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VIETNAM ENERGY UPDATE REPORT 2020

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PREFACE

The Vietnam Energy Update Report 2020 is an annual report produced by the Sustainable Development Program of Centre for Media and Development Initiatives (MDI), Vietnam Union of Science and Technology Associations.

The report examines key features of the development of the energy sector in Vietnam from August 2019 to August 2020, with a focus on major power generation sources. 2020 marks a major turning point in the energy industry of Vietnam. Clean energy has strengthened its solid position and has established itself as a profitable sector with significant potential for development. While the gas-to-power sector has also been prioritised, coal-fired thermal power no longer holds the position as a favored energy source in Vietnam.

Once considered something of a side-show, clean energy - including solar and wind - is now making an increasingly important contribution to the national power system, and has become a priority in the country's energy development orientation.

Gas thermal power, especially imported liquefied natural gas (LNG), is also a sector with potential, with the construction of the first two gas import terminals underway. A series of large gas power plant projects are also being put forward by local and foreign developers.

Overall, new proposed policies by the ruling Communist Party and government to limit the development of coal-fired power, combined with opposition from various provincial governments and difficulties in project implementation mean the fossil-fuel based sector is unlikely to achieve anticipated growth rates.

In 2016, the revised National Power Development Plan for the period 2011-2020 with a vision to 2030 (revised Master Plan VII) set plans to increase the share of coal-fired power in the total national power output to 49.3% by 2020, to 55% by 2025 and 53.2% in 2030. The share of thermal power from natural gas and liquefied natural gas (LNG) was planned to account for less than 20% of the total power output by 2030. In particular, according to this plan, solar and wind power would only account for a small proportion of the total.

The MDI report pointed out that at least six provinces across the country have proposed to have coal-fired power projects cancelled due to concerns about environmental pollution. These include Quang Ninh - a major coal-producing region of Vietnam. Other provinces such as Bac Lieu, Long An, Thua Thien-Hue, Ha Tinh and Tien Giang plan to replace planned coal-fired power plants with projects using imported LNG.

Additionally, on February 11, 2020, the Politburo, the highest body of the Communist Party of Vietnam between its Central Committee meetings, officially gave a direction to reduce the proportion of coal power in a reasonable way (Resolution No. 55-NQ/TW on the orientation of Vietnam's national energy development strategy to 2030, with a vision to 2045). The policy aims to give priority to wind and solar energy over fossil fuels, including the implementation of new ground-breaking policy mechanisms.

According to the Vietnam Energy Institute, those guiding views will be concretized in the Power Plan VIII, which is being prepared for submission to the government for consideration in October 2020.

In fact, unlike in previous years, no new coal-fired power projects will be integrated into the plan. Instead, a series of large gas and wind power projects have been proposed by domestic and foreign investors to the authorities.

The path of sustainable development chosen by Vietnam is now clear and consistent. Furthermore, Vietnam has increased its nationally determined contribution (NDC) to join hands with the international community in efforts to reduce the impact of climate change. Paths not conducive to this development trend will be replaced by more sustainable options.

Authors of the Vietnam Energy Update Report 2020



“Over the past year, Vietnam has begun to mark itself out as a clean energy success story. Though there is some distance to go, its shift away from coal and rapid uptake of renewables make it one of the leaders in Southeast Asia, and an example to other nations looking to transition. And Vietnam has much to gain, not just in terms of a safer climate and cleaner air, but in jobs and investment. Around the world, renewables are proving to be the smarter, cheaper option and it is inspiring to see Vietnam beginning to seize the opportunity.



Laurence Tubiana

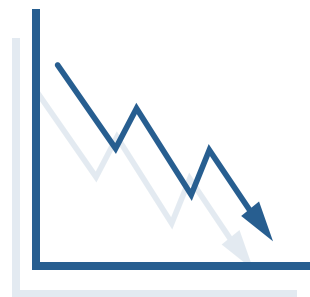
*CEO of the European Climate Foundation (ECF), former France's Climate Change Ambassador and Special Representative for COP21, and a key architect of the landmark Paris Agreement, **said in an exclusive statement** for the Vietnam Energy Update Report 2020 by the Sustainable Development Program of MDI Center.*

SUMMARY

International energy market overview

The COVID-19 pandemic caused global energy demand to **decline** in the first quarter of 2020, and this trend is expected to continue throughout 2020, according to the Global Energy Review 2020 by the International Energy Agency (IEA).

Renewable energy was the only source that posted growth in demand in the first quarter of 2020, while both coal and gas fell.



Vietnam

Coal-fired power

Coal-fired power has become the largest power generation source in Vietnam. A surge in domestic demand for coal has led to record-high imports in recent months.

However, coal-fired power projects in Vietnam continued to encounter difficulties in construction, competition from alternatives such as gas-fired power and renewable energy, and challenges to find sites for new projects.



Solar power

There has been a slowdown in solar development since June 30, 2019 - when incentives defined in Decision 11 expired, while new incentives seem less attractive. However, the sector is expected to achieve strong growth in the years to come thanks to the government's direction for development, preparation for auction policy for the new phase, the strong development of rooftop solar sector and the addition of a large number of new projects in the national power plan.

Activities of upgrading and building new power

transmission systems in order to unleash the production capacity of renewable power projects, including solar power plants, continue to be enhanced. Many solar power plants are proving to be operationally efficient, which has been demonstrated by the increase in their revenues and profits.

There have been some concerns about transfer of ownership of projects from local developers to foreign companies, but Vietnam's authorities have confirmed this is normal in the market-based economy.

Wind power

Vietnam's wind power has grown at a modest rate despite being affected by grid curtailments, which have also hampered the solar power sector.

Significant policy support by the government to promote wind power development has resulted in the addition of **nearly 7 GW** of wind power to the master plan in order to fill in the capacity gap caused by several delayed coal-fired power plants. Authorities are also considering extending the incentive period to facilitate construction of wind power projects and limit the impact of the COVID-19 pandemic on the sector.



Gas-fired power

Domestic gas output continued to decline while development of major gas projects has not made major progress.

Plans for LNG imports for power generation were being promoted with the first two import terminal projects being constructed in southern Vietnam.

New thermal power projects using imported LNG continued to be proposed, among which a 100% foreign-owned project has been licensed for investment and an existing power plant is being upgraded and expanded to use LNG as a fuel.



Essential updates on hydroelectricity and biomass power are also included in this report.

I. INTERNATIONAL ENERGY MARKET OVERVIEW

According to Global Energy Review 2020 [1] by International Energy Agency (IEA) released in April 2020, global energy demand fell by 3.8% in the first quarter of 2020 due to the impact of the COVID-19 pandemic. Impact of this pandemic on the global demand is forecasted to be seven times greater than that of the 2008 financial crisis.

In Q1 2020, global coal demand was hit the hardest, falling by 8% compared to the same period in 2019, mainly because of the demand decline in China and the plummeting price of gas and renewables.

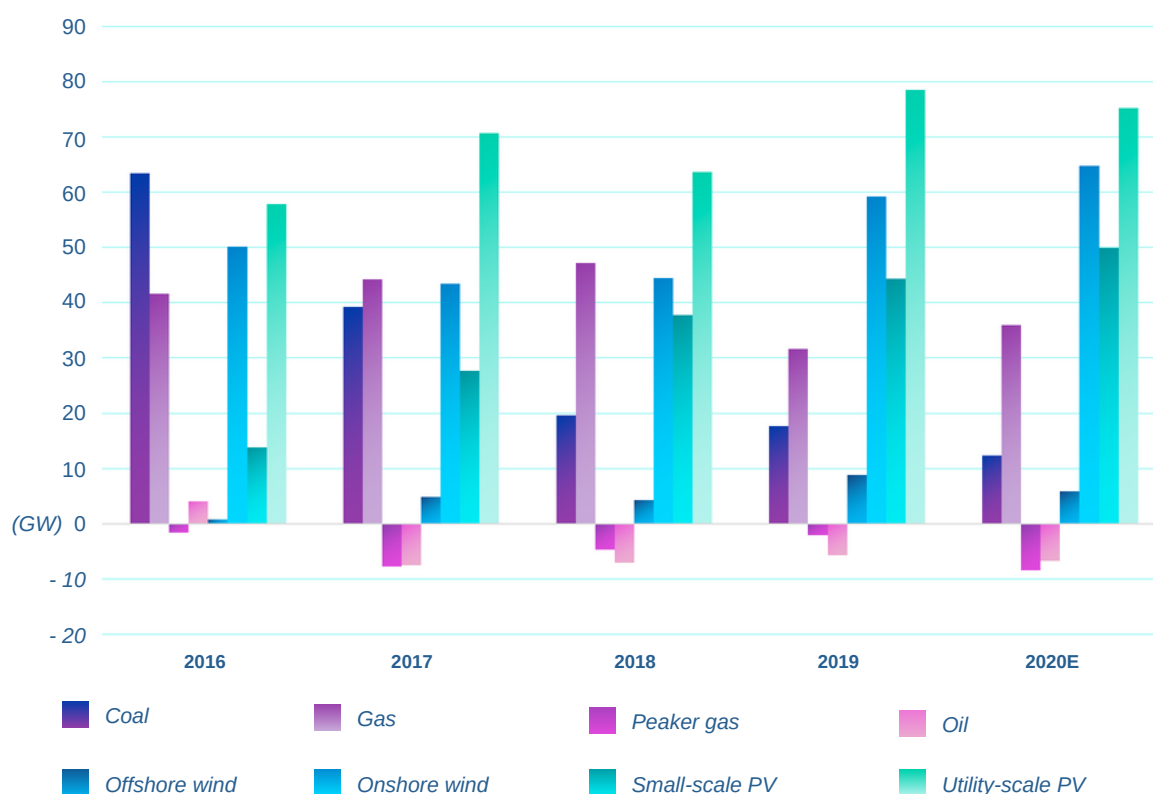
It is forecasted that global coal demand will decline by around 8% this year.

The impact of COVID-19 on gas demand was less striking, with a 2% decrease, as gas-based economies were not strongly affected by the pandemic in the first quarter. However, it is projected that the fall in global gas demand in the entire year of 2020 will far exceed that in Q1.

Renewable energy was the only source to enjoy demand growth in the first quarter of 2020, driven by larger installed capacity and priority dispatch in many countries. Forecasts indicate that global demand for renewables will continue to grow throughout 2020 thanks to lower operating costs and preferential access to many power systems around the world.

Graph 1. Cumulative Capacity Additions (2016-2020E)

Source: BNEF



Graph 2. Year-on-Year Cumulative Generation Change (GWh), 2016-2020E

Source: BNEF



II. VIETNAM ENERGY

1. Coal-fired power

1.1. Surging coal imports

In the context of declining gas and hydroelectric power outputs and low utilization of renewables, coal remains the main supply for national power generation. In the first half of 2020 [1], output of coal-fired generators reached 69.77 billion kWh, up 16.03% from the same period in 2019 and accounting for 58.4% of the country's total electricity production and imports. Consequently, this led to an increase in coal supplies from both domestic sources and imports.

Data from General Statistics Office [2] shows that in the first half of 2020 Vietnam produced about 25.3 million tons of coal, an increase of 4.9% from the same period of 2019.

