Restructuring the Indian Power Sector: Some Issues*

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Abstract

The power sector is undergoing a structural change in many parts of the world, involving dismantling of public monopolies. In India, power policy has changed since 1991, but the progress has been slow and uneven. The response of the private sector has been disappointing, mainly because of the financial weakness of the State Electricity Boards. Public investment on power development should not be scaled down. Corporatisation of SEBs will not bring about any improvement without tariff rationalisation and a change in the style of their functioning. Large-scale privatisation is neither feasible nor desirable. The credibility of the regulatory authorities is important, but the state governments must play a supportive role. It is unrealistic to expect the emergence of an electricity market in India in the near future. Serious thought should be given to the creation of a new legal framework for future power development in India.

Introduction

Power sector reform has been under way in many countries though the pattern varies from one country to another. India has also made a start in restructuring its power sector. This figures prominently in current public discourse as well as in the media, and rightly so, as it concerns every citizen of the country. Electricity plays a ubiquitous role in the modern world; it touches every segment of the economy and the life of every individual. It is a crucial component of infrastructure; at the same time, it is highly capital-intensive. Over the years, massive investments have been made the world over to attain high levels of economic advancement. For a developing country like India, a healthy, vibrant and expanding power sector is an imperative need. As estimated by the Planning Commission in the Ninth Five Year Plan document, the Electricity-GDP elasticity was as high as 1.36 during 1990–96, indicating that GDP growth rate of 7-8 per cent

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per annum cannot be achieved without an increase of close to 10 per cent a year in electricity consumption. There is another aspect. The Indian economy is getting integrated rapidly with the global economy. The Indian consumer must benefit from competition following the process of liberalisation instituted since the nineties. At the same time, the domestic economy has to grow stronger and bigger. For this, adequacy of supply is not enough; energy must be available at a reasonable price, which can happen only if the electricity industry displays high efficiency and productivity. It is equally important that, even in a market economy, underprivileged sections of society are enabled to have some access to the benefits of electricity. These must be the criteria by which to assess the outcome of the restructuring process taking place in the Indian power sector.

The process of reform of the power sector is still in its initial stages and it would be premature to assess the outcome. The steps taken in the last few years have, however, brought to light several problem areas that need to be resolved before the sector is fully restructured and the expected impact is felt. The paper attempts to highlight the more important among them and suggest how they should be dealt with. The next section begins by tracing the genesis of reform of the power sector worldwide and proceeds to set out the developments in this sector in India since 1991, when there was a marked shift in the country’s economic ideology. The progress so far is briefly reviewed. This is followed by a section in which the major issues and problems having a bearing on the content and direction of reform are discussed. The concluding remarks are presented in the last section of the paper.

Reform: Process and Progress

Paradigm Shift

India, as mentioned earlier, is not the only country in which power sector reforms are being carried out. Indeed, it was in the industrialised West that impulses for change originated. If we look across different countries, we see a paradigm shift taking place in varying degrees from the United States at one end to Australia at the other. In order to appreciate the underlying reasons, it is useful to take a quick look at the evolution of the power sector in the last sixty years or so. We see that during the first four decades after the end of the Second World War, in industrialised and developing countries alike, power development took place almost wholly in the public sector. USA was a notable exception, but the industry was subject to strict regulation. Broadly, one can identify four reasons (Chandran 1998) for the development of the power industry in the public sector:

First, power systems provide a classic example of a natural monopoly. Unlike other commodities, electricity cannot be stored and, at all times, supply must match demand. Consequently, it is desirable that the three components of a
power system, namely, generation, transmission and distribution are vertically integrated. Having regard to the diurnal and seasonal variations of demand, system efficiency and reliability can be optimised through grid operation, preferably under single ownership. Every consumer must have a dedicated delivery system. Therefore, the industry is characterised by high sunk cost, making it difficult for an existing operator to exit and setting up a high entry barrier to new players. The larger the operational network of a power system, the smaller the marginal cost of service to a new consumer—another characteristic of a natural monopoly. If an important component of infrastructure like power is inherently monopolistic, it was argued, a public monopoly is preferable to a private monopoly.

Second, power development requires large and lumpy investment. Among all the components of infrastructure, the power industry has the highest incremental capital-output ratio. At the same time, as it mostly provides an intermediate good, electricity tariff must be kept low in order that the final product is not priced out. As a result, capital amortisation requires a relatively long time. These make it difficult to mobilise requisite investments from the private sector.

Third, the socialist ethos held sway over most countries of Europe in the aftermath of the Second World War. It was believed that public interest would be maximised by public ownership of the vital means of production. This philosophy spread to colonial countries newly securing independence.

Lastly, in the developing countries, there was another policy angle, namely, the role of electricity as an instrument to enhance the welfare of the poorer sections of society and accelerate the development of backward areas.

Public monopoly of infrastructure development began to be questioned seriously around the seventies. Economists and political scientists put forward different theories like Public Choice theory, Contestability theory and Principal-Agent theory; while the arguments advanced were different, the net conclusion was that under exclusive public ownership of infrastructure, the citizen could not get economic and responsive service and that only market competition could ensure efficiency and optimal allocation of resources. This perception was strengthened by the global recession of the early 80’s. There was a growing feeling in western countries that public monopolies were inefficient, unresponsive to citizens’ needs and not accountable, whereas the private sector was perceived as being capable of providing better service. The growing importance of international financial markets, which could help the private sector to mobilise large funds, was a supportive factor. Some technical developments occurred in parallel favouring demonopolisation. These were spectacular in telecommunications where satellite communication made a dedicated delivery system unnecessary. In the power sector, the discovery of abundant reserves of natural gas made it possible to add capacity in smaller increments. This meant less lumpy investment, which made it easier
for private players to step in. The lead in dismantling public monopolies was taken by UK in 1989 when Prime Minister Margaret Thatcher launched an aggressive programme of privatisation of electricity, coal, gas and telecommunications. Since then, a large number of countries are pursuing a similar course. The arguments in favour of a greater role for the private sector in infrastructure mentioned earlier, no doubt, have relevance to developing countries also; but the major compulsion of these countries is the acute scarcity of investment funds in the public sector and the priority to be given to social development in the utilisation of available resources. They have no option except to welcome private investment. As domestic capital markets are small and weak, this means, in effect, attracting foreign investment, especially into power and telecommunications, which need and have the potential to absorb funds on a large scale.

