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Restructuring & Privatization Reforms in the Philippine Electricity Supply Industry – *How Will Consumers Benefit ?*

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ABSTRACT

This paper presents the features of the planned restructuring of the Philippine Electricity Supply Industry (PESI) and the privatization of the National Power Corporation (NPC), as described in the proposed Omnibus Electricity Act soon to be re-filed in the 11th Philippine Congress. Estimates of consumer surplus expected due to reforms are also provided.

Introduction

The PESI is in a state of flux. The first wave of change occurred in 1987 when Executive Order (EO) 215 was signed by Ex-President Aquino. EO 215 effectively deregulated the generation sub-sector of the Philippine Electricity Supply Industry (PESI). The privatization of NPC began in 1991 when the first Build-Operate-Transfer (BOT) plants came on stream. This process has continued today when almost half of the capacity in the system is IPPs selling to NPC.

The highly successful BOT program has already transferred the construction and operations risk to the private sector. However, the Government, through NPC, still shoulders most of the financial and market risks. Privatization in the sense of an absolute transfer of ownership from government to private (as distinguished from the transfer of management function under most BOT schemes) would necessarily include some transfer of the financial risks. In addition, the creation of a wholesale market for electricity would eventually transfer all of the market risks to the private sector. This alternative effectively reduces the financial burden on the State and the state enterprise.

Until today, the expansion requirements of the PESI were met through debt financing since the Philippine Government has only put in P 23 Billion (B) into NPC over the past 61 years of the Corporation's existence. In today's exchange rate, this is less than 5% of total capitalization. To service the ballooning debt account, power rate increases were implemented. With the demand growth forecast and a Return on Rate Base (RORB) rate fixing mechanism, considerable rate increases should be expected.

According to NPC's CORPLAN the Philippines has now one of the highest retail power rates in Asia. Alternative financing options would be to increase taxes or direct appropriation by Congress or both. These options are largely dependent on political factors but morally, the Government should not put money in businesses where private enterprise is willing to enter.

The BOT program, and the entry of IPPs, were unarguably the key solutions to the severe power crisis, which plagued the economy in the early 1990s. However, the IPPs resulted in high generation costs compared to NPC's own generating plants. In a previous study done by SBC Warburg (1996) for NPC, assuming a uniform 80 per cent dispatch level for all the plants, the weighted average IPP tariff exceeds NPC's production cost (exclusive of hydro and geothermal plants) by about 25 per cent. In a deregulated market, faced with falling generation costs, contractual liabilities inherent in these IPP off-takes present serious problems for the state monopoly.

Therefore, NPC must pursue a strategy that will maximize cash proceeds from privatization and at the same time minimize stranded liabilities. NPC must avoid triggering contractual buy-out situations.

The industry and NPC successor companies should be restructured in a manner that would attract the most number of qualified and financially strong private investors. It should be able to provide a market with non-discriminatory rules for business transactions allowing the industry players to fairly compete against each other and receive a fair return on their investments. The competitive structure should have built-in incentives or mechanisms for efficiency so that there is constant downward pressure in electricity rates.

It is important, from a competitive market framework, that generation be open to competition among entities such as the generation companies, independent power producers, distribution utilities owning and operating generation plants, cogeneration facilities and self-generators. The experience of other

countries has shown that electricity is a product which can be produced and transported like any other product, and thus, can be sold in a competitive market.

Competition among suppliers concurs with the exercise of choice by the customers. This is a right not available to consumers in the present set-up of the industry. To ensure that competition is robust, this exercise of choice should be protected and strengthened in the restructured industry. Non-discriminatory access must be allowed up to the retail level.

