Sector note

08 December 2022

POWER: GEARING TOWARD GREEN

- Vietnam's power sector is eagerly waiting for the official announcement of the PDP8 and renewable energy (RE) price mechanism to start a new development phase.
- Thermal power plants likely benefit from the downturn of hydropower into 2023-24F. RE power plants wait for a policy boost.
- Our stock pick including: PC1 and POW.

The PDP 8 and new RE price policy to start a new development phase

Vietnam's power development picture became clearer after several iterations. The Nov-22 draft stressed more intense wind power growth of 16% CAGR in 2022-45F; additionally erasing 6,800MW coal-fired power and stopping developed gas-fired power after 2035F with hydrogen switch condition after 10 years of operation. The new version addressed the continuation of only 726MW solar power that have chosen investors to avoid legal risk, while encouraging rooftop solar development for self-use purpose.

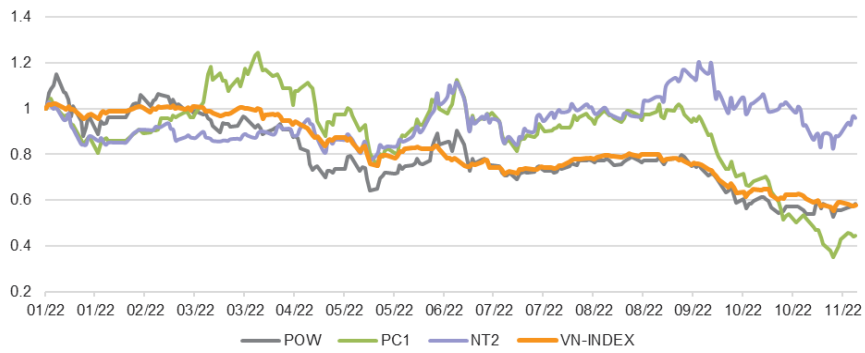
We see the PDP8 to be published at soonest 3Q23F, creating a premise for RE price mechanism to follow up. We see these two policies play a crucial role, opening up a playground for enterprises in the new development phase of Vietnam power segment. With an enormous potential and green nature, we see wind power to be the main highlight in 2022-30F, and gas-fired power – a stable energy source to be the companion, ensuring the system's safety.

2023-24F energy outlook and our stock picks

For 2023-24F, we estimate the remained high coal price to hamper coal-fired power output. However, we see lighter pressure for domestic coal-fired power plants in the North thanks to lower ASP and fast power demand growth of this region. We see hydropower will come out of its peak with the La Nina phase to end in 2023F. We expect gas-fired output continues to rise in 2023-24F, trailing the strong power consumption growth, and lower hydropower output. We believe POW, and NT2 will ride on this trend. For RE power, we see the untie of policy bottleneck to open up a big playground for large institutions. We think PC1, REE and BCG to be beneficial in this development phase. Our stock picks are PC1, POW.

Downside risks include: 1) Power consumption grows lower-than-expected, 2) The increasing trend of input price, putting pressure on thermal power plants, 3) The publishing of PDP8 and RE price mechanism are longer-than-expected; 4) Duo effect from interest rate and exchange rate loss hindered profit growth.

Figure 1: P/B performance of Power stock picks versus the VN-Index since 2022 to date



Source: Bloomberg, VNDIRECT RESEARCH

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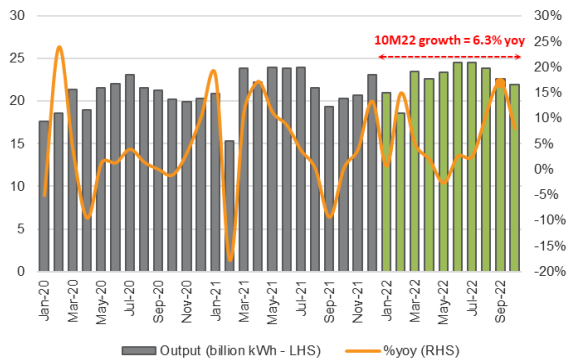
Vietnam Power 2022 snapshot