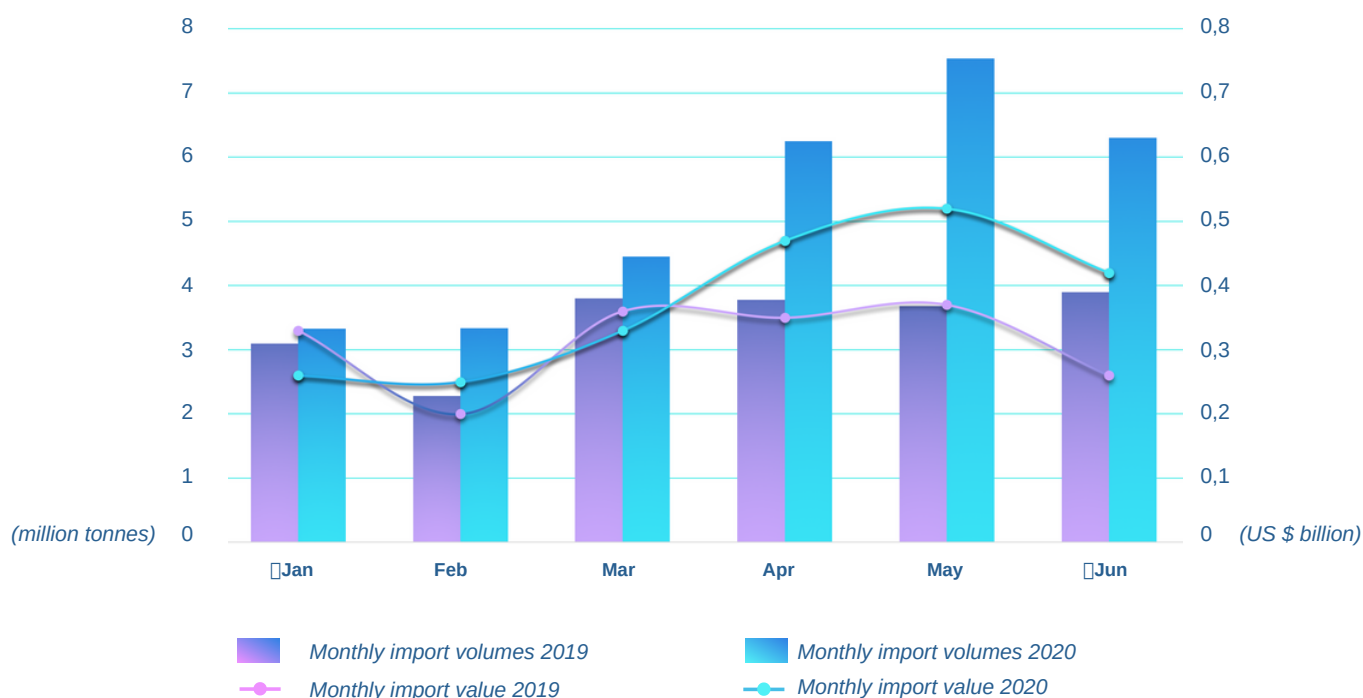
Of this, the country's largest coal miner Vietnam National Coal and Mineral Industries Holding Corporation Limited (Vinacomin) [3] produced 21.4

million tons, 2.2% higher than the same period of 2019. In the first half of 2020, 20.6 million out of 23.7 million tons of coal was sold to thermal power plants, up 11.4 % compared to the same period in 2019, accounting for nearly 87% of domestic sales volume of Vinacomin.

Rising demand from coal-fired power plants and limited availability of domestic coal supplies led to a sharp increase in coal imports. According to the General Department of Customs, in the first half of 2020 Vietnam imported 31.57 million tons of coal with an import value of US\$2.26 billion, up 15% and 53.8 % year-on-year, respectively. Major suppliers were Australia (10.83 million tons, surging 53.4% year on year), Indonesia (9.83 million tons, up 34.5%) and Russia (4.35 million tons, up 18.2%).

Chart 3. Vietnam's coal imports in the first half of 2019 and 2020

Source: General Department of Vietnam Customs



[1]<https://www.evn.com.vn/d6/news/Thong-cao-bao-chi-tinh-hinh-hoat-dong-6-thang-dau-nam-2020-va-muc-tieu-nhiem-vu-cong-tac-6-thang-cuoi-nam-2020-66-142-25976.aspx>

[2]<https://www.gso.gov.vn/default.aspx?tabid=621&ItemID=19651>

[3]<http://www.vinacomin.vn/tin-tuc-vinacomin/thang-62020-cac-chi-tieu-sxkd-cua-tkv-deu-dat-va-vuot-ke-hoach-202007021703202968.htm>

1.2. Challenges to coal-fired power projects

Under-construction projects:

While existing power plants were operating at full capacity, under-construction projects continued to face various challenges, including financing woes and contractor-related issues. Moreover, COVID-19 has caused delays to projects under construction.

Currently, eight power projects of Vietnam Oil and Gas Group (PetroVietnam - PVN) [1], one of the country's major power producers, were not likely to be completed on schedule as set in the revised National Power Development Plan for the 2011 - 2020 period, with a vision to 2030 (widely known as revised PDP 7). Three of which, namely Thai Binh 2, Long Phu 2 and Song Hau 1, are now 2 to 3 years behind schedule.

Construction of **1,200-MW Song Hau 1** [2] commenced in May 2015 and was expected to be operational by 2019. By the end of May 2020, the project has completed only 83.46% of total work, the remaining 16.54% means about 24 months behind schedule set in EPC contract. One of its challenging problems is financing. Currently, delays in adjusting price has affected progress of procurement, manufacturing, construction and installation, drying out financial resources for contractors to purchase equipment and to continue work. COVID-19 also hindered efforts to mobilize experts needed for installation and testing of systems in the main plant and subcomponents.

Nevertheless, Song Hau 1 is probably the most promising among PVN's struggling thermal power projects. On July 28 2020, its unit 1 began a trial to run by diesel fuel, an essential step for the plant to begin coal-fired operation in November 2020 and begin commercial operation in 2021.[3]

Construction of **1,200-MW Long Phu 1** [4] kicked off in April 1 2011. The biggest problems for the project are related to Russian contractor, Power Machines, including legal troubles and its failure to continue work at the project.

One year after being listed as one of Russian entities sanctioned by the United States, on January 28, 2019 Power Machines officially announced termination of EPC contract. It officially ceased all activities at the construction site on March 15, 2019 and recalled its construction director on March 29, 2019. Subsequently the contractor filed a lawsuit against PVN with the Singapore International Arbitration Center. Accordingly, Power Machines (1) considers U.S. sanction as a force majeure event, (2) alleges that PVN has not paid for the works performed by Power Machines and (3) asserts that it was baseless for PVN to withdraw the contract security interests. PVN has denied all complaints by Power Machines. Notably, PVN did not consider the U.S. sanction as a force majeure event.

Construction of **1,200-MW Thai Binh 2** [5] started on March 3, 2011. After years of delays, on April 17 2020, with permission from the government and Commission for the Management of State Capital at Enterprises, the Board of Members of PVN issued a resolution approving the use of equity to complete this project. As of early April 2020, accumulated disbursement value of Thai Binh 2 was over VND 33 trillion (about 80% of total investment value). Currently the investor is pushing procurement for materials, fuel and equipment, and mobilizing personnel for the test run and completion of this plant.

Challenges to thermal power projects, including coal-fired power plants, led to failure to realize several targets set out in the revised PDP 7. According to the National Steering Committee for Power Development, by 2025 and by 2030 Vietnam's coal-fired thermal power capacity will fall short of the targets 8,760 MW [6] and 6,340 MW, respectively. This is attributed to delays of under-construction projects and provincial governments' refusal of new coal-fired power projects.

[1]<https://www.vietnamplus.vn/pvn-co-8-du-an-dien-kho-hoan-thanh-tien-do-theo-quy-hoach-dien-vii/625651.vnp>

[2]<http://nangluongvietnam.vn/news/vn/dien-luc-viet-nam/nhiet-dien-song-hau-1-co-the-dot-lua-bang-dau-do-vao-thang-7-2020.html>

[3]<https://congthuong.vn/dot-lua-lo-hoi-to-may-so-1-du-an-nha-may-nhiet-dien-song-hau-1-141110.html>

[4]<https://vietnamnet.vn/vn/kinh-doanh/dau-tu/nhiet-dien-ty-do-co-nha-thau-bi-my-cam-van-pvn-trong-vong-xoay-moi-586858.html>

[5]<http://nangluongvietnam.vn/news/vn/dien-luc-viet-nam/du-an-nhiet-dien-thai-binh-2-co-the-hoan-thanh-trong-quy-2-2022.html>

[6]<https://www.vietnamplus.vn/cong-suat-cac-nha-may-dien-than-se-giam-con-8760-mw-vao-nam-2025/625206.vnp>

More provinces say no to new coal-fired power plants:

Finding sites and funding remained typical challenges faced by new coal-fired power projects in Vietnam.

The approval of large power projects included in the national power master plan falls under the authority of the prime minister. However, local governments in Vietnam also play a very important role in project development. Provincial and municipal leaders can propose to the Ministry of Industry and Trade (MoIT) and the central government to consider implementing some changes to the project compared to the planning, based on the actual situation in their localities.

In recent years, provinces such as Bac Lieu, Long An, Thua Thien - Hue, Tien Giang, Ha Tinh and Quang Ninh have refused to place new coal-fired power projects in their localities. Among those, many wish to replace coal-fired power projects with plants using LNG.

Citing environmental concerns, in 2016, Bac Lieu proposed to withdraw the 1,200-MW Cai Cung coal-fired power project from the revised PDP 7 and replace it with a gas-fired plant. On February 21, 2020, the People's Committee of **Bac Lieu** province granted an investment license for Delta Offshore Energy Pte. Ltd (DOE Singapore) to build the 3,200-MW Bac Lieu LNG-to-Power Plant project. [1]

Long An has proposed to the MoIT and the central government to replace two coal power plants, the 1,200-MW Long An 1 and 1,600-MW Long An 2, with LNG power [2]. On May 13, 2020, the MoIT agreed to work with the province to complete the proposal and submit to the prime minister for final approval.

Thua Thien- Hue and Banpu Company (Thailand) in March 2016 signed a memorandum of understanding on the construction of a 1,200-MW coal-fired power plant in Phong Dien district.[3] Banpu would go on with Phase 2 of the project, expanding capacity to 2,000 MW if the economic feasibility is proven. However, in 2019, Banpu proposed a switch of fuel from coal to gas, to

align with local development direction. The province's industrial development plan to 2020, with a vision to 2030, emphasizes "sustainable industrial development towards a green economy", stated Phan Thien Dinh, Vice Chairman of the People's Committee of Thua Thien Hue. As a result, coal-fired power projects were not included in the province's development plan.

In 2016, in **Tien Giang**, the Power Generation Corporation 3 (an affiliate of Vietnam Electricity Corporation - EVN) proposed to build the Tan Phuoc Power Center with capacity of 2,400 MW (expandable to 3,600 MW) running on imported seaborne coal [4]. But in September 2019, Doan Van Phuong, Director of Department of Industry and Trade of Tien Giang stated that the province only endorsed the use of LNG for the power center, for the sake of environment.

People's Committee of **Ha Tinh** targets to convert planned coal-fired power projects into LNG-based plants. This was stated in its Decision No. 164/KH-UBND dated May 8, 2020 on the action plan to implement Resolution No. 55-NQ/TW of the Politburo on the National Energy Development Strategy to 2030, with a vision to 2045.[5]

Quang Ninh, home to Vietnam's coal industry, would not opt to develop new thermal power plants, Nguyen Van Doc, the Secretary of the provincial party committee and Chairman of People's Council stated in 2018.[6] For existing plants, the province would strengthen supervision, inspection and impose heavy penalties on violations. The province would not allow the additional planning, feasibility research, or construction, of new thermal power projects.

