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Vietnam's Infrastructure Constraints

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ABSTRACT

Successful countries provide economy and society with infrastructure needed to maintain growth. Development experience suggests that investing 7 percent of GDP in infrastructure is the right order of magnitude for high and sustained growth. Over the last twelve years, the government of Vietnam was able to sustain infrastructure investment at 10 percent of GDP. This remarkably high level of investment has resulted in a rapid expansion of infrastructure stocks and improved access. Despite this achievement, Vietnam is experiencing more and more infrastructure weaknesses that negatively affect its ability to sustain high economic growth in the long term. Transport and electricity – the two most essential infrastructure activities – appear to be the weakest infrastructure sectors in Vietnam with blackouts and traffic jams occurring more and more frequently.

In transport, many large-scale railway, seaport and airport projects are being planned in near total disregard of the emergence of fast growing industrial clusters. These wrongheaded projects will need to be terminated in order to make funds available for a few crucial projects in the most rapidly growing regions that currently face severe transport bottlenecks. The private sector participation in transport development will help identify and execute the most viable projects. But its potential will only be realized if the returns to private investors come from the projects' own cash flow, rather than from government subsidies in the form of land.

In electricity, the investment pattern of over-reliance on hydro needs to be changed. If hydro continues to be the single largest production source, then extensive idle time will be inevitable for thermal stations, since the wet/dry season power output ratio is so uneven. Vietnam must determine the appropriate mix of hydro and thermal generating capacity that can reliably supply the country's demand. Electricity prices have to be raised to levels that enable EVN or a single buyer in the future to contract for new generating capacity through competitive bidding. The roadmap for liberalization in the energy sector contemplated in the 2004 Electricity Law needs to be implemented if Viet Nam is to successfully attract the volume of investment and promote the levels of competition and private sector participation required to meet Viet Nam's long term energy and, hence, developmental needs.

Introduction

The Government of Vietnam has done a remarkable job in achieving a high level of investment in infrastructure over an extended period of time. Over the past twelve years, total infrastructure investment has accounted for more than 10 percent of GDP on average, putting Vietnam ahead of most East Asian economies, which are renowned for their high level of infrastructure investment.

Despite this achievement, Vietnam's infrastructure constraints are still not being solved effectively. In fact, infrastructure bottlenecks, rather than uncertain and complicated government policies, are now regarded as the biggest problem hindering Vietnam's business environment according to many international surveys.¹ The apparent inability of heavy investment to solve infrastructure constraints is explained by the fact that a disproportionate number of infrastructure projects, particularly those in the transport sector, are economically non-viable but approved under political pressure with inflated costs. Therefore, the most important infrastructure challenge facing Vietnam is *investment inefficiency* rather than inadequate levels of investment.

The government budget is currently financing a majority of new infrastructure projects, many of which are supported by official development assistance (ODA). However, as Vietnam is quickly approaching the per capita income level of a lower-middle income country, it can expect significantly fewer soft loans from foreign governments and will need to rely much more on private sector participation to execute its infrastructure development program. But the expected private sector investment in infrastructure in the coming years should be viewed not only as an additional source of finance and but more importantly as a new mechanism to develop the most economically viable projects. However, private sector participation and public-private partnerships can only promote efficiency if they are undertaken in a competitive setting and if the government focuses its role on risk sharing and mitigation rather than direct subsidies such as land swaps.

The infrastructure contradiction: sustainable high-level of investment and chronic bottlenecks

Successful countries provide economy and society with infrastructure needed to maintain growth. Development experience suggests that investing 7 percent of GDP in infrastructure is the right order of magnitude for high and sustained growth.² Taiwan and South Korea both invested heavily in infrastructure during their period of rapid industrialization. (9.5% of GDP for Taiwan during 1970-90³ and 8.7% for South Korea during 1960-1990⁴). China on average invested 8 percent of its GDP in

¹ World Economic Forum, Global Competitiveness Report 2008-2009; Japanese External Trade Organization (Jetro), 2007 Survey of Japanese-Affiliated Firms in ASEAN and India.

² World Bank, The Growth Report, World Bank Growth Commission, 2007.

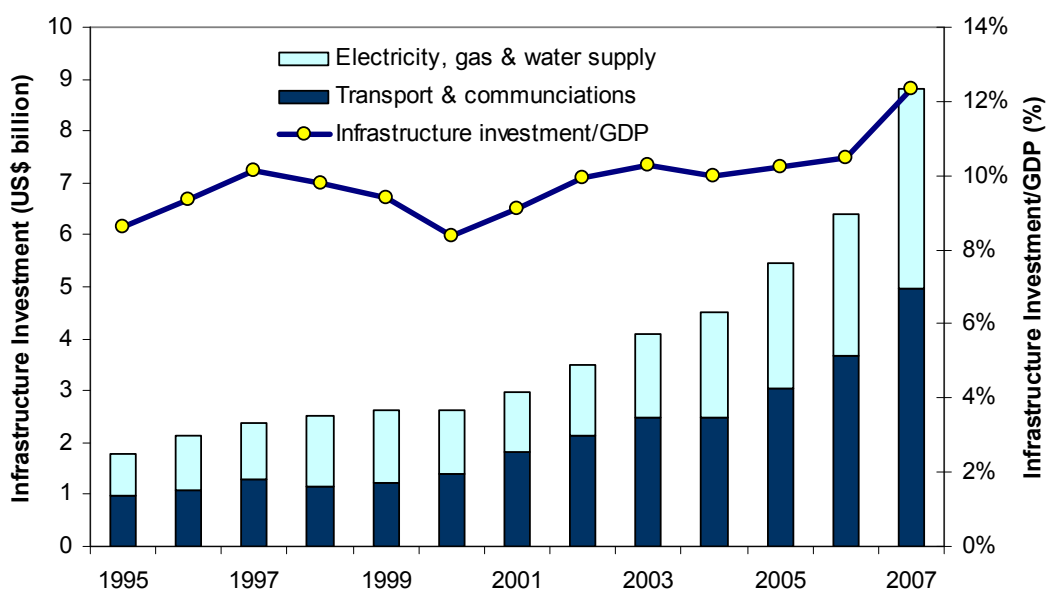
³ World Bank, Infrastructure Strategies in East Asia: The Untold Story, 1997.

⁴ During 1960-1990, Korea's total domestic investment accounts for 26.3 percent of GDP (World Bank's World Development Indicators) with one third going to infrastructure (Danny Leipziger, "Lessons from East Asia", University of Michigan Press, 1994.

infrastructure during 2003-2004.⁵ All the three countries were able to build modern systems of essential infrastructure facilities.

Infrastructure has also been an important component of Vietnam's development strategy. Over the last twelve years, the government of Vietnam was able to sustain infrastructure investment at 10 percent of GDP (Figure 1). This remarkably high level of investment has resulted in a rapid expansion of infrastructure stocks and improved access. From 2000 to 2005, the total length of paved roads increased three-fold from 30,000 km to almost 90,000 km, resulting in significant improvements in rural transport. The ratio of rural households connected to electricity grids also increased from 73 percent to 89 percent during 2000-2005.⁶ This success in small-scale and rural infrastructure development is a key feature of Vietnam's inclusive development and poverty alleviation achievements, so often praised by the international donor community.⁷

Figure 1: Infrastructure Investment in Vietnam



Note: Infrastructure investment includes electricity, gas, water supply, transport and communications.
Source: Vietnam General Statistics Office.

More than twenty years since the launch of Doi Moi, Vietnam is now entering a stage of development that requires strategic investments in trunk transport infrastructure such as expressways, railways, seaports, and airports, and in energy with an efficient mixture of hydro, coal, and gas power plants. The government frequently talks about the single biggest constraint which is money. According to the Ministry of Planning and Investment, Vietnam will need US\$25 billion a year to invest in infrastructure. It

⁵ ADB, Connecting East Asia – A new Framework for Infrastructure, 2005 and Laurel Graefe and Galina Alexeenko, Building a Better World: Infrastructure's Role in Economic Growth, EconSouth, Vol 10, No 2, 2008

⁶ Vietnam General Statistics Office.

