

NETWORKS OF FINANCING GENERATION AND THE ROLE OF THE WORLD  
BANK IN THE ELECTRICITY MARKET LIBERALISATION PROCESS:  
CASE STUDY OF THAILAND AND VIETNAM FROM 1957 TO 2013

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**Abstract:** Unbundling and liberalization of electricity systems has been the paradigm model used by policy makers and international institutions as the essential framework for developing the sector and dealing with issues including inadequate pricing, lack of capacity, fiscal constraints, efficiency problems, and underinvestment. The process has been actively led by the World Bank. The research collects empirical data to explore the World Bank financing networks (include lending, granting, guaranteeing and channelling) in the electricity sector in Thailand and Vietnam. Public sector actors including government institutions and SOEs are the dominant recipients and create highly dense connections in the financing network whilst the network of private sector actors is much more sparse and receive much less fund from financiers. Funds for Market Reforms account for 38% (in Vietnam) and 44% (in Thailand) of total financing from World Bank, which is comparable to other developmental, infrastructure funds. These loans are directed to the government institutions as borrowers, implementers and end users. The finding puts a question on what key role the World Bank should play in supporting developing countries. The Bank could be much more efficient at initiating connections, guaranteeing and building technical capacity or legitimacy than being the main financial source.

## 1. INTRODUCTION

Unbundling and liberalization of electricity systems has been the paradigm model used by policy makers and international institutions as the essential framework for developing the sector and dealing with issues including inadequate pricing, lack of capacity, fiscal constraints, efficiency problems, and underinvestment. The core principle is that there exists a potential competitive market for generating capacity that will drive continuous commercial investment to efficiently supply electricity to meet the growing demands in developing economies. This requires upfront government commitment in creating and opening the market and eventually minimal government regulation.

The process has been led by the World Bank, which has stated that: ‘..reforms....are equally or more important for emerging, developing and transition economies...where regulatory failures expose people and the environment to horrify horrific risks’ (World Bank, 2012). Among 172 countries that received loans from the World Bank, more than 90 countries accepted liberalisation of the energy market as a conditionality (Erdogdu, 2013). These loans are thus expected to ‘leverage’ private investment.

A recent review published by the World Bank itself (Besant-Jones and Vagliasindi, 2013) notes that ‘unbundling is not an end itself, but rather a means to achieve better performance’. The report examines links between liberalisation policies and outcomes including price and efficiency. A number of other empirical studies have also examined the link between these policies and performance (Jamashb, 2006; Nagayama, 2007; Clifton et al, 2011; Kessides, 2012; Erdogdu, 2013), but there has been little attempt to analyse the actual investment flows associated with liberalisation. Discussion of investment has usually referred to the PPIAF database on investment, which records forecasts of investments rather than actual investment.

This research aims to both fill that gap through detailed collection and analysis of data on actual investment in electricity generating projects and study whether the initial model of reform actually works in practice in two major developing countries, Thailand and Vietnam, where economic growth has increased demand for energy by 10% p.a. on average since 1990, and the WB has provided finance of more than \$18 billion to the electricity sectors of these countries through over 140 loans in this period.

The research collects empirical data to build a database and to explore actual investment in generation both in World Bank-led financing networks (include lending, granting, guaranteeing and channelling) and the system as a whole in the electricity sector in Thailand and Vietnam from 1957 (when the institution started their first project here) to 2013 (the most updated data). The research then employs dynamic social networks and regression analysis on networks to offer a view into market participants’ and international financial institutions’ role, strategy and outcomes of their activities in developing countries.

## **2. THEORY AND PRACTICE**

### ***2.1. HISTORICAL GLOBAL PICTURE***

The period between World War II and the 1970s witnessed a regulatory stability in Western Europe and other OECD countries which favoured public ownership in public infrastructure services including electricity. This traditional model was a safe and certain choice for governments to resolve conflicts between investors and consumers (Newbery, 2004), to ensure social justice (Van de Walle, 2009) and to address the strategic positions of these sectors for economic development. However, since the early 1990s, OECD countries, led and modelled by the UK’s privatisation-then-liberalisation policies, had taken their turns to embark on the marketization and liberalisation process to deeply reform these public sectors (Borgnetti and Obermann, 2008).

In the 1990, in the UK, ‘liberalisation was a domestic political decision’: the Labour party believed in the Keynesian model of nationalisation to boost aggregate demand through government spending, whilst the Conservative party argued for the market mechanism as the answer to state-owned enterprises’ inefficiency and national budget deficit (Newberry, 2002). Starting with privatisation and restructuring the British electricity supply industry, the sector then embarked on full liberalisation by unbundling CEGB generation and transmission units into one privatised transmission company (NGC) and 3

generation companies (Powergen, National Power and Nuclear Electric) which were then gradually broken up into 8 generation companies. A Power Pool was set up in 1990 for generators to bid against each other, marking the creation of a wholesale market. The UK model was the most complete version of electricity liberalisation. (Newbery and Pollitt, 1997).

The reform in the UK inspired and got replicated in the EU. The EU electricity market was created by a series of Directives in the 1990s. The Directives address four aspects: opening generation and retail markets; access to transmission and distribution networks, unbundling integrated companies and regulatory bodies of ESI (Thomas, 2005). By 2000, most EU member countries have opened retail markets with the exception for Greece (Pollitt, 2009). After 15 years, there are still wide discrepancies between what is required in the Directives and what has been implemented (Wolfl et al., 2009). In 2004, the EC sent formal warnings to 18 out of 25 members about their non-compliance (Thomas, 2005).

Other OECD countries that have been active in this reform process include the US where there is a federal obligation to create wholesale market but regulations are open at the state level to whether to introduce retail markets; Germany where the market is fully open, a regulatory body is set up, all without unbundling vertically integrated incumbents; Spain where full market opening is not accompanied by market-clearing prices but prices are determined by regulated tariffs. These countries' reform models show similarities with subtle adaptation and paces. It should be noted that most OECD countries are not pressured by international financial institutions to liberalize. They do so as part of a common policy (in the EU) or as a result of domestic pressures (US, Japan, Singapore).

Meanwhile, the context in developing countries is commonly characterised by international pressures from IFIs and donor countries with decisions to reform are made through the medium of loan conditionalities. Sectoral loans are majorly structural loans that are strategic themselves. The other actors are multinational companies (MNCs) who see developing countries as growing yet immature markets to yield higher returns in utilities in general and electricity sector in particular (Foch, 2012). The first place to witness this is in Latin America in the 1990s, reinforced by regime and presidents who are sympathetic with market liberalisation, namely in Chile, Brazil, Argentina.