In the light of difficulties in the development of new coal-fired power projects, especially due to opposition from several provinces, at the review conference of industry and trade on December 27, 2019 Tran Viet Ngai, Chairman of Vietnam Energy Association warned of energy shortages caused by delays of coal-fired power projects included in the revised PDP 7. Notably, Ngai suggested that the prime minister prohibit opposition to planned coal-fired power projects by southern provinces.

[1]<http://baobaclieu.vn/hoat-dong-lanh-dao/ubnd-tinh-bac-lieu-trao-quyet-dinh-chu-truong-dau-tu-va-giay-chung-nhan-dang-ky-dau-tu-cho-du-an-nha-may-dien-khi-hoa-long-63140.html>

[2]<https://www.moit.gov.vn/web/guest/tin-chi-tiet/-/chi-tiet/bo-truong-tran-tuan-anh-lam-viec-voi-lanh-%C4%91ao-tinh-long-an-19361-16.html>

[3]<http://nangluongvietnam.vn/news/vn/dien-luc-viet-nam/xin-chuyen-nghien-cuu-du-an-dien-than-o-phong-dien-sang-dien-khi.html>

[4]<https://www.thesaigontimes.vn/294388/nhiệt-dien-than-het-duong-phat-trien-o-mien-tay.html?sfns=mo>

[5][https://qppl.hatinh.gov.vn/vbpq_hatinh.nsf/4b438b320dbf1cda4725719a0012432c/07E497B0C220062E472585620030C076/\\$file/KH164.signed.pdf](https://qppl.hatinh.gov.vn/vbpq_hatinh.nsf/4b438b320dbf1cda4725719a0012432c/07E497B0C220062E472585620030C076/$file/KH164.signed.pdf)

[6]<http://baoquangninh.com.vn/tieu-diem/201810/quang-ninh-noi-khong-voi-nha-may-xi-mang-nhiệt-dien-2405203/>

[7]<https://dantri.com.vn/kinh-doanh/hiệp-hoi-nang-luong-kien-nghi-chi-dao-cac-tinh-khong-phan-doi-nhiệt-dien-than-20191227151752725.htm>

However, Prime Minister Nguyen Xuan Phuc said although he agreed to push forward under-construction power projects, the continuation of the development of new coal-fired power projects in Vietnam might face public opposition. Instead, new power projects should apply green models.

The PM's statement was praised by an alliance of organizations relevant to health protection,

environment, energy and legal rights. In a joint statement on December 31, 2019[1], they urged the government to suspend construction of 14 coal-fired power plants pending more comprehensive review and evaluation on financial feasibility as well as their impacts on health, environment, security and social order.

Table 1. Projects proposed to be suspended

Province	Power plant	Situation	Capacity (MW)
Long An	Long An 1 Long An 2	Opposed by city leaders	1200 1600
Quảng Ninh	Quảng Ninh 3 Cẩm Phả 3	Province plans to switch to clean energy	1200 400
Tiền Giang	Tân Phước 1 Tân Phước 2	Province leaders plans to switch to gas	1200 1200
Nghệ An	Quỳnh Lập 1 Quỳnh Lập 2	Opposed by local residents	1200 400
Bình Thuận	Vĩnh Tân 3	Opposed by local residents	1980
Hà Tĩnh	Vũng Áng 3	Opposed by local residents	1200
Sóc Trăng	Long Phú 1	Delayed for 8 years	1200
Sóc Trăng	Long Phú 2 Long Phú 3	Investors not identified	1320 1800
Bắc Giang	An Khánh	Opposed by local residents and communities	650
			Total 17.390

1.3. Orientation for development

Current development of coal-fired power still follows the revised PDP 7 signed by the prime minister in 2016.

For the next phase, on October 1, 2019 the prime minister approved the development of the National Power Development Plan for the 2021-2030 period, with a vision to 2045 (PDP 8) and assigned this to the MoIT. The first draft of the plan is expected to be submitted to the prime minister by October 2020 at the latest.[1]

PDP 8 will be developed in adherence to the Politburo's Resolution No. 55-NQ/TW dated February 11, 2020.[2] The resolution underscored “a roadmap for a reasonable reduction of coal share in power generation mix”. It also set out orientation of “developing coal-fired power at a reasonable level; prioritizing units of large capacity, high efficiency and advanced technologies such as ultra-supercritical (USC) technology and beyond; ensuring full compliance with laws and regulations on environmental protection in accordance with international standards; conducting a holistic review and promptly launching technological upgrade for existing coal-fired power plants to meet environmental protection requirements; resolutely decommissioning power plants that fail to upgrade technology as required”.

Restricting coal-fired power development constitutes one of the guidelines for developing PDP 8, claimed Deputy Minister of Industry and Trade Hoang Quoc Vuong in the 1st workshop on PDP 8 on July 8, 2020. [3]

According to Institute of Energy of Vietnam - the advisor for drafting PDP 8 - 18 GW of new coal-fired power running on both domestic and imported coal, will surely be developed during 2020-2025. The new plan is expected to terminate about **9.5 GW** of coal-fired power set in the revised PDP 7 and postpone another **7.6 GW** until after 2030. In addition, one of the six scenarios proposed for the plan suggested no new coal-fired power plant be built after 2030.

It is expected that in PDP 8, subcritical technology could only be allowed for plants using domestic coal which cannot be used for more advanced plants. Imported coal must meet standards for use in power plants of supercritical technology and beyond during 2021-2025, ultra-supercritical technology during 2025-2035 period, and advanced ultra-supercritical technology and beyond after 2035. Newly built and renovated coal-fired power plants must ensure application of advanced technology and equipment, increased flexibility, enhanced efficiency, and reduced emissions.

[1]<https://viettimes.vn/sau-dien-mat-troi-lai-xuat-hien-phong-trao-dien-gio-387765.html>

[2]<http://tulieuvankien.dangcongsan.vn/he-thong-van-ban/van-ban-cua-dang/ngphi-quyet-so-55-nqtw-ngay-11022020-cua-bo-chinh-tri-ve-dinh-huong-chien-luoc-phan-tien-nang-luong-quoc-gia-cua-viet-nam-den-6096>

[3]<http://tapchicongthuong.vn/bai-viet/trong-moi-tinh-huong-quy-hoach-dien-viii-phai-dam-bao-du-dien-73246.htm>

Table 2. Coal-fired power projects terminated

Province	Power plant	Capacity (MW)
Hải Phòng	Hải Phòng III	1200
Hà Tĩnh	Vũng Áng III	1200
Long An	Long An I & II	2800
Tiền Giang	Tân Phước I	1200
Sóc Trăng	Long Phú III	1800
Sóc Trăng	Long Phú III	1320
		Total 9.520

Table 3. Coal-fired power projects postponed until after 2030

Province	Power plant	Capacity (MW)
Quảng Ninh	Hải Hà	2100
Quảng Ninh	Quảng Ninh III	1200
Nghệ An	Quỳnh Lập I & II	2400
Quảng Trị	Quảng Trị	1200
Thanh Hoá	Công Thanh	600
		Total: 7.500

Table 4. Coal-fired power projects planned for 2021-2025

Anthracite coal			Imported coal		
Province	Power plant	Capacity (MW)	Province	Power plant	Capacity (MW)
Lạng Sơn	Na Dương II	110	Thanh Hóa	Nghi Sơn II	1200
Bắc Giang	An Khánh II	650	Hà Tĩnh	Vũng Áng II	1200
Thái Bình	Thái Bình 2	1200	Quảng Bình	Quảng Trạch I	1200
Hải Dương	Hải Dương	1200	Vân Phong	Khánh Hòa	1320
Nam Định	Nam Định I	1200	Vĩnh Tân III	Bình Thuận	1980
		Total: 4.360	Duyên Hải II	Trà Vinh	1200
			Sông Hậu I	Hậu Giang	1200
			Long Phú I	Sóc Trăng	1200
			Sông Hậu II	Hậu Giang	2000
					Total: 13.700

2. Solar power

2.1. Growth slowed due to delayed issuance of incentive policies

Solar power output in the first half of 2020 reached 4.71 billion kWh, 5.35 times higher than the same period in 2019 and accounted for 3.94% of the country's total electricity production and imports.

Solar power sector boomed when numerous projects began operation before June 30, 2019 to enjoy the favorable Feed-in-Tariff (FiT) rate of VND 2,086/kWh (equivalent to 9.35 US cents/kWh). However, the following one-year period witnessed a slowdown in growth. Decision No.11/2017/QĐ-TTg of the prime minister, effective until June 30, 2019, was a boost for investors to complete solar power projects ahead of time to enjoy the incentives. As of June 30, 2019 4,460 MW of solar power capacity was connected to the national grid.[1]

However in his speech before National Assembly on June 15, 2020, Minister of Industry and Trade Tran Tuan Anh stated that total solar power capacity in operation stood at about 5,000 MW.[2] That means just more than 500 MW of solar power was added in nearly a year after the expiry of Decision 11.

The slowdown was largely attributed to the delays in issuance of policies for solar power after June 30, 2019. Various drafts prepared by the MoIT failed to gain approval from the government. On June 4, 2020, nine months after Decision 11 expired, the government finally issued Decision No.13/2020/QĐ-TTg on mechanisms to promote development of solar power after June 30, 2019.[3]

Decision 13 took effect from May 22, 2020, applicable to grid-connected solar power projects, projects with

investment proposals approved before November 23, 2019, and those which began partial or entire commercial operation from July 1, 2019 to December 31 2020. For Ninh Thuan province, the tariff of VND 2,086/kWh (equivalent to 9.35 US cents/kWh) will be applied for the grid-connected solar power projects with a combined capacity up to 2,000 MW that are already included in the power development plan and started commercial operation before January 1, 2021.

The new FiT for all three groups of ground-mounted, rooftop and floating solar power projects are lower than those set in Decision 11 and draft policies proposed by the MoIT after June 30, 2019.

Accordingly, the FiT is VND 1,783/kWh (equivalent to 7.69 US cents/kWh) for floating systems; VND 1,644/kWh ((equivalent to 7.09 US cent/kWh) for ground-mounted systems, and VND 1,943 VND/kWh (equivalent to 8.38 US cents/kWh) for rooftop systems. Decision 13 also assigned the MoIT to develop a bidding mechanism for solar power projects, a roadmap for implementation before submitting to the prime minister for approval and implementation on nationwide scale.

In January 2020, the Ministry of Finance expressed concern that the FiTs in Decision 13 (drafted) were "lower than the ceiling rates regulated in the 2019 electricity price framework and existing average electricity retail rate of VND 1,864.44/kWh".[4] Such low rates, the Ministry of Finance said, could not serve as an advantage for solar power against other existing sources.

[1]<https://www.evn.com.vn/d6/news/Den-3062019-Tren-4460-MW-dien-mat-troi-da-hoa-luoi-6-12-23925.aspx>

[2]<https://baoxaydung.com.vn/bo-truong-cong-thuong-canh-bao-nguy-co-thieu-dien-tu-nam-2021-281924.html>

[3]http://vanban.chinhphu.vn/portal/page/portal/chinhphu/hethongvanban?class_id=1&_page=1&mode=detail&document_id=199694

[4]<https://vnexpress.net/bo-tai-chinh-ban-khoan-ve-chinh-sach-gia-dien-mat-troi-moi-4045210.html>

2.2. Growth of rooftop solar

While grid-connected power projects face a number of challenges, rooftop solar power generation has achieved rapid growth.

