Assessment of Several Key Factors Influencing the Competitiveness of Vietnam Electricity Prices into the Trans-Pacific Partnership (TPP)

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Abstract: In recent years, the business investment environment has made improvements, competitiveness is improved and international organizations have recognized prestige, the business community appreciate, in which several ministries such as the Ministry of Finance, Planning and Investment, Agriculture and rural Development, Vietnam Electricity ... and some localities have actively implemented the testing organizations and supervising the implementation should be in this area of business investment environment improved both in score and rank. The objective of the resolutions made in the time to strive for environmental indicators of business achieved by the average minimum of 4 ASEAN groups; 2017 average level of ASEAN 4 groups on a number of indicators of competitiveness indicators indicating improve efficiency.

Goals by 2020, the business environment and competitiveness have averaged 3 of the ASEAN countries on a number of criteria with international practice. Prime Minister asked the ministers, chairmen of local focus on directing, operating flexibility and efficiency goals outlined in the Resolution; urgently complete the construction of legal documents on investment and business conditions. At the same time, review and repeal the business conditions are not suitable; formulation and promulgation of the decrees on business conditions.

Besides, Vietnam became a member of the World Trade Organization (WTO) and The Trans-Pacific Partnership (TPP). Vietnam's international trade grew rapidly, especially after Vietnam became a member of the World Trade Organization (WTO). Vietnam has trade goods and rapid growth, resulting in the development of some service sectors concerned. This paper conducted during the period from March 2014 to March 2016. Besides, the research results showed that there were 400 enterprises that interviewed and answered about 16 questions (but 377 samples processed). The researcher had analyzed Cronbach's Alpha test, the result of KMO analysis used for multiple regression analysis. The results showed that there were three factors, which included of factors following Fuels and Power plants (FP), Weather conditions and Transmission and distribution system (WT) and Regulations (RE) affecting the competitiveness of Vietnam electricity prices with significance level 5 %.

Keywords: The competitiveness, electricity, prices, TPP and Vietnam.

INTRODUCTION

In recent years, along with economic development, the country's society, the Party and State's special attention devoted to the field of developing the country's energy sector. According to the development strategy of national energy until 2020, vision 2050 of the Government's long-term objective is the energy sector to ensure national energy security, contribute to ensuring the maintenance of security, defense and economic development independence, sovereignty of the country; adequate supply of high quality energy for economic development - social; exploitation and rational use, resource efficient domestic energy; diversifying methods and business investment in the energy sector, formation and development of the energy market healthy competition; develop fast, efficient and sustainable energy sector coupled with environmental protection. Thus, with the motto "energy to go ahead," the energy sector to ensure adequate supply requirements of electricity, coal and other types of fuel, as a firm basis for industrialization chemical and modernization of the country.

Electricity is one of the important components of the energy sector in general, Vietnam's power sector in recent years has received the attention and close guidance of the Party's leadership, the State and the Government, to ensure develop common policy oriented towards the common goal of all the country's energy sector. Besides the objective of ensuring security of supply of electricity, providing enough power to operate the economic - political - social with good quality, safe, reliable, Vietnam's power sector also aims to promote developing competitive electricity markets.

In addition, in first years of the 21st century, the Party, the State and the Government have set out the policy and legal framework issued for the development of a competitive electricity market in Vietnam. Electricity Act passed by Congress in December 2004 has provisions on power development policy in Article 4, which states: " Construction and development of the electricity market in accordance with the principle of openness, equality, healthy competition, which are regulated by the State to improve the efficiency of electricity activity; ensuring the legitimate rights and interests of the electricity units and customers use electricity; attracting all economic sectors involved in power generation, electricity distribution and electricity wholesale and retail electric and specialized electricity consultancy. State monopoly in transmission activities, which the national electric system, the construction and operation of large power plants, have particularly important implications for economic - social, defense and security. From the above mentioned things, the author researched subject "ASSESSMENT OF SEVERAL KEY FACTORS INFLUENCING THE COMPETITIVENESS OF VIETNAM ELECTRICITY PRICES INTO THE TRANS-PACIFIC PARTNERSHIP (TPP)". It is a paper for the development of the competitiveness of Vietnam electricity industry in the future.
LITERATURE REVIEW

An electricity market is a system enabling purchases, through bids to buy; sales, through offers to sell; and short-term trades, generally in the form of financial or obligation swaps. Bids and offers use supply and demand principles to set the price. Long-term trades are contracts similar to power purchase agreements and generally considered private bilateral transactions between counterparties.

Wholesale transactions (bids and offers) in electricity are typically cleared and settled by the market operator or a special-purpose independent entity charged exclusively with that function. Market operators do not clear trades but often require knowledge of the trade in order to maintain generation and load balance. The commodities within an electric market generally consist of two types: power and energy. Power is the metered net electrical transfer rate at any given moment and is measured in megawatts (MW). Energy is electricity that flows through a metered point for a given period and is measured in megawatt-hours (MWh).

