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## **Vietnam's National Energy Development Strategy to 2030 and Outlook to 2045**

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**Abstract:**

**Purpose:** *The article evaluates Vietnam's Energy Development Strategy to 2030 and vision to 2045, according to Vietnam Credit, 2019 and Base on Ref. 55-NQ/TW Resolution of the politburo On Orientations of the Viet Nam's National Energy Development Strategy to 2030 and outlook to 2045. Viet Nam 's Energy company need to reset up the strategy and review long term plan to adapt resolution No 55-NQ/TW.*

**Approach/Methodology/Design:** *This study conducted a systematic review of various documents and secondary data from various sources.*

**Findings:** *the paper shows that it is vital to balance the energy supply-demand in terms of oil and gas, coal, renewable energy, and other energy sources. The gap between the supply and demand is the framework to setup strategy.*

**Practical Implications:** *The result of the paper is towards an overview formulate and implement the Vietnam power sector development strategy for the new period. Enable the rapid and sustainable development of power sources, with well-designed structure and allocation, to ensure safety, reliability, stability towards diversification, an increased active power factor, and proper power reserve; and to meet the requirements for the protection of the ecological environment.*

**Keywords:** *Development strategy, energy, energy development strategy.*

**JEL codes:** *L27, L78, K23.*

**Paper Type:** *Research Paper.*

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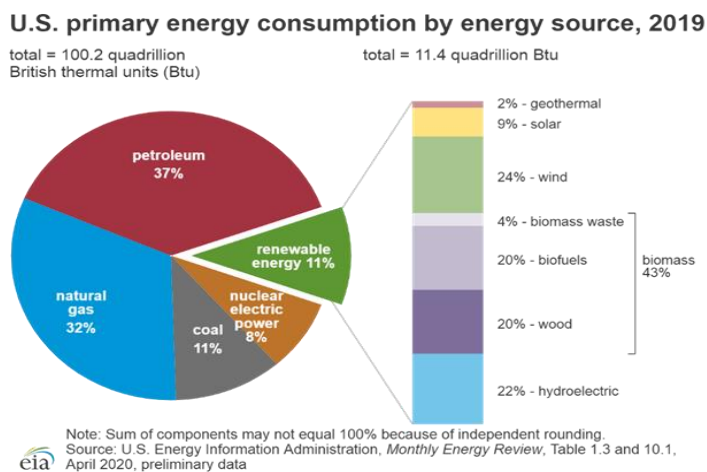
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## 1. Introduction

Countries around the world are almost acutely aware of the new challenges facing in the next two decades as the energy source reaching that end is depletion and climate change. Another way, the world economy has experienced a marked slowdown during 2018 and 2019 (Repsol, 2019). Although in 2018 as a whole global expansion was 3.6%, the year began at 4% and fall to 3.2% in the second half. During 2019, activity has continued to weaken, with growth standing at around 2.9%, the slowest pace since the international financial crisis. The economic slowdown is due to the confluence of several factors that have fed back into each other: a) the escalation of trade tensions between the United States and China, which put pressure on their bilateral trade, hurt confidence and raised uncertainty at the global level, slowing down investment decisions and, with it, international trade; b) a sharp slowdown in automobile production and sales (a sector that accounts for 5.7% of world output), c) Covid 19 pandemic crisis, many country lockdown and stop operating factory lead to low demand energy.

To address this issue, countries around the world have enacted a series of special policies to develop energy development strategies to cope with changes in external energy production and consumption. The US energy development strategy (VNEEP, n.d.) aims to develop green economy, implement energy saving policy, reduce environmental pollution and implement renewable energy policy. The US government has invested US \$ 150 billion to implement the "green economy" policy for 10 years, aiming to revive the economy, promote economic development and create 5 million new jobs.

