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ASIA'S ELECTRICITY CRUNCH, POLICY-MAKING AND THE IPP SOLUTION

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A lack of electric power continues to constrain the economic growth of Asia's developing countries. Traditionally, the state-run power sector tends to be manipulated by domestic politics in regard to the size, cost, output pricing, financing, and location of new plants. As a result, when recession hits, generator construction and planning literally grind to a halt, exacerbating economic conditions and slowing recovery. In this paper, an alternative to the cyclical frustration of unwieldy state projects is explored. Privately-owned Independent Power Producers (IPPs) can provide developing Asian countries with power plants and related infrastructure specifically tailored to local demand, fuel sources, and financing capacity. Additionally, IPPs can assume risks in project management, construction, technology, and financing that developing world governments and their state power sectors are ill-equipped to handle. Current power sector policy-making in Asia's developing countries tends to overlook the benefits of international IPPs in favor of political and security interests that, in fact, impede economic growth. Furthermore, governments need to install a credible and transparent regulatory and policy mechanism for the power sector that encourages private participation and investment.

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INTRODUCTION

Governments throughout developing Asia face a vicious circle of development needs requiring power, and the power sector lacks the investment, technology, and market know-how that development brings. Unfortunately, traditional power sector planning has not been able to resolve this conundrum, leaving an expansive gap between power needs and supply. A solution, however, is at hand: Independent Power Producers (IPPs) and their engineering, procurement, and construction (EPC) partners represent a flexible growth option to the governments of developing markets in energy hungry East Asia by providing smaller scale plants tailored for local conditions, world-class equipment, and international financing connections. The practice of adjusting power policy for recessions, national security issues, local interests, and even international politics undermines foreign participation and investment in the sector. Independent power project construction is a feasible solution to traditional public sector efforts, and, therefore, developing Asia's policy makers should smooth the way for IPP participation.

THE POWER CRUNCH IN DEVELOPING ASIA

Demand is escalating across Asia in primary energy consumption and electricity generation, jumping 160 percent and 189 percent respectively between 1986 and 1996. By way of comparison, North America consumed 1.26 times its 1986 primary energy level in 1996 and produced 1.42 times more electricity; the Middle East (186 percent) and Central/South America (152 percent) recorded the second and third greatest generation gains, consuming about 50 percent more primary energy in the process (EIAa). While no region comes close to touching the energy or economic growth levels of Asia in the past few decades, developing Asia's supply of electricity remains insufficient to support efficient growth, even in the go-slow period of the present financial crisis.

Annual GNP growth rates have slowed in Asia recently, reducing power sector development but not significantly impacting the demand for electricity. The increasing gap between power demand and supply—the electric energy crunch—is a consequence of feeble power sector architecture, slow policy reform, and the traditional practice of squeezing utility profits for economic development. Traditionally, electric power has been a resource prone to political manipulation. In addition to granting official appointments, plant contracts, and employment opportunities to friends and associates, politicians in many developing countries have pursued cheap energy policies for big business interests. In this scenario, electric

utilities' profits are squeezed by mandated price ceilings to promote economic growth. The implicit costs of this activity, including the opportunity costs of capital and chronic under-investment in existing infrastructure, and the explicit costs of lower debt ratings and higher interest payments drive the overall costs of generation up. Certainly foreign investors, as potentially significant players in many new projects, will not be convinced to enter into the market under these conditions.

In the last decade, authorities in developing Asia have approached industry reform in different ways to match power growth to economic development. Two policy camps seem to be taking root in developing Asia's power sectors: opening reformers and self-sufficiency advocates.

Two Power Policy Schools of Thought

Opening reformers have to some extent eliminated barriers to foreign competition in domestic power production and construction and actively support regulations that encourage foreign investment in the sector. At the other end of the spectrum, self-sufficiency advocates promote internal solutions to power sector problems. Governments in these countries often find it expedient to keep competition to a minimum for political or economic purposes.