Markets for energy-related commodities trade net generation output for a number of intervals usually in increments of 5, 15 and 60 minutes. Markets for power-related commodities required and managed by (and paid for by) market operators to ensure reliability, are considered ancillary services and include such names as spinning reserve, non-spinning reserve, operating reserves, responsive reserve, regulation up, regulation down, and installed capacity.

In addition, for most major operators, there are markets for transmission congestion and electricity derivatives such as electricity futures and options, which are actively traded. These markets developed as a result of the restructuring of electric power systems around the world. This process has often gone on in parallel with the restructuring of natural gas markets.

A retail electricity market exists when end-use customers can choose their supplier from competing electricity retailers; one term used in the United States for this type of consumer choice is 'energy choice'. A separate issue for electricity markets is whether or not consumers face real-time pricing (prices based on the variable wholesale price) or a price that is set in some other way, such as average annual costs. In many markets, consumers do not pay based on the real-time price, and hence have no incentive to reduce demand at times of high (wholesale) prices or to shift their demand to other periods. Demand response may use pricing mechanisms or technical solutions to reduce peak demand.

Generally, electricity retail reform follows from electricity wholesale reform. However, it is possible to have a single electricity generation company and still have retail competition. If a wholesale price can be established at a node on the transmission grid and the electricity quantities at that node can be reconciled, competition for retail customers within the distribution system beyond the node is possible. In the German market, for example, large, vertically integrated utilities compete with one another for customers on a more or less open grid. Although market structures vary, there are some common functions that an electricity retailer has to be able to perform, or enter into a contract for, in order to compete effectively. Failure or incompetence in the execution of one or more of the following has led to some dramatic financial disasters:

- Billing
- Credit control
- Customer management via an efficient call center
- Distribution use-of-system contract
- Reconciliation agreement
- "Pool" or "spot market" purchase agreement

Hedge contracts - contracts for differences to manage "spot price" risk

The two main areas of weakness have been risk management and billing. In the USA in 2001, California's flawed regulation of retail competition led to the California electricity crisis and left incumbent retailers subject to high spot prices but without the ability to hedge against these (see Manifesto on The Californian Electricity Crisis). In the UK a retailer, Independent Energy, with a large customer base went bust when it could not collect the money due from customers.

Competitive retail needs open access to distribution and transmission wires. This in turn requires that prices must be set for both these services. They must also provide appropriate returns to the owners of the wires and encourage efficient location of power plants. There are two types of fees, the access fee and the regular fee. The access fee covers the cost of having and accessing the network of wires available, or the right to use the existing transmission and distribution network. The regular fee reflects the marginal cost of transferring electricity through the existing network of wires.

New technology is available and has been piloted by the US Department of Energy that may be better suited to real-time market pricing. A potential use of event-driven SOA could be a virtual electricity market where home clothes dryers can bid on the price of the electricity they use in a real-time market pricing system. The real-time market price and control system could turn home electricity customers into active participants in managing the power grid and their monthly utility bills. Customers can set limits on how much they would pay for electricity to run a clothes dryer, for example, and electricity providers willing to transmit power at that price would be alerted over the grid and could sell the electricity to the dryer.

METHODS OF RESEARCH

This study used of quantitative research methods to survey enterprises in selected the enterprises in Ho Chi Minh City. The results obtained from quantitative research processed by SPSS statistical software version 20.0.

Quantitative research is the collection of numerical data and exhibiting the view of relationship between theory and research as deductive, a predilection for natural science approach, and as having an objectivist conception of social reality. Therefore, this specific form of research uses the quantitative data to analysis. In addition, preliminary investigations, formal research is done by using quantitative methods questionnaire survey of 400 the enterprises in Ho.
Chi Minh City that interviewed and answered about 16 questions. The reason tested measurement models, model and test research hypotheses.

Reliability test: Bryman and Cramer (1990) suggested that, it is just fine when Cronbach’s alpha is 0.8 or above 0.8, while Nunnally (1978) stated that it is still acceptable with the value of 0.6, especially for initial investigation like in this research. Therefore, in this research, the value is confirmed when it is greater than 0.7.

Data collected were tested by the reliability index excluding variables with correlation coefficients lower < 0.30 and variable coefficient Cronbach’s alpha < 0.60), factor analysis explored remove the variable low load factor < 0.50. The hypothesis was tested through multiple regression analysis with linear Enter method.

