POWER SECTOR EXPERIENCE IN ASIA

by

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and
Ranjit Lamech

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The experience of the Asian countries provides useful insights on the issues that define both the private power debate and the sector reform strategies. Given the variations in macroeconomic performance, organizational and institutional sophistication of the power sectors and uneven clarity of government objectives, precise generalizations are neither possible nor necessarily required. It is possible, however, to delineate the principal issues and observe the extent to which different countries have successfully or unsuccessfully resolved them. This very same diversity in country circumstance can also provide insights into the strategies that may be appropriate at different stages of private power entry and the pace, depth and sequencing of power sector reform.

The Asia Technical Department (AST) had organized a workshop for the regional energy staff in June 1994 to explore the two themes. These two discussion papers: (a) *Private power in Asia* and (b) *Power sector reform strategies* review the various issues raised during the workshop and try to distill lessons from the experience in Asia.

The views and interpretations set forth in the report are those of the authors. However, it is hoped that disseminating this information among the Bank staff advising borrower governments on power sector reform and related issues will lead them to bring the information and recommendations here to the attention of Asian decision-makers. The expected result would be to bolster the effectiveness of the Bank’s operations in the Asia Region.

Harold W. Messenger  
Director  
Asia Technical Department
ACKNOWLEDGEMENT

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AST is grateful to the staff members of Asia Region, IFC and CVP who participated in the workshop and were gracious enough to comment on the earlier draft.
## ABBREVIATIONS AND ACRONYMS

<table>
<thead>
<tr>
<th>Abbreviation (Abbrev.)</th>
<th>Description</th>
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<tbody>
<tr>
<td>IPP</td>
<td>Independent Power Projects</td>
</tr>
<tr>
<td>BOO</td>
<td>Build, Own and Operate</td>
</tr>
<tr>
<td>BOOT</td>
<td>Build, Own, Operate and Transfer</td>
</tr>
<tr>
<td>ROL</td>
<td>Repair, Operate and Lease</td>
</tr>
<tr>
<td>OL</td>
<td>Operating Lease</td>
</tr>
<tr>
<td>ROM</td>
<td>Rehabilitate, Operate and Maintain</td>
</tr>
<tr>
<td>HIC</td>
<td>High Income Countries</td>
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<tr>
<td>PPA</td>
<td>Purchase Power Agreement</td>
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<tr>
<td>ECA</td>
<td>Energy Conversion Agreement</td>
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<tr>
<td>O&amp;M</td>
<td>Operations and Maintenance</td>
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<tr>
<td>PLF</td>
<td>Plant Load Factor</td>
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<tr>
<td>LNG</td>
<td>Liquefied Natural Gas</td>
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<tr>
<td>LRMCC</td>
<td>Long Run Marginal Cost</td>
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<tr>
<td>OSEB</td>
<td>Orissa State Electricity Board</td>
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<tr>
<td>NPC</td>
<td>National Power Company</td>
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<tr>
<td>Kuh</td>
<td>Kilowatt Hours</td>
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<tr>
<td>MW</td>
<td>Megawatt</td>
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<tr>
<td>KgOE</td>
<td>Kilograms of Oil-Equivalent</td>
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POWER SECTOR EXPERIENCE IN ASIA

EXECUTIVE SUMMARY

1. Energy demand in the developing countries is growing rapidly. Countries in Asia have, over the last decade, had an average annual growth rates in energy consumption in the range of 6 to 10. Despite these high growth rates, energy consumption in Asia in 1992 was only 383 kilograms of oil equivalent (kgoe) per capita as compared to 5100 kgoe for the OECD countries. Electricity consumption per capita in most of the populous Asian countries – India at 292 kwh/capita and China at 497 kwh/capita are far behind even the East Asian countries like Korea at 2150 kwh/capita, while the US consumption in 1991 stood at 13,247 kwh/capita. Driven by rapid economic growth, population increase, industrialization, urbanization, and competitive needs of the global market, electricity demand in Asia is projected to increase by an average of 7.3 % per annum over the next decade.

2. In a recent review of the plans of utilities in ten countries in Asia over the next decade, the additional generation capacity required in the period 1994 to 2004 was estimated at 290,000 MW. This implies that on average 2000-2400 MW of new generation capacity per month will need to come into operation over the next ten years. In broad terms, the region would need investments of about $ 35 billion per annum - $ 20 billion in thermal generation, $ 5 billion in hydro, geothermal, nuclear etc., and $ 10 billion in transmission and distribution.

3. The magnitude of the investments required poses formidable financing problems. The bulk of external financing in energy development in the developing countries in the past has been in the form of export related credits, international concessionary finance from multilateral and bilateral agencies and commercial flows. In the present environment, the projected required investments in the power sector, however, are unlikely to be available from the conventional sources alone. In addition to constraints on international concessionary and commercial bank finance, domestic public resources are also seriously constrained. This leaves only two alternatives, the domestic and international capital markets. But before capital markets can be utilized to raise funds for the power sector, the sector will have to dramatically improve the performance of its public sector institutions.

4. In the power sector, in spite of the impressive expansion during the past decade, the overall technical, institutional and financial performance of the state owned utilities has deteriorated. Over 1979-88, rates of return have fallen from about 9 % in the mid seventies to less than 5 % in 1991, average power tariffs declined from 5.2 cents/kwh to 3.8 cents/kwh, self financing ratios on average were only 12 % in 1991, and the average of accounts receivable was 96 days compared with the Bank target average of 60 days. Transmission and distribution losses are two to four times higher than the normal level for an efficient utility. Institutional arrangements in the developing countries have tended to be characterized by: (a) widespread ad hoc government involvement in

<table>
<thead>
<tr>
<th>COUNTRY</th>
<th>AVERAGE ANNUAL GROWTH RATE OF ENERGY CONSUMPTION 1988-92</th>
<th>ENERGY USE PER CAPITA 1992</th>
</tr>
</thead>
<tbody>
<tr>
<td>NEPAL</td>
<td>8.4</td>
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<td>BANGLADESH</td>
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<td>INDIA</td>
<td>6.8</td>
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<td>PAKISTAN</td>
<td>6.9</td>
<td>223</td>
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<tr>
<td>SRI LANKA</td>
<td>1.3</td>
<td>101</td>
</tr>
<tr>
<td>CHINA</td>
<td>5.1</td>
<td>600</td>
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<tr>
<td>INDONESIA</td>
<td>7.2</td>
<td>303</td>
</tr>
<tr>
<td>PHILIPPINES</td>
<td>3.1</td>
<td>302</td>
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<td>THAILAND</td>
<td>10.1</td>
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<tr>
<td>KOREA</td>
<td>9.2</td>
<td>2569</td>
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<tr>
<td>USA</td>
<td>1.2</td>
<td>7662</td>
</tr>
<tr>
<td>HIC’S</td>
<td>1.5</td>
<td>5101</td>
</tr>
</tbody>
</table>

most aspects of the management of the utilities and the sector as a whole; (b) rivalry and inadequate coordination among sector institutions and with other agencies; and (c) weak accountability of sector managers to both supervising ministries and their consumers. As a result, with a few exceptions, the power sector suffers from a combination of poor pricing, investment and regulatory policies, and inefficient operating and maintenance practices. This has led to a situation in which the sector is not in a position to raise resources either in domestic or international capital markets because most of its institutions are unable to earn a return sufficient to attract private debt or equity investment. The financial resources required for the power sector in Asia thus necessitate a fundamental reexamination of the sector—by the government, the private sector and the international financial institutions.

5. An examination of the problems facing the developing countries has led to the recent changes in Bank's policies in the power sector. The Bank policies now focus on the interrelated institutional, regulatory and financial reform issues that are essential to improve power sector performance and help mobilize the financial resource required in the nineties. The new Bank guidelines require an explicit country movement towards the establishment of a legal framework and regulatory processes; aggressive pursuit of commercialization and corporatization of, and private sector participation in, the country's power sector; encouragement of private investment through use of Bank's resources to support programs that will facilitate the involvement of private investors; and focus on countries with a clear commitment to improving sector performance in line with the above principles.

6. As a region, Asia represents the largest potential power market and consumer base well into the next century. But despite the wide recognition of a role for private sector participation, private power entry has been uneven in Asia. Some countries have multiple projects in operation or under construction (e.g. Philippines), others have few projects that are under implementation but large numbers that are in stages between concept and realization (e.g. China, India—with over 50 projects under consideration each). The experience of these Asian countries provides useful insights on the issues that define the private power debate. The first paper—"Private Power in Asia: A Review of Issues and Experiences"—tries to distill such lessons from the few independent power projects (IPPs) and on-going efforts to attract them in Asia. It focuses on the need for explicit government commitment to private sector entry; the issue of equitable allocation of risk; regulating returns to the developer; the project selection process; the need for stability of investment framework; conflict resolution mechanisms; the project structure and the linkage of IPP entry with the overall issue of sector reform.

7. The major conclusions of this paper are:

a) IPP investment opportunities are conditioned on existence of specific government policies and programs which encourage private sector entry. While establishment of a fully developed policy and institutional framework is not essential to the development of the first IPP's, it is critical to the long run development of a power market with substantial private sector participation. Regulation through contracts can achieve the same objective in the initial stages, and in some cases trying to establish a full framework may actually work to deter early entry of the private sector. A dual track approach thus seems advisable.

b) Risk sharing is at the heart of most reservations in regard to BOT projects. As may be expected in high risk countries, investors expect the government to provide greater
level of support. But quantifying the risks in large infrastructure projects is difficult and poses substantial complications in determining a fair return.\(^1\)

c) Absence of transparency in the bidding process and evaluation has often led to high transaction costs and delayed financial closings. The application of competitive bidding was relatively common but these require legal and institutional capabilities in the country. The role of negotiations in project selection should not be seen as being totally incompatible with competitive procurement but negotiations are best used after shortlisting potential developers based on an initial bid. The details and nuances of a draft power purchase agreement (PPA) can be refined and finalized based on negotiations with several developers and the final PPA put up for a final round of bidding based solely on price. This flexibility allows the market to deliver an optimum solution.

d) Most projects were structured as some variation of BOO/BOT and were highly leveraged with debt equity ratios varying from 80/20 to 70/30. The maturity of loans ranged from 5 years (Jamaica) to 23 years (Pakistan), while the average term for senior commercial debt was 9.5 years. The challenge for developers is to secure debt with maturities long enough to accommodate a reasonable tariff profile.

e) Foreign capital provided between 80-100% of the total equity capital in the IPP’s. A framework needs to be established for channeling domestic investments into long term investments for sustainable growth of the power sector in a country. The domestic market may be encouraged if power projects could be refinanced after construction.

f) Targeted role of government, bilateral and multilateral guarantees and credit enhancement is often critical to successful financing of early projects and during the transitional phase from state dominance to a more market oriented system. Government funding can facilitate private financing in three ways: (a) leverage- a 30% funding contribution by the government could be expected to mobilize equity of 25-30% plus additional debt for the balance of 40-45% of total funding; (b) decrease in foreign exchange burden to the extent the repayment of government funding is met with local currency; and (c) subordination: governments may subordinate their funding to commercial lenders to provide additional incentives. The provision of limited government guarantees in certain critical areas (e.g. utility performance, fuel-supply, access to foreign exchange) may be the best option in the short term to attract IPP investments.

g) There is a continuing critical role for the government in the sector which needs to be carefully defined. System expansion planning, ensuring fuel security, environmental compliance, lifeline rates for the poorest, transmission system management, enhancing service to remote areas, development of hydro projects etc. will remain as areas for direct government intervention. And finally, the introduction of IPP’s often has the impact of accelerating sector reform.