Under the political influence of the US through the 'Chile Project', Chilean ministers of Economy, Finance, Education, Planning and Labour, along with leading economic advisors to the government were all 're-educated' by free-market academics in University of Chicago, namely Milton Friedman and Arnold Harberger. With the Electricity Act 1982, Chilean's electric power authorities unbundled vertically and horizontally integrated companies, opened wholesale market, introduced a centralized power pool, let large users choose supply sources, and opened access to transmission and distribution networks (Kessides, 2004).

The conditionalities are also applied in Africa. Significant unbundling has started in Africa namely in Kenya, Tanzania and Nigeria. The process started in South Africa, the most developed country in Africa but then abandoned later. This 'world-wide phenomenal reform' also reached Asia, especially South and East Asian tiger countries in the 1990s. There is a range of economic development in this region. Some are strong emerging countries (China, India), transitional countries (Vietnam, Laos, China), low-income countries (Laos, Cambodia)... In spite of their differences in political and economic arrangements, most countries in this region are under-going some forms of liberalisation in the electricity sector. Since most of them are still in the first few stages of the reform model, studies on the outcomes of liberalisation are limited.

## *2.2. STANDARD REFORM MODEL OF LIBERALISATION*

The standard reform model of liberalisation is originated from the neoclassical theory of economics. Since the collapse of the Soviet Union, there was a strong argument against Marxist theory of economics that central planning and state control fail to use market mechanism to get the right economic decision of what products to get at what price to charge. The reform model in general consists of several elements including corporatization, unbundling, marketization, competition, regulation and privatisation. This model was first implemented in the retail sectors where the state is believed to be better staying away from provision and production. Later, it was applied to infrastructure sectors which John Stuart Mill in 'On the Influence of Government' argued that they cannot be delivered without the state (Mill, 1848).

Public infrastructure sectors then became important and difficult targets for governments who want to reform because their traditional set-up of the networks is vertically and horizontally integrated to allow easy central control and involve national and social security issues. There was no room for any private company to build or join the network. So unbundling came in as a necessary step to separate input and output, lowering entry barriers and allowing for bidding or contracting to privately owned companies. These views have been articulated by a number of key theorists by Friedman (in 'Capitalism and Freedom, 1962; in 'Free to Choose: A personal Statement, 1980), Megginson (in series of papers in 1994, 1997, 2001), and in the electricity sector, by Newbery (2004) and Pollitt (2007).

Under this model, the system is expected to move from monopoly to a single buyer of electricity and wholesale competition, to a free choice of energy source for supply companies, to retail competition where consumers can choose their suppliers. Electricity market liberalization primarily aims to 'improve performance: financial performance, supply side efficiency and demand-side efficiency' (World Bank, 1994). It is expected that liberalization attracts new investment in generation, reduces prices, ensures security of supply and provides universal coverage.

## *2.3. THE WORLD BANK AND WASHINGTON CONSENSUS*

The wide spread of liberalization policies in the world is associated with the 'Washington Consensus', a term coined by John Williamson. The

consensus includes trade liberalization, privatization, and deregulation among other fiscal and monetary consolidation policies. As Birdsall et al (2010) points out, 'it is not a coincidence that the appearance in 1989 of the Washington Consensus coincided with fall of the Berlin Wall, which symbolically marked the burial of centrally planned economies'. In Williamson's own words, it was the year that marks the beginning of the British model, the gift that Mrs. Thatcher brought to the world (Williamson, 2004). Primarily intended for Latin America, the 'Universal Convergence' 10 policies then became the prescription used by the Bretton Woods institutions for developing clients in need of capital inflows via conditionalities in the 1990s, the Washington Consensus' 'glorious years' (Williamson, 2004; Birdsall et al, 2010). In 2004, the President of World Bank, Wolfensohn, admitted that the consensus was dead and had been replaced by other consensuses. Yet, the IFIs still hang on to the notion of liberalization, especially in public utilities, and public sector reforms quite similar to the prescription of the Consensus (Hailu, 2009).

#### *2.4. ONGOING DEBATE ON REFORMS*

The consequences of liberalisation are gradually unfolded that little has been gained in sector performances in terms of affordability, accessibility and reliability in all groups of countries.

In terms of extending coverage, it is difficult to say if a reduction in population without access to electricity (IEA, 2000; Winkler et al, 2011) is the result of liberalisation or central planning. Notably, the South Asia and Sub-Saharan Africa regions experienced a rise in population without electricity. As Doll and Pachauri (2010) found out private investors are unlikely to find it profitable to invest in distribution networks in underdeveloped regions with only a few households. Besides, accessibility needs to be accompanied with affordability so that households can truly benefit from electricity coverage. Unfortunately, in order to provide more networks, companies have to transfer their additional costs to consumers, causing the price to rise.

In 2010, NUS Consulting Group report points that global electricity prices have been increasing and will continue in the future. In particular, in 15 most expensive countries for electricity, prices are subject to rise from 3 to 33% per year. Among them are leading examples of liberalization, namely, Sweden, Austria, and UK. The study of real electricity prices in OECD from 1978 to 2008 by IEA also shows similar results. Dagdeviren (2009) points out that in the short term when investment starts to kick in, electricity prices went down but this temporary results 'can be misleading'. Since 2000, when markets are relatively open, 'prices started to increase'. Using data of 83 countries from 1985-2002 in Latin America, the former Soviet Union and Eastern Europe, Nagayama (2007) finds little correlation between unbundling, wholesale market competition and decrease in electricity prices. On the contrary, they are associated with a rise in prices. Argentina and India also see price rising regardless of poor quality of services (Wamukonya, 2003). As Thomas (2005) argues, the cost of competition is not cheap. The combined cost of capital/loan, cost of market design, cost of marketing, cost of customer switching, cost of installation... is additional to generation costs that in the end, taxpayers have to pay.

Woodhouse (2006) points out that by 2030, developing countries need investment of \$5 trillion, two thirds of it for new generation capacity. Demand in these countries is growing exponentially, which private investment is expected to benefit from. In fact, private investment in new generation boomed in the 1990s. Yet, similar to what is witnessed in price movements, it started to go opposite way in the 2000s. Private investment in infrastructure more than halved from 1997 to 2001. The World Bank (2004) argues that this drop is due to 'falling stock markets worldwide, financial crises in emerging markets, and hesitancy caused by public opposition to privatisation'. However, Thomas (2006) believes the problem could be 'more fundamental'. Private generators have to face demand risk, political risk, fuel risk, payment risk along with currency risk for foreign investors (Thomas, 2006; Woodhouse, 2006; Liong, 2008). As being risk averse, private investors do not have sufficient incentives to invest unless long-term contracts or capacity payment mechanism are offered to them by the government (Neuhoff and De Vries, 2004).

