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## **Draft proposal on Vietnam's Power Development Plan VIII: Power supply allocation across regions**

On 22 February 2021, the Ministry of Industry and Trade of Vietnam (**MOIT**) released a draft proposal for Vietnam's national power development plan for the period of 2021 - 2030, with a vision to 2045 (**Power Development Plan VIII** or **PDP8**) for public consultation. The draft PDP8 highlights the allocation of power supplies across regions, provinces, and cities in Vietnam.

### **1. General**

MOIT contemplates in the draft PDP8 that Vietnam's total installed capacity of power projects will be 137.67 GW by 2030 with the national energy mix to include 30% renewable energy (18-19GW wind power and 19-20GW solar power), 21-23% gas-fired power projects (28-33GW), 27% coal-fired power projects.

Vietnam will require USD128.3bn investments in the power sector for the period of 2021 - 2030, of them USD95.4bn in power generation (approximately USD9.5bn/year) and USD32.9bn in power transmission (approximately USD3.3bn/year) constituting a 74/26 split. Noting that an average margin production cost for power generation is estimated to be UScents 8.8/kWh for the period of 2021 - 2030.

Regarding Vietnam grid's strength, MOIT seeks to alleviate grid overload and power curtailment issues by proposing expansion and upgrade of its existing transmission network and contemplating numerous investments in new 500kV and 220kV transmission lines and substations in key areas in order to accommodate upcoming power projects.

Particularly, the draft PDP8 recognises the requirements for formulating an incentivised regulatory framework in attempts to accelerate mobilising private-sector investments in power transmission lines and substations which connect individual power plants with the national transmission grid.

Vietnam's national transmission grid will remain publicly owned and operated by a State-owned power transmission corporation EVNNPT.

## 2. Registered power projects heavily located in Central Vietnam

The uneven allocation of registered power supplies across regions is noticeable despite being determined by the power optimization program. Specifically, registered power projects are mainly located in Central and Southern Vietnam, causing a massive oversupply of electricity. Under PDP8, by 2030, Southern Vietnam and South Central will register a surplus of 80 GW, and Central Highlands will register a surplus of 18 GW. The registered capacity of the South Central region is 38 GW, more than seven times the on-site load (5 GW).

If all of the registered power projects are approved, Vietnam's total installed capacity will reach 220 GW (a surplus of 162%) and 150 GW in 2045 (a surplus of 47%). Consequently, only part of the registered power projects will be additionally approved, and the remaining will be considered for the period of 2031 - 2045.

Under the draft PDP8, for the period of 2021 - 2045, the national power system needs an additional 215 GW of power supply, while the total registered power supply currently is only capable of providing 162 GW. The Northern and Southern regions both face shortages in registered power supply and need approximately 28.8 GW and 23 GW of supplemented power supply capacity, respectively.

Regarding the allocation of the power supply to regions, provinces, and cities, the draft PDP8 suggests that along with the total additional capacity, the power structure from the power optimization program, the grid source constraints, and other criteria of the power source must also be considered.

## 3. Current situation of registered solar and wind power projects

In addition, the draft PDP8 notes that due to the current policies which promote investments in solar and wind power developments, the amount of registered capacity has far exceeded the optimal estimation for power supply development until 2030. Most of the newly registered renewable (solar and wind) power projects are located in Central, Central Highlands, South Central, and Southern Vietnam, surpassing the estimation in the power optimization program.

The draft PDP8 points out a massive oversupply of solar power in 2030 in many regions, such as the Central Highlands (estimated 1,500 MW but registered 5,500 MW), the South Central (estimated 5,200 MW but registered 11,600 MW), or the Southern (estimated 9,200 MW but registered 14,800 MW). The wind power will face the same situation as the registered capacity surpasses optimal estimated capacity in Central Highlands (estimated 4,000 MW but registered 10,000 MW) and Southern (estimated 6800 MW but registered 17,000 MW).

The draft PDP8 suggests that an optimal, inclusive, and long-term estimation is much needed to prevent uneven power supplies across regions, causing technical difficulties in operating the power system and wasting resources in the grid infrastructure, ultimately resulting in long-term losses of the socio-economic system.

#### 4. Investment opportunities for LNG-to-power projects

The draft PDP8 lays out significant opportunities for the development of LNG-to-power projects in Vietnam as approximately 15 GW of LNG-to-power projects have been added to the Revised PDP7. Specifically, new LNG-to-power projects include: Ca Na 1 (1,500MW), Son My 1 (2,250 MW), Son My 2 (2,250 MW), Nhon Trach 3 and 4 (1,500 MW), Bac Lieu (3,200 MW), Hiep Phuoc (1,200-2,700 MW), Long An 1 and 2 (3,000 MW). Details of those added projects can be found in Annex 1. The draft PDP8 also lists power projects that are proposed for additional planning, details about those power projects can be found in Annex 2.

According to the MOIT, LNG-to-power projects are in-line with the global development trend because they are advanced in technology, highly efficient, and environmental-friendly. The abundant supply of LNG in the world being sold at competitive prices also contributes to the development of LNG-to-power projects. Furthermore, LNG-to-power projects are more likely to receive debt facilities from credit institutions, as well as support from organizations and countries that produce natural gas for export.

