

# **An Analysis of the Philippine Electric Power Industry**

EPICTETUS E. PATALINGHUG\*

*This study analyzes the Philippine electric power industry. First, it gives a brief history of the industry. Second, it assesses the interaction between the electric power industry and the Philippine economy. Third, it describes the structure of the industry as well as its major players. Fourth, it examines the industry's legal and regulatory framework. And fifth, it discusses the problems and prospects facing the industry. It concludes that the real challenge facing the industry is how the regulatory authorities enforce open access to transmission and distribution facilities which is a prerequisite before introducing competition at the wholesale and retail levels.*

## **Introduction**

The Philippine electric power industry used to be dominated by the National Power Corporation (NPC) in the generation sector. All generating plants were owned by NPC; Independent Power Producers (IPPs) were restricted from directly connecting to the electric distribution utility. The Electric Power Crisis Act of 1993 (R.A. 7648) and the Expanded BOT Financing Law of 1994 (R.A. 7718) allowed IPPs to deal directly with distribution utilities and bypass the NPC grid. Thus, generation has now become a competitive segment of the industry. Under the Electric Power Industry Reform Act (EPIRA) of 2001 (R.A. 9136), part of NPC would be retained as the National Transmission Corporation (TRANSCO) which is organized as a government-owned monopoly in the transmission sector. However, the government plans to bid a minority share of TRANSCO to strategic investors with experience in the electricity transmission business, provided that Congress approves TRANSCO's franchise. In the distribution sector, private investor-owned utilities (e.g., Manila Electric Company, Visayan Electric Company, etc.) dominate the electricity supply business in the major urban centers, while electric cooperatives (e.g., Albay Electric Cooperative, Sulu Electric Cooperative) supply electric service to rural areas connected to the grid.

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\*Professor, College of Business Administration (CBA), University of the Philippines (UP) Diliman, Quezon City.

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The Philippines practices the geographic area franchise concept which obliges franchise holders to connect all households and other potential customers in their franchise areas, unless by doing so it will undermine the financial viability of the distribution utilities. The geographic area concession, which divides the country into area franchises, creates a monopoly supplier in each franchise area. This type of market arrangement has been rationalized by the theory of natural monopoly. The theory implies that long-run average cost declines continuously by increasing the supply of electricity. Thus, dividing the market between two or more firms will mean an inefficient allocation of resources because the average cost of supply is higher for each firm. The rationalization of natural monopoly could no longer be justified in the generation sector when increased cost of constructing power generating stations shows that the real cost of power production exhibits decreasing returns to scale. This means that relatively small generators such as those operating combined cycle gas plants can effectively compete against large generators such as those operating large-scale coal and nuclear plants. In the face of the disappearance of the natural monopoly characteristics of the industry, and the high Philippine electricity rates compared to those in neighboring countries (see Table 1), the regulatory regime had to be restructured. The EPIRA was approved on 8 June 2001 by the Philippine Congress "to ensure transparent and reasonable prices of electricity in a regime of free and fair competition and full public accountability to achieve greater operational and economic efficiency and enhance the competitiveness of Philippine products in the global market" (RA 9136, Section 2C).

**Table 1. Comparative Average Rates of Asian Utilities  
(as of December 1996)**

<i>Utility</i>	<i>Rates (in pesos)</i>			
	<i>Residential</i>	<i>Commercial</i>	<i>Industrial</i>	<i>Overall</i>
PULN (Indonesia)	1.78	2.78	1.60	1.84
MEA (Thailand)	2.25	2.28	1.85	2.03
TNB (Malaysia)	2.09	2.63	1.97	2.16
KEPCO (Korea)	2.83	2.76	1.50	1.96
SP (Singapore)	2.81	2.48	2.19	2.43
TAIPOWER (Taiwan)	2.11	2.72	1.81	1.97
CLPO (Hong Kong)	2.98	2.86	2.70	2.85
MERALCO (Philippines)	3.61	3.69	3.34	3.54
Kansai (Japan)	5.55	4.86	3.01	4.16

Source: Manila Electric Company.

The study is organized as follows. Section II gives a brief history of the Philippine electric power industry. Section III discusses the interaction between the electric power industry and the Philippine economy. Section IV describes the structure and various stakeholders of the industry. Section V analyzes the major players of the industry. Section VI explains the legal and regulatory framework. Section VII elaborates on the problems and prospects facing the industry. And Section VIII discusses the conclusion.

### **History of the Industry**

Electricity was known to have reached the country in 1890. Sociedad Mercantil which became La Electricista provided electricity in Manila and nearby provinces. La Electricista was established in 1892 in association with the Compañia de Tabacos de Filipinas (TABACALERA). The Municipal Council of Manila signed a 20-year contract with Sociedad Mercantil Millat, Marti y Mitjans to provide electric lighting for city streets, parks and other public places originally illuminated by oil lamps. The contract also allowed Sociedad to enter into arrangements with private customers to have their homes and establishments lighted by incandescent lamps. La Electricista was given rights to Sociedad's 20-year contract. Manila Electric Company (MERALCO) was established in 1903 and bought La Electricista the following year. By early 1905, some 40,129 incandescent lights and 495 arc lamps were installed in both public and private areas (Cabrera 1992).

In 1925, MERALCO expanded services to the municipalities of Rizal and other parts of Luzon by purchasing the franchises and plants of the small provincial electric companies. It began retrenching its provincial operations after the Second World War to concentrate on rehabilitation and expansion of its Manila facilities. By 1953, MERALCO had disposed of all its provincial facilities, and in 1961 it became Filipino-owned when a group of Filipino businessmen led by Eugenio Lopez, Sr. bought MERALCO from General Public Utilities Corporation of New York.