Electricity consumption grew at lower-than-expected rate of 6.3% yoy in 10M22

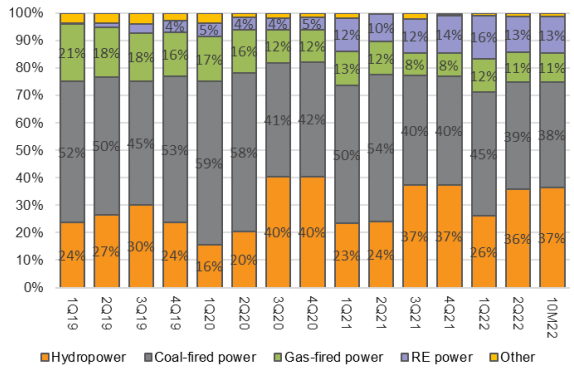
According to EVN, total electric production growth reached a high rate of 10.7% yoy and 16.9% yoy in August and September 2022 from its low base in 2021, thus, leading to 6.3% yoy of national power consumption of 204.5bn kWh in 10M22. However, the growth rate is still lower than GDP growth and also the forecasted level in the Power Development Plan 8 (PDP8) draft owing to 1) 2022 recorded unusual weather, thicker rainfall, and cooler temperature, in contrast with intense hot weather in 2021; 2) Some of the electricity-intensive industries, such as steel, recorded solid capacity decline due to lower demand in the context of property sector difficulties.



Source: EVN, VNDIRECT RESEARCH

Output mobilization breakdown by types of power sources in 10M22 (Unit: %)

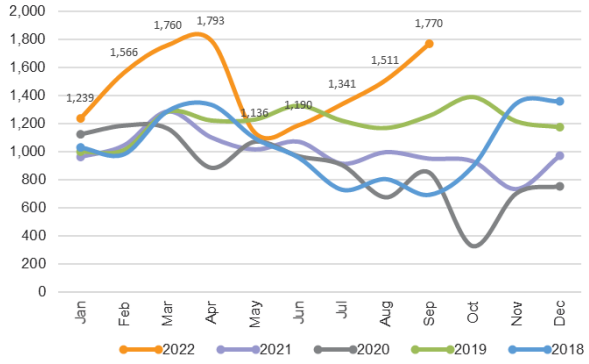
Thanks to ideal weather conditions, hydropower continued to record a vibrant output mobilization of 82bn kWh (+30% yoy), accounting for 37% total output. Coal-fired power recorded a gradual thinner output mobilization, reduced 14% yoy, and account for only 38% total output. It was due to the negative impact of coal price hike, causing capacity cut down in several imported coal power plants. RE power output rose 24% yoy, accounting for larger portion of 13% total capacity in 10M22 thanks to lighter curtailment ratio, and additional output from newly added 4GW wind power plants from Nov 2021. Gas-fired power output stay the same, edge up only 7% yoy and grabbed 11% total output due to the remained high gas price.



Source: EVN, VNDIRECT RESEARCH

Full market price (FMP) in the Competitive Generation Market (CGM) remained high due to larger mobilization from gas-fired power (Unit: VND/kWh)

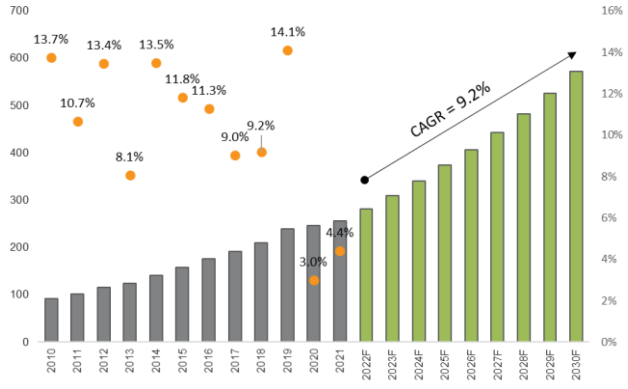
The average 9M22 FMP in the CGM reached VND1,478/kWh, increasing 41% yoy, in which, FMP price gradually shift up to VND1,770/kWh after the sharp drop in May. The 2022 system marginal ceiling price (SMP cap) issued at VND1,602/kWh (+6.5% yoy) creates an ideal condition for higher priced thermal power to bidding in the CGM market, especially in the high CAN price period. Therefore, higher thermal power output mobilized from the CGM has shifted the FMP to a very high level in 9M22.



Source: GENCO3, VNDIRECT RESEARCH

Solid power demand growth underpins sector outlook

We see Vietnam power sector will record a fast electricity consumption growth in 2022-30F period, following the expected high GDP growth. According to the PDP8 draft high-load scenario, power demand will increase at high forecasted CAGR of 9.2% in 2022-30F. We see this to be the primary factor to underpin power sector outlook thanks to more intense output mobilization in the upcoming years.