\(^1\) IPP investors in the US while earning very high >30% returns in the early years, have returns now in the range of 10-15% due to increased competition, standardization in financing structures and clarity in risk allocation.
8. Debates on power sector policy reform in developing countries place emphasis on the institutional and legislative framework that supports the sector, redefining participant roles, and entity structures. There are questions on the compatibility of available institutional endowments and frameworks with market-driven corporate governance and sector regulation. How does one evaluate these various perspectives in a manner that is operationally useful? The second paper-

"Power Sector Reform Experience in Asia"- focuses on these issues in the context of the Asian experience. The conclusions and lessons drawn are by necessity preliminary given the early stage of power sector reforms in the region. But the tentative insights below should provide a useful basis for evaluating and planning further reform in these countries:

a) Sustained government commitment to the reform process is a prerequisite. It is not enough to have a narrow focus on the power sector - power sector reform should be a part of an overall country approach to a market based economy. It is necessary to recognize that exogenous factors and complementary reforms are required to achieve successful reform within the power sector.

b) Power sector reform is process driven rather than a project-specific activity. But it is realistic to attach well-defined and limited objectives to individual projects and ensure consistency with the overall reform strategy. This will allow for achievable goals to be linked to projects that incrementally advance the reform envelope.

c) The reform process typically seeks to separate and reduce the role of the government in sector and utility operations. The driving forces for reform- ineffective operation of existing systems; poor utility finances; large demand-supply gaps and rising environmental concerns. are for the most part the result of ad-hoc and excessive government interference. Hence the focus on rationalizing the role of the government.

d) Enterprise reform in the power sector should be evaluated on the basis of induced efficiency gains and the extent to which the reforms can be made irreversible. Performance contracting allows for a compact between government and enterprise, allowing the enterprise to focus on its core business. It is a suitable transition in cases where the necessary corporate legislation and legislative amendments concerning the status of existing power entities is yet undefined. Commercialization and corporatization are, however, the first steps affecting irreversible transformations of enterprise operations. Though privatization is an overall strategy for public-enterprise reform in some countries, there is an emerging consensus that privatization should not be viewed as an end in itself but as a means to lock-in gains achieved through commercialization and corporatization.

e) There is a clear need for appropriate indicators to measure the success of a reform effort. Given that most reforms focus on deregulation, increasing competition, encouraging private ownership, unbundling etc. some of the traditional indicators may not be wholly appropriate. For example, evaluating commercial performance based on customers per employee is unsuitable for unbundled systems; also under true commercial operation of enterprises a self-financing ratio greater than 25% may not be compatible with a rapid expansion of supply provided commercial financing is possible.
f) Allowing for private entry in the generation business is often the first step in deconcentrating the sector and paving the way for increased supply competition. In that sense it is the tentative first step in sector unbundling and structural reform. But a necessary condition for sustained and large scale power sector investments by the private sector is that government administrative arbitrariness be restrained through some form of an "arms-length" regulatory mechanism. A country's exogenous institutional endowment, defined as the country's legislative and executive institutions and capability, is an important determinant of whether a country can have a regulatory system that is credible. For credible regulation, three complementary mechanism need to be in place: restraints on the regulator's discretion embedded in the regulation; formal or informal restraints on changing the regulatory system and institutions that enforce the constraints.

g) There is no unique reform strategy or sector structure that could simultaneously meet the objectives of reform in the widely diversified Asian economies. The need to improve enterprise efficiency, garner additional investment resources, satisfying the varying demands of consumers, environmentalists, rationalizing intergovernmental relationships, and providing energy at a reasonable cost, all need to balanced. The chosen strategy will depend on the state of a country's institutional endowment and the balancing of multiple pressures and objectives. But it is critically important to develop a flexible transition strategy when embarking on major reform. The cost of mistakes can be high in countries which are supply constrained and where the cost of unserved demand is large.

9. The process of private sector entry and sector reform is ongoing and needs to be carefully watched over the next few years. There are many lessons to be learnt from each country's experience and this discussion series intends to pursue the various themes over the future growth of the power sector in Asia.
Private Power in Asia

A Review of Issues and Experience

1. As a region, Asia represents the largest potential power market and consumer base well into the next century: the combined new supply requirements of China, India, Indonesia, Philippines, Thailand and Malaysia — is in the order of 25,000 to 30,000 MW per year. To put this in perspective — 25,000 MW represents five times the existing installed base capacity in Malaysia. Build, own, operate and transfer (BOOT or BOT) type projects have been advocated during the past decade as the most likely source of any major additional private sector financing in the power sector. Under the BOOT approach, a project company under private ownership, or a joint venture with a minority public participation, is set up to plan, finance, design, procure, construct and operate the project facilities for a determined period of time under a concession granted by the host government, after which ownership is transferred to the public sector. Boot projects are a variation of the limited recourse financing projects where financing is on the basis of project risks and cash flows in which guarantees from or recourse to project owners are limited. Its potential benefits include freeing future borrowing capacity for the project sponsors, sharing project risks, bringing private sector efficiency and commercial discipline to the public sector, and increasing the available human resources to the host country. Despite the wide recognition of a role for private sector participation, private power entry has been uneven in Asia. Some countries have multiple projects in operation or under construction (e.g. Philippines), others have few projects that are under implementation but large numbers that are in stages between concept and realization (e.g. China, India — with over 50 projects under consideration each). Two countries have experienced a long gestation period in negotiating projects to an implementation stage or near implementation — Pakistan with the Hub project and Indonesia with the Paithon project. In contrast, Malaysia has successfully financing two projects each costing over a billion US dollars within an 18 month time frame and without any government guarantees.

2. The experience of these Asian countries provides useful insights on the issues that define the private power debate. Given the variations in macroeconomic performance, organizational and institutional sophistication of the power sectors in these countries and clarity of government objectives, precise generalizations are neither possible nor necessarily required. It is possible, however, to delineate the principal issues and observe the extent to which different countries have successfully or unsuccessfully resolved them. This very same diversity in country circumstance can also provide insights on the strategies that may be appropriate at different stages of private power entry. This discussion tries to distill such lessons from the few independent power projects (IPPs) and on-going efforts to attract them in Asia, and the recent workshop on “Power Sector Experience in Asia”.

3. The discussion is organized into the following sections:

A. Government Commitment
B. Allocation of Risk
C. Regulating Returns to the Developer
4. The major impetus for private sector entry in power has been the large investment shortfall, or financing gap, being experienced in most Asian power sectors. The other important driving forces are the endemic inefficiencies and the demands by industrial and commercial consumers for improved service. A common element of the efforts to encourage private investment in the power sector in Asia has been the absence of any ideological leaning to the private sector based on efficiency gains alone. This element has influenced the depth of government commitment and the resulting initiatives. But it is clear that providing a credible, and sustained, government commitment to private sector entry is the fundamental requirement for success. Private developers need a clear long term structure and credible government commitment to the reforms. The reform and the move to the private sector thus needs to be codified in law, or promulgated by executive decree, and have parliamentary approval. Explicit government statements and legislative pronouncements have been seen in almost all Asian countries during the last few years. Philippines¹ and Pakistan used presidential directives or legislative decrees. In India, Malaysia and Indonesia certain restrictive clauses in the Electricity Act were amended. China amended its foreign investment laws to allow entry in the power sector. Given that these initiatives by themselves eased only the legal impediments to private power entry, countries also began to assess the financial incentives that could attract the required capital.

5. Broad features of the incentive packages that were developed and are summarized in Box I. It is interesting to note that while the packages provided a number of concessions to investors in the power sector there was also an effort to control the return to risk capital through implicit or explicit restraints. An example of the former is the avoided cost or bulk purchase price in Pakistan and the Philippines. Explicit restraints are found in both China and India, where there has been an attempt to specify upper limits on equity returns.

¹ "Improving Power Sector Efficiency in Developing Countries - Is Competition the Answer?" - paper by Anil K. Malhotra at Power Sector Conference, Hong Kong, Nov., 1993.
6. Some governments have been proactive in offering incentives by specifying the entire package upfront (Annex I). This provides a degree of transparency and fosters a perception that there really is a level playing field. While some developers may view a well-defined incentive package as a means of reducing their project negotiation (i.e. transaction) costs, others seem quite comfortable with negotiating customized incentive arrangements with the government. For example, Mission Energy completed PPA negotiations on the Paithon project without a defined incentive package. Enron began negotiations with the Indian Government and the State Government of Maharashtra without an explicit government policy on private power. The government did, however, develop a uniform incentive package before signing a PPA. The other benefit of a uniform incentive package is that it reduces the possibility of public accusations of non-arms-length dealings by the government.

7. On the other hand, incentive packages may also institutionalize impediments to project closure. The case in point is the Chinese package which specifies a 12.5% return on equity. This specification has greatly reduced the attractiveness of private power investments in China. The lesson here is that incentive packages should be designed prudently and not be seen as a means of drawing a “line in the sand”.

8. It is clear that there is significant role for the government to play in defining an appropriate framework for the entry and operation of IPPs. The limited experience suggests that countries where the government has either defined a policy position or is willing to work with investors and multilateral agencies in defining a framework have had some success in implementing projects or are at least being approached by interested investors. These countries include: China, India, Indonesia, Malaysia and Pakistan. In contrast countries such as Bangladesh, Sri Lanka and Vietnam, who are relatively less advanced in the private power learning curve, have governments who have not explicitly tried to define a private power policy or investment framework.
B. Allocation of Risk

9. Risk sharing between the government, utility, lenders and developers is at the heart of most reservations or debate with regard to private BOT/BOO projects. Most private power investments in developing countries have been and are likely to be limited-recourse project financed structures. The risks in these projects can be divided into market, sovereign, project and commercial which need to be allocated between the utility, lenders, international development agencies and the private power company. There appears to be a belief that host governments can transfer all risks to the IPP developers. But in reality the developer takes such risks only to the extent of their equity stake and liquidated damages provisions. Depending upon the definitions of force majeure, government default and consortium default, as well as the impact of potential project scope changes, termination, abandonment and disputes; such risks rest with the host government. The attempts in replicating the project financing structures that are used in the West to power sectors in Asia have raised four unique issues.

10. Firstly, most incumbent purchasers of power generated by IPPs are state-owned utilities whose finances do not allow them to use commercial corporate finance (i.e. commercial debt or equity securitized by the utility’s balance sheet assets). Consequently, investors have been seeking explicit contractual guarantees from other domestic and international entities that are seen as being more creditworthy. The domestic entity is typically the central government and international guarantees take the form of bilateral export credit guarantees (e.g. the Hub project in Pakistan) and/or guarantees from Multilateral Investment Guarantee Agency (MIGA). In India, for example, the government is offering an explicit counter-guarantee for contractual power purchases by the State Electricity Boards for seven fast-track projects in relatively advanced stages of negotiations. In the Philippines the government has guaranteed the obligations of the National Power Company (NPC).

11. Secondly, countries do not have a exchange rate regime that is totally market based or the exchange rate outlook is not a risk that the private investor is willing to accept. Investors are therefore demanding foreign exchange pass-through clauses in the power purchase agreements.

12. Thirdly, the broader infrastructure that support the power sector, particularly fuel suppliers and transportation systems are once again largely publicly-owned entities. These entities are viewed by investors as being either unreliable and/or being outside the purview of contractual obligations. Private investors and governments therefore seek risk allocation arrangements that transfer the risk of supply and fuel price away from the project company. In the Philippines, NPC has had to take the fuel supply and cost risk. In effect these arrangements may be termed as *energy conversion agreements (ECAs)*. There have, however, been recent attempts to allow project developers to quote for fuel supply and fuel price risk thus potentially enlarging the scope of risks borne by the private investor.

13. Finally, there is the allocation of market risk – an issue that is perhaps the most contentious. The most common form of allocation has been the “take or pay” obligation which

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2Risk analysis of a project must cover pre-commissioning risks (e.g. capital cost, construction delay, availability of fuel infrastructure, force majeure, government procedures etc.); post commissioning risks (e.g. operation, price and off take, technical, strikes, governmental change in legislation etc.) and project lifetime risks (foreign exchange fluctuations, currency convertibility, general political risks etc.).
ensures a minimum level of offtake by the purchaser. While most project financing structures are based on the recovery of the debt service obligations, the corresponding operating agreements between purchaser and seller can often be in conflict with the operational efficiency objective (i.e. dispatch based on merit-order). While there are pricing structures that can reconcile the debt-recovery and operational efficiency objective, the existing contracts that transfer all market risk to the purchaser are driven by a rigid sector structure and policy that allows the IPP no alternative avenue for power sales i.e. the purchasing utility is the only consumer/market that the IPP is allowed access to. Box II summarizes the risk allocation profiles in Asian IPP projects at the present time:

<table>
<thead>
<tr>
<th>Box II.</th>
<th>Allocation of Risk</th>
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<tbody>
<tr>
<td><strong>(a).</strong> Risks that are transferable to the IPP:</td>
<td></td>
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<tr>
<td>- Construction risk: cost overruns, delays</td>
<td></td>
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<td>- Performance risks: thermal efficiency, plant availability</td>
<td></td>
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<tr>
<td>- Operations and maintenance risks</td>
<td></td>
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<tr>
<td><strong>(b).</strong> Risks that project developers are reluctant to accept:</td>
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<tr>
<td>- fuel price risk</td>
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<tr>
<td>- fuel supply risk</td>
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<td>- interest rate fluctuations</td>
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<td>- foreign exchange risk</td>
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<td>- market risk</td>
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<td>- regulatory and tax change risk</td>
<td></td>
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<td>- environmental regulations change risk</td>
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**Government Guarantees**

14. A few additional points worth noting concern the provision of government counter-guarantees for power purchase by the incumbent utility. Many critics of private power in Asia view government counter-guarantees as providing project developers with risk-free returns. Analysts of government finances view them as contingent liabilities which adversely impact a country's credit-rating, as well as a country's overall foreign debt capacity. This is because most of the debt in some of these projects is foreign debt. While all these points are valid, it is useful to assess the counterfactual — what would happen if governments did not offer explicit counter guarantees for power purchase obligations? The answer in most cases is that private power projects may not become a reality. This points to the deeper problem of purchaser solvency and credit-worthiness which has been largely unresolved in most Asian countries with the exception of Malaysia.

15. Amongst the ideas that have been advanced as a strategy to reduce the residual risk on the government when shouldering such contingent claims is the use of guarantee/insurance fees. In
theory, this would require governments or financial markets to provide counter guarantees\(^3\) (i.e. insurance) for a fee. The fee could be determined based on what a competitive insurance market would charge for protection against non-payment by the purchasing utility. The cost of the premium would of course be passed on to the purchaser as a component of the power price. Two options exist: (i). a financial institution (with some or no government involvement) could provide risk coverage; (ii). a competitive insurance market could provide coverage for such contingent claims. While these concepts need to be advanced beyond the realm of being a theoretical construct there is an extremely important point underscored i.e. that there are risks that exist beyond the project which neither the developer, purchaser and government can adequately control, necessitating market mechanisms to diversify them and insure against them. In September 1994, the Bank introduced guarantees as a mainstream instrument in its operations to cover risks that the market is not able to bear or adequately evaluate. The risk sharing may be for specific risks (the partial risk guarantee) or for part of the financing (the partial credit guarantee). The former covers risks arising from nonperformance of sovereign obligations or from force majeure aspects in a project, while the latter typically extends maturities beyond what private creditors could otherwise provide— for example, by guaranteeing latedated repayments or by providing incentives for lenders to roll over medium term loans. It is too early to evaluate whether the Bank’s guarantee will attract new sources of finance, reduce financing costs or extend maturities.

