



The Philippine power sector: issues and solutions

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The Philippine government acknowledges that reliable and affordable power is important to achieve economic development and reduce poverty. In fact, it has been at the forefront for a long time, providing generation and transmission services through the National Power Corporation (NPC). However, NPC failed to deliver and live up to its mandate of providing reliable and affordable electricity. The power crisis in the 1990s, the high cost of electricity, and NPC's financial difficulties led to the restructuring of the sector to save this ailing industry. This paper traces the evolution of the power sector, explores the events that brought it to insolvency, and discusses the issues that need to be addressed to restore operational and financial viability.

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1. Introduction

The power sector of the Philippines experienced impressive growth over the past century, from supplying electricity to only a few households in Manila at the turn of the 20th century, to about 20 percent of the population by the early 1950s, and to more than 70 percent today. Private enterprise managed much of the power sector in the earlier years, and electricity was available to consumers who were able and willing to pay the cost of having it. Although a much larger proportion of the population has access to electricity today,

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encouraged by subsidies and less than full cost recovery, much of the power sector is insolvent, with prospects of electricity shortages looming on the horizon.

Today's problems in the power sector can be traced back to events in the early 1970s, with the nationalization of the generation and transmission components of the power system and the regulation of the parts that were privately owned. Nationalization was in keeping with views at the time that the power system was a strategic asset and only the public sector could provide the large amounts of capital needed for investment in the generation, transmission, and distribution facilities. The fact that public ownership could lead to inefficiency, poor management decisions, and political interference was not considered, or at least, was not a concern.

The weak operational and financial performance of the main monopoly, the National Power Corporation (NPC), led to underinvestment in generation and transmission capacity and to eventual power blackouts throughout the country in the early 1990s. The usual approach to such problems is to recapitalize the main power sector entities with investment in new plant and equipment as part of a shorter-term solution. In the longer term, measures are implemented to deal with the underlying problems of inefficiency and weak management.

The government essentially took this approach in 2001 when it promulgated Republic Act (RA) 9136, the Electric Power Industry Reform Act (EPIRA). EPIRA allowed for restructuring of the power sector and relied on the private sector to provide the investment needed in the short term because of the government's weak fiscal position. To address longer-term issues, EPIRA required the government to introduce policy, institutional, and regulatory reforms. Some progress was made in implementing EPIRA, but much of the restructuring and reform agenda is still incomplete. Implementation of EPIRA was delayed by excessive politics, regulatory bottlenecks, and poor institutional coordination among concerned government agencies. As a result, the NPC's financial losses continued to grow, further aggravating the fiscal position of the government and increasing the risk of another power sector crisis in the near future.

This paper has two objectives. The first is to shed light on historical events that led to the power crisis in the 1990s and the government's response to it. It illustrates how politics can influence decision making to the detriment of an efficiently operated power sector and jeopardize the economic well-being of a country. It also contextualizes the need to restructure the sector. The second

is to spell out the key issues and policy challenges that must be addressed to prevent the recurrence of a power crisis and usher in a successful restructuring of the industry, as envisioned by EPIRA. This paper is organized as follows: section 2 traces the history of the power sector, its emergence, growth, and eventual decline. Section 3 discusses the key issues and suggests policy responses to overcome obstacles to the restructuring. Section 4 concludes and sums up the policy recommendations.

2. Historical overview of the power sector

2.1. The early years

Electricity was first introduced in the Philippines in 1890 with the installation of three electric arc lamps in Escolta, Manila, and the first power station was built in 1895. In 1901, Manila Electric Light and Railroad Company (Meralco) took over the franchise for providing electricity to Manila and 57 municipalities around the city. Private electric utilities were also established during this period in other major cities and towns throughout the country.

In 1936, the government enacted Commonwealth Act 120, creating NPC for the purpose of developing the country's hydroelectric potential. NPC started operations in 1937, developing feasibility studies for hydroelectric plants in different parts of the country. In 1939, NPC constructed its first project, the 8 MW Caliraya Storage Hydro Power Station in Lumban, Laguna. NPC continued to build other hydropower facilities,¹ and by 1956 NPC generation accounted for about one-third of the country's total generation capacity. The remaining two-thirds was in the hands of 336 private and municipally owned electric utilities, of which Meralco was the largest, accounting for 990 MW of 1,745.5 MW total demand [Cabrera 1992]. Most of this private generating capacity was thermal plant. NPC acquired Meralco's generation and distribution systems outside Manila in 1953 when Meralco decided to concentrate its electricity business in the Manila area.

Only about 20 percent of the population enjoyed the benefits of electrification in the early 1950s, concentrated mostly in and around Manila. The performance of electric utilities outside Manila was poor, operating for only limited number of hours each day. The transmission system was inadequate and it was difficult to transmit electricity between Luzon and the Visayas, and

¹ Major projects included Ambuklao (75 MW), Lomot (32 MW), Maria Cristina (25 MW), and Agus (25 MW). Minihydro projects in the island provinces included Buhi-Baritan in Camarines Sur, Loboc in Bohol, and Agusan in Agusan.

the Visayas and Mindanao. The government recognized the need to expand electrification to a greater part of the country and created the Electrification Administration (EA) in 1960. The government also encouraged the private sector in setting up power distribution systems in the rural areas by awarding franchises. Electricity was sourced from privately owned generating plants or through bulk purchases of electricity from NPC. The performance of these private sector electricity providers was generally poor. Private generators served only small communities for 6-12 hours per day, typically only for lighting. Distribution systems were unreliable, with power outages occurring for days and often weeks at a time. After a decade of rural electrification, only about 23 percent of the population had access to electricity. Technical and financial problems eventually caused many private distributors to cease operations.

In response, the government enacted the National Electrification Act in 1969 and created the National Electrification Administration (NEA) to replace EA. The law authorized NEA to establish and regulate rural electric cooperatives (RECs) for distributing electricity in the rural areas. It also authorized NEA to grant loans, acquire physical property and franchise rights, and borrow funds to implement the national electrification program. Under the national electrification program, NEA defined the franchise area of each REC, paid for the construction of the distribution network, and then devolved ownership of the distribution network to the REC. RECs were responsible for meeting operational expenses and loan repayments to NEA from tariff revenue collected.

Strong government support and financial assistance from donors, as well as from international commercial banks, facilitated the expansion of the rural electrification program during the 1970s and 1980s [Denton 1979]. Investments undertaken by the government through NPC and NEA resulted in a 50 percent electrification rate in rural areas. However, the rapid expansion created problems for both NEA and the RECs. Political patronage and pressure created financially nonviable RECs, and tariffs were set unrealistically low. Collection efficiency was weak, and the distribution systems were poorly operated and maintained. As a result, NEA became financially insolvent in 1989. Although the government subsequently restructured NEA and reviewed its policies in the 1990s, the financial and management problems were never resolved until today.

During the 1960s and 1970s, the demand for electricity grew rapidly in step with rapid population and economic growth. To keep pace, NPC pursued an aggressive power development program, financed largely by foreign borrowing. A fixed exchange rate regime benefited NPC from a stable peso-dollar exchange rate. In 1972 the government enacted Presidential Decree 40

to nationalize the Philippines' power sector. The government established NPC as a monopoly in power generation and transmission and purchased Meralco's generating capacity. Private sector generation operated in regions outside Manila at the discretion of NPC. In 1977, NPC began the construction of the 2x600 MW Bataan Nuclear Power Plant at a cost of US\$ 1.9 billion. Although the project was completed in 1984, it was never operated because of safety concerns.