NPC is in a very unique position. As a 60 year old monopoly, it is willing and in fact, spearheading the total rather than partial dismantling of its monopoly by unbundling vertically and horizontally - vertically, by separating the generation and transmission function, and horizontally; by splitting the generation part into several generating companies. Transmission is regarded as a monopoly business and therefore should be regulated. The proposed Privatization & Restructuring (P & R) reforms envisions the achievement of the following benefits:

a) Efficient plant planning. Electricity producers will not build generation facilities unless the demand for electricity shows that more facilities are needed. Essentially, the pricing of energy and repayments to capacity would in turn serve as efficient market signals for additional plant capacity.

b) Incentive for efficient operation. Electricity producers and utilities will have the incentive to operate efficiently since it has to reduce cost to ensure that it will be dispatched.

c) Incentive for efficient consumption. Conservation is encouraged when the market price is high, with the electricity price serving as an efficient market signal.

d) Incentive for lowering costs and power rates, which is a consequence of allowing more players to come into the generation sector. As more players participate in the market, greater price competition is seen, with the players competing on the basis of their respective selling prices.

To ensure that customers can successfully negotiate the lowest prices, there must be direct access to electricity customers. To enable direct access, electricity generators must be allowed to transmit or wheel power directly to customers. Direct access involves wholesale wheeling or sending bulk power over the transmission grid.

In addition, open access should go hand in hand with tariff reform. The existing tariff structure lacks transparency. The electricity rate that is being paid by the consumer is actually composed of several charges that are imposed by different entities. Transparency in rates is important in reflecting the true cost of electricity. Consumers are not willing to pay for those costs that do not add value to the commodity.

Conceptual Framework

The tabulation below outlines the P & R reforms and characteristics of the new PESI. Briefly, the left column enumerates the industry wide reforms while the right column describes the NPC specific components that must be implemented in order to arrive at generation and transmission sub-sectors consistent with the design of the new industry.

In order to support the concept of electricity priced on the basis of supply and demand interactions, it is imperative that NPC's functions be separated into its basic components, namely, generation and transmission. This separation of functional responsibilities is technically termed as "unbundling." In essence, vertically unbundling NPC entails the separation of the generation and transmission function, and horizontal unbundling, by splitting the generation part into several generating companies.

The basic high voltage transmission function is regarded as a natural monopoly business and therefore, will remain a regulated function. A wholesale electricity market involves competition in generation and the choice for distributors. This includes wholesale wheeling, the process of sending electricity from one utility to another over the transmission lines of an intermediate utility.

The P & R reforms are supported by the current successful trend towards wholesale market reform in other countries which shares the common theme of introducing competition. Countries as diverse as Norway, England and Wales, New Zealand, Australia, Chile, Argentina and soon California, show that spot markets can encourage efficient operations and pricing (Pollitt, 1997)[1].

CONCEPTUAL FRAMEWORK

Industry Restructuring	NPC Restructuring & Privatization
• Unbundled Services Competitive Generation Transmission Wires Distribution Wires Supply (Retail)	⇨ 7 Gencos + 1 IPP Manager ⇨ Transmission & Sub-T[2] Subsidiary Missionary Services Subsidiary NPC Holding Company
• Unbundled Tariffs	⇨ Generation Charge Transmission and Ancillary Services System-wide levy Distribution Services
• Open Access Transmission Distribution	⇨ Transmission Wheeling Direct Connections ⇨ Distribution (Retail) Wheeling Consumer Choice
• Competitive Market Electricity Pool Least Cost Economic Dispatch Universal Membership	⇨ Plant by Plant and Portfolio Bidding
• Spot Market Day Ahead Market Imbalance Market	⇨ One Day Sales Contract
• Contracts Market Forwards & Futures	⇨ Term Contracts with Cunsumers
• New Regulatory Regime	Sale of Successor Companies

1 Pollitt, M.G., 'The Impact of Liberalization on the Performance of the Electricity Supply Industry: An International Perspective,' The Journal of Energy Literature, The Oxford Institute for Energy Studies, Vol. III, No.2,1997

2 Sub-transmission assets are those lines and substation connecting the high voltage backbone to the distribution system.

