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A Case Study on Power Sector Restructuring in Vietnam

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EXECUTIVE SUMMARY

This essay provides a case study on power sector restructuring in Vietnam.

Main Argument

Over the last decade, the rapid growth and expansion of Vietnam's economy has dramatically increased the demand for electricity in the country. Faced with this challenge, Vietnam's power industry has struggled to expand and improve the country's power system, as evidenced by difficulties with developing new resources, enhancing high-voltage transmission lines, and reducing transmission and distribution losses. However, in 2006, the government approved a roadmap for establishing a competitive power market and began to restructure the electricity sector, starting with establishing Vietnam Electricity (EVN) as a private holding company. This essay provides an overview of the key features of the restructuring and reform process of Vietnam's power sector and then assesses both its success to date and the road ahead for continued progress. It argues that as a result of unbundling, competition in the electricity sector is increasing and the quality of power networks has improved.

Policy Implications

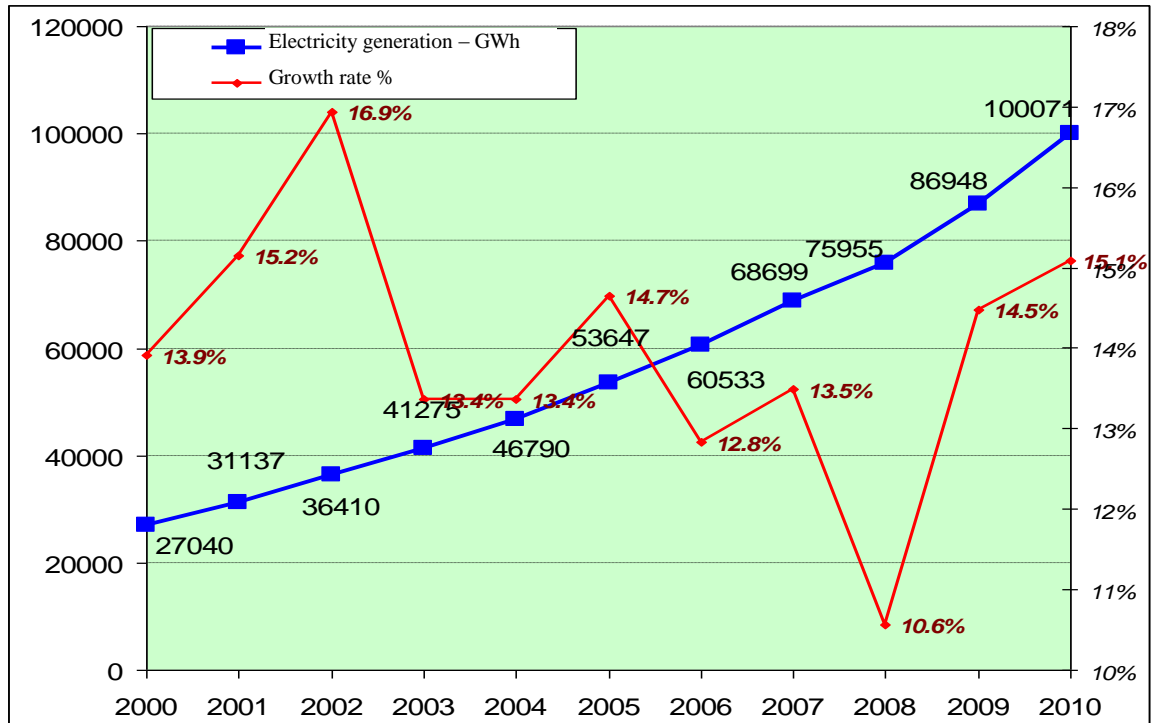
- Vietnam has embarked on an ambitious long-term program to completely restructure its power sector, which may span twenty years from beginning to end. However, critical strategic choices will need to be made over the next few years to adhere to this program.
- There are still many framework limitations to establishing a perfect power market in Vietnam. Government authorities should review their experiences with EVN to develop and prioritize optimal strategies for further unbundling. This process should also take into consideration the need to develop new shareholder companies that are financially viable and have the desire to ensure a solid foundation for future expansions of the power market.
- Creating an effective power market cannot be done through unbundling alone and requires holistic approaches to the energy sector. Among other tasks, this will require reforming electricity tariffs, allowing utilities to have decent operational margins, and improving and developing infrastructure to deliver electricity to customers.

The Power System in Vietnam: An Assessment

Main Features of the Power Sector in Vietnam

Electricity demand and supply in Vietnam. With the rapid growth and expansion of the Vietnamese economy over the last decade, power demand has been increasing dramatically. With an average annual growth of power demand of 14.5% from 2001 to 2010, electricity demand reached 86.5 terawatt-hours (TWh) in 2010, three and a half times as great as demand in 2001.

Figure 1: Power generation and growth rate in Vietnam during 2000–2010.