During the 1970s, the government pursued loose fiscal and monetary policies, and the fixed exchange rate system collapsed. Consequently, the central bank shifted to a managed floating exchange rate. This resulted in a depreciation of the peso and a substantial increase in interest expenses on NPC's foreign loans that subsequently led to financial losses in 1970 and 1971. Rapidly increasing fuel prices also increased NPC's operating expenses. However, with the retreat of oil prices and tariff increases in 1972, NPC returned to profitability. Profitability further improved when the government implemented a policy of reducing reliance on imported oil by developing the Philippines' abundant geothermal resources. This reduced the share of oil-based power plants from 80 percent in 1977 to 59 percent in 1982. The experience with high oil prices in the early 1970s underscored a need for a strong institution to manage the country's energy needs. Presidential Decree 1206 directed the government to create the Department of Energy (DOE) in 1977 to formulate, coordinate, and implement the country's energy resource development program. NPC was placed under the purview of the DOE for better policy coordination and integration of the power development program.

In 1983, NPC began to experience cash-flow problems again because of an economic and political crisis in the country. The government's austerity measures and its decision to declare a moratorium on the payment of its foreign obligations resulted in a shortage of foreign financing for the construction of NPC's ongoing projects. NPC's financial performance deteriorated as its foreign-denominated expenses, such as fuel costs, increased dramatically with the sharp depreciation of the peso and foreign exchange losses. NPC's operational performance also suffered. Between 1983 and 1986, the Luzon grid experienced six complete power system failures, and load shedding was a regular occurrence.

The return of economic and political stability in 1986 saw a renewal in investor confidence in the economy, with real gross domestic product (RGDP) growing at an average annual rate of 4.9 percent in the latter half of the 1980s. Strong economic growth accelerated the demand for electricity and hastened the need for new generation, transmission, and distribution capacity.

As part of its restructuring efforts, the government issued two executive orders (EOs) in 1987: EO 172 for the creation of the Energy Regulatory Board whose responsibilities included electricity tariff setting; and EO 215, which withdrew NPC's exclusive right to power generation, permitting private sector participation in the industry. As a result of EO 215, the first build-operate-transfer (BOT) agreement for a generation project between the private sector and NPC was signed in 1989.² In 1987, EO 193 replaced the DOE (renamed the Ministry of Energy in the late 1970s) with the Office of Energy Affairs, and in 1988 EO 338 created the Energy Coordinating Council. The reconstitution of the Ministry of Energy into these two independent governmental agencies had the effect of weakening the government's ability to adequately formulate policy, plan the development of the energy sector, coordinate activities of other energy agencies, and provide oversight to these agencies.

The rapid growth in the demand for electricity in the late 1980s and the lack of generating capacity precipitated a power crisis in the early 1990s. No new generating capacity was added to the system in the Luzon grid at the time because of the expectation that the Bataan Nuclear Power Plant would begin operation in 1984. NPC was also in a poor financial position as tariffs were not adjusted to keep in step with costs. Thus, internally generated resources were insufficient to finance new capacity. The existing generating plant was unable to meet the power requirements because it was nearing its maximum life. Installed generating capacities in the two major grids, Luzon and Mindanao, were operated at less than their nameplate ratings because of age. For example, in the Luzon grid, availability ranged from 2,300 to 3,100 MW against an installed capacity of 4,321 MW. Several older oil-fired thermal plants, used as base load, also broke down. With no new plant to supplement existing capacity, NPC ran its remaining plant to the maximum, which led to further breakdowns. Since NPC was in a weak financial position, rehabilitation and maintenance were on a piecemeal basis.

The power crisis precipitated an economic crisis. In 1990, there were 103 days of blackouts for an annual duration of 1,273 hours, resulting in 251 GWh of lost energy sales [World Bank 2003]. Daily 8- to 12-hour-long blackouts

² Republic Act (RA) 6957, the BOT Law, of 1991 complemented EO 215 by allowing the private sector to finance, construct, operate, and maintain infrastructure projects. The BOT Law was amended in 1994 by RA 7718 to include build-own-operate and build-transfer arrangements. Republic Act 7648, the Electric Power Crisis Act, was promulgated in 1993 to allow the president of the Philippines to enter into negotiated contracts for the construction, repair, rehabilitation, improvement, or maintenance of power plants, projects, and other facilities.

severely crippled the economy as factories were forced to close or reduce operations. Productivity fell and unemployment rate increased. To address the capacity shortfall, the government arranged for NPC to enter into fast-track power project contracts with the private sector, ending the power crisis in 1993. Between 1993 and 1996, NPC contracted about 1,600 MW of generating capacity from the private sector. By 1996, peak demand in the Luzon grid was about 4,600 MW while available capacity was 5,100 MW,³ and load shedding ceased.⁴ On the financial front, NPC had its most profitable year in 1994, followed by two more years of good profitability. Although the basic tariff did not change appreciably since 1993, strong electricity sales and automatic adjustments for fuel price and foreign exchange movements contributed to improvement in NPC's financial performance.

Meralco embarked on a similar program of contracting with independent power producers (IPPs) as a result of the power crisis in the early 1990s for supplying electricity to its franchise area. By 2002, Meralco contracted 2,038 MW of power from IPPs. In 1994-1996, Meralco's profitability also improved, primarily because of a tariff increase in 1994.

The power sector in the Philippines returned to normalcy by 1996 after the tumultuous 1990-1993 period. There was sufficient generating capacity to meet demand, with IPPs augmenting NPC's installed generation and Meralco's distribution needs. NPC's and Meralco's financial positions were stable, with both entities returning to profitability. The government assumed NPC's debt acquired from the ill-fated Bataan Nuclear Power Plant. NPC's diversification of generation away from thermal to renewables (geothermal) was successful and reduced NPC's and the country's reliance on imported energy. However, NPC's financial position was still weak because of decreasing profitability and rising debt load. Although the electrification rate rose to 70 percent by 1996, NEA and the rural electric cooperatives were still insolvent, and quality of service to rural consumers was poor.

2.2. The unraveling of the power sector: 1997-2004

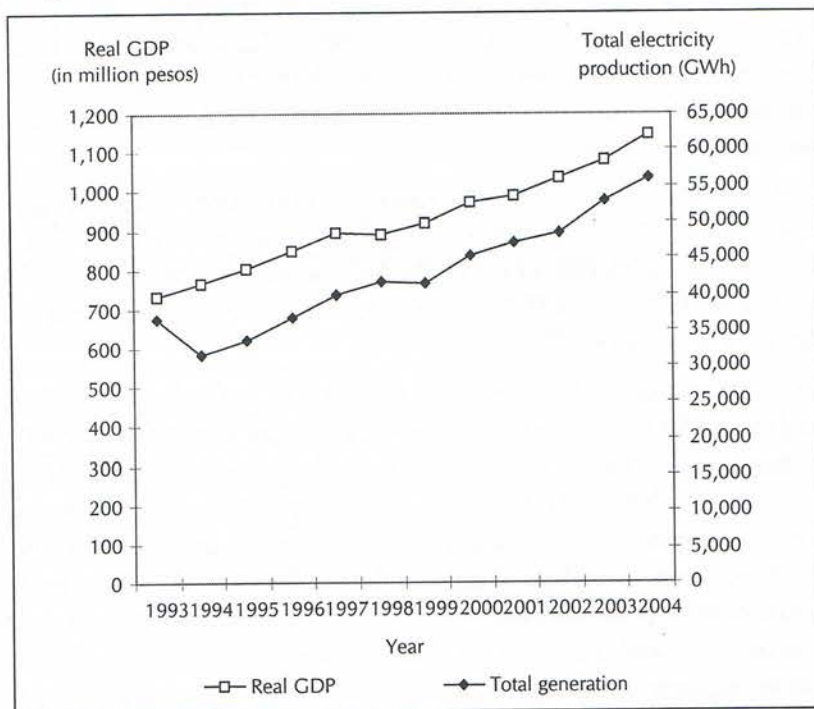
The return of the power sector to normalcy in 1993 was short-lived. Although the Philippines was not as severely affected, the 1997 Asian economic

³ Peak demands and available capacities in the Visayas and Mindanao in 1996 were 647 MW and 828 MW, and 877 MW and 1087 MW, respectively.