As of August 31, 2020, EVN has signed power purchase agreements with investors in over 50,000 rooftop solar power projects with a combined capacity of 1,200 MWp, which have been connected to the grid.[1] The capacity figure represented a two-fold capacity increase since just January 2020.[2]

Development of rooftop solar power generation currently enjoys incentives from the government. Under Decision 13, rooftop solar power projects receive a feed-in-tariff of VND 1,943/kWh (equivalent to 8.38 US cents/kWh) for 20 years and are not required to seek permission to be added to the national power plan.

Apart from policy incentives, the decline in installment cost per unit is a major driver for the boom in rooftop solar power projects.[3] The current average cost per 1 kWp has reduced significantly. For a 3-kWp project, the cost has now dropped to between VND 42 million and VND 54 million, from VND 90 million to VND 100 million a few years back.

Development of rooftop solar power generation has recently been encountering challenges that need to be addressed. In July and August 2020, EVN proposed the MoIT issue guidelines to show the difference between rooftop solar, agricultural farm-based solar, grid-connected and ground-mounted solar. [4]

Lam Xuan Tuan, Deputy General Director of EVN Southern Power Corporation said thousands of MW of rooftop power generation capacity will be added if the Ministry of Finance and MoIT maintain and enhance incentives for rooftop solar power projects. [5]

Germany, a country with a population roughly the size of Vietnam, has installed 24,000 MW of renewable energy capacity, 10,000 MW of which is rooftop solar. Therefore, if Vietnam is determined to do so, the rooftop solar power field will develop at great speed.

Photo: Rooftop solar in Ho Chi Minh City. (Credit: MDI)

[1]<https://www.evn.com.vn/d6/news/Tinh-hinh-hoat-dong-thang-8-nam-2020-va-muc-tieu-nhiem-vu-cong-tac-thang-9-nam-2020-66-142-26392.aspx>

[2]<https://vnexpress.net/dien-mat-troi-ap-mai-phat-trien-manh-nua-dau-nam-4127771.html>

[3]<https://vnexpress.net/o-at-dau-tu-dien-mat-troi-mai-nha-de-huong-gia-cao-4152936.html>

[4]<https://www.evn.com.vn/d6/news/Nhieu-vuong-mac-ve-dien-mat-troi-mai-nha-EVN-tiep-tuc-co-van-ban-de-nghi-Bo-Cong-Thuong-huong-dan-cu-the-6-12-26223.aspx>

[5]<https://tuoitre.vn/dien-mat-troi-ap-mai-rat-soi-dong-2020053008040569.htm>



2.3. Grid upgrades to unleash solar power output

In recent years the MoIT and EVN have completed various projects to build, expand or upgrade transmission lines and substations to consume the capacity of solar power projects, especially in the central region.

On June 29, 2020, EVN put into operation the 220-kV substation in Ninh Phuoc district, Ninh Thuan province.[1] With construction beginning on January 22, 2020 and a total investment of 360.38 VND billion, this project can free up more than 300 MW of solar power in the area.

According to the National Steering Committee [2] on power development, among grid projects aimed at consuming capacity of renewable energy projects added to PDP 7 by the prime minister in December 2018, two were completed ahead of schedule. These are the installation of two substations in Ham Tan and the upgrade of capacity for the 220-kV Thap Cham station, all performed by EVN-affiliated National Power Transmission Corporation.

Completed projects include:

- Building 110-kV transmission line Phan Thiet - Phan Ri - Luong Son.
- Upgrading 110-kV transmission line Thap Cham - Ninh Phuoc - Tuy Phong - Phan Ri, raising load capacity from 100 MW to 130 MW (up 30%).
- Installing second transformer at Ham Tan 220-kV substation (250 MVA), end of October 2019.
- Upgrading capacity for 220-kV Thap Cham substation, from 2x125 MVA to 2x250 MVA, October and November 2019.

In addition, EVN has carried out numerous projects to unleash output of solar power projects that started operation before June 30, 2019, including:

- Upgrading capacity for Vinh Tan 500-kV station (from 2x600 to 2x900 MVA).
- Upgrading capacity for Di Linh 500-kV station (from 450 to 2x450 MVA).
- Upgrading capacity for Phan Ri 220-kV station (250 MVA) and 220-110 kV connection lines.
- Building 220-kV transmission line Nha Trang - Thap Cham.
- Building 110-kV transmission line Thap Cham - Ninh Phuoc (line 2).
- Building 110-kV transmission line Ninh Phuoc - Tuy Phong - Phan Ri (line 2).

It's noteworthy that in 2020 the first private enterprise in Vietnam, Trung Nam Group [3], got approval to participate in construction of transmission lines to free up power generation capacity on the south central coast. Trung Nam is committed to completing the following projects in September 2020: a 450-MW solar power plant associated with a 220/500-kV substation; 500-kV and 220-kV transmission lines with total length of over 17 kilometers from Phuoc Minh commune, Thuan Nam district, Ninh Thuan province to Vinh Tan commune, Tuy Phong district, Binh Thuan province.

Duong Quang Thanh, Chairman of EVN's Board of Members, told the Vietnam Energy Summit in July 2020 that all output from solar power plants in Ninh Thuan and Binh Thuan will be purchased and no grid overload will occur by the end of 2020.[4]

[1]<https://baodautu.vn/dong-dien-tram-bien-ap-220-kv-ninh-phuoc-tang-huy-dong-dien-mat-troi-d124928.html>

[2]<http://nangluongvietnam.vn/news/vn/dien-luc-viet-nam/cap-nhat-tien-do-cac-du-an-luoi-dien-giai-toa-cong-suat-nlft.html>

[3]<https://www.trungnamgroup.com.vn/tin-tuc/truyen-thong/truyen-thong/trungnam-group-phat-dong-chien-dich-thi-dua-102-ngay-dem-thuc-hien-du-an-nang-luong-tai-cao-12000-ty-dong>

[4]<http://baochinhphu.vn/Doanh-nghiep/EVN-co-ban-giai-toa-cong-suat-cac-nha-may-dien-mat-troi/401632.vgp>

2.4. High economic performance

Despite facing curtailment, many developers have gained high profits from their solar power projects in 2019.

More than 10 solar power projects in Vietnam reported profits last year, including those that have just been put into operation for a few months.[1]

Below are some typical examples:

Dau Tieng solar power project in Tay Ninh with maximum capacity of 420 MWp of the joint venture Xuan Cau Company Limited of Vietnam and B. Grimm Power Public Company Limited of Thailand achieved a revenue of 807 billion VND and a profit after tax of 456 billion.

Trung Nam Group, one of the major clean power developers in Vietnam, gained a revenue of over 500 billion VND and a net profit of 131 billion VND from their Trung Nam Ninh Thuan solar power plant project of 258 MWp capacity. Trung Nam Tra Vinh

factory with a capacity of 165 MWp also brought the company VND 275 billion in revenue and VND 94 billion in profit in 2019.

TTP Phu Yen solar power project (Hoa Hoi) with a capacity of 257 MWp, which is owned by a joint venture between Vietnam's Truong Thanh Group and Thailand's B.Grim Group, achieved VND 407 billion in revenue and a net profit of 135 billion in 2019.

Hong Phong 1A - 1B solar power projects owned by Vietnam Construction Trading Corporation (Vietracimex) in Binh Thuan generated 393 billion dong in revenue and 200 billion dong in profit after tax last year. Their Hong Phong 2 project also achieved 264 billion dong in revenue and 70 billion dong in net profit.

The gross profit margin of the aforementioned projects ranges from 65% - 75% and investors are exempt from corporate income tax.

2.5. Changes in project ownership

At the end of March 2020, Thailand-based Super Energy Corporation Company Limited (Super Energy) informed Thailand Securities and Exchange Commission its decision to invest up to USD 456.7 million in four solar power projects in the Binh Phuoc province [2], namely Loc Ninh 1 (200 MW), Loc Ninh 2 (200 MW), Loc Ninh 3 (150 MW) and Loc Ninh 4 (200 MW). Prior to this, Super Energy had owned six solar power projects in Vietnam with a total capacity of nearly 287 MW (as of March 2020).

Another Thai company, Gulf Energy, in mid-2019 joined local partner Thanh Thanh Cong Group to invest in the construction and operation of two solar power plants (TTC 1 and TTC 2) with a total capacity of 119 MWp in Tay Ninh province.

Initially the Thai company had a 49% stake in the project, which has been raised to 90%. Prasert Thirati, Director of Gulf Vietnam Company, now serves as the legal representative of TTC Green Energy Investment JSC, Gulf Tay Ninh 1 JSC and Gulf Tay Ninh 2 JSC. Gulf Energy and TTC Group also plans to develop a 310-MW wind power project and another 30-MW solar project in Ben Tre province. [3]

Addressing concerns, the MoIT stated that partial or entire transfer of ownership of an investment project is normal in the market economy, and in line with the Investment Law.[4]

[1]<http://nhipsongkinhte.toquoc.vn/ly-do-bim-trung-nam-va-hang-loat-tap-doan-do-xo-lam-dien-mat-troi-lai-ngay-hang-tram-ty-moi-nam-ma-chi-mat-vai-thang-xay-dung-42020497211798.htm>

[2]<https://www.set.or.th/dat/news/202003/20035328.pdf>

[3]<https://baodautu.vn/ttc-va-gulf-khanh-thanh-hai-nha-may-dien-mat-troi-tai-tay-ninh-d102370.html>

[4]<https://congthuong.vn/chuyen-nhuong-du-an-dien-mat-troi-giao-dich-binh-thuong-cua-co-che-thi-truong-137669.html>

2.6. Orientation for development

The Politburo's Resolution No. 55-NQ/TW [1] aims to:

- Create breakthrough mechanisms and policies to encourage the strong growth of renewable energy to replace fossil-fuel energy, prioritizing the use of wind and solar in electricity generation.
- Develop renewable energy hubs in regions of favorable conditions.
- Ensure the safety of the national grid and prioritize the generation sources with reasonable electricity prices; promote development of rooftop and floating solar power projects.

Based on current status of construction and operation of power projects set in the revised PDP 7, the Institute of Energy of Vietnam in February 2020 released a report [2] on power supply-demand for the 2020 - 2025 period. Accordingly, to ensure supply-demand balance, it is necessary take into consideration the development of renewable energy sources, particularly solar power, due to the possibility for rapid construction as well as operation from 2021.

Total solar power capacity expected to be developed is 14,450 MW by 2025 and 20,050 MW by 2030. Currently 10,300 MW of capacity has been added to the plan. Consequently, to adopt the auction model, 4,000 MW and 5,600 MW need to be added by 2025 and 2026 – 2030, respectively.

Under the Report No. 1968/TTr-BCT dated March 19, 2020, the MoIT has proposed the prime minister to consider the following options.

Option 1: Project-based auction

This will apply to solar power projects which have been supplemented to the power planning and are not eligible to apply for the new FiT. This option will be implemented until June 2021 for rapid mobilization of solar power sources to ensure competitiveness (a transition period from the FiT to an auction mechanism).

Option 2: Substation-based auction

The auction will apply for solar power projects with capacity from 10 MW to 100 MW. It will establish a mechanism and pilot plan from 2020 to 2021 and apply on a large scale from July 2021.