RESEARCH RESULTS

Table 1: Cronbach's Alpha test for the competiveness of Vietnam electricity prices

<table>
<thead>
<tr>
<th>1. Fuels and Power plants (FP)</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>FP1: Fuel costs can vary based on the per unit cost, such as dollars per ton for coal</td>
<td>3.97</td>
<td>.956</td>
</tr>
<tr>
<td>FP2: Fuel costs can vary based on thousand cubic feet for natural gas</td>
<td>3.43</td>
<td>1.094</td>
</tr>
<tr>
<td>FP3: Fuel costs can vary based on the relative cost, in dollars per million British thermal unit equivalent</td>
<td>3.63</td>
<td>1.313</td>
</tr>
<tr>
<td>FP4: Fuel costs can vary based on electricity generators with relatively high fuel costs tend to be used most during periods of high demand</td>
<td>3.36</td>
<td>1.378</td>
</tr>
<tr>
<td>FP5: Fuel costs can vary based on each power plant has construction, maintenance, and operating costs</td>
<td>3.21</td>
<td>1.081</td>
</tr>
</tbody>
</table>

Cronbach’s Alpha: 0.915

<table>
<thead>
<tr>
<th>2. Weather conditions and Transmission and distribution system (WT)</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>WT1: Rain and snow can provide water for low-cost hydropower generation</td>
<td>3.34</td>
<td>1.073</td>
</tr>
<tr>
<td>WT2: Extreme temperatures can increase the demand for electricity, especially for cooling</td>
<td>3.38</td>
<td>.999</td>
</tr>
<tr>
<td>WT3: Severe weather can also damage power lines and add costs to maintain the electricity grid</td>
<td>3.22</td>
<td>1.071</td>
</tr>
<tr>
<td>WT4: Maintaining and using the transmission system to deliver electricity contributes to the cost of electricity</td>
<td>3.24</td>
<td>.971</td>
</tr>
</tbody>
</table>

Cronbach’s Alpha: 0.933

<table>
<thead>
<tr>
<th>3. Regulations (RE)</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>RE1: Prices are fully regulated by Public Service Commissions</td>
<td>3.10</td>
<td>.862</td>
</tr>
<tr>
<td>RE2: While in other states there is a combination of unregulated prices for generators</td>
<td>3.14</td>
<td>.879</td>
</tr>
<tr>
<td>RE3: Regulated prices for transmission and distribution</td>
<td>3.23</td>
<td>.814</td>
</tr>
</tbody>
</table>

Cronbach’s Alpha: 0.865

<table>
<thead>
<tr>
<th>4. The competitiveness of electricity prices (CP)</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>CP1: Changes in prices generally reflect variations in electricity demand, availability of different generation sources, fuel costs, and power plant availability</td>
<td>3.33</td>
<td>.706</td>
</tr>
<tr>
<td>CP2: Prices are usually highest in the summer when total demand is high and more expensive generation is added to meet the increased demand</td>
<td>3.25</td>
<td>.801</td>
</tr>
<tr>
<td>CP3: Electricity prices are usually highest for residential and commercial consumers because it costs more to distribute electricity to them.</td>
<td>3.48</td>
<td>.841</td>
</tr>
</tbody>
</table>

Cronbach’s Alpha: 0.810

(Source: The researcher’s collecting data and SPSS)

Table 2 showed that there are 16 items and also there were 400 enterprises interviewed but 377 samples processed. All of variables surveyed Corrected Item-Total Correlation greater than 0.3 and Cronbach’s Alpha if Item deleted greater than 0.6 and Cronbach’s Alpha is very reliability. Such observations make it eligible for the survey variables after testing scale. This showed that data was suitable and reliability for researching.

Table 2: KMO and Bartlett's Test the for the competiveness of Vietnam electricity prices

<table>
<thead>
<tr>
<th>KMO and Bartlett's Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kaiser-Meyer-Olkin Measure of Sampling Adequacy:</td>
</tr>
<tr>
<td>Bartlett's Test of Sphericity</td>
</tr>
</tbody>
</table>
Table 2 showed that Kaiser-Meyer-Olkin Measure of Sampling Adequacy was statistically significant and high data reliability (KMO = 0.583 > 0.5). This result is very good for data analysis. Table 2 showed that Cumulative percentage was statistically significant and high data reliability is 79.748 % (> 60 percentage).

