NOTES

Financing of Power Projects in India: Problems and Prospects - A Note

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Since 1991, the Government has opened the power sector to private sector and undertook various policy initiatives to reform its working and attract private investment. The liberalisation of power sector has, however, raised many pertinent issues, especially relating to financing of private power projects. This note presents some issues regarding private sector power projects and analyses alternative financing options.

Introduction

Infrastructure and in particular power plays a crucial role in economic development. Recognising this fact, high priority has been accorded to the power sector in the allocation of funds in successive plans. However, power sector still remains a financially weak sector with daunting requirements for improvement. In the recent restructuring exercise, the Government opened the power sector for private participation. But power projects, being capital-intensive, long-gestation and risky ventures, require competent promoters, congenial investment climate and huge funds for financing. How has the private sector responded to this policy initiative? What will be the sources of funds? To what extent the Indian banks and financial institutions (FIs) will be able to cope with the financial demands of the power sector? What will be the cost of funds raised from various sources? What risks will be involved in financing these projects and how these risks can be mitigated? What further policy changes will be required to make the power sector vibrant? This note attempts to address some of these questions.

The note is organised in five sections. Section I discusses the structure of the power sector, Section II deals with the financing issues, while Section III presents issues involving institutional approach and major risks in financing power projects. Section IV examines the problems and prospects relating to restructuring of the power sector and some concluding remarks are presented in Section V.

Section I
Structure of India's Power Sector

Historically, India's power sector has been rooted in the public sector. In India, the legal framework provided for three types of utilities *viz.,* State Electricity Boards (SEBs), licensees and fully government-owned generating companies. SEBs generate, supply and distribute electricity within a State. About 65 per cent of the total generation and the bulk of transmission and distribution now takes place through SEB route. Licencees supply electricity (generated from their own stations or bought) only to specified areas within a State, having total generation capacity of about 2,969 MW in 1995. Government-owned generating companies, promoted by Central or State Governments, supply power to grids without specific responsibility for retail distribution. National Thermal Power Corporation (NTPC) and National Hydro-electric Power Corporation (NHPC) are prominent among government-owned power generating companies. In addition, there are also captive power plants operated by companies or organisations for their own use whose total generating capacity is estimated at 6,250 MW (Jain, 1995). While the Central Government has regulatory powers *vis-a-vis* bulk generators as well as distribution

licensees with regard to important elements in the permitted tariff, the Central Electricity Authority (CEA) is responsible for regulation of the entry of new bulk-generating units and providing Central clearance to all major projects of SEBs, licensees and generating companies. SEBs remain within the purview of State Governments for all purposes, with some degree of autonomy in their functions. SEBs, apart from being in a position to exercise monopoly power as the sole agency controlling State-level transmission, also exercise regulatory functions in relation to distribution licensees including control over operations and reserve power in the tariff area (The India Infrastructure Report, 1996).

Till 1991, development of power sector had been primarily the responsibility of the State and Central Governments. In 1991, with the introduction of new economic reforms, it was realised that given the various constraints, the Government could at best provide only 30,538 MW of capacity addition during the Eighth Plan period as against the requirement of 35,153 MW. This would result in acute energy shortage. To meet the emerging demand and supply gap, the strategies adopted in the short run included efficiency improvements and demand management. In the long-run, the Government resolved to mobilise additional resources to augment supply by encouraging greater participation by the private sector in electricity generation, transmission and distribution (Eighth Five Year Plan, 1992-97). In October 1991, the Government of India (GOI) formulated a scheme to encourage private enterprises both Indian and foreign to put up power generation projects. Accordingly, the Indian Electricity Act, 1910 and the Indian Electricity (Supply) Act, 1948, were amended to allow entry of private enterprises into power sector. The assortment of incentives in the policy comprehensively cover the legal, administrative and financial environment to make private investments in the power sector attractive (Jain, 1995). As a result, a number of proposals have been received for setting up new power projects. While most of the prospective entrants have been examining the feasibility of setting up new projects, their main concern has been the problems related to transmission and distribution (T&D).