C. Regulating Returns to the Developer

16. Returns to risk capital (i.e. equity return) is perhaps the most important variable that determines investor interest in potential power projects. Governments have devoted a great deal of effort in defining an appropriate policy position on this issue for the same reason. In addition, governments face various internal pressures, both political and economic, expanding the number of objectives to be reconciled. The most common, being: (i). the perception that private investors seek “unfairly” high returns on their investments; and (ii). that the economic interests of the country and incumbent sector operators are being subordinated to that of private investors. Governments have used three methods to regulate the rates/returns of independent power producers. The three regulatory techniques, which directly and indirectly affect the developer’s rate of return on equity, are:

(a). Specification of a benchmark equity rate of return
(b). Setting a fixed (or ceiling) purchase price
(c). Allowing a market determined rate to accrue to the investor

(a). Specification of a benchmark equity rate of return:

17. This method has been adopted in different forms by China and India. In China, the government presently allows investors to earn a return on equity in the region of 12%.\(^4\) In India, a

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\(^3\) Counter guarantees are normally more limited in scope when compared to sovereign guarantees. A sovereign guarantee is a direct assurance from the government to the lenders that the money loaned to a project would be repaid. A counter-guarantee, on the other hand, is activated only if the IPP delivers energy and the state enterprise and/or the state government fail to pay for the energy delivered by the project.

\(^4\) The exact figure is uncertain and has according to various reports ranged from 11 to 12.5%.
16.5% return on equity is allowed, coupled with incentive clauses which can increase the final returns that accrue to the investor. The tariff notification specifies:

- A cap on capital cost based on an assessment by the Central Electricity Authority (CEA).
- Specified limits on unit heat rate, secondary oil consumption, auxiliary energy consumption, and O&M and insurance costs.
- Incentive for an additional 0.7% return on equity for every 1% improvement of plant load factor above the normative 68% level.

18. There are various drawbacks inherent to this approach of specifying equity returns, as well as multiple tariff control variables. The principal disadvantages are similar to those associated with a "cost-plus" basis of regulation. The problems center around the definition of allowable costs. As the tariff is not fixed, the question is how can the costs passed through into the final tariff be regulated to ensure that there is no abuse? The situation is very similar to the intrusive rate-of-return regulation in the United States and is subject to "gold-plating" or "cost-padding" by the project developer. Other drawbacks of this approach are:

- A cap on equity returns raises the question of what is an acceptable equity return for investors to assume equity risk in a country. As the power sector competes for fungible equity capital both internationally and domestically, equity investors are unlikely to choose investments that are uncompetitive. In China the equity return seems inadequate when compared to the 16-25% return that investors seek in developed country markets.
- A review of capital costs to justify their reasonableness is like dealing with a moving benchmark. While one can define broad limits, a case-by-case approach is subject to numerous site and fuel specific nuances. (The presence of this feature in the Indian tariff notification may be reaction to public criticism that private developer costs were well above historically observed capital costs for public-sector power projects, or an extension of existing Central Electricity Authority (CEA) review of all capital costs on an ex-ante basis).
- The incentive linking additional equity returns to plant load factor (PLF) can have a perverse and uneconomic effect depending on the purchase and dispatch agreement. It could result in the purchaser having to buy power which may be more expensive than his short-run system costs, owing to the operator running his plant flat-out to garner the additional equity return.
- Limits on heat rates, secondary oil consumption, auxiliary energy consumption etc., are all products of the cost-of-service regulation method. They increase the amount of information that has to be reviewed by the regulator making the process expensive.

(b). Setting a fixed (or ceiling) purchase price

19. There are two variants of this approach and the distinction is in the extent of competition in the procurement process. The first, fixes a standard price that will be paid to a project developer. This price could be set at some estimate of the buyer's avoided cost or at some other fixed price. The buyer offers to purchase at this price on a first-come, first-served basis.

There exists some accounting confusion on the exact equity portion on which the return is allowed — presently it is based on paid-in capital — issues on the inclusion of retained earnings and equity injections are undecided.
Typically, no attempt is made to let sellers compete on price. The second, specifies a maximum tariff level (ceiling) and allows competition to decide the final tariff paid.

20. Both variants are employed by the Pakistani government. The government has specified a fixed US dollar denominated average bulk tariff of 6.5 cents/kWh for the first 10 years at a 60% load factor. A levelized tariff of 5.9 cents/kWh over the life of the project has been defined as the final parameter for acceptance of tariff. These tariffs are based on a capacity charge and energy charge with fuel cost a pass-through in the energy charge. These posted tariffs will serve as the reference for all unsolicited proposals. In the case of solicited proposals the lowest offer will be selected.

21. The avoided cost approach to procurement with a fixed price was pioneered in the US in the mid-1980s where the regulatory authorities verified a target avoided cost and required the purchasing utility to buy the output of any independent power producer who was willing to offer power at that price. While there is a perception of increased transparency through a standard avoided cost approach, there is some compromise on efficiency in cases where unsolicited proposals are being evaluated. More specifically, a fixed standard offer might not realize the benefits of lower cost electricity through improved productivity brought about by a competitive selection process. This is because a potential supplier who can deliver electricity at a lower price than the standard offer does not have the opportunity of passing on the benefits to the purchasing utility and finally the consumer. This begs the basic question: What’s the advantage of specifying a price ceiling in the first place — Why not have competition without any pre-specified price?

22. The other problem with a fixed price is that it could be fixed too low or too high. If fixed too low, it can result in no private interest. This problem was experienced by some midwestern utilities in the US wherein no investor showed any interest. This resulted in expensive nuclear plant construction by the utilities. When the price is fixed too high there can be flood of proposals, requiring a labor-intensive process of evaluation to select successful suppliers.

23. In theory, the second method with a tariff ceiling and competitive procurement should deliver a better or more-optimal outcome. This approach was used by Virginia Power in the US, wherein IPPs were selected based on the lowest cost offered provided it was below the defined ceiling. The advantage is that the purchaser obtains the lowest cost power. If there are no offers below the ceiling which represents the utility’s cost of incremental capacity — the utility builds its own supply options. This scheme is driven by transparent commercial considerations and would deliver least-cost power. There is a view that the specified ceiling could result in bids that are just below the ceiling/avoided cost, not necessarily the lowest cost power. However, a competitive procurement process should correct this gaming by bidders.

(c). Market Determined Rate of Return

24. This method requires a competitive process to determine the return that will accrue to the successful project bidder. Here the fundamental criteria is to accept the supply price offer that results in the lowest cost to the purchaser and consumer on the basis of an open, competitive bidding process. It represents a form of administrative deregulation i.e. it still preserves the right of the regulator to step in if required as opposed to statutory deregulation. There is no attempt to

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determine the cost structure of the operation and the return that accrue to the successful project developer. The first application of this method was in 1987 when the US FERC used it for overseeing IPP sales in some states and inter-utility sales. This approach has been used in a number of more recent projects in the Philippines. This method of regulation (or the lack of it) has major advantages in terms of administrative and regulatory cost. However, to realize the full benefits of a market determined approach it is necessary to have a number of potential suppliers who can compete for projects and in effect create a market that results in least cost power delivery. The structure of the project and the design of the bidding documents and evaluation criteria have a major impact on its success.

25. The generalized conclusion that may be drawn at this point is that the rate of return regulation method is the most intrusive and susceptible to a larger number of subjective criteria when instituted. The avoided cost method and market based method of regulation are compatible with a competitive bidding process and could potentially result in cost-effective project choice. But there are a number of qualifying factors that influence the transparency and clarity of such a process.

D. The Project Selection Process

26. The transformation of private power projects from concept to reality is closely linked to the issue of project proposal evaluation and selection. The issue often debated is the merits of allowing and accepting unsolicited proposals versus using a more formal competitive bidding process. This is with reference to the selection of a project developer and distinct from the selection of equipment provider etc.. It is generally understood that competitive bidding eliminates the problems of dealing with single unsolicited offers — more specifically, criticisms of negotiated deals lacking transparency, breeding graft, etc.. While there are definite advantages of a competitive bidding process as opposed to one based on single offers, it may not always be possible to structure a “clinical” process for developer selection. Some negotiation is usually common to both processes (i.e. unsolicited proposals and competitive bidding) as a grid connected power station is still not an off-the-shelf product despite the advances in standardization.

27. The treatment of unsolicited bids is a political nightmare for most Asian governments. A case in point is the evaluation of fast-track projects in India— all of which were based on unsolicited offers. The problem is exacerbated by the fact that these are all large projects for which comparators are not easy to justify. For example, the Dhabol Project in Maharashtra State is a two-stage development of 1,850 MW of LNG fired gas turbines with the associated development of LNG handling facilities and port. The project has attracted considerable criticism from the Indian press and sector observers, many of whom feel that the capital costs are too high. The complexity of the various cost elements makes the cost justification an intractable issue. The academic counterfactual of whether a bidding process would have worked better can only be evaluated with reference to the cost of preparing the bidding documents, the cost of evaluating a number of potential bids, engaging in negotiations with short-listed parties etc.

28. The trade-offs in most countries between a solicited bids and unsolicited proposals is essentially the tangible benefits of lower cost and efficient supply and the intangible benefits of better public accountability, versus, the cost of project delay and implementation and reduced public accountability or a perception of unfairness. It is true that in a few cases some of the
quickest project closures were based on unsolicited bids. In these cases the deciding “cost” factor may be the degree of preparation, clarity of policies and evaluation skills that the purchaser and government can bring to the table. The level of preparation and other software will of course be the factors on which the transaction costs of the entire process of private power procurement will eventually be decided. In effect, there will always be a trade-off between the benefits of such a process and the cost of delay in project evaluation and implementation. In countries where the cost of non-availability is significantly higher than the existing cost of private supply, these trade-offs may not be insignificant.

29. The first private power project development in the Philippines and China occurred through an unsolicited proposal. In the Philippines the government and NPC were, however, of the opinion that the availability of price quotations for similar gas turbine technology permitted proxy comparisons and evaluation of price-reasonableness to be made. A few of the subsequent “fast track projects” used similar proxy comparisons of operational parameters, prices and equipment specification. Later procurements were based on bid solicitations—at least two acceptable offers were obtained in these cases. The use of an “avoided cost” estimate helped the government to benchmark the acceptable range of power costs from project developers. There is also evidence from the Philippines that the more recent competitive bids are cheaper than the early unsolicited offers although some of this may be explained by the specific risks facing developers. Despite the use of energy conversion type arrangements, which made the process more transparent, factors such as financing structures still introduce an element of subjectivity. For example, the level of foreign commercial debt financing and the currency that such debt is denominated in can result in different final cost scenarios for the purchaser. It is always possible to question the assumptions that the government or the purchasing utility uses in such an evaluation.

30. But the issue from the perspective of public accountability is whether these factors can be quantified and specified up-front. The real debate should focus on the initial process of shortlisting potential project developers, the factors that will be open to negotiation with shortlisted bidders to develop an acceptable final project structure that can subsequently be put up for a final bid based on price alone. In effect, it should be realized at the outset that there is no completely objective process for project selection—there will always be factors that require an element of negotiation. The challenge is to ensure that negotiations are done in good faith as a process of addressing legitimate concerns of both purchaser and project developer—something that is not possible in an inflexible procurement process. The initial process of shortlisting potential developers could be through a competitive qualification process, or as has been the case in many countries through an unsolicited offer. It is interesting to note that in the recent workshop on “Competitive Bidding for Private Power” in Hyderabad, India, there was a tacit consensus amongst participants that negotiations could be useful in:

- defining the various non-price factors in a power purchase agreement with developers who were selected by a competitive pre-qualification process.

- the draft power purchase agreement with all non-price factors defined through negotiation could then be put up for a final competitive bid on the basis of price alone.

Thus competitive bidding with judicious use of negotiation can provide the “best of both worlds”.

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7 YTL Project and Genting-Sanyen both in Malaysia were unsolicited offers processed in less than two years.
Based on the above we may make the following observations:

- Transparency and public accountability are best achieved through a competitive bidding project selection process. It is possible to use negotiations to satisfy purchaser and developer concerns without compromising the transparency of the project selection process.
- Well specified project selection criteria and evaluation process makes for a transparent framework. This reduces cost to both the project developer and the country in question and could lead to quicker and successful closure of projects.
- It may help if the first few projects are relatively small. Large projects are more complex and riskier. Beginning with a few small projects increases the “comfort level” of both the developer and government/utility.

E. Project Structure — BOO or BOT

An issue that needs some focus is the choice of project structure — more specifically, the choice between a Build Own Operate (BOO) and Build Operate Transfer (BOT) model. There are a number of variants to the above which involve differences in the timing of the asset transfer, sale and lease-back provisions and the rehabilitation and operation of existing assets. The fundamental concerns from the perspective of the host country government is whether the structure has adequate incentives to ensure adequate investor commitment and cost-effective operation. From the investor’s perspective the concern is whether there is adequate policy stability to own a facility for perpetuity (i.e. a truly unbounded equity ownership), and if not, is there a reasonable exit mechanism.