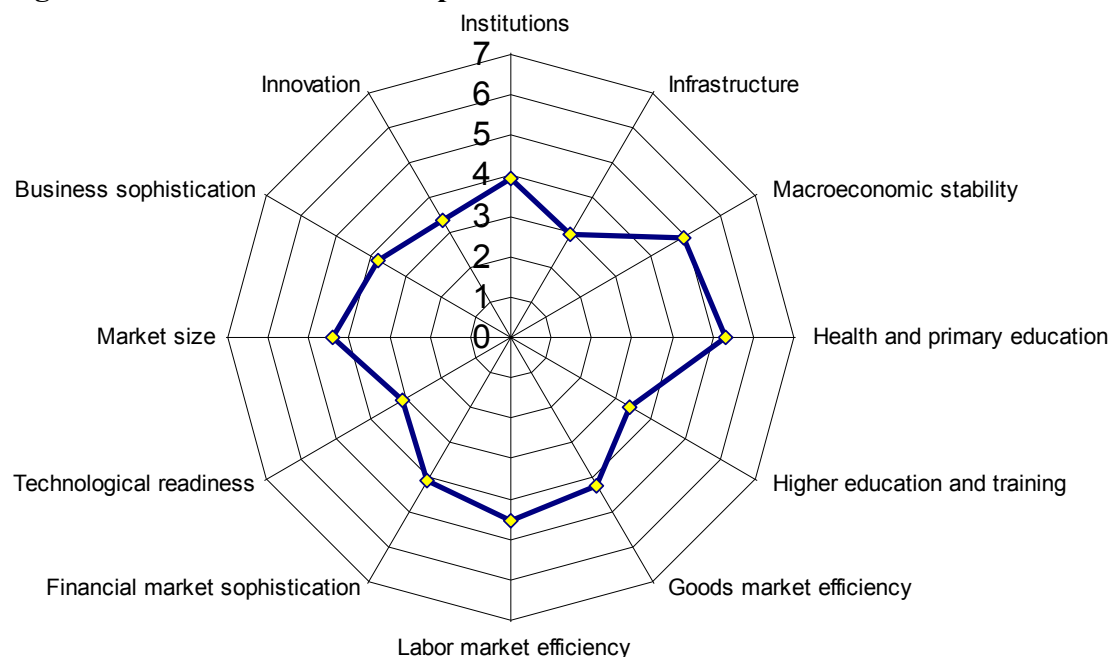
⁷ See Vietnam Development Report published annually by the Vietnam Donor Consultative Group.

estimates that annual funds available for infrastructure development from both the public and private sectors are less than US\$16 billion.⁸

While financing is always a crucial factor in infrastructure development, the efficiency factor can never be neglected. Experience in Vietnam has shown that the planning and execution of these large-scale infrastructure projects has proved to be very problematic in terms of project selection, investment coordination and management. Specifically, poor master planning and project design, lack of capability in site management and supervision, and financial difficulties of owner and contractor are most frequent and important causes of delay and cost overrun in large projects.⁹ These failures may eventually prevent Vietnam from achieving rapid growth in the long-term.

A major concern is that while countries in East Asia were able to benefit from their high level of investment and achieved competitive advantage in infrastructure services, Vietnam is experiencing more and more infrastructure weaknesses. According to the latest global competitiveness rankings of the World Economic Forum, infrastructure is the biggest drag on Vietnam’s national competitiveness (Figure 2). The Japanese External Trade Organization’s annual executive opinion survey also identifies infrastructure as the top constraint for companies operating in Vietnam. Within a ten year period (1997-2007), uncertain policy was replaced by underdeveloped infrastructure as the most problematic factor affecting Vietnam’s investment environment (Table 1).

Figure 2: Pillars of Global Competitiveness Index



Note: Each factor is scored in the 1-7 scale with 1 being the poorest quality and 7 being the best.

Source: World Economic Forum, Global Competitiveness Report 2008-2009

⁸ Sai Gon Tiep Thi (Saigon Marketing), “Tu nhan ngoanh mat” (The private sector says no), 17 September 2008.

⁹ Long Le-Hoai, Young Dai Lee, and Jun Yong Lee, “Delay and Cost Overruns in Vietnam Large Construction Projects: A Comparison with Other Selected Countries”, *KSCE Journal of Civil Engineering* (2008) 12(6):367-377.

Table 1: Top Five Problems of Investment Environment
(Percent of Multiple Responses)

Manufacturing firm	
Underdeveloped infrastructure	69.2%
Troublesome and complicated administrative procedures	50.0%
Underdeveloped economic legal system, and arbitrary legal management and application	46.2%
Uncertain and unclear policy management of local governments	38.5%
Troublesome and complicated tax practices	23.1%
Non-Manufacturing firm	
Underdeveloped infrastructure	76.9%
Insufficient office space and rent increases	69.2%
Underdeveloped economic legal system, and arbitrary legal management and application	57.7%
Troublesome and complicated administrative procedures	46.2%
Uncertain and unclear policy management of local governments	42.3%

Source: Japanese External Trade Organization (Jetro), 2007 Survey of Japanese-Affiliated Firms in ASEAN and India.

Transport and electricity – the two most essential infrastructure activities – appear to be the weakest infrastructure sectors in Vietnam with blackouts and traffic jams occurring more and more frequently. The 2008 Global Competitiveness Report points out that among various infrastructure sectors, Vietnam is ranked lowest in the quality of ports, roads, and electricity (Table 2).

Table 2: Vietnam: International Ranking of Infrastructure

	International Ranking	Competitive Advantage (+) / Competitive Disadvantage (-)
Quality of overall infrastructure	97	
Quality of port infrastructure	112	–
Quality of electricity supply	104	–
Quality of roads	102	–
Quality of air transport infrastructure	92	–
Quality of railroad infrastructure	66	–
Available seat kilometers	42	+
Telephone lines	37	+
Country Competitiveness Index Rank	70	

Source: World Economic Forum, Global Competitiveness Report 2008-2009

The contradiction between high investment and poor performance in infrastructure points to the important question of efficiency. If many infrastructure projects are wasteful and riddled with corruption and the few good ones are delayed because of poor management, then the return to investment will be low. As shown in Table 3, Vietnam is the least efficient users of capital based on the incremental capital-output ratio (ICOR). For the past 10 years, Vietnam needed five units of capital to generate one unit of growth while other Asian economies needed only 2.5-3.5 during their rapid growth period. Clearly, this extraordinarily high ICOR is at least partly caused by inefficient investments in infrastructure.

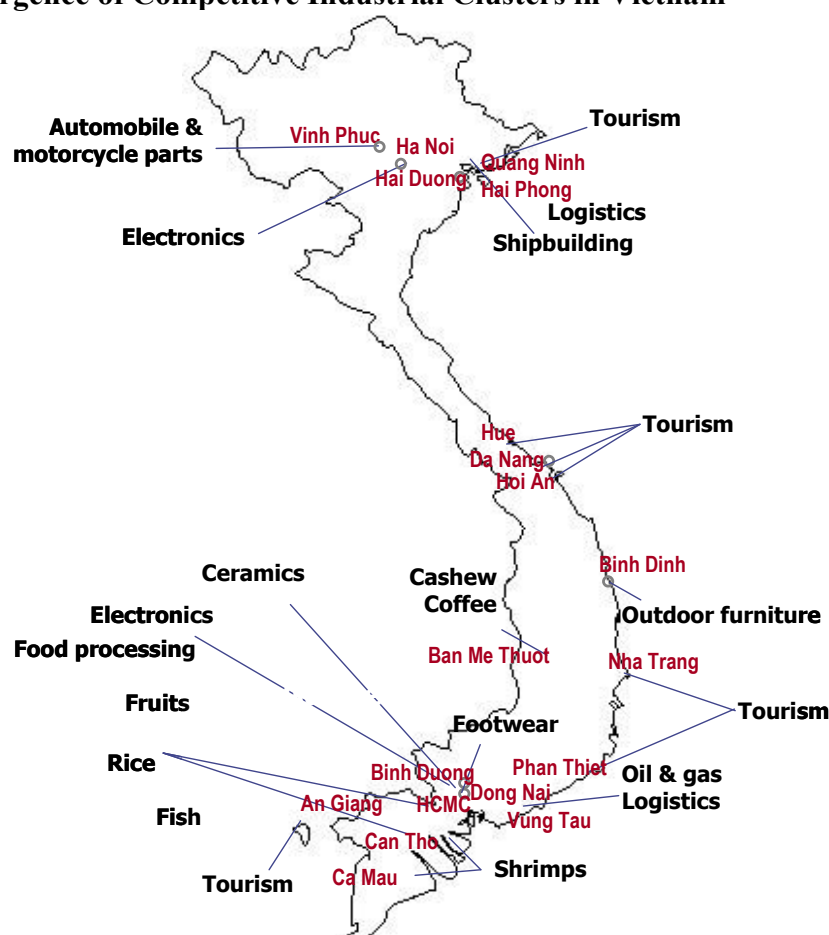
Table 3: ICOR in Selected Asian Economies

	% GDP growth	ICOR
Vietnam 1997-2007	7.2	5.1
Korea 1969-1988	8.4	2.8
Malaysia 1977-1996	7.4	4.9
Thailand 1976-1995	8.1	3.6
Taiwan 1963-1982	9.8	2.9
Indonesia 1977-1996	7.2	2.8

Source: Calculated from World Bank's World Development Indicators

The following two sections look into the inefficient nature of investment in major transport projects and the inefficient mix of power sources that were and are being developed in Vietnam.