Since the T&D network is owned by the SEBs, the private power generating companies will also be selling power generated by them to the SEBs. In view of the poor financial performance of SEBs in the recent past in terms of irrational tariff, low plant load factor (PLF), high T&D losses, high level of receivables, etc., the prospective promoters have been insisting upon guarantees from the State Government and counter-guarantees from the Government of India for the settlement of their dues for sale of electricity to SEBs. In response to their demands, the Central Government, in November 1994, approved the general parameters for counter-guarantee. As a follow up, the Central Government agreed to issue counter-guarantees in respect of eight fast track power projects. This arrangement was, however, discontinued to contain its external exposure. Instead, alternative arrangements for counter-guarantees have been mooted (Jain, 1997). A process of mutual dialogue between the promoters and the regulators have begun in order to resolve the problems of generation, transmission and distribution satisfactorily. The financing of power projects, however, poses a daunting task and this is where a long-term solution has become quite expedient.

Section II
Financing of Private Power Projects

Financing Requirements

At present, developing countries spend over $200 billion a year on infrastructure development. About 90 per cent of this is sourced from Government tax revenues or funds intermediated by Governments, which bear almost all project risks. On an average, half of Government investment spending is accounted for by the infrastructure sectors. In addition, maintenance and operating expenses command a high share of current expenditures. However, Governments' ability to spend on infrastructure has been severely constrained, partly due to poor performance and pricing and partly because Government budgets have come under tightness due to macroeconomic reasons. In the Philippines, for example, public investment in infrastructure fell from 5 per cent of GDP between 1979 and 1983 to less than 2 per cent during the remainder of 1980s. But renewal of economic growth requires accompanying investments in infrastructure. Private financing of infrastructure is, therefore, needed to ease the burden on Government finances. More importantly, it will encourage better risk sharing, accountability, monitoring and management in infrastructure provision. In some sectors, such as power the scope for private financing is enormous. The challenge for the future is to route private savings directly to private risk bearers who make long-term investments in infrastructure projects. Doing so will require institutions and financing instruments adapted to the varying needs of investors in different types of projects (World Development Report, 1994).

Accelerating India's growth rate calls for a matching rate of growth of the power infrastructure. The electricity - GDP elasticity for the Indian economy is estimated at about 1.5. In order to support a sustained GDP growth rate of around 7 per cent per annum, demand for power can be expected to rise at the rate of around 10.5 per cent annually for the next decade. Based on the 14th Electric Power Survey findings, the Central Electricity Authority (CEA) prepared a National Power Development Plan in 1991, covering the period upto 2006-07. According to this, the requirement of additional generating capacity to provide target levels of reliability in power supply is about 1,42,000 MW, reflecting an annual capacity growth rate of 9 per cent as against the demand growth rate of 7.5 per cent. Capacity addition needed for the next 10 years (from 1996-97 onwards) is thus calculated at 1,11,500 MW (44,000 MW during 1996-2001 and 67,500 MW during 2001-06). Total investment required for this could be of the order of Rs. 6,24,400 crore at fixed prices (Rs. 2,46,400 crore between 1996-2001 and Rs. 3,78,000 crore between 2001-06). This includes investment in transmission and distribution (T&D) and assumes an average price of US $1 million per MW of generation capacity and dollar to rupee conversion rate of Rs.35. There are, however, measures through which investment in capacity addition could be reduced. The measures include removal of current inefficiencies, improvement in capacity utilisation, raising end-use efficiency through targeted programmes to effect industrial, agricultural and lighting efficiencies and cogeneration and captive generation of electricity.

An alternative capacity scenario has been developed taking into consideration the above measures to reduce investment requirements. This projection assesses the capacity saving potential at 25 per cent of the estimated additional requirement of 1,11,500 MW, reducing the needed additional capacity over the next decade to 83,625 MW (32,750 MW during 1996-2001 and 50,875 MW during 2001-06) and lowering the investment requirement from Rs. 6,24,400 crore to Rs. 4,68,300 crore (Rs. 1,83,400 crore during 1996-2001 and Rs. 2,84,900 crore during

2001-06). An additional investment of Rs. 31,200 crore would be needed during the next 10 years for plant renovation and cogeneration. Overall investment requirement is thus estimated to be Rs. 4,99,500 crore. The total investment requirements are envisaged to be shared by both the public and private sectors depending on the extent to which the private sector is involved in the generation, transmission and distribution. The shares of public and private sectors have been estimated at Rs. 2,07,000 crore and Rs. 2,92,500 crore, respectively. Clearly, the private sector will have a massive role to play (The India Infrastructure Report, 1996).