⁴ In 1992, the Department of Energy was also reestablished under Republic Act 7638 to improve management of the energy sector.

crisis had a contagion effect. Economic growth slowed, unemployment rose, and controls over credit and foreign exchange markets were tightened. The economic slowdown led to a decrease in the demand for electricity at a time when many IPPs were beginning to operate their newly commissioned power plants (Figure 1).

Figure 1. Real GDP and total electricity production, 1993-2004



Source: Department of Energy and the Asian Development Bank.

IPPs were shielded from the effects of the Asian economic crisis because of take-or-pay clauses in their contracts with NPC, together with government guarantees. Of the 35 IPP contracts with NPC, 27 had take-or-pay arrangements. The IPP facilities operated at an average plant factor of nearly 36 percent in the period 1991-2000, compared to a minimum contracted volume equivalent to 85 percent plant factor. Although NPC nominally assumed the risks of the IPP contracts, retail customers ultimately shouldered some of NPC's obligations. In 2002, NPC estimated that the stranded cost associated with the IPP contracts was Php 1.09 per kWh and submitted an application to the Energy Regulatory Commission (ERC) for a tariff adjustment in that amount. However, the

government interceded and capped the tariff increase at Php 0.40 per kWh, thus requiring NPC to absorb the balance of the stranded costs.

Sharp depreciations of the peso also took a heavy toll on NPC's finances (Table 1). The dollar-peso exchange rate fell from Php 26 to the dollar in 1996 to Php 44 to the dollar in 2000. In effect, all outstanding obligations incurred before the crisis doubled in peso terms. Together with the decline in electricity sales volume, NPC incurred a loss of Php 3.6 billion in 1998, compared to a profit of Php 3.1 billion the year earlier. Losses continued to escalate in succeeding years, reaching Php 117 billion by 2003. In 2004, electricity sales increased from stronger economic growth, but NPC still incurred a loss of Php 29.9 billion. NPC's losses occurred despite the tariff, at which NPC sold electricity to distributors, doubling in peso terms over the period 1997-2004.⁵ By 2003, accumulated losses eliminated NPC's equity capital from its balance sheet. Losses were financed with higher external borrowing, which further aggravated the debt problem. NPC's weak financial position affected its capacity to maintain and repair its plants, and invest in the expansion of the transmission system.

Table 1. Profitability and debt burden of NPC and Meralco, 1993-2004

Year	NPC		Meralco	
	Net profit/loss (in million pesos)	Debt/equity ratio ¹	Net profit/loss (in million pesos)	Debt/equity ratio
1993	1,365.2	2.3	1,631.0	1.0
1994	7,460.0	1.7	3,357.3	0.8
1995	3,193.8	1.9	4,411.0	0.9
1996	5,543.3	1.8	5,063.7	0.9
1997	3,053.7	2.3	5,765.1	1.0
1998	(3,617.3)	2.2	4,526.2	1.2
1999	(5,953.4)	2.6	4,941.0	1.2
2000	(12,963.8)	3.5	2,489.7	1.5
2001	(10,377.4)	4.4	1,480.5	1.6
2002	(33,735.0)	8.2	(2,015.0)	6.1
2003	(117,015.0)	- ²	1,267.0	5.2
2004	(29,901.1)	- ²	(2,610.0)	6.4

¹ Debt portion excludes capital lease obligations.

² Equity in 2003 and 2004 was negative.

Source: National Power Corporation and Meralco.

⁵ In dollar terms, the currency in which major expenses such as fuel, debt service, and lease obligations were denominated; the tariff increased by only 8.5 percent over the 1997-2004 period.

Meralco's financial position also began to deteriorate in the late 1990s because of rising costs and the absence of adjustments in Meralco's retail tariff, the last one approved in 1994. In 2002, Meralco posted a net loss of Php 2 billion, the first in its history. The 2003 outcome was more favorable as a number of regulatory issuances allowed Meralco to recover purchased power costs that were denied earlier. Meralco's fortunes turned for the worse again in 2004 as the judicial system halted the implementation of a tariff increase approved by ERC in November 2003 for 2004 implementation. Later that year, the courts annulled another tariff increase approved by ERC. Thus, in 2004, Meralco incurred a loss of Php 2.6 billion. The smaller distribution utilities in Mindanao and the Visayas—for example, Davao Light and Power, Cotabato Light and Power, Cagayan Electric, and Mactan Electric—shared Meralco's experience. In the absence of tariff increases to recover rising costs, profitability declined and internally generated funds were insufficient to finance capital expenditures and working capital requirements. Debt burden also increased.

The 1997 Asian economic crisis dealt the Philippines' power sector a severe setback and exposed its vulnerability to unforeseen external economic shocks because of excessive reliance on contracted power from IPPs and NPC's heavy debt load. Power sector problems were further aggravated by judicial and government interference in the regulatory process. By 2002, the sector was in financial disarray, with NPC insolvent, Meralco experiencing financial difficulties, and NEA unable to adequately manage the RECs in the rural and remote areas of the country. The government's immediate response to the sector's problems was to borrow on capital markets on behalf of NPC to cover shortfalls in cash flow and to finance ongoing capital projects. NPC's high debt burden and poor financial position weakened its ability to meet the future power needs of the country.

2.3. EPIRA and power sector reforms

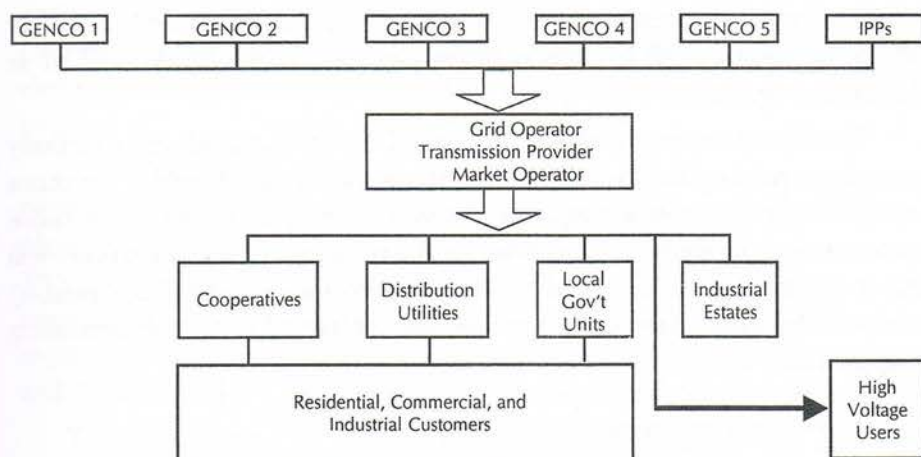
The government viewed restructuring and reform as the longer-term solution to the problems of the power sector. The large capital requirement for new generation capacity and expansion of the transmission and distribution network was estimated at an annual average of US\$ 1.0 billion. Given its own fiscal constraints, the government recognized the need for greater private sector involvement in the power sector. Although some private sector participation had been successfully introduced earlier, largely through BOT schemes between NPC and IPPs, the power sector was still largely a public monopoly and inefficient.

