

Future Shock! The Indian Power Sector

India aspires to achieve double digit economic growth in order to lift vast sections of its population out of poverty while at the same time creating a modern, diversified industrial and services base. One of the most formidable challenges it faces is that of an infrastructure deficit which is reinforced by the scarcity of funds to create new infrastructure. Sporadic and confused legislative and administrative changes have ensured that far from adequate investments are being made in the power sector in India. This lack of legislative and administrative clarity had led to a rapidly growing deficit in India's ever-increasing demands for energy (especially that for electricity), thus seriously hampering the long-term growth of the economy.

Central Government Intervention in the 1970s

The socio-economic model adopted by India at the time of independence led to the establishment of the 'command economy'. However, in the mid-1970s, it became apparent to the central government, particularly to the late prime minister, Indira Gandhi, that the states which had till then been driving capacity addition and distribution were now beginning to lag. Hence, the government set up the National Thermal Power Corporation (NTPC), the National Hydroelectric Power Corporation and the National Power Transmission Corporation (Power Grid Corporation). It is important to remember that till this time the primary drivers of capacity addition in generation and transmission were state governments; from 1948 to 1975 the development of transmission systems was primarily state-centric, that is, from the state generating stations to the load points. After the establishment of the central generating stations (CGS) of the NTPC, the electrons started flowing from the new generation points to various interconnecting points of the state grids. This capacity was superimposed on the existing capacity of the state grids. Now, there is a need for beltways or ring roads or transmission rings across the country where the supplier of electricity can inject power at any point and the consumer can draw at any point, thereby allowing affordable and easy access to all.

Public Good versus Private Profit

Despite the central government's efforts, capacity addition in power remained grossly inadequate in meeting the rapidly increasing demand. Recognising the crucial need to rapidly augment capacity, the government opened up the sector to private and international participation in the 1990s. However, while the government continues to withdraw from large parts of the infrastructural sector, making way for the private sector under various options (including public-private partnership), the policy maker and regulator remain confused about the primary function of the private sector. The role of the private sector is to invest with a profit motive. If consumer and/or social interest become the expected role of the private sector, then we are clearly looking at a proposition which is a non-starter. As the late prime minister P V Narasimha Rao said at the IPPAI conference in 1994, 'it is not the business of the private sector to invest in social sectors or to provide for poverty alleviation programmes or rural development. It is the job of the government to do that and to leave the private sector to freely invest in infrastructure and make profit so as to encourage other private sector investors who, looking at the success of the first wave, would also invest in the Indian infrastructure sector.'

The role of government regulators and policy makers is primarily to create an environment which will attract private investments into the infrastructure sector, particularly energy, so that capacity can be built up. In fact, the Electricity Act, 2003, specifically states that governments can subsidise consumers as long as they make a provision in their budget and pay the subsidy up front. However, this is not happening for various reasons, political and otherwise, resulting in the consumer being taken for a ride.

The power sector has been in the hands of the state for more than half a century. State governments have been vested with a dual responsibility: adding capacity while, at the same time, fulfilling a rather unique role of being the development catalysts by extending connectivity to remote parts of the country. As this has not been a profitable exercise there is an apprehension that the private sector is not best suited for this responsibility. This apprehension is based on the perception that it is impossible for a private sector profit-seeking entity to provide the same level of service to the public without increasing the tariffs and profiteering. The private sector can only be incentivised to invest in long gestation, capital intensive projects like power generation and distribution if there is sufficient return on investment.

Sanctity of Contract and Rule of Law

The installed capacity of power in India today is in the range of 145,000 megawatts (MW), servicing a population of around 1.2 billion. Compare that with China where the installed capacity is 800,000 MW for a similar population base. And this is when the installed capacities in both countries was 1,400 MW in 1947–48! In spite of the so-called advantages India has over China, the latter has consistently been able to attract far more international investment than India over the last many decades, particularly in long-term infrastructure projects. So, what are we missing?

The answer lies in the simple concept of ‘sanctity of contract and rule of law’. In China, a contract, once signed, is final and binding and cannot be changed by anyone. Investor confidence is heightened in the knowledge that once formalities have been completed, a project will be executed without any interference, interruption or reversal. The Indian context, in contrast, disappoints as there are a large number of cases where contracts have not been honoured by the state; they have been renegotiated, cancelled and set aside with impunity, in total disregard of the impact on the investing community.