Sources of Finance

As per the new guidelines, the promoter's share must be at least 11 per cent of the total outlay and the company will be allowed a debt equity ratio of upto 4:1. Further, 40 per cent of the total outlay can be raised from Indian financial institutions and banks. However, the maximum quantum of term finance that a bank or FI can sanction is restricted to the prudential exposure norms i.e. 25% of its net worth for an individual company or project and 60% of net worth for a corporate group. Also, the total exposure of a bank or FI to a single industry cannot exceed 15% of its total outstanding loan and guarantee portfolio. Funds can also be raised from Indian and foreign capital markets, multilateral institutions (World Bank, IFC, ADB, etc.), export credit agencies (U.S. Exim Bank, Japan Exim, etc.), bilateral agencies (FIIs, equipment suppliers, foreign banks, etc.) and specialised infrastructure funds (Global Power Investment of GE, Asian Infrastructure Fund, etc.). However, large scale foreign financing of power projects can create its own balance of payments problems. Therefore, under the current policy, foreign funding through debt is limited to two times the foreign equity (Jain, 1997). But, the question is whether the existing sources will be sufficient to meet the financial requirements of the power sector.

In developed countries, power projects raise finances from institutional investors (insurance companies, pension funds, endowments, etc.) either through bonds markets, or through direct private placements. In India, the contractual savings institutions (LIC, GIC, PFs, EPF) that have long-term liabilities make natural investors in private power projects. Apart from these institutions, other institutional investors such as charitable and religious trusts can also be a source of substantial funds. With the development of an active and liquid market for securitised corporate debt, mutual funds, commercial banks and financial institutions could also emerge as potentially large investors. However, all this calls for substantial reform in the debt market (The India Infrastructure Report, 1996).

At present, contractual savings institutions mostly keep their investment portfolio heavily loaded with Government papers. If power projects have to be financed through the capital markets, it is necessary to initiate major reform in the area of contractual savings institutions allowing for the entry of private companies and institutions in each of these areas and encouraging them to develop interests in power sector investment, where returns from a long term view are high. The more widespread availability of contractual savings instruments which provide good returns can be expected to lead to increasing financial savings rates of households. To leverage their core competence of project appraisal, the FIs would need to adopt a number of strategies, such as taking of loans on to their books and then syndicating them, or lending to projects during the construction and start-up stages, and securitising the loans or selling down

the bonds, once operations have begun and the project is investment grade. FIs would thus bring to bear their risk assessment capabilities during the riskier pre-operative phase. Such turnover of portfolio would have a salutary effect on the quantum of funds mobilised. However, securitisation as a financing mechanism would require a fair amount of reform in the legal framework.

In case of foreign sources, in addition to the standard sources of foreign funds like the multilateral agencies, much greater effort will have to be made to tap commercial sources. This will be increasingly necessary in the context of declining importance of official debt flows. Similarly, syndicated loans and direct borrowing routes will have to be explored in foreign markets, along with increased openness to foreign investment. Borrowing in foreign markets could be helped by sovereign benchmark issues of Government debt instruments. Infrastructure funds provide a new important source of equity finance for power projects in developing countries, particularly in Asia. At present, each equity investment sought to be made from these funds has to be routed through the foreign direct investment approval route of Foreign Investment Promotion Board (FIPB). Equity investment from such funds could be put on a special footing, allowing them ease of investment in eligible infrastructure projects (The India Infrastructure Report, 1996).

Availability of Funds

As mentioned earlier, the investment requirements of the private sector in power industry have been estimated at Rs. 2,92,500 crore for the next decade. The maximum amount that the private power projects can borrow from Indian FIs and banks is pegged at 40% of total outlay which would mean that an assistance of Rs. 1,17,000 crore is required from Indian FIs/banks over a period of 10 years. In other words, FIs and banks are required to generate on an average about Rs. 12,000 crore per annum for deployment in the private power projects. Some of the recent estimates made by FIs and the World Bank, however, indicate that FIs and banks can provide about Rs. 6,000 crore per annum against the yearly average commitment of about Rs. 3,000 crore since 1991. Thus funds required are quite sizeable as compared to availability which require special initiative to bridge the financing gap.

