

**MINISTRY OF EDUCATION AND TRAINING
THE UNIVERSITY OF DANANG**

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**CONSTRUCTION AND DEVELOPMENT OF
COMPETITIVE WHOLESALE ELECTRICITY
MARKET IN VIETNAM**

SUMMARY OF DOCTORAL ECONOMIC THESIS

Da Nang - 2014

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at The University of Danang on 29/6/2014.

Thesis can find out at:

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LIST OF WORKS BY AUTHOR

1. Nguyen Thanh Son (2005), *The electricity market models and the abilities to apply in Vietnam*, Journal, UD, No.9, 2005.
2. Nguyen Thanh Son (2009), *Development trends of competitive electricity market in Vietnam*, Electricity & Life Magazine, Association of the Electricity of Vietnam, No.126 10/2009.
3. Nguyen Thanh Son (2014), *Development solutions of Vietnam's competitive wholesale electricity market today*, Electricity & Life Magazine, Association of the Electricity of Vietnam, No.179 03/2014.
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PREAMBLE

1. The necessity of the subject

Electricity market is an inevitable development trend of many countries in the world, electricity market formed to ensure the optimal exploitation of all resources, meet the power needs for socio-economic development with stable quality, safety and economic, contribute to national defense, national security and energy security. Many countries in the ASEAN region and around the world have been positive steps in building a competitive electricity market.

To date, Vietnam has put into operation the competitive generation electricity market power generation from day 01/7/2012 under the cost base price. Because of the limitations of such problems: most are under the ownership of the power plants is the largest economic group of the State, in which EVN accounted for over 50%, single unit buying power owned by EVN, the issues related to the regulation and operation of power system,... competitive electricity market Vietnam is still basically monopoly, there are limitations that need to be overcome. Due to the necessity of the development of electricity market competition in the market mechanism, so by not going into the wholesale electricity market research competitiveness of the electricity industry, to contribute to the work of the electricity sector for the construction and development of competitive electricity market Vietnam, I choose the research topic: *"Construction and development of competitive wholesale electricity market in Vietnam"* as my doctoral thesis.

2. The research purposes

The purpose of the thesis research is to clarify:

- The theory of the electricity market, electricity market characteristics and conditions of conversion, development of a

market typical number of countries around the world each stage of development of the electricity market: competitive generation electricity market; competitive wholesale electricity market; competitive retail electricity market from which to draw lessons for the development of the electricity market in Vietnam. Going into theoretical models, operational mechanism, the form of the secondary market in the wholesale electricity market model competition as the basis for the construction and development of competitive wholesale electricity market Vietnam in accordance with the schedule of the Government.

- Analysis of the current status of Vietnam's power sector, the legal basis the Vietnamese electricity market, the state, the formation and development of the electricity market in Vietnam in the coming time. Research, pilot operational situation analysis internal competitive electricity market EVN, and analysis facility, the characteristics and operation mechanism of the competitive electricity market Vietnam to orient the development competitive market model wholesale stage.

- To study and model building competitive wholesale electricity market in Vietnam in terms of transition from competitive generation electricity market model, and provide solutions to the implementation of the switch to the model, competitive wholesale electricity market suitable for Vietnam in the coming.

3. Object and scope of the thesis research:

The main researching object of the thesis research is the Vietnam electricity wholesale market.

The scope of the thesis research is Vietnam national territory with the data collected during the period 2005 - 2012; research solutions and proposals for the period to 2020.

4. Research methodology

Collect, inherit the literature related to the formation and development of the electricity market in the region and around the world, the thesis uses the methods of analysis, synthesis, comparison, interpret, and expert consultation for reasearching.

5. The layout of the thesis:

Chapter 1. Overview of market research on competitive wholesale electricity

Chapter 2. Theoretical and practical development of competitive wholesale electricity market

Chapter 3. Current status of Vietnam's electricity market and the necessity of construction and development of Vietnam wholesale electricity market

Chapter 4. Proposed model and solution for building and developing Vietnam wholesale electricity market.

6. The new contribution of the thesis

- The thesis outlined the basics of the electricity market, the characteristics and principles of operation, conditions for formation and development of the electricity market, the form of organization of the electricity market, going into the analysis of the characteristics of the wholesale power market competitive power market as well as learn of a number of countries around the world.

- The thesis analysis, to assess the status and trends of development of the power sector in Vietnam; situation implementation of the steps taken to apply market in Vietnam; identify the existence and cause of current shortcomings of the electricity market Vietnam.

- The thesis proposed mechanism of action for building competitive wholesale electricity market with the operational

requirements, the relationship of each department participating in the electricity market in Vietnam, proposed solutions, which focus on the implementation Vietnam's power sector restructuring is to ensure conformity with the model competitive wholesale electricity market in Vietnam in the coming time.