Figure 3: Emergence of Competitive Industrial Clusters in Vietnam



Source: Author's compilation based on provincial statistics of industrial output and export value.

Transport

Vietnam has been embarking on an ambitious investment program comprising many large-scale highway, seaport, airport and railway projects to support the high economic growth target that the government has set in its 2010-2020 long-term development plan. Figure 3 shows that Vietnam is seeing the emergence of several competitive industrial clusters, many of which are labor-intensive and export-

oriented. Whether Vietnam can position itself for rapid long-term growth will depend on the successful development of these clusters. However, the location and composition of transport investments undertaken in the past and planned for the near future do not seem to support these industrial clusters.

Road Transport

So far, only the improvement of Highway 1 (the North-South highway), the improvement of Highway 5 (connecting Hanoi and the port city of Hai Phong) and the expansion of Hai Phong port will reduce transport costs between the hinterlands and major domestic and global markets, thereby promoting domestic and foreign investments.¹⁰

An example of how politics can lead to bad infrastructure decisions is that of the North-South Road link. In 2000, the government decided to construct the US\$1 billion Ho Chi Minh highway which is parallel to Highway 1 but cuts through mountains of central Vietnam, tracing the path of the famous wartime Ho Chi Minh Trail. The rationale for the project is that Vietnam needs a second North-South highway as sections of Highway 1 are often affected by tropical storms and the poor regions in the northwest and the central highlands need a modern road for poverty alleviation. The first stage of the Ho Chi Minh highway, 1,230 km in length, is now near completion with actual costs rising to more than US\$2 billion. With the road nearly devoid of traffic, it is clear that connecting a poor province with another poor province does not create a lot of new traffics. Furthermore, the horrendous nature of the highland regions that the highway goes through means that it is more easily damaged by floods than Highway 1. As evident in Figure 3, Vietnam's geography is such that it is very cost effective to build a limited-access highway and a railway that can go through all major coastal towns. Feeder roads can be constructed to connect poorer areas in the highlands to the richer ones in the coast.

Port Development

In relation to maritime transport, the lack of an efficient limited-access highway and freight rail system contributes to the rising costs of inland transports. As illustrated in Table 4, the World Bank calculated that exporters in Vietnam have to pay US\$669 of domestic costs to ship a 20-foot container from Vietnam, while it only costs Chinese exporters US\$390 and Singaporeans US\$416. Since the costs include costs of documents, administrative fees, terminal handling in addition to inland transport costs, the high-cost problem with maritime infrastructure does not only relate to the hardware (e.g. ports) but also to "software" aspects (e.g. customs, good loading and logistical services, etc.). The repeated occurrences of bottlenecks at Saigon Port in the first five months of 2009 when shipping demand weakened substantially in the face of the global economic slowdown further indicates that there is still ample room to improve efficiency of exiting port facilities by focusing on the "software" infrastructure.¹¹

¹⁰ World Bank, Vietnam's Infrastructure Challenge, 2006.

¹¹ Tuoi Tre Newspaper, 12 May 2009.

Table 4: Domestic Cost Component Facing Exporters (US\$)

Country	Cost to Export (US\$ per container)	Cost to Import (US\$ per container)
China	390	430
Singapore	416	367
Malaysia	432	385
Hong Kong	525	525
Thailand	615	786
Indonesia	667	623
Vietnam	669	881
South Korea	745	745
India	820	910

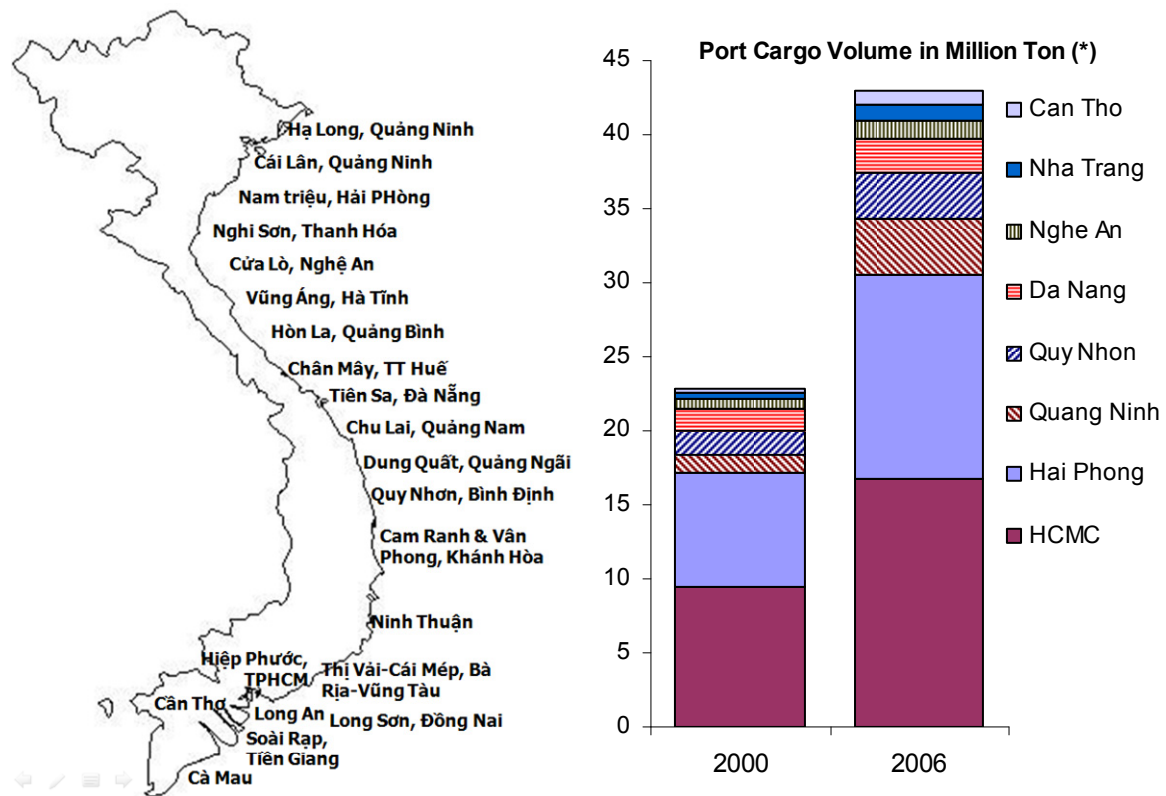
Source: World Bank, Doing Business 2008.

Despite rapid developments of other means of transport such as airplanes, shipping remains the main mode of international transport of goods. Currently, 80 percent of trade involving developing countries is waterborne. Ports play a critical role as gateways for trade. Excessive port costs make a nation's products less competitive in world markets. In light of the country's rapidly growing trade, ambitious plans have been announced by the government to build deepwater ports in many coastal provinces (Figure 4). Investing in a few world class port facilities that can accommodate "mother ships" while upgrading road and rail links to other provinces, however, is a much more economically viable strategy. In fact, if Vietnam decided to follow the current plan, containers would have to be thinly spread out among many ports in order to utilize all of them. But then, only feeder ships would come and Vietnamese firms would continue to suffer a transport disadvantage as their containers would have to be transhipped through Hong Kong and Singapore to reach European and North American markets.