To improve the efficiency of the sector, Republic Act 9136, or the Electric Power Industry Reform Act, was passed in June 2001. Restructuring centered on (a) functional separation of generation and distribution sectors from the transmission function, (b) introduction of competition in generation, (c) access to the monopoly-owned transmission and distribution networks, and (d) tariff structure reforms. The key to the restructuring was separation of NPC's generation and transmission assets, followed by the privatization of these assets. Figure 2 illustrates the planned structure of the power sector.

2.3.1. Generation

Competition at the wholesale (generation) level was expected to improve efficiency in the operation of power plants and lower electricity prices. On the supply side, the wholesale electricity spot market (WESM) was to be composed of IPPs, privatized NPC generators, and generating plants not yet privatized. Electricity marketers/brokers will be allowed to participate to provide an arbitrage function. The demand side of the wholesale market will be composed of distribution companies, large commercial and industrial users, and aggregators.⁶ The interaction of the supply and demand sides of WESM will determine the wholesale prices for electricity.

Figure 2. Proposed power sector structure



Source: National Power Corporation.

⁶ Aggregators accumulate the load of small electricity consumers and bid in WESM on their behalf. The banding of small electricity consumers expands their choice of suppliers and lowers cost.

2.3.2. Transmission

NPC's transmission function was to be transferred to the National Transmission Corporation (TransCo). TransCo will have the authority and responsibility for the planning, construction, centralized operation, and maintenance of its high-voltage transmission facilities, including grid interconnections and ancillary services. It will not be permitted to participate in WESM as a buyer or seller of electricity. TransCo will earn revenues from regulated wheeling and access fees that it levies for facilitating the transmission of electricity from generators to end-users.

To enhance market competition, EPIRA requires that TransCo liberalize access to the transmission network by third parties. Third-party access will allow entry of new generators into the competitive market and allow greater consumer choice of supplier. Large consumers will be able to directly contract with third-party generators, bypassing distribution utilities.

2.3.3. Distribution

EPIRA mandates that distribution utilities also allow third parties to access to the distribution network. This will permit independent electricity generators, retailers, and aggregators to deliver electricity without owning the distribution infrastructure. Users will pay wheeling and access charges to the distribution utilities for the use of the distribution network. Third-party access to distribution is expected to eventually lead to retail competition. Consumer choice of supplier will be initially offered to customers with demand of at least one megawatt.

Third-party access at the transmission and distribution levels will effectively create two primary markets for electricity: (a) the regulated market for those consuming less than one megawatt and (b) the unregulated market or those consuming more than one megawatt. In the regulated market, end-users will pay a regulated price approved by ERC. In the unregulated (or contestable) market, large users of electricity will negotiate contracts directly with generating companies.

2.3.4. Tariffs and financial restructuring

EPIRA requires that electricity tariffs be unbundled to better reflect the costs of generating, transmitting, and distributing electricity. The intention of the unbundled bill is to help end-users identify the cost of the service they are using. A universal charge is to be imposed on all electricity end-users to cover various expenditures: (a) NPC's and qualified distribution utilities' stranded

debt and stranded contract costs, (b) electrification of some remote and rural areas, (c) equalization of taxes and royalties between indigenous and renewable energy resources, (d) environmental charge for rehabilitation and maintenance of watershed areas, and (e) mitigation fund for the removal of cross-subsidies. EPIRA legislation also provided for the removal of interregional, intraregional, and interclass cross subsidies to better reflect the actual cost of electricity. Low-income end-users who cannot afford to pay the full cost of electricity will be subsidized under a lifeline rate for a period of ten years after the removal of cross-subsidies.

To improve the financial viability of RECs, EPIRA directed the Private Sector Assets and Liability Management (PSALM) Corporation to assume all outstanding financial obligations of RECs within three years of its implementation. PSALM Corporation was also directed to renegotiate IPP contracts to reduce stranded contract costs.

2.4. Progress in restructuring the power sector

Restructuring of the power sector began in 2002 with the retrenchment of about 11,700 NPC employees and the unbundling of NPC's generation and transmission functions. The PSALM Corporation was established to facilitate the privatization of NPC's generation and transmission assets and to manage NPC's IPP contracts. NPC's transmission assets were reorganized under TransCo, and the Energy Regulatory Board was reconstituted as the Energy Regulatory Commission with expanded responsibilities for promoting competition in the electricity market, encouraging market development, and ensuring customer choice.

EPIRA required that 70 percent of total NPC-owned generating capacity be privatized within three years. To date, however, only five hydroelectric power plants and one coal-fired power plant have been sold to the private sector. The transfer of management and control of NPC's IPP contracts to IPP administrators, as provided by EPIRA, has not yet taken effect. EPIRA also requires that 70 percent of total energy output of power plants under contract with NPC located in Luzon and the Visayas be privatized within three years.

The privatization of the TransCo's transmission assets has also been delayed. PSALM conducted negotiations with four interested bidders in August 2004; however, the government decided to conduct public bidding for these assets to increase transparency of the process. Legal issues also arose regarding the award of the franchise for operating the transmission assets, which further delayed privatization. The sale of some subtransmission assets to qualified

distribution utilities began in 2004 with 13 subtransmission packages sold. The remaining subtransmission assets will continue to be operated by TransCo until their eventual disposal.

The Philippine Electricity Market Corporation (PEMC) was created to undertake preparatory work and initial operation of WESM. PEMC currently acts as the market operator in accordance to the WESM rules. Commercial operation of WESM in Luzon was expected to commence in the first quarter of 2006, and retail competition to follow in July 2006. Trial market operation in the Visayas is ongoing to test the rules, systems, and procedures, and ensure readiness of market participants.

ERC approved 93 percent of tariff unbundling cases submitted by distribution utilities and NPC. Two out of the five components of the universal charge—a charge for the electrification of remote and rural areas, and an environmental charge—are now being charged to consumers. PSALM is the administrator of the universal charge fund. The interregional tariff cross-subsidy was removed in 2002, followed by the removal of most intraregional grid cross-subsidies in 2003-2005.

PSALM renegotiated 18 of 35 IPP contracts for an estimated savings of about US\$ 1 billion.⁷ Of the remaining balance, nine contracts are still under negotiation and eight IPP contracts expired. PSALM also began to assume the financial obligations of RECs as required by EPIRA. As of 2005, PSALM paid Php 2.8 billion to NEA, local government units, and government financial institutions out of Php 18.1 billion owed by RECs.

3. Key issues in the power sector

Good planning, efficient operation, and sound regulation are key to a well-run power sector. These elements have not always been in place in the Philippines, particularly in the last 15 years. Although the government took some steps to address the most urgent issues in the sector with the EPIRA legislation, these measures have yet to produce tangible results and much still needs to be done to put the sector on a solid footing. The following are the main issues that need to be addressed.

3.1. Sector planning

Planning of the power system in the Philippines needs improvement. The ill-fated Bataan Nuclear Power Plant, the power crisis in the early 1990s, and

⁷ In net present value terms, discounted at 10 percent.

the response to the crisis indicate that the country's generation needs are inappropriately planned. Constraints in parts of the transmission system along with excess capacities in others also point to a need for better transmission system planning [ADB 2005a]. Since its establishment in 1977, DOE has had little opportunity to develop its oversight and policy formulation capacities because of numerous reorganizations and changes in its mandate. Inadequacies in the planning function and policy development indicate that institutional strengthening is needed to provide better guidance for the allocation of investment resources in the sector. This will be even more important now that the power sector is undergoing restructuring to a market orientation.

3.1.1. Demand forecasting

Before EPIRA, NPC was responsible for forecasting the demand for electricity; DOE assumed the responsibility thereafter. Both NPC and DOE followed similar approaches to forecasting electricity demand. For Luzon, the approach essentially comprised projecting demand based on forecasts of real gross domestic product for each province, adjusting for income elasticity. A similar approach was used to forecast electricity demand for the main consumer classes in the Meralco service area. DOE later refined the methodology by considering population and other economic variables, and integrating peak load forecasts provided by the distribution utilities. For the Visayas and Mindanao, DOE changed the approach to aggregating peak demands provided by distribution utilities and directly connected consumers, adjusting for the coincidence factor.

