

Private Participation in Infrastructure: Lessons from Asia's Power Sector

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Many countries need to expand and improve their infrastructures in order to remain competitive and ensure continued high growth rates. Using illustrations from Asia's power sector, this article discusses approaches countries can take to accomplish the necessary upgrading.

THE COUNTRIES of East Asia are facing a major challenge in the provision of infrastructure even as their economies grow at rapid rates. As the World Bank's *World Development Report 1994* pointed out, the provision of infrastructure plays a crucial role in facilitating economic growth and international competitiveness. Historically, for each percentage point of growth in a country's per capita GDP, its infrastructure stock has grown by 1 percent. The East Asian countries, for example, have been devoting 4.7 percent of their GDP to infrastructure investments (2.1 percent for the power sector) but are now planning to increase this to 7 percent a year to keep pace with the high economic growth rates projected for the late 1990s.

East Asia's need for infrastructure is massive, amounting to \$1.2–1.5 trillion over the next decade (Table 1). This need is being driven by projected economic growth rates of 6–8 percent in the region;

bottlenecks owing to the lack of available financing in the past; growth in urbanization, as a result of which an additional 1 billion people will live in cities in 2010; and globalization of trade, which requires adequate and efficient infrastructure, including power, roads, and telecommunications systems. Businesses recognize the increasing importance to international competitiveness of decisions affecting the cost effectiveness and choice of infrastructure services and are therefore demanding better quality and service.

The growth rate of electricity provided in Asia, for example, is expected to average 7–8 percent per annum over the next decade. (See Table 2 for information on recent energy use and production in the region.) Installed generation capacity was about 329,000 megawatts (MW) in 1993, and it is estimated that an additional generation capacity of 340,000 MW would be required in the following decade. Total investments of about \$550 billion would be required to provide the necessary upgrading of power generation, transmission, and distribution.

A number of forces that converged in the 1980s and early 1990s have led to a fundamental change in governments' perceptions of their role in the infrastructure sector:

- Investment requirements exceed the capacities of national utilities and governments.
- The performance of the infrastructure sector has, in general, not met international standards. In the power sector, for example, in spite

Table 1
Investment requirements for infrastructure, 1995–2004
(billion dollars)

	Power	Telecommunications	Transport	Water	Total
China	200	141	302	101	744
Indonesia	82	23	62	25	192
Korea	101	32	132	4	269
Malaysia	17	6	22	4	50
Philippines	19	7	18	4	48
Thailand	49	29	57	10	145
East Asia	493	256	607	153	1,509

Source: World Bank, 1996, *Infrastructure Development in East Asia and Pacific: Towards a New Public-Private Partnership* (Washington).

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Table 2
Energy use and production in Asia and the United States

	Average annual energy growth rate, 1980-93 (percent)	Energy use per capita, 1993 (kilograms of energy)	Electricity production per capita, 1992 (kWh)	System losses, 1992 (percent)
Bangladesh	7.9	59	79	32
China	5.1	623	647	7
India	6.7	242	373	23
Indonesia	7.5	321	233	17
Korea	9.2	2,863	2,996	5
Nepal	8.1	22	45	24
Pakistan	6.8	209	435	17
Philippines	3.5	328	419	13
Sri Lanka	1.9	110	200	17
Thailand	10.5	678	1,000	10
United States	1.4	7,918	12,900	8

Source: World Bank, 1996, *Infrastructure Development in East Asia and Pacific: Towards a New Public-Private Partnership* (Washington).

of an impressive expansion during the last decade, the overall technical, institutional, and financial performance of state-owned utilities has deteriorated.

- The managerial and technical resources available are inadequate.

- Innovations in technology (for example, small but economic combined-cycle power plants fueled by gas) permit the unbundling—vertical and horizontal—of the power sector.

- Demonstration effects arising from the success of privatization and unbundling efforts (for example, in the United Kingdom) and the possibility of using regulation to protect the public interest (for example, the incentive regulation and yardstick regulation used in Spain) are making new approaches to upgrading infrastructure viable.

- The limited coverage and quality of some Asian countries' infrastructures are hindering their efforts to achieve international competitiveness.