A series of blackouts and system failures in the early 2000s in California, US (2003), Italy (2003), Switzerland (2003), southern Sweden (2003), Northeast blackout of 2003 in Toronto, New York, New Jersey..., Malaysia (2003, 2005), Rio de Janeiro, Brazil(2005)... have raised questions on efficiency of unbundled and liberalised systems. UK institutions, namely DECC, CCC, also believed that the system only works if it can deliver 'secure, sustainable and affordable electricity' (CCC, 2009; DECC, 2011) and the current UK liberalised system cannot deliver these three objectives, hence the need for a 'reform of reform'. Some academics stay firm with the model, blaming the undesirable outcomes do not lie in the model itself but in the implementation process and that there is not sufficient incentive to invest (MarketWatch, 2004), that the model should be applied in the correct and logical order (Jamash, 2006). However, there is no clear definition of 'sufficient' and 'correct'.

In facing with climate change target challenges, academics have not specifically suggest practical approaches or strongly believe that the liberalised system can deliver. Kessides (2012) offers a solution of distributed generation (DG) that is suited for generating renewables at a small scale in rural areas. For larger economy, she thinks a new paradigm should be in place. Newberry (2012) acknowledges that reforming existing liberalised markets to meet climate change targets is more difficult than in a state-controlled market, but only suggests that even more reforms should be on the way to address its shortcomings.

### **3. DATA AND SOCIAL NETWORK ANALYSIS**

In order to evaluate the desirability of the liberalisation model, apart from analysing prices (Nagayama, 2007) and consumer behaviour (Florio, 2014; Clifton et al, 2011), we would also want to know if the model can provide incentives to private investors to leverage the substantial up-front costs borne by the governments to open the market. This research attempts to find the answer to the roles of participants in the energy market in investment and the flow of funding in capacity generation. A simple consolidation standing alone can

only tell who is the largest direct investor in the sector at any one time by calculating the total sum of investment and the percentages out of that sum each investor contributes. This technique ignores the complexity of investment as an element in the circular flow of income (investment in one company can be reinvested in another company) as well as ignoring the roles of institutions such as governments and financial institutions (which commonly channel funds to companies to encourage investment in public services). Also, investors (individuals and institutions) tend to look at other investors' behaviour, and even attempt to mimic each other. This could be witnessed when it comes to investment after the financial crisis. In addition, investors are often interdependent on each other in the sense of creating an investment environment in a market and supporting or limiting each other's decision movements. Therefore, it is important to realise that investment environment 'can be expressed as patterns or regularities in relationships among interacting units' (Wasserman and Faust, 1994, pg 1). Social network analysis will therefore fits in the purpose of creating a realistic social network of investors and their channels of funds, identifying the key player (direct or indirect investors) in terms of significance of investment and key role in bridging the funds to receivers.

The research first builds a database using raw data from the World Bank archive and government portals on all projects in the electricity sector, actual investment based on the construction of power plants. The raw data is then analysed and categorised into periods, purposes, relationships. All actors, amount of investments and relationships are recorded in each year from 1957 to 2013. In order to carry out the centrality analysis, a network of actors must be created. Yet, a network of investors alone cannot be created without the link to where they invest. In order to identify who invest in where and how much, the network should start with the most identifiable and physical event (construction of power plants and/or the presence of power plants). Taking the point of when the construction finishes, it can be assumed that capital investment has been made in full; hence the figure for investment will be reliable, in comparison to predicted or proposed investment. Considering the time scale of the research (most up-to-date), there are a number of power plants that are in different stages before completion, e.g. proposals, bidding, construction... It would not be complete without realising that these events contribute to the investment environment in the sector. In these cases, the figures of proposed investment (submitted to the government agency in official documents) would be taken. As a result, the network consists of 2 modes: one is actors (investors) and the other is events (power plants). Considering the actors as investors alone can cause confusion. Investors in general terms can often refer to private individual investors. In this context, I am taking all individuals and institutions, private and public who make money transfers or contribute to the pot of capital investment as investing actors. That would mean including governments (national and international), financial institutions (national and international), investors (individual and companies). After loading this sorted data using UCINET-6 software, centrality algorithms are applied (in-degree and out-degree represent receiving and sending funds) to identify the degree of importance and connection of each actor in the network. The results of these degrees are then

loaded into E-views using regression algorithms to analyse the correlation between the centrality degree of each actor and total network funding through time.

#### **4. LIBERALISATION PROCESS IN THAILAND AND VIETNAM**

##### **4.1. *ELECTRICITY LIBERALISATION IN THAILAND***

Before the 1990s, the electricity sector in Thailand comprises of 3 state-owned companies: EGAT (Electricity Generating Authority of Thailand) being in charge of electricity generation since 1968, MEA (Metropolitan Electricity Authority) being in charge of distributing and selling to Bangkok and its suburban areas since 1958; and PEA (Provincial Electricity Authority) being in charge of distribution to all other Thai provinces. The tripoly played important role in supporting the industrialisation years of Thailand in the 1980s. Their financial loss and expansion projects were both largely financed by international debts. This debt amounted to 'nearly half of all of Thailand's external borrowing between 1967 and 1971' (Wisuttisak, 2010). The World Bank therefore advised the government to level retail prices to the market level and privatise SOEs since the 1980s.

The government under Prime Minister Chatichai Choonhavan then attempted to privatize the electricity sector in 1989 but failed because of strong opposition from EGAT Trade Union in 1989. Not until 1992 did the government under Prime Minister Anand Panyarachun successfully pass the amended Electricity Generating Authority of Thailand Act which allows the participation of Small Power Producers (SPPs) and Independent Power Producers (IPPs). SPPs aimed to promote clean and renewable energy. IPPs mostly operated under Power Purchasing Agreements that forced EGAT to buy in any amount of production. The government allows PPAs to be pegged to dollars in order to provide certainty and lower risk to investors (Greacen and Greacen, 2004). The independent regulatory body, National Energy Policy Office (NEPO), was established.