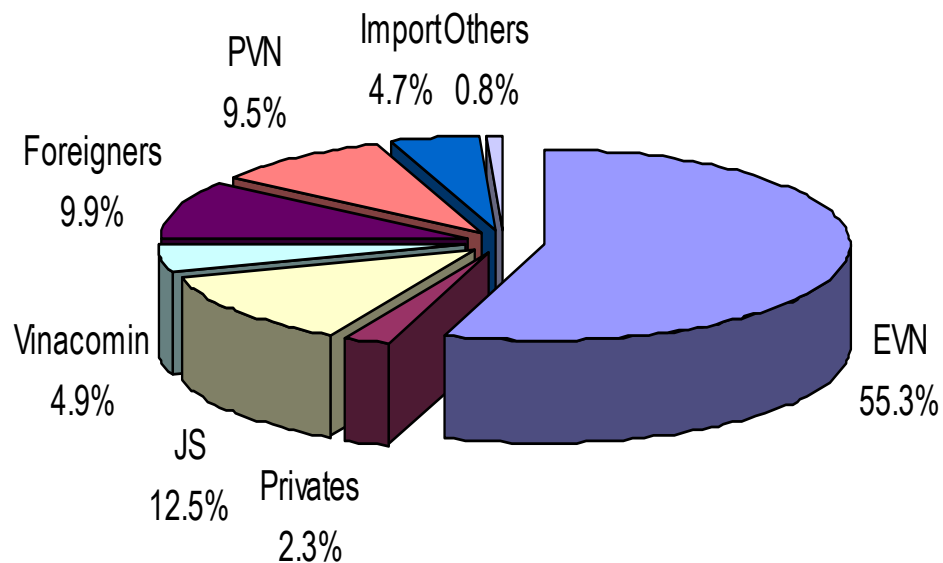


Source: “Power Development Plan VII,” Institute of Energy, 2011.

In order to meet this rapidly growing demand, Vietnam’s power industry has struggled to expand and improve the power system by developing its resources, enhancing transmission lines that connect the country’s three regions (north, center, and south), and reducing transmission and distribution (T&D) losses. Power resource development was facilitated not only by investment from Vietnam Electricity (EVN), but

also by Build-Operate-Transfer (BOT) schemes granting concessions for construction and development, and independent power producer (IPP) schemes through the participation of private capital. As a result, the firms PetroVietnam (PVN) and Vietnam National Coal and Mineral Industries Group (Vinacomin) now represent 14.4% of total installed capacity, and other IPP/BOT schemas (not including PVN and Vinacomin) represent 25.3% of total installed capacity. EVN has also completed a parallel, second north-south 500 kilovolt (kV) line totaling 3,232 kilometers (km) as of 2005, and strengthened power transfer capabilities among the regions. T&D losses fell sharply, from 21.40% in 1995 to 11.00% in 2006 and 10.15% in 2010, largely due to improvements in management.

Figure 2: Installed capacity mix by owners in 2010



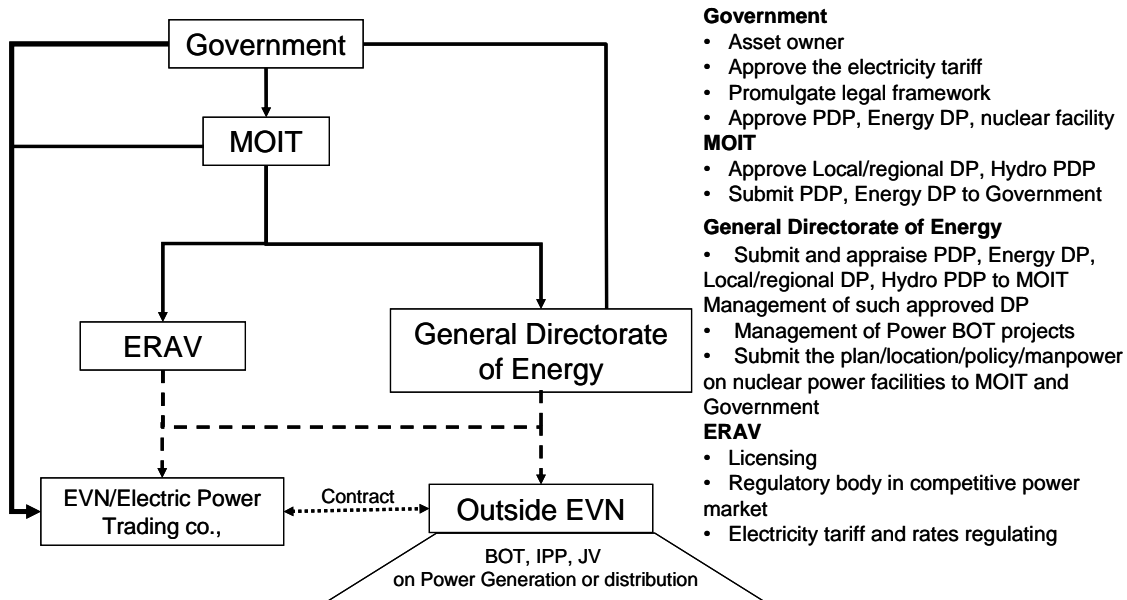
Source: Institute of Energy, 2011.

The power sector structure. As of January 2012, the key organizations in Vietnam's power sector are DGE (Directorate General of Energy, under the Ministry of Industry and Trade, or MOIT),¹ ERAV (Electricity Regulatory Authority of Vietnam),

¹ DGE was established in October 2011, replacing the Department of Energy within MOIT.

and EVN. DGE is responsible for overall energy planning and policy, but not for day-to-day management. ERAV is the country's regulatory agency, responsible for establishing and supervising the power market, power planning, tariff regulation, and licensing. EVN is a state-owned and monopolistic utility that is responsible for the whole chain of electricity production, transportation, and distribution.

Figure 3: Government institutions in the power sector



Source: Elaborated by this study.

The restructuring process of 2003–10. In the past, Vietnam's power sector was dominated by EVN, but its position has since been challenged by other state-owned enterprises (SOE) and IPPs as well as BOTs since 2005 when the electricity law that outlines the principles of the Vietnamese government's policy for the power sector came into effect. The law's key objective is to develop a power market based on the principles of transparency and competition that achieves economic efficiency and attracts public and private investments. The law also states that the state monopoly in the sector would be limited to power transmission, national load dispatch, and strategically important large power plants, leaving power distribution and non-strategic power generation to potential private investors.