International experience suggests that the traditional approaches to financing that involve term loans from FIs and banks and equity offerings in the domestic capital markets are inadequate to match the risk-return profile and payback periods of power projects. FIs and banks are constrained by the time profile of their own liabilities and may not prudently lend large volumes of debt. Hence special intermediaries would be needed to provide credit enhancements and to extend the maturity of funds raised for power projects. In many countries, Governments have made special arrangements for power companies for raising resources from the capital market at the lowest possible cost and with the longest possible debt maturities. For example, in the U.S. much of urban infrastructure is financed through the sale of municipal bonds which have been given tax-free status by the federal Government. In Germany, much of infrastructure financing is done through the sale of mortgage bonds called *pfandbriefs* which are backed either by state guarantees or mortgages that can be conveyed. In Japan, the widespread postal savings system provides funds to different infrastructure financing institutions such as Japan Development Bank and the Long Term Credit Bank (The India Infrastructure Report, 1996).

In India, some of the recent initiatives have been along these lines. These include setting up of the Infrastructure Development Finance Company Limited (IDFC), broadening the scope of the public sector Power Finance Corporation (PFC), allowing an active role for PFC in negotiating loans from international banks and foreign capital markets, constitution of a Power Development Fund by the Power Ministry for speedy implementation and execution of power projects as also to finance feasibility and pre-feasibility studies for setting up power projects, mooting a Power Trading Corporation to purchase power from power-surplus regions and to sell it to power-deficient regions, launching of 'Infrastructure Bonds' to channelise household savings to power sector, and involving Provident funds as potentially important source of funding. The Government has also evolved a guarantee scheme to cover dues from SEBs by the major public sector power generating companies. On the strength of such guarantees, the PSUs concerned will be able to raise resources either by securitising these debts or directly entering the market for tapping resources (Union Budget, 1998). These measures by being very essential need to be supplemented with an overhaul of the working of SEBs and developing a separate market for power sector bonds, with inbuilt features for improving marketability of these bonds. What is important in this connection is creating a liquid secondary market for power bonds, once these bonds are issued through primary issues. Given that an active market would provide a proper evaluation of the commercial status of the power infrastructure and the long-term profitability of these instruments to the savers, mobilising substantial household savings through capital market route would not be difficult. The future financing challenges, therefore, rest heavily on developing a long-term debt market for infrastructure financing.

Cost of Capital

The minimum returns in the power sector is around 16 per cent now, if we go by the trends in assured returns. The cost of term loans from FIs and banks is, however, above 16 per cent. The bond and debenture market is also ruling firm with an effective cost of capital higher than the minimum return. The depressed capital market conditions at present do not provide much scope for raising funds from this comparatively cheaper equity route. The cost of raising capital from foreign markets though lower in the range of 8 to 12 per cent than the domestic rate, the effective cost of capital may not be very favourable taking into account exchange risk. Thus the cost of raising funds before tax and with exchange risk seems to be on the high side *vis-a-vis* the assured minimum rate of return. But, if we consider interest as tax-deductible and cost of raising foreign currency funds as insulated from exchange rate fluctuations as provided in the cost plus return on equity formula of the current power policy, the scenario changes dramatically. For example, consider corporate tax rate at 35% and cost of raising rupee funds at 16 to 18 per cent, then the effective cost of raising rupee funds will be 16 (1-35%) = 10.4% to 18 (1-35%) = 11.7%, which is much lower than the assured minimum rate of return of 16%. Similarly, in case of foreign investments, the promoters have been insulated from exchange risk and therefore, the cost of raising foreign currency funds would not be affected by fluctuations in the exchange rate. The cost of raising capital from foreign markets will, therefore, be much lower at 8 to 12 per cent than the assured minimum rate of return of 16 per cent (Jain, 1997).

It can, therefore, be inferred that the cost of raising funds before tax and with exchange risk is higher than the assured minimum rate of return, but it is much lower when we consider

interest as tax-deductible and foreign currency funds as insulated from exchange rate fluctuations as provided in the present cost plus return on equity formula. Therefore, there seems to be reasonable incentives to induce private investment in the power sector.

Section III
Institutional Approach and Major Risks in Financing Power Projects

The financial institutions and banks have always been the main habitats of the market for power sector financing. But their main focus has been the public sector projects till the opening of the power sector for private participation. Besides, IDBI has also been financing purchase of indigenous equipment by various state electricity boards through its Bills Rediscounting Scheme. In private sector, FIs assistance has been limited to financing some reputed companies like Tata Electric Companies, CESC Ltd., Ahmedabad Electric Company Ltd., etc. and a number of captive power plants (Gupta, 1995). Banks have been meeting the working capital needs of both public and private sector units. Consequent upon the opening up of the power sector, FIs interest in private sector power projects has seen improvement. FIs have already committed assistance to the tune of Rs. 17,000 crore to the power sector till November 1997.