Policy Changes in India

Policy changes in India have followed a similar two-stage pattern. When we attained Independence in 1947, socialist beliefs were widespread in the country. The Industrial Policy Resolution of 1948 (reiterated in 1956) placed power, among others, in the list of areas reserved for the public sector. The Electricity (Supply) Act was enacted in 1948 to provide the legal framework for power development, including the establishment of State Electricity Boards (SEBs) and Central Electricity Authority (CEA). Without question, there has been a large expansion since then. Creditable as this may be, the fact remains that capacity and energy shortages have become rampant. The utilities are in financial disarray: on the one hand, their costs tend to be high because of inadequacies in operating efficiency, overstaffing and poor management. On the other hand, they operate under an irrational tariff regime characterised by distortions in the charges borne by different categories of consumers and, overall, under-recovery of cost. The tables below present a quick picture.

We have a situation in which the higher the energy production of a power utility, the higher the loss. Also, certain categories of consumers are overcharged while others are subsidised indiscriminately. The distortions appear even more pronounced when the figures are examined statewise.

For their part, the Central and state governments, which have been the main source of investment funds, are themselves under financial strain and are required to reduce the fiscal deficit. The fact that in the Eighth Five Year Plan period, the actual addition to generation capacity was only 17,600 MW against the target of 30,500 MW is a clear indicator that, without harnessing private funds, expansion of the sector commensurate with ambitious economic growth targets will not take place. It was against this background that under the new economic policy initiated in 1991, the power sector was thrown open to private investment, domestic as well as foreign. This was a part of a range of measures
### Table 1: Consumer Categorywise Average Tariff

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<thead>
<tr>
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<tbody>
<tr>
<td>Domestic</td>
<td>118.5</td>
<td>133.9</td>
<td>131.1</td>
</tr>
<tr>
<td>Commercial</td>
<td>291.5</td>
<td>333.3</td>
<td>345.3</td>
</tr>
<tr>
<td>Agriculture</td>
<td>21.1</td>
<td>27.7</td>
<td>29.7</td>
</tr>
<tr>
<td>Industry</td>
<td>282.4</td>
<td>284.8</td>
<td>297.5</td>
</tr>
<tr>
<td>Traction</td>
<td>352.9</td>
<td>374.8</td>
<td>398.9</td>
</tr>
<tr>
<td>Outside State</td>
<td>148.1</td>
<td>146.9</td>
<td>156.7</td>
</tr>
<tr>
<td>Overall</td>
<td>163.0</td>
<td>184.5</td>
<td>197.9</td>
</tr>
</tbody>
</table>

### Table 2: Recovery of Cost through Tariff

<table>
<thead>
<tr>
<th>Year</th>
<th>Average Cost (paise/kwh)</th>
<th>Average Revenue (paise/kwh)</th>
<th>Revenue as a Percentage of Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>1996–97</td>
<td>207.1</td>
<td>163.0</td>
<td>77.4</td>
</tr>
<tr>
<td>1997–98</td>
<td>225.2</td>
<td>184.5</td>
<td>80.1</td>
</tr>
<tr>
<td>1998–99</td>
<td>242.9</td>
<td>197.9</td>
<td>78.8</td>
</tr>
</tbody>
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*Source: (Tables 1&2) Planning Commission (1999)*

marking a major shift in India's economic philosophy—from a command economy to a competitive market economy. Since then, further steps have been taken to break up the public sector monopoly of the power industry and to facilitate an increasingly larger role for the private sector.

Broadly, reform of the power sector has four components: unbundling, establishment of regulatory mechanisms, corporatisation of SEBs with a redefined role and privatisation. Let us examine what these imply.

**Unbundling.** Unbundling of the power system means segregating the monopolistic and the non-monopolistic components of the system. Clearly, generation is an activity, which permits multiple players, is amenable to market competition and can be opened for private investment. Distribution in a given area does partake of a monopoly, but the element of competition can be brought in two ways—first, the right to distribute power to consumers in the area may be allotted to private parties through competitive bidding ensuring at the same time that the consumer gets supply at minimum price. Second, yardstick competition, i.e., comparison of the performance of different distribution agencies, can be used to drive efficiency improvement and, where possible, bring down the tariff. As for transmission, private parties can own individual lines but, operationally, there is room for only
one player in a given region and it remains a monopoly. What is needed in the case of transmission is to establish institutional arrangements, which guarantee equal access to power producers and fairness in load dispatch during periods of congestion.

**Regulatory Mechanism.** The primary function of the regulator is to balance the interests of the consumer in getting energy at as low a price as possible with the interests of the producer in earning a reasonable return on his investment. The regulatory authority has also to lay down the guidelines for a smooth technical and financial interface between the monopolistic and the non-monopolistic elements of the power system. Where, as in India, both public and private entities are engaged in a similar activity such as generation, the regulator must see to it that there is a level playing field. For regulation to be credible, the regulatory body should be independent, should give opportunity to all the stakeholders to present their views and function in a transparent manner (Expert Group 1996).

**Corporatisation of SEBs.** While generation and distribution may be taken over by separate entities, the SEB will be the appropriate agency to look after transmission. It will be the intermediary between producers and distributors of power, purchasing power from the former and selling to the latter (or to consumers until the distribution entities come into existence). Load forecasting and system planning will be their other functions. In order that SEBs perform their role effectively in the new environment, they will be corporatised, which will, hopefully, give them greater functional and financial autonomy.