Chapter 1. OVERVIEW OF MARKET RESEARCH ON COMPETITIVE WHOLESALE ELECTRICITY

1.1. The reference books and research works on electricity wholesale markets of some countries in the world

"Fundamentals of Power System Economics" [20] of the author Daniel Kirschen and Goran Strbac the University of Science and Technology Manchester - England; book *"Competitive Electricity Market Design: A Wholesale Primer"* [40], *"The model competitive electricity market"* [41], Dr. Steven Soft. International Energy Agency (IEA) has many documents referring to the reform of the energy sector of the countries in the world such as: *"Electricity Market Reform"* [25], *"Competition in Electricity Market"* [26], Along much of the research literature scholars and organizations around the world such as: *"Electricity Markets - Pricing, Structures and Economics"* [19], *"Electricity Economics"* [24], *"Power System Restructuring and Deregulation - Trading, Performance and Information Technology"* [30], ...

Many countries have undertaken consultancy is hiring organizations and individuals to conduct a baseline study for their national electricity market this is to make recommendations, revealing, the steps taken to reform the electricity market to advance to the national competition model. Accordingly, a number of authors collected data is useful in the research process towards the

construction and development of the electricity market in Vietnam such as: *"Introduction to the Singapore New Electricity Market"* [21], *"Competition in Electricity Markets: The Case of the Philippines"* [31],...

Accordingly, this study is useful in the research process towards the construction and development of the electricity market in Vietnam such as the status, the development, the reform process, the experience of handling that some countries have already encountered in the process of building and developing the electricity market.

1.2. The topics and research works on Vietnam's electricity market

For Vietnam, along with the identification of objectives and the development of Vietnam's electricity market, there are many research works related to the construction and development of Vietnam's electricity market, industry restructuring Vietnam power in accordance with the development of the electricity market, ... the study of market power in our country has focused on the study of the status of Vietnam's power sector, the requirements set out reform and economic experimental deployment models in the world market and region to find a suitable model for the conditions and circumstances of Vietnam, set out a roadmap for appropriate reforms.

There are many research works, such as: *Study revealed the formation and development of Vietnam's energy market"* [1], *Report design consultancy competitive electricity market Vietnam* [4], *the overall design scheme competitive electricity markets and the restructuring of the electricity industry electricity market development* [5], ...

These comments and issues raised for further research of the thesis

On the basis of the content and results of a number of research projects related to the construction and development of the electricity

market, access to the thesis, the basic thesis has some following comments:

- The study of electricity market in our country are united in the conditions and circumstances of Vietnam, the immediate benefit market model is the most appropriate and electricity market model, in which EVN will play as the single buyer in the market;

- These researches focused on identifying common roadmap for the development of Vietnam's electricity market, deep into research Vietnam's electricity market in transition from monopoly to market model the competitive power generation and mechanisms of VCGM operating conditions, a number of topics to delve into electricity prices, a number of technical conditions for the operation of competitive electricity market. Many of the research projects have achieved certain achievements in science and practice, such as made some comments on Vietnam's electricity market today, are specified in the legal documents to guide leads to the formation, operation VCGM, ...

- These researches did not address the development of the electricity market in Vietnam is the next step in the competitive electricity market sewn purchase wholesale electricity along with the model, as well as the operational mechanism of the conversion, and conditions the problems while developing the model VWEM.

So the question here is the study and recommendations for further development of the electricity market in Vietnam in the finishing stages competitive electricity market, wholesale market development, market retail electricity competition as an objective necessity, to ensure that Vietnam Electricity market operation stability, sustainability, energy security, meet the economics of the whole system.

Chapter 2

THEORETICAL AND PRACTICAL DEVELOPMENT OF COMPETITIVE WHOLESALE ELECTRICITY MARKET

2.1. OVERVIEW OF THE ELECTRICITY'S MARKET

2.1.1. Power and the role of power in the economy

Power is a special commodity, can not be seen, not in stock and reserve. The process of energy production to final consumption is occurring at the same time. Power sector supply includes: Generation - Transmission - Distribution - Supply.

Table 2.1. Structure of the Power Sector Supply Chain [25]

No.	Function	Fraction of total cost (in the United Kingdom)
1	Generation	65%
2	Transmission	10%
3	Distribution	20%
4	Supply	5%

2.1.2. The basic concept of market power

The thesis refers to basic concepts such as market: demand for electricity; price elasticity of demand for; frequency, voltage and market equilibrium; energy loss; adjustment price signals.

2.1.3. Electricity market's characteristics

The thesis refers to the basic characteristics of the electricity market as: Limit the area of the electricity market; participation of various types of plants have different production costs in the electricity market; Without power on the market, the recovery period usually lasts; market conditions, the standard stimuli and mechanisms for the construction of new power plants will fundamentally change compared with the monopoly details.

2.1.4. State regulation of the electricity market

Referring to the issue of natural monopoly characteristics of electricity and the problem must be regulated by the State.