The city of Da Nang in central Vietnam provides a good illustration. In early 2000s, Da Nang city government invested heavily in infrastructure including Da Nang port and Tien Sa port. Da Nang port was even ranked first class by Vietnam National Shipping Lines (Vinalines) alongside Hai Phong and Sai Gon ports. However, because of low volumes of exports, ships called infrequently. In 2002, moving containers by trucks from Da Nang to Saigon created an extra cost of US\$385. But, the average shipping cost for a 20-foot container was US\$300 cheaper at Saigon port. Furthermore, compared to Da Nang port, shipments at Sai Gon port were one week faster. As a result, Da Nang's exporters, especially those in processed seafood, still chose to export their products through Sai Gon port.¹²

¹² Nguyen Xuan Thanh, Da Nang: policy options for investment and economic development, Research Paper, Central Institute for Economic Management and Asia Foundation, 2002.

Figure 4: Location of Deep Sea Ports under Development and Existing Cargo Volume



Source: Authors' compilation from government's development plans for port location; and Vietnam and Provincial Statistical Yearbooks 2006 and 2007 for port cargo.

As economic activities are heavily concentrated in the southeast (i.e. Ho Chi Minh City and surrounding provinces), the region is best suited for a major deep-seaport that can accommodate large mother ships. In fact, major multinational companies that have production facilities in Vietnam and international shipping companies have told the government that the development of new port facilities at Thi Vai/Cai Mep in Ba Ria-Vung Tau should be a national priority. After many years of delay, construction of the US\$700 million Thi Vai/Cai Mep port was started in October 2008 with ODA support from ADB. The next step will be to develop links from central provinces and the Mekong Delta, and abandon the port development plans in these regions.

The plan to develop a port in each and every coastal province stems from the political pressure to invest heavily in underdeveloped areas to eliminate the gap between the urban centers in Ha Noi and Ho Chi Minh City (HCMC) and other poorer regions. In the past, the slow growing provinces were often given transfers from the central government budget or directed bank credit to invest in industrial projects such as sugar mills, cement or steel plants.¹³ As Vietnam committed to open its market

¹³ In the mid 1990s, the Government initiated a program called "One million tons of sugar", which supported the development of sugarcane farms and sugar mills throughout many provinces of the country. Ten years later, a report from the State Inspector revealed that there was VND7.1 trillion (US\$ 450 million) of non-performing loans from 34 loss-making sugar mills that were set up under the program. (See Investment Newspaper, "The program of one million tons of sugar", 23 November 2005). In an interview with Tuoi Tre Newspaper on 6 July 2003, Former Deputy Prime Minister Nguyen Cong Tan, the program architect, pointed to the pressure from provinces to get their sugar

through WTO membership and other bilateral and regional trading agreements, this old style industrial activism has become less feasible. Provinces quickly switched to infrastructure lobbying. On the surface, this seems to be a healthy change of direction. The allocation of funds for infrastructure development, however, suffers from a problem of perverse incentive. While more than 80 percent of tax revenue collected in fast growing provinces like HCMC and its surrounding provinces are transferred to the central budget for reallocation, provinces that perform poorly in private investment attraction and job creation are rewarded with funds for expensive transport facilities that are under-utilized. While roads need to be built to support the rural economy – a job that Vietnam has been doing very well – allowing every province to have a large and expensive port is a wasteful and unproductive investment strategy that will not lead to rapid industrialization.

As argued above, Viet Nam needs to upgrade its railway to support both passenger and freight transport. The project under consideration by the government is a US\$33 billion Ha Noi-HCMC high speed rail project. It is problematic, for several reasons. Firstly, the 1,700 km distance between Ha Noi and HCMC will be more economically and conveniently served by air than high-speed rail. Secondly, the planned high-speed rail will not be able to support freight. Another issue is the high cost nature of the project. The 334-km Ha Noi-Vinh section – the project’s first stage – has a projected cost of US\$12.9 billion. Its cost per kilometer, therefore, is more than double that of the Beijing-Shanghai project (Table 5)!

Table 5: Cost Comparison of Railroad Development in Vietnam and China

	Ha Noi-Vinh	Beijing-Shanghai	Qinghai-Tibet
Length	334 km	1,318 km	1,142 km
Speed	200 kph	300-350 kph	120 kph
Travel Time	1.5 hours	5 hours	
Cost	\$12.9 bil	\$22.6 bil	\$3.68 bil
Mil US\$/km	38.6	17.1	3.22

Source: Author’s compilation from The Saigon Times Daily (May 3, 2008 - Vietnam) and People’s Daily Online (May 20, 2008 - China).

Airport Development

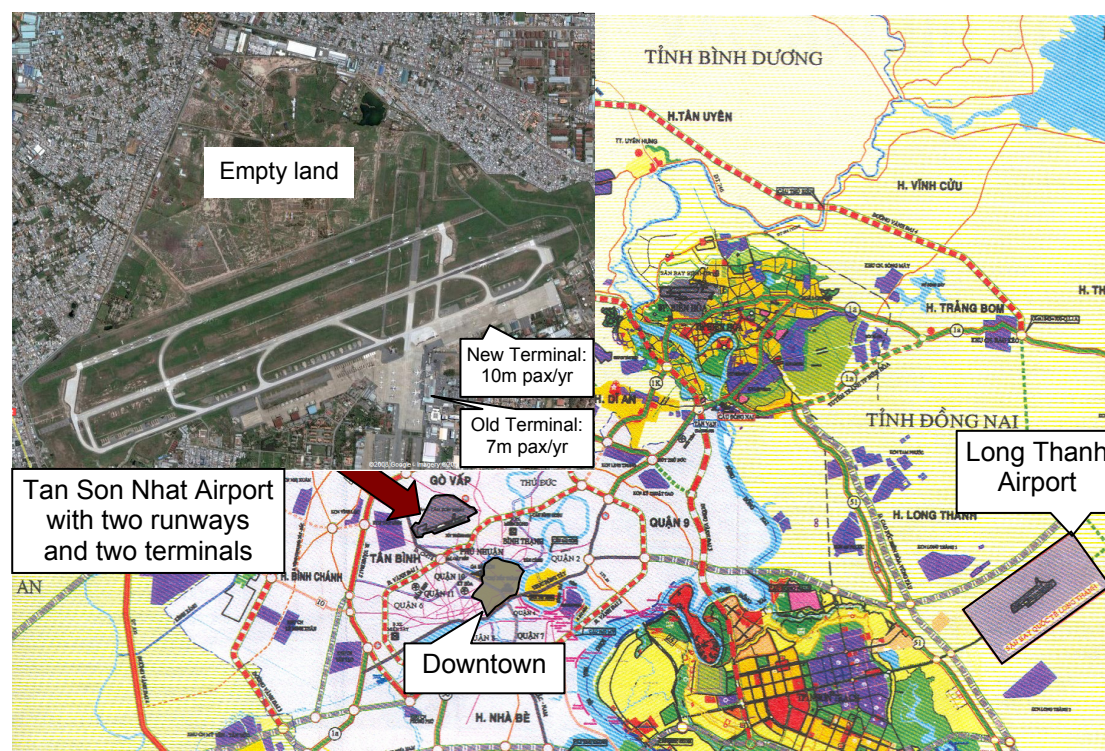
Another major transport component is airport development. Vietnam is about to start building a new 5000-hectare airport in Long Thanh, Dong Nai to replace the international operations of Tan Son Nhat (TSN) airport in HCMC. The existing airport would continue to provide domestic service after the new airport begins to operate in 2013-15. Long Thanh airport, 50 km northeast of downtown HCMC, would be able to handle 25 million passengers a year and cost US\$4 billion in its first phase. When completed, the new airport would serve 80-100 million passengers a year and cost US\$8-10 billion. The idea behind this massive investment is to turn Long Thanh into a hub, which makes very little sense given the existence of many regional hubs including Hong Kong, Singapore, and Bangkok. TSN airport, with a newly completed US\$220 international terminal, can handle 17 million passengers a year. From the

projects approved regardless of commercial and financial criteria as the chief cause for the program’s failure.

level of 7.2 million passengers in 2006 and with an assumed annual growth rate of 10 percent, this capacity will not be reached before 2015.¹⁴

It is also important to note that the total area of TSN airport is 1,800 hectares, of which 1,000 hectares belongs to the Vietnamese military leaving only 800 hectares for civilian use. If the area available for civilian use can be increased, then at least two more terminals can be added in the future to increase TSN capacity to 30 million passengers a year. Changi airport in Singapore, which has 1300 hectares, in 2006 handled 35 million passengers a year and will have a capacity of over 70 million with its third terminal. (See Figure 5)

Figure 5: Tan Son Nhat and Long Thanh Airports



Source: Ho Chi Minh City Transport Masterplan and Google Map.

