

Sector Note

Power

PDP8 - a turning point for the industry

- In 15 May 2023, the Power Development Plan 8 (PDP8) was officially approved, opening up a new chapter for Vietnam power sector.
- Under the strong energy transition scenario, large financial pressure to meet demand for power development.
- We see M&E and RE EPC contractors to be benefited soonest under the PDP8, following by wind power and gas-fired power plants developers.

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After the strong commitment in the COP26, and the recent COP27, targeting “net-zero” goal in 2050, Vietnam government has shifted its view from PDP7 revise to a more intense green transition in the PDP8:

- **For coal-fired power**, the official PDP8 finally remove total 13,220MW, putting an end for the coal-fired era. Coal-fired power will increase 2% CAGR over 2023-30F then decrease -1% CAGR over 2030-50F, accounting for 19% and 4% in 2030-50F, respectively.
- **For gas-fired power**, the energy sources will become the major spearhead over 2021-30 period with CAGR of 26%, accounting for 27% total capacity. From 2030-50 period, gas-fired power development will slow down at 4% CAGR and accounting for total 15% in 2050F.
- **For wind power**, this energy sources will become the main target in both short and long term. Onshore wind power will grow at 25% CAGR over 2021-30F and 6% CAGR in 2030-50F, accounting for 14% and 13% total capacity in 2030-50F, respectively. On the other hand, there will be the first 6,000MW offshore wind power on board in 2030F, before surging 15% CAGR in 2030-50F, accounting for 16% total capacity.
- **For solar power**, the energy sources will postpone under excessive growth over 2020-21 period. However, the PDP8 still encourage unlimited growth of solar power for self-use purposes. Therefore, solar power will grow modestly over 2021-30F then thriving at 12% CAGR from 2030F onward, accounting for 33% total capacity in 2050F.

Higher capital requirement in order to actualize green ambition

Capital demand for power capacity reach US\$114bn in 2021-30 period, allocating majorly on gas-fired and onshore wind power with 30% and 35% total capital need, respectively. In 2031-50 period, total capital for capacity development will reach US\$495bn, with wind power require the most of 63% total capital, follow by the comeback of solar power (18%). Capital needs for power grid development accounting for about 11%-7% of the total power sector investment in 2021-30F and 2031-50F period, respectively. In our perspective, the PDP8 has concluded a “sufficient and green” plan, but it may be more difficult to implement than the amended PDP7 with strong emergence of gas-fired and RE power, while hydrogen, ammonia technologies for thermal plants are still being explore and not yet marketed.

We name some of the players who will benefit from PDP8

We see PC1, FCN, TV2 – listed outstanding M&E and RE contractors to benefit soonest thanks to the high workload under the PDP8. PVS is another heavyweight contestant in long-term thanks to its participation in offshore wind power construction. Gas-fired power plant developers that own project included in the PDP8 will have brighter outlook such as Nhon Trach 3&4 (POW), LNG Long Son (PGV, TV2) and O Mon III, IV (Genco 2). GAS is also a key beneficiary in the LNG-to-power transition with the LNG terminals projects. As the PDP8 favour for wind power, it is the opportunity for top RE players such as Trung Nam, BCG, REE, GEG enlarge their portfolio. However, we see the major affection on the RE outlook will come from new price framework, which has not yet to be cleared up. Besides, we expect PDP8 approval to boost long-stalled, multibillion-dollar gas field projects like Block B and Blue Whale in coming years.

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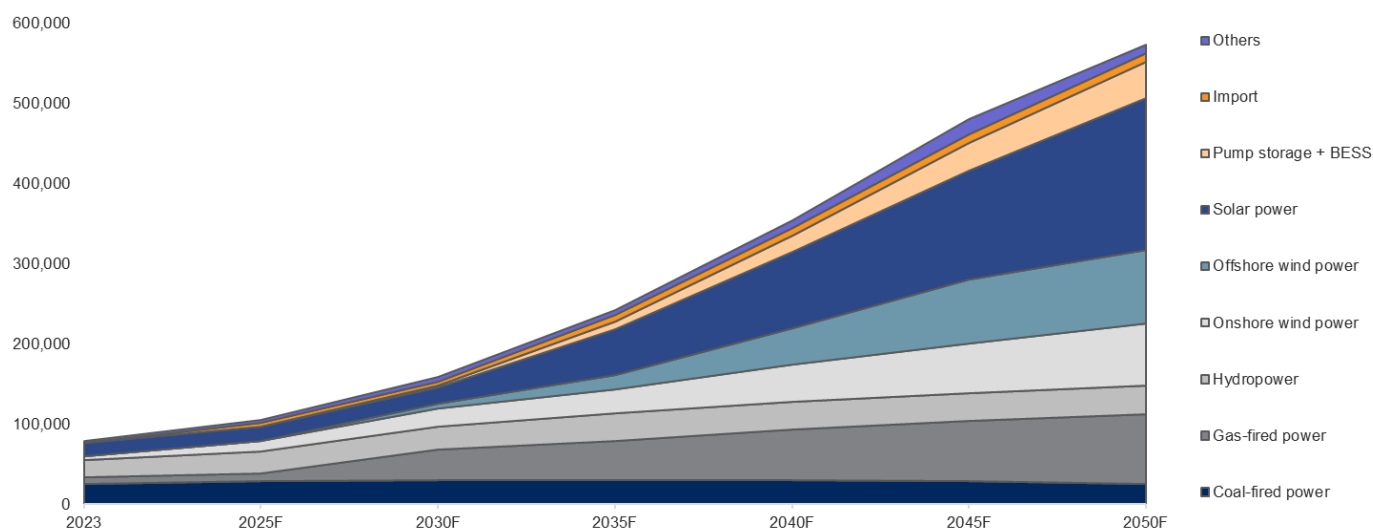
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PDP8 marks a turning point for the industry