2.1.5. Restructuring the electricity industry with the development of a competitive electricity market

The main contents of the restructuring include: One, the reform of the function of the power company with the main content of corporate restructuring monopoly power vertical separation earlier in the vertical direction and horizontally. Second, reform of the owner is converting the 100% power state owned companies to the multi-owner companies.

2.2. ELECTRICITY MARKET ORGANIZATION MODELS

Classified according to the criteria of the competition model can analyze the current market organizations into four categories as follows: monopoly electricity market model; single buyers market, competition in electricity generation model; competitive wholesale electricity market model; competitive retail electricity market model.

The thesis introduces the concept of wholesale electricity market competition is the purchase of electric power from manufacturers and sell to resellers to sell power back to the electricity consumers in the end, along with the ancillary services to ensure stability and power quality in the transmission process.

2.3. STRUCTURE AND MECHANISM OF OPERATION OF COMPETITIVE WHOLESALE ELECTRICITY MARKET

2.3.1. Structure of competitive wholesale electricity market

The units involved in the competitive wholesale electricity market, including:

- System Operation, Management Operation;

- The remaining group of units including: power generation units, power transmission units, power distribution units, electricity wholesale brokerage units and power consumers.

2.3.2. The forms of the competitive wholesale electricity market

2.3.2.1. Wholesale electricity market

Worldwide there are now over 150 countries operate the electricity market, electricity market in every country has its different characteristics and peculiarities. However, the basic principle according to market time can be divided into two main categories as follows: Gross Pool Electricity Markets and bilateral contracts market.

Gross Pool Electricity Markets: In the Gross Pool Electricity Markets, all power according to the power generating units are required to be traded, through market purchases. On the basis of the calculation of the bid generator unit, centralized electricity market model fall into two categories: Price Base Pool and Cost Base Pool.

In the Price Base Pool: Generator units free to make offers within the ceiling price of the market with the desire to offset the total cost and maximum profit generator. The PBP mechanism is believed to economic efficiency because electricity prices in the market reflect the close relationship of supply and demand in the system.

In the Cost Base Pool: offering price of the unit generators are limited in the scope of the variable costs, market prices will not be raised too high. As a result, many generators will not be able to recover all fixed costs. Therefore, this model is usually applied capacity payment mechanism to help recover the full investment costs and fixed operation. CBP market is considered most appropriate for developing countries where the power sector is not highly developed infrastructure, high electricity demand growth rate, the system is always at a low level and move to new market

mechanism schools from traditional vertical integration model in the electricity sector.

The thesis also pointed out how the power purchase such as: contract for difference, bilateral power purchase contract in parallel with the electricity market model focused in competitive wholesale electricity market.

2.3.2.2. Ancillary services market

Auxiliary services necessary to survive in the wholesale electricity market to ensure stable power system operation, quality and effective [38]. There are five types of support services: Services adjust frequency; Reserve rotation; Provision launch; reactive power services; Services black start.

2.3.3. Electricity prices in the wholesale electricity market

In competitive wholesale electricity market will be priced to sell electricity to the stage, including: Price generators; transmission prices; distribution and retail prices of electricity and ancillary services prices.

2.4. ELECTRICITY MARKET DEVELOPMENT EXPERIENCE OF THE COUNTRIES IN THE WORLD

The thesis research experience in building and developing the electricity market of a number of countries around the world have been given the success of the reform process, such as the UK, Australia, New Zealand, Japan, USA, Argentina, Brazil , Philippines, Singapore, China, ... the construction and development of the electricity market model with experience in restructuring and building the electricity market.

Chapter 3

CURRENT STATUS OF VIETNAM'S ELECTRICITY MARKET AND NECESSITY OF CONSTRUCTION AND DEVELOPMENT OF VIETNAM WHOLESALE ELECTRICITY MARKET

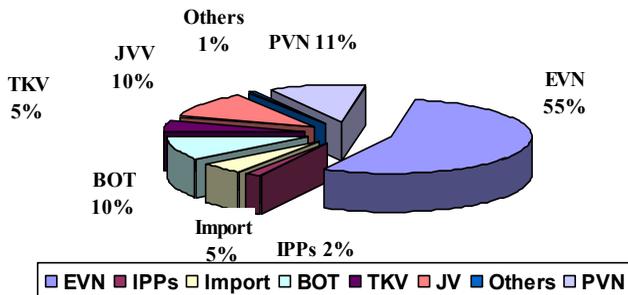
3.1. CURRENT STATUS OF VIETNAM'S ELECTRICITY MARKET

3.1.1. The formation of the Vietnamese electricity market

This thesis refers to the formation of the Vietnam's electricity market since the government set a target for power sector reform in 1995, through the stages of development, along with the results of research and development, construction electromagnetic fields of Vietnam, July 2012, Vietnam's competitive generation electricity market was officially put into operation. In addition, the thesis analysis detailed of the stages of the business process power of Vietnam today.