## Annex 1

## Recently added LNG to power projects under PDP7 Revised

No.	Project location	Total capacity (MW)	Progress under PDP7 Revised	Current situation	Feasibility assessment
1	Ca Na 1	1,500	2025-2026	Added to PDP7, currently under PreFS	
2	Son My 2	2,250	2023-2024	FS appraised. AES (BOT) replaced PVN to be the investor	
3	Son My 1	2,250	2026-2028	Currently under FS, EDF is the Investor	
4	Nhon Trach 3&4	1,500	2021-2022	PV Power is the Investor, power purchase agreement (PPA) signed	To construct and operate in 2023-2024
5	Bac Lieu	3,200	2025-2027	Added to PDP7 Revised, currently under FS	
6	Hiep Phuoc	1,200-2,700	2021-2022	The PM approved additional 1,200 (825+375) MW operated in 2021-2022. After 2025, considering adding to Phase 2 1,500 MW in PDP8.	1,200 MW to construct and operate in 2022
7	Long An 1 and 2	3,000	Appraised and added to PDP7 Revised	Appraised and added to PDP Revised: Long An 1 (1,500 MW) in 2025-2026; Long An 2 (1,500 MW) before 2035	
	Total	<b>14,900-16,400</b>			

Source: The Electricity and Renewable Energy Authority and National PDP Steering Committee – December 2020

## Annex 2

## LNG-to-power projects proposed for additional planning purposes

No.	Project location	Total capacity (MW)	Progress under PDP7 Revised	Note
<b>I</b>	<b>Total feasibility of the Northern Region</b>	<b>30,100</b>		
	Hai Phong 1 (Tien Lang)	4,500		Collected by Institute of Energy
	Hai Phong 2+3 (Cat Hai)	1,600+4,500		
	Hai Phong 4 (Do Son)	4,500		Collected by Institute of Energy
	Quang Ninh 1 (Cam Pha)	1,500		Added to PDP7 Revised
	Quang Ninh 2 (Cam Pha)	1,500		
	Quang Ninh 3 (Quang Yen)	4,500		
	Quang Ninh 4 (Hai Ha)	3,000		Consider location of the project in Hai Ha ~3GW
	Thai Binh	4,500		Consider a port and warehouse plan in Lach Huyen (Hai Phong) and construct a pipeline to Thai Binh
<b>II</b>	<b>Total feasibility of the Central North Region</b>	<b>14,000</b>		
	Nghi Son (Thanh Hoa)	5,000		Nghi Son industrial zone, Hon Me port
	Ha Tinh	6,000		Vung An industrial zone, Son Duong port, consider using LNG in Formosa Ha Tinh 2
	Quang Binh	3,000		Hon La port industrial zone
<b>III</b>	<b>Total feasibility of the Central Central Region</b>	<b>20,200</b>		
	Hai Lang – Quang Tri	4,500	2026-2027	Phase 1 (1,500 MW) added to PDP7 Revised
	Hai Lang 1 – Quang Tri	1,500		
	Chan May - Hue	4,000		
	Phong Dien - Hue	3,000		
	Quang Nam	4,000		
	Nui Thanh (Quang Nam)	3,200		

<b>IV</b>	<b>Total feasibility of the South Central Region</b>	<b>28,100</b>		
	Binh Dinh	5,000		To find the location
	Van Phong	3,000		My Giang. Feasible of large-scale construction in Hon Heo
	My Giang	6,000		Van Phong economic zone, My Giang, Ninh Phuoc, Ninh Hoa district, Khanh Hoa province
	Ca Na I	1,500	2025-2026	Added to PDP7 Revised, currently under PreFS
	Ca Na I+II	4,500		
	Mui Ke Ga	3,600		
	Son My II	2,250	2023-2024	
	Son My I	2,250	2026-2028	
<b>V</b>	<b>Total feasibility of the Southern Region</b>	<b>49,150</b>		
	Nhon Trach 3&4	1,500	2021-2022	PV Power is the investor
	Kien Giang	1,500	2021-2022	PVN has established PreFS, PDP7 Revised plans to use gas of Block B
	Bac Lieu	3,200	2025-2027	Added to PDP7 Revised, PreFS established
	Hiep Phuoc I+II	2,700	2021-2022	The PM approved to add 825MW. The plan has 375MW replaced with LNG
	Phu My 3.1	850		
	Ba Ria 2	1,200		
	Long Son I	1,200	2025-2026	Added to PDP7 Revised
	Long Son II+III	3,200		
	Long Son IV (West location)	3,600		
	Cai Mep Ha	6,000		
	Long An	3,000+3,000	Long An 1 – 1,500MW in 2025-2026 and Long An 2 – 1,500MW before 2035	Additionally appraised 3GW
	Tan Phuoc	4,500		
	Ca Mau 1,2,3	300 + 1,500		
	Tan Thuan - Dam Doi, Ca Mau	3,200		
	Song Doc (Ca Mau)	3,000		
	Ben Tre	3,000		

Source: The Electricity and Renewable Energy Authority – December 2020. Consolidated data from ExxonMobil; Vingroup & SK (Republic of Korea), Hamek (Vietnam); GELEXIMCO; Joint Venture of PV Power, Colavi, T&T; Truong Thanh Group Vietnam; Millennium Energy; T&T Group; Joint

*Venture of Tai Tam Ltd.-Thang Long Corporation; Chan May LNG JSC; Banpu Public Company Limited; RATCHABURI Group (Thailand); Viet Phuong Group; Sumimoto; EVN, Trung Nam Group; Energy Capital Vietnam, Exelon, Excelerate Enenergy, KOGAS; BOT Phu My 3; Baria Thermal Power Joint Stock Company; Genco 3-Thanh Thanh Cong-PECC2-Mitsubishi-GE-Thai Binh Duong; 6 investors of Long Son I; Marubeni; T&T Group; VinaCapital (Vietnam) & SK (Republic of Korea); IES (Thailand) and Mitsubishi (Japan), Green Solution Ltd.; GULF Energy Development Public (Thailand) and other units.*



## Key contacts

If you have any questions or would like to know how this might affect your business, please contact the key contacts.



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