Most countries in Asia have thus embarked on reforms of their infrastructure sectors during the past few years. But despite the active wooing of private investors by Asian governments and their efforts to reform this sector, the number of infrastructure projects with private participation has been limited. For example, relatively few independent power provider (IPP) projects have been commissioned, and very few build-operate-transfer (BOT) projects in water, transport, or ports have reached financial closure. The reasons for this slow progress have been well documented in the proceedings of various power industry seminars and in other industry publications. Private developers, however, need to recognize that the environment for

private investment in Asia has been changing rapidly over the past few years and that attractive opportunities are becoming available to private investors. Some of the more significant trends are the following:

Government commitment. In most Asian countries, governments have now indicated their explicit commitment to private participation in infrastructure. (For a discussion of what governments can do to create an enabling environment for the private sector; see box.) A new power policy in Pakistan was announced by the prime minister in 1994; the Electricity Law in India has been changed; there is a new BOT law in Vietnam; and so on. Similar developments in roads and ports have also taken place.

Increased private interest. Deregulation in the developed world has suddenly brought utilities into the IPP game. In the United Kingdom, for example, electric utilities were divested in 1991, which encouraged the national power company to seek opportunities for investment in Pakistan's power sector. Also, the deregulation of its power sector that Japan began in April 1996 is likely to force Japanese utilities to invest outside the country and thus provide their resources—financial, managerial, and operational—to other utilities in Asia, a development the Ministry of Trade and Industry views as positive.

There has thus been a dramatic increase recently in the supply of private developers in the power sector. Development of consortiums of equipment suppliers, consulting companies, construction companies, and fuel suppliers have created more than 200 prospective bidders for power projects worldwide. A recent invitation for IPPs in Thailand, for example, attracted more than

100 bidders, and more than 30 developers sought prequalification for the first IPP offering in Vietnam. Another interesting trend is the increasing participation of domestic and regional companies (for example, YTL in Malaysia, KEPCO in Korea, the China Light and Power Company in Hong Kong, and Reliance in India) in new power projects.

Move to competitive processes. Governments have moved toward some form of competitive procurement. For example, both India and Indonesia have formalized competitive procurement for IPPs in generation. The ad hoc, memorandum of understanding approach in Asia seems to be on its way out after the protracted delays in Enron's power project in Dabhol, India.

Greater availability of information. In Asian countries, there is increased information available about, and more widespread knowledge of, the private sector, the power industry, power purchase agreement formats, the cost of capital, and successful bids on power projects in the region. Governments have now become more confident about dealing with private participation in infrastructure than they were a few years ago.

Acceptable prices and developer returns. IPPs have been asking customers in developing countries to pay higher prices for power than their counterparts in developed countries. For example, in Australia and the United Kingdom, wholesale prices were 3-4 US cents/kilowatt-hour (kWh), while the average price charged by IPPs in Indonesia is now 6 cents/kWh and Pakistan's policy of 1994 accepted a charge of 6.25 cents/kWh. But these Asian countries' prices may have not only started dampening electricity demand but also raised issues about acceptable rates of return on investments in power projects. If US bond yields are about 9 percent per annum, isn't a risk premium of 6-10 percent too high for Asian developing countries, especially if sovereign guarantees are demanded by the developers?

Size of projects. Most independent power provider projects have tended to focus on the construction of large plants that require large investments. The high costs of power projects may result from not only their size but also the risks involved, the complexity of the contracts (for example, 167 contracts were required to accomplish one transaction in Teeside, United Kingdom), and the escalating legal and financial closing costs involved. There are several reasons why large power projects

Creating an enabling environment for the private sector: what governments need to do

In order to facilitate greater private sector participation in infrastructure projects, the governments of Asian developing countries need to concern themselves with the following issues:

Transparency of process. Private sector investment opportunities are conditioned on the existence of specific government policies and programs that encourage private sector entry and a transparent system of evaluating bids and awarding contracts.

Competitiveness of bids. Transparency and public accountability are best achieved by using a competitive bidding process to select contractors for infrastructure projects.

Appropriate allocation of risk. Risk sharing among the government, utility, lenders, and developers is at the heart of most reservations or debate about private sector BOT/BOO (build-operate-transfer/build-own-operate) projects.

Developer returns commensurate with risks. Quantifying the risk inherent in—and, by extension, acceptable equity return on—large infrastructure projects is difficult but essential.