3.1.2. Supply and demand of Vietnam's electricity market

Reserve system is the rate of approximately 25% of the total capacity of the entire system. In the period from 1996 to 2012, the basic power supply is rated to meet the needs of the Vietnam's power system.



Source: National Electricity Dispatch Centre

Figure 3.2. Vietnamese power structure by ownership in 2012

3.1.3. Purchase and sale of electric in Vietnam market

The thesis analyzed the mechanism of prices and electricity prices in the build Vietnam power market today including: purchase price of wholesale electricity from EVN through auction buyers only (10% yield) through concentrated market power and power purchase contracts bilateral (90% of the rest), EVN's wholesale internal electricity prices for the area's power corporation; price transmission between EVN and NPT; price of ancillary services; electricity to retail customers by the Prime Minister issued.

3.1.4. Technical infrastructure for the operation of the electricity market in Vietnam

Technical infrastructure for the operation of the electricity market in Vietnam include: electricity transmission system, distribution voltage of 6 KV to 500KV; Information Systems, control and metering systems and system management softwaremanagement and operation of the electricity market.

3.1.5. State management for Vietnam's electricity market

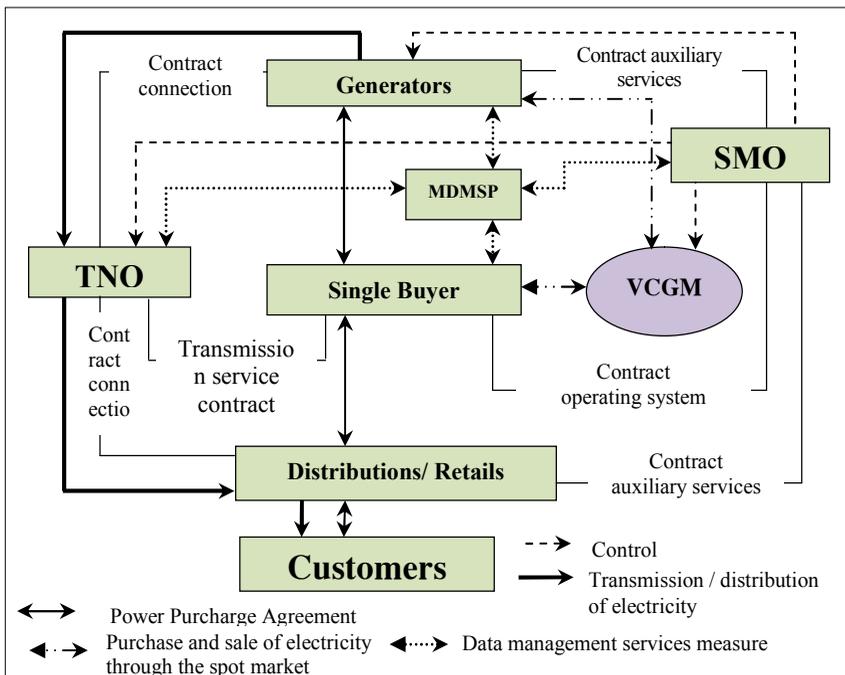
The State management for Vietnam's electricity market, including: the Prime Minister; Ministry of Industry and Trade; General Department of Energy; Electricity Regulatory Department; Ministries, ministerial-level agencies; People's Committees at all levels.

Regulating electricity activities of Vietnam's power sector include: building regulations, adjust the supply-demand relationship, the electricity activity permits, construction and retail tariffs implementing the policies on electricity prices, electricity price regulation framework, the wholesale price of electricity, approval of price transmission and distribution of electricity, ...

3.2. STRUCTURE, MECHANISM AND ACTUAL OPERATION OF VIETNAM'S COMPETITIVE GENERATION MARKET

Government has approved the design competitive electricity market in Vietnam and officially started operating from 01/7/2012. In the competitive electricity market Vietnam, entire power output of the power plant is sold to single buyer, the unit mobilization schedule was established based on the offer price of the variable costs. Power purchase price paid by the contract and the spot market price of each transaction cycle through contracts for different. Model of the competitive generation electricity market Vietnam as follows:

Figure 3.12. Vietnam's competitive generation electricity market structures



Percentage of power in contract prices paid for the market is set at 90% of total electricity generator, the rest is paid by the spot market prices. This rate will be gradually reduced over the next year

to increase competition in the electricity generation stage, but not lower than 60%. Going into the thesis analyzes the operation of specific mechanisms, including mechanism of power purchase contracts in the market operation mechanism of the electricity market spot exchange rate mechanism of the market price; supply mechanism ancillary services in the market; payment mechanism and market mechanism to mobilize hydroelectric multi-purpose strategy.

Competitive electricity market in Vietnam has been put into operation from the date of payment to 25/06/2012, the official date of 01/07/2012, there are 93 plants in the market, the total capacity of the entire system system is estimated at 23 493 MW. Information on 4 months of operation in the market from July 10/2012, the market is basically stable operation, the power plants are used to receive and exchange information as well as pricing strategy in the market , was initially more efficient power plant have increased profit from the bid plans from reasonable, cost-shifting ...