Opening and reform efforts have been most actively pursued in Thailand, Malaysia, and the Philippines. Indonesia, Bangladesh, China, and India have also begun to alter the traditional paradigm of power sector management, choosing some degree of power sector opening and market-orientation as a formula for success. Policies have usually focused on government re-prioritization of energy needs in the competition for fiscal resources, efforts to attract foreign investment and foreign partner participation, increased local partner participation, a transparent regulatory regime, fuel source diversification, and, in some cases, market-oriented approaches to power sector management.

The implementation of these reforms has produced mixed results, and in general terms even those countries previously committed to economic liberalization have wavered since the crisis appeared. Even Malaysia, Thailand, and the Philippines have since stalled the process of restructuring, deregulating, and sometimes privatizing their power generating systems. The crisis has forced policy makers to re-evaluate, and in some cases retreat from, opening and market reforms.

Malaysia and Thailand have led their peers in generating capacity increases in the last decade (EIAb). With the onset of the Asian financial crisis, however, Malaysia has resorted to traditional power sector manage-

ment techniques, putting pressure on utilities, including foreign IPPs, to lower rates for the sake of business. In Thailand, the state generating authority has suffered a 53 percent decline in annual profits from 1997 to 1998 as a result of government orders to cut tariff rates, although some of the Thai authority's prior international loan commitments strictly preclude it (Luce 1999).

China, long an adherent of *ziji zicu* self-sufficiency strategies in development, seemed to be switching camps until electricity consumption and output declined in late 1998 (*Milwaukee Journal* 1998). In December, the government mandated that power sector restructuring now be done with local equipment in order to trim imports and stimulate domestic industry (Bangsberg 1998). The current five year plan indicates that electric generation needs will jump from 200,000 megawatts (Mw) to 300,000Mw by 2000, at a cost of $100 billion. Twenty to twenty five billion dollars of this is expected to come from foreign sources (Halasz et al 1996), which the central government is vigorously trying to attract through two 1997 initiatives: the Build Operate Transfer program and the Measures on the Administration of International Project Finance.

China's impressive gains in power generation have significantly outperformed the Indian model in the last ten years. Despite Delhi's 1992 "fast-track" approval and opening programs, the Indian sector has added about five percent a year in kilowatt hours (kWh) as compared to eleven percent annually in China. Indeed, a 1997 Indian power ministry report noted that "power shortages are likely to accentuate in the next three years," because only 11,000 of the needed 40,000Mw will come on line in this period (Nicholson 1997, 6) in the face of provincial opposition. Similarly, Bangladesh announced a major power reform in 1995 to encourage foreign participation in funding and construction of 2,300Mw capacity by 2000 (Independent Power Report 1995) and has not yet reaped significant capital inflows or power development.

On the other side of the fence are countries like Vietnam, Mongolia, and to a lesser extent, Pakistan, which have pursued self-sufficient development. These countries' power sectors are typified by limited foreign capital and construction, cumbersome state power ministries, and politically-oriented project planning. Vietnam, which currently lacks raw and refined fuels (although its South China Sea share has been valued at 600 billion barrels of proven reserves and 6 trillion cubic feet of gas) has recently ignored two foreign consortia recommendations on a new refinery location in favor of the regime's vastly more expensive Dung Quat site (Birchall 1998). Plans to increase generation by 17.5 percent a year to 50

billion kWh by 2012 (from 15 billion kilowatt hours in 1996) seem almost unattainable without a consistent supply of fuel and investment.
In Pakistan, where foreign participation in any sector inspires emotional demonstrations, planners estimate the country will need about fourteen to eighteen thousand megawatts of capacity by 2010, but the state sector is not equipped to provide the growth. Sadly, the government lacks the political support and policy direction to open the power sector to more than minimal foreign participation. Although Karachi promulgated a limited set of reform measures recently to appease the World Bank, it is not clear how committed the government is to these new regulations, nor how committed it is to the independence of the power sector in the face of the Asian crisis. Six IPPs in Pakistan have been threatened with intent of termination notices, and several other projects under construction have been suspended (Gray 1998) because their dollar denominated power purchase agreements (PPAs) have become 25 percent more expensive in terms of the rupee paid by domestic customers.