Urban Transport

It becomes increasingly clear that the rapidly worsening traffic conditions in Ha Noi and HCMC will soon bring economic activities in the two cities to a standstill. In response, the government has decided to build MRT systems in each city at a total cost of US\$15 billion. But a quick look at the masterplans of the two systems reveal that this projected cost is grossly underestimated.

The MRT system planned for HCMC will consist of six lines. In addition, there will be two tramways and three monorails. MVA Asia – the consulting firm hired by the ADB to undertake the HCMC MRT Masterplan – estimates that the entire network of 161 kilometers would cost US\$ 9.7 billion, or an average of US\$60 million per km.

¹⁴ See David Dapice and Nguyen Xuan Thanh, Long Thanh or Tan Son Nhat Airport: Build New or Expand, Fulbright Economics Teaching Program Case Study, 2007.

Forty-eight kilometers would be in tunnel (at an estimated cost of US\$90 million per km) while 98 km would be elevated (at US\$ 50 million per km) and only the 15 km of tram at grade (at US\$ 20 million per km).

Construction of the eastern segment of Line 1 with a total length of 11.9 km was started in 2008. It will connect Ben Thanh market at the down town with the eastern part of the city which is still empty. The ridership of Line 1, therefore, will be significantly lower than those of Line 2 and 3 which connect the Central Business District with Tan Son Nhat airport area and the China Town respectively.¹⁵

The current MRT Masterplan of HCMC poses another concern. Firstly, it is based rigidly on a rather unrealistic target set by the city's transport plan that 44 percent of all trips in 2025 will be captured by public transport modes while the current share is less than 2 percent. Current surveys done by various consultants show a more realistic public mode share of 22 percent in 2025.¹⁶ If the this mode share is used, the projected daily ridership of the entire MRT system falls from 3.3 million to 2.3 million passengers. Under the original model, it is estimated that while the fare and non-fare revenue cannot cover the total investment costs, it would be just enough to cover operating costs. The city government, therefore, has to use its tax revenue to cover the principal and interest repayments of ODA and commercial loans. If that is the case then there is a scope for public-private partnership (PPP) by allowing the private sector to bid for the operation of the MRT system. However, under the adjusted ridership model, the revenue will not be able to cover even operating expenses, implying that the city government will have to subsidize the MRT system on an on-going basis. While, this is standard practice around the world, the People's Committee of HCMC needs to face this reality and looks for sources of revenue that can be used as subsidies for the operation of the metro system.

Financing transport infrastructure development - PSPs

For the financing of large-scale road, railway, seaport and airport projects, the government expects that private sector money will supplement the state budget and ODA. In fact, they are already listed by the government as BOT or some other private project financing arrangements. Compared to other infrastructure sectors such as telecommunications and electricity, transport has received very limited private sector participation (PSP). From 2001 to 2008, transport investment from sources outside of the government budget, government bonds and directed bank lending accounted for less than 12 percent of the total investment in the sector.¹⁷ The few private transport projects are all located in the southeast encompassing HCMC and its surrounding provinces.

The most significant transport project with foreign participation is the 17.8-km, 10-lane Nguyen Van Linh Parkway connecting Highway 1 and Tan Thuan Export Processing Zone in the south of Ho Chi Minh City. The road was developed by a joint

¹⁵ See Jose Gomez-Ibanez and Nguyen Xuan Thanh, "Ho Chi Minh City", Harvard Kennedy School and Fulbright Economics Teaching Program Case study, 2008.

¹⁶ MVA Asia had to modify their model parameters to conform to the target of 44-percent public mode share. See MVA, "Ho Chi Minh City Metro Rail System Study, HCMC Master Plan Ridership and Revenue Forecast Study, Final Report", January 2008.

¹⁷ Ministry of Transport as reported by Saigon Tiep Thi Newspaper on 27 June 2008.

venture between the Taiwanese CT&D Corporation (owning 70 percent) and Tan Thuan Industrial Promotion Corporation (IPC) – an SOE belonging to the HCMC People’s Committee at a total cost of US\$ the 100 million. Although operated as a toll road, toll revenue will barely cover maintenance costs. The project investors are getting returns from 400 ha of land provided by the city government, which they are developing into a very successful new urban town. Another big foreign project is the US\$340 million 13.4-km road connecting Tan Son Nhat Airport with the outer ring road of HCMC. It was just started in June 2008 as a BT project by the Korean GS Engineering and Construction Corporation. Land for real estate development is also the form of compensation for the Korean investor.

In the area of port development, the Beria Serece bulk cargo port in Ba Ria-Vung Tau and VICT container handling terminal in HCMC are the only two projects with foreign investment. The highly expected BOT port in Thi Vai/Cai Mep ultimately failed to materialize. The lack of commitment on the part of the government to build connecting roads and the unwillingness of Saigon Port, situated in the center of HCMC, to relocate to Thi Vai/Cai Mep may be the main reason behind the lack of interest from foreign investors. Recognizing the strategic importance of the port, the Ministry of Transport opted to develop it itself with ODA financing from the ADB.

According to the Ministry of Transport, most of the BOT transport projects are small-scale. The successful toll roads and bridges with genuine private sector participation are those that serve as parts of existing essential transport arteries. Examples are Truong Son Street leading to Tan Son Nhat Airport and Nguyen Tan Thanh Street leading to Saigon Port in the mid 1990s, and Co May Bridge on National Highway 51 to Vung Tau, and National Highway 13 in the fastest growing province of Binh Duong.¹⁸ Other road and bridge projects are much less successful, many of which had to be turned over to the government. An exception is the domestic Phu My BOT Bridge project. The bridge connects Nguyen Van Linh Parkway and District 2 of Ho Chi Minh City in what will become one of the most important transport routes connecting the Mekong Delta with the future Thi Vai/Cai Mep port and northern provinces. Its economic viability coupled with a competitive bidding process and careful contractual arrangements ensure that it receives adequate financing and is ahead of schedule despite the domestic economic and financial turmoil experienced in 2008.

Other BOT projects are often undertaken by SOEs which belong to the Ministry of Transport and the Ministry of Construction. Although they are labeled as BOT, in reality little equity is contributed by the SOEs and the bulk of their financing comes from the government budget, directed bank lending, bond issues with government guarantees, or a combination of the three.

Looking at the past experience of PSP and the non-viability of many projects that are being planned, genuine private investment, both foreign and domestic, may not be forthcoming. The land for infrastructure deals may continue to be used by the government to compensate private investors; however, this strategy is problematic in

¹⁸ All of these projects were so successful to their investors that the press led a public outcry against them and blamed the government for given the project sponsors too favorable concession terms. Tolls in Truong Son and Nguyen Tat Thanh streets were eventually removed before their concession terms expired.

several respects. Firstly, the non-transparent nature of land swap projects provides fertile ground for corruption, inflated investment costs and loss of state resources. Secondly, private investors, who traditionally are much more careful about evaluating the commercial and financial feasibility of a project than SOEs and government agencies, will be willing to undertake non-viable projects as long as they get valuable land in return. Thirdly, relying on land as a form of subsidy will become less and less feasible for the government as most valuable plots in urban areas and along the coast are already occupied and their inflated prices are being questioned by the market. Alternatively, the government can force its larger SOEs to undertake the projects with government-guaranteed borrowings and ODA. But then, the sheer amount of finance demanded by the proposed projects will put the government into a highly indebted position.

In short, the current policy of spreading out scarce public funds over many provinces in Vietnam to develop the same transport facilities and the planning of unneeded multi-billion dollar projects will hugely increase the financing cost while contributing little to performance improvement. What Vietnam needs is a well-coordinated national strategic plan that identifies and prioritize a number of viable large-scale projects such as a north-south expressway connecting Ha Noi and HCMC and going through major coastal provinces, a north-south normal speed railway that can be used efficiently for both passenger and freight transport, and at most two international airports and deep seaports, one serving the greater Ha Noi area and one serving greater HCMC. Provinces should be rewarded major infrastructure investments only when they find ways to attract efficient private investment of sufficient quantities to warrant the demanded infrastructure. Doing this way will align provincial interests with those of the whole country.