3.3. EVALUATION OF THE CURRENT'S STATUS OF VIETNAM'S ELECTRICITY MARKET

3.3.1. The achievements

First, the diversification of the economic sectors involved in manufacturing power business, make sure to provide enough electricity for socio-economic development of the country. Second, the development of power transmission system to ensure redress the lack of electricity, lack of local power. Third, the implementation of organizational restructuring in order to meet the development requirements of the power sector in Vietnam. Fourth, put into operation officially competitive generation electricity market.

3.3.2. Some problems

3.3.2.1. Regarding the organizational structure and business efficiency in power sector

The issue of reforming the organizational structure and operation of decentralized electricity industry remains slow. The rate of return on business capital of EVN average over the whole year is only about 4% - 6.5%/year, especially with a number of losses in the power business. Costs have not been clearly separated phases generator - transmission - distribution - retail.

3.3.2.2. Regarding electricity price

The relationship between the units in the phases of the purchase process as the situation electric power industry can now be evaluated as not to create transparency in the purchasing power stages, namely: the stage of buying wholesale power from EVN's power plant buying wholesale power from EVN, retail prices for electricity consumers, electricity problem in rural areas, mountainous and public interest in electricity activities.

3.3.2.3. Problems develop the transmission grid system

System transmission and distribution of electricity is focused on building and developing, but has not been synchronized with the progress of construction of the power supply and the growth of the load, did not meet the requirements set out.

3.3.2.4. The cause of the existence

First, many state management policies shortcomings. Second, the current organizational structure of EVN not create strong incentives to encourage businesses to improve business efficiency. Third, the current model does not create competition between firms within the EVN, between EVN and outside businesses. Fourth, determine the mechanism prevailing electricity prices are not based on power supply and demand relationship in the market. Fifth,

barriers to competitors outside the business involved is even greater power.

3.4. NECESSITY OF CONSTRUCTION AND DEVELOPMENT OF VIETNAM WHOLESALE ELECTRICITY MARKET COMPETITION

The thesis focused on analyzing the need to build and develop the wholesale electricity market competition issues including: economic diversity components engaged in electric power, investment demand to meet development power development, raise the quality and reduce the cost of power, link and integrate electrical systems of other countries, energy security and sustainable development of electricity.

Chapter 4

PROPOSED MODEL AND SOLUTION FOR BUILDING AND DEVELOPING VIETNAM WHOLESALE ELECTRICITY MARKET.

4.1. VIEWPOINT FOR CONSTRUCTION, DEVELOPMENT WHOLESALE ELECTRICITY MARKET COMPETITION VIETNAM

The thesis synthesized the predicted data from the Master Plan VII relating to supply, demand, energy, development planning transmission grid to meet the requirements of the electricity market. Assess the suitability of market conditions during the Vietnam's electricity wholesale competition.

Besides, the thesis driven synthesis of state building and development of Vietnam such as the Politburo's Conclusion have stated their intention to build Vietnam's electricity market over a period match; Electricity Law 2004 specified levels of market power,

and many research institutions at home and abroad for the construction and development of the electricity market in Vietnam.

The goal to build Vietnam's competitive wholesale electricity market include: Ensure balance between electricity supply and demand capacity, Reduce manufacturing costs power business, enhancing the responsibility of the manufacture and supply of electricity, enabling customers to use electricity, eliminating the monopoly the use of the transmission and distribution grid, creating an attractive environment for investment and development of socio-economic development of electric power, enhanced safety and stability of power supply and electrical service, reasonable use and efficient energy sources.

4.2. PROPOSED MODEL FOR WHOLESale ELECTRICITY MARKET COMPETITION IN VIETNAM

4.2.1. Formation of the members wholesale electricity market through competitive electricity industry restructuring Vietnam

4.2.1.1. The necessary restructuring of the electricity industry Vietnam

Restructuring is one of the preconditions required by the process of building and developing the electricity market in all countries. The restructuring must simultaneously achieve the following two: (i) first, address the existence of the current model are hindering the development of the power sector, (ii) long-term, to meet the stability requirements for wholesale electric market and develop the retail electricity market.

Requirements for development of wholesale electricity market competition.

- Separation owned stages generator, transmission, distribution and retail to remove conflicts of interest in power purchase;
- The power plant is under construction and owned by the State must be restructured to the number of units of electricity at a reasonable level, with equal competitiveness.
- Separating these functions provide exclusive service from the operation stage will compete.
- Sewing retail should be restructured to facilitate the equitization and retail competition in the later stages.

