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Vietnam's Power Development Plan 8 (PDP8): A bold step towards a net-zero future

Minh Ha-Duong

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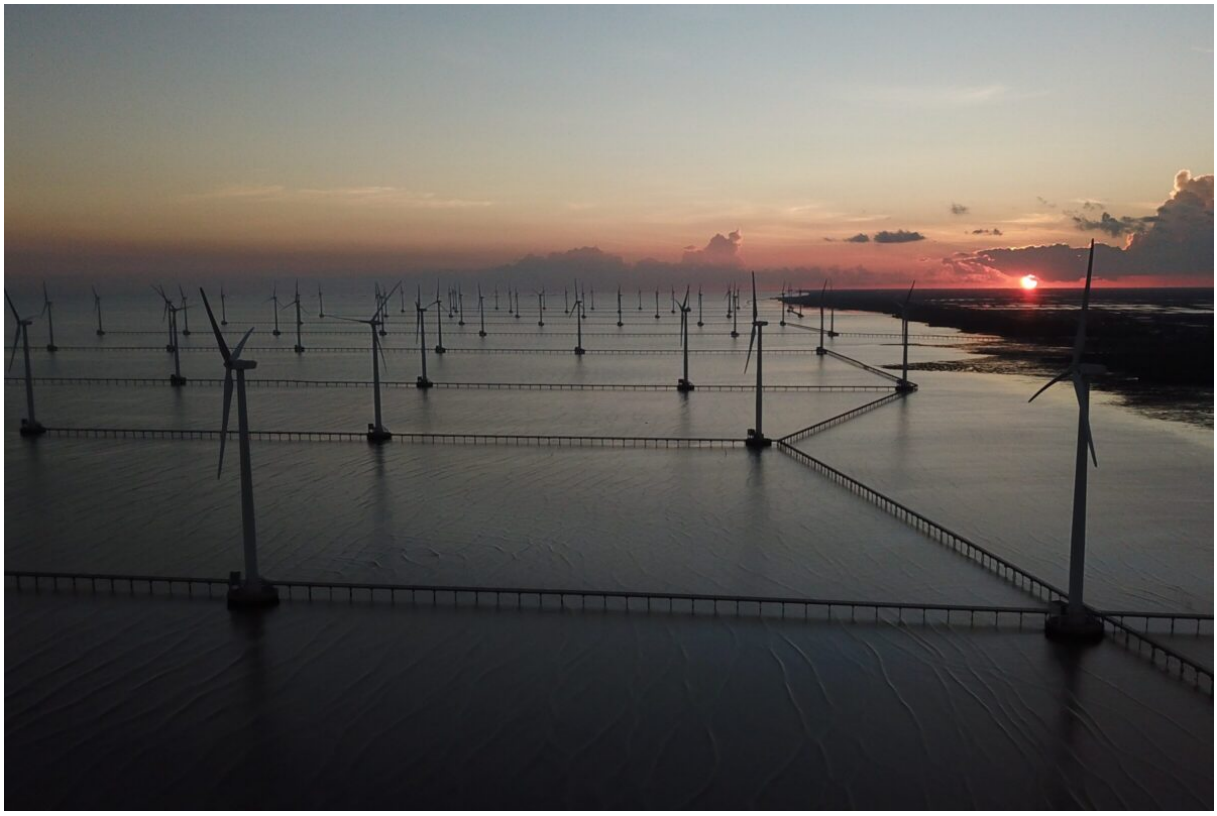
The long-awaited power development plan shows Vietnam is determined to make a green transition, but much needs to be done.



The Bac Lieu wind farm's phase 1 and phase 2 projects in Bac Lieu city have operated for ten years. PHOTO: Chi Quoc

After years of anticipation, Vietnam's Prime Minister Pham Minh Chinh recently approved Power Development Plan 8 (PDP8, Decision 500/QĐ-TTg). This plan determines how to invest $13.5 billion per year and put the country's electricity system on the way to a net-zero future. The decision comes as Vietnam, which made a head start on other Mekong countries in the clean energy race in 2019-2021, was running out of steam. Releasing the PDP8 was critical to give a new dynamic and unlock investment in the electricity sector.

The plan wants to double the country's power generation capacity by 2030, from 69 GW at the end of 2020 to 150 GW by 2030. The first power generation source will be domestic and imported liquefied natural gas (LNG), accounting for 25% of the total capacity. Coal will contribute 20%, followed by hydropower (21.1%), wind energy (18.5%), solar electricity (8.5%, excluding rooftop solar power), imports (3.3%), and biomass. These policy goals are a significant shift from the previous plan, under which coal was supposed to produce 53.2% of Vietnam's electricity in 2030 and nuclear 5.7%.

Between 2019 and 2021, Vietnam emerged as a leader in the energy transition race, capturing the interest of renewable energy investors worldwide. By 2022, renewables accounted for half of the country's total electricity output, leaping from just over a quarter a decade ago. The private sector's growing role in electricity production indicates that structural reforms in the power sector are effective.

However, the breakneck speed of this renewable development has brought its own set of issues. Solar and wind farms build faster than the necessary upgrades to the transmission grid, leading to difficulties in releasing their power. The regulatory systems have struggled to keep up with the private sector excitation, not to say cowboy-minded behaviors. 2022 and the first half of 2023 were sad for Vietnam's renewable energy industry. Many solar and wind power projects faced difficulties selling their electricity, deterring investors from building new ventures.