In 1998, the 'Master Plan for State Enterprise Reform' was approved by the government that planned the restructuring and privatisation of the energy sector with 3 other public sectors. The plan set out 3 stages for the liberalisation of the sector: 1998-2001 with EGAT as primary generation source, 2001-2003 with increased competition in generation and distribution to large customers, 2003 onwards with the unbundling of EGAT and the creation of complete wholesale and retail markets. However, in 2003, the government under PM Thaksin cancelled the NEPO model and consulted the Boston Consulting Group who later came up with a relatively similar model, ESB but less focusing on objectives of liberalisation. In 2004, EGAT was about to be privatised by offering shares on the Stock Exchange but this act was postponed when EGAT Trade Union protested. However, Thaksin government later resumed the plan of corporatizing EGAT in November 2005. Foundation of Thai Consumers requested the Supreme Administrative Court to consider the validity of corporatisation of EGAT. In March 2006, the Court declared the corporatisation invalid and later in 2006, privatisation became illegal in the sector. From that on, the sector returned to the oligopoly structure with the dominance of three



utilities, EGAT, MEA and PEA. RATCH and EGCO are the main IPPs in generation with 14% and 11% market share respectively. Yet, majority shares of these companies are held by EGAT of 45% and 25% shares respectively. MEA also is now vertically integrated with EGAT.

#### *4.2. ELECTRICITY LIBERALISATION IN VIETNAM*

Since 2001, the Vietnamese government has acknowledged the need to increase generation capacity in the electricity industry to support annual economic growth averaging 7.3% between 2000 and 2009 (Business Monitor International, 2011). With unprecedentedly growing demand, tripling in less than a decade, the electricity industry, however, commonly fails to deliver, most frequently during peak hours and dry seasons. It is reported that 'in the whole country there were 3,000 blackout incidents due to system overloading during the first 7 months of 2008', equivalent to '14 blackouts a day' (Nguyen and Dapice, 2010). As a way to mitigate this chronicle electricity shortage, the industry's biggest player, EVN has to buy in all that is produced domestically and import from neighbour countries such as Laos and China. Yet, EVN, not only cannot satisfy its primary objective of ensuring security of electricity supply but also causes significant annual financial losses of hundreds of million dollars (in 2010, about \$343 million-VND10000 billions; in 2011, VND8040 billions). EVN claims that too-low average pricing of electricity is the cause of this loss. In addition, audit reports revealed that EVN's diversification policy had caused further losses. The inefficiency in infrastructure investment and inadequacy in organizational management have caused anger amongst the public, creating an extremely negative attitude towards the traditional monopoly structure of the electricity sector. As a way to deal with these issues, policy makers mainly favour the 'marketisation' or liberalization model. The main reasons behind the policy are: one, to assist the government in infrastructure investment (this was expected to cost \$13.5 billion from 2005-2020); two, to expose EVN to competitive forces through encouraging private and foreign investment forcing it to improve its financial and operational performance.

Until mid-2012, the electricity sector has supported this liberalization plan. A competitive market for generation (with a single buyer) was planned to be in operation by 2009 but the implementation has been delayed several times. The latest plan was to operate such a market from June 2012 but it has not yet been seen in place. In 1/6/2011, Prime Minister Nguyen Tan Dung agreed to adjust the electricity price on the basis of actual costs, i.e. the sum of input costs, resulting in gradual price increases from this year on until average price truly reflects actual costs. This adjustment is controlled by the supervisory bodies, i.e. MOIT and MOF and has to be passed by the Prime Minister himself. However, these are temporary measures and cannot bring in as much change as the government wishes.

### **5. WORLD BANK FINANCING IN THAILAND AND VIETNAM**

#### *5.1. FINANCING THAILAND'S ELECTRICITY*

The World Bank has been lending to Thailand specifically in energy sector since the 1950s with projects which focuses on increasing capacity and rural electrification. In contrast to the belief that World Bank only started to promote

neoliberalism policies since 1993, the Bank actually suggested privatisation and corporatisation in the energy sector since 1982 with its SAL 01 (1982-1983) and SAL 02 (1983-1984). However, the first attempt failed. The model had not been popular to academics and had interfered with the interest of labour unions in SOEs. From 1989, the Bank focuses its financial resources to reinforce reforms in public sectors in general and in energy sector in particular. When the Electricity Act 1992 was published, Thailand was actually on Power System Development Project (02) which facilitated private sector development in energy sector. As an aftermath of 1997 financial crisis, Thailand obtained IMF loan on condition of public sector restructuring. During this time, World Bank also provided 2 loans with objective of privatising MEA and PEA as a complimentary act with IMF. The loans did not however deliver their objectives. The Bank later moved to loans on public administrative and law reform that promoted decentralisation and SME supports from 1999. Since 2001, the Thaksin government strongly pursued their own direction in energy sector which marginalised the Bank's influence. In 2006, the military coup resulted in the reverse of all its efforts. From 2006-2010, the political crisis suspended WB plan for Thailand's public sector reform. Yet, the Bank still perseveres with its reform policies by substantially increasing its loan sum. In 2010, the latest Public sector Development Policy loan amounts to \$1 billion with focus on private sector development.

## *5.2. FINANCING VIETNAM'S ELECTRICITY*

The World Bank entered Vietnam since 1978 with one development project for basic services. Not until the US lifted embargo on Vietnam in 1994, did the Bank officially offer a series of projects to the government. It may not be a coincidence that the projects underpinned many of policy reforms in the sector. First, the first structural adjustment project was commenced in 1994 to 1996. As the end of this project, the first Decree on Equitization was passed, marking the first steps towards SOE privatisation and corporatisation. Second, the Power Sector Rehabilitation and Expansion Project from 1996 to 1999 was rated as 'highly satisfactory' with the issue of policy statement for power sector reform by Ministry of Industry in August 12, 1997. Third, from 2000 to 2006, the Bank constantly lent to the sector with 6 loans, 5 of them are reform-based. This full force was rewarded with Decree 45 on opening generation market to private and foreign investment in 2001, with Electricity Law in 2004 on a competitive market plan, with the creation of ERAV (Electricity Regulating Authority of Vietnam)-a regulatory body of the industry and with the corporatisation of EVN in 2006. From 2006 to 2009, despite promises to develop the private sector as in conditionalities in previous loans, the electricity sector is still dominated by EVN, the single buyer, the monopoly of the networks. Forth, from 2009 to 2011, the Bank replaced multiple-objectives loans with reform loans only in order to push the liberalisation process faster. Just in 2011, there are 4 reform-based loans, 3 for electric power sector, 1 for public administration to support a more general economic liberalisation. The result is the Power master Plan in the same year drawing a more detailed plan. In this plan, the government shows its commitment to increase efficiency in the sector, in EVN in particular, and to withdraw price subsidies, levelling it closer to the market price. Hopefully, with this effort, the sector can attract more foreign investment.