**Privatisation.** This does not require any elaboration. The idea is that over a period, government will divest itself of ownership of public enterprises in favour of the private sector. However, there is as yet no official policy on privatisation, except in respect of distribution. The advantages perceived in placing distribution under private ownership are – first, pilferage of power will be brought under control through elimination of unauthorised connections, metering, regular billing and rigorous collection of dues. Second, the private operator will be more consumer-friendly and responsive to their needs.

The measures listed above could lead eventually to the development of a market in electricity in which a consumer can choose his supplier and there will be all round improvement of efficiency as a result of competition.

While appraising the reform strategy, we should bear in mind that the overall goal is to make the power sector technically and financially sound. The consumer must get good quality service at a reasonable price. Competition-driven price of electricity should help our export industries to hold their own in the global markets. The reforms should provide an environment conducive to a large inflow of private funds for investment in the power sector, so that the growing
demand can be met.

What has been presented above is the framework of reform. We will now briefly review how far we have actually moved ahead in the last ten years. It should be borne in mind that under our Constitution, electricity is a concurrent subject and the Central and state governments share responsibility for implementation. The important developments since 1991 were as follows:

(a) In 1991, Electricity (Supply) Act was amended to permit private sector entry into power generation.

(b) In 1992, the policy for thermal power generation was announced. It allowed licence for thirty years with possible further extension, 100 per cent foreign equity, tax holiday for five years plus tax rebate of 30 per cent for the next five years and protection against rupee depreciation. The two unique features were guarantee of a return of 16 per cent on equity at 68.5 per cent PLF, with incentive for better performance and inclusion of ‘take or pay’ clause in the power purchase agreement. Initially, the Memorandum of Understanding (MOU) route was permitted so that there could be a quick start on new power stations, but as there were apprehensions of cost-padding, competitive bidding was made mandatory (except for small projects).

(c) In 1995, Orissa passed legislation for restructuring the State’s power sector. The State Regulatory Commission started functioning in 1996. Power distribution was subsequently privatised.

(d) In 1996, at a Conference of Chief Ministers, the Common Minimum National Action for Power was agreed upon, which included setting up of State Regulatory Commissions, rationalisation of tariff and private sector participation in distribution.

(e) In 1998, Parliament passed laws enabling private sector entry into transmission, designating the Central Transmission Utility (Powergrid Corporation) and State Transmission Utilities (SEBs or their successor bodies) and for setting up Regulatory Commissions at the Centre and in the states. Modified guidelines for hydropower projects were issued to make investments in such projects more attractive to the private sector. Government recast its policy on mega power projects, which would cater to the power needs of more than one state. These projects would enjoy additional tax concessions; the sharing of power by a state would be conditional on its implementing reforms.

(f) Some states have passed their own reform laws, set up Regulatory Commissions and converted their SEBs into companies. A few states have set up regulatory bodies under the Central law. The rest of the states have not moved at all.

(g) In order to persuade state governments to implement reforms, an incentive has been held out in the form of World Bank assistance and facilitation of private investment. Power Finance Corporation and Infrastructure Development Finance
Corporation have started linking their assistance with milestones in the completion of the reform process.

Two facts stand out from the foregoing account. The first is that Central initiatives have been fitful and piecemeal. One does not see a grand design and the time lags have been excessive. The second is that progress in the states is uneven. Apparently, to give a push to implementation of reforms at the state level, the Union Cabinet gave approval, in December, 2000, to the Accelerated Power Development Programme to fund projects aimed at reform and restructure of the power sector. An outlay of Rs.1,000 crores was provided in the financial year 2000-01; in the budget for 2001–02, the provision has been raised to Rs.1,500 crores.

In the ten years that have passed since the new policy was adopted, the contribution of the private sector to power development in India has remained limited. Soon after the policy announcement in 1991–92, a large number of private parties from within the country and outside showed interest and state governments signed dozens of MOUs. If all of them had been implemented, the installed generation capacity in the country would have almost doubled! In actuality, capacity addition in the last ten years in the private sector was only about 5,500 MW. This apart, other issues have cropped up in the course of implementation of reforms. The more important among them are examined in the next section.

Some Issues

Role of Private Sector

If one may repeat, an attractive package of terms and conditions was offered to private investors. India has a well-established legal system and an independent judiciary. India should therefore be a preferred destination for foreign investment. International capital markets are flush with funds and heavy electrical equipment manufacturers look upon the developing world as their main market. Yet, there has been only a trickle of foreign direct investment (FDI). The most important reason is the extremely weak financial position of the SEBs (in the rest of the paper, the term SEB should be taken to include its successor bodies). If the sole purchaser of power is on the verge of bankruptcy and already has large outstandings towards purchase of power and coal, investor confidence is bound to be weak. Investment in power means a long-term commitment and the investor must have reasonable assurance of regular cash inflow during the licence period. This will not be forthcoming unless tariffs are rationalised so as to make the SEB operation commercially viable.

As restoration of the financial health of power utilities will take some time whereas the need for investment is immediate, a solution would be to offer sovereign guarantee; in the Indian context, it translates into state government
guarantee backed by counter guarantee by the Central Government. At first, there was an inclination to give such a guarantee. But it was soon realised that this was not a sustainable arrangement, as it shifted the burden to government and therefore indirectly to the non-consumer also. Moreover, governments are themselves required to reduce their deficit. Government of India restricted the facility of counter guarantee to a small number of fast-track projects (which are in fact still lingering) and, as an alternative, asked SEBs to offer escrow cover to independent power producers (IPPs). Even this has proved unworkable for two reasons: first, the proportion of energy consumed by large industrial consumers who are regular in payment is relatively small, thereby restricting the escrow capability of an SEB. Second, the escrow arrangement will further weaken the SEB, as it creams away its best customers.