The use of this "top-down" approach has not been successful in forecasting electricity demand with reasonable accuracy. Forecasts have typically overestimated demand by large margins that eventually led to surplus capacities in the generation and transmission system. The reasons for this are threefold. Real gross domestic product forecasts were often too optimistic and overestimated future economic growth. Income elasticities were simple measures of historical changes of electricity demand relative to changes in RGDP. Since the effects of other economic variables were not removed, income elasticities were also overestimated. Forecasts did not take into sufficient account the different consumption behavioral characteristics of the electricity consumer classes in the regions.

DOE should modify its approach to electricity demand forecasting and consider adopting a "bottom-up" approach that would better reflect regional parameters and consumer behavioral characteristics. At the first level, electricity

demand forecasts should be prepared separately for each independent grid: Luzon, Visayas, and Mindanao. At the second level, within each grid, electricity demand forecasts should be prepared for each major consumer group—for example, domestic, commercial/small industrial, large industrial/government—and any other consumer group that may be explicitly identified.

The forecasting methodology for each consumer classification should reflect the specific characteristics of the consumer class and data availability. For example, domestic electricity demand (that is, electricity sold and consumed) is usually best forecast on the basis of data at the household level. Electricity demand of a representative household may be modeled econometrically with income, the price of electricity, and household size as the principal determinants of demand. Data for such econometric modeling are typically obtained from surveys. Judicious assumptions of the future value of these demand determinants along with assumptions in the growth of the size of the domestic market based on distribution system expansion plans will provide a forecast of electricity demand for the representative household that can then be aggregated to a market level.

Electricity demand for commercial and small industrial consumers is best modeled econometrically at the market level because of the heterogeneity of sizes and load characteristics. Output (proxied by regional RGDP) and the price of electricity will likely be the principal determinants of demand. Again, judicious assumptions of the future value of these determinants will provide a forecast of electricity demand for the commercial/small industrial market. Total electricity demand for large industrial and government institutions is usually best forecast by aggregating the demand expectations of individual consumers based on surveys.

Total electricity demand for the grid in any year is the sum of the demands of domestic, commercial/small industrial, large industrial/government, and any other consumer groups. The amount of electricity needed to be generated is this total demand adjusted for expected system losses (technical and nontechnical). Peak demand may then be derived by applying the system load factor to total electricity generated.⁸

This methodology for forecasting the power requirements of the Philippines should improve the accuracy of the forecasts. To implement the suggested methodology, DOE will likely need to increase the number of staff responsible for forecasting and change the skill mix to strengthen its capacity

⁸ Peak demand is calculated by the formula $MW = MWh \text{ generated} / (8760 \times \text{system load factor})$.

in statistical analysis and surveying. Fortunately, these skills are available in the Philippines, and a relatively small investment in them should result in large paybacks in terms of greater efficiency in the utilization of the Philippines' scarce investment resources. Multilateral or bilateral donor institutions could provide technical assistance for additional training or fill in any skill gaps that may exist.

3.1.2. Least cost expansion planning

Energy sector planning in the Philippines is the primary responsibility of DOE. DOE sets out the major objectives and policies of the sector, including each of its subsectors. These goals become the basis for formulating development plans for agencies that report to DOE. Since EPIRA moved development planning in the power sector from NPC to DOE, the latter is now also responsible for least cost expansion planning in the sector.

3.1.2.1. Generation

Least cost generation planning will likely have to continue into the future, even though some form of power market will be developed at the wholesale level. In theory, new sources of electricity supply become available in response to capacity shortfalls and higher prices in the electricity market. However, in practice, this does not always happen. Experience in some developed countries has shown that pricing signals may not be timely or sufficient incentive for new investment in generation. IPPs are unlikely to invest unless future demand conditions in the electricity market are known so that market risks may be assessed. Therefore, a centralized agency is needed to gather market information and prepare forecasts of electricity demand and investment needs based on least cost principles, and to provide interested parties with information for mitigating market uncertainties.⁹

Electrification rates in Mindanao are only about 50 percent, and the Mindanao grid is not interconnected with the Luzon or Visayas grids. Endemic poverty and poor security in the region are disincentives for private sector investment in the power sector. In the Visayas, the situation is similar, except that security is not a major concern. Both grids face thin margins in reserve capacities. The public sector will likely continue investing in the power sector in Mindanao and the Visayas for the time being because of a lack of private

⁹The Canadian province of Ontario established the Ontario Power Authority in 2005 to support new investment in generation and transmission through long-range planning. It also acts as a creditworthy counterparty with whom IPPs will be able to sign long-term electricity supply contracts.

sector interest. Least cost generation planning should continue to be an important function in DOE for the foreseeable future.

3.1.2.2. Transmission

The transmission system in the Luzon grid is largely underutilized [ADB 2005a]. Average loading of the 500 kV transmission lines is about 30 percent, while loading on the 230 kV lines is about 40 percent. Underutilization is expected to continue for the next ten years as the capacity of the transmission lines will substantially exceed the demand for that capacity. At the same time, there are instances in which overloading occurs on certain transmission lines in the Luzon grid.

TransCo will likely face more complicated operating conditions with the introduction of a wholesale market for electricity. It is expected that the transmission grid will have to cope with larger power transfers over greater distances (for example, a consumer in Luzon could request supply from a generator in the Visayas). Transmission system operators will also have to control the greater power flows while maintaining voltage levels and ensuring system stability. This may require constructing new transmission lines to remove capacity constraints and, consequently, new investment in transmission capacity. The supply-demand mismatch in the transmission system and the need for incremental transmission capacity indicate a need to upgrade the transmission planning function in TransCo.

The planning of transmission facilities must also be integrated with generation plans to ensure that the development of the power system be at least cost. Unfortunately, EPIRA reforms do not provide TransCo with incentives to ensure such integration, and transmission planning is undertaken in relative isolation. In other jurisdictions, this shortcoming was recognized and addressed in a number of ways. For example, the Ontario Power Authority integrates generation and transmission planning, which directs investment in transmission for the provincially owned transmission company. In Australia, an interregional planning committee has the power to require construction and augmentation of regulated grid interconnections. In New Zealand, a newly established Electricity Commission has the authority to require the grid operator to undertake transmission investments. In the Philippines, there is need to formally delineate the responsibilities for transmission planning and ensure that transmission investments be economically planned. In the current organizational setup, this function should be undertaken by DOE in collaboration with TransCo.

3.1.3. Institutional capacity for planning

The transfer of power system planning from NPC to DOE combined policy and planning of the power sector in one institution. The Electric Power Industry Management Bureau (EPIMB), created in 2002 in DOE, is responsible for the planning function. However, the Power Planning and Development Division of EPIMB was not adequately staffed and had insufficient staff for load forecasting, generation planning, and the review of transmission development plans.¹⁰ Additional people are needed in these areas to integrate the planning of generation with that of the transmission system. Training of EPIMB staff on a continuous basis is also a priority to keep staff apprised of the latest technologies in power system planning.

The software used by TransCo for transmission planning, Power Simulator for Engineering, should be upgraded. This software is dated and cannot meet the needs of ERC and the Grid Code. There is software on the market more capable of meeting these needs, and this should be acquired as soon as possible.