Restructuring of the electricity sector was initiated with the establishment of EVN as a holding company in 2006. In June 2006, EVN was converted into a holding company structure with a number of strategic business units; the units engaged in power distribution were established as independent accounting units (profit centers), while transmission and generation units were viewed as non-revenue dependent accounting units (cost centers). In April 2007, the government approved an equitization plan² for the partial privatization of most of the operating units engaged in power generation and distribution, with EVN keeping more than 50% of share capital. However, equitization was no longer pursued when the global financial crisis made it increasingly difficult to find investors.

In 2006 the Vietnamese government approved a roadmap for establishing a competitive power market that envisages a phased approach to reforms. The first phase comprises the establishment of a competitive generation market; it was expected to start in late 2009 or early 2010 but was delayed (see next paragraph). A single buyer would buy electricity from the generating companies and sell it to distribution companies and large consumers at regulated prices. The next phase will entail a wholesale competitive market where sellers (power plants) and buyers (distributors and large consumers) will competitively transact in a power pool. This phase is scheduled to start in 2014 with a pilot wholesale market. The final stage, scheduled to start in 2022, will be a competitive retail market, where retail consumers will be allowed to choose their supplier.

As of July 2011, MOIT decided to begin implementing the pilot competitive market. In the pilot phase, 48 of the 73 power plants with installed capacity greater than 30 megawatts (MW) will directly bid in the market. The total installed capacity of the players in the market account for approximately 61% of the total installed capacity of the power system. BOT plants (e.g., Phu My 3 and Phu My 2.2) will be bid in the market by the representative of the power purchase company to ensure responsibility for payment. Big hydroelectric plants that have multi-strategic objectives (e.g., Son La, Hoa Binh, and Ialy) will not participate in the market and continue to operate as usual to ensure optimal

² Equitization in Vietnam is a process of transforming a state-owned enterprises into a joint-stock company, and it is considered partial privatization.

coordination between power generation and social goals (i.e., managing flood control and irrigation).

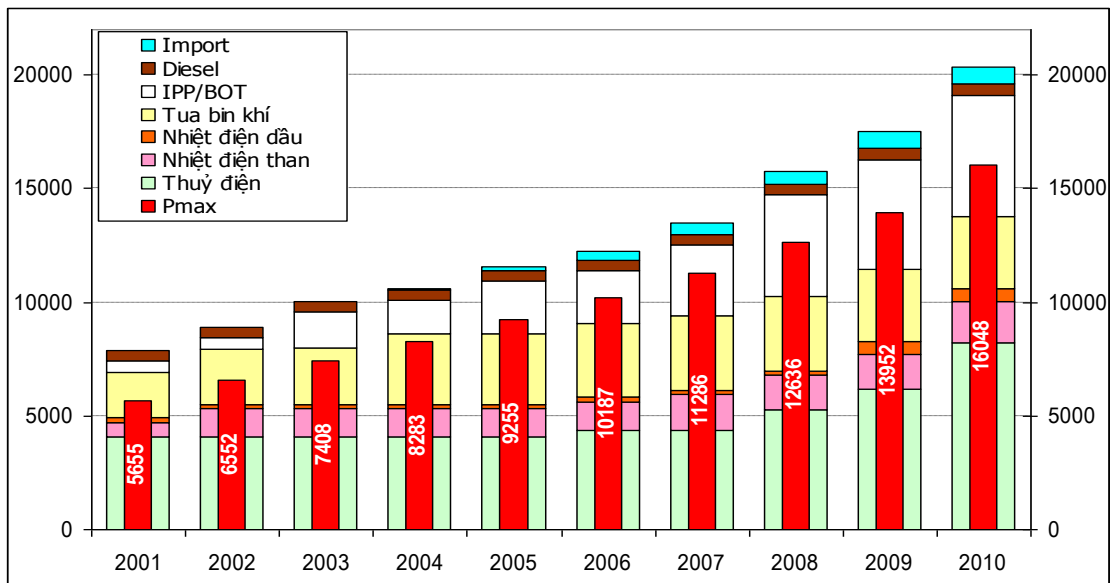
Power sources. By the end of 2010, total installed capacity of the system was 21,542 MW, including 20,542 MW from domestic power plants and 1,000 MW imported from China. The available capacity was 19,735 MW, of which EVN power plants contributed 13,466 MW (68%) and non-EVN power plants contributed 6,269 MW (32%). Presently, large hydropower contributes 37% to total capacity; gas turbines contribute 14.9%; coal-fired plants make up 11.5%; and IPPs, BOT projects, and imports have a share of 32%. Oil-fired plants, diesel plants, and small hydropower plants make up the rest.³

Table 1: Total installed capacities during 2004–10

Year	2004	2005	2006	2007	2008	2009	2010
Total installed capacities of power system (MW)	11,469	11,578	12,270	13,512	15,763	18,481	21,542
Increase from the previous year (MW)	1,459	109	1,192	1,242	2,251	2,718	5,779

Source: “Power Development Plan VII,” Institute of Energy, 2011.

³ EVN Operations Report, 2010.

Figure 4: The structure of power generation by sources (MW)

Source: EVN report, 2010.

IPP development in the power sector has rapidly increased, with a dramatic shift toward greater reliance on power purchased from IPPs, from 1,302 gigawatt-hours (GWh) in 2003 to 41,872 GWh in 2010.⁴ EVN aims to increase purchases from IPPs in the next phase. Going forward, EVN will focus the development of its generation capacities on large hydroelectric projects that it has exclusive rights to develop and rely more on IPPs for the development of thermal power plants.