It is clear that there are no soft options. No industry can run indefinitely at heavy loss, nor can (or should) government prop up such an industry diverting funds, which are badly needed elsewhere. Rationalisation of tariff based on normative performance standards is the only solution. The determination of tariff will hereafter be with the regulatory authorities. But this will have to be backed by strong political commitment and the willingness to deal firmly with vested interests, which have been enjoying undeserved benefits.

Among other factors inhibiting the inflow of FDI in the power sector is the lack of coherence in policy. The power sector is open for private investment, but coal and railways continue to be in the public sector. Captive coalmines can be under private ownership, but private investors desiring to set up a power station do not want to go into a business in which they have no expertise and which means raising additional capital, besides having to deal with a host of other problems. This asymmetry creates a serious problem for investors in thermal power generation based on domestic coal. The IPP has to achieve the specified normative level of generation if it is to recover fixed costs and get a return on investment. The IPP therefore needs a fuel supply guarantee from the coal company, which produces coal and from the railways, which transport coal from the pithead to the power station. But, neither the coal company nor the railways are willing to enter into a legally enforceable agreement with the IPP. The result is that the project is non-bankable and remains a non-starter. This is not a hypothetical example, but is the case of one of the ‘fast-track’ projects. We have a situation in which our country has fairly abundant reserves of coal, but IPPs opt for coastal locations so that they can import LNG or Australian coal – a clear distortion of energy policy, not to mention the outgo of foreign exchange. It is high time that the coal industry was thrown open to private merchant producers.

In our federal set-up, several agencies at the Central and state levels are involved in the processing of IPP proposals. Examination by each agency tends to
be sequential and time consuming. Some clearances are mandatory and necessary, such as those from safety and environmental angles. But, in general, as there is no appreciation that time costs money, negotiations drag on interminably. A power project involving large investment has many technical, financial and legal ramifications and the power purchase agreement has to cover all kinds of eventualities, which could arise over a thirty-year period. Having had no experience of negotiating such complex agreements, officials have had to pass through a learning curve. There is also the problem that, more often than not, negotiators on the government side are drawn from the very same organisations whose monopoly is being taken away. It is perhaps too much to expect that their mindset will be proactive to the devising of arrangements for the curtailment of their own powers and functions. An IFC-World Bank document (Sader 2000) says, ‘India’s electricity sector is by now infamous for the difficulty it presents to those interested in developing private power generation projects’. It is significant that of the projects initially identified by Government of India as fast-track projects, not one of the major projects has got off the ground. It is imperative that deadlines be set at both Central and state levels for processing by the different agencies.

Among the public, there is a feeling that the tariff of private power producers is higher than that of their public sector counterparts. Therefore, there is lack of enthusiasm for the concept of IPPs. Factually, it is true that private power is generally costlier. Primarily, this is because the private investor evaluates his risk and tries to minimise it. An investor is expected to bear the ‘commercial risk’ (e.g. non-performance of equipment according to specifications, shortcomings in maintenance, etc.), but it is mainly the ‘country risk’ that accounts for higher cost. Country risk includes foreign exchange variation, changes in taxation and labour laws, and civil unrest. This is partly covered by host country guarantee. For the rest, the investor protects himself to the extent possible by insurance, which adds to the cost. Even the rate of interest on foreign borrowing depends on the credit rating of the host country, which in turn takes into account the prospects of policy consistency. The World Development Report 2000/2001 has some interesting data on Institutional Investor Credit Rating of different countries. India’s rating is 45.3 while that of Singapore is 80.4; the figures speak for themselves. In contrast, in the case of a public sector project, there is no such ‘add on’, as all risks are absorbed by the exchequer. Therefore, a one-to-one comparison of cost between ‘public’ and ‘private’ power will not be strictly correct. Whatever be the explanation, it must be noted that the fervour for IPPs has abated a little in some developing countries. We in India do need large private investment, at least in generation, to ensure adequate availability of power. To allay public misgivings regarding the purchase price and to enable consumers to understand the basis for pricing, the Power Purchase Agreement entered into by the SEB with the IPP,
should be placed in the public domain, with all supporting documents. This will be taken care of when the Regulatory Commission steps in, as their approval of the purchase price is mandatory and the procedures of the Commission provide for public hearings.

What does this add up to? It means that we should not put all our eggs in the private sector basket. We should not act on the assumption that private finance can substitute for public investment; it can only be a supplement. We should remember that neither has nuclear power generation been opened to the private sector nor would international financial markets support nuclear power projects. Hydropower does not attract private capital, because of hydrological and geological uncertainties inherent to such projects. Private investment in transmission lines has not been forthcoming even in western countries, as there is little room for the investor to improve profitability through higher efficiency. Thermal generation and distribution do provide avenues for private capital, but there are hurdles, as explained earlier. Both the Central and the state governments must move quickly to minimise these hurdles.