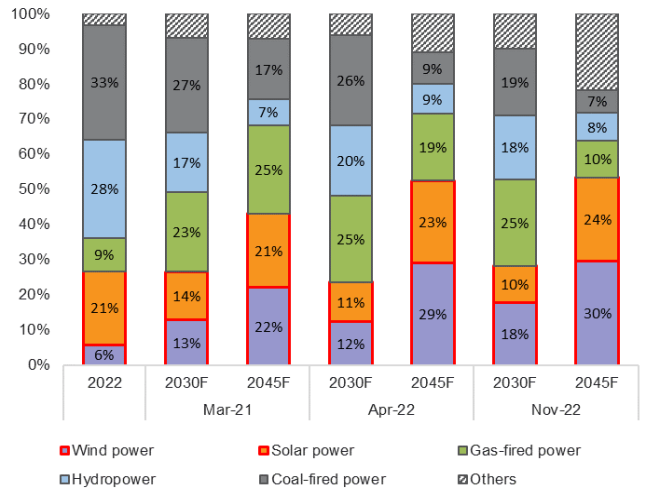
Source: VNDIRECT RESEARCH, PDP8 draft

Renewable power: Waiting for a policy boost

The newest PDP8 draft cemented renewable energy bright outlook

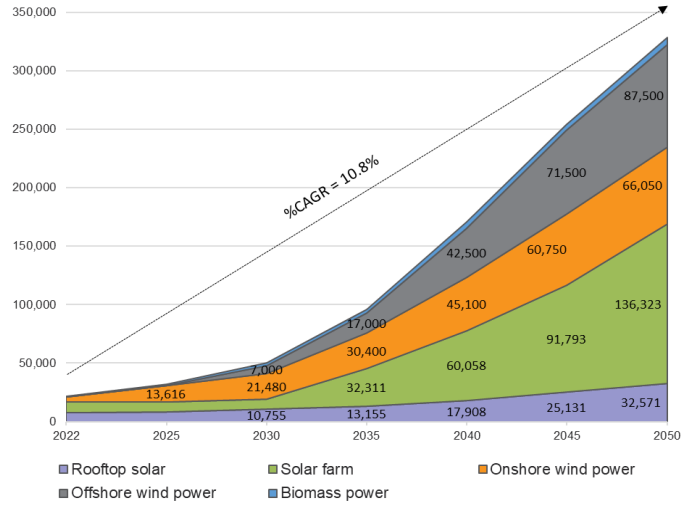
After several discussion sessions based on the spirit of Report No.2279/TTr-BCT dated April 29, 2022 (the PDP8 draft April 2022). The Ministry of Industry and Trade (MOIT) has continued to complete, carry out appraisal procedures, and submit to the Prime Minister the newest iteration – the Power Development Plan 8 draft (PDP8 draft) in November 2022. Accordingly, the newest draft has basically provided several valued pieces of information, in which, it continually favored renewable energy (RE power). We see RE to be the spearhead of Vietnam's power development in the long term.

Figure 2: The newest draft continued to enhance a larger portion of RE power in 2022-45F



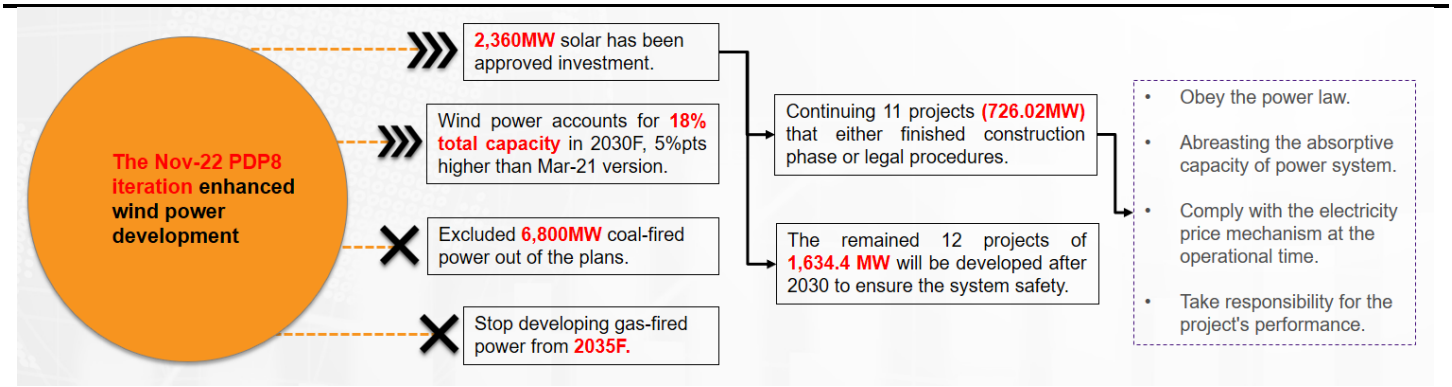
Source: PDP8 draft, VNDIRECT RESEARCH

Figure 3: RE power will be the major driver in Vietnam's power plan in 2022-45F (Unit: MW)