Brief discussions of each feature are as follows:

a) Competitive generation companies. There must be real competition and safeguards against abusive market power and anti-competitive behavior. NPC plants therefore must be grouped to form generation companies (gencos) which shall achieve this purpose. There must be an adequate number of market participants who do not have the ability to influence prices or raise barriers to entry.

b) Central economic dispatch[3]. All generation facilities connected directly or indirectly to the Grid with an installed capacity exceeding a threshold (to be determined by the Regulatory Commission), other than self-generators, shall be subject to central economic dispatch by the System Operator.

c) Competitive Spot Market Price. The wholesale market operates on the pool system[4] and the market price is determined based on the supply and demand for electricity. NPC's current one-day sales contract is the precursor of the proposed day-ahead market where electricity priced at NPC's system marginal cost is offered to self-generators on a daily bidding basis. The one-day sales contract aims to increase the utilization of generating capacity available in the grid at the expense of smaller, isolated generators.

d) Trading Rules. Transparent, non-discriminatory and fair rules to govern the Wholesale Market which will determine among others, the determination of merit order for economic dispatch; establishment of the market price; and administration and governance of the market.

e) Bilateral Contracts are contracts negotiated between suppliers of bulk electricity and distributors or direct users of electricity. These are commercial contracts that are not under the scope of the industry regulator. The development of the forwards and futures contract market will provide liquidity and hedging opportunities to the holders of these take-or-pay instruments.

f) Independent Transmission Company which is a neutral organization responsible for the system. A separate Transmission Company will increase the efficiency of the electricity market and grid operations. It separates the service interest of the grid company from the market interests of the power companies.

g) Independent dispatcher or grid operator controls the behavior of all suppliers connected to the system. The grid operator has the responsibility of ensuring that the system is operated at the least cost while satisfying pre-set reliability and stability standards. The independence of the grid operator from the commercial interests of generators and distributors is crucial for effective mitigation of vertical market power.

h) Transmission Price is the regulated price for the use of the high-voltage backbone transmission line and assets. This tariff, for wheeling services is already defined and approved by the regulator as part of the Open Access Transmission Tariff and Services (OATTS).

Estimation of Consumer Surplus (Benefits)

A simulation model was constructed to estimate the consumer surplus or benefit due to savings in total generation cost available to the end user. These calculations assume a constant consumer willingness-to-pay and all benefits are due to the difference in price. The fixed cost components of the status quo tariffs have been adjusted to reflect border prices. The status quo is defined as:

1. Generation assets earning a minimum, regulated 8% RORB.

2. Standard accounting practice of yearly asset revalu ation. In the case of NPC, an estimated 4% revalua tion per annum, as approved by the regulator.

The contra-factual scenario, on the other hand, envisions a competitive generation sector with generation prices composed of:

1. A flat, unescalated basic charge, nominated either as demand or energy components as currently filed with the Regulator or, as peak and off-peak tariffs which NPC intends to file. The currently filed tariff is P1.50/kWh. This tariff is a market determined price which incoming IPPs offer directly to utilities seeking supply contracts. This tariff does not include an RORB component[5].

2. A system-wide, non-bypassable levy, capped at a maximum of P0.22/kWh, intended to cover the following cost items:

(a) The cost of missionary electrification, generation component only.

[1] Central economic dispatch is a procedure whereby all available generating capacity are stacked from cheapest to most expensive on the basis of marginal cost to produce a "merit order". Plants are then dispatched or given instructions to generate, using the least expensive up to the most expensive unit to fill a particular demand profile, subject to transmission line constraints.

[2] Pooling is a system where all available generators are "pooled" as a portfolio irrespective of who the contracting parties are.

[5] The justification for excluding the RORB portion is the reason that in a deregulated industry, NPC ceases to have the responsibility for supply. In the desired competitive situation, the market will have that responsibility. Utilities and generators would have to come together and forge supply contracts to meet demand. The RORB implicitly provides NPC with a 'return' in order to build up capital for additional capacity or replace older units.

(b) The cost of indigenous energy development[6].
(c) A portion of the island interconnection costs[7].
(d) Estimated stranded liabilities of NPC upon full deregu lation and eventual privatization.

As stated, the change in consumer willingness-to-pay, DCWP, is a function of a change in prices of electricity available to the end user. A change in the ownership of the seller or a change in the way the commodity is sold should not affect the way we value electricity. The change in market prices (due to changes in the price of the generation component) DMP can be expressed as the difference between NPC's currently filed unbundled, generation tariff and the implicit regulated tariff as computed from an RORB methodology.