**Role of Public Sector**

The limitations of private investment referred to above mean that the primary responsibility for power development remains with the public sector. The World Development Report 1994 (its theme is ‘Infrastructure’) estimated that 90 per cent of annual investment on infrastructure in developing countries is derived from government revenues or intermediated by governments. Besides, the point merits repetition that in a country like India where poverty is pervasive, electric power plays a dual role—while, in the main, it is a vital infrastructure for productive economic activity, it can be harnessed through appropriate policies, to alleviate poverty and enhance the welfare of those living at the subsistence level. Electricity can help to improve farm productivity and stimulate growth of non-farm employment. Electrification of households makes a significant difference to the quality of life, facilitates the spread of education of the growing generation and reduces human drudgery. In the words of the World Development Report referred to above, ‘The lack of access to infrastructure is a real welfare issue’. This is a responsibility that the private sector will not take over. Therefore, public sector investment on power development must be maintained at a high level. This does not mean that investment funds must be mobilised solely by government through revenue or borrowing. The power industry under the public sector, which will continue to be large, must generate a surplus that will at least partially meet investment requirements; this takes us once again to the key issue of properly designed tariffs. The financial aspect apart, the style of functioning has to change. Public sector entities can no longer be treated as subordinate agencies of government. We will revert to this aspect while dealing with the question of
corporatisation. The point to be underscored is that there should not be any abdication of responsibility on the part of the Central and state governments in ensuring adequate resource availability to public sector power entities even after corporatisation. In the words of A.A. Churchill, ‘International capital flows, both private and official, can support domestic effort to raise resources, but they are seldom substitutes. The energy sector and, in particular, the requirements of electric power are far too large relative to the overall size of the national economies to be dependent exclusively on external savings’ (Churchill 1999). Latterly, there is some improvement in the Plan outlay on power in the Central sector, but viewed across states, the picture is not encouraging. This needs to be rectified.

Subsidies in the Power Sector

It is well known that the financial difficulties of the power sector emanate mainly from subsidies to the agriculture and domestic sectors. The projections for the year 2001–02 as given in the Economic Survey 2000–01 (Government of India 2001) are revealing:

<table>
<thead>
<tr>
<th>Amount in Rs. Crs.</th>
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<tr>
<td>Subsidy on Agriculture</td>
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<tr>
<td>Subsidy on Domestic Sector</td>
</tr>
<tr>
<td>Subsidy on Inter-State Sales</td>
</tr>
<tr>
<td>Gross Subsidy</td>
</tr>
<tr>
<td>Subventions received from State Govts.</td>
</tr>
<tr>
<td>Net Subsidy</td>
</tr>
<tr>
<td>Surplus generated by sale to other sectors</td>
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<tr>
<td>Uncovered Subsidy</td>
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<tr>
<td>Commercial Losses</td>
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The losses on agricultural supply are, clearly, very heavy. What is also significant is that in spite of overcharging industry, the extent of cross-subsidisation that can be achieved is limited. The need to reduce the subsidy burden has been recognised for many years, but competitive populism hindered remedial action in most states. Under the Electricity Regulatory Commissions Act passed by Parliament, cross-subsidisation is not ruled out, but within three years, no category of consumers should be required to pay less than fifty per cent of the average cost of supply. For agricultural consumption, a minimum of 50 paise per unit has been prescribed. There are no corresponding explicit provisions in the Karnataka Electricity Reform Act, where the only requirement, as in the Central Act, is that in case the State
Government requires the grant of subsidy to any class of consumers, it must bear the consequential financial burden. Possibly, the position is similar under the reform laws of other states. The legal position is thus somewhat tenuous and will have to be clarified soon.

The basic question is, can we do away with subsidies? The answer is, by no means, simple. Looking first at subsidy to domestic consumers, there is no case for a general subsidy to this category of consumers. The poor, we all agree, must have access to electricity, since, as stated earlier, electric lighting makes a difference to the quality of life and confers other benefits. Then again, merely because the cost of delivery of power to rural areas is high, the rural domestic consumer should not be placed at a disadvantage. We should bear in mind that the hard core of poverty lies in the rural areas. However, losses on this account could be made up through a well-designed reverse block tariff, as consumption by poor households accounts for only a small fraction of total domestic consumption.

Subsidy for agricultural consumption is a more complex issue. In the first place, losses on agriculture as reported by SEBs are generally inflated; as the supply is unmetered, losses arising from theft of power are also ascribed to agriculture. This is clearly borne out by the fact that, in the proceedings of the Regulatory Commissions which have issued tariff orders, the SEBs’ filings before their respective Commissions disclosed altogether higher transmission and distribution losses than what they had been reporting in their Annual Reports. For instance, the losses declared by Karnataka Power Transmission Corporation were — 18.56 per cent in 1997–98, 30.19 per cent in 1998–99, 38.00 per cent in 1999–2000 and 36.50 per cent in 2000–01 (projected) (Karnataka Electricity Regulatory Commission 2000). The sudden jump in 1998–99 is significant. Second, the subsidy accrues, in the main, to relatively better off farmers. The fact that many of them have diesel backup indicates that capacity to pay is not a real issue. On the other hand, the cost of cultivation has a link with the minimum support price paid by government to maintain buffer stocks of food grains and run the Public Distribution System, which caters to the essential needs of low-income consumers. This is not to suggest that there is no scope for reduction of subsidy to agriculture. It should be possible to keep the quantum of subsidy within limits by imposing tariff in the manner envisaged in the Electricity Regulatory Commissions Act, metering of supply and institution of programmes to encourage installation of high-efficiency pump sets. This apart, there is scope for increasing revenue by controlling theft and reducing technical losses in transmission and distribution. But this will take time, as there is a large backlog of investment on these components of the power system. However, it will not be possible to eliminate subsidy altogether for quite some time. Meanwhile, the subsidy burden should be borne squarely and clearly by the state government, as the subsidy subserves public policy.
SEBs as Corporate Bodies

Corporatisation is not a panacea for the basic problems of SEBs. The main purpose of moving over to the corporate form of organisation is to professionalise the management, endow it with functional and financial autonomy free from political interference and introduce commercial orientation. But will this happen once the SEB puts on a new garb? The manner in which public sector companies are run even today, whether at the central or state levels, does not inspire confidence. They continue to be treated as agencies on a par with field departments. There have been several high-level committee recommendations to change the nature of the interface between public sector enterprises and government, as also of control by Parliament (or State Legislature), audit, etc. But the substantive recommendations remain unimplemented. A determined effort needs to be made by the political leadership and the bureaucracy to develop a new model of relationship with public sector enterprises.