An Assessment of Power Market Structure and Performance in Vietnam

Preconditions for perfect competition. Perfectly competitive markets are referred to be efficient, that the social welfare has been maximized. The theory of microeconomics states that the total social welfare, the consumer surplus, and producer surplus are maximal in perfectly competitive markets, whereas in all other conditions (e.g., a monopoly or an oligopoly), the total surplus is not maximal. Therefore, when competition is introduced to markets, structures close to perfect competition should be implemented. I

⁴ These figures include the electricity generation from power plants owned by PVN and Vinacomin.

will next analyze this framework for Vietnam's power market to identify how this theory would be applied to Vietnam.

The following suppositions are generally accepted as the framework for perfect competition (complete unbundling):

1. Consumers as well as producers are price takers.
2. There is perfect information.
3. There is free entry to and exit from the market.
4. A homogenous product is produced.
5. There are no large economies of scale.

In the context of Vietnam's power sector, let us consider a market for the direct trading of electricity, where consumers and producers meet in an ideal marketplace for simply selling and buying electricity. How do the suppositions for perfect competition apply to such a power market?

Supposition 1 states that both consumers and producers should be price takers. For consumers, this statement is applicable, as normally no consumer has the power to influence prices. On the producer side, the situation must be analyzed under two problems: optimal plant size and market power.

The trend toward distributed generation supports competition by increasing the number of generation players, therefore reducing the market power of any single player. However, an analysis of Vietnam's power market indicates a reverse tendency. For this market, we have calculated the HHI (Herfindahl-Hirschman Index) for several years from 2003 to 2010. The HHI is 8553 in 2003 and 4508 in 2010. Although less concentrated than in previous years, Vietnam's power market is still considered critically concentrated.

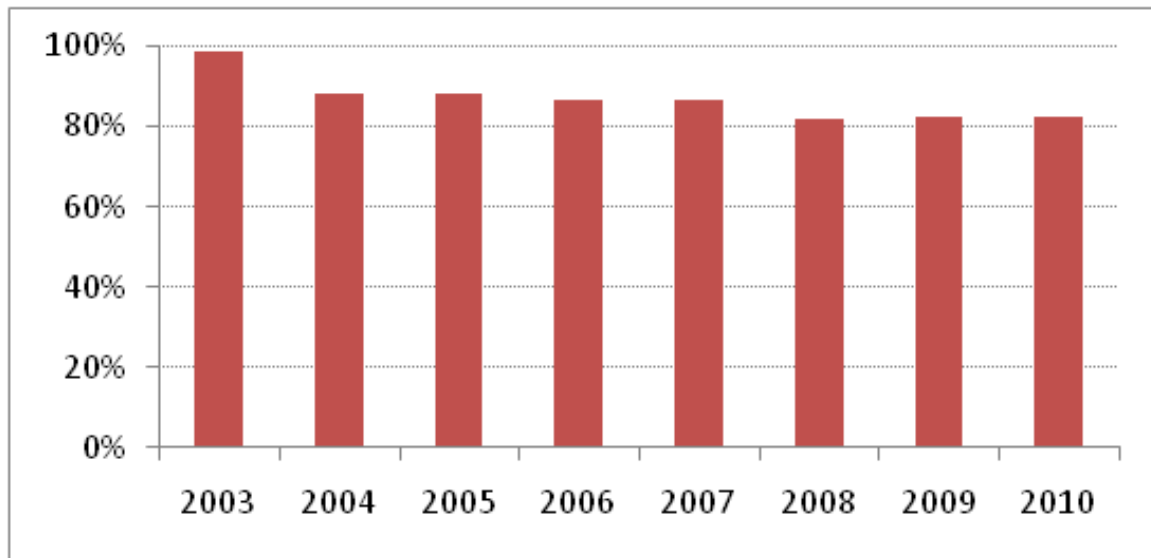
Table 2: HHI for Vietnam's power sector

Year	2003	2004	2005	2006	2007	2008	2009	2010
HHI	8,553	6,208	6,208	5,983	5,153	5,153	4,824	4,508

Source: Elaborated by this study.

Another indicator is the Concentration Ratio (CR_n), which is defined as the market share of the n largest undertakings competing on the market. We calculated CR_n for $n=3$ (See **Figure 5**).

Figure 5: The CR_3 of the three major power suppliers in Vietnam



Source: Elaborated by this study.

When we put these analyses (market power and concentration ratio) together for the power market in Vietnam, we found that no general statement can be made about whether generators are price adjusters overall. One certainty is that they are not price takers, as these analyses show a negative influence on competition.

Supposition 2 is highly theoretical, as no one can have perfect access to information, but it is generally accepted that communication control and processing technology have allowed for the dissolution of the vertical structure of network markets in developed countries. For Vietnam's power market, no such general statement can be made at present because its information revolution is just starting. Vietnam has a long tradition of centralized command and control with limited access to information.

Supposition 3—free entry to and exit from the market—would be fulfilled through government proposals and laws promoting free access to the energy market, which are actually under elaboration. However, the transaction cost for entry into

Vietnam's power market is very high, with a long negotiation process and many procedures to follow.

Supposition 4—a homogenous product is produced—is fulfilled, as electricity can be assumed to be a homogenous product.

Supposition 5 should be explained in terms of what economies of scale are and how they influence market structures. When a firm manufactures a product, it has two types of costs (in the short run): fixed costs (FC) and variable costs (VC). Variable costs are those costs that vary in the short run with changes in output. Although some forms of labor, once hired, are fixed in the short run and some forms of capital are rented under agreements that depend on output, we will assume that labor is variable and capital is fixed in the short run.