**Figure 1.** US. Primary energy consumption by energy sources, 2019

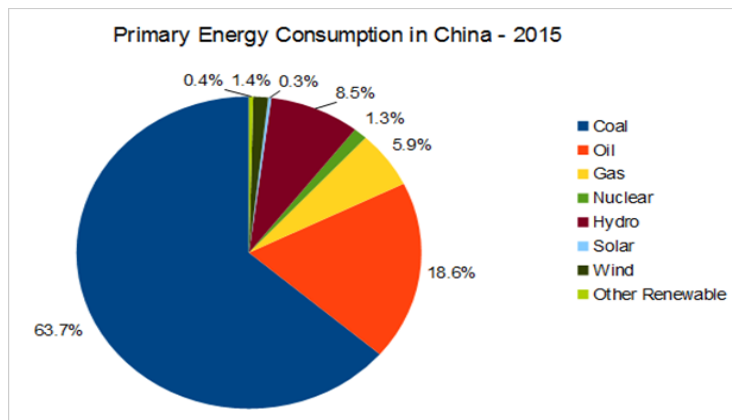


Source: EIA, 2020.

China has also launched its Energy Development Strategy in the direction of "green special economic zones" (VNEEP, n.d.) (EIA, n.d.) (Wu and Li, 1995) (Linwei Ma *et al.*, 2019) in order to create strong and innovative breakthroughs in the campaign to conserve resources energy and ecological environment protection. China's energy development strategy is designed for specific types of energy - oil, coal, natural gas, hydropower and nuclear energy - while regional strategies are determined by the location of the energies.

The purposes, objectives and technology pathways for alternative energy development are well discussed with the aim of reaching sustainable energy development in China. Special attention has been paid to alternative power and alternative vehicle fuels. Instead of limiting alternative energy to energy sources such as nuclear and renewable energy, the scope of discussion is extended to alternative technologies such as coal power with carbon capture and sequestration (CCS), electric and hydrogen vehicles.

**Figure 2.** Primary Energy Consumption in China -2015



**Source:** Linwei Ma *et al.*, 2019.

Korea's energy development strategy also followed the trend of "green growth strategy" (VNEEP, n.d.) with \$ 38 billion for CO<sub>2</sub> reduction and greening of nine key industries, whereby energy efficiency and environmental friendliness are becoming key factors to enhance competitive advantage, which involves shifting industrial structure and building new growth engines designed to create an export platform, Reducing the level of carbon emissions from industrial policy initiatives. The Korean initiative dates from 2008, when the current President Lee Myung-bak, committed his government to a green growth strategy in a speech celebrating the 60th anniversary of the founding of the Korean Republic.

Germany is the country that built the first "green energy" economic strategy in the world. Accordingly, the country is making great efforts to become the first industrial power in the world to use 100% renewable green energy and towards a "green target"

by 2050. The German Ministry of Environment The new Roadmap is published, outlining the process of implementing plans toward an entirely renewable energy economy. In 2008, renewable energy accounted for 7% of Germany's total energy consumption. But the number is expected to rise to 33% by 2020 as the country quickly surpasses other European nations in developing renewable energy (VNEEP, n.d.) (IEA, 2020). The German government initially planned to further increase the share of renewables in electricity to 50% by 2030, 65% by 2040 and 80% by 2050. But according to the new coalition agreement of March 2018, as affirmed by the climate cabinet, the government is now planning to speed up the growth, to reach a share of 65% renewable electricity by 2030 (contingent on a corresponding expansion in grid capacity). In addition, to be able to make strategy plans, by collect data from other companies as below:

**Table 1.** Data of some companies in the world

Company	Strategy plans
Repsol	- Downstream; Upstream; Eneergy transition
PTT Thai Land	- Downstream; Upstream; Eneergy transition; Digitalization
Petronas	- Downstrea; Upstream; Midstream gas; Midstream gas; Underwater Services