Option 3: Auction for specific projects

The auction will apply for potential sites for developing utility-scale floating plants and ground-mounted solar power projects of over 100 MW capacity. A mechanism and pilot scheme will be established from 2020 to 2021, while implementation on a nationwide scale will begin from July 2021.

In its report “Vietnam Solar Competitive Bidding Strategy and Framework,” published in February 2020, the World Bank (WB) stated that it was cooperating with Vietnam to pilot a bidding mechanism for selection and construction of solar power projects. Competitive bidding is aimed at cutting electricity production costs and risks for solar power projects operating below installed capacity due to transmission grid curtailment.

The MoIT [3] is working on a draft of the prime minister's decision on pilot auctions for solar power projects. If approved, it will be implemented within this year.

Under the draft decision, projects need to meet the following requirements to be eligible for bidding:

- They must already be included in the approved power development plan.
- They must be planned to begin commercial operation before June 30, 2022.
- They must be able to free up output to the grid when commercial operation commences.

[1]<http://tulieuvankien.dangcongsan.vn/he-thong-van-ban/van-ban-cua-dang/nghe-quyet-so-55-nqtw-ngay-11022020-cua-bo-chinh-tri-ve-dinh-huong-chien-luoc-phat-trien-nang-luong-quoc-gia-cua-viet-nam-den-6096>

[2]<http://nangluongsachvietnam.vn/d6/vi-VN/news/De-xuat-co-che-xac-dinh-gia-dien-canh-tranh-cho-cac-du-an-dien-mat-troi-6-165-6102>

[3]<https://vnexpress.net/xem-xet-thi-diem-dau-gia-dien-mat-troi-trong-nam-2020-4141571.html>

3. Wind power

3.1. Power output cuts

Since wind power projects were forced to cut output due to grid overload in central region, on January 13, 2020, EVN held a conference to seek solutions.

Three wind power plants in Binh Thuan and Ninh Thuan had to reduce production capacity as did solar farms in the region, said Bui Van Thinh, Chairman of the Binh Thuan Wind Power Association.[1] At the time of the conference, during a period of high winds, local wind power plants had to lower 61% of their capacity. With the remaining 39% of capacity in operation, their total output dropped to 3 million kWh from 11 million kWh in same period of 2019.

Binh has twice requested EVN to remove wind power plants from the list of projects that are forced to reduce capacity, stating they are not to blame for grid overload.

As of January 2020, 440 MW out of over 4,500 MW of combined wind and solar power capacity put into operation before June 30 2019 was affected by the forced capacity reductions, said Tran Dinh Nhan, General Director of EVN.[2]

3.2. 7 GW of additional wind power capacity to the national power plan

On June 9, 2020 the prime minister issued document No. 693/TTg-CN approving the proposal of the MoIT to add wind power projects to the revised PDP 7.[3] This is considered as an urgent solution to help the country avoid a severe power shortage due to delays in construction of many large-scale coal-fired power plants.

On June 25, 2020, the government of Vietnam issued document No. 795/TTg-CN adding 91 wind power projects with a total capacity of nearly 6,977 MW to the revised PDP 7.[4] Among those, the south central region, the country's recent hot spot for renewable energy development, accounts for only nine projects with combined capacity of 336 MW, all in Ninh Thuan province. Two regions prioritized for development are the Southwest (37 projects with a total capacity of 3,167 MW) and Central Highlands (28 projects with a total capacity of 2,433 MW).

:Photo: Bac Lieu Wind Power Plant (Source: Wikimedia under Creative Commons Attribution-Share Alike 3.0 Unported)

[1]<https://tuoitre.vn/nha-dau-tu-dien-gio-muon-duoc-doi-xu-cong-bang-voi-dien-mat-troi-20200113161957167.htm>

[2]<https://www.evn.com.vn/d6/news/EVN-to-chuc-hoi-nghi-voi-cac-nha-dau-tu-dien-gio-tai-Viet-Nam-6-12-24959.aspx>

[3]<https://www.evn.com.vn/userfile/User/xuantien/files/2020/6/Quyetaidinh693TTgCP2020.pdf>

[4]<https://baodautu.vn/danh-tinh-91-du-an-dien-gio-vua-duoc-bo-sung-quy-hoach-dien-d124740.html>



Table 5. List of additional wind projects

Source: 693/TTg-CN - June 9, 2020

No.	Project	Capacity (MW)	Location
1. Northern Central			
1	Hướng Linh 5	30	Hướng Hoá, Quảng Trị
2	Hướng Hiệp 2	30	Hướng Hoá, Quảng Trị
3	Hướng Hiệp 3	30	Hướng Hoá, Quảng Trị
4	TNC Quảng Trị 1	50	Hướng Hoá, Quảng Trị
5	TNC Quảng Trị 2	50	Hướng Hoá, Quảng Trị
6	Hướng Linh 7	30	Hướng Hoá, Quảng Trị
7	Hướng Linh 8	25,2	Hướng Hoá, Quảng Trị
8	AMACCAO	50	Hướng Hoá, Quảng Trị
9	Tân Hợp	38	Hướng Hoá, Quảng Trị
10	LIG Hướng Hoá 1	48	Hướng Hoá, Quảng Trị
11	LIG Hướng Hoá 2	48	Hướng Hoá, Quảng Trị
12	Hải Anh	40	Lao Bảo, Quảng Trị
13	Tài Tâm	50	Hướng Hoá, Quảng Trị
14	Hoàng Hải	50	Hướng Hoá, Quảng Trị
15	HBRE Ha Tinh Wind Farm	120	Kỳ Anh và thị xã Hà Tĩnh, Hà Tĩnh
16	B&T Wind Farm Cluster	252	Lệ Thủy, Quảng Bình
2. Southern Central			
1	Điện gió 7A	50	Thuận Nam, Ninh Thuận
2	Đầm Nại 4	27,6	Thuận Bắc, Ninh Thuận
3	Lợi Hải 2	28,9	Thuận Bắc, Ninh Thuận
4	Đầm Nại 3	39,4	Thuận Bắc, Ninh Thuận
5	Wind farm No.5 Ninh Thuận	46,2	Ninh Phước, Ninh Thuận
6	Công Hải GĐ2	25	Thuận Bắc, Ninh Thuận
7	Phước Hữu-Duyên Hải 1	30	Ninh Phước, Ninh Thuận
8	Việt Nam Power số 1	30	Thuận Nam, Ninh Thuận
9	BIM Wind Farm	88	Thuận Nam, Ninh Thuận
3. Central Highlands			
1	Ea H'leo 1,2	57	Ea H'leo, Đắk Lắk
2	Ea Nam	400	Ea H'leo, Đắk Lắk
3	Đắk Hoà	50	Đắk Song, Đắk Nông
4	Cửu An	46,2	An Khê, Gia Lai
5	Song An	46,2	An Khê, Gia Lai
6	Chợ Long	155	Kong Chro, Gia Lai
7	Yang Trung	145	Kong Chro, Gia Lai
8	Hưng Hải Gia Lai	100	Kong Chro, Gia Lai
9	Cư Né 1	50	Krông Búk, Đắk Lắk
10	Cư Né 2	50	Krông Búk, Đắk Lắk
11	Krông Búk 1	50	Krông Búk, Đắk Lắk
12	Krông Búk 2	50	Krông Búk, Đắk Lắk
13	Ia Le	100	Chư Pưh, Gia Lai
14	Nhơn Hoà 1, 2	100	Chư Pưh, Gia Lai
15	Asia Đắk Song 1	50	Đắk Song, Đắk Nông

Table 5. List of additional wind projects (continued)

Source: 693/TTg-CN - June 9, 2020

No.	Project	Capacity (MW)	Location
3. Central Highlands (continued)			
16	Chế biến Tây Nguyên	50	Chư Prông, Gia Lai
17	Phát triển miền Núi	50	Chư Prông, Gia Lai
18	la Pech	50	la Grai, Gia Lai
19	la Pech 2	50	la Grai, Gia Lai
20	la Pết, Đắc Đoa	200	Đắc Đoa, Gia Lai
21	Kon Plong	103,5	Kon Plong, Kon Tum
22	Tân Tấn Nhật	50	Đăk Glei, Kon Tum
23	Đắc ND'rung 1	100	Đăk Song, Đăk Nông
24	Đắc ND'rung 2	100	Đăk Song, Đăk Nông
25	Đắc ND'rung 3	100	Đăk Song, Đăk Nông
26	Nam Bình 1	30	Đăk Song, Đăk Nông
27	la Bang 1	50	Chư Prông, Gia Lai
28	la Boong-Chư Prông	50	Chư Prông, Gia Lai
4. Mekong River Delta			
1	Đông Hải 1, GĐ 2	50	Đông Hải, Bạc Liêu
2	Hoà Bình 1, GĐ2	50	Hoà Bình, Bạc Liêu
3	Hoà Bình 2	50	Hoà Bình, Bạc Liêu
4	Hoà Bình 5	120	Hoà Bình, Bạc Liêu
5	Sunpro Thiên Phú	30	Bình Đại, Bến Tre
6	Thiên Phú 2	30	Thạnh Phú, Bến Tre
7	Điện gió số 5 Bến Tre (GĐ2)	30	Thạnh Phú, Bến Tre
8	Hải Phong	90	Thạnh Phú, Bến Tre
9	Thạnh Phú	200	Thạnh Phú, Bến Tre
10	Nexif Bến Tre, GĐ2,3	120	Thạnh Phú, Bến Tre
11	Bảo Thạnh	50	Thạnh Phú, Bến Tre
12	Số 19 Bến Tre	50	Ba Tri, Bến Tre
13	Số 20 Bến Tre	50	Thừa Đức, Bến Tre
14	VPL Bến Tre - GĐ2	50	Thừa Đức, Bến Tre
15	Bình Đại 2	30	Bình Đại, Bến Tre
16	Bình Đại 3	49	Bình Đại, Bến Tre
17	Khai Long GĐ2	49	Bình Đại, Bến Tre
18	Khai Long GĐ3	100	Ngọc Hiến, Cà Mau
19	Long Mỹ 1	100	Ngọc Hiến, Cà Mau
20	Sóc Trăng 4	100	Long Mỹ, Hậu Giang
21	Phú Cường	350	TX Vĩnh Châu, Sóc Trăng
22	Sóc Trăng 1A và 1B	200	Vĩnh Châu, Sóc Trăng
23	Sóc Trăng 16	40	Vĩnh Châu, Sóc Trăng
24	Điện gió số 7 Sóc Trăng, GĐ2 x	90	Vĩnh Châu, Sóc Trăng
25	Sóc Trăng 11	100,8	Cù Lao Dung, Sóc Trăng
26	Hoà Đông 2	72	Vĩnh Châu, Sóc Trăng
27	BCG Sóc Trăng 1	50	Vĩnh Châu, Sóc Trăng
28	Trần Đề	50	Trần Đề, Sóc Trăng

Danh mục các dự án điện gió đề xuất bổ sung quy hoạch (tiếp tục)*Nguồn: Văn bản 693/TTg-CN ngày 9/6/2020*

No.	Project	Capacity (MW)	Location
4. Mekong River Delta (continued)			
29	Sông Hậu	50	Long Phú-Trần Đề, Sóc Trăng
30	Nexif Energy	40	Sóc Trăng
31	Lạc Hoà 2	130	Vĩnh Châu, Sóc Trăng
32	Đông Thành 1	80	Duyên Hải, Trà Vinh
33	Đông Thành 2	120	Duyên Hải, Trà Vinh
34	Đông Hải 1	100	Duyên Hải, Trà Vinh
35	Thăng Long	96	Trà Vinh
36	Tân Phú	150	Gò Công Đông, Tiền Giang
37	Đông Viên An	50	Ngọc Hiển, Cà Mau

3.3. Recommendations for extending the incentive period

On April 9, 2020, the MoIT submitted Document No. 2491/BCT-ĐL to the prime minister to request an extension to the feed-in tariff for wind power projects until December 31, 2023. [1]

According to the MoIT, on September 10, 2018, the prime minister signed Decision No. 39/QĐ-TTg amending Decision No. 37/2011/QĐ-TTg on mechanisms to encourage wind power development in Vietnam.

