements with domestic coal producers. Import of fuel and feedstock were also liberalised as were foreign exchange regulations for domestic power producers seeking to augment supplies by purchasing coal mines or rights in oil and gas fields abroad.

Reactions to the Electricity Act have been mixed with critics arguing that the legislation did not go far enough, especially in enacting the radical reform that was needed to pull the Indian power sector out of its low growth rate trap that had hobbled it for the past five decades. On the other hand, its proponents argued that any reform in a sector as sensitive as the power sector in India can only be incremental and point to the tremendous obstacles that power sector reform has had to face, even 12 years after sweeping reforms were enacted in the rest of the economy.

#### *The Impact of the New Legislation and the Way Forward*

While the legislation enacted was certainly forward looking, responses from the private sector have followed a wait-and-see approach, given India's long autarchic tradition, characterised by a high level of government control over the economy and the recent experiences of IPPs in India during the 1990s. However, the green shoots of private sector participation (both Indian and foreign) are beginning to emerge, especially in the power equipment sector, where India is seen as being among the two most promising markets in the world, along with China.

The Eleventh Plan (2007-12) called for the addition of 78,000 MW of power from all sources. It is unlikely that this target will be realised, though a late surge during the past few years has resulted in the rapid addition of generating capacity. It is envisioned that the final capacity addition at the end of the Eleventh Plan will be somewhere between 60,000 and 65,000 MW. The Twelfth Five-Year Plan (2012-17) is even more ambitious, calling for

the addition of over 100,000 MW of power. Planners are confident of realising this target given that the policy reforms of the Electricity Act would have had time to play out, leading to greater private sector participation is concerned.

It is undeniable that the liberalisation process initiated by the Electricity Act involving greater private sector participation cannot be reversed. Indeed, private sector participation in power generation is expected to increase from 10% during the Eleventh Plan to 34% during the Twelfth plan. Thus while the government is heavily investing in ramping up the capacities of the state-owned National Thermal Power Corporation (NTPC) and the National Hydro Power Corporation (NHPC), which until now were the predominant thermal and hydro power producers, respectively, power sector liberalisation has led to a rapid increase in the number of private-sector players and a resultant decrease in the share of power produced by state-owned enterprises.

Another policy reform that has been recently enacted is the de-linking of NTPC and Bharat Heavy Electricals Limited (BHEL), where supply of power generating equipment is concerned. As a result, NTPC is not obliged to generate all its generating equipment from BHEL. Consequently, private sector power equipment manufacturers have a tremendous opportunity to sell equipment to India's largest power generator. The same applies to NHPC, the country's largest hydro power generator. This has led to several private-sector players, domestic and foreign, ramping up their production capacities in India and entering into joint ventures to competitively bid for supply of equipment for power projects.<sup>7</sup>

Another interesting development that has taken place is India's aggressive pursuit of regional power trading agreements with neighbouring countries. These agreements were earlier limited to Bhutan, whereby India financed the construction of hydropower plants in that country, in return for the export of excess power generated to India. Such agreements are being extended to Nepal and Bangladesh for the development of hydro and gas-based power plants, respectively. It is expected that by 2020 over 20,000 MW of power will be procured from external sources. While earlier agreements required capital equipment to be sourced from BHEL and the power to be generated by government entities, power equipment will hereafter be sourced through competitive bidding, while generation will largely be through structured finance arrangements underwritten on a case-by-case basis by the Indian government. Policy planners are very optimistic about the prospects of such agreements as it represents a win-win situation for both power exporters, who would benefit from the export revenue and power-hungry importers like India.

Despite full liberalisation, foreign players have not entered the power-generation market with the same enthusiasm as power-equipment manufacturers, preferring to adopt a cautious approach. The first positive step in this direction is the decision by China Light and Power Company to set up a 200 MW coal-fired plant in the north-western state of Haryana. On the other hand, domestic power producers such as Reliance Power, Tata Power, Jindal Steel & Power and several other companies have aggressively entered the generation space and have ambitious plans to expand existing capacities.

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<sup>7</sup> Examples of joint ventures between Indian foreign power equipment manufacturers include Larsen & Toubro's joint venture with Mitsubishi Heavy Industries to manufacture super-critical steam turbines, Jindal Steel Works' joint venture with Toshiba and Alstom's agreement with Bharat Heavy Electricals Limited. Several companies with an established presence in India, such as Siemens and General Electric, are significantly expanding operations in India to manufacture next generation technology and also their related R&D activity.

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Despite the positive intention displayed by successive governments in reforming the power sector, there are certain serious shortcomings within the power sector in India, both structural and administrative, which it is hoped will be addressed soon:

- (1) Transmission capacity lags behind generation capacity, with the result that the power generated often cannot be evacuated. This has created considerable opportunities for the private sector and several domestic companies like Larsen and Toubro, Reliance Infrastructure and Kalpataru Transmission Systems, as well as foreign companies such as Areva T&D, are ramping up capacity for producing transmission equipment in India.
- (2) Supplies of coal and gas to the private sector have yet to be completely streamlined, though the government has constituted a high-power committee to address this issue, which is expected to turn in its recommendations shortly. This is a relatively minor problem given that foreign firms can source fuel from abroad, subject to foreign exchange clearance.
- (3) Land acquisition is a problem. It has been recommended that the CEA purchase land of suitable size, which generation companies could bid for. Progress on this count has been tardy.
- (4) The problem of 'open access' persists, as does the merchant power facility, both permitted by the Electricity Act. Given that power is a concurrent subject, states retain the authority to deny open access. For example, the two most industrialised states in India, Maharashtra and Gujarat, allow both open access and merchant sales, while Karnataka, a fairly advanced state and India's Information Technology hub, does not. The Power Ministry in India has recently tabled a parliamentary note, mandating open access.<sup>8</sup> The granting of open access is expected to greatly enhance interest among private power-generating companies.
- (5) The financial situation of most SEBs is still parlous and so generating companies are still anxious about recovering payments on power sales to these boards, though the federal government underwrites some of these sales. The present arrangement is that any financial bailouts of the SEBs is deducted from the allocations made to the respective states, thereby adding pressure on states to be more responsible in ensuring effective metering of supplies and minimal Transmission and Distribution (T&D) losses.
- (6) A bigger problem to reform is the resistance of SEBs to unbundling, fearing that unbundling would make it easier to identify the source of financial losses. SEBs are also reluctant to part with exclusive rights to T&D, widely seen as the most lucrative businesses in the sector, despite the abolition of exclusive privilege by the Electricity Act. Private sector companies are aggressively petitioning the government to be allowed entry into T&D as well, so as to be able to provide end-to-end solutions to consumers. A resolution of this issue in favour of greater private sector participation in T&D is expected soon.

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<sup>8</sup> *Business Standard*, 23/XII/2009, p. 6.

**Conclusion:** Recent legislation in the form of the Electricity Acts and amendments such as universalising open access have added a spirit of dynamism to the power sector in India. It is hard to see this trend reversing. Indian private sector companies are also confident of competing with foreign companies in all sectors and hence the possibility of a return to autarchy under pressure from domestic lobbies is equally unlikely. The issues previously discussed can be daunting, but the regulatory regime is evolving and is being amended to induce greater transparency and a level playing field. Above all else, there is multiparty agreement on the need for urgent reforms, which minimises the chances of political disruption. From a private investor's standpoint, this augurs remarkably well and players who are willing to cope with an evolving regulatory regime will reap rich rewards in the near to medium future.

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