NPC was established in 1936 to develop the country's hydroelectric resources. In 1960, the Electrification Administration (EA) was created by Philippine Congress to implement the government's declared objective of total electrification as a national policy of the country. The government granted franchises to private companies to encourage them to set up local distribution systems in rural areas. Some of these companies generated their own power, but most of them made bulk purchases of power generated by NPC. Up to 1969, EA helped in the establishment of 217 small systems (each with fewer than 500 kilowatts of capacity) throughout the country; however, many of these systems did not survive due to technical, financial, and managerial problems. A 1966 study recommended that a total electrification program based on the rural electric cooperative (REC) model used in the United States

be instituted in the Philippines. Two pilot projects were initiated to adapt the U.S. model to Philippine conditions: (1) Misamis Oriental Rural Electric Service Cooperative (MORESCO), and (2) Victorias Rural Electric Service Cooperative (VRESCO).

In 1969, the National Electrification Administration (NEA) was created by Congress to replace EA as the implementing agency of the country's total electrification policy. Under NEA, the RECs (or electric cooperatives) were designated as the country's primary electricity distribution system. NEA was given the authority to establish and oversee the RECs, to make loans, to acquire physical property and franchise rights of existing suppliers, to borrow funds, and to extend subsidies to RECs.

In 1970, NEA drafted a total electrification program on a 24-hour daily service to be realized by 1990; however, external events changed the financial environment for electrification funding. The oil crisis in the mid-1970s hiked energy prices, concessional loans from international agencies declined, and investment costs of the electrification program drastically increased. Internal factors were likewise not helpful. Financial, technical, and managerial problems beset many of the small power systems established in this period.

Since the creation of EA in 1960, private utilities as well as government utilities were encouraged to set up distribution systems in rural areas. By 1971, there were about 479 electric utilities and 876 generating plants with a total capacity of 2,314,868 kw. In 1970, 8.54 million of the 38 million total population (22.5%) had electric service and 2.56 million of the 8.54 million (29.9%) resided in rural areas; however, more than 86% of the rural families did not have electric service (Armas 1978).

NEA was converted into a public corporation by Presidential Decree No. 269 in 1973. Under this statute, NEA was given the sole authority to regulate the electric cooperatives, as well as to repeal, alter, and amend its franchises. NEA's authorized capital stock was also increased to P1 billion, and the decree empowered NEA to borrow from foreign and domestic sources. In December 1975, NEA accumulated a total fund of \$94.8 million in foreign loans and P775 million in government budgetary appropriation. By end of 1977, NEA had a total fund consisting of P1 billion component and \$103.5 million foreign loan component. NEA disbursed P662.4 million component which allocated P71.8 million to take over existing franchises in 263 towns and cities. But total cost of takeover was estimated at P113.1 million in 1977. Of the 596,967 NEA electrified households in 1977, 302,978 households (50.8%) were formerly served by the private utilities taken over by NEA (Armas 1978).

Nevertheless, many of the electric cooperatives are beset with financial, technical and managerial problems. At least 61 percent of the electric

cooperatives are not commercially viable and need to be restructured (World Bank 1989). Recently, Executive Order (E.O.) 119 (dated 28 August 2002) condoned some P18 billion in debts of electric cooperatives to the National Electrification Administration and other government agencies; but E.O. 119 also mandated that to qualify for debt condonation, electric cooperatives must undertake some meaningful organizational and financial reforms, submit rehabilitation and efficiency plans to NEA, and pay their financial obligations to NPC on time. So far, eight electric cooperatives have been given provisional authority by the Energy Regulatory Commission (ERC) to cut their rates between 7 and 24 centavos per kilowatt-hour.

Starting with two electric cooperatives in the early 1970s, NEA now supervises 119 electric cooperatives all over the country. Although the original target of total electrification by 1990 was not achieved, only 5,404 barangays out of a total of 41,995 barangays remained unelectrified as of 31 December 2002; however, many of the remaining unelectrified barangays are areas which are called "last mile" areas on the distribution network because they are technically inaccessible for grid extension. The challenge for rural electrification is how to maximize connections per household in remote, marginalized and unserved areas whose geographical isolation entails high cost of power installation and whose population has a low capacity to pay. A subsidy policy design responsive to the environment is needed.

In 2001, EPIRA was passed by Congress to ensure the quality, reliability, security, and affordability of the supply of electric power. To achieve these goals, EPIRA has mandated the organizational and financial restructuring of the industry, institutional and policy reforms, and stricter accountability for generation, distribution, and transmission utilities. Under the EPIRA, only transmission and distribution utilities need a franchise authority from Congress in order to operate. Generation utilities and electricity suppliers simply have to obtain a license from the ERC to engage in their respective economic activities. The transition from a highly regulated to a deregulated electric power industry requires the adoption of market rules, financial and technical standards, and minimum regulatory requirements in order to make a smooth transition from a regulation-based and inefficient industry to a market-based and efficient one.

### **Electric Power Industry and the Philippine Economy**

The energy crisis that occurred in the 1970s imposed a substantial cost to the economy—Gross Domestic Product (GDP) declined. The scrapping of the Bataan Nuclear Power Plant and the abolition of the Department of Energy (DOE) by the Aquino regime were significant causes of the power blackouts in the early 1990s. The electricity crisis of the early 1990s led to high power costs and was an important factor in the loss of international competitiveness

of the country's export products. The Bataan Nuclear Plant could have reduced government reliance on petroleum supply and could have replaced aging thermal-powered and coal-powered plants. The retention of DOE could have provided institutional continuity and retained a core of trained technicians who were responsible for implementing a highly respected energy development program that was then considered a good model of power sector adjustment during the energy shocks of the 1970s (Sicat 2002).

The growth of the economy drives the demand for electricity. The energy-to-GDP elasticity is estimated to vary from 0.8 for the transport sector to 1.0 for the industrial sector (DOE 1998). This means that an economy with an annual rate of GDP growth of six percent will drive energy demand from 4.8 percent to 6 percent; however, Nuqui (1992) reported that the estimated elasticity of power demand relative to GNP is 1.2 to 1.5 which means that if the country's national economic growth averages at 4.5 percent in the next five years, energy supply will have to increase from 5.4 to 6.75 percent. Moreover, the higher the GDP per capita, the higher will be the electricity per capita (measured in tons of oil equivalent). Thus, a government that successfully implements a program to spur economic growth will drive up the demand for electricity. Electricity demand is projected to grow at an average annual rate of 9.7 percent from 2002 to 2011. The forecast is based on the assumption that electricity demand will increase from 46.6 kilowatt-hours (kwh) per P1,000 of economic output in 2002 to 62.9 kilowatt-hours per P1,000 of economic output in 2011 (DOE 2001).