A number of projects in the Philippines have been structured on an asset transfer-back basis (i.e. BOT). The transfer is usually at the end-of the “financial life” (i.e. financial amortization) of the project, typically around 20 years. Despite having covered the initial debt-service burden and covering adequate returns, the implications for an equity holder can be significant. This is because the conditions of final transfer may affect asset values and consequently an equity holder’s stock. Under these circumstances the equity holder might adopt a strategy of gradual dilution with increased leverage. Equity dilution is sometimes seen as being an indication of investor short-termism and often not favourably viewed by governments. It is worth noting, however, that while it is desirable to have low-leverage in the initial years when the implementation risks are relatively high and that project sponsors scrutinize implementation carefully, low-leverage translates into higher tariffs. Consequently, the dilution of equity during the operational phase of a project may indeed lower power tariffs.

However, there is a general perception that if the IPP is operating satisfactorily no transfer back of assets may occur and that the investor would prefer to continue owning the facility. This is quite natural because an amortized asset yields a significant stream of positive cash-flow that has tremendous value to an equity holder — this structure also has the potential for mobilizing domestic private capital.

In effect, it is possible to conclude that the choice of project structure is likely to be driven by an investor’s long-term perception of country stability. Under a stable policy outlook an investor is
likely to prefer a BOO structure. From a host government’s perspective the BOO structure would avoid any contingent cash-outflow to acquire project assets, irrespective of the timing of any potential asset transfer. In some cases, governments may initially opt for a BOT structure as it continues to maintain the long-term ownership of power system assets in government hands.

36. The other project structures that have been implemented or under consideration include:

- **Rehabilitate-Operate-Maintain (ROM)**: A project developer or partner takes on an existing generation asset and invests in upgrading the unit to provide power over a specified time-frame. While the complexities of negotiating PPAs and other fuel supply arrangements remain, the advantage is that focus is on improving the utilization of existing assets. This is likely to provide lower cost power than investments in new generating facilities.

- **Operating Lease (OL)**: A project developer/operator leases existing assets from the incumbent utility/owner. The operator brings to bear his expertise in efficient unit operations and delivers power at a specified cost and schedule. In cases where there are legal impediments to the transfer of power system assets the OL is a viable means of gaining operational benefits.

**F. Stability of Investment Framework & Conflict Resolution Mechanisms**

37. Private power investors, both domestic and foreign, seek a policy (i.e. tax, investment framework etc.) that is stable and predictable. Most surveys of investor preferences also indicate that investors place greater emphasis on policy stability even if it may be less favourable, than a significant tax-break which is likely to be subject to ad-hoc reversal. This is in turn related to their perception of whether conflicts if any will be resolved on a timely and fair basis.

38. The areas where disputes or differences are likely to arise are:

- In the contractual obligations of the project developer vis-à-vis the purchasing utility, fuel suppliers, construction contractors, etc. Most contracts have provisions for international arbitration for problems that may not be entirely in the purview of host country legislation. The localized disputes and their resolution is of concern to investors. (In India, for example, fuel supply arrangements with domestic state-owned oligopolies are not legally enforceable contracts — greatly increasing risk to project developers).

- Ad-hoc policy or legislative changes that could result in a financial impact or increased risk to the investor during the operational period. As the contractual period for independent power investments is in the range of 20-25 years — it is a real concern for investors whether the commercial parameters that influenced their entry are maintained relatively stable over a projects operating life.

39. In countries where the regulatory framework is well-defined and there is some history of its successful operation, project developers may not seek added safeguards written into their contracts with purchasers and suppliers. These contractual safeguards are similar to “regulatory-out” clauses seen in many IPP contracts in the United States — which allow for cost impacts of regulatory amendments to be passed through. In cases where investors see the broader legislative
framework for commercial matters and electricity specific issues as being enforceable and fairly
decided through arbitration or litigation, they are usually willing to work with simpler contracts.

40. An example of a contractual provision that allows investors to exit in case of changes in
the initial commercial parameters is the "Accession undertaking" in the Philippines. The accession
undertaking permits the IPP to require the publicly-owned power purchasing utility (i.e. NPC) to
buy it out under the following conditions: (a). withdrawal, rescission or amendment of any
approval, law or regulation or failure to obtain any new approval or consent required for the
development of the project as planned; (b). the power station is unable to operate within its
operation parameters due to compliance with any environmental and other Philippine laws or
regulations; (c). any change in laws or regulations that adversely affect the investors economic rate
of return on investment; (d). certain force majeure events; (e). NPC fails to make payments
within three months.

G. IPP Linkages and Issues

41. The role of IPPs in a power system raise issues that go beyond their contribution to
incremental supply in the short/medium term. Some of these issues are:

(a). Influence on Sector Reform
(b). Cost of Power
(c). Additionality of Funds
(d). Supply Security and Planning Implications
(e). The role of government
(f). Foreign vs. Domestic Capital Mobilization

(a). Influence on Sector Reform:

42. IPPs in most Asian countries have been seen as a complement to the existing government
funded/supported supply equation. As noted at the outset national governments were driven largely
by the need to close the huge demand-supply gap in the absence of adequate public resources. But
the introduction of IPPs has as an offshoot necessitated reforms of the power sector regulatory
framework, principally in terms of: (i). defining the terms and conditions of entry for private
investors in specific power sector activities; and (ii). providing for the pass-through of tariffs paid
to IPPs; (iii). creation of mechanism for the conduct of "arms-length regulation. Further, the very
presence of IPPs has realigned the expectations of other sector entities — for example, incumbent
state-utilities expect to be granted the commercial and operating flexibility that private operators
have, increasing pressure for fundamental enterprise reform. Since enterprise reform is the only
means to improve the credit-risk of the power purchaser thereby mitigating the need for
government guarantees — governments are compelled to re-examine the existing patterns of sector
ownership and control. The other benefit is that IPPs provide a more transparent accounting of all
costs than the state owned enterprises who might shield inefficiencies and other tax-expenditure
items. This is because IPPs require and demand a coverage of all costs and an adequate margin of
profits.
43. Additionally, there is a move in some countries (e.g. Philippines, India) to allow IPPs to seek purchasers other than the incumbent utility. This is driven by the need to diversify market risk away from the primary purchaser, who is otherwise required to guarantee the entire off-take. These moves are indicative of pro-competitive structural reform. To institutionalize these reforms would require amending the existing electricity legislation in these countries. Consequently, the initiatives which on the surface are driven by efforts at risk diversification, become pressures for substantive structural reform of the power sector.

(b). Cost of Power:

44. The benefits under IPP projects result entirely from the premise of inherently higher efficiencies due to the fact that (a) developers are international reputed parties with proven track records and corporate images to maintain, (b) BOT projects are normally given an offshore/ free trade zone status entailing minimum or no interference from resident bureaucracy with regard to various approvals and clearances. The absence of open competition, contracting out project implementation, construction and operation to international IPP's, sharing of the project risks with foreign project proponents and granting of the offshore status does-not, however, come free to the host government. This route is economically and financially superior only if the benefits outweigh the associated costs. Thus the average cost of production per unit of power in such a deal should be below the marginal cost of producing an additional unit of power in the existing system. The overriding principle should be the comparison of the ultimate output or service of the facility being created. A IPP project based on a negotiated deal, greater reliance on commercial financing, limited recourse security structure, private sources of equity with much higher return expectations, can be only a preferred option if the guaranteed undertaking during implementation construction and operation are based on substantially higher efficiency levels of resource utilization.

45. The contention that power from IPPs is higher priced than utility generated electricity has been advanced in most Asian countries. The concern has been the impact on consumer prices and the competitiveness of the industrial sector. It is certainly true that electricity generated by state-owned utilities is lower priced than the price required by private power developers. The relevant question is whether these comparisons on a pure cents per kWhr basis are indeed appropriate? To make a valid comparison, one must also account for the following factors:

- a commercial equity return should be used for both public and private generation in order to internalize the risks and real cost of funds. Public utilities tend to treat equity as grant financing requiring no dividend — this is clearly inappropriate.
- a market based economic cost of debt should be used to recompute the implicit cost of public electricity. This would internalize the cost to government of providing “low-cost” funds to public utilities. In a situation where public funds are limited and fungible such a correction is important.
- structure the comparison on the basis of a new generation facility. It is erroneous to use an imbedded public investment for comparison with a prospective generation facility. One must include costs such as interest during construction (a function of construction time, total construction cost and of course the cost of funds).

There are other minor factors that need to be internalized such as insurance costs etc., however, the point is the need to use accurate benchmarks for the comparison.
46. In many countries, the IPP tariff was below the long run marginal cost of generation (LRMC). This could be because of the huge capacity gaps prevalent and the fact that LRMC is a forward looking concept that accounts for these financing needs. In contrast, the tariff bid by most IPPs in a competitive process is designed to cover project specific costs of supply and not system-wide costs into the future.

47. As such comparisons have not been systematically made, it is difficult to state a conclusion on whether private power is actually competitive with public power or not in Asian developing countries. Experience in the developed world (i.e. US and UK) with IPPs has shown a progressive decrease in real power prices due to competition. This experience is indeed indicative of the efficiencies gained by opening the sector to private generation. Further, there have also been gains in terms of plant construction lead times and cost management.

(c). Additionality of Funds:

48. Some critics have questioned whether the introduction of IPPs within a framework of government guarantees represents a form of public procurement, as opposed to the entry of private risk-capital. Despite governments taking on contingent liabilities by offering guarantees, there is a definite additionality of resources as governments are able to leverage more resources than they would be able to through direct borrowing on their own account. In other words, a dollar of contingent liability is not equivalent to a dollar of direct debt servicing liability. One must also realize that the extent to which a contingent liability is seen as real liability is a factor that is within the purview of government control. Governments that are willing to take positive enterprise reform steps and strengthen their regulatory systems would find the need for such counter-guarantees diminishing. One can therefore argue that IPPs do bring additional resources to the power sector and the degree of additionality is a function of reform pace and depth.

49. It must be stated that there is also additionality in commercial funding to the extent that sourcing gets spread over a much larger segment of banks and syndication brings in new commercial banks. The new equity contributions are certainly additional though some of it is diminished since a part of it is recovered in higher costs. But there are two benefits- diversity of funding institutions goes up and to the extent that commercial funding is brought under the multilateral umbrella, the commercial banks may loosen or expand their specific country limits selectively.

d). Foreign vs. Domestic Capital Mobilization:

50. IPPs in Asia have a large share (i.e. 80-100%) of foreign financing. The exception, thus far, is Malaysia where over 50% of the investment needs have been raised domestically. The magnitude of the annual foreign exchange financing requirements if this trend continues is unlikely to be sustainable. It is critically important the domestic resources are mobilized for these projects.

51. While the increased interest in private foreign investment needs to be expanded, it is clear that the process needs to include local private investors. There are a number of advantages to all concerned. For the government, the encouragement of a local capital market has to be an important developmental goal. For local investors, large and small, putting money in a large partially foreign financed domestic enterprise may offer an attractive alternative to foreign bank deposits. For the government, the existence of local interests in energy company or utility finances may ease some political problems and at the same time provide some assurances to the foreign investor who would
know that his interests coincide with local interests. In practice, there are many ways in which domestic capital markets can be encouraged. The degree to which special incentives have to be offered to local investors will depend on the current state of the local capital market. Local investors may be willing to accept shares valued in local currency as long as dividends receive the same type of treatment given the foreign owners—perhaps convertible to foreign exchange. The foreign shareholders could be permitted (or required) to sell (or buy) part of their shares each year in the local market. Foreign banks now holding non-performing government loans could be encouraged to swap these debts for equity or other forms of financial participation. The objective should be to establish a local market in which shares or debt instruments held by both local and foreign nationals can be traded. The existence of such a market will improve the liquidity and acceptability of private participation in electric power investments as well as providing a channel for encouraging local savings. As power projects provide a relatively stable return over many years, these projects can ideally raise capital through domestic bond issues. These projects also represent a secure and stable investment for domestic pension funds and insurance companies.

(e). Supply Security & Planning Implications:

52. The introduction of IPPs in the power supply equation would impact supply security only if power supply is made a totally contestable market. Under the current framework for introducing IPPs, which is essentially based on an IPP selling power to a single monopoly purchaser (i.e. the purchasing agency model), the responsibility for supply security rests with the integrated licensee. The integrated licensee is responsible for ensuring adequate power is available which could be through its own generating capability or IPPs from which it purchases electricity. In a sector structure where IPPs sell into a pool based on a combination of long-term contracts and short-term transactions supply security would be a concern. As most Asian countries are still some years away from adopting such a structural model, supply security may not be of immediate concern.

53. Another aspect of supply security and planning relates to fuel diversification. IPP projects such as Hub in Pakistan and Dhabol in India, rely on imported fuels i.e. imported fuel oil and LNG respectively. There is some concern that this could adversely impact fuel security. With increased integration of fuel markets on a global basis, this contention is difficult to support. Japan, for example, relies largely on imported fuels. The US also imports large quantities of LNG for power generation. Imported fuels do increase foreign exchange outflows, but the overall economic impact is no different from using a domestic fuel which is potentially exportable (i.e. tradable). In countries where domestic fuels such as coal are available cheaply and abundantly there are grounds to question the importation of fuels. However, a open bidding process that allows IPP developers to bid based on price would permit the selection of the most cost-efficient fuel. It is important not to equate imported fuels with cost-inefficiency. For example, even in India with abundant coal resources there are many instances of imported coal being a cheaper alternative than domestic coal for power generation — despite the high import duties and taxes.