The data analysis for EVN has shown that its average cost for production of 1 kWh is steadily increasing. The average cost was 321 VND (Vietnamese dong) per kWh in 2000, 450 VND/kWh in 2005, and around 860 VND/kWh in 2008.⁵ However, real values in VND 2000 are relatively stable for this whole period.

From the above analysis, it can be concluded that there are still many limitations to establishing a perfect power market in Vietnam in the near future. However, to deregulate and organize imperfect markets, there are several possible models to achieve the best possible results for all market players, ranging from engaging in direct trade to establishing a power pool.

Competition in distribution. Distribution of electricity in Vietnam is under the responsibility of power (distributor) companies, of which there were eight in 2003 and eleven in 2008. Under the framework of an experimental introduction of shareholders into distribution and a privatization of distributors, EVN has been breaking down big distributors into smaller ones, but keeps its position as the majority shareholder in all the distributors except one. However, due to poor economic performance and delays in the introduction of the power market (generation), the government reduced the number of distributors to five in 2010 and removed the joint-stock model (Khanh Hoa). Still, the objective of restructuring remains to increase the economic and financial performance of

⁵ This estimation is based on data collected by the author.

distributors, concentrate distributors into a critical size to better mobilize heavy investment in the near future for the distribution network, and better direct control and management under EVN.

Sector performance. Performance of power industries in Vietnam, primarily managed by EVN, has been good during the considered period. These power systems have kept pace with a very high increase in demand, maintaining good-quality service in terms of the average number and duration of interruptions experienced by customers, voltage drop, and basic services provided to all customers most of the time. EVN productivity is steadily increasing as measured by the number of its employees per MWh produced, while EVN has improved its average thermal efficiency from 36.5% in 2003 to 37.4% in 2008.

EVN has maintained strong financial viability, as shown by the data, while keeping tariffs to customers low (see below) to comply with government control. However, under its current tariff system, it is understood that this low average tariff is a sophisticated cross-subsidy system and that it cannot be sustained for long periods of time without reasonable increases in costs to customers.

Technical and nontechnical losses from all T&D networks are steadily declining and have been less than 10% in recent years (see **Table 3**). This is a notable achievement for a system, such as Vietnam's, with huge and extended networks at this stage of its development, especially given the high volume of low-voltage power and extended rural coverage. However, this performance must be carefully understood, including the fact that rural low-voltage systems were under cooperative management at the local level, so they cover losses. These systems will be transferred from local authorities to EVN according to the government decision to transfer rural electricity management to EVN, so technical losses may have to be redefined and monitored carefully against benchmarks. Access to electricity in rural areas increased dramatically during 2000–2010, making Vietnam home to one of the most successful rural electrification programs in the world, and an example for World Bank support. However, achieving these results for the

remaining 5% of the unserved population will be a difficult challenge for the power sector in the coming years.⁶

Table 3: Power sector performance

Year		2003	2004	2005	2006	2007	2008	2009	2010
Productivity*	MWh /employee	463.2	459.5	465.3	514.8	548.7	580.2	616.3	632.6**
T&D losses	%	12.23	12.10	12.00	11.05	10.56	9.35	9.57	10.25

Source: Elaborated by this study based on EVN annual reports and the “Power Development Plan VII.”

(*): Calculations include the total number of EVN employees, including those involved in generation, transmission, distribution, consulting services, research institutes, and telecommunication.

(**): Estimate.

Electricity retail prices. In Vietnam, retail electricity tariff schedules are set by the government for the whole country. This means that if customers buy the same amount of electricity, they will pay the same price and companies will collect electricity charges at the same price schedule.

From 2005 to 2011, electricity tariffs were adjusted each year. However, due to the rise in value between the VND and USD, the price increase is not much in real terms. The price in 1999 was 4.48 US cents/kWh, increased to 5.00 US cents/kWh in 2005, and reached nearly 6.00 US cents/kWh in 2011. This price level is far lower than a price level of 7.00 US cents/kWh, which was committed to by EVN in 2001 in loan agreements with international financial organizations.

The average retail electricity tariffs for Vietnam are found in **Table 4**. Electricity tariff schedules from 2005 to 2011 become more reasonable after adjustments; however, there are still many problems for customers. At present, prices that customers pay cannot cover actual costs of electricity. Without incentive to reduce their usage to manage more affordable payments, customers may not change their patterns of electricity use, and thus

⁶ According to the government plan, 100% of the population is to have access to electricity by 2020, an increase from actual 95% in 2009. See Nguyen Anh Tuan, *Energy for All: Viet Nam's Success in Increasing Access to Energy through Rural Electrification* (Manila: Asian Development Bank, 2011), http://www.energyforall.info/site/wp-content/uploads/2011/07/RSDD_Energy-for-All_Rural-Electrification_final_14july2011_WEB3.pdf.

this may not benefit the power sector. In particular, the present electricity tariff is lower than cost of production, transmission, and distribution. Actually, there is no subsidy from the government, but there are cross-subsidies between different customer categories. The structure of the electricity tariff schedule is not equitable. Industrial, commercial customers use electricity at higher voltages that have lower costs for electricity supply, yet they must pay more than residential customers who use electricity at lower voltages that have higher costs to the distribution network and higher distribution losses. This is an obvious form of a price subsidy for residential customers.

Table 4: Average electricity retail tariffs

Item	2005	2006	2007	2008	2009	2010	2011
Average tariff (VND/kWh)	787	815	860	870	948	1,058	1,242
Average exchange rate VND/USD)	15,800	15,973	16,042	16,400	17,010	18,544	20,803
Average tariff (US cent/kWh)	4.98	5.10	5.36	5.30	5.57	5.70	5.97

Source: Elaborated by this study.