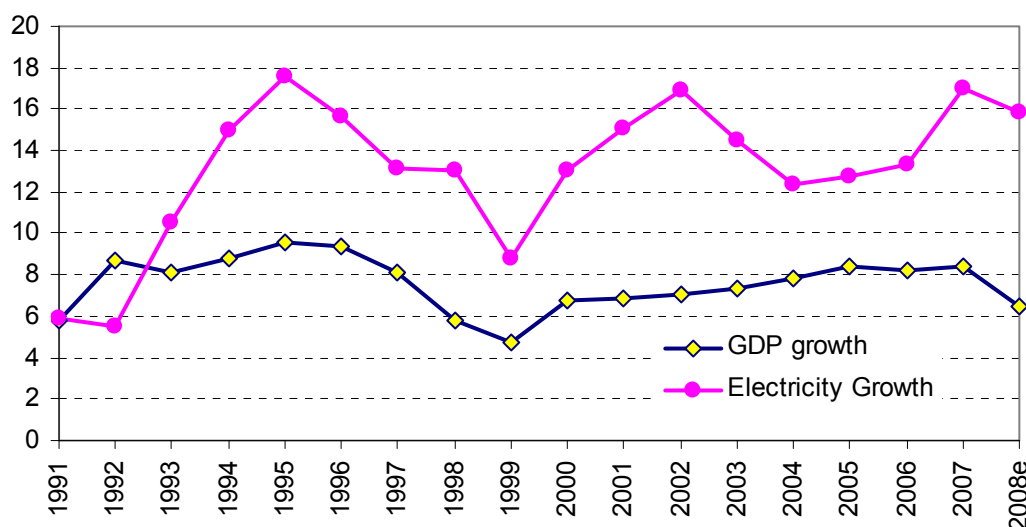
Electricity

Vietnam has experienced rapid increases in electricity production for almost 15 years. From a mere 8.8 billion kilowatt-hours (kWh) in 1990, output soared to 26.7 billion kWh in 2000 and 66.8 billion kWh in 2007. On average, electricity output grew at 14 percent per year during 2001-2007 while GDP grew at 7.7 percent (Figure 6).

Despite this tremendous growth, electricity supply has still strained to keep up with demand. The entire system has an installed capacity of 13,512 megawatts (MW) with a peak load of 11,824 MW in May 2008. According to Electricity of Vietnam (EVN), during peak hours, the capacity shortfall is 1,500-2,000 MW. As a result, EVN is forced to cut power repeatedly. Citing an internal memo of the Electricity Regulatory Authority, *Tuoi Tre* newspaper reports that in the whole country there were 3,000 blackout incidents due to system overloading during the first 7 months of 2008. That means an average number of 14 blackouts a day.¹⁹ The situation is expected to get worse as the rapid growth of electricity consumption at 14-15 percent per year is expected to continue at least until 2015. This high growth projection partly reflects the fact that Vietnam's per capita electricity consumption is only 785 kW, which is less than two-thirds of China's and two-fifths of Thailand's.

¹⁹ *Tuoi Tre*, "Khong co ly do gi de thuong cho EVN" (No reason to give EVN bonus), 20 October 2008.

Figure 6: Electricity Output and GDP Growth Rates (percent per year)



Note: 2008 growth rates of electricity output and GDP are projected figures made by EVN and the Government respectively.

Source: Vietnam General Statistics Office and EVN

All of the power investment activities are coordinated by EVN, which is a vertically integrated state-owned corporation controlling the generation, transmission, and distribution of power. Faced with increasing criticism about its inability to provide reliable power, EVN often cites lack of finance for new capacity development as the main cause.²⁰ However, EVN is also very determined to expand into telecommunications, financial services, and real estate development given its government-approved status as a “business group” (*tap doan kinh te*). For instance, EVN Telecom, which was established as a 100%-owned subsidiary, is growing rapidly to become a major player in the domestic telecom market.²¹ Similarly, in 2005, EVN became a strategic investor in An Binh Joint-stock Commercial Bank (ABB), controlling 30 percent of the bank’s capital.²² Within the last quarter of 2007, EVN established four real estate companies, namely, EVN – Land, EVN – Land Central, EVN – Land Nha Trang and EVN – Land Saigon. Figure 7 shows the pyramid ownership structure of EVN and its subsidiaries in the four companies. Most recently, EVN Finance Company, in which EVN and An Binh Bank have controlling interests, started operation in September 2008.

Thus, the conglomerate model that EVN is pursuing with so many new and unrelated activities makes it lose focus on the main task of providing electricity effectively and profitably at reasonable cost. In 2007, EVN was supposed to add 700 MW of new capacity to the system but only 64 MW from a hydro plant in central Vietnam came

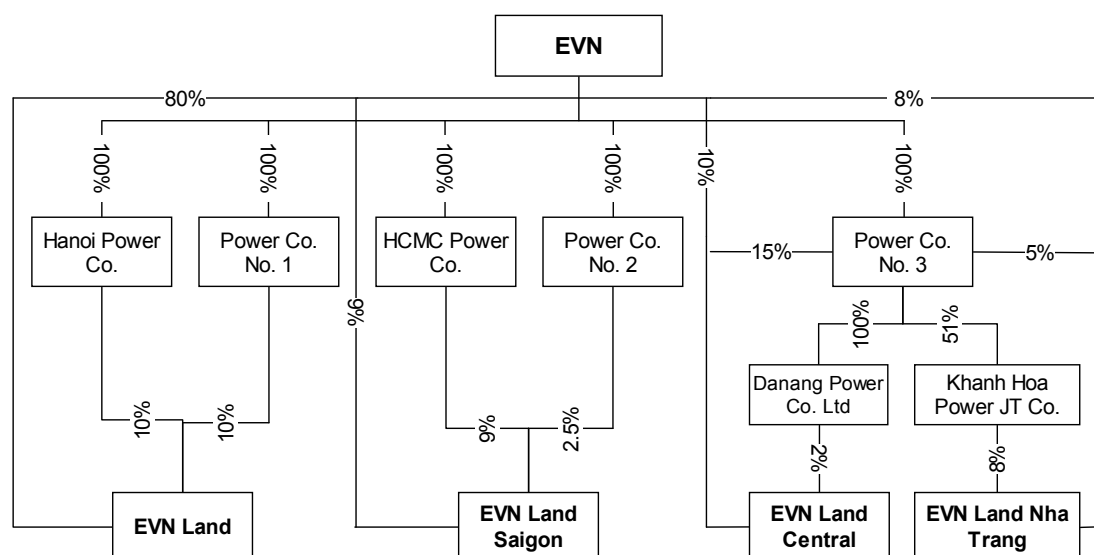
²⁰ In August 2008, EVN “returned” to the government 13 power projects with a total capacity of 13,800 MW it was supposed to develop, saying it could not secure finance for the projects.

²¹ It must be noted that EVN Telecom has been playing a very positive role in promoting competition in the domestic telecom market. And the potential is there for the telecom business to benefit substantially from EVN’s electricity infrastructure. Nevertheless, the author is of the opinion that EVN Telecom will be better run as an independent corporation instead of being a subsidiary of EVN.

²² The Minister of Industry and Trade told the National Assembly XII during its 3rd session in 2007 that “EVN invested in An Binh Bank but only in order to borrow from the bank while other banks turn down EVN’s requests”.

online. And most of the 18 generation projects currently developed by EVN are falling behind schedule.²³ Furthermore, the conglomerate model, which incorporates a vertically-integrated structure of electricity production, is incompatible with the power market development roadmap stipulated in the 2004 Electricity Law.

Figure 7: EVN’s Ownership Structure in Real Estate



Note: The percentage figures represent equity ownership of a parent company in its subsidiary.
Sources: Author’s compilation from the corporate charters of EVN’s power companies and EVN Land Companies.

The Electricity Law sets out a legal framework for comprehensive reforms in the electricity industry with a special focus on the development of a competitive power market in three phases. The first phase, which is expected to last from 2009 to 2014, is to create competition in generation activities by allowing power plants to sell electricity to a single buyer. The single buyer will then sell electricity to distributors and large industrial customers. In the second phase, the single buyer model will be replaced by a wholesale competitive market in which distribution companies and larger buyers will compete to buy bulk power from power plants. The competitive wholesale market is expected to be developed between 2015 and 2022. In the third phase, expected to start in 2023, power plants will compete to sell power to final users directly or indirectly via distributors.