Rural energy projects provide services that cater to the basic needs which confer indirect benefits on other citizens. The externality relates to the external benefits accruing to the society when there is an improvement in the circumstances of individuals or families belonging to the low-income groups (Evans and Kraft 1997). Beneficial externalities for Photovoltaic (PV)-generated electricity projects include the avoidance of air (carbon) emissions associated with kerosene lighting, reduction of occasional burn injuries, bad odors, and the inconvenience of having to buy and store the fuel (Meier 2002). Furthermore, Frederiksen (1985) confirmed the positive effect of rural electrification on income levels.

World Bank (2002) measured the monetary value of benefits derived from rural electricity services in the Philippines. Rural electricity is assumed to generate the following social and economic benefits: education, health, entertainment and communication, comfort and protection, convenience, and productivity. Electricity improves children's study conditions during the evening, enhances the flow of information to rural households, decreases the amount of time rural households spend in their daily chores, and improves the productivity of small businesses. Electrified households attained about two years more formal education than their non-electrified counterparts. Use of

electricity saved households about one hour per day. Electrification increased the chances that a household will engage in a home business by about 10.7 percent; with electricity, home businesses operated about two hours more per day. The total benefit of providing electricity to a typical non-electrified Philippine household ranges from \$81 to \$150 per month depending on the number of wage earners in the household and whether a household operates a home-based business.

Herrin (1979) argued that the availability of a relatively cheap source of power through rural electrification facilitated investments in agricultural infrastructure, business and industrial enterprises, health and environmental sanitation facilities and services, and educational facilities and services which brought about significant changes in productivity, employment, and income. And that the need to save and invest in electricity installation, in farm and business enterprises and in human capital created pressures to control the family size because the opportunity costs of additional children were raised.

### **Industry Structure and Stakeholders**

The restructured electric power industry is composed of four sectors: generation, transmission, distribution, and supply. Generators convert primary energy source (such as oil, coal and hydro) as well as renewable source (such as solar, wind, and ocean) into electricity. Transmission utilities transport electricity produced by generators through high-voltage wires. Distribution utilities transform high-voltage electricity to lower voltage wires with the goal of supplying individual customers; thus, the major product produced by the industry is electric power and its complementary services consist of transmission services, distribution services, and suppliers' services that involve selling, brokering, marketing or aggregating electricity to the end-users. The generation sector is composed of generation companies, co-generation companies, and independent power producers.<sup>1</sup> A generation company is required to obtain an authorization from ERC to operate in this sector. Generation is a relatively capital-intensive and energy-intensive activity. During the power crisis in the early 1990s, NPC augmented the country's energy generating capacity by entering into supply agreements with IPPs. However, the IPP contracts contained "take-or-pay" provisions which form part of the fixed liabilities of NPC and the distribution utilities under a situation where electricity demand is weak (i.e., during economic downturn). The consumers pay for the "take-or-pay" provisions in the IPP contracts under the Purchased Power Adjustment (PPA) component of electricity bill. A review of IPP contracts negotiated in the 1990s found five contracts to be defective and prejudicial to public interest.<sup>2</sup>

On 24 February 2003, ERC issued an order replacing PPA with Generation Rate Adjustment Mechanism (GRAM). GRAM differs from PPA

because it excludes transmission component, system loss, and franchise tax. It requires quarterly review before the cost is passed on to the consumers. Any change of recovery of fixed costs of generation must pass through a petition and be subject to approval by ERC; however, unlike PPA, GRAM provides a three percent carrying charge over and above the 91-day Treasury Bill rate, provided that the combined effect should not exceed twelve percent. Since ERC has not invalidated previous IPP contracts (for lack of legal basis), GRAM is not radically different from PPA, and the detrimental impact of take-or-pay provision of IPP contracts on the electricity bills of consumers remains.

The transmission sector is a regulated common electricity carrier business and subject to the ratemaking powers of ERC. At present, the generation and transmission sectors are dominated by the state-owned National Power Corporation (NPC). Under the EPIRA, the generation assets of NPC will be privatized. The transmission function of NPC will be retained under TRANSCO. TRANSCO is wholly owned by the Power Sector Assets and Liabilities Management Corporation (PSALM). TRANSCO will assume the following transmission function of NPC: planning, construction and centralized grid operation and maintenance of high-voltage transmission facilities, including grid interconnections, ancillary and other allied facilities. TRANSCO will need a franchise from Congress before it can sell a minority stake to a strategic private investor which is most likely to be a foreign investor with experience in the transmission business. This sector, through TRANSCO, shall provide open and non-discriminatory access to its transmission system to all electricity users.

Distribution of electricity to end-users is a regulated common carrier business. Distribution utilities must secure a national franchise and are subject to regulation by ERC. Distribution utilities are composed of private utilities, electric cooperatives, LGU-operated utilities, and other duly authorized entities. Distribution utilities can merge, consolidate, integrate, and enter into management contract, bulk procurement and joint ventures, subject to ERC guidelines. Being a regulated sector of the Philippine electric power industry, distribution utilities cannot change the terms and conditions of their services to end-users without approval by the ERC. The distribution sector is composed of 17 private investor-owned electric utilities, 119 electric cooperatives, and ten local government owned or operated electric utilities. MERALCO is the most dominant player in the distribution sector.