Reforms and Governance in the Power Sector

Key Features of Restructuring and Reforms of the Power Sector

The key objectives driving the decision to unbundle Vietnam's power system are the following: to improve efficiency through competition in the power industry, to minimize costs to consumers, and to expand the mobilization of investment and managerial resources from outside the current state-operated system. Furthermore, there is lobby pressure from the private sector and donors to ensure that all generators have fair access to the power sector, and Vietnam's most important objective for the power sector is to ensure their investment, as EVN alone cannot sufficiently finance investment.

One can look at the balance sheet for EVN over the last five years and observe that the self-financing ratio of EVN is declining significantly from 37% in 2007 to 17% in

2008. Vietnam's power system capacity will need to double between 2010 and 2015 and increase by two and a half times again by 2020, according to Power Development Plan VII. This huge expansion will need a huge investment amount, which cannot be ensured by EVN and public enterprises alone. Thus, there is an urgent need to unbundle the power system to provide incentives for domestic and international investors. As EVN plans to concentrate its own financing and borrowings on the hydro sector in particular, there are substantial portions of the thermal power investment requirement that potential IPPs can invest in, as well as small hydro plants.

During 2003–11, the process of equalization⁷ in the power sector was carried out intensively under the objective of restructuring the state-owned monopoly EVN into shareholding companies in order to create more market-oriented companies that are more separate from government. This process involved splitting subsidiary entities from EVN to form shareholding companies in which EVN maintains at least 51% of the shares.

Type of Unbundling and Governance

Unbundling. EVN was a vertically integrated utility until the end of 2008. Since January 2009, EVN has been set up as the National Power Transmission Company—a separate legal entity responsible for the operation of the transmission network, and thus legally unbundled (i.e., it has its own accounts, management, and board of directors).

Legal unbundling inevitably has initial costs and may have ongoing costs as well. The initial costs would be for setting up a new company, including the recruitment of a new management team, and setting up headquarters and new operating systems, all costs that were previously shared with a generation or retail business. There may also be ongoing costs from the loss of scale economies. If the new company is relatively small compared to the previous arrangement, there may be other costs. For example, the cost of capital might be higher for a small company, which might also be less effective in carrying out necessary training and have less scope to carry out R&D. The one-off costs associated with unbundling are not yet available to evaluate the degree of effectiveness of the ongoing unbundling process in Vietnam.

⁷ “Equalization” in Vietnam means to transform a wholly state-owned enterprise into a shareholding company.

Governance. EVN, as the single SOE in the power sector, is 100% owned by the government. The tutorial ministry exercises voting rights in the annual general meeting and nominates board members on behalf of the prime minister. As an SOE, it is not exempt from paying the corporation tax, which is 19% of benefits.

EVN's board of management consists of seven members, which are drawn from the following groups:⁸

- | | |
|-------------------------------------|---|
| a. executive directors (management) | 1 |
| b. non-executive directors | 0 |
| c. government representative | 6 |
| d. others | 0 |

To assist EVN's board of management, there are two committees: a control committee (whose functions are similar to those of an audit committee) and an administrative committee, both of which are separate from EVN personnel. Board members meet frequently, usually one time each month and occasionally even more often, upon the request of or as needed by one of its members. Under the control committee's recommendations, the board can replace EVN's CEO or its key managers, which has actually happened within the last five years.⁹

Market Structure and Pricing Mechanisms

The nature of the current power purchase agreement (PPA). Unbundling implies a decision on prices related to generation auctions, as well as to the prices used for wholesale prices (and whether these are passed on to end users). Electricity generation consists of electricity purchased from power resources outside of EVN and electricity production by ENV's power plants, based on:

⁸ In Vietnam, the term "board of management" refers to this group of seven individuals. The term "board of directors," as used in other documents (e.g., audits and reports), refers to the executive directors (i.e., the president and vice presidents).

⁹ Under the bylaws of EVN, the EVN president will be removed from his/her functions if: EVN has losses over two consecutive years or an alternative loss and benefit, but it cannot solve the problem; EVN becomes bankrupt; and/or the fixed objectives as set by the management board are not attained.

- PPAs between EVN and IPP, and BOT power plants
- Power plants of EVN that are dependent accounting units of EVN, which apply internal accounting mechanisms within EVN

The price of electricity purchased from power companies varies, depending on fuel prices. The electricity prices are based on the following stipulations: that total benefit of the joint-stock companies is 12%, share benefit for dividends is 90% of total benefit, and benefits of IPP and BOT power plants is 10%–12% (pursuant to Decision 709/BCN-NLDK dated April 13, 2004, by the Ministry of Industry). Therefore, electricity prices are increasing, depending on fuel prices, the dispatching mix of power plants, and the demand for electricity.

Pricing mechanisms. The average wholesale electricity price of EVN for distribution power companies is equal to the price of electricity generation (electricity purchase and electricity production) plus transmission cost and electricity transmission loss. Power distribution companies are independent accounting companies and calculate their retail electricity prices based on the wholesale price of EVN plus taxes.

EVN sells electricity to power companies according to an internal electricity tariff schedule. The procedures of internal electricity in wholesale reflect the accounting mechanism of EVN in compliance with state regulations (Decision 275/2006/QD-TTg, dated April 12, 2006).

Wholesale prices differ between power companies, as determined by varying production costs and retail electricity prices set by the Vietnamese government for the whole country. Therefore, companies, which have higher retail electricity prices, will buy electricity from the power grid at a price higher than those with low average prices. The internal electricity tariff schedules shall be adjusted if the new prices are endorsed. The average wholesale price of EVN in 2010 was 1,060.63 VND/kWh.