Mongolia, which returned the communist party to government in 1997 after a tumultuous encounter with market reforms, has also sidelined reforms. The previous government's efforts to establish a market-oriented power sector were thwarted by the incoming communists, an action that lost the country some substantial Asian Development Bank loans. Not surprisingly, the Mongolian power system has actually seen a yearly reduction in generation capacity since 1989 (EIAc), an inescapable indictment of state sector management.

In conclusion, some countries have been more successful than others in escaping the vicious circle of economic growth and power development. From the evidence, it appears that the ability of countries to free themselves of this problem in the future rests heavily on a consistent and effective opening and market reform policy today.

The Asian Financial Crisis: Throwing a Wrench in the Works

The crisis has barely reduced long-term demand forecasts for electricity while diminishing the Asian state sector's ability to invest in new power projects. Bureaucrats battling with depreciated currencies and capital flight have not inspired investor confidence by meddling in power sector affairs. Adding to this mess, capital markets, wary of developing world IPP ventures since late 1997, were scarred again recently by the Russian debt moratorium.

Many developing Asian states have seen current accounts go into deficit as their national currencies erode, making it difficult to finance fuel imports or power projects. Borrowing in dollars has become an impossibly risky venture, and few developing Asian governments, aside from Malaysia, have been able to finance in local currency (Gray 1998). Furthermore, recent increases in interest rates to limit capital flight have also stymied planned power project construction.

In short, the Asian power industry is in turmoil. Besides encouraging under-investment within the power sector, the Asian crisis has also spurred capital exit. Contract re-negotiations have become common between utilities and those plants with IPP operators or owners throughout Asia, because original price forecasts embedded in PPAs were built on higher barrel prices. In Pakistan, Malaysia, and Indonesia, governments have simply bullied the IPPs into taking lower prices for their electricity production. In Thailand, the state utility racked up record losses and froze all dealings with IPPs (Power Technology 1998). The Pakistani government ordered nine IPPs to cut rates (Petroleum Times 1998) and called in the army to run its loss-stricken national utility corporation in December 1998 (Nicholson 1998). Manhandling the industry, however, simply reinforces financial market fears of investing in these countries' power sectors and causes an exodus of capital from the power industry when it needs to be growing.

Additionally, the depressive influence of the crisis on oil prices has discouraged fuel source diversification plans in Asia. Cheaper oil creates a reluctance to develop new fuel sources, a sentiment reinforced by weak Asian currencies. Coal-dependent countries like India and China will be less likely to reduce emissions by substituting natural gas for low-quality brown coal, and energy efficiency will take longer to improve as a result. Net investment in hydro, nuclear, liquid natural gas, and natural gas projects will naturally fall off as oil-fired investments prove more profitable at ten to twelve dollars a barrel. Economic theory dictates that newly formulated environmental policies and energy-efficient gas plant programs will both suffer under-investment. This predisposition for oil consumption ultimately leads to long-term distortions in fuel source diversity, and could even present policy-makers with major fuel security issues, such as the defense of sea-lanes connecting Asia to the Middle East.

Whether or not the crisis will endure is still a matter of dispute, but it is possible to imagine a worst case scenario in which foreign IPPs and their Asian clients may no longer be able to raise equity for projects due to lack

of investor confidence. In similar circumstances during the Tequila crisis of 1994, many IPPs spent periods varying from several months to a couple of years trying to re-establish capital financing for developing world projects (International Trade Finance 1995).