### 5.3. FINANCING STRATEGIES

Figure 1 and 2 (below) show the time periods when the loans are taken in the sequence of time. Thailand and Vietnam's energy sectors have been constantly on loans with the World Bank. These loans are even overlapping in time. The former one has not finished, the later one already comes. The sector has never been out of debt since 1957.

Figure 1 Overlapping World Bank loans in Thailand in Periods.

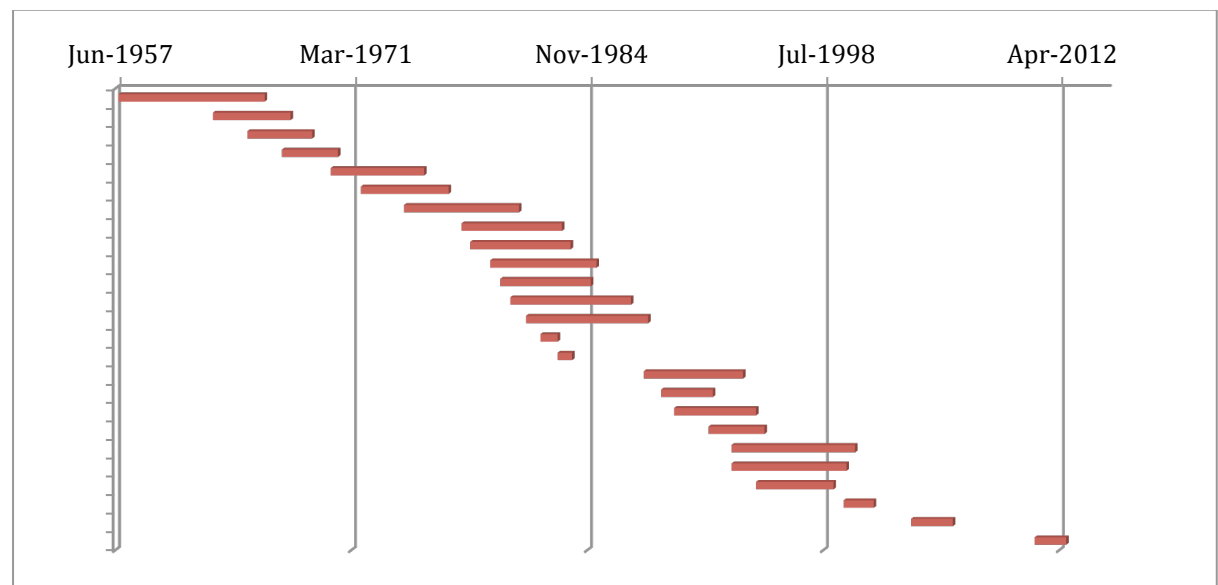
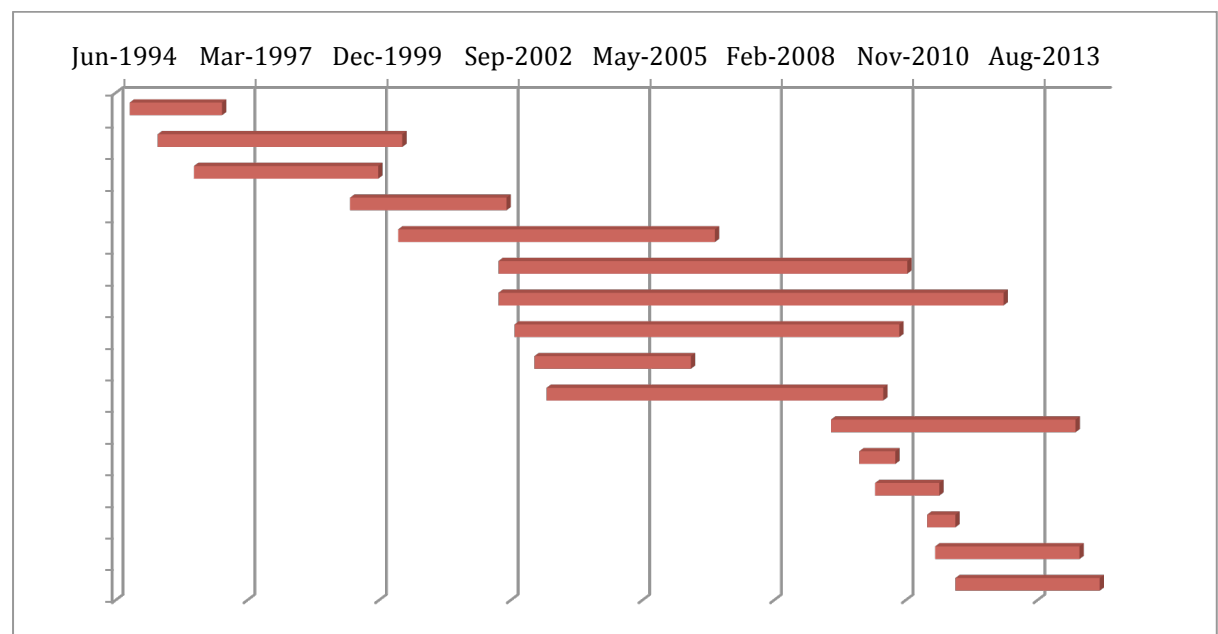


Figure 2 Overlapping World Bank loans to Vietnam in periods.



When arranging the loans according to project periods, the figures show that there is no time when the Bank is not a lender of these countries. The loan periods are effectively overlapping. To say more correctly, the energy sectors are

always and constantly under loans with the World Bank. When one project has not ended, the next one is already in operation. When one project just commenced, the next one is already in the authorization stage. When adding periods of all projects and divide this sum by the number of years from starting point of the first project to the ending point of the latest project, it is striking to see that on average, every day, there is always more than 1 project in operation in all countries. In Thailand, 25 projects took about 114 years to complete but are only carried out in 55 years. It means the sector has at least 2 projects in operation at any point in time. In Vietnam, it takes only 19 years to complete 15 projects that are supposed to be completed in 69 years. The energy sector is in fact always operating at least 3 loans at any time. It is doubtful that the sectors truly need those loans at such a density over time. But the continuous flow makes these 'captive' countries as borrowers for life. Once these countries are used to receiving loans every year, they would not want to end it by clearing loans that bulk up far over their own national financial resources. Since the same pattern occurs in all three countries, it may be analysed as a deliberate strategy by the WB whose result is to give the WB effective power over sector policy for an indefinite period.