Accordingly, the FiT for onshore wind power was raised from VND 1,614/kWh (equivalent to 7.8 US cents/kWh) to VND 1,927/kWh (equivalent to 8.5 US cents/kWh); the FiT for offshore wind power was set at VND 2,223 /kWh (equivalent to 9.8 US cents/kWh), excluding value-added tax.

These tariffs are applied to wind power projects which were partially or entirely put into commercial operation before November 1, 2021, and applicable for 20 years from the first date of commercial operation.

Decision 39 constituted a big boost to the wind power market in Vietnam. Hundreds of projects have been proposed to be added to the national power development plan, while various projects are under construction. However, as of April 2020 only 11 projects with combined capacity of 377 MW were under operation.

Decision 39 took effect from November 1, 2018, but the registration and addition to the planning of new wind power plants, as well as grid upgrade projects, have been delayed for more than a year due to the lack of detailed guidelines for implementation of the Planning Law, which entered into force from January 1, 2019.

Furthermore, the spread of the COVID-19 pandemic globally has affected the development of the wind power projects, risking further delays in construction work, as turbine and equipment supply was disrupted while foreign workers and experts could not arrive due to travel bans.

In addition, wind power projects with a combined capacity of 1,600 MW planned for the southwestern provinces, mostly offshore power plants, require technology and construction techniques different to those applied in onshore projects. It takes about two years to complete an onshore wind power project while an offshore project will take three to three and a half years for completion. Furthermore, the complicated regulations in identifying operable maritime zones and acquiring permits may prolong the preparation period and incur additional costs for these projects.

According to the MoIT, wind power projects had to start commercial operation from April 2020 to the end of October 2021 to be eligible for the FiT under Decision 39. The remaining time (18 months at the time of that statement) was not enough for preparation and construction of the projects, especially offshore wind projects and the ones that have not been approved to be added to national power development plan.

In order to tackle such difficulties for wind power investment and ensure electricity supply by 2025, the MoIT has proposed to the prime minister to consider extending the FiT for wind power projects set in Decision 39 to the end of December 31, 2023. After 2023, competitive bidding mechanisms will be applied to wind power projects. At the same time, the MoIT asks the prime minister to assign it the task of establishing a new FiT for the wind power projects operational from November 1, 2021 to December 31, 2023.

In document No. 693/TTg-CN, the government instructed the MoIT to urgently study and collect feedback from relevant ministries and agencies on the proposed extension of the FiT for wind power projects, and report to the prime minister for consideration.[2]

However, in a letter sent to the government, EVN proposed the government not extend the fixed-price mechanism, despite the requests of investors.[3] EVN argued this would ensure transmission capacity for wind power projects, whilst reducing purchase prices for electricity output from the projects through auctions in preparation.

[1]<https://www.evn.com.vn/d6/news/Bo-Cong-Thuong-de-xuat-keo-dai-ap-dung-co-che-gia-dien-gio-co-dinh-den-nam-2023-141-17-25386.aspx>

[2]<https://www.evn.com.vn/userfile/User/xuantien/files/2020/6/Quyetchinh693TTgCP2020.pdf>

[3]<https://vnexpress.net/de-xuat-khong-gia-han-uu-dai-gia-dien-gio-4138015.html>

3.4. Orientation for development

Resolution No. 55-NQ/TW [1] aims to:

- Prioritize wind and solar power development while ensuring safety of national power system and reasonable electricity prices.
- Develop disruptive mechanisms and policies to encourage the development of offshore wind power, in association with the implementation of Vietnam's Marine Strategy.

So far nearly 7,000 MW of capacity has been added to the national power development plan. Another 38,000-MW of capacity proposed by various provinces is still pending approval. These projects will be considered in the process of developing PDP 8.

In addition, on July 22, 2020, the Danish fund management company Copenhagen Infrastructure Partners, together with its partners, signed a memorandum of understanding with the People's Committee of Binh Thuan province to develop an offshore wind power project off La Gan coast with a total capacity of up to 3.5 GW.[2]

Another major project in Binh Thuan, Thang Long Wind, was licensed for site survey in 2019.[3] Thang Long Wind is expected to have a total capacity of 3.4 GW with a construction cost of about US\$11.9 billion.

These can potentially become the biggest offshore wind power projects in the world, a title currently held by Hornsea in the UK, which has a Phase 1 capacity of 1.2 GW.

Photo: Pixabay

[1]<http://tulieuvankien.dangcongsan.vn/he-thong-van-ban/van-ban-cua-dang/ngghi-quyet-so-55-nqtw-ngay-11022020-cua-bo-chinh-tri-ve-dinh-huong-chien-luoc-phat-trien-nang-luong-quoc-gia-cua-viet-nam-den-6096>

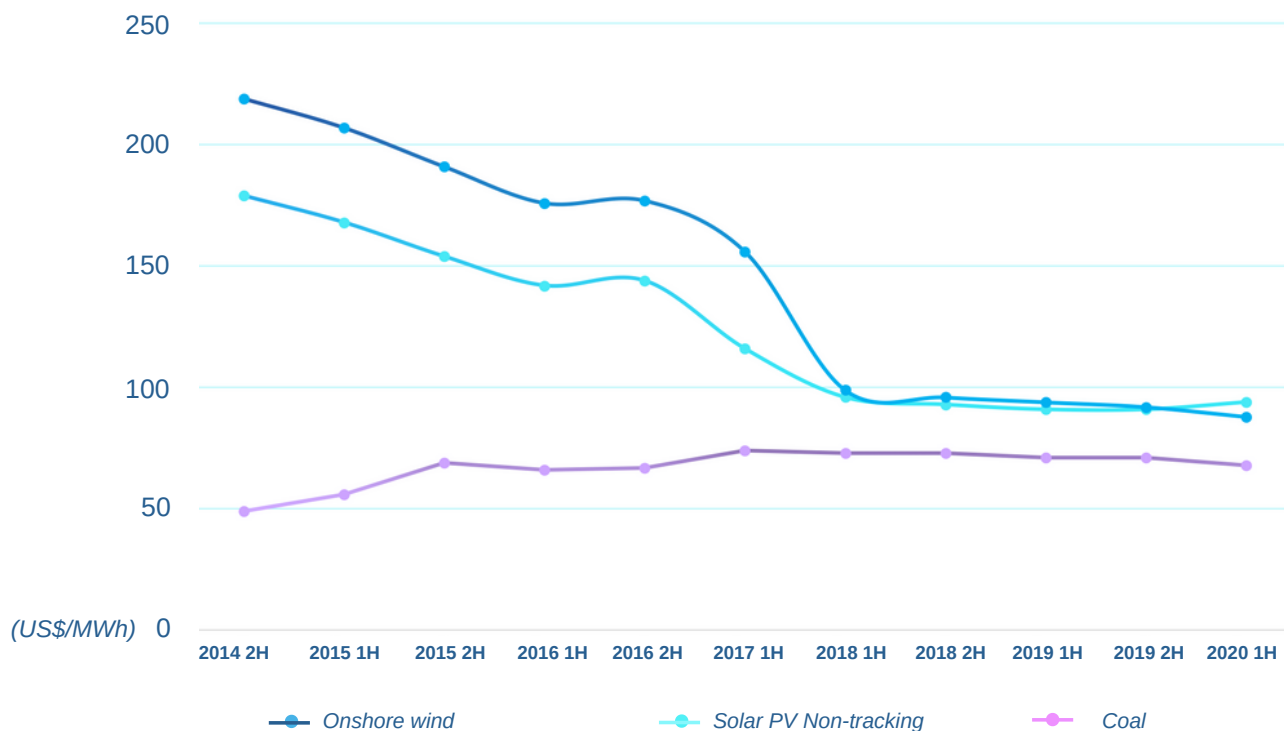
[2]<https://www.thesaigontimes.vn/306208/cip-dan-mach-muon-phat-trien-du-an-dien-gio-10-ti-do-la-tai-binh-thuan.html>

[3]<http://www.thanglongwind.com/about.html>



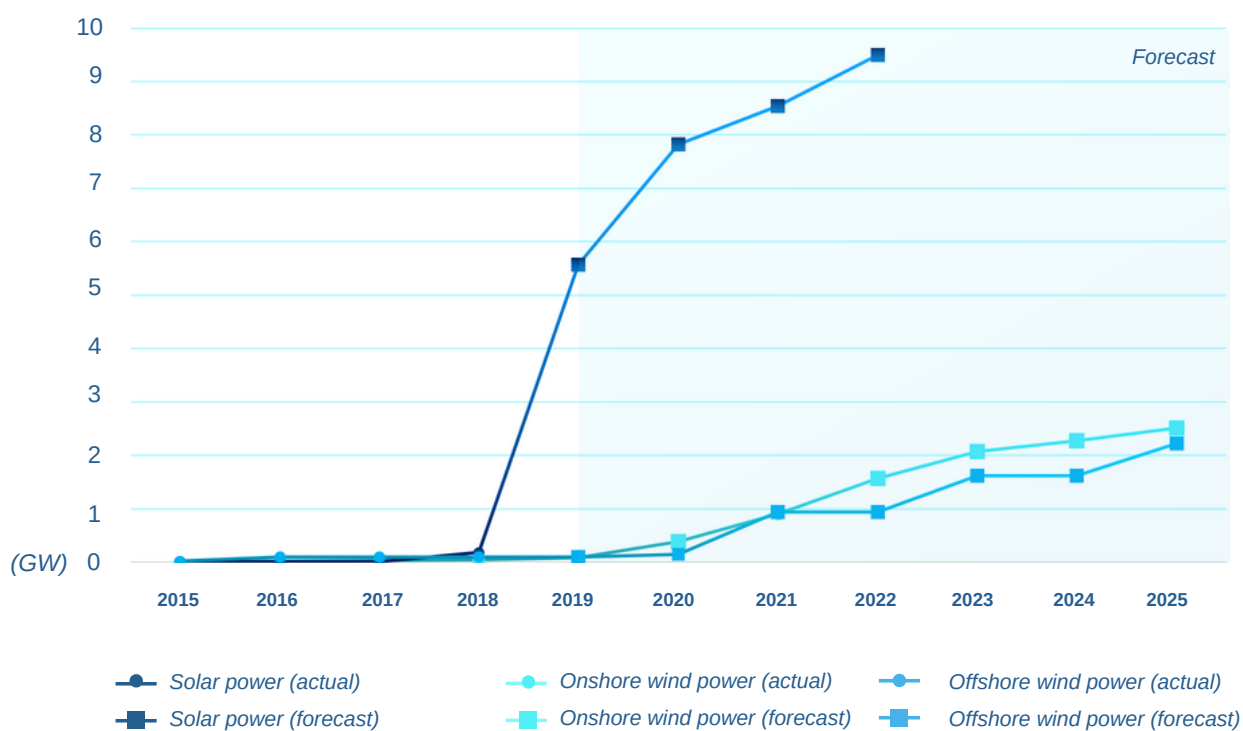
Graph 4. The Levelised Cost of Wind and Solar vs Coal in Vietnam (2H 2014 - 1H 2020)

Source: BNEF



Graph 5. Capacity Forecast for Wind and Solar in Vietnam (2015 - 2025)

Source: BNEF



4. Gas power

Gas-fired power generation currently enjoys priority for development as new coal power has been facing difficulties. Meanwhile, the share of renewable energy in the national power supply remains low.