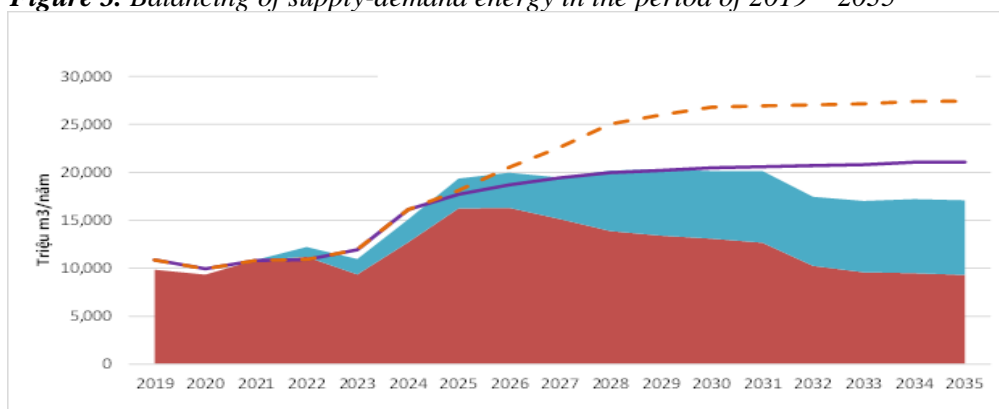
*Source:* Own study.

## 2. Balancing of Supply-Demand Energy in Vietnam

Energy demand in Viet Nam is expected to continue to grow significantly, driven by robust economic growth, industrialization, urbanization, and population growth. So that many research is expected that the energy demand in the coming years will keep increasing at a significant rate of 10 percent annually during 2016-2020 and by eight percent per annum during 2021-2030 (Shigeru Kimura and Han Phoumin, 2019).

According to the Vietnam energy outlook 2019 of the Ministry of Industry and Trade of Vietnam in collaboration with the Danish Energy Agency. In the future, Vietnam will lose its energy balance, domestic supply is not enough to meet demand and will have to depend on imported energy. The figure 3 and table 2 below shows the future energy supply and demand balance of Vietnam in general, and the balancing of supply-demand natural gas in particular.

- *Oil and gas:* Extend seeking and exploration activities to provide additional reserves and extraction volume in potential, deep and offshore areas in association with the mission of protecting the national maritime sovereignty; improve recovery coefficient and salvage coefficients for small fields and marginal remnants (Cruz *et al.*, 2000). Review and employ a proactive and efficient strategy on the cooperation in overseas oil and gas seeking, exploration and extraction. Develop the gas industry; give priority to investment in technical infrastructure for the importation and consumption of liquefied natural gases (LNG) (Rangnow and Govia, 2008).

**Figure 3.** Balancing of supply-demand energy in the period of 2019 – 2035

Source: Own study.

**Table 2.** Balancing of supply-demand Gas - Base case (Unit: billion m<sup>3</sup>)

From 2021-2025		From 2026-2035		Demand and Supply	
Supply	Demand	Supply	Demand	2021-2025	2026-2035
(1)	(2)	(3)	(4)	(5)=(2)-(1)	(6)=(4)-(3)
<b>60,67</b>	<b>62,80</b>	<b>135,93</b>	<b>166,13</b>	<b>-2,13</b>	<b>-30,2</b>

Source: PVN, 2020.

Continue to attract investment in oil refinery and petrochemicals in the direction of deep processing, improving the quality of petroleum products, proactively meeting domestic demand and towards export. For oil and shale gas, gas hydrates (flammable ice): proactively conduct more in-depth research and assessment of geology and deploy advanced science and technology to expand the exploration area; conduct a holistic assessment, and boost trial exploitation when conditions allow (Smith, 1985), (Dekker and Reid, 2014).

### 3. The Viet Nam's National Energy Development Strategy

#### 3.1 PVN's Strategies

- To provide sufficient energy to meet domestic energy demand and satisfy targets of the 10-year Socio-economic Development Strategy for 2021-2030, namely: the total primary energy supply to reach 175 – 195 million tons of oil equivalent (TOE) by 2030 and 320 – 350 million TOE by 2045; the total installed capacity of power sources to amount 125 - 130 GW and the power output to reach 550 - 600 billion kWh by 2030 (55.NQ-TW, 2020), (Clark, J. and Lamb, T, 1996)

- The share of renewable energy sources in the total primary energy supply reaches 15 - 20% in 2030 and 25 - 30% in 2045.