Major Risks in Financing Power Projects

To raise debt successfully, the lenders have to be convinced about the regular cash flow from the project. The risks which could jeopardise the cash flow, therefore need to be identified and allocated to third parties. The major risks which can be expected from such projects and the means of their mitigation need pointed attention for mobilising funds for private power projects.

Construction risk is a major risk as construction consists of a major component of a power project. It refers to whether the project can be completed in time and within budget. Provisions for liquidated damages, adequate to cover costs arising on account of the delay, are incorporated in the engineering procurement construction (EPC) contract (which is usually a fixed time frame, fixed price contract). Sponsor support in the form of completion guarantee is also used to mitigate this risk. Further, the equipment supplier also guarantees performance of the plant and machinery (Mitter, 1994).

Market risk is another major risk and consists of demand risk and price risk. The demand

risk is virtually non-existent in private power projects, not because of the large deficit in the demand-supply scenario, but because of the "take or pay' nature of the power purchase agreements (PPAs). The PPA is essentially a long term sales contract between the State Electricity Board (SEB) and the private power project, wherein the SEB agrees to pay the private power project the "availability charge" (regardless of usage). This implies that the SEB is obliged to pay for a negotiated minimum level whether it accepts delivery of power or not, known as "deemed availability." The other aspect of market risk is price risk. Price risk is also covered in the PPA by way of the tariff structure which is essentially a cost plus return on equity (ROE) formula. All costs of producing power, fixed (interest, depreciation, O & M costs, insurance and taxes) and variable (fuel), along with the return on equity for the achieved PLF are charged to the SEB in the tariff. Since transmission and distribution continues to be controlled by the SEB, most private power projects have no option but to sell their entire output to the concerned SEB. Most SEBs are not considered bankable due to poor financial health and therefore pose credit risk for recovery of dues. To mitigate credit risk, State Government guarantees are to be insisted upon for the SEBs dues. Developers and lenders have not found sufficient comfort even in this arrangement and have thus sought a counter-guarantee from the Government of India (GOI). Alternatives to the guarantees involve escrow accounts and revolving letters of credit, used either on stand alone basis or in tandem (Mitter, 1994).

Lenders are also concerned about the timely availability of sufficient quantity of appropriate quality fuel. In coal-based projects, fuel supply risk is mitigated by offering captive mines to the private power projects. The reserves as well as quality of the fuel in such cases are ascertainable. Gas-based projects sign long term supply contracts with the public sector monopoly, Gas Authority of India Ltd. (GAIL). Since the assurance of gas supply, despite the contracts, is uncertain, most gas-based power projects are built with dual fuel capability. It is, therefore, essential to select an alternative fuel which allow quick switching, easy storage and local availability (Mitter, 1994).

An additional risk is that of fuel transportation. Where coal linkage is with mines located several hundred kilometers away, dependence on the railways is unavoidable. While the "own-your-wagon scheme" of the railways alleviates the problem of wagon availability to some extent, the project is still dependent on railways for haulage. Maintaining larger stocks at the plant site could also mitigate the problem to some extent (Mitter, 1994).

Usually environmental clearances are taken care of *ab initio* and is a condition precedent to the operation of the PPA (Gupta, 1995). There could, however, be risks associated with social response to such projects on grounds of damage to ecology, loss of means of livelihood and inadequate compensation for rehabilitation leading to legal entangles (Jain, 1997). These risk perceptions have a significant adverse effect on investors commitment to a long-term investment project such as power projects.

Once a project is closed financially, the developer has direct access to the funds committed by the lender to the project. A project, therefore, reaches financial closure when the financing agreements related to the project have been executed and delivered. Normally, financial closure risk should be borne by the sponsors as its achievement mainly depend on the capability of the promoters. But consequences of delay may concern the lenders as well.

Therefore, their commitment should be subject to achieving financial closure within the fixed time frame (Jain, 1997).

Banks source their funds primarily from deposits which are not very long-term in nature i.e. their liabilities are of short-term nature. They consequently also lend, or acquire assets which are likely to be liquidated within a similar time frame. But, power projects generally involve long payback periods. By investing in power projects, they take the risk of aggravating mismatches in their assets and liabilities. To circumvent this risk, banks should plan their assets and liabilities prudently and review the position periodically to prevent any deviation. The involvement of a specialised institution for credit enhancement can also help in mitigating this risk.