The power market roadmap is considered by the government as a key to attract domestic and foreign private investments in power generation. In 2007, EVN made a proposal for the creation of the Power Trading Company, which will act as a single buyer. Given a number of BOT and equitized power plants, EVN concluded that there were enough independent power producers (IPPs) for the introduction of the single buyer.

²³ VCI News, “Cham tien do cac cong trinh nguon dien: Ngay co thieu dien luon rinh rap” (Delays in power generation projects: The ever-presence of power shortage”, 29 September 2007, <http://www.kinhte24h.com/index.php?page=news&id=17795>

Fundamentally, the creation of the single buyer requires that it is independent of the vertically-integrated electricity company. This national electricity company itself has to be broken up so that the generation, transmission and distribution activities are separated. And to avoid duplication of activities, the load dispatch and transmission functions, which have characteristics of natural monopoly, need to be incorporated into the single buyer. This is essentially what China did in 2002 with the disintegration of the State Power Company (SPC) and the creation of generators and distributors under the control of the Asset Management and Monitoring Committee belonging to the State Council. In Poland, a case study used by EVN to support its proposal, the single buyer Polskie Sieci Elektroenergetyczne was established from the state-owned consolidated utility after generators and distributors had been separated and privatized.

In contrast, EVN's proposal allows for the single buyer to be 51-percent owned by EVN while keeping the EVN's structure intact.²⁴ This would potentially create a serious conflict of interest as the single buyer would be under pressure to favor EVN's power producers and those of other shareholders. As a result, not only existing independent power plants would be discriminated against, potential investors would be discouraged.

The single buyer proposal was eventually rejected by the government. But as long as EVN continues to express its strong unwillingness to be disaggregated and pursue investment opportunities to strengthen its conglomerate structure, the power market roadmap will likely be delayed.

Another important issue is the need to achieve an efficient mix of power sources. Over the years, EVN has been over-investing in hydro facilities, which currently account for 38 percent of the system's capacity and 34 percent of output.²⁵ As existing hydro plants have limited reservoir capacity, power supply is subject to seasonal fluctuations. During the rainy season, hydro plants can run at their full capacity. During the dry season, which typically experiences higher electricity demand, flows into the reservoir are a small fraction of the wet season and hence it is not possible for full hydroelectric output to be maintained. During the dry season of 2008 (which lasted from January to May), the production of hydroelectricity was only 7.1 billion kWh, accounting for just 22 percent of the base load.

The seasonal problem of electricity generation must be solved by installing more thermal power. However, during the 1996-2006 period, only 8,000 MW of new capacity were realized while the Fifth Power Development Masterplan (Masterplan

²⁴ In its proposal, EVN wants to create a for-profit single buyer. EVN owns 51 percent of the new firm. Other shareholders include PVN, Vinacomin, Song Da Corporation, Vietnam Postal Telecommunication Corporation (VNPT), Vietnam Machinery Installation Corporation (LILAMA), Vietnam Cement Corporation (Vinacement), and Vietnam Steel Corporation (VinaSteel), all of which are active in power generation as investors or contractors

²⁵ Hydro power – including Hoa Binh in the North, Yali in the Center, and Tri An in the South – accounts for 38 percent of the total generation capacity. Gas and oil thermal power, which is concentrated in the South accounts for 49 percent. Coal thermal power, which is concentrated in the North, accounts for the remaining of 13 percent.

V) envisaged an additional capacity requirement of 15,261 MW in 1996-2010.^{26, 27} In its latest plan (Masterplan VI), the government has approved 47,638 MW for the period from 2007 to 2015.²⁸ And hydro power still accounts for 32 percent of the total new capacity (Table 6). Among all the planned hydro plants, only Son La with a capacity of 2,400 MW has a large enough reservoir to counter the seasonal production pattern. All the remaining hydro plants will have a capacity below 600 MW with many being around 350 MW.

Table 6: Planned Power Investments in Vietnam from 2007 to 2015

	Hydro	Coal	Gas	Total
New capacity (MW)	15,389	25,890	6,404	47,683
Share (%)	32.3%	54.3%	13.4%	100.0%
<i>By region:</i>				
North	5,911	11,090	0	17,001
Center	6,479	2,400	104	8,983
South	954	12,400	6,300	19,654

Source: The Prime Minister, Decision on Approval of National Electricity Development Masterplan for 2006-2015, 110/2007/QĐ-TTg, 18 July 2007

The over-reliance on hydro power and underinvestment in thermal power reflects the low cost nature of hydro relative to other sources of generation (Table 7). Prices charged by EVN are currently fixed by the government at 5-6 cents per kWh. Two problems arise. Firstly, the government is under-pricing electricity compared to the cost of producing thermal power. In other words, it costs more for EVN to add and deliver a kilowatt-hour of electricity from a thermal power plant than it is allowed to charge for it. Secondly, hydro power produced by the very low cost historic plants is profitable for EVN when it is available. This gives EVN a strong incentive not only to invest in hydro power, but also to only buy electricity from hydro plants whenever their supply is sufficient. Right now, EVN is still able to make profits by blending expensive new energy with older low-cost energy. However, this advantage diminishes rapidly as demand grows quickly.

Table 7: Total Costs of Generating Electricity in Cents per Kilowatt-hour

	Fixed	Fuel	O&M	Total
Hydroelectricity	3.5	--	0.2	3.7
Large coal	2.0	4.2	0.8	7.0
Chinese coal	1.2	4.3	1.0	6.5
Combined-cycle gas	1.2	6.7	0.4	8.3
Gas turbine	2.6	9.0	0.7	12.3
Diesel	1.6	30.0	1.0	32.6

Source: David Dapice, Vietnam Electricity, Case Study, Fulbright Economics Teaching Program, July 2008.

Investors, therefore, are discouraged from investing in combined-cycle gas or coal plants as they do not expect to be able to sell electricity to EVN throughout the year.

²⁶ VietnamNet, “10 nam phat trien, tong cong suat dien chi tang 8.000MW” (Total power capacity increased by only 8,000 MW in 10 years of development), 17 October 2007, <http://vietnamnet.vn/kinhte/2007/07/719075/>.

²⁷ The thermal power plants planned between 2002-06 such as the northern coal plants in Uong Bi, Hai Phong, Quang Ninh, Mong Duong, Na Duong, Cao Ngan, and Cam Pha, and the southern gas plants in Ca Mau and Nhon Trach were all delayed, some of which only came online in late 2007 and early 2008.

²⁸ The Prime Minister, Decision on Approval of National Electricity Development Masterplan for 2006-2015, 110/2007/QĐ-TTg, 18 July 2007.

The case of the Ca Mau I gas fired power plant developed by Petro Vietnam (PVN) even illustrates the reluctance of EVN to buy power from independent producers (IPP) during the dry season. As soon as the plant came online in 2008, disputes broke out between PVN and EVN. PVN accused EVN of failing to buy up the available electricity produced by Ca Mau I while the entire country suffered severe electricity shortages. PVN reported that its 720 MW plant could run at full capacity for only 4 hours a day and on average less than 50% during off-peak hours in May 2008. In return, EVN pointed out that it cost $\text{¢}7\text{-}8$ to buy a kWh from Ca Mau I compared to $\text{¢}4.5$ a kWh of power imported from China.²⁹

While most households and companies in Vietnam have no alternative but to suffer rolling blackouts caused by the electricity shortage, others resort to small diesel generators whose cost can exceed 30 cents per kWh. In short, the current blackouts are the cost of EVN's over-reliance on hydro power which is relatively cheap but unreliable. Plans are being made to develop nuclear energy. However, given the large outlay and long construction time of nuclear energy projects, providing reliable electricity in the short and medium terms will essentially require combining thermal and hydro power efficiently.