- Total final energy consumption reaches 105-115 million TOE by 2030 and 160-190 million TOE by 2045. The primary energy intensity is expected to be 420-460 kgOE/ USD 1,000 GDP by 2030 and 375-410 kgOE/ USD 1,000 GPD by 2045.

**Table 3.** Some specific objectives of the strategy

Some specific objectives of the strategy	Unit	In 2030	In 2045
Primary energy	Million TOE (tons of oil equivalent)	approx 175 - 195	approx 320 - 350
Total capacity of power sources	GW	approx 125 - 130	
Power output	Billion kWh	approx 550 - 600	
Rate of renewable energy sources in total primary energy supply	%	approx 15 - 20	approx 25 - 30
The final total energy consumption	Million TOE (tons of oil equivalent)	105 - 115	160 - 190
Primary energy intensity		420 - 460 kgOE/1.000 USD GDP	375 - 410 kgOE/1.000 USD GDP
The ratio of energy saving to total energy consumption in the end compared to the normal development scenario	%	7	14
Reduction of greenhouse gas emissions from energy activities compared to the normal development scenario	%	15	20
Power supply reliability		Top 4 leading countries ASEAN	
Electricity access indicator		Top 3 leading countries ASEAN	

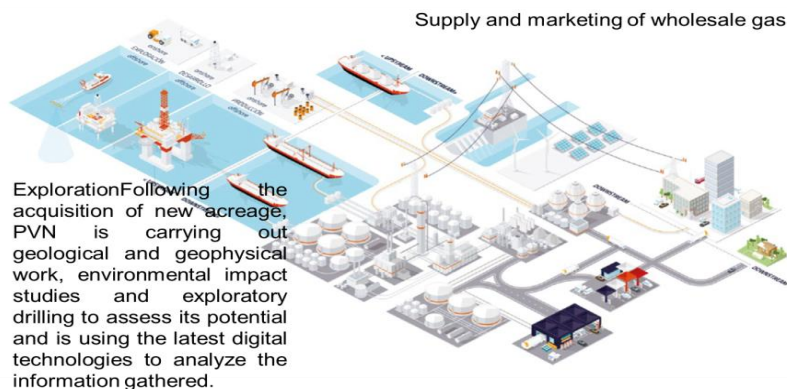
Source: 55.NQ-TW, 2020.

- Oil refinery plants to meet at the minimum 70% of the domestic demand; ensure strategic petroleum reserve equal to at the minimum 90 days of net oil import. Ensure the capacity to import 8 billion m<sup>3</sup> of LNG by 2030 and 15 billion m<sup>3</sup> by 2045.

- The energy-saving over the total final energy consumption against business as-usual (BAU) scenario to reach 7% by 2030 and up to 20% by 2045.

- To reduce greenhouse gases emission from energy activities against the BAU scenario by 15% by 2030 and 20% by 2045.

**Figure 4.** Supply and marketing of wholesale gas



- The Upstream business will prioritize creating value over production growth, focusing on the rotation and active management of its portfolio that offers high-quality barrels and cash generation

- The Downstream business will move towards decarbonization by promoting of projects associated with the energy transition, in addition to generating new opportunities to create value.

*Coal:* Develop a novel development strategy for the coal sector in agreement with the mission of efficient investment in overseas activities and coal imports in the long run. Ensure coal reservation to meet the requirements of production activities, particularly electricity generation. Extend seeking, exploration activities and improve the quality of the assessment on the levels of reserves and resources. Boost domestic coal extraction based on ensuring safety, efficiency and saving; urgently undertake technological research to enable the exploitation of the coal basin in the Red River delta improve the clean coal recovery coefficient in mining operation. Quickly implement the development of a system of large-scale ports, and coal storage facilities and transshipment stations; increase mechanization and modernization of coal screening, sorting and mining equipment's and machines.