Merely because an SEB ceases to be a statutory body and becomes a company, its financial position will not alter. No purpose will be served by replacing one loss-making organisation by several such organisations (as has already happened in Orissa). If annual losses continue, government will have to bail them out as in the past. How the balance sheet will turn out will depend on the decisions of the Regulatory Commission. Ultimately, the balance sheet can be cleaned up only through higher efficiency and proper pricing of power. There is also the question of the outstanding liabilities of the SEB, which are quite large. Securitisation appears to be the best way as it provides immediate relief, but the State government must shoulder the burden of discharging the liability. Otherwise, tariff increases will reach unacceptable levels.

The Privatisation Question

There is a view that as the Central and state governments are heavily indebted and interest payments take away a large proportion of current revenues, existing assets should be sold to the private sector and the proceeds used to retire public debt. Without any doubt, privatisation can attract FDI on a large scale. Out of a global FDI inflow of $138 billion for infrastructure between 1990 and 1998, Latin America was the largest recipient with $79 billion; of this, $67 billion was towards privatisation (Sader 2000). Do we want to follow the same route? This is an issue that calls for debate on a wide scale, as its implications are serious and sensitive. In my view, wholesale privatisation is neither desirable nor feasible. Given the limited scale on which capital can be raised domestically, privatisation will inevitably mean sale to foreign private parties. One cannot be comfortable with a situation in which a vital segment of the country’s infrastructure is under foreign ownership. As mentioned earlier, investment in transmission is not
interesting to private investors. In relative terms, distribution is manpower-intensive and the scale of investment is not large; Indian parties will be willing to enter when there is a resolution of the tariff issue. It is the generation sector which can attract a large inflow. What Government of India has done so far is to effect piecemeal disinvestments in Central power undertakings. Such an approach does not fetch the best price for the shares, nor is there any benefit in terms of change in the style of management. On their part, the states have not moved at all. India has a number of thermal power stations of old vintage, which could be hived off to parties who are willing to undertake renovation and modernisation. Our focus should be on greenfield projects that add to capacity, and it is here that we should create an environment that makes it possible to secure private investment on a substantial scale.

The Regulatory Regime

As already stated, the Centre and several states have set up Electricity Regulatory Commissions. With the exception of Orissa, other Commissions have been in existence for only a short period. According to information available, the Orissa Commission had passed three tariff orders, and the Andhra Pradesh, Uttar Pradesh and Maharashtra Commissions one order each by June 2000. The Karnataka Commission passed its first order in December of that year. It will be premature to judge performance, but comments may not be out of order on two aspects, viz., functions entrusted and credibility. Referring to functions first, the main task assigned to the Regulatory Commissions at both national and state level is the determination of tariff. The Central Act contains enabling provisions for a state to entrust other functions to the State Commission, notably, licensing of generation. But, to the best of our knowledge, no state has done so. The Commission comes into the picture only for determination of the purchase price of energy by the Transmission Utility. This must be regarded as a lacuna, as it leaves the coverage of regulation incomplete.

When we look at countries where the power sector is being deregulated or restructured, we see two broad approaches to tariff regulation—cost-plus approach and price cap approach. The cost-plus approach has been followed in USA for a long time. It involves a detailed scrutiny of costs and the monitoring is close and continuous, but has the merit of ensuring financial viability and minimising market risk. The complaint of some American utilities has been that it does not permit generation of financial surpluses of the order needed for fresh investment. Under the price cap approach which originated in UK, the regulation is light-handed and lays down only an upper limit for the tariff for a specified period (three to five years). After initial benchmarking, indexation is allowed on the basis of the formula ‘RPI-X’, where RPI is the Retail Price Index and X is a factor that represents improvement in efficiency. The price cap approach is closer
to market competition and allows higher profit to those who achieve better levels of efficiency. Consumers in UK have benefited from lower tariffs, but in the initial stages, the regulator was apparently too liberal, with the result that the biggest beneficiaries were the shareholders in the privatised companies (Newberry 1998). In the literature on regulation, one finds reference to a third approach to regulation, namely, the Performance-based approach. In my view, the distinction is semantic rather than substantive, as under both cost plus and price cap approaches, performance norms are built in.

In India, there was hardly any debate on the choice of methodology of tariff determination, which is the main function of the regulatory authorities. Under both the Electricity Regulatory Commissions Act and state reform laws, the State Commissions are required to follow Sections 57 and 57A and the Sixth Schedule of Electricity (Supply) Act. If the Commission wants to make a deviation, it has to give reasons to justify it. This means that we have implicitly adopted the cost-plus approach. As it happens, this is the right choice in our context. It gives greater comfort to the private investor. Also, fixing a price cap in a situation where new capacity is being added all the time is difficult.