In dividing the projects according to their purposes, funds for Market Reforms account for 38% (in Vietnam) and 44% (in Thailand) of total financing from World Bank, which is comparable to other developmental, infrastructure funds. These loans are directed to the government institutions as borrowers, implementers and end users. The non-reform loans are the loans to build generating capacity and rural electrification; that produces tangible and lasting assets. Reform loans on the other hand involve working, discussing and planning policy papers that pave ways for sector reforms. The published reports do not produce accounting statements of what the funds are spent on. But it raises a big question of transparency when infrastructure loans are subject to itemized accounting audit and easier to monitor financially whereas the accounts of reform loans are typically presented under broad headings only, such as 'consulting services, training, program marketing, evaluation and administration costs' (World Bank, 2003). Under the umbrella of 'Demand-side Management and Energy efficiency Project' 2003-2010, the grant (in addition to the loan fund to make up to \$18.56 million) actually aims to promote private participation and marketisation in the sector. The break-down of this loan shows that the two recipients are EVN and MoI (Ministry of Industry). The costs comprises of 'control program', 'promotion', 'market transformation', 'training', etc. In the grant's cost break-down, 'consultant services' are \$3.34 million whilst the cost of 'goods' is only \$0.93 million. The sheer size of these projects clearly shows the discrepancies in evaluation of costs and objectives between reform projects and non-reform projects.

Figure 3 World Bank fund allocation to infrastructure and non-infrastructure items in total loans to Thailand

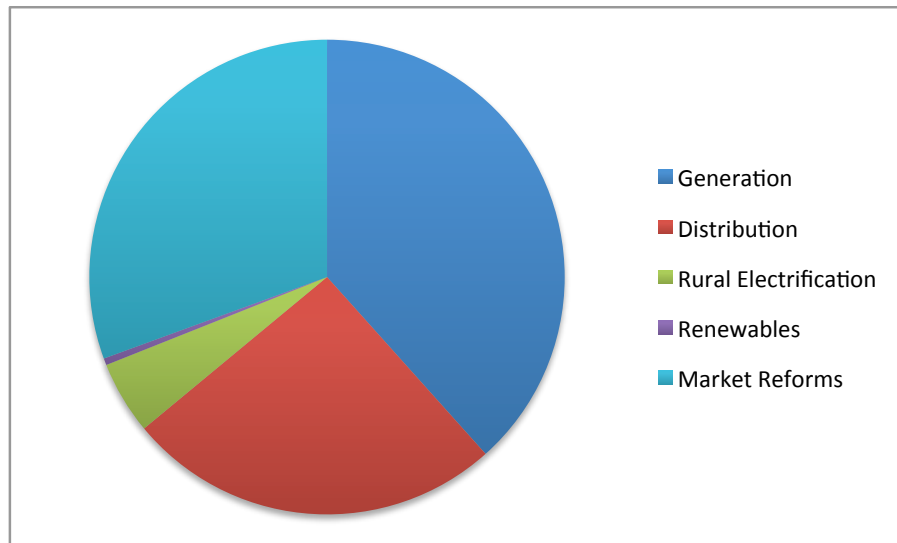
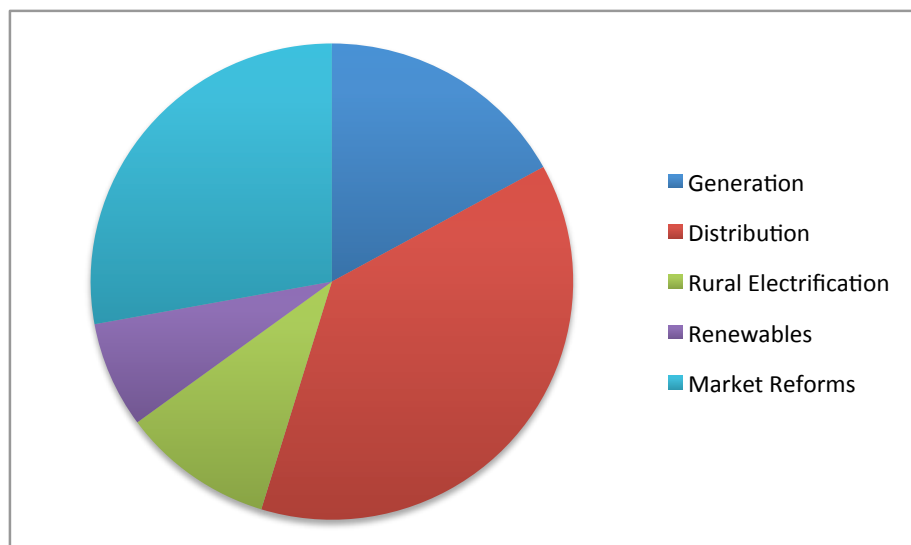


Figure 4 World bank fund allocation to infrastructure and non-infrastructure items in total loans to Vietnam



#### 5.4. NETWORK STRUCTURE

##### 5.4.1. Public actors vs. Private actors

Figure 5 and 6 (below) captures the network structures of all World Bank-led finance in the electricity sector in Thailand and Vietnam from 1957 to 2013. The two networks are of similar shapes with a highly dense circle, centred around the highest recipients of funds which are EGAT in Thailand and EVN in Vietnam. The figures also highlights the ownership attributes of all actors in the networks with Blue colour representing public ownership and Red colour for private ownership. It can be seen that the blue nodes dominate the network. Public sector actors including government institutions and SOEs are the dominant recipients and create highly dense connections in the financing

network whilst the network of private sector actors is much more sparse and receive much less fund from financiers.