4.2.1.2. Objectives and principles of electricity industry restructuring Vietnam

The principle stages of restructuring the power sector during the wholesale electricity market competition in the following diagram:

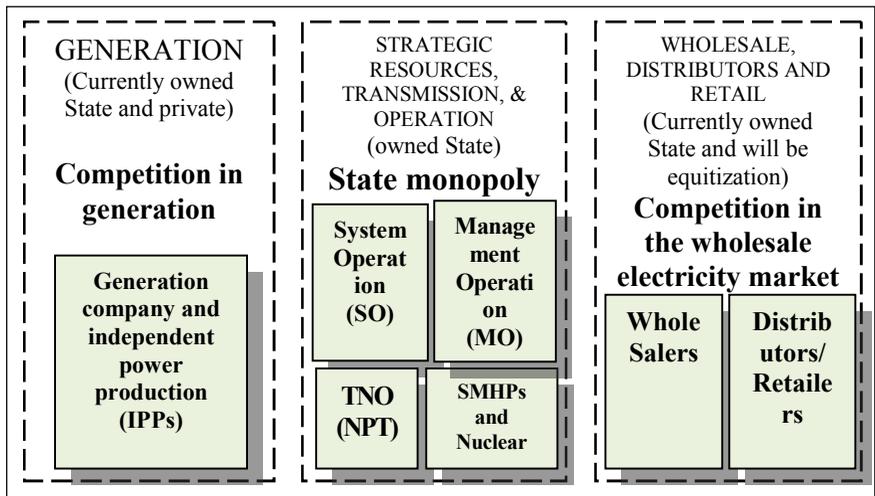


Figure 4.5. Principle diagram the stages of restructuring the power sector

The main objective of restructuring the electricity industry is to address the existence of electrical current models and meet the requirements for development of the electricity market in the future.

Specific objectives include: To promote competition, increase business efficiency, attract investment in power sector, to ensure stable power supply; Having industry structure consistent with market power model, capable of development to a higher level of market power.

4.2.1.3. The members of the wholesale electricity market competition Vietnam

For stage generator

For Vietnam's electricity market today, the units involved in the power stage has met the basic requirements to participate as models converted to competitive wholesale markets include: the corporations power, the power plant was shares, the investor's state and private foreign investors,...

However, to compare the size of the installed capacity of the generating units, that is expected that in 2015, if there is no electricity restructuring stage, EVN continues to account for 62.4%, the whether the company has split into independent generator but continued EVN holds 100% equity, with the proportion of market manipulation and EVN affect fair competition in the market is inevitable . So restructured electricity sector should be conducted.

Pinciples for restructuring the power sector and power plant group EVN owned or occupied by the stakes to form the generator unit is equivalent competitive electricity market participants to split into single an independent power, which does not have unit sizes too large, can afford market manipulation.

Scale power generation companies estimated that by 2015 are presented in the following table:

Table 4.5. Power generating units expected in 2015

No.	Generator	Capacity	Market share (%)
01	Strategy Genco	6.160	14,4%
02	Genco No.1	7.220	16,9%
03	Genco No.2	6.525	15,3%
04	Genco No.3	6.773	15,8%
05	PVN	5.222	12,2%
06	TKV	1.485	3,5%
07	SDC	414	1,0%
08	IPPs/BOTs	7.928	18,5%
09	Import	1.021	2,4%
	TOTAL	42.748	100%

Operating systems and operating transaction in electricity market: In the wholesale electricity market competition, to ensure power system operation and real-time electricity market requires the existence of the SO and MO. SO and MO activities in different functions, however, have a very close relationship with each other. Actual experience developing successful wholesale electricity market competitiveness of the country along with an analysis of the functions of the SO and MO show to grow up wholesale electricity market competition, Vietnam has market power missing units clue as intermediaries for the purchase and sale of electric power plant, PC and large consumers. In fact today A0 plays the role of SO and MO to ensure markets operate.

From the above analysis, applied to the condition of EVN, with the goal of transparency of the process stages of purchasing power, promote the development of the electricity market. The dissertation proposal is necessary to separate the functions and operation of the electricity market electricity system for wholesale electricity market in Vietnam, so to add new components involved

wholesale electricity market that is MO. SO and MO are two independent bodies should be operating under the Enterprise Law.

For transmission stages: key principles for building successful competitive electricity market to ensure fair and non-discriminatory right transmission grid penetration of all parties to purchase sale transactions on the electricity market. To achieve the above principles, the company needs to convey to the members independent power market. NPT will continue to operate as a Company Limited by the State holds 100% equity basis to be members holding power transmission market participants Vietnam competitive wholesale stage. Due to transmission companies operating characteristics of natural monopoly, regulatory agencies should be regulated electricity transmission charges, quality of service ...

For electricity trading companies and the formation of new wholesale units: when the new unit was established wholesalers, Power Purchase Company will be the unit is no longer normal wholesale monopoly position in the wholesale buying power. The new wholesale unit will be allowed to participate in the electricity market, competition to buy electricity from the generator unit and buy electricity on the competitive spot market for resale to distribution companies and large customers. The distribution companies can also participate in competitive electricity trading as a wholesale buying power unit. Therefore, the Power Purchase Company should be separated from EVN to ensure equal competition competitive electricity purchased from the PC to the unit purchase wholesale electricity markets established.