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After the strong commitment in the COP26, and the recent COP27, targeting “net-zero” goal in 2050, Vietnam government has shifted its view from PDP7 revise to a more intense green transition in the PDP8. Accordingly, the PDP8 official has been assessed more comprehensively, accounting for more complex power sources. Basically, PDP7 and PDP8 are both built to meet the economic development scenario with GDP growth at 7% CAGR and power consumption growth at averaging 9% CAGR over 2021-30. However, capacity structure has changing toward cleaner solution in order for Vietnam fulfill the 2022 Just Energy Transition Partnerships (JETP) agreement:

Figure 1: The new PDP8 favoring toward gas-fired and wind power over 2021-30 period, after focusing on RE power from FY30F onward (MW)



Source: VNDIRECT RESEARCH, PDP8

- **For gas-fired power**, the energy sources will become the major spearhead over 2021-30 period with CAGR of 26%, the highest growth among peers and accounting for 27% total capacity. Similar to coal-fired power, in order to fasten clean transition, gas-fired power also must to convert a part of its input to hydrogen combustion after 20 years. From 2030-50 period, gas-fired power development will slow down at 4% CAGR and accounting for total 15% in 2050F.
- **For wind power**, thanks to Vietnam massive potential for RE power, this energy sources will become the main target in both short and long term, especially when Vietnam has clear incentive to meet JETP standards to raise green capital. Onshore wind power will grow at 25% CAGR over 2021-30F and 6% CAGR in 2030-50F, accounting for 14% and 13% total capacity in 2030-50F, respectively. On the other hand, there will be the first 6,000MW offshore wind power on board in 2030F, before surging 15% CAGR in 2030-50F, accounting for 16% total capacity.
- **For solar power**, the energy sources will postpone under excessive growth over 2020-21 period. However, the PDP8 still encourage unlimited growth of solar power for self-use purposes. Therefore, solar

power will grow modestly over 2021-30F then thriving at 12% CAGR from 2030F onward, accounting for 33% total capacity in 2050F.

- **For coal-fired power**, the official PDP8 finally remove total 13,220MW, putting an end for the coal-fired era. Moreover, the new plan has also taken into account for 6,800MW coal-fired power that facing difficulties in capital arrangement by increasing reserve from higher portion of wind and gas-fired power. 40-years old power plants will be erased and the new plants gradually convert a part of its input to biomass and ammoniac after 20 years of operation. Under the official PDP8, coal-fired power will increase 2% CAGR over 2023-30F then decrease -1% CAGR over 2030-50F, accounting for 19% and 4% in 2030-50F, respectively.
- **Hydropower** capacity grow at 1% CAGR over 2021-50 period as the energy sources potential has reach its limited, with only minimal growth space for small and medium hydropower. On the other hand, the PDP8 has boldly taken into account other flexible power sources including pump-storage hydropower, battery energy storage and biomass. We believe these additional sources will strengthen Vietnam power system reliability in long-term.

Higher capital requirement in order to actualize green ambition

Figure 2: Capital requirement will high under the strong energy transition, allocating major on wind power (Unit: US\$bn)