Source: PDP8 draft, VNDIRECT RESEARCH

Figure 4: The latest adjustments under the Nov-22 PDP8 draft

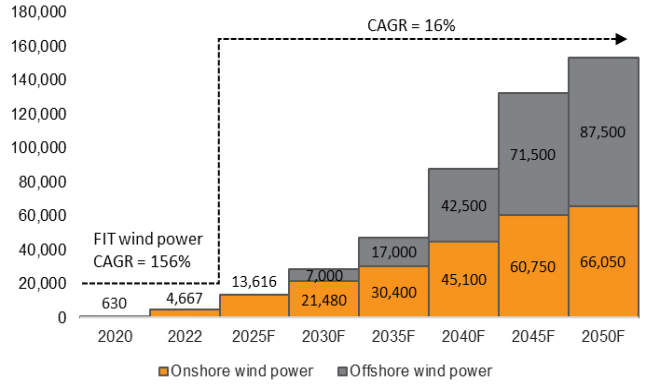


Source: VNDIRECT RESEARCH

For wind power, the Nov-22 PDP8 draft continued to enhance wind power with higher capacity portion in 2022-45F. We see a continuation fast-paced growth of wind power after the FIT policy expired in 2021. Accordingly, wind power capacity will rise at highest rate of 16% CAGR in 2022-45F period, in which, onshore wind power will bloom 4.6x to 21,480MW in 2030F after reaching 66,050MW in 2050F. On the other hand, we expect an initial 7,000MW of offshore wind power to be developed in 2022-30F, then start accelerating to 87,500MW in 2050F. Overall, wind power will grab 18% capacity weight in 2030F, 5%pts higher than the Mar-21 version, before absorbing highest portion

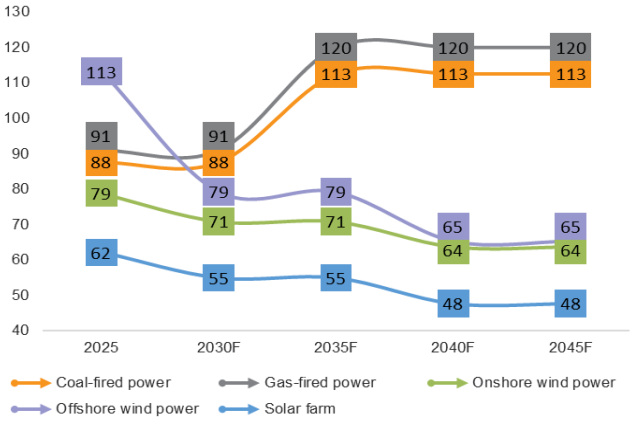
of 30% total capacity in 2045F. Moreover, we see the decreasing trend of the Levelized cost of electricity (LCOE) of wind power to benefit the explosion of this energy source. According to MOIT, although the investment cost of RE power sources is higher than traditional thermal sources, it is gradually dropping thanks to the improvement of capacity factor and economies of scale. On the other hand, thermal power LCOE is expected to rise following higher input prices and technological advancements to reduce emissions.

Figure 5: Wind power will grow at the highest CAGR of 16% in 2022-45F (Unit: MW)



Source: PDP8 draft, VNDIRECT RESEARCH

Figure 6: RE power LCOE will gradually drop while thermal power LCOE will surge due to higher input price (Unit: US$/MWh)



Source: PDP8 draft, VNDIRECT RESEARCH

For solar farms, after excessive growth in 2019-21 period, grabbing 21% total capacity in 2022, solar power will postpone until 2030F. Notably, the 2,360MW of delayed solar project that was proposed to continue developing in the Oct-22 iteration has been adjusted down in the Nov-22 version. Under the firm view to limited solar growth in 2022-30F from the government, MOIT has reviewed and suggested to continue deploying 11 projects of 726.02MW that either finished the construction phase or fulfilled legal procedures. The remaining 12 projects of 1,634.4MW that are in the stage of preparing procedures and FS will be delayed until after 2030F to ensure system safety. Although these projects are currently not included in the power plan, we see the continuation of these to be reasonable to avoid legal risk, as well as future lawsuits and investor compensation. Besides, the new PDP8 draft encouraged **rooftop solar** for self-use purposes with additional 3,000MW in 2022-30F. Under the direction of the Prime Minister, the MOIT is developing a mechanism to support the development of such projects.