Distribution: The PC will compete with each other to buy and sell electricity to retail customers. To ensure fair competition the PC must have the financial capacity and scale equivalent. So, the PC will

form 2 blocks subsidiary is an independent accounting firms operate electricity distribution networks and retail trading company. Besides, with the diversification of the economic sectors involved in the electricity business, individuals and organizations can set up the PC only perform distribution function is involved buying and selling electricity on the market that are not owned electricity distribution networks. The PC is separated from EVN into independent units.

Retail: in the Vietnam's wholesale market competition, electricity retail level for the final consumer (possibly large customers and market participants are not all small customers) still exclusive, the power distribution company and a reseller of electricity remains the only power supply to customers in their respective localities.

4.2.2. Proposed model and operational mechanism of Vietnam's competitive wholesale electricity market

As theoretical analysis of the electricity market, particularly for models wholesale electric power market competition, the country experienced in Chapter I, as well as the electricity market situation today Vietnam is mentioned in Chapter II, along with building orientation and development of Vietnam's electricity market and the objectives to be achieved by the construction and development market. The thesis proposed overall structure of the transition from VGCM to VWEM as shown in Figure 3.6 below.

To determine the operating mechanism for Vietnam's competitive wholesale electricity market we have to assess the PBP and CBP models, analyze the advantages and disadvantages of each model in the specific conditions of Vietnam's power sector from it has been proposed to continue to apply the model selection CBP for Vietnam's competitive wholesale electricity market .

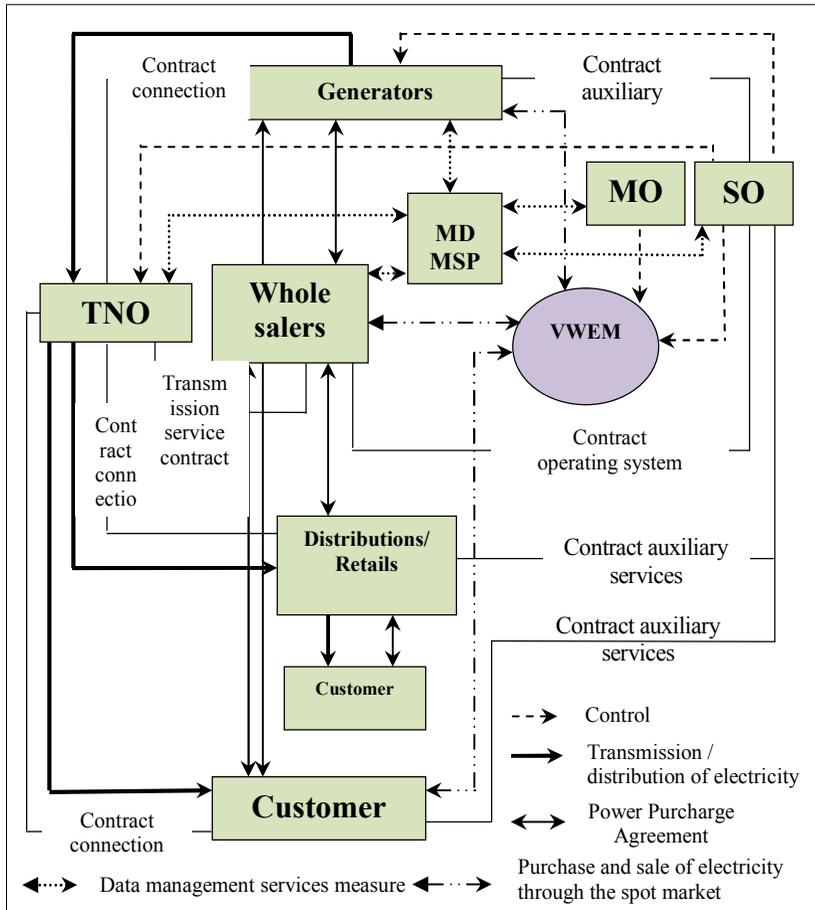


Figure 4.6. Structure of Vietnam's competitive wholesale electricity market and the contractual relationships in the market

Besides, the thesis raises the activity of wholesale electricity market in Vietnam with two competitive secondary market are: market power purchase contract bilaterally with many parties on the basis of purchasing power voluntary and binding properties to the system and spot market power of the parties to the purchase and sale of electricity on the electricity market equilibrium balance.