3.2. Privatization of NPC generation and transmission assets

The key to the creation of a wholesale market for electricity as envisioned by EPIRA is the privatization of NPC's generating assets.¹¹ Privatization has been slower than expected. Of the 26 generating plants currently in operation and five decommissioned generating plants, only five hydroelectric power plants and one coal-fired power plant have been privatized to date. The privatization of TransCo has also been delayed. Two biddings in 2003 for TransCo were not successful because very few expressed interest and submitted proposals.

Slow progress in obtaining approvals from some creditors for the transfer of generating assets from NPC to PSALM created delays in looking for investors for these assets. Slow resolution of legal issues, such as the lack of clear title to land where generation assets are located, compliance with domestic ownership rules of geothermal generation, and requirements for operation and maintenance agreements between parties involved in the privatization have also delayed the process of privatization. In the case of transmission, legal issues such as the 40 percent constitutional limitation on foreign ownership

¹⁰ Currently, only 9 out of 13 positions are filled and a division director has not yet been appointed.

¹¹ The experience in Ontario demonstrated that the presence of a major player in the wholesale electricity market—in this case, government-owned generation—discouraged private sector investment in new generating plant and participation in the electricity market [Trebilcock and Hrab 2005].

of public utilities and the lack of a legal framework for franchises have been impediments to the privatization of the transmission system. The transfer of NPC's subtransmission facilities to local distribution companies has been slow because many distribution utilities are in poor financial shape to effectively support basic maintenance and new investment.

Investment in generating capacity is urgently needed in the Visayas and Mindanao, which are currently experiencing power outages due to generating capacity problems. However, under EPIRA, the responsibility for new investments in generation was transferred from NPC to the private sector. Therefore, privatization of NPC's generation assets needs to be undertaken as soon as possible to open these regions to the private sector and attract investment in generation to prevent the power situation from worsening.

The privatization of generating assets could be accelerated if the procedural and legal hurdles to privatization could be quickly overcome. The sale of the Masinloc coal-fired power plant to a group of foreign and local investors showed that there is interest in power sector assets in the Philippines, at least in Luzon. To exploit this interest, the government needs to expedite the process of obtaining approvals from the World Bank and the Japan Bank for International Cooperation for the transfer of assets from NPC to PSALM for privatization.¹² When these approvals are obtained, privatization of the generating assets should be undertaken in earnest.

The attractiveness of NPC's generation would be enhanced if buyers of these assets could enter into long-term contracts for part of the generating plant's output with TransCo or some other creditworthy counterparty.¹³ Potential investors perceive that uncertainty and risks are high because of a lack of a track record of wholesale markets for electricity in the Philippines and elsewhere in Asia. Long-term contracts could alleviate these concerns. Experience (for example, California in 2000) has demonstrated the risks of depending totally on "merchant plant" type of operations. The risk of market power that leads to higher electricity prices where there are insufficient participants in the market to foster competition or where regulatory oversight is not fully developed could be reduced with long-term contracts [Borenstein 2002].

¹² The Asian Development Bank has already given the required approvals to the government.

¹³ Arrangements sanctioned by EPIRA only provide for transition supply contracts that ensure a market for the electricity produced by privately owned generators until WESM is fully functional.

Privatization of the transmission system has been seen as an important component of the restructuring process. Proceeds from privatization were expected to relieve some of NPC's debt burden and help in financing capital expenditure for transmission system upgrading and rehabilitation. However, from an efficiency perspective, the privatization of the transmission system may not be urgent as the system will still be operated as a monopoly. Also, the legal questions that the privatization of the transmission system has raised will likely not be resolved for some time. Therefore, the government could de-emphasize its commitment to the privatization of this component of the power system for the time being and focus exclusively on privatizing generation assets and creating a competitive environment at the wholesale level.

An important consideration in assessing the risks of investing in generating plant is the financial soundness of the distribution companies that buy the generating plant's output. Meralco is the largest distribution company, accounting for more than 60 percent of countrywide retail sales. Because of its recent poor financial performance (see Table 1), Meralco's credit rating by Standard and Poor's had suffered nine downgrades in the last four years, from "BB+" in 1999 to "CC" in 2003 [ADB 2005b].¹⁴ There are also 18 other private distribution utilities and 119 RECs that may be classified into four categories: (a) about 25 percent of these distribution utilities are creditworthy and financially self-sufficient, (b) 10 percent are large distribution utilities with partial creditworthiness, (c) another 35 percent are marginally viable financially and are unable to attract private financing, and (d) 30 percent are financially nonviable.

The return of Meralco and the other distribution utilities and RECs to financial soundness is of utmost importance to the success of the restructuring of the power sector and attracting investment in generation. Meralco's financial difficulties are the most tractable and could be resolved if legal impediments that interfere with the regulatory process could be avoided and tariff increases previously granted by ERC implemented.¹⁵ Financial difficulties of a few of the other larger distribution utilities could likewise be resolved.

Consideration should be given to recapitalizing NEA and NEA taking over the management, operation, and maintenance of 65 percent of the distribution utilities/RECs that are not financially sound.¹⁶ Since the main problem that

¹⁴ In February 2005, Standard and Poor's upgraded Meralco's credit rating to "B-".

¹⁵ This issue is discussed under section 3.5.

¹⁶ EPIRA requires that the PSALM Corporation assume the financial obligations of RECs.

these distribution utilities/RECs face is the nonpayment of electricity bills by consumers, electricity tariffs and the quality of supply have to be reassessed to better reconcile consumers' willingness to pay for electricity and the cost of producing it. There may be a case for providing lower tariffs to these consumers in exchange for an interruptible supply or an electricity supply that is available only during off-peak periods. Some form of subsidy, either for electricity consumption or access to the grid, could also be considered on economic or social grounds for poor consumers in the rural and remote areas.

3.3. Establishing a wholesale market for electricity

Although the target dates for implementation of the restructuring of the power sector are proving ambitious, some progress has been achieved in the establishment of a wholesale market for electricity. Nevertheless, the introduction of a competitive electricity market in a developing country such as the Philippines is a formidable task. It requires careful design and implementation of trading systems, market rules, and operational systems. It also requires (a) strong, sustained political will, and commitment to the reforms; (b) financially viable market participants; (c) knowledgeable and well-prepared participants; (d) a competitive environment for suppliers of electricity; (e) developed financial markets to manage risk; (f) commercially focused participants; and (g) competent and credible market supervision.

The government has shown its commitment to the establishment of the wholesale market with the creation of PEMC. DOE and PSALM worked closely with PEMC and ERC to finalize details for testing rules and systems for trial market operation of WESM that have already begun. Submissions have also been made to ERC for the approval of a price determination methodology and a schedule of fees to cover registration and transaction costs. The current generation and transmission capacity seems adequate for the initial operation of WESM. Nonetheless, privatization of NPC's generation assets needs to be accelerated to strengthen the basis for competition at the wholesale level. To date, out of 21 IPPs contracted to NPC, only eight have committed to participate in the wholesale market besides NPC, a number that may not be sufficient to create meaningful competition.

In the event that effective competition cannot be immediately established because there are too few participants, wholesale prices could be determined on the basis of a merit order rule while arrangements are made to expand the number of participants. Under the merit order rule, the market operator ranks plants on the basis of short-run marginal operating costs and dispatches those

with the lowest cost first. Market participants are paid the short-run marginal operating cost of the last plant dispatched for all electricity sold to the wholesale market. This system of wholesale pricing closely resembles the bidding system, although incentives for improving productive efficiency may not be as strong as under a bidding system. Nevertheless, the merit order rule has been successfully tried in other countries and may be acceptable until such time when competition can be established through a bidding system [Choynowski 2004].