This still caption of the evolving network highlights 2 keys findings. First, the bigger nodes who receive more funds hence higher in-degree centrality, are public actors and the highest recipients are the state-owned incumbents. Despite the fact that this is a network constructed in the liberalisation process and led by the World Bank, public actors are still so important in providing services that cannot be replaced by private actors throughout the years. This finding is strengthened when looking at the same network re-arranged to separate networks of public actors and private actors. It can be witnessed that the public actor networks are much more dense, representing much more active activities and transactions among actors whilst the private actor ones are much more sparse. Private actors also are smaller nodes. Their sizes show that they receive much less from financiers including government sources and other private sources. In both figures 5 and 6, there are unconnected strings where the role of private actors is more balanced. These are micro-networks that are built from projects financed by MIGA and IFC, two member institutions of the World Bank that guarantee and finance private investment projects in infrastructure. The fact that these projects do not make connection with the central network can be interpreted that the private investors could not find funds from other major sources that are favoured by public companies. Another way of looking at this separation is that the projects tend to be of smaller size (because of the size of funds in the micro-network), it is more accessible to get financed by the Institutions. This leads us to the second finding of this network that looks at the relationship between private actors and their link to public actors. Looking at figure 7, the network of private actors in Thailand is a star-form, centered around a single node but all of them are connected to a few sources of public ownership. Meanwhile, connections among these actors are majorly indirect, i.e. via the central node.

#### 5.4.2. International vs. National actors

When rearranging these financing networks according to the attributes of financing sources of the actors, the network structures illustrated in figure 7 and 8 (below) show that the most active networks occur between national actors whilst international donors and multilateral funds play an initiative yet less central roles. National investors (in Red) are highly connected, creating a dense network among them whilst the international financial institutions (in Yellow) are well connected with this national network but less connected to each other. The network of donor actors (in Blue) also bears similar characteristics with the IFIs' network. It is notable that this network structure can be witnessed in both Thailand and Vietnam.

Figure 5 Networks of World Bank-led financing in electricity generation in Thailand, highlighting normalised in-degree centrality.

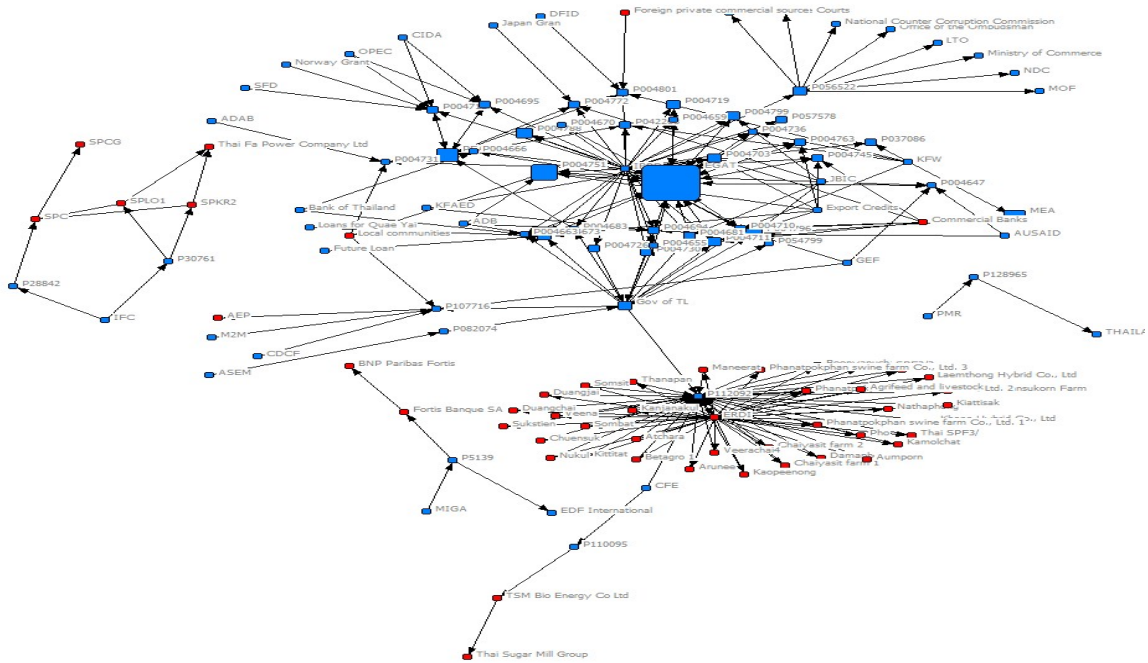


Figure 6 Networks of World Bank-led financing in electricity generation in Vietnam, highlighting normalised in-degree centrality

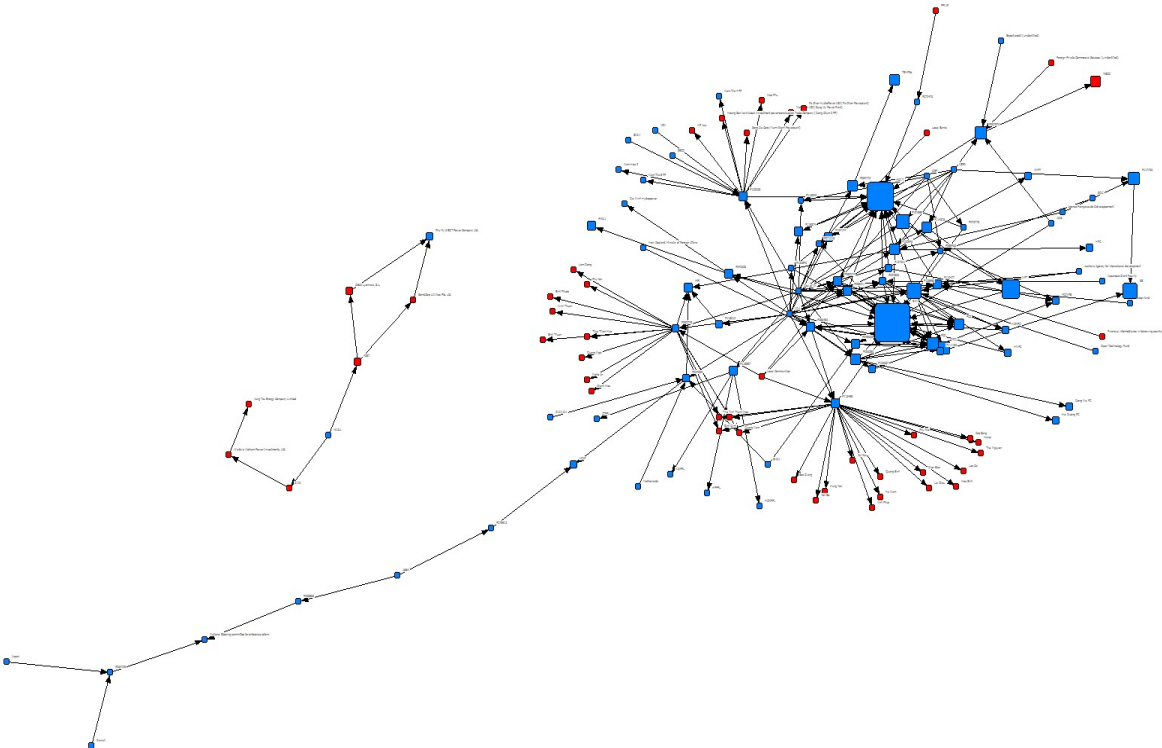


Figure 7 Networks of national and international actors in financing generation in Thailand