IPPs and EPCs: What the International Private Sector Can Offer Asia

Independent power producers engage in the building of electrical generation facilities for industrial, commercial, and residential use. Many IPPs are based in the United States, where stateside power deregulation in the Reagan era has led to a spot market for electricity. Big U.S. players in Asia include Edison Mission of Southern California, Southern Energy, Duke Power (now owned by EPC Fluor Daniel), CalEnergy, Oxbow Power, and Enron. European firms also have a stake in this competition, including the Belgian Tractabel, UK National Power, and French-owned Sithe and EDF. Large-scale Japanese manufacturers like Mitsubishi have also been active in the IPP market, while Korean companies such as Lucky Goldstar have participated as suppliers in power plant consortia for at least a decade. It is likely that Korean, Japanese, and Hong Kong-based companies like Hopewell will take larger shares of the Asian IPP market in the future. Many other firms, including turbine producers Siemens/Westinghouse, ABB, and G.E., and EPC interests (e.g., Bechtel or Fluor Daniel), play a significant role in construction, as do financial institutions, government ministries, resource suppliers, and host utilities. These firms can construct economically feasible plants for a variety of fuel sources, recommend or obtain financing, and perform maintenance in the post-construction phase. In a nutshell, the foreign IPPs' or EPCs' expertise lies not only in technology but also in business operations and financial connections. While cumbersome state power bureaucracies tend to think big and finance on the run, if at all, IPPs will build smaller, more efficient plants that economize the use of resources and capital while tailoring plants to demand.

Examples of public sector resource misallocation abound in the global power industry: Brazilian hydro plants working far from capacity in the remote interior, Paraguayan generators being abandoned for lack of funds (Hines 1998), and Vietnamese plans to construct multiple nuclear reactors in the near future despite a lack of capital and grid infrastructure (EIAd). IPPs are often more capable of handling fuel supply arrangements, analyzing demand issues, and constructing the plants than government ministries. Additionally, they can provide financing avenues in global

capital markets and vital "operation and maintenance" knowledge to cash-strapped, technology-poor host governments.

IPP Financing Advantages

The positive experience generated globally by IPPs over the past decade has permitted a broader array of ownership options, such as "build own and operate" (BOO), "build lease and transfer" (BLT) as well as the more popular "build operate and transfer" (BOT), among other models. These models provide the IPP, its customer, and the financing entities with a new way of sharing risk and rewards. At the same time, these ownership formulas can overcome host country regulatory aversion to foreign involvement in the power sector.

Funding can be derived from traditional project finance sources, such as commercial banks, public sector bond issues, and multilateral agencies, or from newer sources such as international capital markets, where governments may not be welcome for political risk or creditworthiness issues. Certainly, borrowing on international capital markets does decrease the borrower's flexibility, as tenors tend to be too long (from 15 to 25 years) for IPP planners to adequately forecast future income streams and repayment probabilities, and transaction costs of changing payment terms are high. However, securitization concepts in capital markets have also created flexibility by encouraging new forms of financing to replace company equity, so that an IPP can, in effect, issue subordinated debt based on its corporate cash flows instead of raising funds specific to a risky project (Meyers 1998). Enron's work in Dabhol, India, for example, managed to survive unilateral U.S. sanctions in the aftermath of the nuclear testing imbroglio by substituting this company-side financing for U.S. Exim bank funds.

As an IPP with global credentials, Enron International was able to borrow capital market subordinated debt on its name, at rates derived from the holding company's credit rating. In these circumstances, an Indian state-owned utility would have been forced to accept marginally higher rates associated with international evaluations of the nation's sovereign and political risk. Creative financing by IPPs therefore diminishes some of the financial burden of project risk by reducing the cost of funds.

The U.S. Securities and Exchange Commission's (SEC) Rule 144a program provides another alternative for American and international IPPs to finance projects which foreign governments and state-owned companies cannot tap. The SEC 144a program allows for private, prearranged

equity sales to sophisticated, qualified buyers—usually large institutional investors—without the hassles of official SEC registration. These notes are rated and can be tendered for secondary market sale, adding some degree of reliability and liquidity as an incentive to institutional investors (Barr 1995). In short, the option to use a private placement program like SEC 144a gives IPPs an additional advantage in raising funds for projects deemed unattractive to open market investors.