Supply of electricity to end-users is a competitive and contestable market. An electricity supplier (sometimes called electric service provider, ESP; public electricity supplier, PES; or retail electric provider, REP) has to obtain a license from ERC to engage in the selling, brokering or marketing of electricity in the competitive or contestable market. The contestable market refers to electricity end-users with a monthly average peak demand of at least



750 kilowatts over the preceding twelve months. Subsequently, ERC will evaluate the performance of the market, and may reduce the threshold level until it reaches the household demand level. An electricity supplier shall not be required to secure a national franchise. The prices to be charged by electricity suppliers for the supply of electricity in a competitive environment are market-driven and shall not be subject to regulation by ERC.

In addition, a Wholesale Electricity Spot Market (WESM) will be established by the DOE to provide the mechanism for identifying and setting the price of actual variations from the quantities transacted under contracts between sellers and purchasers of electricity. WESM is managed by a DOE-constituted market operator, with equitable representation from electric power industry participants. Initially, WESM will be under the administrative supervision of TRANSCO. Eventually WESM will be managed by an independent entity. WESM participants will be composed of generating companies, distribution utilities, suppliers, bulk consumers/end-users, and other similar entities authorized by ERC.

### Major Players

NPC is the most dominant player in the industry. It dominates the generation and transmission sectors and comprises the upstream segment of the industry. NPC sources approximately half of its electricity requirements from its own generation plants and purchases the other half from IPPs (see Table 2). At its peak in the 1980s, NPC had about 20,000 employees which went down to 15,794 by 1994. NPC had a total of 14,742 employees by 28 February 2003 which was drastically reduced to slightly over 7,000 thereafter equally divided between TRANSCO and PSALM which reflects the on-going corporate restructuring aimed at streamlining its support services. Over 1,000 employees will staff the specialized and downsized NPC to handle specific

**Table 2. NPC: Gross Energy Generation, 2001  
(in Gigawatt hours)**

<i>Source</i>	<i>NPC-Owned</i>	<i>NPC-IPPs</i>	<i>Total</i>
Oil-Based	2,360	6,724	9,084
Hydro	6,164	822	6,986
Geothermal	5,152	5,420	10,572
Coal	6,851	9,977	16,828
Total	20,527	22,943	43,470

Source: NPC 2001.

tasks of missionary electrification of the government. Through its Small Power Utilities Group (SPUG), the new NPC will be responsible for electrifying remote, unviable, and unserved areas of the country. The majority of NPC's generating and transmission assets will be privatized by PSALM to create revenues for government and to enhance competition in the industry that would lead to better services and lower rates. In 2001, NPC had a total number of 266 customers comprising mostly utilities and large industries. While NPC's total assets were valued at P1.01 trillion, it likewise incurred a net loss of P10.4 billion, in spite of its ability to increase energy sales to 39,948 Gwh (gigawatt hours) in 2001 from 37,320 Gwh in 2000, at a selling rate of P2.90 per kwh. However, small island grids are more costly at P3.87 per kwh. NPC reported a system loss of 3.66 percent in 2001, from 3.58 percent in 2000.

The cost of retirement benefits (e.g. gratuity pay, terminal and accrued leaves related to operation) due to NPC privatization is treated as deferred debits to be amortized over two years starting in 2002.

**Table 3. Profile of Major Players: 2001**

<i>Utility</i>	<i>Assets (in pesos)</i>	<i>Number of Employees</i>	<i>Number of Customers</i>	<i>Electricity Sold</i>	<i>System Loss (%)</i>
NPC	1,005,985,279,893	14,742	266	39,948 Gwh	3.66
MERALCO	134,543,533,926	6,060	3,805,117	22,689,259 Mwh	10.39
Visayan Electric	4,792,812,482	482	245,103	1,242,840,688 kwh	10.74
Davao Light	4,725,422,118	350	205,537	999,684,051 kwh	8.99
CEPALCO	2,359,422,118	292	82,545	477,397,960 kwh	13.56
Panay Electric	2,022,269,427	162	48,778	297,021,198 kwh	11.72
Dagupan Electric	793,748,281	154	67,756	185,294,757 kwh	9.50

Source: Energy Regulatory Commission.

MERALCO is the most dominant distribution utility in the country. It has a franchise area that covers 9,337 square kilometers serving 22 cities and 89 municipalities, and sold 22.7 billion kilowatt hours of electricity in 2001. Over 19 million people reside within MERALCO's service and territory which accounts for approximately 48 percent of the country's gross domestic product (GDP). MERALCO's total assets were valued at P134.5 billion in 2001, with a total revenue of P129.4 billion and net income of P1.48 billion, a 40.5 percent decrease from its 2000 net income of P2.49 billion. MERALCO rates are the highest in Asian region after Japan (see Table 1).

MERALCO employed a total of 6,060 employees, serviced 3,805,117 customers, reported a system loss of 10.39 percent, and sold electricity at an average selling rate of P5.67 per kwh in 2001 which increased from its 2000 selling rate of P4.71 per kwh as a result of the rise of purchased power cost from P3.41 per kwh in 2000 to P4.22 per kwh in 2001. MERALCO purchased 90 percent of its total energy requirement from NPC in 2001. Between 2000 and 2001, MERALCO's sales increased by 3.7 percent, number of customers increased by 3.6 percent, purchased power from NPC increased by 3.4 percent, and average selling rate increased by 20 percent.

Recently, Congress granted MERALCO a 25-year mega franchise to operate and maintain a distribution system for electric power in Metro Manila, Bulacan, Cavite, Rizal, and some parts of Batangas, Laguna, Quezon, and Pampanga.

The Anti-Pilferage of Electricity and Theft of Electric Transmission Lines/Materials Act of 1994 (R.A. 7832) provided for the rationalization of system losses by setting caps on recoverable system loss allowed to private electric utilities and electric cooperatives. Table 4 shows the allowable caps on recoverable rate of system loss for the 1996-2000 period. The allowable caps for 1994 and 1995 were set at 22 percent.

**Table 4. Caps on Recoverable System Loss**

<i>Year</i>	<i>Private Utilities (%)</i>	<i>Electric Cooperatives (%)</i>
1996	14.50	22.0
1997	13.25	20.0
1998	11.75	18.0
1999	9.5	16.0
2000		14.0

Source: DOE 1997.