3.4. The future role of NPC in the power sector

Currently, the NPC's main role is to operate the generating plants that were transferred to PSALM Corporation until they are privatized. NPC also serves as the sole buyer of fuels for the IPPs. NPC will be left with about US\$ 8 billion in debt after privatization, which is expected to raise approximately US\$ 2 billion.¹⁷ This debt represents the implicit subsidies that electricity consumers enjoyed over the years from tariffs that recovered less than the full financial cost of electricity supplied and less-than-optimal investment decisions made in the past by NPC and the government.

The privatization of NPC's assets will leave NPC with essentially no role to play in the power sector.¹⁸ The assets of the Small Power Utilities Group could be transferred to NEA because of the similar role in providing electricity to the rural and remote areas of the country. IPPs should assume responsibility for purchasing fuel for generating electricity, instead of relying on NPC. This would improve efficiency of the fuel purchase process, have a positive impact on the government's budget, and eliminate any potential for rent seeking in NPC. After retrenchment of any remaining employees, NPC's should be wound up as a going concern.

The key issue regarding the dissolution of NPC will be the US\$ 6-8 billion in debt that remains. Since there is no basis for assigning this debt to any entity in the restructured power sector, the government should assume responsibility for the servicing and the eventual retirement of this debt. The assumption of

¹⁷ NPC's current debt obligations amount to about US\$10 billion, and NPC has negative equity value. The privatization of TransCo could potentially raise another US\$2 billion for NPC's debt reduction exercise.

¹⁸ NPC still supplies electricity to rural and remote regions of the country by small diesel plant through the Small Power Utilities Group. The Small Power Utilities Group also owns and operates several small transmission grids in some islands of the Philippines.

this debt will further weaken the fiscal position of the government; however, there are few, if any, options. The government should avoid financing this incremental obligation by increasing the universal charge on electricity as required by EPIRA for recovering "stranded costs" because it would be distortionary and would have a negative effect on economic growth.

3.5. Improving regulation

ERC was an outcome of 2001 EPIRA legislation that converted the Energy Regulatory Board to a statutory regulatory body. The objectives of ERC are to (a) promote competition, (b) encourage market development, (c) expand the range of consumer choices, and (d) discourage abuses of market power. In the short time that ERC has operated, it demonstrated some institutional weaknesses and shortcomings in technical expertise. This affected the speed of reform, specifically, the privatization of the generation and transmission assets. Some of ERC's rulings also proved vulnerable to court challenges, which were filed on the basis of lack of strict compliance with rules and procedures set in the relevant laws.

Although regulatory uncertainty is a major concern for foreign investors, the establishment and implementation of an effective regulatory regime in a market-driven setting is proving to be a difficult task. ERC employees are unable to undertake thorough analyses because of a lack of knowledge and skills in regulation and rate-setting methodologies; ERC's document tracking and filing system is poor as business processes are not clearly defined; and the staff is inexperienced in handling consumer complaints and dispute resolution. ERC has yet to establish ground rules for the effective implementation of performance-based regulation. Market monitoring is also a new area of responsibility that ERC has to learn while WESM is still not operational.

While EPIRA ensured the independence of ERC through the chairperson's and the commissioners' security of tenure, this has not been the case in practice. There have been three ERC chairpersons since it was established, and two of the three were political appointees with no background in regulation of public utilities. Likewise, there have been changes in the roster of commissioners even though the law provides for fixed-term appointments. Also, ERC does not enjoy financial independence and relies on a budget provided by the government. This has led to executive and legislative influence in its decision making.

There are a number of areas in which ERC needs to be strengthened, some of these currently being addressed. A code of ethics and professional

conduct needs to be developed for ERC to promote the transparency and accountability of the institution. At the same time, the government needs to grant ERC independence in its decision making by eliminating its reliance on the government for its budget.

The legal and technical competence of ERC needs strengthening in tariff setting. ERC staff needs to be firmly grounded in the economics of electricity pricing and its relationship to financial, social, and other objectives. Knowledge of tariff setting should extend beyond the simple ideas of cost recovery and financial sustainability. Staff training should include performance-based regulation for setting transmission and distribution tariffs, evaluation of utility performance and monitoring of compliance with service standards, monitoring of competitive markets, and protection of consumer and industry interests.

The regulatory process needs strengthening in terms of streamlining the current administrative and regulatory rules of procedure, along with developing operational manuals to codify the new rules of procedure. The new rules of procedure should strengthen the consumer complaints, grievance, and dispute resolution mechanisms. The full text of applications and decisions on tariff adjustments, consumer complaints, market participant disputes, and the like should be made public (for example, on the ERC website) to improve ERC's accountability and transparency of the regulatory process.

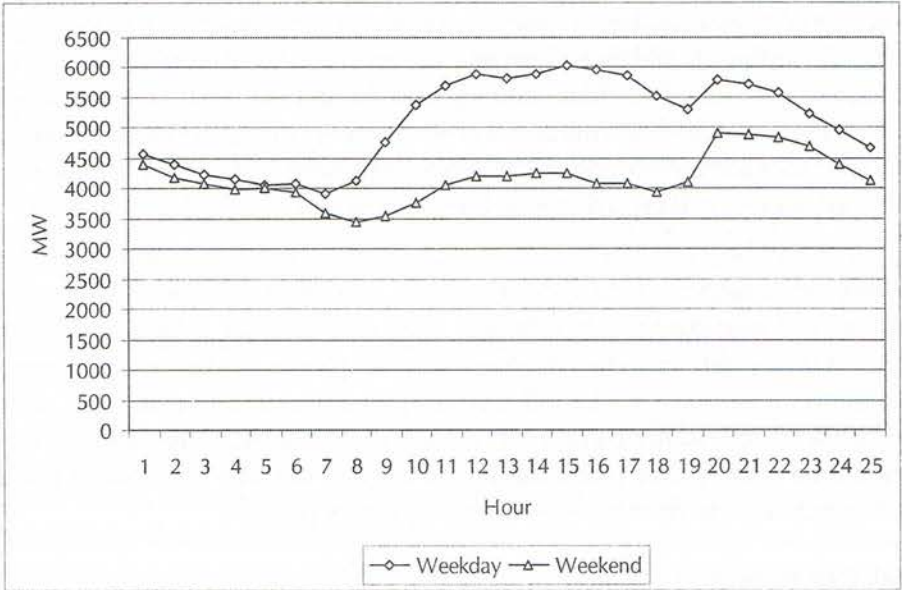
3.6. Cost of electricity and tariffs

Tariffs will be market-determined in the Luzon grid once WESM becomes operational. The wholesale price of electricity determined in WESM, augmented by regulated transmission and distribution charges and adjusted for losses, will form the basis for the retail tariff for end-use consumers. The Visayas grid will participate in WESM at a later date when all transmission facilities are completed.

The creation of an electricity market will improve technical efficiency and should lead to lower prices of electricity at the wholesale level. To further improve efficiency, time-of-use tariffs should be introduced at the retail level to reflect more precisely the cost of producing electricity at the time of consumption. Time-of-use tariffs encourage consumers to shift electricity consumption in peak periods to off-peak when costs of electricity production are lower and thus promote a more efficient use of generating capacities, reduce operation of more expensive peaking plants, and postpone construction of additional generation capacity as demand for electricity grows. As a result, electricity production costs fall and should ultimately lead to lower tariffs.

Figure 3 illustrates load curves for the Luzon grid, showing the peak period falling on weekdays from 9:00 a.m. to 9:00 p.m.

Figure 3. Weekday and weekend load curves for the Luzon grid, May 2003



ERC approved NPC's application to implement mandatory time-of-use tariffs in early 2005 for distribution utilities. For NPC's direct customers, time-of-use tariffs are optional. For the time-of-use tariffs to be effective in managing demand, distribution utilities should implement time-of-use tariffs at the retail level, at least for their larger customers. ERC should play a more proactive role in promoting time-of-use pricing with a view to eventually making time-of-use tariffs mandatory to all consumers to maximize the benefit of such a pricing scheme. To further improve economic efficiency, ERC should also consider introducing real-time pricing for large industrial or commercial consumers.