A classic case in point is Enron’s Dabhol project. Various reasons, justifications and interpretations notwithstanding, this contract was reneged almost 10 years ago. Despite the fact that this contract had the indirect sovereign guarantee of the Government of India, the promoter was unable to get payment for power supplied, ultimately resulting in the project being abandoned. Nobody was held accountable for the debacle of the single largest foreign investment ever made in the history of the country (of \$5 billion). Instead, there have been comments and reactions on issues which were irrelevant from the perspective of a serious investor, and from the standpoint of a host country which was exploring the options of expanding its infrastructure investments using innovative financing methods such as ‘project finance’ or ‘off balance sheet’ financing of which Dabhol was the

first test case. Notwithstanding the fact that there may have been sound reasons for reneging on the contract, this experience has affected the flow of investments to various other infrastructure projects in India. Investors are very sensitive to the perception that a contract could be cancelled or changed at will, and such experiences undermine the comfort levels in making long-term capital investment in a country's infrastructure. In this context, it is significant to note that not a single international investor bid directly for any of the projects falling within the ambit of the government's ambitious Ultra Mega Power Projects.

For proponents of the theory that there is a great deal of development in the power sector in spite of the Dabhol phenomenon and its cascading impact, the problem lies in the fact that most of the finance for projects being planned today is balance sheet-based rather than off balance sheet/non-recourse finance projects. With the global financial meltdown of 2008 and the liquidity crunch strangling the industry, there is a fear that the availability of funds for projects in the pipeline as well as new projects will be severely affected, thus resulting in a delay or even abandoning of projects.

Open Access and Consumer Choice for Market Creation

Radical changes came about with the Electricity Act of 2003; it was put together, among others, by Gajendra Haldea, a bureaucrat who sincerely believed in unshackling the potential of the power sector by enabling the private sector to invest in a market-driven and competition-enabling new power sector model. The act provisioned for 'non-discriminatory open access' for generating companies and for different licensees in transmission/distribution/trading and also pushed for the creation of a power market through traders, market makers and power exchanges. In addition, the act also provided consumers with a choice: they could choose between various suppliers of electricity.

This has resulted in a situation of a square peg in a round hole where the act envisages open access and consumer choice. These provisions presuppose the availability of transmission grid points across the country where any generator could inject power and any consumer could draw it. Further, the generator/consumer is given the right to execute short-term transactions using the unutilised capacity in the transmission system. However, there is a contradiction in the Electricity Act which, on the one hand, talks about the creation of markets and competitive prices and, on the other hand, talks about regulating almost all aspects of the supply chain: generation, transmission, distribution and trading of power.

While the act envisages opening up of the power sector by way of light regulation, to date not a single open access has been granted under section 42 (2). Overregulation has resulted in delays, while unimaginative market design, capping price of power, ineffective enforcement, lack of skilled manpower and a host of other problems have made regulatory uncertainty a new risk.

Failure to Provide Open Access

The Electricity Act mandates that the State Electricity Regulatory Commissions (SERCs) introduce 'open access' latest by January 2009. This diktat has also been reiterated in the National Electricity Policy (2005) and attendant issues have been addressed in the National Tariff Policy (2006).

However, very few SERCs have taken this mandate seriously and a review suggests that they are far from ready.

The Electricity Act talks about creating a market and competition and herein lies the rub. Since 97 per cent of the power transaction in the country is controlled and owned by the state and sold at a regulated price under long-term power purchase agreements (PPAs), the question that comes up is, market for whom? And where is the concept of competition if we go back to regulating the entire sector right from generation, transmission and distribution to trading?

Square Peg in a Round Hole

The second dimension of the problem lies in the fact that the structure of the power sector, prior to the Electricity Act, was focused from the generation point to the load point and for decades this initiative was primarily driven by state governments. Subsequently, however, with the intervention of the central government, allocations were made against the capacity of the central generating stations and inter-state transmission systems to various states under the Gadgil Formula. Now, with the Electricity Act, it is becoming a challenge to create a market in an overregulated situation where there is one primary player, the government. Further, there is no clarity on how this competition will be created considering all aspects of the power sector are being regulated, leaving no scope for market/price discovery. A lack of clarity also exists about the nature of new investments, and how they will be made and interwoven into the existing set up where everything is on a cost-plus basis. So, while the act talks about competition, open access and consumer choice, how this will be achieved and at what price remains unclear. In a nutshell, the effort at creating regulated competition through market-driven measures is half-baked and flawed. The overarching presence of the government in all aspects of the power sector creates a dominant position, thereby making any kind of free market phenomena a distant dream.