Since power generated by private power projects (PPPs) is not meant for exporting, the promoters of PPPs can not directly generate foreign exchange earnings to repay their borrowings abroad. This problem of lacking a natural hedge is likely to affect the project viability in a large way. In order to overcome the foreign exchange risk, most international power projects set their charges in US dollar. One of the ways by which foreign exchange risk can be handled is by ensuring forex payments through payments into an international escrow account maintained with an international bank in terms of currency of payment. Further, a reasonably high level of foreign exchange reserves have to be maintained by the country to enable the promoters to enjoy this type of facility. Risk perceptions are also influenced by the image of the country relating to political stability, administrative effectiveness, hassle-free dealings and continuity of policy. This is a dominant factor, in so far as attracting foreign investment to power sector is concerned.

Section IV
Power Sector Restructuring

Since the transmission and distribution (T&D) network in India is presently owned by the State Electricity Boards (SEBs), the financial health of the SEBs, therefore, assumes utmost importance for development of power sector. The financial performances of most of the SEBs, have been poor in terms of irrational tariffs, low plant load factor (PLF), high T&D losses, high level of receivables, inadequate investments, etc. resulting in rising level of commercial losses. While State government guarantee and counter-guarantee from the Central government is one way out to resolve this issue, exclusive use of this measure can lead to a strain on government finances and undue exposure of the Government to external liabilities which can ultimately impact the overall sovereign rating. An improved version of this type of arrangement is the Thai Guaranty Facility initiated by the Thailand Government to guarantee recovery of loans made by private financial institutions to municipalities and private operators of urban infrastructure. The facility is planned as a public-private corporation with private sector management. Moreover, government guarantees are not always necessary, as demonstrated by the financing of Pro-Electrica, the Colombian power plant. A significant part of the foreign direct investment and portfolio flows to developing countries has not been guaranteed -the underlying economic environment is what drives the flows. Thus, when offering guarantees to private lenders, government need to determine whether such guarantees are truly required, what form the guarantee should take, and how they should be accounted for in government accounts (WDR, 1994). The other alternative is the special reserve account or escrow account. But, SEBs are

finding it difficult to agree for opening of escrow accounts in all cases because (i) the limited escrow-capacity is not enough to accommodate the projects which are being currently negotiated; (ii) the "cherry picking" of escrow regions leaves the SEB with the unremunerative distribution regions to service its loan commitments, etc; and (iii) the existing stakeholders in the cash flows of SEBs are objecting for any such arrangement. To sort out the matter, the Centre formed an Inter-Institutional Committee on Infrastructure Financing in 1997. The Committee suggested that over the long term, there is no easy way out for ensuring settlement of dues of SEBs and thereby attracting private investment in private power projects other than immediate restructuring of SEBs on commercial lines.

In this context, the Standing Independent Group (SIG) set up by the Ministry of Power to oversee the setting up of mega power projects has also mooted a financing structure in which the ultimate security for continuous payments does not rest on escrow account, in turn, on an earmarked distribution region, in a SEB default situation. From the power producer's end, the contractual interface is not the SEB but a power trading company. The Power Trading Company (PTC) would be set up by a consortium of National Thermal Power Corporation, Power Grid Corporation of India, Power Finance Corporation and other financial institutions. The PTC would, in turn, enter into contracts with States which want to purchase power. Apart from providing a guarantee through mandatory LCs, which would have to be opened with SEBs, PTC would also have a right on the devolution fund of the States if the SEBs fail to meet their energy payment obligations. These proposals even when acted upon may not provide a long-term solution. It is only by improving the financial health of SEBs which can form the anchor for long-term development of power sector.

Thus, if private investment in power sector in needed volumes is to materialise, the basic pre-requisite will be to provide the degree of security that private promoters would need concerning their expected cash flows. Of equal importance is the need to upgrade the public sector to promote healthy partnership with the private sector. These objectives call for a whole set of policy inputs covering pricing, structural and regulatory reforms including restructuring of SEBs (The India Infrastructure Report, 1996).

Awareness of past mistakes, together with new opportunities, demands that a fresh look be taken at the roles that governments or other public agencies and the private sector should play in providing a more efficient and more responsive power infrastructure. The challenge is to determine those areas in which competitive market conditions can work and those that require public action. Within these broad parameters, there is a menu of institutional options that allows governments, public sector agencies and private groups (both for profit and non-profit) to assume responsibility for different aspects of service provision. The spectrum of options is broad, but four main approaches can be identified:

Option A : Public ownership and operation, through a public enterprise or government department;

Option B : Public ownership but with private responsibility for all operations (and for financial risk);

Option C : Private ownership and operation; and

Option D : Community and user provision.