The more important question is, does the experience so far confirm that the regulatory bodies in India enjoy the requisite measure of independence? This question is important, as the experience of the first regulatory body constituted under the new economic policy, namely, Telecom Regulatory Authority of India (TRAI) was not happy. When certain recommendations of the Authority were not to their liking, Government of India had the law amended to dilute the powers of TRAI. Judging by the brief experience of the State Electricity Regulatory Commissions which have passed orders, it is encouraging that they have affirmed their autonomy, as evidenced by the fact that all the five State Commissions scaled down the T & D loss projected by the Transmission Utility and exercised their own judgment for purposes of tariff determination. Assertion of independence is all right, but it has to be blended with pragmatism. There have been critical comments on the Orissa Commission’s orders on the ground that unachievable efficiency improvements were assumed while deciding the tariff. If the tariff is pitched too low and there is under-recovery, private parties that take over distribution will be unable to function, as they cannot finance losses indefinitely. A quotation each from two recent studies will give a flavour of the observations. ‘The regulatory commission is limiting itself to regulation and appears to consider that the development of the sector is beyond its responsibilities. In Orissa, the state government too has absolved itself of all its responsibilities leaving the power sector in a lurch’ (Sankar T.L. and Usha Ramachandra 2000). ‘Where governments are co-operative as in the case of A.P., the allowed revenue requirement is much closer to a real level. In contrast, in Orissa, where the government has not actively assisted in the process of transition, the efficiency improvements required are
much more dramatic’ (Ahluwalia 2000). In Karnataka, the pattern of events has been a little different. In the first order issued by the Karnataka Electricity Regulatory Commission towards the end of last year, the Commission raised the tariff by about 17 per cent on an average. The increase in the agricultural tariff was modest; it was set at 50 paise per unit for most farmers. The Commission introduced an innovation by distinguishing affluent farmers and imposing a tariff of Rs.1.35 per unit on them. The Commission also issued several directives intended to improve the operational efficiency of the power utility. Karnataka Government went along with all the tariff increases, except for the agricultural consumers (including rich farmers), but committed itself to providing additional subsidy. Karnataka Electricity Board’s successor, Karnataka Power Transmission Corporation, has gone up in appeal to the High Court questioning the jurisdiction of the Regulator to issue those directives. In Maharashtra, the State Government has responded to the Regulatory Commission’s order on tariff for agriculture (and powerlooms) on the same lines as in Karnataka. These are not encouraging signs; they signify lack of readiness to put in place a credible regulatory regime. What is more, as a truly independent regulatory body enjoying the confidence of both the power suppliers and consumers is a cornerstone in the rebuilding of the power sector, it raises the question whether at all there is political commitment to set right the technical and financial ills of the sector.

Electricity Market

In industrial countries that have embarked on deregulation of the power sector, the emergence of an electricity market in which electricity is traded like any other commodity with competition among suppliers is regarded as the ultimate goal. The UK has been the pioneer in this respect. It introduced a pool system, with half-hourly price bids offered by different power producers; the highest accepted price would be paid to all the suppliers during the particular time period. As explained earlier, the UK adopted a soft regulatory system. It will be interesting to look at a couple of other models. New Zealand restructured its power sector as a part of a changeover (which began in 1986) in the pattern of governance to conform to the principles of New Public Management. The new regime only mandated disclosure of operational and financial information; reliance on market competition was total and regulation was considered unnecessary. California passed a law in 1996 making elaborate provisions to make the power industry market-based. These included the Power Exchange for wholesale trading in electricity and the Independent System Operator (ISO), who not only looked after load dispatch, but also operated the balancing market for emergent purchases of electricity in case of mismatch between supply and demand (Sioshansi and Morgan 2000). A new class of electricity traders who mediate between merchant generators and distributors (or large consumers) came into being. As in other states of USA,
the California Public Utilities Commission had been in existence for several decades, the style of regulation being hands-on; inter-state electricity trade came under the purview of the Federal Energy Regulatory Commission (FERC). In all the countries referred to above, consumers were given the freedom to choose their suppliers.

In all the three countries, the functioning of the electricity market has not been without problems. We may take a quick look at them:

1) UK – When UK denationalised the power industry, generation was taken over by two large companies (National Power and Powergen). Though a number of merchant generators came up later and nuclear power was under another company, these two large players dominated the electricity market and dictated prices. There was even criticism of manipulation of the market. The UK has decided to give up the pool arrangement and let suppliers and consumers enter into direct arrangements. But, according to Richard Green, ‘Abolishing the pool in favour of a less transparent market, at greater risk of manipulation by the dominant generators, does not seem a rational policy’ (Green 1999).

2) New Zealand – The market was, no doubt, competitive, but it led to a situation in which investments were not made to maintain adequate reserves. Some time ago, a part of Auckland, the capital city of New Zealand, went without electricity for some weeks; a power cable had developed a fault, but there was no redundant capacity. Lack of a proper arrangement for system planning was evident.

3) California – Since around May 2000, California has been facing a power shortage and the problem has reached crisis proportions. When reform measures were introduced, there were three investor-owned utilities, two of which, namely, Southern California Edison (SCE) and Pacific Gas and Electric (PGE) were large and served the major part of the State. Under the law of 1996, the utility tariff was frozen till March 31, 2002, before which the utilities were required to sell their own plants and convert themselves into distribution companies buying power in the wholesale market. The new system worked well to begin with. But the demand forecast had underestimated the rate of growth and no new major plant had been built in California for the last ten years. When the demand started rising sharply last year, the utilities had to buy wholesale power from outside sources. As the power shortage grew, electricity traders jacked up the prices, while the income of the utilities remained frozen. The suppliers even resorted to gaming – withholding offers to the Power Exchange and selling power at higher rates in the balancing market. FERC refused to intervene. By the end of the year, the two utilities together had lost $13 billion and the banks were unwilling to lend them any
more money. Large parts of California suffered rolling blackouts in January this year. In order to retrieve the situation, Government of California had to start funding the utilities to the tune of $50 million per day to enable them to buy wholesale power. Towards the end of March, California Public Utilities Commission finally allowed a tariff increase of 46 per cent for PGE and 42 per cent for SCE in respect of non-domestic consumers; the increase in the case of households was less sharp. Government is planning to recover its money by floating bonds to the tune of $12.4 billion. The situation is expected to ease fully only by 2003, when new capacity is expected to be commissioned in California.

The experiences mentioned above offer important lessons to countries embarking on restructuring of the power sector. These are:

1) There must be institutional arrangements for system planning and ensuring that the required capacity additions take place.

2) Regulatory mechanisms are necessary. Tariff determination should not lose sight of the need to generate funds required for maintaining sufficient reserves. The Regulator should respond quickly to evolving situations.

3) The Electricity Market will work well only if supply exceeds demand at all times and there is a multiplicity of players. Otherwise, the ugly side of market power will show up (This is the most important lesson).