Political Barriers to IPP Entry

Both domestic and international politics can play a pivotal role in the growth of the power sector. Often, the involvement of politics in project financing and planning can distort the outcome, leaving the power system in a less than optimal position to suffice demand. Occasionally, international politics can also have a positive effect, by providing the leverage necessary to maintain an open and transparent regulatory system, and by assisting the IPP deal process through domestic political barriers.

Domestic Politics

Corruption, political intrigue over resources, environmental or Not In My Backyard (NIMBY) measures, perception of future needs among government officials, other development priorities and agendas, and civil unrest can effectively prevent power plants from being built.

The massive sums of money involved in power projects render them vulnerable to corruption. In 1994, for example, the government of Malaysia banned British firms from participating in government contract bids after British newspapers accused Malaysian officials of requiring bribes for large-scale projects (Independent Power Report 1994). The best efforts of Prime Minister Mahatir to defend his bureaucrats only served to cloud the image of Malaysian regulatory affairs among foreign investors and power sector players.

Certain IPPs manipulate corrupt regulatory systems in innovative ways. Enron, for example, casually uses the term "consulting" to cover the fees required by influential local leaders (Hines 1998). This shady feature of the business does nothing to improve the reputation of IPPs abroad, and in fact, hinders the reform process.

On the legal side, contract enforcement, dispute arbitration, and protection of intellectual property rights can all become sources of dispute between IPPs, EPCs, and the contracting entity. In Turkey, for example, constitutional laws recognizing power as a public good have been used by the Turkish supreme court to invalidate BOT contracts, denying foreign IPPs the right to fair arbitration.

International Politics

International politics can intervene in the power project selection process in several ways, from security issues to sanctions, debtor-creditor state politics, and even via International Monetary Fund lending provisos. For better or for worse, security issues play an important role at every step of the project planning process. The decision to import fuel supplies for the power sector is often conditioned by a nation's foreign policy. In China's case, national security concerns may force southern China-based IPPs to use poor quality domestic coal, instead of Saudi oil or Australian coal, since the Beijing government has reservations about U.S. control of sea-lanes and a political fetish for self-sufficiency. Beijing planners have subsequently preferred large-scale hydro and nuclear projects to fossil fuels, suppressing the market for IPP solutions and failing to account for the dynamics of future electricity demand. Funding these huge public works, such as the Three Gorges, which will cost between $40 and $60 billion (Lu 1993), also carries a long-term interest burden for the government. A private, market-funded series of smaller plants would be more appropriate for the cash-strapped central government, but instead perceptions of a security threat are guiding power policy.

U.N. or U.S. sanctions can also turn power project planning upside down, as Enron's experience in the Dabhol, India plant project proves. After Delhi's dabbling in the nuclear realm in May 1998, President Clinton announced sweeping sanctions which encompassed federal financial support for several power projects. Luckily for Enron, the company's reputation allowed it to borrow capital market subordinated debt to replace withdrawn Exim Bank funds (Gray 1998). The costs of doing business in a pariah state are very high; bankers will not want to take on the challenge of political and sovereign risk for the outlaw states without massive returns and limited exposure.

Multilateral borrowing, while attractive in terms of rates, requires accounting transparency that creditor governments promoting large-scale state power projects may not desire. An IPP, on the other hand, can only benefit from increased, multilateral-certified transparency, which makes the job of project finance far easier.

The IMF can also represent a hurdle to project financing. The IMF may prohibit a client country from borrowing above a certain limit, which can make it difficult for governments to approve any traditional project finance. IPPs, however, can employ BOT or other ownership measures to avoid increasing host country loan obligations. Ironically, some government officials and politicians, particularly in Turkey and China, still oppose BOT contracts as foreign encroachment upon national interests.