In Option A, ways are devised to create accountability in a public agency or government department by establishing commercial principles and through organisational restructuring (corporatisation). Under this arrangement, contracting instruments are also reviewed to permit better monitoring and performance of operations, and appropriate mechanisms are devised for achieving financial autonomy. Option B, provides for entering into lease contracts for full operation and maintenance of publicly owned infrastructure facilities. Arrangements between the owner (Government) and the operator (firm) are set out in a contract that includes any regulatory provisions. In Option C, the private ownership and operation of power infrastructure facilities are envisaged both through new entry by private firms and through divestiture of public ownership of entire system. The main objective is to provide services competitively. Option D examines issues that neither commercialisation nor competition alone can address problems of externalities, distributional equity and the need for coordination of investments. It addresses approaches for assessing and creating accountability to social and environmental concerns through decentralisation of governmental responsibilities, participation by users and stakeholders, including self-help groups (WDR, 1994).

Far from exhaustive, these four options merely illustrate possible points in a broader array of alternatives. Much depends on the strength of the private sector, the administrative capability of the government to regulate private suppliers, the performance of the public sector providers, and the political consensus for private provision. In this context, the Orissa model of power sector reform based on options A, B and C fits well in Indian conditions for restructuring SEBs. The Model suggests the setting up of a State-level Electricity Regulatory Commission, corporatisation of the SEB with transmission responsibility being retained by a state-owned grid corporation, and provisions that would facilitate the transfer of State/SEB assets to new licensees and privatised entities for distribution. However, public accountability and transparency in the functioning of the regulatory authority need to be ensured through mandatory provisions in the Act (Sant et al, 1998). The reform programme can be realised to the fullest degree if measures are taken to restructure the SEBs into compact, viable and corporatised units that separate to a feasible degree the generation, transmission and distribution functions and ensure that these units are run ac- cording to commercial principles.

Option D can also be considered in certain cases. In India, cooperatives have been playing an important role in rural banking, supply of agricultural inputs, production of fertilisers, milk processing, etc. But these have never been tried in the power sector, per- haps because the power sector had been reserved for the public sector till 1991. Even after its opening to the private sector, no worthwhile effort has been made for the involvement of cooperatives in it. Setting up of power projects under cooperatives can be a viable proposition in the case of industrial parks, industrial estates, free trade zones, etc. Power Cooperatives can also be set up by farmers on the lines of milk and fertilisers cooperatives. The Krishak Bharati Cooperative (Kribhco) is reported to be making a foray in power generation in collaboration with the state-owned Gujarat State Petroleum Company (GSPC). Moreover, co-operatives exclusively for distribution of power to the households and farms can be formed region-wise to take care of the

problems associated with distribution to these sectors.

Reforming the present practice of uneconomic consumer pricing constitutes an essential element of the power sector restructuring programme. It has to be implemented at the State level. Price reform must aim at (a) reaching cost-based pricing for each consumer segment in a phased manner through a gradual increase in average tariff per annum net of inflation; (b) replacing unmetered supply by providing metering at the consumer end or at an intermediate distribution point; (c) identifying institutional means to administer subsidies to target consumer groups; (d) independent regulation of prices with provision for price reform to be balanced by improvement in quality of service, technical as well as commercial; and (e) reform of pricing for agricultural consumers. Pricing reforms can be made even politically popular by providing adequate and uninterrupted power supply to farmers (Parikh, 1996).