Table 3: Structure Matrix for factors of the competiveness of Vietnam electricity prices

Table 4: Regression factors affecting the competiveness of Vietnam electricity prices

ANOVA^a^b:

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression</td>
<td>225.215</td>
<td>3</td>
<td>75.072</td>
<td>185.706</td>
<td>.000</td>
</tr>
<tr>
<td>Residual</td>
<td>150.785</td>
<td>373</td>
<td>404</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>376.000</td>
<td>376</td>
<td>1.296</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Coefficients^c^:

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
<th>Collinearity Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
<td></td>
<td>Tolerance</td>
</tr>
<tr>
<td>(Constant)</td>
<td>4.426E-017</td>
<td>.033</td>
<td>.000</td>
<td>1.000</td>
<td>1.000</td>
</tr>
<tr>
<td>X1</td>
<td>.674</td>
<td>.033</td>
<td>.674</td>
<td>20.440</td>
<td>.000</td>
</tr>
<tr>
<td>X2</td>
<td>.163</td>
<td>.036</td>
<td>.163</td>
<td>4.508</td>
<td>.000</td>
</tr>
<tr>
<td>X3</td>
<td>.212</td>
<td>.036</td>
<td>.212</td>
<td>5.839</td>
<td>.000</td>
</tr>
</tbody>
</table>
Table 4 showed that Adjusted R Square was statistically significant and high data reliability. In addition, Adjusted R Square reached 59.6%. Results showed that all t value > 2 (Sig < 0.00) was statistically significant and high data reliability. Besides, the regression coefficients were positive. This means that the effects of independent variables in the same direction with the competitiveness of Vietnam electricity prices.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

This paper conducted during the period from March 2014 to March 2016. Besides, the research results showed that there were 400 enterprises that interviewed and answered about 16 questions (but 377 samples processed). The researcher had analyzed Cronbach’s Alpha test, the result of KMO analysis used for multiple regression analysis. The results showed that there were three factors, which included of factors following Fuels and Power plants (FP), Weather conditions and Transmission and distribution system (WT) and Regulations (RE) affecting the competitiveness of Vietnam electricity prices with significance level 5%.

RECOMMENDATIONS

Recommendation 1: Fuels and Power plants:

The Vietnam should build the construction of the power sector strategy is essential and important, but it needs to determine whether the challenges, strategic goals of 10-20 years is nothing new on this basis given the prize implement measures that achieve efficiency goals. The fact Vietnam is facing many challenges as the demand for electricity for economic development in high growth of over 10%/year; lack of primary energy sources; large power systems but weak; environmental pressures for power sector development, especially with thermal coal. Another challenge is the fact that Vietnam is still a country with average income, while electricity resources for development are limited.

The Vietnam should build the objective of the competitive electricity market include: i) to ensure stable power supply; ii) attracting investment in the power generation industry; iii) To improve the competitiveness of the generator stages; and iv) To improve transparency in the activities of electricity generation, mobilization and pricing power generators. Competitive electricity market was built in the model of centralized bidding market under variable costs (Mandatory Gross Cost-Based Pool).

Recommendation 2: Weather conditions and Transmission and distribution system:

The Vietnam should base on practical achievements and challenges of the future needs to define strategic goals and specific objectives for the power sector. Accordingly, special attention to the problem: ensuring sufficient to meet demand for electricity safely, the quality of economic development - economic development of the country; development of the logical structure, ecological environment protection, climate change prevention; development of new energy sources, renewable energy; strengthening international cooperation.

The Vietnam should build all of the power plants with a capacity greater than 30 MW set required to market participants. The power plant will sell the entire power output of their ability to market development. The offer price of the power plant are determined based on the variable costs of each plant (including fuel costs, operation and maintenance costs change, startup costs ...). Unit only purchasing electricity (currently Power Trading Company EVN) will purchase the entire electricity market were offered and sold to the Electricity Corporation to provide customers use electricity. The mobilization of the power plant will be based on the offering price, offering output and load demand power system each trading hours, and is performed centrally by operating the system unit power - the electricity market (it is the Centre National electricity system EVN).

Recommendation 3: Regulations:

The Vietnam should improve the organizational solutions, mechanisms, investment, finance, markets, improve labor productivity... is one of the important measures is to improve the efficiency of the use Its power to generate economic benefits - society in all fields such as electricity in the building, electrical manufacturing industry, agriculture, power consumption.

The Vietnam should agree to the view that the power industry one step ahead, to fully meet the economic development - social, people's daily life. Besides need to mobilize all social resources in developing the power
system, but the state retains management rights transfer system.

The Vietnam should build market electricity prices are determined on the principle of the system marginal price, depending on the degree of balance between supply and demand - the market in every hour of trading. Market power prices are uniform across the country, and are used to pay for all of the power plant is mobilized, based on the actual measured output of the plant. The success of competitive electricity markets showed the correctness of the strategy developed by the Party energy market, the State and the Government has set out. In the coming years, to competitive electricity markets operate more efficiently, require flexible measures to deal with the outstanding issues in the technical provision of the organizational structure as industries.

Recommendations for the future Research:

The above-mentioned things, the future research should survey more than 400 enterprises related the competitiveness of Vietnam electricity prices. This will help to collect the data that is more significant. Moreover, the future research should survey more 16 items (questions) that affecting the competitiveness of Vietnam electricity prices in Vietnam.

REFERENCES