If EVN is going to be able to contract for sufficient power, the immediate action will be to raise electricity prices to adequate levels. Table 7 suggests at least a 50 percent increase will be needed. Rather than simply raising all electricity prices to the marginal cost of new power, a variety of transitional strategies could be considered that might provide EVN with a politically feasible path to reliable and adequate supplies. To this end, the government in March 2009 decided to raise average retail electricity prices in 2009 to VND948,5 a kWh (US ¢ 5.4), an increase of 8.92% from the 2008 level. Although the price increase is less than the 16 percent asked by EVN, the fact that it was approved during a very difficult economic time shows that the government is determined to put the electricity sector on a financially sustainable path. The government is also actively planning for a gradual introduction of market prices to the electricity sector during 2010-2012.³⁰

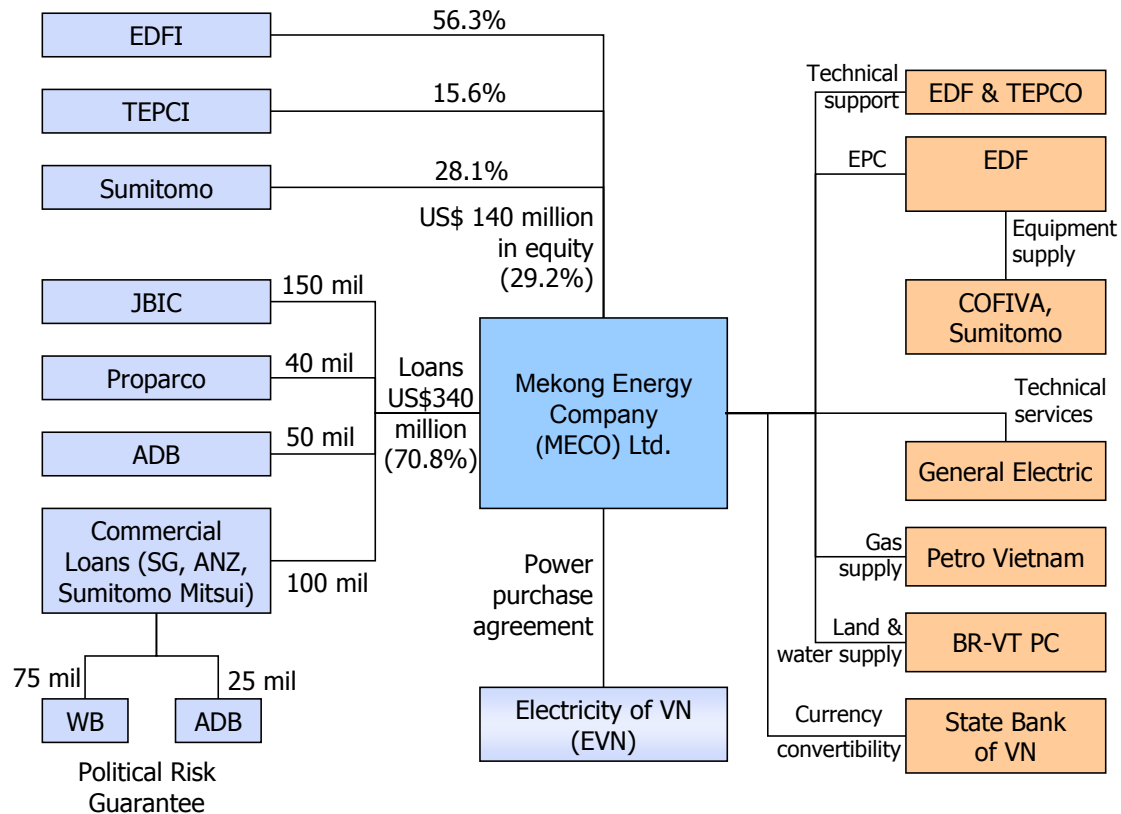
If electricity prices are raised to levels that reflect actual costs of production and distribution, and a competitive market is introduced at least in the generation part, there will be real opportunities for private sector participation in power generation so that an efficient mix of power sources can be achieved. In this sense, there are signs of progress in this area. Currently, there are only three foreign power projects in operation. The 375 MW Hiep Phuoc Oil Fired Power Plant, which was licensed as a BOO project to the Taiwanese CT&D corporation, contracts to sell power directly to users in the CT&D-owned export processing zone and residential area, while also selling some to EVN. The other two are BOT gas fired projects – Phu My 2.2 (developed by Electricite de France, Tokyo Electric Power and Sumitomo) and Phu My 3 (developed by BP, Nissho Iwal and SemboCorp Industries). The two plants both have a capacity of 715 MW and sell electricity to EVN under government-guaranteed 20 year power purchase agreements (PPAs). Phu My 2.2 was the first private power project that went through a competitive bidding process. Although the bidding process

²⁹ VietnamNet, "EVN dat quyen loi cua minh len tren tat ca" (EVN puts its interest above all else), 12 May 2008, <http://www.vietnamnet.vn/kinhte/2008/05/782708/>.

³⁰ The Prime Minister, Decision 21/2009/QĐ-TTg on Electricity Prices in 2009 and 2010-2012 based on market mechanism, 12 February 2009.

and the subsequent negotiations were lengthy, it was a resounding success with the participation of six bidders and a resulting contracted electricity price of €4.04 per kWh in 2004 prices. Financial closure was achieved with the international commercial banks with political risk guarantees provided by the World Bank and ADB (Figure 8). More importantly, the process provided the government and EVN with a set of standard BOT documents including the PPA to be used for future projects.

Figure 8: Phu My 2.2 Project Structure



Source: Author's construction based on World Bank's Appraisal Documents on the Phu My 2 Phase 2 Power Project, August 2002.

Recent years also saw a number of state-owned enterprises outside EVN investing in large independent power projects under the government's encouragement. Petro Vietnam (PVN) and Vietnam Coal and Mining Corporation (Vinacomin) are becoming large players in gas and coal fired power generation respectively. Unlike the foreign BOT projects, the domestic IPPs typically only have short-term PPAs with EVN without government guarantees and no fixed annual capacity charge in the form of a take-or-pay agreement. However, as suggested by the experience of Ca Mau I, this makes the project sponsors very susceptible to the risk that they cannot sell electricity at full capacity regularly.

Foreign BOT and domestic IPP projects account for 62 percent of the total new thermal capacity planned from 2007 to 2015. In order to realize this, EVN needs to contract with thermal IPPs with a fixed annual capacity charge to cover the capital cost and a fuel charge and pass those costs on to industry. Given the uncertain nature of the power market development roadmap, most foreign BOT projects will demand government guarantee for their PPA. Because oil, coal and gas costs going forward

may be very high, paying extra for less used base-load capacity and combining it with cheap hydro may be a least cost solution. Compared to blackouts and diesel backups costing more than 30 cents/kWh, this could be preferable for many firms. However, premium and residential customers would have to be segregated, suggesting more investment in distribution would be needed.

The government also needs to allow industry to contract directly with IPP producers on an unregulated basis, such as Hiep Phuoc. Because its supply is reliable and of high quality, many factories and new urban areas are willing to pay more than EVN currently charges. Simply giving industrial estates and new towns the choice of EVN or an IPP would make them no worse and would call forth additional IPP thermal investment.³¹

* * *

In summary, Vietnam must fundamentally rethink its development strategy in infrastructure in general and in the transport and electricity sectors in particular. The fact is that the very high level of investment in the past 12 years has not turned the country's infrastructure assets into a source of competitive advantage. Therefore, particular attention has to be paid to the issue of efficiency in terms of investment coordination, project selection, and management.

In transport, many large-scale railway, seaport and airport projects are being planned in near total disregard of the emergence of fast growing industrial clusters. These wrongheaded projects will need to be terminated in order to make funds available for a few crucial projects in the most rapidly growing regions that currently face severe transport bottlenecks. The private sector participation in transport development will help identify and execute the most viable projects. But its potential will only be realized if the returns to private investors come from the projects' own cash flow, rather than from government subsidies in the form of land.

In electricity, the investment pattern of over-reliance on hydro needs to be changed. If hydro continues to be the single largest production source, then extensive idle time will be inevitable for thermal stations, since the wet/dry season power output ratio is so uneven. Vietnam must determine the appropriate mix of hydro and thermal generating capacity that can reliably supply the country's demand. Electricity prices have to be raised to levels that enable EVN or a single buyer in the future to contract for new generating capacity through competitive bidding.

Finally, the roadmap for liberalization in the energy sector contemplated in the 2004 Electricity Law needs to be implemented if Viet Nam is to successfully attract the volume of investment and promote the levels of competition and private sector participation required to meet Viet Nam's long term energy and, hence, developmental needs.

³¹ Hiep Phuoc wants to expand to 700 MW and to build a combined cycle generator south of HCMC. EVN will resist this because it reduces its monopoly and sometimes uses its strained transmission and distribution lines, complicating grid management.

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