Command and Controlled Competition

The act does not clearly define how the command control structure of the power sector is now going to be open to free market principles, allowing new non-government players to freely participate in a market driven by competition from a certain date. The ownership of the grid is a question—do the states have absolute ownership since they pay the capacity charges to Power Grid or is it a national asset open for use to all?

Working at Cross Purposes

The transition from a command structure to a market structure remains a serious issue. Who will drive this change, when, and to what extent? This transition is being further compromised by the fact that many states do not have regulatory commissions and neither have they unbundled

their electricity utilities. Contrary to the mandate of the Electricity Act, no serious attempt is being made to make systems transparent and accountable as a result of which they are incurring large transmission and distribution losses. In fact, there is already a major conflict in many states between the regulatory commission and the state governments, thereby defeating the very purpose of creating regulatory commissions, that is, to distance the state from micro-managing the sector.

Knee Jerk Reactions and Short-Term Measures

States need to understand that continuing to run an electricity utility in a 'business as usual' mode results in annual losses running into thousands of crores. Furthermore, the lack of transparency and accountability results in a dwindling flow of investment into the infrastructure sector, thereby completely bankrupting the weakened power sector. Not only that, but it also results in drying up any private investment coming into the infrastructure sector. Governments need to be extremely sensitive to investor concerns, ensuring that nothing is done to shake the confidence of the private investors. This is particularly so since the state governments themselves have run out of money and it is difficult for them to generate the investments needed (this fact has been recognised even in the National Electricity Policy, 2005), long before the 2008 financial meltdown.

The Electricity Act has remained largely on paper rather than the dynamic driver that the late power minister, P R Kumaramangalam, had thought it would be. Its mandate has been thwarted, curtailed and suppressed for political and bureaucratic considerations. Consumer choice is a distant dream; open access for consumers has not really taken off. The privatisation of distribution companies is on hold and the creation of a deep debt, equity and a power market is at a nascent state. Meanwhile, the sector bleeds and inadequate capacity is being added: compare India adding 25,000 MW from 2002 to 2007 while China added 100,000 MW in 2006 alone.

Free power to the agriculture sector, routinely promised during elections, is scoffed at. Farmers have begun to realise that free power actually translates into 'no power'! Or, if at all there is any, it is of very bad quality and at the wrong times. This results in an unfortunate chain of events: erratic and bad quality power leads to low crop productivity which leads to debt traps for marginal farmers which are actually death traps. Even the urban consumer is becoming intolerant of power cuts and this is beginning to show in electoral results across the country. Many governments have lost their mandate due to power shortages.

If India is to maintain its growth trajectory, it needs a new and revolutionary policy which addresses the concerns of the consumer and the investor equally. In terms of the latter, the government can explore the possibility of creating a de-risking reserve fund for infrastructure which can be accessed by project developers in case of any state or central entity reneging on their contract. Till such a time that this happens, the nation's energy development is gasping in darkness.

Missing the Wood for the Trees

There is already talk of regulating and capping short-term traded power prices through artificial intervention in the so-called public interest. Enormous effort is being put into trying to regulate and cap the 1 to 1.5 per cent of the entire quantity of power transacted in India. The focus has shifted from trying to take steps to stem the losses emanating from transmission and distribution (which is a consequence of 98.5 per cent of the power transacted) to concentrating on merchant power plants

and short-term trades (taking place in only 1 to 1.5 per cent of the total transaction of power). In fact, there is a proposal to ration surplus power in the public interest. This is absurd and will only lead to greater shortages. We are clearly missing the wood for the trees. Instead of rewarding merchant power plants and those investors who have built up capacity during the shortage period (without power purchase agreements and at great risk using their own balance sheets), the effort is on to kill the nascent electricity market. If the government is to make use of the skills and financial resources available to the private sector through the public–private partnership model, it clearly needs to nurture the private investor's confidence. They should avoid the shortsighted witch-hunt against profit makers and should desist from destroying the power beacons of profit makers who could have attracted others into the power sector. The treatment meted out to the private sector may well be the last nail in the coffin of erosion of investor confidence. We, then, may as well centralise the power sector and let the state invest in delivering the power it promises. People have forgotten the inefficiencies that existed in the state power utilities of the 1980s and 1990s.