In line with this system loss standard, it is clear that MERALCO's system loss of 10.39 percent in 2001 did not meet the law's minimum standard of 9.5 percent. But MERALCO was able to decrease its systems loss from 15.6 percent in 1993 to 10.39 percent in 2001.

In addition, Table 5 shows that the Philippines had the worst transmission and distribution (T&D) losses in 1994 compared with selected Asian countries. For instance, the Philippines T&D losses were approximately six times the percentage losses suffered by Singapore.

**Table 5. Comparison of Transmission and Distribution Losses in Selected Asian Countries, 1994**

<i>Country</i>	<i>% Losses</i>
Singapore	3.39
South Korea	5.26
Japan	5.98
Malaysia	8.88
Thailand	9.65
Indonesia	12.47
Philippines	19.00

Source: ESCAP.

Visayan Electric Company (VECO) serves Cebu City and its adjacent towns and cities. VECO had assets of P4.79 billion in 2001 and employed over 482 workers. It serviced 245,105 customers and sold 1,243 million kilowatt hours valued at P6.33 billion at an average selling rate of P5.02 per kwh in 2001.

Davao Light and Power Co., Inc. serves Davao City and its adjacent towns covering 3,561 square kilometers. Its assets were valued at P4.73 billion in 2001. It employed 350 people in 2001, serviced 205,537 customers, and charged an average selling price of P3.38 per kwh. It sold 999 million kilowatt hours in 2001. Of all the private investor-owned utilities, Davao Light had the lowest system losses in 2001 at 8.99 percent.

Cagayan Electric Power and Light Company (CEPALCO) serves Cagayan de Oro City and its surrounding towns covering 720 square kilometers. It sold 477 million kilowatt hours in 2001, serviced 82,545 customers, employed 292 workers, and grossed P1.67 billion in total sales. CEPALCO's assets were valued at P2.36 billion in 2001. CEPALCO's system losses in 2001 are approximately 14 percent which is below the 9.5 percent cap on recoverable system loss for private utilities.<sup>3</sup>

Dagupan Electric Corporation serves Dagupan City and its surrounding towns. It had assets valued at P794 million in 2001, employed 154 workers, serviced 67,756 customers covering 351 square kilometers and sold 185 million kilowatt hours. Its average selling rate in 2001 was P5.03 per kwh (see Table 3).

NPC financial performance for 2000-2001 has marginally improved. Its operating revenues increased by 15.4 percent, and its net loss was P2.6 billion

less in 2000 compared to 2001 because its income from foreign exchange adjustment exceeded its interest charges for the period.

MERALCO's operating revenue increased by 24.8 percent during the same period, but its net income declined by 4.05 percent because its total expenses increased by 26.2 percent. VECO's operating revenues increased by 28.6 percent, its operating expenses increased by 26.5 percent, and its net income increased by 129.3 percent. Davao Light's operating revenues increased by 15.1 percent, its operating expenses increased by 14.5 percent, leading to a rise in net income of 29.5 percent.

CEPALCO's operating revenues rose by 17.3 percent, while its operating expenses also increased by 15.8 percent, and its net income improved by 96.3 percent. Panay Electric had improved its operating revenues by 17.3 percent, and also increased its operating expenses by 17.7 percent, but was able to increase net income by 96.4 percent. And finally, Dagupan electric increased its operating revenues by 24.8 percent, increased its operating expenses by 24.9 percent, and its net income by 33.8 percent (see Table 6). The average values during the period among major players for growth in operating revenues, operating expenses, and net income were 20.5 percent, 20.1 percent and 52.1 percent, respectively.

### **Regulatory Framework**

The electric power industry is subject to a number of laws, policies, administrative rules, and regulations governing entry and ownership, electricity pricing, technical and financial standards, customer service standards, access to inputs, and fiscal treatment of electric utilities.

The entry and operation conditions of electric utilities are generally governed by the Public Service Law which is administered by ERC. In addition, Foreign Investments Law (R.A. 7042), Power Cogeneration Law (E.O. 215), Electricity Power Crisis Act (R.A. 7648), BOT Law (R.A. 6957), and Expanded BOT Law (R.A. 7718) improve entry conditions by providing a fair rate of return to private investors. The old ERB, and now ERC, was and is given the power to adopt and implement technical, customer service and financial standards for TRANSCO, generating companies, distribution utilities, and suppliers to ensure the quality, reliability, security, and affordability of the supply of electric power, and to safeguard against the risk of financial non-performance. R.A. 9136 mandates that ERC shall regulate the retail rates charged by distribution utilities, the distribution wheeling charges of distribution utilities, and the transmission charge imposed by TRANSCO. There are few administrative restrictions on access to inputs for electric power operators. NPC and electric cooperatives often enjoy tax exemptions and subsidies under existing laws. The importation of coal, electric generator

**Table 6. Financial Performance of Major Players: 2000-2001 (in pesos)**

<i>Utility</i>	<i>Operating Revenues</i>		<i>Operating Expenses</i>		<i>Net Income</i>	
	<i>2000</i>	<i>2001</i>	<i>2000</i>	<i>2001</i>	<i>2000</i>	<i>2001</i>
NPC	102,163,741,896	117,928,198,182	94,681,759,326	108,860,731,147	(12,963,767,536)	(10,377,390,598)
MERALCO	103,690,991,256	129,399,866,533	99,708,598,010	125,808,474,053	2,489,730,102	1,480,546,454
VECO	5,145,942,058	6,615,274,105	4,931,868,238	6,236,976,755	89,824,929	205,939,411
Davao Light	2,974,886,428	3,424,553,432	2,753,126,304	3,153,013,307	83,551,460	108,185,402
CEPALCO	1,432,011,610	1,680,176,671	1,366,773,146	1,582,895,269	53,514,565	105,065,132
Panay Electric	1,440,916,936	1,690,160,094	1,365,749,589	1,606,849,606	109,065,223	214,238,296
Dagupan Electric	751,094,453	934,468,576	712,149,915	889,592,900	36,754,726	49,174,322

Source: Energy Regulatory Commission.

sets, new and renewable technologies, and other electric power equipment has been liberalized. Electric generation and distribution are given access to official development assistance (ODA) provided that they are given high priority by the National Economic and Development Authority (NEDA) and that they are economically viable but not financially feasible. Proposed projects requiring foreign-loan financing must be financially and economically viable and must be endorsed by the Regional Development Council. This rule also applies to projects funded by NPC and NEA (Nuqui 1992).