54. Planning continues to be a centrally dictated function in many Asian countries — a central authority develops a medium- to long-term expansion plan based on which a capital expenditure budget/program is defined. IPPs are just one option for meeting this capital expenditure program. The changes that are envisaged in planning relate to the degree of specification of new generating plant. Apart from specifying a specific MW and kWhr requirement some plans specify technology, fuel and site. In order to gain the benefit of cost-efficiency it may be necessary to specific the quantum of power required and leave it to the bidding process to decide the cheapest generating technology, fuel and site. This is sometimes referred to as “indicative planning”. None
of the Asian countries reviewed had adopted indicative planning. The concept is, however, under consideration by many governments. In conclusion, one may state that planning as a function has not changed much with the introduction of IPPs, but it is possible that the planning function will become less prescriptive in the future. This transition is seen as a necessary complement to improved resource allocation. Currently, the major impediment to making this transition is a mind-set that highly specific plans are an important government function and necessary for supply security.

(f). The Role of Government:

55. Proponents of the private sector often note that the private sector is capable of providing the necessary financial, managerial and operating resources for power sector expansion. This contention could be interpreted as a rejection of government involvement in power sector development/expansion. This notion is misplaced. The following areas are likely to continue requiring government support/involvement:

- **Rural Electrification:**

  Developing countries in Asia have large unserved populations and areas that as yet have no access to electricity. These loads are not financially viable on a project basis. However, they cannot be ignored as they are critical to the overall objective of fair and equitable economic development.

- **Large Hydro Project Development:**

  Many Asian countries have the potential for large-scale hydro-power development. These hydro-based projects tend to be multi-purpose i.e. irrigation, flood control, navigation, power etc. The complexity and sheer size of these projects makes them unattractive for private development. Once constructed some elements of these large projects may be operated/managed by the private sector. In other words, private operators are in general unwilling to take on the development risk of these projects. This points to a continued role for the government in large hydro-power system development.

- **Transmission & Regional Grid Development:**

  Major transmission interconnections between unconnected systems, for power export/import are examples of projects that are economically viable but complex owing to the transactional relationships between multiple entities. The private sector has shown little interest in investing and managing such transmission facilities. Governments will need to continue pursuing such projects as they can have major benefits in terms of system efficiency and capacity utilization. This once again points to the need for continued government involvement in system expansion. Examples of these projects in Asia are: the North-South Interconnection in Vietnam which is a 1,500km 400kV line; the inter-regional interconnections in India being developed by Powergrid Corporation; the power evacuation line from Laos to Thailand.
• **Maintenance of Existing Assets:**

As most of the power sector in Asia continues to be in government hands, the responsibility of government to manage, repair and maintain these assets will continue in the absence of large-scale privatization.

56. Targeted role of government, bilateral and multilateral guarantees and credit enhancement is often critical to successful financing of the IPP projects, particularly in the early years, and during the transitional phase from state dominance to a more market oriented system. Government funding can facilitate private financing in three ways: (a) leverage- a 30% funding contribution by the government could be expected to mobilize equity of 25-30% plus additional debt for the balance of 40-45% of total funding; (b) decrease in foreign exchange burden to the extent the repayment of government funding is met with local currency; and (c) subordination: governments may subordinate their funding to commercial lenders to provide additional incentives. The provision of limited government guarantees in certain critical areas (e.g. utility performance, fuel supply, access to foreign exchange) may be the best option in the short term to attract IPP investments.

**H. Conclusions**

a. IPP investment opportunities are conditioned on the existence of specific government policies and programs which encourage private sector entry. While establishing a fully developed policy and institutional framework is not essential to the development of the first IPP’s, it is critical to the long run development of a power market with substantial private sector participation. Regulation through contracts can achieve the same objective in the initial stages, and in some cases trying to establish a comprehensive and inflexible framework may actually work to deter early entry of the private sector — as the framework may not be compatible with market realities.

b. Risk sharing/allocation is at the heart of government-developer reservations in IPP projects. As may be expected in high risk countries investors expect the government to provide greater level of support. Governments on the other hand feel that investors are not bearing adequate risk. There is no such-thing as fair and unfair risk sharing — the risk allocation arrangement required to make a project a reality is probably some indication of what is possible and perhaps equitable. Only a competitive procurement process can give and indication of what the market will accept or bear — as opposed to a negotiating project risk allocation with a single developer.

c. Quantifying the risk inherent and by extension an acceptable equity return in large infrastructure projects is difficult. IPP investors in the US while earning very high >30% returns in the early years, have returns now in the range of 10-15% due to increased competition, standardization in financing structures and clarity in risk allocation. Consequently, defining a fixed equity return up-front may not result in adequate investor interest if too low, and would be sub-optimal if set too high. A market test through competitive procurement should yield a more realistic result.

d. The role of negotiations in project selection should not be seen as being totally incompatible with competitive procurement. A power plant with a 20 year operating
lifetime is not a commodity. Negotiations are best used after shortlisting potential developers based on an initial bid. The details and nuances of a draft power purchase agreement (PPA) can be refined and finalized based on negotiations with several developers and the final PPA put up for a final round of bidding based solely on price. This flexibility allows the market to deliver an optimum solution which may not be possible with a PPA that is defined in detail by the purchaser on an ex-ante basis.

e. Government guarantees and bilateral and multilateral credit enhancement will continue to play an important role in IPP financing during the transitional phase from state dominance to a more market oriented system. The provision of limited government guarantees in certain critical areas (e.g. utility performance, fuel supply, access to foreign exchange) may be the best option in the short term to attract IPP investments. The demand for government counter-guarantees is likely to decrease once fundamental problems such as: credit-worthiness of the purchasing utility; public monopoly on fuel supply; and, full exchange rate convertibility are addressed.

f. The introduction of IPP’s could act as a driver for deeper sector reform — as governments begin to deal with issues of purchaser creditworthiness, transparent and predictable regulatory structures, and allowing IPPs to access other customers directly to reduce market risk borne by monopoly purchasers.

g. There is inadequate information to make a clear assessment of whether IPPs deliver cost-effective power. From the available information in the Philippine we see that the price of private power is close to average tariffs and decreasing. Experience in the US indicates that IPP’s have resulted in lower generation costs. To make any objective comparisons of IPP costs with power costs from publicly-owned and operated power systems it is important to accurately reflect the true cost of public capital, — i.e. it is unacceptable to use a subsidized cost of public equity and debt for comparison. Further, it is erroneous to compare imbedded public facilities with a prospective new private generation project.

h. There will remain a continuing role for the government in the sector which needs to be carefully defined. System expansion planning, ensuring fuel security, environmental compliance, lifeline rates for the poorest, transmission system management, enhancing service to remote areas, development of hydro projects etc. will remain areas for direct government intervention/involvement. These government functions do not, however, conflict with the increased use of IPPs to provide additional resources for power sector development
Power Sector Reform Experience in Asia

1. Debates on power sector policy and reform for developing countries places emphasis on the institutional and legislative framework that supports the sector, redefining participant roles, and entity structures. Underlying these debates are questions that remain largely unresolved, concerning the applicability of certain advances in utility economics — such as the contestable market theory, arguing that the focus on the electric power sector as a natural monopoly may have been overstated and substantial competitive arrangements are possible, and that light-handed less prescriptive regulation is feasible and desirable. In some countries, there exist views in favour of maintaining the economies of scale and scope and which argue that vertical deintegration and competitive generation and distribution arrangements may increase transaction costs offsetting possible efficiency gains. Further there are questions on the compatibility of available institutional endowments and frameworks with market-driven corporate governance and sector regulation. How does one evaluate these various perspectives in a manner that is operationally useful?

2. These issues were discussed in the recent Workshop on “Power Sector Reform Experience in Asia”. The conclusions and lessons drawn are by necessity preliminary given the early stage of power sector reforms in the region. Cases are drawn from the power sectors in Asia where the Bank is currently operational: Bangladesh, China, India, Indonesia, Pakistan, Philippines and Vietnam. Malaysia where the Bank ceased power sector lending in 1992 is also examined. These tentative insights should provide a useful basis for evaluating and planning further reform in these countries. The discussion is organized as follows:

A. Power sector reform as a process
B. Commitment to reform
C. Enterprise ownership, management and governance
D. Power sector structure
E. Power sector regulation
F. Implementing and sequencing reform
G. Conclusions

A. Power Sector Reform as a Process

3. The first step in thinking about power sector reform is to clarify specific country objectives for reform. Only then is it possible to evaluate strategies and options that will achieve the same. The fundamental objective of power sector reform should be to provide reliable and cost effective power supply and wide national coverage. Today power sector reform is being driven by what are clearly shortcomings in the existing system: inefficient operation and utilization of existing power system assets; unviable capital structures, poor financial performance of sector entities; and environmental impacts that increase with the need for additional energy supply. In the Asian power sectors, a number of these shortcomings have resulted from excessive government interference in sector operations in the past and achieving the reform objectives will depend on its systematic reduction. There is also the challenge of improving the environment exogenous to the power sector, such as, institutional structures that make the commercial operation of the sector possible.
4. As a process power sector reform involves:

- successfully reducing the resistance of stakeholders – policymakers, managers, unions and the public at large. The government will at the outset need to outline its objectives of reform and the principles on which it should be based.

- redefining and reforming the ownership, management and governance structure of sector enterprises. The underlying objective is to induce commercial operating practices. Many enterprises may require extensive balance sheet restructuring and recapitalization which could involve full or part privatization of sector entities.

- creating new structural relationships between enterprises based on market principles. Referred to as structural reform this is the process of reassessing the existing industry structure and reordering enterprise boundaries and functions to increase competition. This requires acceptance of the evolving paradigm that electricity supply does not have to be delivered by a single integrated monopoly utility.

- redefining an appropriate mechanism for institutional control and oversight of the sector — referred to as power sector regulation.

- instituting or strengthening complementary legislation, market structures, and market-making institutions, such as: labour laws, social safety nets, commercial banking practices, capital market deepening to channel domestic savings into the power sector, credit-rating agencies to apprise entity finances, mechanisms to detect and correct anti-competitive behaviour (i.e. anti-monopoly offices and regulations); etc.

5. These factors and linkages all point to the need for a process driven reform effort. Although a single project loan could expand and contribute to the scope of the reform, it will need to be a part of a broader strategy or reform process. Sector reform cannot be a narrow project-driven activity. The basis for adequate definition of the reform process from the perspective of World Bank operations would be comprehensive economic sector work (ESW) to lay out the objectives of reform, an evaluation of the existing institutional endowments in the power sector and economy that draws the links between implementation and objectives. The ESW on the Philippines, Pakistan and Chinese power sector reform are examples of such an analysis designed to provide a framework for the lending program.

B. Commitment to Reform

6. With the 1993 Board approval of the World Bank Power Policy Paper country commitment to, and progress on reform became a criterion for power sector lending. Hence the term “commitment lending”, wherein operational staff are required to provide a reasonable assessment of country commitment to reform as a condition for loan approval. The question one must then pose is how does one measure a country’s commitment to reform?

7. The two closely related dimensions of sector reform that are pertinent to measuring country commitment is firstly, the scope of reform, and secondly the pace of reform. The terms radical, deep and comprehensive have been used to describe the scope of reform. While
definitions of what constitutes a radical or comprehensive reform vary there seems to be a common
thread in countries whose reforms are defined as comprehensive. These include separation of
transmission from generation and distribution, providing transmission access or a means for
commercial transactions between generators and large consumers, and setting up of an independent
regulatory authority. There has also been a concerted effort to attract private ownership in the
sector. Pace is effectively an issue of how quickly the planned vision for reform is implemented.

8. Comprehensive or “deep” reforms have been seen in Argentina, UK and Chile. In Chile
the process took over 15 years, while in Argentina the process took less than 5 years. The UK
reform effort started with vesting in 1991 but will reach its stated objectives of a competitive
power market only in 1998. In contrast, Malaysian reform whose depth falls short of those in
Argentina and Chile, the stated vision for reform was implemented quickly in a period of about 3–4
years. In doing so the basic goals of power sector reform -- efficient and financially viable power
supply -- have been achieved. As a case where the reform vision was limited but the pace rapid,
the Malaysian example is interesting as it represents the most tangible reform in Asia, yet the
government only partially privatized the incumbent utility as an integrated monopoly, and set up a
regulatory entity that continues to be under the Ministry of Energy, Posts and Telecommunications
-- i.e. it is not completely “independent”. Evidence of its success is seen not only in improved
sector efficiency and performance, but also in its ability to close the financings on two large private
power projects without government counter-guarantees -- the only such case in Asia. But the
success of continuing reform is founded on the government’s commitment to implement the limited
privatization as an irreversible first step.

9. We are, therefore, left with two general conclusions -- first, commitment is not necessarily
a function of articulated reform depth; and, second, tangible actions or progress is a better
yardstick to measure commitment than mere speed of change. Given that reforms in Asia are
unlikely to be completed on a project basis and that they could either be limited or comprehensive
with variations in sequence and strategy, “commitment” is not a uni-dimensional concept.
Commitment may thus pragmatically be assessed in terms of progress along the following
dimensions:

(a). Government willingness to implement some fundamental enterprise reforms in the power
sector. This may commence by creating arms-length working relationships with government
entities, sources of finance and consumers and creating corporate structures that are based on a
uniform commercial/corporate law.