Moreover, this exercise defines the change as the **difference** between the CWP and MP as a **result** of the P & R. Logically, DCWP would be a function of a change in scarcity value or utility of the commodity. If the CWP does not change as a result of the reforms then it is irrelevant in the exercise. Furthermore, since the revenue quantities for each of the successor generation companies (gencos) were determined by dispatch simulations, the same level of system reliability and stability is implicitly assumed and therefore service quality to the customer should be the same.

On the other hand, DMP is expected and known by design. NPC's currently filed unbundled, contract tariff with the Regulator is a lynchpin of the deregulated generation sector and will be assigned contractually to the successor gencos upon sale. The change in market price is nothing more than the change in regulated tariff as computed from an RORB methodology and the price stipulated in the long-term contracts. Hence,

$$\Delta(CWP - MP) = \Delta CWP - \Delta MP \text{ and,}$$

$$\Delta MP = MP_{RORB} - MP_{CONTRACT}$$

In order to estimate these effects, a ten-year simulation of required tariffs under both scenarios was done. The results reveals that consumers can expect savings of about **P 405 B** over ten years or a present value of P 164 B if discounted at the Government's Social Opportunity Cost of 15%. At the currently assumed peso dollar parity of P 42/$, this is almost **US$ 4 B** of present value.

Series 1 in the graph below illustrate the expected movement of the RORB regulated generation tariffs while Series 2 chart the movement of the Basic generation charge - flat P1.50/kWh plus a P.022/kWh system levy plus all the cost adjustments (oil, steam, coal and FOREX changes) implicitly assumed in the RORB tariffs. It can be seen that the long-term trend is towards widening differences between the two tariffs.

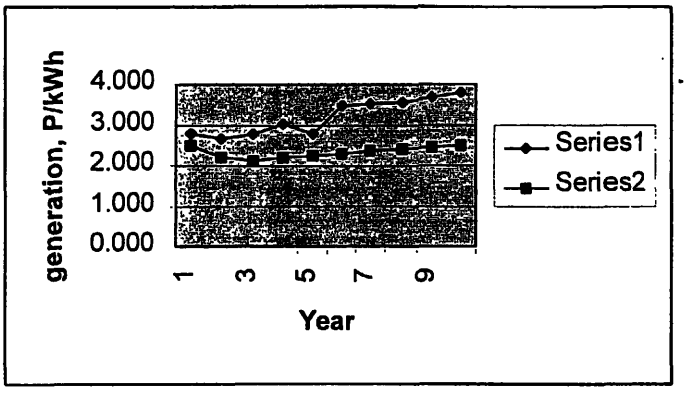

Figure 1. RORB versus R&P tariffs.

Although operating efficiencies can be expected from private ownership and operation of the Transmission Company and certain reforms in the distribution sector will certainly yield efficiencies available to end-users, the transmission and distribution sectors will remain regulated monopolies under the proposed reforms. Estimating efficiencies from these sectors may be too contentious at the current state of affairs. Likewise, deregulation and privatization of the different sub-sectors in the electricity sectors worldwide, are still relatively new. Benchmarking data for such purposes are still rare and very much case specific to each system.

Conclusions

It can be shown that the proposed reforms can and will provide concrete benefits to the electricity consumers. While stranded liabilities are expected in the deregulation process, workable mechanisms have been developed so those taxpayers are not burdened by what electricity consumers should shoulder.

The PESI certainly has come a long way from the 12-hour rotating blackouts experienced in the early 90s. The solution to the crisis came with a cost. There are no free lunches and the complete, rather than partial deregulation engendered by EO 215 will redound to better prices and the right to choose for consumers. Of course, these reforms will also make explicit the social costs incurred during the old structural regime characterized by franchised monopolies. The Philippine Government has no other choice than to recognize these liabilities and find a rational mechanism of allocating these costs among users.

[6] Above market costs pertaining to multi-purpose and small hydro, geothermal and possibly natural gas in the future.

[7] Basically, the difference between an equivalent length of over-land transmission wire and submarine cable.