Before EPIRA (R.A. 9136), NPC was tasked to fix its power generation and transmission rates, NEA was responsible for granting franchises to electric cooperatives, and ERB was to regulate petroleum products, gas pipe concessionaires, and fixing rates of distribution utilities. With the passage of the Downstream Oil Deregulation Act (R.A. 8479) in 1998, ERB was freed of the task of regulating petroleum prices and concentrated its regulatory efforts on electric power ratemaking.

With the passage of EPIRA, the industry was unbundled into four sectors: generation, transmission, distribution, and supply. Distribution and supply shall be competitive and open. These subsectors shall not be considered public utility operations and shall not be required to secure a national franchise. Generators and suppliers shall secure a license from ERC to operate, but they shall not be subject to regulation by the ERC. Transmission and distribution are natural monopolies. These subsectors are public utilities or common carrier business for public service and shall be required to secure a national franchise, and subject to the regulation of the ERC; however, open access is introduced in both transmission and distribution. For instance, TRANSCO shall provide open and non-discriminatory access to its transmission system to all electricity users. TRANSCO is allowed to impose transmission charge for the use of the transmission system, but subject to ERC's approval. In the same manner, distribution utilities are allowed to impose distribution wheeling charge for the use of a distribution system or availment of related services, subject to ERC approval. Distribution utilities cannot change the terms and conditions of their services to end-users without approval by the ERC.

NEA will act as a guarantor for purchases of electricity in the wholesale electricity spot market by any electric cooperative or small distribution utility to support their credit standing. NEA continues to monitor the outstanding uncollected billings of electric cooperatives to any local government unit, and to report them to the Department of Budget and Management (DBM) for collection.

A smaller NPC shall remain as a government-owned and controlled corporation to perform the missionary electrification function through the SPUG. NPC-SPUG is responsible for producing power generation and its

associated power delivery systems in areas that are not connected to the transmission system. NPC-SPUG is a provider of basic electricity services in unviable, unserved, and marginalized areas. DOE is responsible for preparing the Missionary Electrification Development Plan (MEDP). MEDP is expected to provide a detailed master plan for the electrification of unviable areas and for the future development of existing missionary areas of the SPUG. MEDP is an important component of the Power Development Plan (PDP) which will be incorporated in the Philippine Energy Plan (PEP). PEP is submitted by the DOE to Congress annually.

The DOE is responsible for formulating policies for the planning and implementation of projects and programs. It is tasked with preparing and updating annually the PEP and the PDP. TRANSCO undertakes the preparation of the Transmission Development Plan (TDP) which shall be submitted to DOE for integration with the PDP and PEP. Any plan for expansion or improvement of TRANSCO's facilities must be approved by the ERC. In addition, DOE is mandated to supervise the restructuring of the electricity industry.

DOE is required to submit a semi-annual report to the Joint Congressional Power Commission (JCPC), an oversight body, on the implementation of the EPIRA (see Figure 1).

Regulatory ratemaking regimes can be classified into two categories: (1) cost of service regulation (COS), and (2) performance-based ratemaking (PBR).

COS regulation is also called "Return on Rate Base" (RORB) regulation. Basically, COS is the ratemaking regime practiced in the Philippines. The process of determining the rates to be charged by an electric utility consists of two stages: (1) the total revenue that the utility firm is to be allowed in a period is calculated, and (2) the specific prices to be charged various users for particular services are set in order to produce the target revenue.

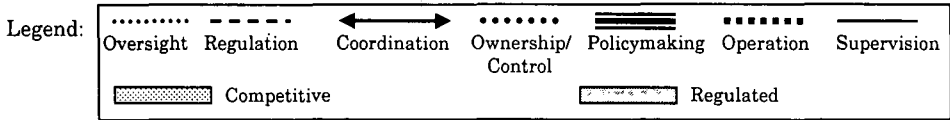
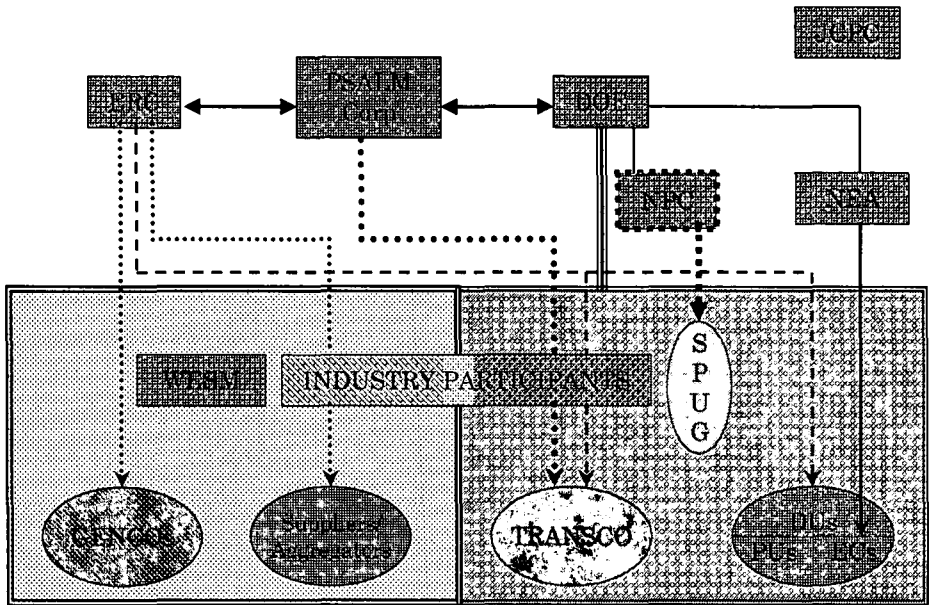
The basic formula for calculating the total revenue requirement or cost of service of an electric utility is:

$$R = C + (V-D)k \quad (1)$$

where R represents the total revenue requirement, C represents all operating costs, V is the gross value of the firm's assets, D is accumulated depreciation of the assets, and k is the rate of return allowed on assets. V-D represents the utility's rate base. The COS formula suggests that the determination of the utility's revenue consists of three steps: (1) estimation of operating costs, (2) identification of the rate base, and (3) calculation of a reasonable rate of return.