(b). Sector restructuring and willingness to introduce competition progressively at various
levels. Allowing the entry of private generators is normally the initial step, followed by gradual de-
integration of functions and increased retail competition. Most Asian nations have allowed entry
in generation (e.g. Malaysia, China, India, Pakistan, Indonesia, Philippines). Creating a single
arms-length power purchaser and bulk/retail seller are being evaluated as a transitory step towards
increased supply and retail competition in some countries (e.g. Malaysia, OSEB in India). China,
India, Indonesia, Philippines® and Thailand® have investigated aspects of structural reform.
Typically these investigations assess the suitability of different structural models, outline possible

8 “Malaysia - A Case Study on Electrical Privatization” - Ranjit Lamech - Draft Note.
medium-term choices; and determine an implementation program. There is, however, no clearly stated sector structure of-choice in any of these countries.

(c). Undertaking significant tariff rationalization measures. The essential steps need to provide for achieving cost recovery and investment surplus, removing sectoral cross-subsidies and allowing for transparent government transfers where subsidies are required. Tariff reform is a fundamental building block of sector reform and is correctly seen as one of the principal impediments to commercial sector operation. Consequently, its impact should not be underestimated. Countries such as China, Thailand and the Philippines have implemented significant measures in tariff rationalization. Malaysia continues to rationalize “discounts” to commercial and industrial consumers in a phased removal of tariff distortions.

(d). Regulatory and complementary legal and market reforms. Progress in power sector reform depends on the existence of suitable regulatory processes and market making institutions and rules. These include the commercial framework of corporate, tax, contract and anti-trust law, as well as capital market regulation. For all of these to work a competent institutional base consisting of a trained bureaucracy and service sector is required. The recent promulgation of a new corporate law and accounting framework in China would pave the way for broad-based enterprise reforms; allowing foreign investment and participation in power sector operations (Indonesia, India, China) could lead to increased private equity and debt financing.

10. The following are some tentative conclusions on reform commitment:

- Commitment is appropriately measured by progress along various reform elements i.e. sector structure, enterprise reform, tariff rationalization and regulation. It is important to get a sense of how these elements are related to institutional capacity in the specific country context. It then becomes possible to set expectations or reform targets and also specific objectives that could be achieved through individual projects.

- The need and role of complementary reforms must be recognized. Complementary reforms and institutional mechanisms are essential to successful transformation of existing power system structures. Commitment to implement complementary reforms will dictate the pace of power sector reform as a whole.

- Power sector reform may be incremental in some Asian countries, and appropriately so for political and institutional reasons. To maintain reform momentum tangible implementation milestones should be defined. To support this effort it will be necessary to develop some appropriate sectoral indicators and benchmarks to track reform progress.

C. Enterprise Ownership, Management and Governance

11. The principal power sector entities in all Asian power systems are predominantly publicly owned as a result of historical evolution or the consequence of the prevailing public sector orthodoxy of the time when Asian power entities came of age. Although, power sector reform in Asia is about reducing government involvement in the sector, the problem when referring to power

enterprises is more about government interference in the management reducing efficiency than purely an issue of transferring ownership. It is important not to lose sight of the objective of enterprise reform which is to improve sector efficiency. In essence, reform strategies should be evaluated on the basis of how they contribute to efficiency improvements. Further, it should also avoid the restrictive view that privatization is the only workable strategy and an end in itself. The real issue is the relationship of the enterprise with the government and the degree of control it exercises.

12. It is in this context of determining enterprise reform strategies that the terms commercialization and corporatization are used. If one had to depict the process of enterprise reform it would be as shown in figure 1. (Note: The rectangular boxes representing a common form of ownership/management and those with arrow-heads a reform step). As one moves from government department to private enterprise the mechanism for enterprise governance/control becomes more market driven and less open to ad hoc government intervention.

Figure 1. Steps in Enterprise Reform

Note: The rectangular boxes represent an entity form and ownership structure. The arrow-heads represent a reform step.

13. The reform of power enterprises in Asia has tended to follow this sequence:

(a). Performance Contracting: Performance contracts are a mechanism for enterprise managers and the government to decide upon specific duties, responsibilities and performance obligations. In general, performance contracts are used in circumstances where the government continues to impose certain non-market constraints on an enterprise -- e.g. price controls on inputs and outputs, staffing constraints, social obligations etc.. The performance contract is usually not a legal document, in the sense that there is no legal recourse for managers in the event that the government wishes to abrogate the conditions in the contract i.e. exercise its powers of "eminent
domain". Consequently, performance contracts work well only in instances where there is reasonable clarity and stability of government objectives vis-à-vis the power enterprise.

Performance contracts have been used quite successfully in the case of KEPCO in Korea. There is also evidence of performance contracts working well in the case of EGAT in Thailand. Performance contracting has also been used widely in the Chinese power sector for defining generation, tariff, taxation and profit levels.

(b). Commercialization refers to an internal transformation of enterprise operations to enhance their efficiency by exposing them to commercial pricing signals and incentives. As power enterprises are gradually faced with the prospect of raising commercial capital, both domestically and internationally, it is necessary that certain internationally accepted commercial practices be adhered to. This transformation would require, inter alia, the adoption and implementation of international accounting standards and practices involving the central issue of resolving ownership claims i.e. reconstructing the liabilities-side of the balance sheet to reflect long-term debt liabilities and the concept of equity; separation of core and non-core businesses i.e. rationalizing social welfare responsibilities; rationalizing tariff structures to ensure that subsidies (if any) are clearly accounted for; and increasing management autonomy, especially in operational and financial decisions.

In terms of process steps, commercialization would require:

- Financial restructuring (i.e. revaluation of fixed assets, debt write-down or rationalization) with subsequent recapitalization of enterprise balance sheets
- Reforms in internal organization and leadership to decentralize management and control
- Development of internal control processes in the functional areas of finance, operations and central administration
- Redefinition of enterprise objectives and corporate policy to reflect commercial objectives and targets

It is the stated intent of most power utilities in Asia to move towards commercialization of their operations.

(c). Corporatization is a process in which the corporate form of an enterprise is established. In this process the legal status of the enterprise is defined with its rights as a separate legal entity, and the rights and obligations of its owners and managers. In general, this represents the transformation to a limited liability entity with a stock-holding capital structure. Such a step presumes the existence of a company law in the country and the willingness of the government to transform government entities (i.e. boards, authorities and commissions) to corporate form.

The power entities in Indonesia, Pakistan and Thailand are government commissions/authorities, and although legislation to affect a commercial and corporate transformation exist in these countries these changes have yet to be fully implemented. These entities vary in name from Authority, Commission, and Board are created by special government
decrees that defines their by-laws and charters. India and China have a few entities that are commercialized and have a corporate form (National Thermal Power Corporation (NTPC) and Neyveli Lignite Corporation in India; and, Huaneng International Power Development Corporation in China) — but these enterprises are in some sense enclaves that operate under specific charters and were newly created to avoid the ownership and management problems in existing sector entities.

(d). **Privatization** refers to the diversification of ownership in a corporation by the sale of its shares to the public at large. There are degrees to the extent of privatization ranging from partial privatization (i.e. selling a minority share to the public: less than 50% of the voting rights to the public) to full privatization (i.e. selling a majority stake to the public). The distinction between the two is principally an issue of voting rights or claims to enterprise governance. Even in cases where over 50% of the common stock is sold to the public, the government could continue to maintain a majority voting interest in the company. This can be accomplished by creating capital structures that assign greater voting rights to special classes of stock. For example, in Malaysia, the government holds a share called the “golden share”, which gives it the right to veto majority shareholder decisions. However, even if the government sold 100% of the common stock to the public, it would continue to have veto rights over shareholder decisions. Government control raises the issue of effective governance and whether the objective of efficiency can be achieved within such a framework. Given that shares are fungible investments that can bought or sold at will — a perception that the government will act in a manner that negatively affect share value could lead to an unsuccessful privatization. Successful privatization’s are a function of how investors perceive the intent of government vis-à-vis the commercial objectives of the enterprise. It is government recognition of this fact that makes even partial public ownership act as a barrier to interference in company operations.

The only country in Asia that has successfully undertaken this transformation route is Malaysia. Malaysia first commercialized its national power entity that was effectively a government commission/authority. The next step was the corporatization and partial privatization. The Malaysian privatization was partial i.e. based on the sale of only 22% of the common stock.

14. Enterprise reform and particularly, public enterprise reform in developing countries is an area that relies heavily on supporting market reforms. It is for this reason that enterprise reforms in the power sector must be closely aligned with broader institutional strengthening. For example, labour redundancy and rationalization of employee welfare benefits is the principal impediment to faster commercialization in many Asian economies. In most cases labour unions are averse to changes in the status quo for the same reason. In China and India, major restructuring of enterprises will be difficult until the state finds ways of dealing with surplus labour and a means is found to transfer substantial pension and welfare liabilities off the balance-sheets of these entities. Clearly, these mechanisms cannot be developed solely for power enterprise restructuring — they must be developed in the broader context of public enterprise reform.

15. Preliminary lessons from the existing experience with power enterprise reform in Asia are:

- commercialization is the first real step in any form of enterprise transformation and will result in the fundamental separation of government and enterprise. Commercialization induces the required changes in enterprise behaviour and decision-making, allowing them to operate like corporate entities. Preoccupation with final corporate form should not lead to the slowing down of commercial reform.
Privatization, partial or full, takes the process of enterprise reform further and in some sense "locks-in" in the benefits of commercialization and corporatization. This is because even partial privatization increases the irreversibility of enterprise reforms.\(^{13}\)

The final corporate form and regulations should not be unique to the power sector — a common commercial/corporate law should define this framework.

### D. Power Sector Structure

16. Structural reform of the power sector refers to a reorganization of the industry in terms of the role of each energy enterprise and the degree of competition (or choice) in trading relations between the enterprises. Structural reform should be seen as a means of instituting the broader efficiency objectives of power sector reform. Once again, it is important that structural reform not be seen as an end in itself for introducing enterprise reform and competition in the sector — rather as a means of improving sector efficiency and financial independence.

17. Four generic models of industry structure are used in most discussions of power sector structure. It is important that these models are not interpreted as rigid representations of reality. Although literature on this subject has from four to ten distinct models to represent power sector structure, the authors believe that the four models schematically represented and conceptually discussed below are the foundations from which other country specific nuances may be analyzed. In other words, the conceptual distinctions and principles are more important than the "boxes and arrows" themselves. (Figure 2. provides a schematic representation of these models):

**Model 1: Integrated Monopoly**  — There are no competing generators or distribution companies in an area. Customers buy from a company who has monopoly over them.

**Model 2: Generation and Transmission** are integrated while distribution is separated. Distributors, however, have no choice over which generator to purchase power from. This is still a full monopoly model, but it may be considered as a step in deconcentration in the distribution sector and towards competition.

**Model 3: Purchasing Agency Model.** There is competition to generate, but all sales must be to a designated purchasing agency. The purchasing agency then sells to retailers or its own customers who have no choice of supplier.

**Model 4: Central Transmission with Open Access for Retail Sales.** Competition to generate, with customers or retailers having a choice of supplier.

18. The conceptual distinctions in the four models are:

(a) Vertical Integration of Activities: The extent to which the activities of generation, transmission and distribution are managed together or separately. The relevant consideration for

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these structural decisions is whether the costs of making contracts between separated entities is greater than the benefits of greater accountability and hence efficiency of separated structures.

(b). Concentration or Fragmentation: An industry structure can also be described in terms of the number of enterprises that conduct the same activity within a geographic or administrative area. This is of course a relative concept — when there are many small enterprises relative to the size of the market, the industry is fragmented or deconcentrated. When there are few enterprises the industry is concentrated.

(c). Competition and Monopoly: Most countries start out with monopolies in the power system, sometimes one monopoly for the whole country (e.g. Malaysia and Indonesia), sometimes local monopolies (e.g. India and China). These enterprises are required to serve everyone, and in return get exclusive rights to operation. The fundamental concept here is the degree of monopoly — monopoly meaning the choice that customers have.

19. In general, at this time most Asian countries have a basic structural skeleton of an integrated monopoly. In some instances there are separate generation and distribution entities — even if it is limited by geographic scope. For example: county distributors in China purchase bulk electricity from the integrated provincial power company in some areas while Thailand has separate distribution companies. In Bombay, India, private and public distribution entities purchase power from an integrated private franchisee. Pakistan has distribution entities that are effectively distribution subsidiaries of the state-owned WAPDA and Philippines has over 130 distribution cooperatives and investor owned utilities. The mere existence of these separate distribution and generation entities indicates that there is scope for increasing the level of sectoral separation. More advantageously, there is evidence that separate distribution and generation operators are workable and replicable on a wider scale.

20. While none of the Asian nations has defined a reform sequence that could lead to central transmission entity that operates as broker or an open access carrier — there is evidence that some countries are positioning themselves for such a transition. It is useful to focus on the necessary institutional and technical requirements that make these models workable in practice. For example, India has begun the task of consolidating its high voltage transmission system into a single operating agency. The Powergrid Corporation is acquiring high voltage transmission assets and establishing the technological pre-requisites (regional control centers, metering stations for monitoring power flows). While describing the present Indian power system as resembling Model 3 would be an exaggeration, it is clear that the structural reform represented by Powergrid is an important step in the correct direction.
Figure 2.