*Renewable energy:* Formulate breakthrough mechanisms and policies to encourage and promote remarkable development of renewable energy sources towards maximal replacement of fossil energy sources. Prioritize the use of wind and solar power for electricity generation; promote investments in the development of power plants utilizing urban waste, solid waste and biomass in parallel with environmental protection and circular economy development.

*Other energy sources:* Promptly grasp relevant information for research and development under allowable conditions for scientific and technical advances, human resources, financial capabilities and other necessary factors.

### **3.2 New points of this Development Strategy**

Balancing method of supply-demand to know how much to setup for strategy

*Hydropower:* maximize the mobilization of the existing hydropower resources. Selectively develop additional small and medium-sized hydropower plants and pumped storage hydropower plants. Deploy a strategy for international cooperation in hydropower development associated with the long-term power imports.

*Wind and solar power:* Prioritize wind and solar power development while ensuring the safety of the national power system and reasonable price. Encourage rooftop and floating solar PV. Develop supporting policies and a breakthrough mechanism enabling offshore wind power development in association with the implementation of Vietnam's Marine Strategy.

*Thermal power:* Promoting thermal power projects with synchronized supply chain, fuel storage, and power plant construction on the basis of feed-in tariffs determined through auction. Develop gas-fired power plants in the direction of prioritizing the use of domestic gas sources. Focus on the rapid development of gas-fired power plant using LNG so that it gradually becomes an important power supply source supporting the regulation of national power system

Investing in the modernization of the power sector in the production, transmission, distribution phases to meet the development requirements of the power market with strong capability to integrate a large amount of renewable energy; improve the capability to ensure power system safety and the quality of power services. Proactively run demand-side management programs and demand response management programs; enable more closely management of power consumption intensity; minimize power losses; finalize supporting policies and mechanisms for encouraging and catalyzing power reserves.

Research and finalize financial regimes and mobilize special capital investments into the development of the power sector. Review and revise the existing regulations on regulating and coordinating the power market. Operate a mechanism that allows the development of localized and self-sufficient power plants within industrial parks and clusters, export processing zones.

Accelerate the competitive power market development roadmap, a mechanism for promoting direct power purchase agreements between producers and consumers, suitable bidding and auctioning mechanisms for energy generation, particularly within new and renewable energy investment projects; enable transparent Feed-in Tariffs. Provide a mechanism for promoting and attracting non-State investment in the national power transmission system. Operate an independent national power transmission system under the state management.

#### **4. Long-Term Energy Sector Outlook**



PVN should continue to make progress with the Digital Transformation, promoting business models and projects that break the mould in the energy sector, with a view to offering solutions and offering value to the entire value chain (Caldwell and Heather, 1989). In 2020, upstream will continue to work on projects that seek to reduce the profitability threshold, optimizing the development of assets, improving the efficiency of operations and guaranteeing safety. In the industrial areas, the aim will be to maximize the margin, improving integrated planning and programming, committing to operational excellence, reliability and operational safety. In the commercial businesses, digitalization projects seek to maximize the cash flow through integrated planning and operations, an analytical price strategy, workforce training, new business models and a customer-oriented approach.

Finally, the aim of corporate projects is to improve efficiency and employee satisfaction through robotic process automation (RPA), an improved user experience, Big Data and Advanced Analytics.

## 5. Conclusion

It can be said that Vietnam's Energy Development Strategy to 2030 with a vision to 2045, is very well-designed, scientific and practical. The spirit or content throughout the Resolution is to develop efficiency and sustainability of Vietnam's energy sector on the basis of competition and transparency.

In which need to focus on three main content:

+ To quickly build a synchronous, competitive and transparent energy market, diversify forms of ownership and business modes; Apply market prices to all types of energy.

+ Accelerating the roadmap for implementation of the competitive electricity market, the mechanism of direct power purchase and sale contracts between producers and consumers, the bidding mechanism, auction of appropriate power supply, especially in the projects of investment in renewable energy and new energies; transparent power purchase price

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