The Outlook for Restructuring the Power Sector

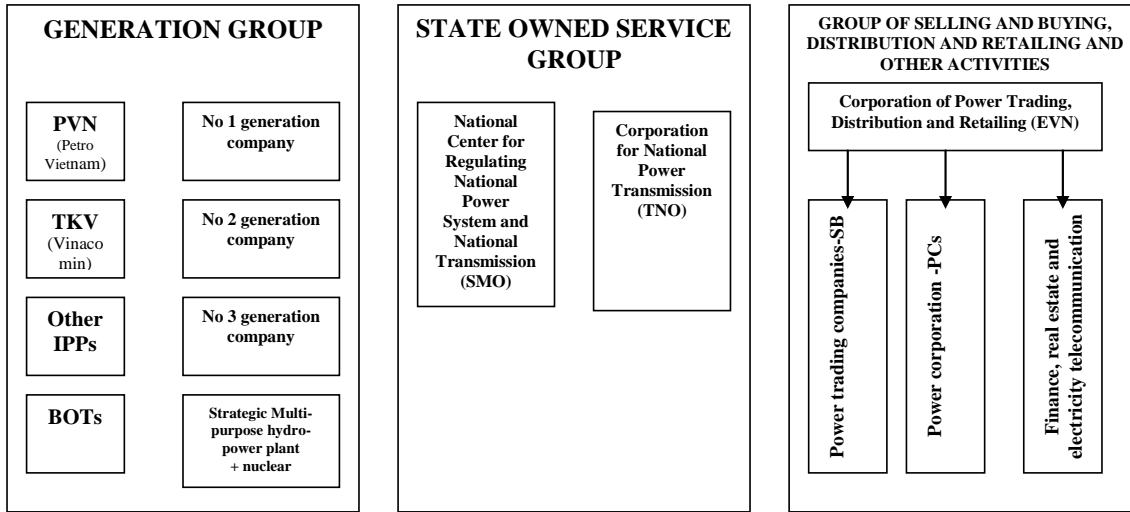
Power sector restructuring options. Vietnam has embarked on an ambitious long-term program to completely restructure its power sector by discarding its current vertically integrated electrical utility system in favor of a competitive power market. As spelled out in the initial 2005 roadmap for reform, the full process may span twenty years from beginning to end. However, critical strategic choices will need to be made over the next one to two years.

As of the time of writing, the details of the future structure of the power sector as well as the competitive power market design were being prepared for the making of a decision by MOIT. The draft report prepared by MOIT/ERAV presents three options for power sector restructuring:¹⁰

1. *Plan 1: Separation of generation, transmission, and distribution.* EVN power plants will be grouped into new, independent power-generation companies that will compete with IPPs and BOT plants. Large, multipurpose hydropower plants will remain in public ownership. The national dispatch center will be separated from EVN and act as the power's system and market operator (SMO) under public ownership. Transmission will also be separated from EVN and become the National Transmission Company. The existing distribution companies (power corporations or PCs) will be regrouped and will operate together with other business units under the Corporation of Power Trading, Distribution, and Retailing.

¹⁰MOIT and ERAV, "Master Plan on Competitive Power Production Market and Restructure of the Electricity Industry for the Development of the Electric Market," December 2008.

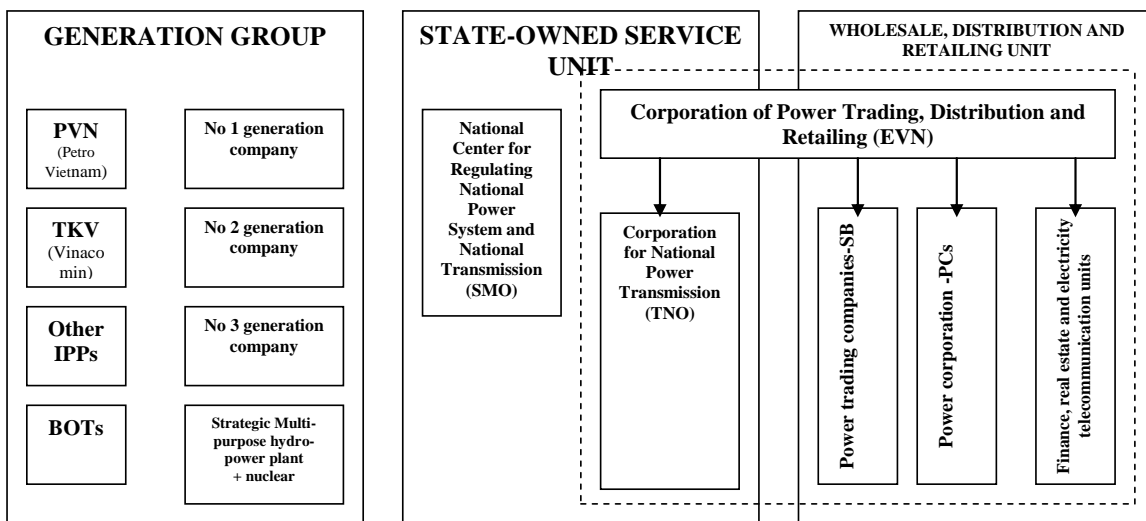
Figure 6: Plan 1 for power sector restructuring



Source: MOIT and ERAV, “Master Plan on Competitive Power Production Market and Restructure of the Electricity Industry for the Development of the Electric Market,” December 2008.

2. *Plan 2: Separation of generation and operation.* The structure under this plan is similar to Plan 1, except that the National Transmission Company will also be part of the Corporation of Power Trading, Distribution and Retailing.