**Figure 1. The New Structure of the Electric Industry**



- DOE - Department of Energy
- DU - Distribution Utilities
- EC - Electric Cooperative
- ERC - Energy Regulatory Commission
- GENCO - Generating Company
- JCPC - Joint Congressional Power Commission
- NEA - National Electrification Administration
- NPC - National Power Corporation
- PSALM Corp. - Power Sector Assets and Liabilities Management Corporation
- PU - Private Utilities
- SPUG - Strategic Power Utilities Group
- TRANSCO - National Transmission Company
- WESM - Wholesale Electricity Spot Market

Source: Department of Energy.

The weakness of COS regulation is that it is expensive, time-consuming and inflexible. To implement COS effectively requires expertise that ERC cannot afford to obtain. But the major drawback of COS regulation is that it does not provide adequate incentives for promoting efficiency improvements in regulated firms.

The PBR provides a price-setting mechanism that automatically adjusts for changes in inflation less productivity, and provides incentives for maintaining service and performance standards in each year of the specified review period. The PBR mechanism also incorporates an automatic adjustment factor, and is considered to be an alternative to COS ratemaking currently practiced by energy regulatory bodies around the world.

The PBR pricing mechanism is based on the following equation:

$$P_t = \frac{P_0(1 + \text{CPI}_{t-1} - X_{t-1})S_t + Y_{t-1} \pm \text{SE}_t \pm \text{CSTP}_t}{S_t} \quad (2)$$

where  $P_t$  is the authorized average price per kilowatt-hour for year  $t$ ,  $P_0$  represents the baseline or initial price level,  $\text{CPI}_{t-1}$  is the rate of inflation for year  $t-1$  as measured by the percentage change in the CPI index,  $X_{t-1}$  is the growth of national productivity measured by total factor productivity (TFP) for year  $t-1$ ,  $Y_{t-1}$  is the allowance for costs to be passed through directly (e.g. currency adjustments, mandated wage changes, etc.) for year  $t-1$ ,  $S_t$  is total sales in kilowatt-hours for year  $t$ ,  $\text{SE}_t$  represents shared earnings for customers for year  $t$ ; and  $\text{CSTP}_t$  represents rewards or penalties for customer service and technical performance for year  $t$ .

The PBR mechanism is based on the two underlying principles: (1) the compensation principle, and (2) the incentive principle. The compensation principle states that the ratemaking mechanism should provide the utility with a fair opportunity to receive reasonable costs and earn reasonable and fair return on investments. The incentive principle states that the use of external benchmark creates strong incentives for the utility to minimize costs and maximize operating efficiencies.

In successfully implementing the PBR mechanism, three obstacles need to be overcome: (1) the regulator must set a baseline for PBR rates at a level that is not too high to achieve real cost savings, (2) to encourage the utility to cut costs by adopting a progressive sharing formula that gives consumers a bigger portion of the initial gains, but gradually increases the share of utility received from additional cost reductions that it achieves, and (3) to institute technical performance standards to ensure that the utility does not sacrifice its service and technical performance in achieving cost savings.

The PBR mechanism is appropriate in a restructured and competitive electric power industry because it provides adequate incentives for promoting efficiency; it has built-in pricing flexibility, and the PBR mechanism holds for a five-year period and avoids the frequent review characteristic of the COS ratemaking.

For both COS and PBR, the initiative to petition ERC for a rate change or price review comes from the concerned utility firm.

Recently, ERC has approved MERALCO's unbundled rate petition, but in doing so it slashed MERALCO's total revenue requirement from P150 billion to P120 billion. ERC fixed MERALCO's rate base at P74.5 billion and its pre-tax return on rate base at twelve percent. Likewise, ERC has approved TRANSCO's unbundled rate petition and fixed the return on rate base (ROB) at 12.32 percent; however, ERC has imposed the PBR scheme in determining TRANSCO's tariffs and proposed a five-year review period in determining TRANSCO's tariffs. It seems that ERC follows a dualistic ratemaking regime, PBR is imposed on the transmission sector, and COS is practiced for the distribution sector.

Although EPIRA has given ERC the mandate to adopt alternative forms of internationally-accepted ratemaking methodology, it faces the regulatory challenge of harmonizing the inconsistency between a regulatory-driven pricing scheme (e.g., COS) and market-driven pricing scheme (e.g., PBR) under a supposedly competitive industry environment.

### **Problems and Prospects Facing the Industry**

The provisions of EPIRA include major industry reforms such as the promotion of competition in the generation and supply sectors, the provision for open access which would introduce competition in the distribution sector once the WESM or market contestability becomes a reality, and the clear delineation of regulatory responsibility between ERC (in charge of issuing rules, procedures and rights to govern the activities of market players) and DOE (in charge of formulating policies for the planning and implementation of a comprehensive program for the industry).