4.3. SOLUTIONS FOR CONSTRUCTION AND DEVELOPMENT VIETNAM'S COMPETITIVE WHOLESALE ELECTRICITY MARKET

4.3.1. Legal solutions and policies

4.3.1.1. *Attracting investment power development*

Continue to create a clear legal framework for attracting and creating favorable conditions for the economic sectors in the country and abroad to invest in the development of electric power; further research issued, amended regimes and policies on banking, finance, and taxes, issues of land use and natural resources, diversification of ownership, etc ... to create an attractive environment for foreign investors to participate electricity activities, policies are needed to build up the business units buying market, which is guaranteed wholesale electricity markets, conducting research and legal framework, the material and technical basis for the inter-our country's power grid with other countries in the region.

4.3.1.2. *Electricity prices*

Electricity pricing policy is designed to meet the interests of electricity consumers and the benefits of investing resources development, grid, even for small customers. At the same time improved pricing power on the note for the electricity price transparency, market prices adjust, offset cross phasing, electric two-component price, electricity price policy areas: border islands, rural, mountain, etc. ...

To promote the efficiency of competitive electricity markets need to reduce the level of state intervention in the market. The competitiveness of the market, the higher the intervention of the State to be more narrow. The thesis proposed a roadmap to reduce state intervention in the Vietnam's competitive electricity market

through each stage: competitive electricity market, wholesale electricity market competition; retail electricity market competition.

4.3.1.3. Legal documents regulate the wholesale electricity market competition

Need to develop and promulgate research and edited to suit the ability of the electricity market development for state documents related to the operation and management of connection and the national transmission grid in market conditions, including competition wholesale electricity: Principles and pricing method, the cost of electricity and phone service; measurement of electricity, billing, control voltage and frequency, mode and plan room in the electrical system, electrical testing, power monitoring and management of electricity demand, electricity safety; Regulatory electricity activities; specialized electrical inspections, handling administrative violations in the electrical activity and use of electricity; management activities of wholesale electricity market competition.

4.3.1.4. Support field operations in electricity

State should enact mechanisms to guide all activities separate nature from the public stage of power production activities, especially stage power supply to rural and mountainous areas. The public service should be secured state budget subsidies directly, either through the power company performing retail distribution or any organization or individual perform.

4.3.1.5. On the change to the power purchase agreement between the single buyer and the generator unit

The state should clearly define the problem of cost recovery to overcome when applying the payment capacity of the market transactions from time to time to ensure that the unit can power full

cost recovery investment in transition markets, ensuring balance and market stability.

4.3.2. On the technical infrastructure

The dissertation offers solutions related to technical infrastructure to ensure operational conditions for Vietnam's competitive wholesale markets include: The capacity of the power source of electricity capacity of the transmission grid distribution, automation systems, control and communications and information technology.

CONCLUSION

This thesis "*Construction and development of competitive wholesale electricity market in Vietnam*" has focused on solving the problems of theory and practice as well as specific solutions for the development of the competitive wholesale electricity market in Vietnam, as follows:

1. Characteristic analysis only in commodities, energy products as well as the important role of power in the economy and human life. Therefore, the majority of the world's electricity companies are organized in the model of a power company management and proprietary trading at all stages of production, transmission, distribution, power sector is considered industry a natural monopoly nature.

2. The thesis research promoting the development of the competitive electricity market model of the world as an inevitable trend to improve business efficiency of PC elevation and the best response of customer buying power. The thesis also going to consider the form of the organization of the electricity market on

each level depending on the characteristics of each country, such as: a buyers market model, the wholesale electricity market, the electricity market model retail; secondary market in electricity market models such as: spot market, bilateral power purchase contracts, power purchase contracts as differences, market support services in the market power. The experience of other countries is a valuable lesson in many ways for our country in building electricity market research in the future.

3. Analyze and assess the current status of Vietnam's power sector, the actual status of the sale of the electricity sector in Vietnam. Look at the legal basis for the formation and development of the electricity market in Vietnam and the Vietnam's electricity market development of the Government in the coming time.

4. Look at the rules, structure model, the relationship between the unit, the operating mechanism of the Vietnam's competitive generation electricity market. Assess the situation of generation competitive electricity market in Vietnam today with the pros, cons and reasons exist to be overcome to ensure the sustainability and market development.

5. Analysis the basic and development needs of competitive wholesale electricity market in Vietnam, at the same time make the classification and going into 06 target group analysis and principles for building and development successful competitive wholesale electricity market in Vietnam.

6. Provide structural models of competitive wholesale electricity market in Vietnam in the future, the relationship between the units in the market. At the same time, further analysis of the mechanism of operation of competitive wholesale electricity market in Vietnam.

7. By studying the development experience wholesale electricity market competitiveness of countries around the world, along with the fact the conditions, characteristics of the current Vietnam's electricity market. The thesis offers recommendations focus on the power sector in Vietnam as well as the policies of the State to ensure that the construction and development success VWEM prepared for tissue development retail electricity market competition, including 02 team -specific solutions are: policy and legal basis: investment policy development power, electricity pricing policy, contract holder converter purchasing power between the single buyer of electricity generation units and policies for the public sector in electricity activities , the role of state power units and state regulators for electricity activities and group solutions for infrastructure construction.