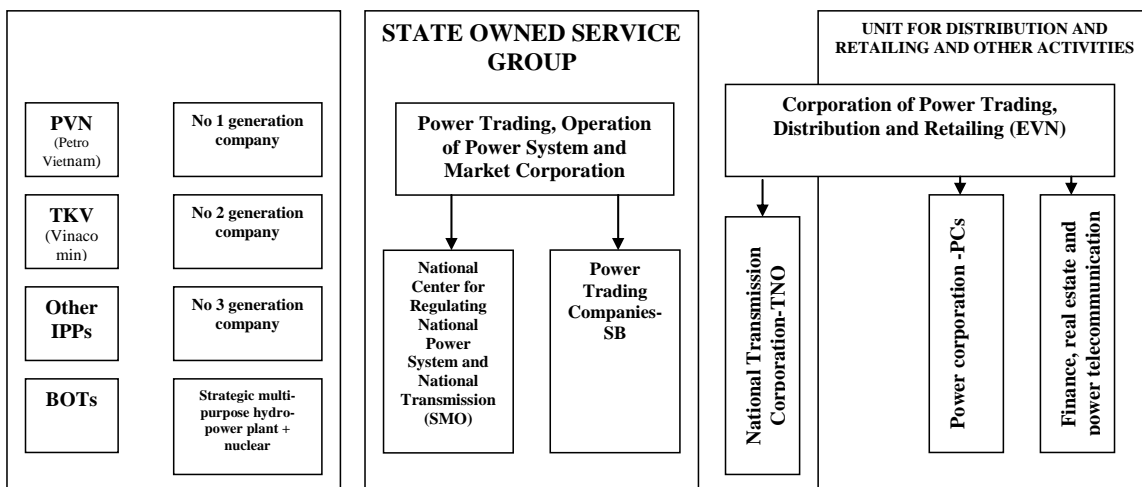
Figure 7: Plan 2 for power sector restructuring



Source: MOIT and ERAV, “Master Plan.”

3. *Plan 3: Separation of generation, buying and selling, and operation.* According to Plan 3, the National Transmission Company will be grouped with the distribution companies, while the power trading companies, together with the SMO will become part of the Company for Power Trading, Operation of Power System and National Power System.

Figure 8: Plan 3 for power sector restructuring



Source: MOIT and ERAV, “Master Plan.”

The decision on the final structure of the sector was supposed to have been made in 2010 but was postponed, and no decision has been made at the time of writing. It is important to move steadily on the comprehensive agenda adopted, as presented in the previous section. However, the current circumstances require caution in approaching a quick restructuring of the power system, which is currently functioning respectably. The transition to a new structure needs to be undertaken smoothly to avoid disturbances in power supply, inefficiencies in the effort to attract much-needed new investment, and

abrupt increases in tariffs on the population. These challenging tensions shape current thoughts and debate in the planning of further reform in Vietnam's power sector.¹¹

Conclusion

Based on the above analysis, several tentative conclusions can be drawn. However, I would like to stress that they are very preliminary. Further, more focused analysis must be carried out to verify these findings.

First, as a result of unbundling, competition is increasing. It was shown from the HHI and CR₃ analysis above that competition is being gradually introduced into Vietnam's power market, along with the unbundling and restructure process.

Another common indication of competition is the development of price levels, which are remaining at the same level at a constant price. Comparing electricity prices is difficult due to the importance of the wholesale electricity price. In Vietnam, which has an abundance of hydroelectric power, it is even more difficult due to the volatility of average prices when there are hydroelectric shortages.

Second, as a result of ownership unbundling, the quality of networks has improved. As demonstrated above, losses, technical and non-technical (administrative), were reduced and have been kept at a more-than-reasonable level since 2003. Moreover, evidence from Vietnam has shown an increase in capacity utilization.

Capacity utilization measures the extent to which the network company uses available capacity. In unbundling, we anticipate that capacity utilization will naturally increase over time as electricity consumption per connection increases and the investments in networks are costly. Network companies will become more efficient and thus will exploit their network more than in the integrated situation.

Third, as a result of ownership unbundling, we expect one-off transaction costs but subsequently lower unit costs. Tariff analysis shows that the unit cost of electricity

¹¹ The main point of the unbundling process is the creation of power market. Currently this process is undergoing an extensive evaluation. The experimentation of the internal power market within EVN was scrapped in July 2007, after a five-year operation within EVN. The main reason for this termination was the unbalance (deficit) of the power supply and demand. By EVN's estimation, the total supply is still far from recommended 20% reserve in order to have loyal competition in a power market.

remained stable, although it cannot be attributed to unbundling, as tariffs and prices are controlled by the government. However, based on the operational cost analysis conducted by EVN and its subsidiaries, unit costs increased rapidly due to labor and fuel costs, although there is no supporting evidence to confirm this hypothesis.

Recommendations

There are still many framework limitations to establishing a perfect power market in Vietnam. Government authorities should review the experiences of EVN pilot equitization, pilot power-market experience, the prerequisite conditions, and the breakdown of distributors so far, to develop and prioritize optimal strategies for the further unbundling of the power sector. This process should also take into consideration the need to develop new shareholder companies that are financially viable and possess the desire to provide the best building blocks for future development of the power market.

At the same time, creating an effective power market cannot be done through unbundling alone. It will require reforming the electricity tariff, allowing utilities and IPPs to have decent operational margins, supporting a fuel-supply pricing policy, and improving and developing infrastructure to deliver electricity to customers. Creating an effective power market will require broad-based, holistic approaches to Vietnam's energy sector.