What is the prospect for an electricity market in India? No doubt, this may benefit the consumer, but is it feasible in our situation? As rightly observed by Central Electricity Regulatory Commission (CERC 1999), the conditions are unfavourable. Unlike many western countries that have excess capacity, we have and will continue to have supply shortages for many years to come. We do not have a multiplicity of generators. There are transmission constraints. The ‘take or pay’ clause insisted upon by IPPs cannot fit into a market situation. There are many old power stations which may have to exit in case the market is wholly competition-driven; this could mean loading ‘stranded costs’ on the consumers. For all these reasons, it is unrealistic to talk of an electricity market in India.

We may not have an electricity market in the real sense, but some limited inter-state trade has been taking place for many years. Recently, the Power Trading Corporation promoted by public sector entities has been set up to buy power from mega projects and sell it to state utilities. It is clear that it can survive only if it can keep its receivables under control; this will depend, once again, on tariff rationalisation in the states. It is not surprising that the Corporation has not been successful in reaching financial closure on even the first mega project that it has proposed to take up.
Negative Fallout of Reform

Markets operate on a short time horizon, which means that energy sources that are not cost-competitive cannot survive. The development of renewable sources of energy, which have long-term potential will suffer unless it receives special support. It is reported that in California where a big push had been given to renewables under the Public Utility Regulatory Policies Act (PURPA) enacted in 1978, 26 per cent of biomass capacity and 11 per cent of wind capacity closed down after deregulation (Wiser et al. 1998). A distribution surcharge had therefore to be imposed. In the UK, renewables are supported by Non-Fossil Fuel Obligation Orders issued from time to time under which electricity suppliers are required to purchase electricity at specified rates from generators using renewable sources of energy. We in India need to give sufficient thought to this aspect. To encourage development of renewable energy resources, Ministry of Non-Conventional Energy Sources (MNES) has issued guidelines indicating the rate of payment to be made by SEBs to producers of electricity from renewable sources. The period covered is ten years from commencement of purchase; appropriate escalations are allowed during this period. The purchase price is no doubt higher than the price of power from conventional sources, but the share of renewables in the total generation is small and therefore not burdensome to the SEBs. The Regulatory Commissions, which have so far passed tariff orders, have not all accepted the MNES guidelines. It is necessary that they do so in order that investment in renewables does not suffer an immediate setback. The long-term solution lies in the imposition of a statutory levy.

Most industrial countries have reduced their national (public and private) investments on energy R&D after the deregulation of their energy sectors. To give an example, total R&D investment in USA has come down from $7.6 billion in 1976 to $4.3 billion in 1996. The cuts have been sharper in several European countries (Dooley 1998, Margolis and Kammen 1999). This is unfortunate, since the bulk of technology generation takes place in the developed countries. The scale of investment on energy R&D is quite low in India; there is an imperative need to step it up.

The Electricity Bill 2000

The power sector developed in India entirely under the aegis of the states, to begin with, and the Centre stepped in later. The legal framework, starting with the Act of 1948, has been subject to modifications from time to time, but it remains in its essence a law designed for operating the power industry in the public sector. As the economic environment has changed radically, it is time to think of a new statute appropriate to the present time. At the request of Ministry of Power, National Council of Applied Economic Research has prepared The Electricity Bill 2000.
‘for evolving a framework for enabling the restructuring and modernisation of the electricity industry in India’. It visualises the unbundling of SEBs into horizontally separated entities, whether public or private. It aims at insulating the industry from government intervention in day-to-day functioning, but leaves room for policy directives. CEA’s role in national planning and technical development is sought to be restored. Strong regulatory mechanisms are provided. Provision is made for levy of a cess by the Union Government to promote non-fossil fuel sources. In brief, it takes care of many of the issues referred to earlier and provides a coherent framework for the development of the sector. Undoubtedly, there are political sensitivities, as there will be some curtailment of the extent to which a state government can influence operational decisions. It is desirable that the need and content of fresh legislation is debated widely and the ground prepared for its being considered seriously.

Conclusion

The power sector has many dimensions and complexities. Reshaping it is by no means an easy exercise, all the more so in a federal set-up where the Centre and the states share responsibility. There is no universally applicable model of reform; each country has to evolve a pattern to suit its circumstances. The reform process in India has made some headway, but the movement is slow and not orchestrated. The private sector has yet to become a significant presence and foreign capital seems shy of entering India. Policy and procedural hurdles need to be removed quickly. The role of the public sector in terms of investment and otherwise will continue to be important and the tendency to play it down should be resisted. Regulatory Commissions should be allowed to play their part, as tariff rationalisation linked with performance standards will play a crucial role in making the industry efficient and viable. Power shortages are presently crippling the economy. The sector has to expand rapidly if the country’s economic growth is to be accelerated and the lot of the masses at a subsistence level is to be improved. Reform of the power sector has therefore become imperative. The need of the hour is sustained political commitment to push through a coherent and effective programme of restructuring the sector.

Notes

1. The independent power producer (IPP) must achieve a Plant Load Factor (PLF) of 68.5 per cent to cover its fixed costs and get the guaranteed return of 16 per cent on equity. In terms of energy, this translates into 6000 kWh per year per kW of installed capacity. Under the ‘take or pay’ clause, the SEB is obliged to purchase at least this quantum of energy from the IPP. If the SEB fails to do so, notwithstanding the fact that the IPP was ready to
supply, the SEB has to pay fixed charges (including profit) for the shortfall, which is treated as deemed generation.

2. The figures in this table are based on the Annual Plan discussions held by the Planning Commission with the Central and state governments.

3. A lot of material on the California power crisis has been available on the Internet. This includes extensive reports in the American press, especially the regional newspapers. According to some reports, when the deregulation legislation was under discussion, the three California utilities spent millions of dollars on lobbyists and political contributions to get the new law passed. Some issues of *The Economist* have carried reports of recent developments.

4. PGE has, however, filed for bankruptcy.

References


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