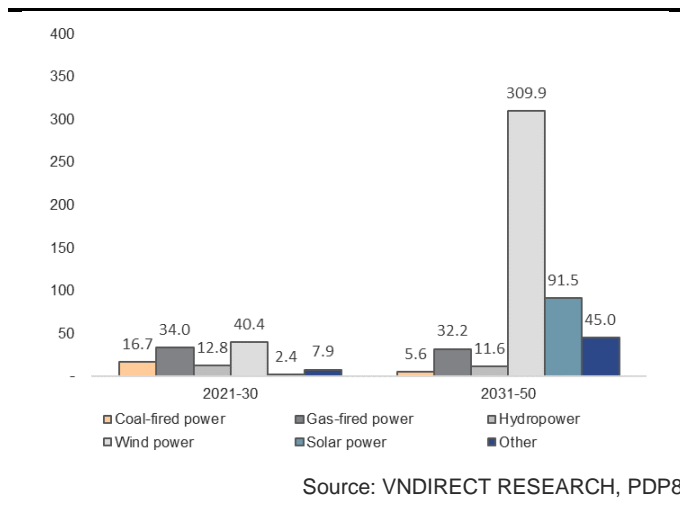
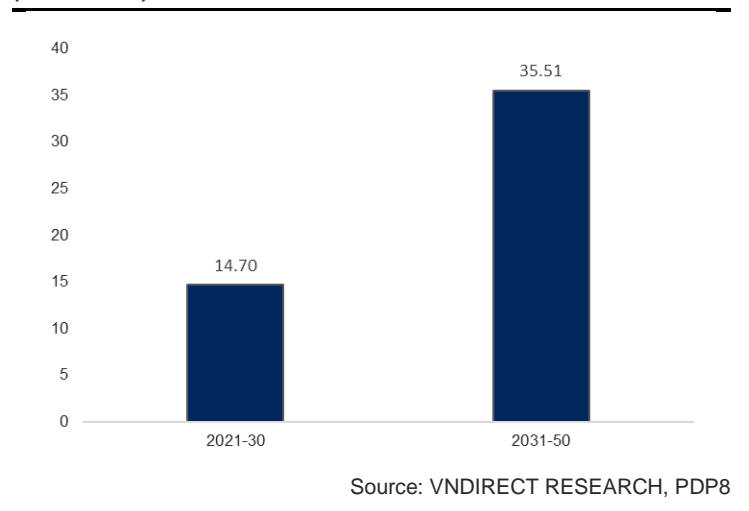


Figure 3: Capital needs for power grid development accounting for about 11%-7% of the total sector investment in 2021-30F and 2031-50F (Unit: US\$bn)



Under the strong energy transition scenario, large financial pressure to meet demand for power development. In comparison to the PDP7, this scenario will dramatically cut fossil fuel imports, enhance electrical supply security, and minimize electricity import burden. However, the energy conversion scenario will raise the investment cost for power system by around 25-32% in 2021-50 period, depending on each load scenarios. In our perspective, the PDP8 has concluded a “sufficient and green” plan, but it may be more difficult to implement than the amended PDP7 with strong emergence of gas-fired and RE power, while hydrogen, ammonia technologies for thermal plants are still being explore and not yet marketed.

In particular, total investment demand for power capacity reach US\$114bn in 2021-30 period, allocating majorly on gas-fired power and onshore wind power with capital need grabbing 30% and 35% total capital, respectively. Coal-fired also account for high capital need of 15% total capital. In 2031-50 period, total capital for capacity development will reach US\$495bn, with wind power require the most of 63% total capital, follow by the comeback of solar power (18%). On the other hand, capital needs for power grid development accounting for about 11%-7% of the total power sector investment in 2021-30F and 2031-50F period, respectively.

We name some of the players who will benefit from PDP8

Figure 4: Outstanding coal-fired power projects that confirmed to developed over 2021-30 period

Power plant	Capacity (MW)	Progress	Investor
Na Duong II thermal	110	2021-25	TKV
An Khanh - Bac Giang	650	2021-25	NA
Vung Ang II thermal	665	2021-30	Kepco - Mitsubishi
Van Phong I thermal	1432	2021-25	Sumitomo Corp
Long Phu I thermal	1200	2021-25	PVN
Quang Trach I thermal	1200	2021-25	GENCO 2

Source: VNDIRECT RESEARCH, PDP8

Figure 5: Outstanding gas-fired power projects that included in the PDP8 with high chance to develop during 2021-35F period

Power plant	Capacity (MW)	Progress	Investor
LNG power plant			
Nhon Trach 3&4	1600	2021-30	PVPower
LNG Hiep Phuoc I	1200	2021-30	Hai Linh Company Limited
LNG Bac Lieu	2400	2021-30	Delta Offshore Energy
LNG Quang Ninh I	1500	2021-30	PVPower - Colavi - Tokyo Gas - Marubeni
LNG Thai Binh	1500	2021-30	TTVN Group - Tokyo Gas - Kyuden
LNG Nghi Son	1500	2021-30	Milennium (USA)
LNG Quynh Lap	1500	2021-30	Bidding
LNG Quang Trach	1500	2021-30	EVN
LNG Hai Lang	1500	2021-30	T&T Group - Hanwha - Kospo - Kogas
LNG Ca Na	1500	2021-30	Bidding
LNG Son My II	2250	2021-30	AES Group
LNG Son My I	2250	2021-30	EDF - Sojitz - Kyushu - Pacific Group
LNG Long Son	1500	2031-35	PGV - TTC - TV2 - Mitsubishi - GE - GTPP
LNG Long An I	1500	2021-30	VinaCapital - GE
LNG Long An II	1500	2031-35	VinaCapital - GE
Domestic gas-fired power plant			
O Mon III, IV (Lo B)	2100	2026-27	EVN (Genco 2)
O Mon II (Lo B)	1050	2027	Vietracimex - Marubeni
Dung Quat I, II, III (CVX)	2250	2028	NA
Mien Trung I, II (CVX)	1500	2028	PVN