Stable policy regime. Private investors in infrastructure, whether they are domestic or foreign, seek a policy regime (including such elements as the tax and investment frameworks) that is both stable and predictable.

Government guarantees and credit enhancements. Bilateral and multilateral guarantees and credit enhancements are often critical to the successful financing of infrastructure (including, among others, independent power provider) projects, particularly during their early years and the transition from state dominance to a more market-oriented economic system.

may entail diseconomies of scale—for example, large power plants often require additional infrastructure, and entail serious social dislocation and high environmental costs—thus making it worthwhile to determine whether “small is beautiful” in many instances.

New strategies for developers

As a result of increased private interest in investing in Asian power projects and the difficulties some projects have encountered, there has been a discernible shift in influence from the IPP developers to governments in the second generation of private participations in power and other infrastructure projects. The positive experiences of pioneer developers like Hopewell in Navotas, Philippines fueled expectations of high returns, but the changing environment will require the second wave of developers to create a new strategy. What issues do they need to focus on to participate successfully in the developing markets of Asia?

They need to find new ways to serve niche markets:

- Creative entrepreneurs need to be found to take on high-risk projects that promise high returns, such as building gas pipelines through Afghanistan, constructing regional electricity grids, and exporting hydroelectric power from Nepal.

- Investment needs to be attracted to new areas of the power sector. For the 12 countries of Asia, total investments in power transmission and distribution over the next decade are estimated at between

\$180 billion and \$220 billion, while investments in generation are estimated at between \$474 billion and \$600 billion. Although almost all the countries in the region have invited IPPs to participate in power projects, there has been only limited private sector activity in areas of the power sector that do not entail thermal generation.

Apart from BOT projects, a number of opportunities for private sector participation have become available, such as the following:

- partial or full sales of existing generation assets (for example, the sale of a 26 percent interest in the Kot Addu power plant in Pakistan);

- medium-sized hydroelectric projects (for example, Kimti Kola in Nepal);

- privatization of distribution (for example, the leasing of existing distribution units in the state of Orissa, India as part of overall state-level reform);

- privatization of management (for example, the KEPCO contract to take over the management and operation of the Malaya power plant in the Philippines); and

- direct sales of shares in electric utilities (for example, in Meralco in the Philippines).

Developing bankable projects

The high-level Jakarta conference on infrastructure, convened by APEC (Asia-Pacific Economic Cooperation) in September 1996, came to the surprising consensus that there was no shortage of funds—to finance debt or equity investments—in the power sector; instead, what was missing

were good, bankable projects. Some steps that could make such projects more attractive to lenders are the following:

- Reducing project costs by introducing better management: in various industries, companies have found that adopting the world's best practices in capital management and choice of technology can reduce their capital costs by 15–45 percent.

- Using domestic fuels instead of imported coal, or using waste gases from nearby industries.

- Reducing complexity to lower costs: rather than shifting risk to other parties, total project risk should be reduced through backward integration—moving into the acquisition of fuel supplies—and/or forward integration—moving into the distribution of power to industrial consumers and creating alliances with others to develop portfolios including more projects.

- Focusing on smaller projects: current technology used to generate power can be economic at around 50 MW. When projects are small scale, it is easier to secure financing for them; quicker execution is possible; and social and environmental dislocations may be more easily handled. Rather than constructing a single large project, developers may wish to consider building a portfolio of smaller projects in a country or across the region.

- Reducing risk instead of allocating it: developers need to work with governments to reduce the total risk on a project during both its construction and its operational life. Some of the measures that both parties can agree upon toward this end are specifying single stop clearances, putting together better bid packages, sharing the costs of bid preparation, and using guarantees and escrow accounts.

Conclusions

Asian countries face a major challenge as they seek to upgrade their infrastructures while their economies are growing rapidly. Given the various constraints on governments—primarily financial ones—in the region, private participation in infrastructure is likely to increase sharply. Most Asian governments have recognized the importance of changing their policies and creating an environment conducive to sustainable private sector involvement in their infrastructure sectors. But the reform of these sectors—including significant institutional changes—needs to be accelerated, and private developers need to develop more flexible, innovative, and realistic project designs and concepts. **F&D**