Mindanao and parts of the Visayas region will not be initially participating in WESM because of transmission constraints. Electricity is primarily supplied to the rest of the Visayas region (Cebu, Negros, and Panay) by independent power plants. The Mindanao grid is not connected to the Luzon grid and will not participate in WESM. The Visayas and Mindanao grids have evening peak

periods from 7:00 p.m. to 9:00 p.m. throughout the year because of the predominance of domestic consumption and the small number of industrial consumers. The shape of the load curve is much like the weekend load curve for the Luzon grid in Figure 3. Tariffs charged in these regions will be determined independently through the regulatory process.

The methodology for determining the tariff level and structure is a key issue. Electricity supply to meet demand on the margin in Mindanao and Cebu, Negros, and Panay in the Visayas region during all periods of the year is provided largely by diesel plant. The economic efficiency rule for pricing electricity in such cases is that price should equal the marginal cost of supplying incremental electricity consumption. The marginal cost of electricity in these regions is in the range of Php 5-7 per kWh at the generation level.¹⁹ The current wholesale tariff charged by NPC is Php 3.2823 per kWh in the Visayas region and Php 2.507 per kWh in Mindanao, substantially less than that required for economic efficiency. An electricity tariff based simply on a usage charge of, say, Php 7 per kWh, would result in excess profit for NPC and would not be equitable given the degree of poverty in these regions. The wholesale tariff could therefore be modified to provide a rebate to distribution utilities and RECs based on their peak demands to reduce NPC's profits to a prescribed level. In turn, retail tariffs should reflect the wholesale tariff with similar rebates to nondomestic electricity consumers based on their peak demands and with lifeline blocks for domestic consumers. The essential feature of the retail tariff in both cases should be the price of electricity consumed on the margin equal the marginal cost of supplying it.

4. Conclusion

This paper traces the historical development of the Philippines' power sector from its early beginnings, explores the events that brought it to insolvency, and discusses the issues that must be dealt with to restore operational and financial viability. The Philippine power sector evolved as a mix of private and public sector involvement until 1972 when much of the power sector was nationalized. Subsequent decisions by the government—particularly the decision to promote nuclear power as a source of electricity—give reason to believe that nationalization may not have been an optimal strategy at the time, considering the country's limited capital and managerial resources. Government

¹⁹ This includes fuel cost, parts, oils and lubricants, and system losses.

reluctance to approve adequate tariff adjustments for populist reasons also created financial problems that led to further operational difficulties. The government's response to these problems was to recognize that the public sector had limited capacity to manage the power sector and to reform it, with a focus on the private sector as a major supplier of electricity.

The government reforms introduced are generally sound and address the main problems faced by the sector. EPIRA provides a framework for key reforms that should lay the foundation for a more efficient and competitive power industry. However, implementation of the reforms is proving slow, and a number of outstanding key issues still need to be addressed. These are summarized as follows.

4.1. Sector planning

The government's planning function needs strengthening in several areas. The methodology for forecasting electricity demand must be improved to minimize tendencies for overestimation. Forecasting methodology should put more emphasis on economic and demographic variables, econometric techniques, and models that more closely reflect consumer behavior. Demand forecasts for electricity are important inputs to system planning, another area that needs strengthening. DOE must continue to develop least cost system plans for Mindanao and parts of the Visayas because access to the wholesale market, WESM, will not be immediately possible due to transmission constraints. Undercapacity in some parts of the transmission system and overcapacity in others, and the need for integration with generation plans indicate that transmission planning also needs strengthening. DOE should take the lead in generation and transmission planning and hire staff to fill current vacancies in its planning function. It should also provide continuous training for staff in planning techniques and upgrade system planning software.

4.2. Privatization of NPC generation and transmission assets

The privatization of NPC's generation and transmission assets has been slower than expected. DOE needs to accelerate the process of obtaining approvals from creditors for the sale of generating and transmission assets and sort out the legal issues that have recently surfaced regarding the privatization of these assets. To reduce private sector concerns about investment in generation, the government should institute provisions whereby private sector generators have an option to sell part of their output to TransCo or some other creditworthy counterparty under long-term contracts. The focus of the government's privatization effort should be on the generation

component of the power system since transmission will likely remain a monopoly for the foreseeable future. The financial position of wholesale buyers of electricity needs to be improved to increase investor confidence that the electricity sold through the wholesale market will be paid for. Thus, electricity tariffs that are approved through the regulatory process must be fair and based on sound economic and commercial principles. The government also needs to find a solution to the financial difficulties of RECs. This may entail the recapitalization of NEA and the takeover of management of the financially nonviable RECs.

4.3. Establishing a wholesale market for electricity

The establishment of WESM is making progress; however, there may be insufficient numbers of generators to create effective competition in the wholesale market. A temporary solution would be to operate the wholesale market initially based on a merit-order rule until competition can be established. This system of pricing closely resembles the bidding system that has been successfully tried in other countries.

4.4. The future role of NPC in the power sector

With the privatization of NPC's generation assets and the establishment of TransCo as an independent company, NPC has no useful role to play in the power sector. NPC should be wound up as a going concern after retrenchment of any remaining employees. The Small Power Utilities Group could be merged with NEA, and IPPs should purchase fuel for their generating plants on their own account, paying the same price that other consumers pay. Since there is no basis for assigning NPC's debt to any other entity in the power sector, the government should assume the responsibility for its servicing.

4.5. Improving regulation

ERC has capacity shortfalls in a number of areas that has reduced the effectiveness and increased uncertainty of the regulatory process. ERC's independence must be enhanced to increase its credibility in the eyes of consumers and investors. The regulatory process needs strengthening in terms of streamlining current administrative and regulatory rules of procedure to improve consumer complaints, grievance, and dispute resolution mechanisms. A code of ethics and professional conduct and the full text of applications and decisions on tariff adjustments, consumer complaints, market participant disputes, and the like should be made public to promote the transparency and accountability of ERC. The legal and technical competence of ERC also needs

strengthening in tariff setting. ERC staff needs to be firmly grounded in the economics of electricity pricing and its relationship to financial, social, and other objectives.

4.6. Cost of electricity and tariffs

The wholesale price of electricity determined in WESM, augmented by regulated transmission and distribution charges and adjusted for losses, will form the basis for the retail tariff for end-use consumers in Luzon and parts of the Visayas. To further improve efficiency, time-of-use tariffs should be introduced at the retail level, at least for larger consumers, to reflect more precisely the cost of producing electricity at the time of consumption. Eventually, real-time pricing should be introduced. In Mindanao and parts of the Visayas region not participating in WESM, tariffs at the wholesale (generation) level should reflect the fact that electricity at the margin is supplied by diesel plant. An electricity tariff based on the cost of diesel would result in excess profit for NPC and would not be equitable given the degree of poverty in these regions. The wholesale tariff, therefore, could be suitably modified to ensure an acceptable level of profit for NPC. The essential feature of tariffs on the wholesale and retail levels should be such that the price of electricity consumed on the margin should equal the marginal cost of supplying it.

EPIRA offers a roadmap for the overhaul of the power sector consistent with the goal of providing reliable supply of electricity that is affordable and accessible to those who are willing to pay for the service. The achievement of this goal will crucially depend, to a great extent, on completing the reform program outlined in EPIRA and on addressing the issues discussed in this paper: sound planning, privatization of generation, improving regulation, among others. Good governance and sound management will also be indispensable to achieving EPIRA's goals.

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