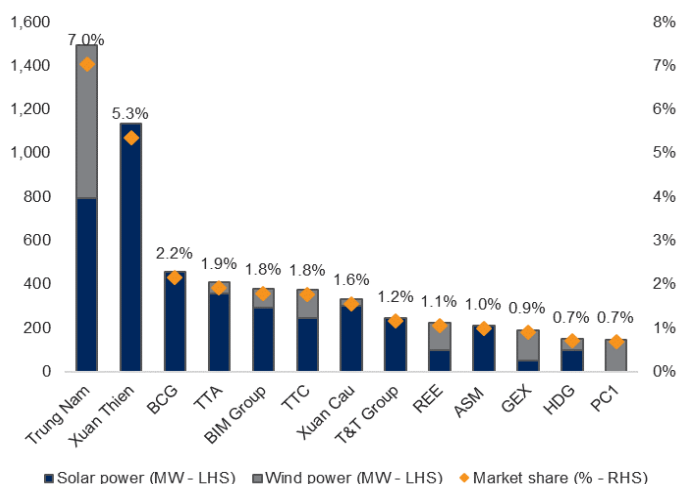
Source: VNDIRECT RESEARCH, PDP8

Figure 6: Requirement for new build and upgrade power grids will gradually increase over 2021-45F

Unit		High-load scenario	
		2021-30 period	2031-45 period
500kV substation			
New build	MVA	46,650	66,600
Upgrade	MVA	37,800	99,450
500kV transmission line			
New build	km	12,490	7,760
Upgrade	km	1,324	801
220kV substation			
New build	MVA	74,275	84,125
Upgrade	MVA	34,497	82,625
220kV transmission line			
New build	km	16,061	8,245
Upgrade	km	6,484	304

Source: VNDIRECT RESEARCH, PDP8

Figure 7: Some of the top RE players will likely to stay ahead in the next development phase of RE power



Source: VNDIRECT RESEARCH

We see the PDP8 clearing the picture for Vietnam power sector, as well as opening up a bright opportunity for power enterprise to growth in the upcoming years. We noted down some of the promising segment that benefited under the PDP8:

- We see power plant contractors to be benefited soonest thanks to the high workload under the PDP8 sharp capacity development, especially among gas-fired and RE power. We see power M&E activities will also grow sharply in the upcoming year, correspondingly with the fast rise of power sources. However, we see the major affection on the RE development outlook will come from new price framework for this energy sources, which, at the moment, has not yet to be cleared up. We see some of the outstanding M&E and EPC contractors such as PC1, FCN and TV2 will be the first companies to enjoy this trend. For a longer term, PVS will enjoy from offshore wind power development thanks to its offshore construction capacity as well as experiences in participating in some offshore wind power recently (Thang Long, La Gan...)
- We see the gas-fired power in general and LNG-to-power specifically contains several promising listed names that own a new development projects including Nhon Trach 3&4 (POW), LNG Long Son (PGV, TV2) and O Mon III, IV (Genco 2). We believe GAS is also a key beneficiary in the LNG-to-power transition in PDP8 with the LNG terminals projects.
- We expect PDP 8 approval to be the motivation to boost long-stalled, multibillion-dollar gas field projects like Block B and Blue Whale in coming years, ensuring domestic gas sources and reduce imported LNG for power generation in Vietnam.

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Stock Ratings

Definition:

Add	The stock's total return is expected to reach 15% or higher over the next 12 months.
Hold	The stock's total return is expected to be between negative 10% and positive 15% over the next 12 months.
Reduce	The stock's total return is expected to fall below negative 10% over the next 12 months.

The total expected return of a stock is defined as the sum of the: (i) percentage difference between the target price and the current price and (ii) the forward net dividend yields of the stock. Stock price targets have an investment horizon of 12 months.

Sector Ratings

Definition:

Overweight	An Overweight rating means stocks in the sector have, on a market cap-weighted basis, a positive absolute recommendation.
Neutral	A Neutral rating means stocks in the sector have, on a market cap-weighted basis, a neutral absolute recommendation.
Underweight	An Underweight rating means stocks in the sector have, on a market cap-weighted basis, a negative absolute recommendation.

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