Models of Power Sector Structure

Model 1. Monopoly at all Levels
No Competition

Model 2. Separate Distribution
Monopoly at all levels
No Competition
(some competition possible if
distribution franchises are
awarded competitively)

Model 3. Competition in Generation
Single Purchasing Agency
Monopoly at the Retail Level

Model 4. Competition in Generation
Competitonal Retail Level for large
consumers
local monopoly − captive retail
customers
21. Structural reform relies upon a number of regulatory, technological and complementary commercial legislation, thereby requiring a pragmatic sequencing effort. Another aspect of a transition to a more competitive system is the institutional “software” i.e. contractual relationships between the various players and a means to monitor and enforce them. These models depend on market relationships between various entities that must be specified clearly and mutually agreed upon, and the instrument for this relationship is generally a legal or quasi-legal contract. Most Asian countries are yet to develop sector relationships that are driven by contractual obligations. This is a product of their largely state controlled power sectors where the various entities were essentially extensions of government administrative departments. This leads to another significant conclusion i.e. commercialization of sector entities is a pre-requisite for any progress towards a more competitive (market driven) sector structure.

22. It is important to note that independent power producers (IPPs) are compatible with models 3 and 4. The degree of competition introduced depends on two factors: (i). competitive procurement – are IPPs selected on the basis of a competitive bidding process or not? In cases where IPPs are selected on the basis of unsolicited bids the procurement is not competitive and the IPP brings only additional generation resources/capital which may not be at the lowest possible cost. There is of course the benefit of introducing an operator who is basing his decisions on a commercial consideration and therefore could bring in efficient operating practices which may or may not accrue as final consumer benefits; (ii). to whom may an IPP sell his output? Under the purchasing agency model there is no choice and hence less competition. In effect, the competitive role of IPPs is a function of how trading relationships are defined.

23. Each of the sector structure models requires a different regulatory approach. Model 1 and 2 require price regulation through either a price-cap or rate of return basis. Most Asian countries have some form of explicit or implicit regulatory mechanism. For example: India has a codified cost-plus regulatory model; Indonesia and China effectively adopt a rate of return approach; Philippines is considering a price-cap model; Malaysia has not defined the price-cap formula although its use was decided at the time of sector commercialization. Some element of performance benchmarking of generation entities and distribution entities can be used to simulate market incentives. On the other hand, models 3 and 4 require a more complex form of market regulation as the market is potentially competitive on a self-regulating basis, but oversight is required to ensure no collusion or monopsonistic practices by the players. Not many Asian countries possess adequate skills and capacity to provide such regulatory oversight. It is in this context that the training and sophistication of the regulatory agency become important. Therefore, the choice of regulatory model while driven by the choice of sector structure, also depends greatly on the institutional capacity to implement and function.

24. The preliminary conclusions on sector restructuring are:

- generation is the typically the first core power sector activity that can be made competitive. Deconcentrating the sector by introducing additional players such as IPPs is the first step towards making generation a competitive activity and in unbundling the sector.

- structural reform requires both the hardware of technological improvements in the power system, as well as the software of workable contractual relationships to be implemented successfully.
• separate distribution is a feature seen in a number of Asian power systems and may indicate a relatively easy transition to a more competitive system.

• regulation is a second-order decision that follows decisions regarding sector structure. It also needs to be noted that regulatory mechanisms increase in sophistication with more competitive structures and thus, adequate attention should be paid to developing the required capacity to regulate.

E. Power Sector Regulation

25. There has been considerable discussion within the World Bank on the need to establish a clear regulatory framework and an independent entity to effectively implement the framework of the reformed power sector. But regulation is strictly only a mechanism for oversight of a given power sector structure— it does not provide a means for sector reform. Regulation only specifies the modalities for transactional relationships between the various power sector entities and cannot be the first step in sector reform.

26. When defining the regulatory structure, it is therefore important that the government first decide upon the direction of power sector reform vis-à-vis ownership, enterprise governance and management and sector structure. The regulatory mechanism and the regulatory agency can then be designed on the basis of the final sector structure and enterprise governance. In a sequence of policy decisions concerning power sector reform, regulation is essentially a second-order decision.

27. Thus if a country is contemplating separation of distribution and generation (e.g. Pakistan), the government must define regulation that is appropriate for this structure. This might require a selection of regulatory alternatives e.g. price-cap, rate-of-return, or cost-plus. Subsequent regulatory decisions will then focus upon the modalities for exchanging operating and financial information, licensing of operations, obligations of different operators etc..

28. Another aspect of regulation that has been under extensive debate is one of vesting regulatory functions and responsibilities. The debate is typically about whether regulatory responsibility should be vested with the government or a so-called “independent regulatory authority”. In the context of most Asian countries, regulation is seen as a government function and it is difficult to ensure the independence of the regulator from government influence. In some sense this is part of the fundamental task of redefining the role of the government in the power sector. For credible regulation, three mechanisms need also to be in place— restraints on the regulator’s discretion embedded in the regulation, formal or informal restraints on changing the regulatory system, and institutions that can enforce these constraints.

29. Regulation is today a responsibility of government departments, ministries or authorities/commissions, both in developed and developing countries. The relevant issue is therefore how can the regulatory agency be insulated from ad hoc government intervention and interference in its decision making. There is no particular solution to this problem. For example, the Indian Electricity Supply Act clearly specifies a return on assets that the government is supposed to allow all power sector entities— this is neither achieved by state-owned entities nor is there any means for them to have any legal recourse to insist on this minimum standard. On the other hand, private operators in India have been able to achieve this minimum standard or at least
have been able to insist upon it. This might point to the need to separate government from enterprise operations rather than a complicated scheme to ensure the independence of the regulatory agency itself. In Malaysia, the power sector was commercialized and partially privatized and a regulator was appointed as per the revisions of the Electricity Supply Act. Though the regulator has thus far been unable to define sectoral performance benchmarks or the modalities for private power purchase — these decisions are still implicitly made by the Minister for Energy, to whom he reports, and the Economic Planning Unit (EPU) of the Prime Minister’s Office.

30. While there is very little useful case-history on how to implement independent regulation in Asia there is evidence to show that:

- an independent regulatory agency, while desirable, is not essential for greater sector efficiency in the short-term. Instituting some form of credible arms-length regulation even if performed by the government has its benefits that outweigh reliance on intrusive government oversight.
- inducing commercial enterprise operations acts as a driver for a more certain regulatory environment.
- in cases where commercial operations have been allowed it is also clear that regulation works as it should — irrespective of whether it is totally independent of government interference or not. This is based on the successful operation of entities such as Tata Electric in India, Tenaga Nasional in Malaysia and KEPCO in Korea.

F. Sequencing and Implementing Reform

31. The above discussion focused on the various elements of power sector reform i.e. enterprise, structural and regulatory reform (Annex II). Implementation is about combining these elements and deciding a specific sequence and pace of reform. Three broad strategies for reform sequence are possible:

a) Focus first on the corporate restructuring and commercialization with subsequent effort on redefining sector structure. Here the first priority is improvement in enterprise operations, increasing competition is a lesser priority. Sector legislation can make new structural arrangements possible in principle, consequently, the regulatory framework is allowed to evolve with further reforms in structure of the sector and transactional relationships between sector entities.

Malaysian power sector reform is an example of this strategy. The government first commercialized, corporatized and privatized the incumbent utility. The government insisted on the gradual creation of arms-length trading relationships between the various functions. Although the incumbent has been granted a license for 20 years, it is being made to contend with the entry of IPPs and is compelled to improve operational efficiency as a consequence. The long term vision for structural reform includes the creation of a separate transmission entity and separate generation and distribution companies. But the government is focusing on supply expansion in the short term and would prefer greater equivalence of supply and demand before moving further on the structural reform front.
b) Focus first on redefining the sector structure and then restructure corporations and institute regulation on the basis of the new sector structure. Here the regulatory skeleton specifies the principles and functional boundaries that are consistent with the defined sector structure and the initial focus is on an upfront definition of structural model consistent with the reform objectives. The actual details on how the structural model and regulatory reform is implemented is allowed to evolve and then codified in secondary legislation.

This strategy has been adopted by Thailand. The first priority has been to define functional (i.e. generation, transmission and distribution) and entity boundaries as a central component of structural reform. As a subsequent step the incumbent utility will be broken-up along these lines and the resulting entities restructured as corporations. The legal and regulatory framework will be redefined in line with these changes.

c) Simultaneous definition of sector structure, enterprise reform and privatization of significant components with the introduction of a revised regulatory framework consistent with the reformed power system. This approach to sector reform may be termed radical and rapid and has been witnessed only in UK\textsuperscript{14} and Argentina. Even the Chilean reforms that were radical in terms of depth, were carried out over a period of over a decade.

32. It is difficult to recommend a specific sequencing approach for all Asian countries. But cautious and flexible approach is necessary in the Asian context, as reform is being attempted at a time when power demand is growing at 7-8\% per annum. The structure, sequence and pace of reform needs to keep this in perspective when attempting to import models from other countries. The high cost of unserved demand, estimated at anywhere from 30 cents/kWh to over a dollar per kWh necessitates a cautious approach. It is therefore necessary to be evaluate the transition strategy carefully.

**G. Conclusions**

a. Sustained government commitment to the reform process is a prerequisite. It is not enough to have a narrow focus on the power sector - power sector reform should be a part of an overall country approach to a market based economy. It is necessary to recognize that exogenous factors and complementary reforms are required to achieve successful reform within the power sector.

b. Power sector reform is process driven rather than a project-specific activity. But it is realistic to attach well-defined and limited objectives to individual projects and ensure consistency with the overall reform strategy. This will allow for achievable goals to be linked to projects that incrementally advance the reform envelope.

c. The reform process typically seeks to separate and reduce the role of the government in sector and utility operations. The driving forces for reform: ineffective operation of existing systems, poor utility finances, large demand-supply gaps and rising environmental concerns--are for the most part a result of ad-hoc and excessive government interference. Hence the focus on rationalizing the role of the government.

\textsuperscript{14} For an analysis of the UK model, refer to note by Anil K. Malhotra on “Do Radical Reforms Work?”
d. Enterprise reform in the power sector should be evaluated on the basis of induced efficiency gains and the extent to which the reforms can be made irreversible. Performance contracting allows for a compact between government and enterprise, allowing the enterprise to focus on its core business. It is a suitable transition in cases where the necessary corporate legislation and legislative amendments concerning the status of existing power entities is yet undefined. Commercialization and corporatization are, however, the first steps affecting irreversible transformations of enterprise operations. Privatization is an overall strategy for public-enterprise reform in some countries. But there is an emerging consensus that privatization should not be viewed as an end in itself but as a means to lock-in gains achieved through commercialization and corporatization.

h. There is a clear need for appropriate indicators to measure the success of a reform effort. Given that most reforms focus on deregulation, increasing competition, encouraging private ownership, unbundling etc. some of the traditional indicators may not be wholly appropriate. For example, evaluating commercial performance based on customers per employee is unsuitable for unbundled systems; also under true commercial operation of enterprises a self-financing ratio greater than 25% may not be compatible with a rapid expansion of supply provided commercial financing is possible.

e. Allowing for private entry in the generation business is often the first step in deconcentrating the sector and paving the way for increased supply competition. In that sense it is the tentative first step in sector unbundling and structural reform. The existing structure of power sectors in many Asian countries (China, India, Philippines and Thailand) allows for increased separation of distribution operations. It is an area that has not received much attention, thus far, and is potentially another area to focus on in the efforts to unbundle the power sector.

g. A necessary condition for sustained and large scale power sector investments by the private sector is that government administrative arbitrariness be restrained through some form of an "arms-length" regulatory mechanism. But a country's exogenous institutional endowment, defined as the country's legislative and executive institutions and capability is an important determinant of whether a country can have a regulatory system that is credible. For credible regulation, three complementary mechanism need to be in place: restraints on the regulator's discretion embedded in the regulation; formal or informal restraints on changing the regulatory system and institutions that enforce the constraints.

f. There is no unique reform strategy or sector structure that could simultaneously meet the objectives of reform in Asian economies. The need to improve enterprise efficiency, garner additional investment resources, satisfying the varying demands of consumers, environmentalists, rationalizing intergovernmental relationships, and providing energy at a reasonable cost, all need to balanced. The chosen strategy will depend on a state of a country's institutional endowment and the balancing of multiple pressures and objectives. But it is critically important to develop a flexible transition strategy when embarking on major reform. The cost of mistakes can be high in countries which are supply constrained and where the cost of unserved demand is large.
Typical Incentive Packages for Independent Power Developers

India

The following are the key features of the scheme to encourage greater private sector participation in electricity generation, supply and distribution:

- The Indian Electricity Act, 1910 and the Electricity (Supply) Act, 1948 have been amended to bring about a new legal, administrative and financial environment for private enterprises in the electricity sector.

- Private sector can set up thermal projects (coal/gas) and hydel projects and wind/solar energy project of any size.

- Electricity projects where the total outlay does not exceed Rs 250 million need not be submitted to the Central Electricity Authority for concurrence.

- Private sector companies can set up enterprises to operate either as licensees or as generating companies.

- All private companies entering the electricity sector hereafter will be allowed a debt-equity ratio up to 4:1.