Regulatory reforms should aim at autonomy of regulatory agencies both at the State level and at the Centre. State-level regulation would cover, in its scope, consumer tariffs, overseeing undertakings within the State, both public and private, in equitable terms, monitoring service standards and approving projects below the threshold specified for Central clearance. Central regulation must focus on bulk generation and inter-state transmission tariffs, approvals for larger projects and enforcing the right of access to the inter-state and inter-region network. The country experience also reinforces the need for regulatory reforms. For example, Argentina which adopted the most far-reaching privatisation programme by privatising all major infrastructure providers and unbundling their activities to foster competition between 1989 and 1993 lagged behind in the capacity for regulatory oversight and where market forces did not provide adequate discipline, the need for regulation was felt. In the Philippines power sector, private provision was based entirely on the entry of new generators. The urgency of reforms was so great that new entry had to be based on contractual agreements between the government and private generators, since reform of the Electricity Regulation Board would have taken too long. Although regulation through individual contracts has attracted new investment to the power sector, further development will require sectoral rules and overall regulation to ensure fair competition. Malaysia's approach put it somewhere between that of Argentina and Philippines. Though utilities have been gradually privatised and new entry has been allowed, statutory regulatory efforts have lagged, and discipline on operations is imposed through contractual agreements. The government has also maintained direct regulatory supervision of large utilities through continued share holding or through "golden shares" that give the government veto rights, especially on matters relating to the social obligation of the utilities. Among the developed countries, the U.S., relying on federal and state commissions, has developed a significant capacity for autonomous regulation. The U.K. has also recently moved towards privatisation and independent regulation, and similar reforms are taking place elsewhere in Europe. Developing countries, however, have no experience with regulation of private providers, except Hong Kong, which has a regulatory system that protects consumer interests (WDR, 1994).

The suggestions relating to replacement of the PLF yardstick by plant availability (Parikh, 1995), adoption of 'time-of-day' pricing and introduction of 'power pooling' arrangements (Parikh, 1996) which have been aired in several studies are also reiterated, basically to bring the power sector in step with concepts proved useful in advanced systems. The need to evolve a medium-term fuel policy has also been recognised. This is necessary for

speediest implementation of the process of commercialisation.

Recently several state governments have initiated power sector reforms along these lines. Orissa was the first State to introduce major reforms in power sector through enactment of Orissa Reforms Act, 1995 which came into effect from 1st April, 1996. The Haryana State Restructuring Bill, 1997 has been adopted by the State Assembly and has received Presidential assent. Rajasthan, A.P., and Gujarat are also following a similar course. Assam, Karnataka, Bihar, M.P., Maharashtra, Punjab, T.N., Kerala and J&K have also initiated action for undertaking reforms and restructuring of the power sector. In order to break the impasse with regard to making power sector commercially viable, a major initiative has been taken for setting up of Central Electricity Regulatory Commission (CERC) at the Centre and State Electricity Regulatory Commissions (SERCs) in the States for rationalisation of tariffs and resolving other allied issues (Economic Survey, 1998).

Section V
Conclusion

Moving from today's still heavy dependence on public financing to tomorrow's system of more private sponsorship is likely to be a long and painful process. In many respects, the traditional style of infrastructure financing has been too easy. Money has flowed through channels where scrutiny has often been limited. The move to a more open and transparent system implies greater scrutiny and the need for more resources to coordinate many diverse interests. In return, it offers the promise of greater accountability and reliability.

With the opening of the power sector for private participation in 1991, a beginning has been made. There has been an encouraging response from the private enterprises since then. Legal and regulatory reforms are already under way. Flows of foreign direct investment (FDI) are on the rise and the growth of domestic FIs and capital market is a source of optimism. The government has also given top priority for creating congenial conditions to attract funds for power financing and a number of measures have been initiated in this regard. As a result, at present 125 private power projects (PPP) having an installed capacity of 67,221 MW are under Government of India (GOI) monitoring. Of this, 95 proposals are based on MOU route (each costing more than Rs.100 crore) and 30 proposals are based on competitive bidding route (each costing more than Rs. 1,000 crore). But, Central Electricity Authority (CEA) has given clearance to only 42 projects having a total installed capacity of 20,282 MW. Currently, 19 projects with a generating capacity of 4099.5 MW, including those not requiring CEA's clearance, are under construction. Of this, five projects with a capacity of 748 MW have been partially commissioned. In last five years, 12 projects with a capacity of 2276.4 MW have been fully commissioned and are in operation.

A lot more needs to be done, particularly on the policy front to address the basic issues in power sector financing. For example, pricing of electricity is still an unresolved issue, T&D network is almost fully under the public sector control with high T&D losses continuing and the cumulative commercial losses of SEBs are on the rise. Until these issues are resolved amicably power situation may not improve substantially. Difficulties may also arise in external financing. In order to keep the debt-service requirements at a manageable level, the debt-equity ratio of net

capital inflows should be maintained in the region of unity. Moreover exports should grow at 15% and a stable macro-economic environment and a high sovereign credit rating should be maintained over the next decade to meet the resultant debt-service requirements.

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