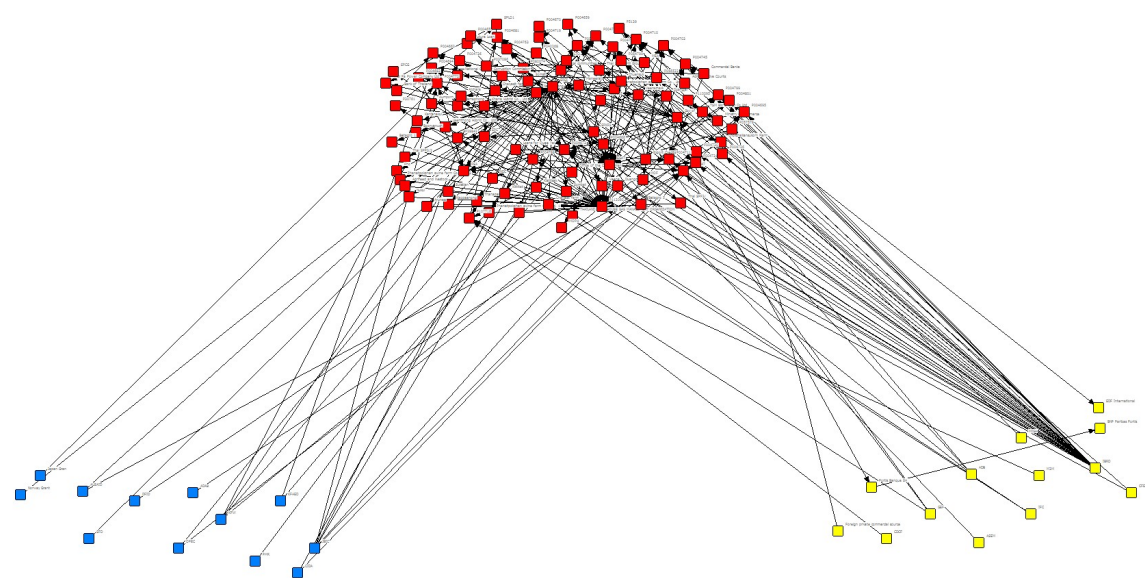
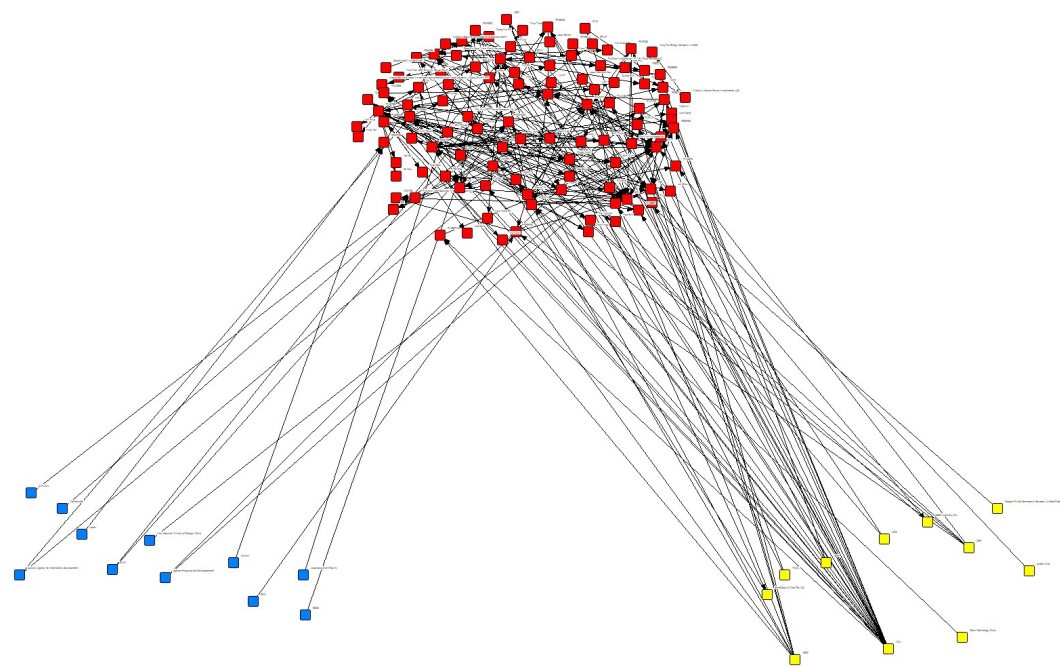


Figure 8 Networks of national and international actors in financing generation in Vietnam





## 7. CONCLUSION

The costs of the reforms are themselves substantial, using one third or more of all World Bank financing, directed at government ministries and agencies. These 'reform' loans can be seen as a fixed overhead, without any direct increase in generating capacity or network extension, thus reducing the leverage achieved by direct project loans, and increasing the costs of direct investments. The World Bank's funds for policy reforms and privatisation aims to reduce the role of governments and leverage private sector development, and costs of reforms are substantial. However, the research shows that the majority of WB funds do not actually reach and involve private actors. With increasing generation capacity, the role of government institutions grows, as well as the funds received by the dominant vertically-integrated SOEs. There then exists a contradiction in the Bank between the Bank's objectives of reducing the role of government in the market and strengthening the role of public actors in the market.

The financial support of the World Bank is generally seen as a 'vital source' for development of the sector in developing countries (World Bank, 2011). The Bank reinforces this by employs a flow of an overlapping projects, so that lending period strategy that keeps the countries are continuously in receipt of bank loans for as 'captive for life' by layering loans on loans. However, domestic networks of financiers and recipients are much more active and dominant than the role of international donors and funds. The value of funds directly from the WB is also less significant than that from other sources. These results support the findings of other studies: private funding does not substitute for public investment in the electricity sector, or other infrastructure; national funding, and public sector funding, continues to be of the greatest importance; private participation is largely limited to thermal IPPs based on long-term power purchase agreements which are vulnerable to overcharging and corruption. (Estache 2006, Estache et al 2009, Foch 2013, WB/AFD 2010).

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