- To ensure that private entrepreneurs bring in additional resources to the sector, not less than 60 per cent of the total outlay for the project must come from sources other than Public Financial Institutions.

- Up to hundred per cent foreign equity participation can be permitted for projects set up by foreign private investors.

- The condition of dividend balancing by export earnings which is normally being applied to cases of foreign investment up to 51 per cent equity will not be applicable to foreign investments in the power sector.

- The rates for depreciation in respect of assets have been liberalised.

- With the approval of the Government, import of equipment for power projects will also be permitted in cases where foreign supplier(s) or agency(ies) extend concessional credit.

- The customs duty for import of power equipment has been reduced to 20 per cent and this rate has also been extended to machinery required for modernisation and renovation of power plants.
• A five-year tax holiday has been allowed in respect of profits and gains of new industrial undertakings set up anywhere in India for either generation or generation and distribution of power. The five-year tax holiday will begin from the year of generation of power.

• Up to 16 per cent return on the foreign equity included in the tariff can be provided in the respective foreign currency.

• Fixed costs including 16 per cent Return on Equity (ROE) can be recovered at 69.5 per cent PLF. Attractive incentives are prescribed for performance beyond this PLF in the form of additional ROE (up to 0.7 per cent) for each 1 per cent rise in PLF.

• The Government of India will extend a counter guarantee for the payment obligations of State Electricity Boards to the private power companies on the specific request of the concerned State Government, subject to certain terms and conditions.

Pakistan

The salient features of the new policy framework and package of incentives for private power development are:

• The investors are free to propose the site and opt for the technology and fuel for the project depending upon the availability of fuel, cooling water, infrastructure, environmental impacts and economics of the tariff.

• The power shall be purchased by WAPDA/KESC under a long term contract covering the concession period. The Government of Pakistan offers a Bulk Power Tariff of US Cents 6.5/kWh (to be paid in Pak Rupees) as an average for first ten years for sale of electricity to WAPDA/KESC. A levelized tariff of US Cents 5.9/kWh (Rs 1.776/kWh) over life of the project has also been calculated as a final parameter for acceptance of the tariff. A premium of US Cents 0.25/kWh based on the energy sold to WAPDA/KESC during the first 10 years of project operations, will also be allowed to the projects above 100 MW which are commissioned under this scheme by end 1997.

• The tariff of US Cents 6.5/kWh is an indicative tariff which has been calculated on an annual plant factor of 60%. The actual payment of the tariff will comprise two components, i.e. Capacity Price and Energy Price.

  a. Capacity price will be paid on a monthly basis and covers the debt servicing, fixed operation and maintenance cost, insurance expenses and return on equity.

  b. The Energy Price will be paid as Rupees per kWh based on actual energy sold to WAPDA/KESC. This includes an element of fuel prices as “pass-through” item. As the capacity payment is assured as per terms of the Concession Agreements, there will be no guarantee for purchase of a specified amount of power.

• The sponsors of private power projects will provide their year-wise tariff profile for the life of the project. The tariff will be acceptable if:
i) The average tariff for the first ten years does not exceed US Cents 6.5/kWh (Rs 1.952/kWh).

ii) The annual base tariff does not exceed US Cents 8.33/kWh (Rs 2.5/kWh) in the first year and US Cents 6.66/kWh (Rs 2/kWh) in any subsequent year.

iii) The levelized tariff for the life of the project does not exceed US Cents 5.91/kWh (Rs 1.776/kWh).

- A mechanism has been provided for indexation/adjustment of the certain tariff components based on Rupee/Dollar exchange rate, fuel price variations and inflation.

- BOO projects will involve limited recourse financing, which means that the funds for the projects will be raised without any direct sovereign guarantee of repayment. Instead, the investors in, and lenders to, the project company must look to the revenues earned by the sale of electricity; for their returns on equity and the servicing of their loans.

- The minimum requirement for equity investment is 20% of the total capital cost of the project.

- The Government has established a Private Sector Energy Development Fund (PSEDF) with the assistance of the World Bank, USAID and other multilateral lending agencies, which may provide up to 40% of the Capital Costs of the project, currently at a fixed interest rate of 14% per annum with a maturity period of up to 23 years including a grace period of up to 8 years.

- The private power companies are exempt from corporate income tax. The companies are allowed to import plant and equipment without payment of customs duties, sales tax, Iqra, Flood Relief and other Surcharges as well as Import License Fee. Repatriation of equity along with dividends is allowed freely.

- The companies can obtain Foreign Exchange Risk Insurance (FERI) on standard terms from the State Bank on the Foreign currency loans contracted by them. The current premium rates of FERI are included in the bulk tariff but any change in FERI will be considered as a "pass-through" item.

- The power generation has been declared as an industry and the companies are eligible for all other concessions which are available to industrial projects. The private parties may raise local and foreign finance in accordance with regulations applicable to industry in general.

- The long term Power Purchase Agreements, typically for 15-30 years with WAPDA/KESC are guaranteed by the GOP for performance obligations of these utilities.

- In case the fuel is to be supplied by a public sector organization, the performance of the fuel supplier will be guaranteed by the GOP under the terms of Fuel Supply Agreement.

- For private power projects, the Government will:

  i) provide protection against specific force majeure risk.
ii) provide protection against changes in certain taxes and duties

iii) ensure the convertibility of Rupees and remittability of foreign exchange to cover necessary expenses of the projects.

• Under the new policy, a Private Power Board is being constituted so as to facilitate one window operation. The Board will be responsible for coordinating with all the agencies and Ministries concerned and taking decisions, monitoring the performance of private sector projects in accordance with the agreements, and safeguarding the interests of the consumers.
Sequencing and Implementing Reform- Some Alternative Paths

Implementation of reform requires that the various elements of power sector reform i.e. enterprise, structural and regulatory be combined. The following examples briefly indicate some of the alternative paths that countries have taken in the sequencing and pacing of their reform programs:

1. **Corporate restructuring and commercialization with subsequent effort on redefining sector structure**: The Malaysian case.

   The Malaysian government followed a systematic approach to privatization and the reform of the power sector. It issued guidelines on privatization in 1985, created a special task force on sector reform and initiated a major effort to improve data collection and monitoring of the state owned enterprises. A master plan for privatization of the power sector was prepared by consultants in 1988. Based on the various studies of three options -- an integrated generation, transmission and distribution company, one generation and transmission company but a separate distribution company, and one generation and transmission company but with several distribution companies-- the government selected the integrated generation, transmission and distribution model. But it moved rapidly to commercialize its operations and to corporatize it prior to sale to the private investors. TNB was, however, required to keep separate records for generation, transmission and distribution under instructions of the regulator, so that at a subsequent stage further changes in the sector structure could be made.

   The revised Electricity act was passed in 1990 and a new public limited company, TNB, was created to take over all assets of existing state owned enterprise, the national electricity board (NEB). The new company was to be regulated under the Act. In order to avoid labor unrest, TNB was required to take all employees of NEB on terms at least as favorable as in NEB. The government decided to retain a "golden share" - (termed the Special Share) with powers to appoint upto 6 out of a minimum of 12 directors. Government could also appoint chairman and managing director of the company. TNB license is for 21 years with a 10 year notice for revocation and it pays the government a license fee of m$1.5 /kwh per annum of installed capacity. Tariffs are based on a (cpi-m+y) formula where cpi is the consumer price index, y denotes the fuel cost pass through and m an efficiency factor. The formula is reviewed by regulator every 4 years. TNB is obliged to provide rural electrification but this cost is shared equally between TNB and government.

   The Director of Electricity Supplies was appointed by the minister as the regulator of the electricity supply industry under the Act. His department remains a part of the ministry. His major function is to issue licenses, promote competition, determine performance standards, and ensure satisfaction of energy demands.

   To make TNB attractive to investors, the organization and management was restructured and the government gave a number of financial concessions. The government considered two
alternative approaches to transfer of equity to the private sector - one, public issue of equity and second, a majority stake to a strategic investor. But in 1992, government decided to proceed with a public issue of equity and 23% of TNB shares were offered to the public - an offer which was heavily oversubscribed.

The Malaysian electricity supply industry has been able during this period to achieve the benefits of private sector efficiencies without extensive sectoral restructuring, an independent regulatory organization, large scale tariff increases or staff redundancies and has also been able to attract independent power producers without sovereign guarantees.

2. *Redefine sector structure first, then restructure corporations and privatize:* The Thailand approach.

In September 1992, the government of Thailand approved a plan for the deregulation, restructuring and privatization of the power sector, which is presently under implementation. In the long term, it is envisaged that a corporatized EGAT, which while continuing to be a major power producer, would purchase electricity from the independent power producers (IPP’s), the electricity generation company (EGCO) and neighboring countries, and transmit and sell it to the Metropolitan Electricity Authority (MEA), the Provincial Electricity Authority (PEA) and major industrial consumers. The regulator of the sector would be the National Energy Policy Office (NEPO) under the prime minister.

The conceptual framework of the government policy and the four step approach of its privatization master plan are:

*Step 1*

EGAT would be deregulated by December 1994 subject to its ability to meet the criteria for a “Good State Enterprise” i.e be able to (a) remit 30% of its net profits to the government,(b) its labor costs not exceeding 20% of total assets,(c) it would earn no less than 6% rate of return on total revalued assets and it would ensure improvement of productivity by at least 2% per annum. EGAT would be required to sell 51% of EGCO, an EGAT subsidiary created in 1992, stock to the public. EGCO would buy over about 2000 MW of EGAT’s power plants. The power sales between EGAT, PEA and MEA would be placed on a commercial contractual basis.

*Step 2*

EGAT would solicit BOO proposals for new generating plants from IPP’s and from EGCO. During this stage EGAT would also commercialize its operations by decentralization, restructuring into business units and possible spin off of some subsidiaries. The government would prepare for the deregulation of the two distribution agencies, PEA and MEA, by their corporatization. Steps would also be taken for the restructuring of PEA on a regional basis.

*Step 3*

EGAT would be corporatized after the amendment of its act. Similar steps to corporatize MEA and PEA would also be taken after the necessary legislation had been passed.
Step 4

EGAT shares would be sold to the public but government still intends to retain a majority holding. PEA would be separated into regional companies in preparation for its privatization.

The plan is expected to be completed by 1997/98 and it is too early to evaluate the success of this approach. EGCO would be listed on the Thai stock exchange in November 1994. EGAT is expected to achieve the "good enterprise" status by end December 1994. EGAT has, however, already signed 20 small IPP’s for 210 MW, has finalized documents for 3800 MW of capacity over 1995-2003 and expects to receive IPP proposals for the first 1000 MW by February 1995.

3. **Simultaneous definition of sector structure, enterprise reform and privatization with the introduction of a revised regulatory framework:** The UK approach.

The reform and privatization of the electricity supply industry in U.K. commenced with the passage of the Electricity Act in 1989. This involved the wholesale reorganization of the industry through the unbundling of generation, transmission, distribution, and supply into separately accounted and administered functions within seventeen newly established companies at Vesting in 1991. It took two years from government approval of reform to the vesting in 1991 and required the drafting and signing of over 1000 contracts.

Pre reform, the state owned, Central Electricity Generation Board (CEGB) held and operated over 90% of the 60 GW installed generating capacity, dispatched power over the high voltage system, while distribution and supply was handled by 12 area distribution boards, each with a local geographical monopoly. CEGB sold energy at the Bulk Supply Tariff which was set annually, to the area boards who then sold this energy on to all users except for five very large customers who were served directly by CEGB. The power stations of CEGB were split among three companies—Nuclear Electric, Powergen and National Power. But under the new rules any company could apply for a generation license and the Regional Electricity Companies (REC’s) were allowed to own up to 15% of their maximum demand. The 12 area distribution boards were renamed Regional Electricity companies and were granted supply license’s within their geographical areas but were required to offer access to their local network on non discriminatory basis. Any company could obtain a license to sell in any area of the REC’s. A new spot market, the Pool, was established as the focal point for the industry along with a new regulatory regime.

The National Grid company was separated from CEGB, and was now owned by the REC’s. It was granted the transmission license, and was appointed the operator of the pooling and settlement system and given responsibility for dispatch under the Pool rules. The Pool system was set up as a spot market within which all wholesale electricity was to be traded. The Pool does not buy or sell electricity, it is simply the marketplace for the trading of electricity by the participating generators and suppliers and it is one of the most interesting innovations in the UK reform of the industry.

A regulator (OFFER) was established to oversee all aspects of the industry and in particular to regulate the prices charged for the natural monopoly elements of the industry—transmission and distribution.

To encourage competition in supply, second tier supply licenses can be granted to any company that wishes to sell electricity in any area. Until 1994 second tier supply is open to consumers
with a maximum demand in excess of 1 mw (about 300 consumers), after 1994 this will be lowered to 100 kw so that about 50000 customers will have access to competitive source of supply and in 1998 all consumers can purchase power from any source. The UK system is still evolving based on operational experience and it is expected that the process would be completed by 1998 when there would be full retail competition i.e a full nine years after passage of the Electricity act.

Based on data till date, there is greater efficiency in the electricity supply industry- plant availability factors have improved by about 10 %. And there has been no decline in quality of service provided. In 1992/93 there were 130000 employees in the electricity supply industry but since privatization the employees have fallen by 11 % with the biggest reductions being in the two generating companies. Consumer prices have reduced in real terms except for previously subsidized large industrial consumers. Increased investments in generation has taken place but there has been inadequate investment in transmission.