Notably, given the continued decline in domestic gas supply, thermal power projects running on imported LNG are likely to develop further.

4.1. Decrease in gas power supply

Data from General Statistics Office showed that Vietnam's natural gas production in the first six months of 2020 reached 4.83 billion cubic meters, down by 9.1% compared to the first half of 2019.

Currently gas from both domestic sources and via pipelines from Malaysia are mainly used to fuel power plants.

According to EVN, the southeast region has eight power plants using natural gas, with a combined capacity of 5,644 MW.[1] The southwest region has Ca Mau 1 & 2 power plants with four generators fueled by natural gas, with a total capacity of 1,500 MW. For the generators to operate at maximum capacity, the southeast needs 23.9 million cubic meters/day, while the southwest consumes 6.4 million cubic meters/day. Therefore, the total natural gas demand of the southern region is 30.3 million cubic meters/day.

However, due to the decline in output of major aging gas fields, the total amount of gas supplied to the southern region by the end of 2019 was only about 20 million cubic meters/day, meeting just under 66% of the demand.

Given current load growth and power supply development, gas demand for power generation during 2020-2025 period is expected to be significantly higher, from 8.5 billion or 9.5 billion cubic meters/year.

According to some forecasts, gas supply for power plants in the southeast region is expected to soar from between 6.5 billion and 7.5 billion cubic meters/year during 2020-2023 to over nine billion cubic meters/year in 2024-2025, before decreasing gradually in the following years. However, supply during 2020 - 2030 will depend on progress of the new gas projects and the production at the existing aging gas fields. If Vietnam secures a contract to purchase additional natural gas from Malaysia's Petronas Group, gas supply for power plants in the southwest will stay at between 1.8 billion and 2.1 billion cubic meters/year. Otherwise the supply will remain at 1.06 billion cubic meters/year.

4.2. Discovery of large gas reserves

Nearly 10 years after the Ca Voi Xanh (Blue Whale) natural gas field was discovered off central Vietnam coast, on July 22, 2020, Italian Eni Oil [2] and Gas Group officially announced a significant discovery of oil and gas at Ken Bau field located in block 114, Song Hong basin.

According to Energy Voice on July 30, 2020 [3], Saloni Kapoor, an upstream analyst at Wood Mackenzie, said the field's preliminary estimates range between seven and nine trillion cubic feet of raw gas. He considered Ken Bau as one of the largest discoveries in Southeast Asia for the past two decades.

If everything goes as planned, Ken Bau can be put into operation from 2028, stated PVN.[4]

The discovery can improve the outlook of Vietnam's oil and gas industry, bringing changes to gas-fired power planning and development as well as LNG import plans of the country.

[1]<https://www.evn.com.vn/d6/news/Viec-cung-cap-khi-dot-cho-phat-dien-hien-nay-chi-dap-ung-khoang-66-nhu-cau-va-con-co-the-kho-khan-hon-trong-thoi-gian-toi-6-12-24855.aspx>

[2]<https://www.eni.com/en-IT/media/press-release/2020/07/eni-confirms-and-expands-gas-and-condensate-potential-in-the-ken-bau-discovery-in-block-114.html>

[3]<https://www.energyvoice.com/oilandgas/asia/255731/eni-gas-find-vietnam/>

[4]<http://www.pvn.vn/Pages/Tap-doan/Lo-114-diem-sang-trong-hoat-dong-tim-kiem-tham-do-ngoai-khoi-them-luc-dia-Viet-Nam/4b056f07-6edf-42ca-b319-54b5b43f7d3f>

4.3. Progress update of existing major gas projects

Ca Voi Xanh (Blue Whale) is a natural gas field off the central coast, with a reserve of about 150 billion cubic meters of gas. According to the product-sharing contract (PSC), US-based ExxonMobil owns 64% equity in the field, with PetroVietnam Exploration Production Corporation (PVEP) and PVN holding 15% and 21%, respectively.

The total investment cost of the phase 1 is approximately US\$10 billion for both offshore and onshore components.

Gas from the field will feed five local power plants with a combined capacity of about 3,500 MW. ExxonMobil has announced that the upstream gas production is expected to start by June 2024. PVN is urging consultants to complete the project feasibility study report (FS) to submit to relevant agencies for approval. In parallel with FS preparation, PVN is in the process of selecting a major contractor, which is expected to be approved immediately after the FS.

In addition, PVN is building an overall plan for construction of two thermal power plants (Mien Trung 1 & 2 in the central region), which will be synchronized with the upstream work.

PVN [1], EVN and ExxonMobil are trying to conclude negotiations, contracts and agreements on gas and electricity purchase and sales, with the target of finalizing the gas sales agreement (GSA) by the fourth quarter of 2020 – the time a final decision for the upstream project is expected to be made.

Block B-O Mon [2]: this key gas and power project is located in the southwest region. Due to a variety of factors, the project has encountered numerous delays.

PVN and its member units hold a 70% stake in the oil and gas blocks of the project, with partners from Japan and Thailand holding the remaining 30%. The total investment for exploration and production is approximately US\$6.7 billion, and the project's duration is more than 20 years.

In July, 2017 the prime minister approved the gas price of the project and subsequently approved the field development plan in July 2018. At the same time, while bidding contracts were under preparation, it was put on hold as other parts of the project are incomplete.

This project will build a pipeline system of more than 400 km in length, connecting the field to the onshore components in Ca Mau and going towards Kien Giang and O Mon district in Can Tho to supply gas for these areas. This pipeline project has a total investment of around US\$1.3 billion.

Gas from the project is expected to be supplied to four power plants of 750 MW capacity each. Under the revised PDP 7, O Mon 3 was expected to start operation from 2020, but it is now delayed until 2025; O Mon 4 was expected become operational in 2021, which is now postponed to December 2023.

According to National Steering Committee for Power Development, the Block B gas and power project are falling behind schedule, especially those downstream. O Mon 4 is expected to face a delay of three years while O Mon 3 will fall four to five years behind the schedule posted in the revised PDP 7, with more paperwork needed in order to get final approval from the government.

On March 10, 2020, the MoIT asked its foreign partners to finalize the Government Guarantee and Undertaking Agreement (GGU) draft for submission to the prime minister.

The foreign loan borrowing plan for Block B gas field development and Block B - O Mon gas pipeline is still pending approval from the Commission for the Management of State Capital at Enterprises and the Ministry of Finance.

[1]<http://nangluongvietnam.vn/news/vn/dau-khi-viet-nam/chuan-bi-hoan-tat-dam-phan-hop-dong-ban-khi-tu-mo-ca-voi-xanh.html>

[2]<http://nangluongvietnam.vn/news/vn/dau-khi-viet-nam/tinh-hinh-trien-khai-chuoi-du-an-khi-dien-lo-b.html>

4.4. Progress on the first two LNG import terminal projects

After years of planning, development of LNG import terminal projects for power generation in Vietnam has made a degree of progress.

Hai Linh LNG: On May 15, 2018, the prime minister approved the addition of the Hai Linh LNG regasification terminal project to Vietnam gas industry masterplan to 2025, with a vision to 2035. The terminal in Cai Mep-Ba Ria Vung Tau industrial zone will have a capacity of 220,000 cubic meters.

On May 15 2018 the investor, Hai Linh Co., Ltd., signed a contract with Lilama 18 JSC for completion and installation of three LNG storage tanks with a total capacity of 219,000 cubic meters.[1]

As of early June 2020, the tanks for the project have been installed. A test-run is expected to begin by the end of 2020, with commercial operation scheduled for 2021. Initially Hai Linh will supply the fuel to its own power plant Hiep Phuoc. If negotiations with EVN succeed, EVN's thermal power plants can also receive gas from this project.

LNG Thi Vai: On June 24, 2019, PV Gas awarded the contractor consortium of South Korea's Samsung C&T Corp. and PetroVietnam Technical Services Corp (PTSC) an engineering, procurement and construction contract to build an LNG import terminal at Thi Vai.

On October 28, 2019, PV Gas and contractors held a groundbreaking ceremony for the project. In phase 1, scheduled to become operational in 2022, the terminal will have a designed capacity of 1 million tons of LNG/year [2]. Phase 2, with a capacity of 3 million tons/year, is expected to begin operation by 2023.

By mid-April, 2020, 13.8% of total work of the project had been finished, with 6.7% of the EPC package completed.[3] The EPC contractor was conducting detail design, procurement, and construction of the foundation for the tanks.

LNG Thi Vai will provide re-gasified LNG to local consumers, including Nhon Trach 3 & 4 power plants, with a total capacity of 1,500 MW.



[1]<https://www.lilama18.com.vn/vi/news/45/lilama-18-va-cong-ty-tnhh-hai-linh-ky-hop-dong-thi-cong-du-an-kho-tiep-nhan-lng-va-tai-hoa-khi-thien-nhien>

[2]<https://www.pvgas.com.vn/tin-tuc/khoi-cong-xay-dung-cong-trinh-kho-chua-lng-thi-vai>

[3]<http://nangluongvietnam.vn/news/vn/dau-khi-viet-nam/cap-nhat-tien-do-chuoi-du-an-lng-thi-vai-va-son-my.html>

4.5. Update on of LNG-based power projects

Currently Vietnam does not have any LNG-based power plant as it has no operating LNG terminals.

In recent years, investors have expressed huge interest in Vietnam's LNG-based power generation. Our Vietnam Energy Update Report published in July 2019 has listed many proposed LNG-based power projects across the country. Over the past year, additional projects have been approved while many others continued to be proposed.

The most promising LNG-to-power projects include Hiep Phuoc, Nhon Trach 3 & 4, and Bac Lieu.

Hiep Phuoc: This may become the first power plant in Vietnam to run by imported LNG from Hai Linh terminal. In June 2019, Hai Linh Co., Ltd. completed the acquisition of Hiep Phuoc power plant, with an aim to convert its fuel from diesel to gas.[1]

In August 2019, Hiep Phuoc Power Company signed a contract with Siemens Corporation to upgrade Hiep Phuoc to a combined cycle power plant, raising its capacity by about 780 MW, to 1,200 MW.[2] A test run is expected to commence in the second half of 2022. By mid-2021, Hiep Phuoc is expected to supply about 520 MW of electricity to the national grid.

Nhon Trach 3 & 4: In February 2020, PetroVietnam Power Corporation (PV Power) [3] announced that two foreign banks, Citibank and INGbank, will jointly arrange funding for its Nhon Trach 3 & 4 power plants in Dong Nai province. The two plants, with a combined capacity of 1,500 MW, would be the first ones to use imported LNG from the Thi Vai terminal. Nhon Trach 3 will cost around US\$703.3 million and is scheduled to start commissioning in 2022, while the Nhon Trach 4 requires US\$704.9 million for construction and aims to start operating in 2023.

Bac Lieu LNG Power: Singapore-based Delta Offshore Energy (DOE) is the investor of the a 100% foreign-invested LNG-to-power project.