The question is: will the people allow these agenda-driven initiatives to destroy their future? Can we hold these agenda drivers responsible? Recently, Alan Greenspan's confession that he was wrong for 40 years (to the United States Senate committee investigating the financial meltdown in the US) is a pointer and a warning that the people will not forgive agenda-driven initiatives which are not in the national interest.

It is interesting, indeed fascinating, to watch bureaucrats, policy makers and incumbents constantly run down private players, accusing them of profiteering from shortages. What they fail—or do not want—to understand is that had the incumbents done a good job, the issue of shortages would not have arisen. We need to mature as a nation and as a people to accept change and to realise that there is no way of meeting the energy needs of our growing population with conventional thinking and mindsets. The government does not have adequate financial resources; constraining private initiative only worsens the already grim situation.

The Incumbent Mafia and Conflict of Interest

There is huge resistance from the incumbent state electricity boards who feel that since they have paid a fixed charge for the transmission system, they have greater custody and first rights of usage on the capacity in the transmission system. Since they perceive themselves as owners, they feel they have the right to deny open access to any short-term trader or generator, even if there is spare capacity on the transmission lines. The Power Grid Corporation thinks they own the lines and the buyers are mere customers. Notwithstanding the negative outcome of this thinking (denial of open access and consumer choice), the fact remains that Power Grid's debt is amortised by way of monthly payments of fixed tariffs of the state electricity boards/constituents. There is, therefore, an inherent conflict of interest between (a) the incumbents who operate and feel they own not only the state grids but also the short-term trades conducted on their grid, and (b) the generators and traders who carry out these short-term trades. As a result of this conflict of interest incumbents often deny generators and traders open access to the grid.

Hence, in the existing system of transmission which is regulated and pre-paid, bringing in open access in all its dimensions and facets is a difficult and uncertain proposition! In fact, this raises certain issues: who will transport new generation capacity or who will convince the existing

constituent state utilities to pay the fixed charges for a merchant transmission line, and so on. This, coupled with the mindset of the engineering and technical incumbents—called ‘the engineering mafia’ who do not want any change from the old school of thought as it directly affects their turf—are some of the issues that bedevil the power sector today, more than 17 years after the sector was opened up. The political and executive classes look on the regulatory system as a dilution of their powers and take a conflicting stand on various issues.

Demand Side Management

If an economy cannot boost electricity supply, it can certainly try to reduce or better manage the amount of electricity demanded. However, demand-side management does not work in India for a number of reasons: (a) theft of power is more profitable than paying less for power through savings; (b) lack of metering systems in rural areas which would allow for establishing existing benchmarks which could then be used to assess energy savings brought about by implementing fresh measures; (c) the rural consumer, primarily the agriculturalist, will not allow you to meter him because he pays a fixed tariff based on his capacity and is anyway extremely dissatisfied with the erratic nature of power supply he gets and also because he has political patronage. A large part of the energy power system in the country is unmetered and therefore results in a large amount of power being stolen by consumers who can actually afford to pay. Unless these problems are addressed on a national scale, energy efficiency and demand-side management are not going to make a substantial difference. There are methodologies and ways in which consumers can be incentivised to save power—by creating an environment where ‘saving power means cash profit’—but then that’s a far cry from the present thinking.

Lack of a Long Term Energy Security Plan

Thus far we have examined critical legislative, financial, legal, regulatory and administrative inputs and frameworks required for India to effectively meet its growing demands for power. This leaves us with the most critical input of all—fuel. India does not have a long-term fuel policy for its energy security. Existing coal mining capacity has reached a saturation point due to a number of reasons: high ash content, wrong placing of generating stations (away from mines resulting in transportation bottlenecks), and most importantly, lack of investment. Hence, access to large quantities of coal is not going to be possible without large investments in coal mines, railway systems for transporting the coal, transmission lines to carry power from pithead mines, etc. In fact it is reliably learnt that Coal India Limited (CIL) has informed the states to make their own arrangements for coal supplies as CIL will be unable to meet their requirements as per the state’s allocations.

Gas

The country has not really had very large gas discoveries for many years except recent finds from the Krishna–Godavari (KG) basin, which have already been allocated by the government even before the flow of gas has started. The India–Pakistan–Iran (IPI) pipeline seems to be stuck for strategic reasons. On the west coast of India, other than the already discovered and saturated sources of gas, the merchant LNG terminal is importing gas at spot rates which makes long-term planning for power projects difficult due to the volatility in fuel pricing. On the east coast, Bangladesh’s gas reserves are

now being claimed to be overrated; and due to the lack of investment they are not really available for export to India. Further, gas in Myanmar has already been lost to the Chinese.