Unfortunately, the weather conditions in 2023 are less favorable than in 2022 – when renewable energy sources supplied 47.7% of Vietnam's electricity. Less water available reduce hydroelectric power generation, and higher temperatures increase power demand. Local coal and gas production have reached their physical limits, and reliance on imported oil and coal has been very costly – the national electricity company EVN lost billions of dollars in 2021 and 2022– risks of blackouts in the North of Vietnam are looming now.

The approval of PDP8 marks the beginning of a new phase, bringing hope after this difficult time. The PDP8 aims to provide national energy security and meet the country's expanding electricity consumption in line with a predicted average GDP growth rate of 7% between 2021 and 2030 and 6.5-7.5% per year between 2031 and 2050. As the first energy planning document issued since the adoption of the net-zero 2050 target in December 2021, the strategy involves many points:

- **Cap coal**: By 2030, coal thermal power will contribute to only 20% of total planned energy resources for local use (30,127 MW out of 150,489 MW). Coal-fired power projects which fail to demonstrate viability by 2024 will be

canceled. By 2050, all coal-fired power plants must transition to renewable energy or ammonia (a move perhaps inspired by the Japanese strategy).

- **Connect and trade**: The investment plan for 2021-2030 allocates around $15 billion for grid development to extend it by 60,000 km, facilitating internal and potential external power trading. The plan aims to develop renewable energy sources for export, to achieve an export capacity of 5,000-10,000 MW by 2030. For example, an offshore wind project connected to Singapore is in the works.
- **Massify onshore wind**: PDP8 envisions onshore wind contributing 14.5% of total power capacity by 2030 (21,880 MW out of 150,489 MW) -- a five-times increase from the 4,596 MW available at the end of 2022. Looking ahead to 2050, the targets for onshore wind are even more ambitious, aiming for 60-77 GW.
- **Kickstart offshore wind**: By 2030, offshore wind could account for 4% of total energy resources (6,000 MW), with the possibility of revising this goal if advancements in technology and affordable electricity rates, and transmission costs make it more feasible. The 2050 offshore wind target is 70-91 GW, plus 240 GW for hydrogen and ammonia production, meaning that Vietnam wants a strong position in these industries.
- **Implement flexibility solutions**: The system planned for 2030 already has a high capacity to regulate the variability of solar and wind power since it has 23.6% of thermal gas power and 18.5% hydroelectricity. Nevertheless, planning for the long term, the PDP8 calls for developing flexibility technology, such as 2,400 MW of pumped hydro storage, 300 MW of battery storage, and 300 MW of fast start-up gas engines.
- **Bet on gas**: Gas-fired thermal power capacity will reach 37,330 MW out of 150,489 MW, including domestic and imported sources. This bet is risky; the international markets are volatile and domestic supplies uncertain. Projects could face delays or become stranded assets due to a shortage of affordable LNG.
- **Encourage consumers to produce their electricity**: The PDP8 prioritizes solar power on households' rooftops or for self-consumption by industries for unlimited capacity development, as long as it does not require grid upgrades.

The plan estimates that $134.7 billion is needed for electricity sources and transmission infrastructure development between 2021 and 2030, going into the range

from $399.2 to $523.1 billion for the following twenty years. The PDP8 establishes two inter-regional renewable energy manufacturing and service centers to boost the local green economy. They are meant for Vietnam to excel in electricity generation, transmission, consumption, and renewable energy equipment manufacturing and services. The government will soon allow private companies to purchase electricity directly from renewable energy producers, and it will launch auctions to secure solar and wind energy at competitive prices.

The plan also recognizes the opportunity to mobilize capital and expertise with international collaboration, such as the Just Energy Transition Partnership, a $15.5 billion green financial pledge agreed to with the G7 and other wealthy countries in December 2022. Renewable energy could make up 20.9 – 39.2% of electricity production, with sectoral CO2 emissions reaching 204-254 million tons in 2030. But with the support of international partners, the share of renewable energy could get 47%, and greenhouse gas emissions stay under 170 million tons.

The situation's urgency will stress developers, contractors, and government officials: there are only seven years to 2030. Coordinating grid-connection schedules with the new power plant construction, ensuring reliable fuel supply and logistics, and keeping regulatory reforms on time are immensely challenging. Nevertheless, the plan's flexibility regarding renewable energy development is a safety net in case the gas-to-electricity ideas are too late to materialize.

Feedback from our colleagues indicates an overwhelmingly positive and enthusiastic response to the PDP8 signature. Everybody sees the plan as a significant step towards the country's sustainable growth and green energy transition. They commend the ambitious targets for renewable energy, particularly wind energy, and view this as the beginning of a new era in Vietnam's power sector.

However, they also highlight the importance of establishing concrete legal frameworks and actionable procedures to translate these aspirations into tangible initiatives. Recognizing that the approval of PDP8 is only the first step, much work lies ahead to achieve the plan's goals. This awareness tempers the initial excitement, emphasizing the need for concerted efforts and sustained commitment to turn the vision of a sustainable, net-zero future into a reality.

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