At the end of 2019, the prime minister approved the addition of Bac Lieu LNG Thermal Power Center to the revised PDP 7, and assigned the People's Committee of Bac Lieu province to find an investor for the project.[4]

On January 21, 2020, the People's Committee of Bac Lieu Province awarded DOE the contract to develop the 3,200-MW gas-fired power plant.[5]

Delta has hired the Vietnam Energy Institute as a consultant to conduct a feasibility study for the project, with an aim to finalize all pre-investment work in 2020, while US-based Bechtel Group has been selected as the engineering, procurement and construction (EPC) contractor.[6] DOE aims to conclude negotiations with the Vietnamese side on the power purchase agreement before October 2020.

Preparation work relevant to Son My 1 and Son My 2 in Binh Thuan is also underway.

Son My 1: In November, 2019 the MoIT[7], the French EDF Group, and representatives of the investors for Son My 1 BOT project signed a Memorandum of Understanding to conduct a feasibility study report for this project. The power plant is expected to become operational in 2027 with a capacity of 2,000 MW.

Son My 2: On November 8, 2019, representatives of the MoIT and US AES Group signed a Memorandum of Understanding on the implementation of Son My Gas Power Plant 2 in Binh Thuan.[8] The project will have a total capacity of about 2,200 MW and has a total investment of US\$1.7 billion.

In addition, there have been recent proposals for large projects from both domestic and foreign investors, including those from the United States. Most of the proposed projects have not been added to the national power development plan, including:

[1]<https://baodautu.vn/hai-linh-mua-lai-nha-may-dien-hiep-phuoc-de-cai-tao-phat-dien-bang-khi-d102002.html>

[2]<https://www.pvgas.com.vn/tin-tuc/khoi-cong-xay-dung-cong-trinh-kho-chua-lng-thi-vai>

[3]<https://vietnamfinance.vn/pv-power-tim-duoc-doi-tac-thu-xep-von-cho-du-an-14-ty-usd-nhon-trach-3-va-4-20180504224234652.htm>

[4]<https://baodautu.vn/bo-sung-trung-tam-dien-khi-lng-bac-lieu-vao-quy-hoach-dien-ubnd-tinh-bac-lieu-duoc-giao-chon-nha-dau-tu-d113495.html>

[5]<https://thanhvien.vn/tai-chinh-kinh-doanh/cap-phep-dau-tu-du-an-dien-khi-tu-nhien-long-4-ti-usd-1174382.html>

[6]<https://www.thesaigontimes.vn/td/305577/du-an-dien-khi-lng-bac-lieu-van-vuong-mac-gia-ban-dien.html>

[7]https://www.moit.gov.vn/CmsView-EcoIT-portlet/html/print_cms.jsp?articleId=13293

[8]<https://baodautu.vn/tap-doan-aes-dau-tu-17-ty-usd-xay-nha-may-dien-khi-son-my-2-d110661.html>

ExxonMobil LNG : In early June 2020, in a phone call with Prime Minister Nguyen Xuan Phuc, Irtiza Sayyed, Chairman of LNG Market Development of US-based ExxonMobil Group, expressed his firm's desire to invest in LNG-to-power projects in Vietnam. [1] The US company seeks to construct an LNG import terminal and an LNG-fueled power plants in Hai Phong city, with a total capacity of 4,000 MW, which is expected to begin operation during 2025-2030. The company also wishes to build an LNG-to-power project with an estimated capacity of 3,000 MW in Long An province.

Chan May LNG: On June 29, 2020, the People's Committee of Thua Thien Hue province, the U.S. Consulate General in Ho Chi Minh City, Chan May LNG Joint Stock Company (CML), and various U.S. and international companies and organizations took part in a meeting to update the progress of the project of "Cooperation in research, investment and development of the LNG-to-power project in Chan May-Lang Co Economic Zone".[2]

According to the memorandum of understanding between CML and the Management Board of Thua Thien Hue economic and industrial zone, dated March 03, 2020, Chan May LNG project has designated capacity of about 4,000 MW and total investment value of around US\$5 billion.

On July 22, 2020, CML and the People's Committee of Thua Thien Hue province signed another MoU to push the project forward.[3] Construction is expected to kick off in the first quarter of 2021 and its Phase 1 commercial operation will begin in 2024. The U.S. side will own a 60% stake in the project, with the Vietnamese side holding the remaining 40%.

In addition, from June to August 2020 a company named Millenium met with local authorities of Thanh Hoa and Khanh Hoa to propose two large LNG-to-power projects in the provinces. At the meeting with leaders of Khanh Hoa on July 31, 2020, Millenium said it wants to build an LNG-to-power project worth US\$15 billion.[4] Previously, on June 1, 2020, the company proposed to Thanh Hoa province LNG-to-power project worth USD 7 billion.[5] Information concerning Millenium was released by authorities of the two provinces. By the time of this report, MDI has not acquired further intelligence about this company.

[1]<http://baochinhphu.vn/Doi-ngoai/Thu-tuong-hoan-nghenh-Exxon-Mobil-dau-tu-vao-Viet-Nam/397883.vgp>

[2]<https://nhipcaudautu.vn/kinh-doanh/hue-thu-hut-du-an-dien-khi-lng-chan-may-5-ti-usd-3335782/>

[3]<http://nangluongvietnam.vn/news/vn/dien-luc-viet-nam/ky-bien-ban-ghi-nho-dau-tu-du-an-nha-may-dien-khi-lng-chan-may.html>

[4]<https://www.khanhhoa.gov.vn/vi/tin-hoat-dong-trong-tinh-0331/khanh-hoa-san-sang-thoa-thuan-cho-nha-dau-tu-vao-nghien-cuu-du-an-ve-khi-hoa-long>

[5]<http://baothanhhoa.vn/co-hoi-dau-tu/bi-thu-tinh-uy-trinh-van-chien-tiep-va-lam-viec-voi-nha-dau-tu-my/119626.htm>

4.6. Orientation for development

Resolution No. 55-NQ/TW [1] seeks to:

- Ensure capacity to import 8 billion cubic meters of LNG by 2030 and 15 billion cubic meters by 2045.
- Develop local gas industry, focusing on developing infrastructure for LNG import and consumption.
- Develop gas-fired power plants, with priorities given to domestic gas.
- Accelerate development of LNG-fueled power generation, making it a significant power supply and a source to ensure efficient regulation of the system.

Significant capacity of LNG-based power generation for the South had been added to the revised PDP 7, reported the Institute of Energy of Vietnam at the first consultation session on PDP 8 on July 8, 2020. However, the load in the southern region is now forecasted to be far below the levels calculated in the revised plan, with various wind and solar power projects being developed in this region. Therefore, many LNG-to-power projects in the south and central regions, which were already added to the national planning for construction before 2030, will be postponed until after that year.

The postponed projects, with a combined capacity of more than 7 GW, include: Bac Lieu 3 & 4 (1,600 MW), Son My 1 & 3 (750 MW), Ca Na (1,600 MW), Long Son (1,600 MW), and Kien Giang (500 MW).

[1]<http://tulieuvankien.dangcongsan.vn/he-thong-van-ban/van-ban-cua-dang/ngghi-guyet-so-55-nqtw-ngay-11022020-cua-bo-chinh-tri-ve-dinh-huong-chien-luoc-phat-trien-nang-luong-quoc-gia-cua-viet-nam-den-6096>



5. Hydroelectricity

The most prominent project is the expansion of Hoa Binh Hydropower Plant.

In April 2019, the government assigned EVN as investor for this project.

EVN initially planned to start work in the second quarter of 2020 [1], to commence power generation of Unit 1 in the third quarter of 2023, Unit 2 in the fourth quarter of 2023 and finish this project in the same year.

However, the project has now been rescheduled to start work in October 2020.

Two additional units of 240 MW capacity each, will be built with a total cost of VND 9,220,831 billion.

The current capacity of Hoa Binh Hydropower Plant is 1,920 MW.

At the first consultation seminar on PDP 8, the Vietnam Energy Institute said that total capacity of medium and large-scale hydroelectricity projects built by 2019 was about 17.9 GW. An additional 1.8 GW is possible for development between 2020 and 2025.

The total potential capacity of small-scale hydropower projects in Vietnam is 6 GW, 3.5 GW of which has already been operational, with the remaining 2.5 GW open for development.

Photo: Pixabay

[1]<https://baodautu.vn/khoi-cong-du-an-thuy-dien-hoa-binh-mo-rong-vao-thang-102020-d121879.html>



6. Biomass power

On March 5, 2020, the prime minister issued Decision No 08/2020/QĐ-TTg on the mechanism to develop biomass power projects in Vietnam.[1]

Under the decision, for combined heat and power (CHP) projects, FiT at delivery point is VND 1,634/kWh (equivalent to 7.03 US cents/kWh), higher than the previous rate of VND 1,220/kWh (equivalent to 5.8 US cents/kWh).

For non-CHP projects, the FiT at delivery point is VND 1,968/kWh (equivalent to 8.47 US cents/kWh).

The targets for biomass power generation under the revised PDP 7 and Renewable Energy Development Strategy were 660 MW by 2020, 1,200 MW by 2025 and 3,000 MW by 2030. [2]

Vietnam has diverse biomass sources including rice husk, straw, bagasse, and livestock waste, etc. However, at present, only bagasse from sugar factories and waste from large-scale livestock farms can serve as adequate sources for power generation.

According to the Vietnam Energy Institute, the country is capable of developing about 5 GW of power from biomass. Currently, installed capacity of bagasse-based power plants has reached 378 MW; another 170 MW will come from under-construction plants running on rice husk and wood by-products.

Photo: Pixabay

[1]<http://baochinhphu.vn/Chi-dao-guyet-dinh-cua-Chinh-phu-Thu-tuong-Chinh-phu/Tang-gia-dien-sinh-khoi/389526.vgp>

[2]<https://nongnghiep.vn/dien-ba-mia-co-co-hoi-phat-trien-d260194.html>



CONCLUSIONS AND RECOMMENDATIONS

Despite declining global energy demand due to the impacts of the COVID-19 pandemic in the first months of 2020, Vietnam maintained a period of growth. The growing demand for imported coal, accelerated construction of new imported LNG terminals, the outstanding contribution of solar energy to the national power system, and the promising prospects for wind power constitute striking features in the country's increasingly diverse energy mix.

The trend of green, clean and sustainable development has remained central to Vietnam's growth in general and in the energy industry in particular. Latest documents by the Party and Government have directed the reduction of the share of coal-fired power in the national energy mix, while boosting renewable sources such as wind and solar power.

Unlike coal-fired or gas-fired power, which increasingly rely on fuel imports, wind and solar are unlimited and environmentally-friendly energy sources that Vietnam can exploit to ensure national energy security in the long-run. In fact, solar power is

proving effective in operations, as it helps increase electricity supply for the country and bring about practical economic benefits to businesses, people and society.

Challenges will definitely emerge in the upcoming development stages, including integration of wind and solar power into the national grid system, as well as fierce opposition from interest groups advocating fossil fuels. However, Vietnam's long-term orientation and development trends together with the incredible breakthroughs of renewable energy technologies in the world will certainly lay a solid foundation for a strong growth for clean energy in Vietnam.

The **Sustainable Development Program** hopes this Update Report can provide journalists and the public with a general and objective overview of the electric power sector in Vietnam today. As a consequence, we hope it inspires more in-depth articles about new renewable sources in Vietnam such as solar power and wind power, as well as interviews with local and foreign experts on the major new energy trends.