International politics can also positively affect the IPP process. Bilateral exchanges tend to facilitate the signing of IPP contracts; there is almost a magic to the "royal visit" of an OECD leader to a developing Asian country, which encourages a flurry of memoranda, letters of intent, and deal confirmations. For example, the Jiang-Clinton summit in summer of 1998 resulted in several power plant deals being signed, including G.E. turbine sales to a $1.5 billion plant in Hainan and an Oxbow Power/ Sithe Energies venture to build a $415 million plant in Zhejiang (Harding 1998).

RECOMMENDATIONS

In the wake of the Asian financial crisis, the downswing of investment in Asia has hobbled the power sector and will effectively make it a stumbling block to recovery. Two policy practices to avoid this power-development vicious circle can be identified. Firstly, IPP participation should be encouraged, because the economic costs of not doing so far outweigh the political costs. Secondly, the governments of developing Asian countries should maintain a transparent and incorruptible regulatory and policy direction in the power sector. This direction will in turn foster interest and confidence among IPPs, EPCs, and the international investment community for developing Asia's needs.

The Merits of IPPs Outweigh the Political Costs

Privatization, or even foreign participation, in the power sector can be a potentially embarrassing problem for an incumbent government. Opponents can use nationalist sentiment to topple those politicians viewed as being hand in glove with the foreigner. While this may be true, the governments of developing Asia have tools at their disposal to sway public opinion and should use them.

Similarly, international politics should not remain an insurmountable barrier to IPP entry. From a fuel security standpoint, IPP plants can form a convenient defense against fuel supply variability, because their fuel sources can be tailored to the market initially and in some cases overhauled to reflect changing fuel availability. Furthermore, by entering into power purchase agreements with IPPs, governments can allow these firms to assume fuel supply risks. From a national security perspective, foreign IPP participation in the power sector may be threatening. However, BOT contracts can be structured to transfer ownership of plants without necessarily forfeiting IPP operations and maintenance expertise.

The success of IPPs in the developed world is too significant to ignore for

political reasons. From a regulatory perspective, the countries of developing Asia have the opportunity to skip a generation by applying the lessons of IPP participation in U.S. and European power sector de-regulation to their own circumstances. On the supply side, IPPs in Europe and the United States have already accumulated extensive knowledge of plant renovation that could be exported to Asia.

Governments that abandon opening and market reforms in the power sector leave their citizens with the cost of subsidizing cheap electricity at increasing costs of production in older, less-sophisticated plants run by state utilities. This is a long-term headache that far outweighs the political costs of inviting IPP participation, and therefore every effort should be made to encourage independent power activity.

Commitment to Opening and Market Reforms: Making the Sector Recession-Proof

To create an attractive investment environment and thereby overcome the obstacles of developing in isolation, policy makers should protect the planning, Foreign Direct Investment (FDI) approval, and power plant management stages of electric projects from political machinations. A series of quasi-judiciary bodies, run by commissioners who cannot be easily fired, is necessary for the purposes of reviewing project bids, resolving contract disputes, and eliminating bureaucratic graft. Transparent regulations governing the bidding process, IPP/EPC work, and subsequent plant ownership would also lower the financial and political risk of IPP projects and actually make electricity cheaper in the long run. If leaders make the power sector reforms both effective, consistent, and credible, IPPs will enter, forcing local generators to become more efficient in plant construction and operations. Consequently, generation capacity will not fall off so significantly in recessions, nor will the power sector later hinder recovery.

The purpose of this paper is certainly not to endorse immediate power privatization or wholesale foreign financing and construction in every environment but to outline ways to inject efficiency into the lagging power sectors of developing Asian countries. IPP plants do not need privatization to work effectively, but they can only serve so well in a badly managed system. On the other hand, with efficient, growing power infrastructure developed under market conditions, everyone will gain. Host country industries can expand, their citizens can make a better living, global resources will be better allocated, and everyone will live under cleaner skies. The remedy remains a simple idea with very difficult implementa-

tion: the permanent removal of political barriers to capital flows, foreign participation, and rational economic planning in ways appropriate to the domestic political context. The IPP solution can then take effect in all phases of the economic cycle.

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