Regulatory overlaps also hamper efficient functioning: the power sector regulator can only regulate the fixed cost of power plants and has very little control over fuel prices as prices come under the purview of the petroleum regulator. In the present context, and due to the extremely volatile situation in the oil and gas market, it is not possible for any serious power generator to ever use gas to generate power on a long-term basis in the near future.

The recent withdrawal of the Tatas from Bangladesh, the Pakistani stance on the IPI pipeline, besides others, are strong reminders of the concerns and sensitivities amongst the neighbouring countries towards meeting India's fuel needs. Bangladesh would like to export value added goods from its gas internationally. The gas pipeline coming in from Central Asia remains a 'pipe dream' because of the fact that China is diverting most of this gas for its own requirements. In fact, the Beijing and Almaty axis is now extremely active in diverting gas resources away from Central Asia to meet China's needs. The gas in Myanmar has already been lost to the Chinese because of bureaucratic delays and bungling. Merchant gas at spot prices coming out of the KG basin from Reliance, Cairn and GSPCL seem to be the future of gas in India. With the great demand from the fertiliser, transport services, city-gas and other sectors, it is uncertain how much gas will be really available for additional power generating capacity.

Hydro

India has a very young range of mountains which are susceptible to earthquakes, landslides, silting and other natural phenomena. This makes it difficult to build and operate large-scale hydroelectric projects. Although there have been small successes with neighbouring countries such as Bhutan (the 2000 MW Tala project), India still has a long way to go if it is to utilise the hydro potential within the country and with the neighbouring countries. While exploring these possibilities issues such as rehabilitation and resettlement and environment (preference for run-of-the-river projects versus large dams as, for example, the Narmada–Sarovar Project) need to be kept in mind. Small hydro projects have been set up by the private sector. These, however, are being crushed by the incumbent engineering lobby which is not giving remunerative tariffs, grid connectivity or open access; these issues need to be addressed at the earliest. The absence of a retail market and balancing market to dispose of hydro power is a great deterrent.

Renewables

Although great progress has been made in wind power—projects upwards of 10,000 MW capacity have been installed—the plant load factor is in the realm of 10–15 per cent average. Bio-mass power generation capability utilisation in the 600-odd sugar cogen plants is still in its nascent stage. Serious solar-power projects are still out of reach for the common man, despite steps taken by the government.

Nuclear Power

The most promising way forward for the country is nuclear power. India must follow in France's footsteps and add about 300–400 GW of nuclear capacity if it is to see sustainable prosperity. This

will reduce, and possibly eliminate, India's dependence on fossil fuel and reduce its carbon footprint. The signing of the necessary agreements with France and the US (and others planned in future) has paved the way for the addition of huge capacities in nuclear power on an emergency basis. The government needs to actively encourage private and public investments in nuclear power. If the state is successful in generating a substantial amount of nuclear power, with the cost of production not exceeding 50–60 paise, the government will be in a position to subsidise all major activities of the economy, such as agriculture and mineral-based industries, by giving them free power and charging taxes on their value-added goods. Imagine a world where power is available in plenty and free! This would jump start the economy.

Keeping in mind the magnitude of our emergent requirements to create a robust and sustainable economy, we need to implement reforms right now rather than wait to be rudely jolted out of our complacency. An entire generation has waited to exercise their fundamental right to power while the state fumbled. It is time for a national consensus on 'power for all' and to unshackle people from ineffective incumbents.

Such as (a) democracy, (b) proficiency in English, (c) well-developed stock markets and (d) a structured legal system.

The contracts signed were to ensure security of payments to DPC: monthly payments for electricity supplied and also in case of termination of the project. A power purchase agreement with the state government, a state support agreement, a state guarantee and escrow accounts of 27 circles of MSEB were signed. Various letters of credit for both phases of the project as well as for termination were made available, as also a central government support agreement and a counter guarantee to the international lenders of the project.

India has missed a huge opportunity to use off balance sheet-based finance structures for the infrastructure sector as a result of which we see very low investor interest. This brings us to the fundamental issue that the Indian state has not learnt how to attract private and international investors to develop the infrastructure sector.

It must be remembered that electricity is a concurrent subject on which 28 states and 7 union territories along with a dozen central agencies and public sector undertakings hold conflicting views. All interests need to converge in order to drive the agenda.