However, one of the problems facing the industry deals with the issue of cross-ownership provision of EPIRA. It allows for cross-ownership between a distribution company and a generation company up to 30 percent of the installed generation capacity of a grid (e.g., Luzon grid) and up to 25 percent of the national installed generating capacity. This provision opens the possibility for a distribution company to enter into supply contracts with its generation subsidiaries and create hidden profits for the owners of the power conglomerate. MERALCO's supply contracts with the Lopez-owned First Gas Power and Quezon Power, Ltd. are singled out as a classic case of the disadvantageous nature of the cross-ownership provision of EPIRA. MERALCO is accused of buying power from its affiliated IPPs at higher prices compared to the price charged by NPC.<sup>4</sup> Both divestiture and open access policy are more effective to demonopolize the industry than simply relying on nondiscriminatory access to existing systems because it is unlikely that

regulatory monitoring and rules can be effectively enforced. On the other hand, placing caps on bilateral contracts between vertically integrated firms is inappropriate because it constrains the industry from responding to opportunities created by new technology or movement in fuel prices. Thus, it would be preferable to take a firmer position against cross ownership (Sicat 2002; Abrenica and Ables 2001).

Another problem is the impact of the cost assumed by PSALM from NPC which cannot be covered by the sale of NPC's generating assets. These costs include the costs of servicing NPC's existing debt, the stranded costs of power generation, and the cost of honoring all or some "take-or-pay" contracts with IPPs. The recovery of these costs through the imposition of PPA and universal charge to all end-users would negate the downward impact of industry restructuring on electricity prices.

The repayment rate of electric cooperatives to NEA is the third problem. Under EPIRA, all outstanding financial obligations of electric cooperatives to NEA and other government agencies shall be assumed by PSALM. At least 61 percent of the electric cooperatives are not commercially viable and need to be restructured (World Bank 1989). Many of the existing 119 electric cooperatives need to undertake meaningful organizational and financial restructuring to attain sustainable commercial viability.

The fourth problem is the increasing subsidy requirement of NPC-SPUG in undertaking its missionary electrification function. Total subsidy for the 1998-2001 period was valued at P13.2 billion. Subsidy requirements for the 2002-2006 period are valued at P29.7 billion which, most likely, cannot be covered by the missionary component of the universal charge.

Thus the issue of access, equity, and total electrification policy must address the conflict between cost recovery and the need to provide poor households with minimum basic needs such as six hours of electricity per day. The issue of subsidy brings the question of whether a public provider or a private provider is more efficient in connecting more rural households per peso of subsidy. Ideally subsidies are awarded on a competitive bidding to proponents that offer the smallest subsidy to connect a given number of households in a targeted rural area.

The structure of the electricity industry in the future is shown in Figure 1; however, how the Philippine electric power industry will actually look remains uncertain. Abrenica and Ables (2001) reviewed the experiences of Chile, Argentina, California, Australia, and England and Wales with respect to cross-ownership and provisions for anti-competitive behavior. The lessons learned from the restructuring experiences of these countries are:

- (1) the success of reforms hinges more on the degree of competition introduced in the market, and less on the extent of privatization,
- (2) structural remedies are more effective than imposition of behavioral rules in curtailing the exercise of market power,
- (3) sequencing reforms is crucial, and
- (4) sound and independent system of regulation is key to ensuring market efficiency in a restructured industry where noncompetitive segments coexist with potentially competitive segments.

Some of the lessons are taken into consideration in the current restructuring of the Philippine electric power industry; for instance, the sequencing of reforms is gradually adhered to. The passage of EPIRA by Congress in June 2001 provided the legal framework for restructuring. The creation of ERC by EPIRA as well as the ongoing reorganization at DOE, restructuring at NEA, and the wholesale restructuring of NPC into three separate organizations: TRANSCO, PSALM, and NPC-SPUG, provided the regulatory and administrative apparatus for future reforms and privatization of the industry. ERC is getting technical assistance to strengthen its regulatory capacity, recruit competent people, unbundle tariffs, train its staff, and streamline its rules, systems, and procedures for sound decisionmaking and organizational independence.

The real challenge of the future direction of the industry reform agenda is how the regulator enforces open access to transmission and distribution facilities, which is a prerequisite before introducing competition at the wholesale market, and subsequently at the retail level. How the industry manages the transition from the current state to a state where competition reaches the retail level will depend on the degree of the government's commitment to the reform program, and on its ability to overcome resistance from losers of the reform process.

### **Conclusion**

The Philippine electric power industry has embarked on a reform journey to a direction it has not travelled previously. This journey requires the restructuring and privatization of its existing agencies and institutions, and the establishment of a new legal and regulatory apparatus. The ultimate goal of this journey is to create a price-based competition, incentive-based regulation, open access to transmission and distribution facilities, and to attract sufficient private investments to meet demand in the long run and provide reliable supply to consumers.

However, the reform process also requires a strong and independent regulatory body that does not succumb to pressures from the influential market players it regulates, as well as a government whose commitment to reform does not change with the change of the political environment.

### Endnotes

<sup>1</sup>E.O. 215 (Allowing the Private Sector to Generate Electricity) classifies four types of generating plants: (1) cogeneration units, (2) electric generating plants intending to sell their production to the grids, (3) electric generating plants intended primarily for the internal use of the owner, and (4) electric generating plants outside the NPC grids.

<sup>2</sup>These projects are: Binga Hydroelectric Plant, Cavite EPZA Diesel Plant, Sual Coal-Fired Thermal Plant, Casecnan Multipurpose Project, and the San Roque Multipurpose Project.

<sup>3</sup>Before R.A. 7832, ERB suggested in 1991 a minimum standard of 14 percent system loss, and a preferred standard of ten percent for all utilities. But these standards were never implemented. (ERB Resolution No. 91-32, 6 December 1991).

<sup>4</sup>"Enrile Hits Rise in March Electricity Rates, Blames MERALCO PPA Charges," *Manila Bulletin*, 12 March 2003. It accused MERALCO of buying power from Quezon Power, Ltd. at P6.54 per kwh, from First Gas-Sta. Rita at P5.54 per kwh, and from First Gas-San Lorenzo at P4.89 per kwh for December 2002. In contrast, NPC supplied MERALCO at only P3.62 per kwh.

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