Overall, we see the solar power outlook will return from 2030F onward, after being slowed down in 2022-30F. Its capacity will reach around 45,400MW in 2030-35F then accelerate to 168,000MW in 2045F, accounting for 24% of total power capacity.

EVN has submitted the price mechanism for transitional projects – the first disassembly signal for investors

We see a crucial factor to enhance RE developers' outlook is the ability to grow capacity, which is currently hindered under no clear RE price mechanism after the FIT expired. We believe that with very clear guidance from the PDP8 draft, focusing on RE capacity growth is an inevitable trend. Therefore, urgently publishing an official price mechanism will remove the bottleneck for RE investment, creating favorable conditions for Vietnam to achieve the strong capacity growth target.

Figure 7: In Nov-22, EVN submitted the price mechanism for transitional projects

	Option 1	Option 2	Option 3	Option 4	EVN suggestion
Price (VND/kWh)					
Solar farm	1,482.7	1,508.4	1,508.8	1,188.0	**1,188.0**
Floating solar	1,740.8	1,569.8	NA	NA	**1,569.8**
Onshore wind power	1,590.9	1,597.6	1,630.2	NA	**1,590.9**
Nearshore wind power	1,971.1	1,944.9	1,974.0	NA	**1,944.9**
Estimation methodology	Basing on guidance in the Circular No. 15/2022/TT-BCT	Same as Option 1, except for using average investment cost/MW	Same as Option 1, except for using output and investment cost/MW assumption base on the Gauss standard.	Base on the information of Phuoc Thai 2, 3 (EVN solar farm)	**Minimum value from four options**

Source: EVN, VNDIRECT RESEARCH

At the moment, RE investors who missed the FIT date are suffering from cost loss while unable to sell electricity to the grid. However, there is a way out for these delayed projects. Following Circular No.15/2022/TT-BCT, EVN is coordinating with the MOIT to calculate the price band for transitional RE projects. Accordingly, it proposed a new price for each RE segment, applying the minimum value among 4 options. While the new wind power price is about 20-25% lower than the previous FIT price, solar farm prices plummeted by nearly 50% to only 1,188VND/kWh. In our perspective, although having a clearer policy somewhat reduces pressures for investors, suggesting an excessively low price might be not supporting enough for the transitional project to run efficiently. Whereby, we see a larger headwind for solar farms under the very low-price suggestion, while for transitional wind power projects, we see a brighter outlook thanks to remained high price.

We think the publishing of this price draft to be a crucial step, untying the bottleneck that has been stuck for a while and at the same time, provoking the following steps to be handled more urgently. We see the new mechanism creates a premise for FIT-delayed investors to negotiate a new PPA contract with EVN, and at the moment, this framework has been submitted to the MOIT for overview and further discussions. Along with that, the MOIT is also coordinating with other related departments to finalize the issuance of either the pilot Direct Power Purchase Agreement (DPPA) mechanism or the bidding mechanism to create a legal corridor for future RE project negotiation.

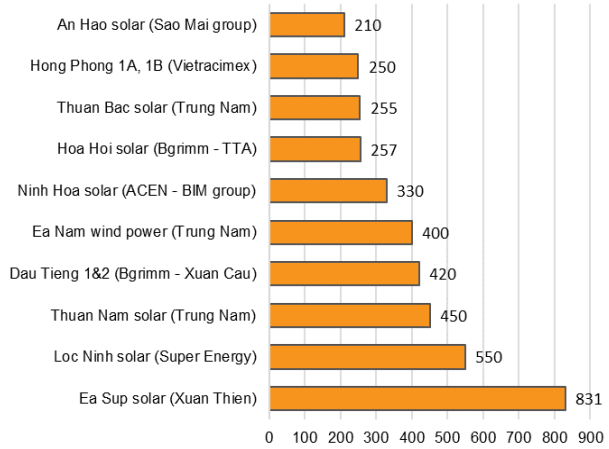
Wind power will be the mainstream in post-FIT period. Who will seize this opportunity?

Unlike the FIT time during 2019-21, when private businesses, whatever the size, with or without experience, competed to participate in the RE market. We expect that time to be over, and the new price policy, regardless of the mechanism, will aim to be more competitive in a healthier manner. Whereby, enterprises that have advantages in scale, price negotiation, and access to capital will hold a great decisive factor to enhance their RE portfolio and grab larger pieces of the “pie”. We break down some of the factors that we think to be the main theme in the post-FIT era:

- Price and investment cost competition will be the major theme in the upcoming years, increasing the market efficiency and attracting actually capable institutions to join the industries.
- Enterprises with scale advantage will hold higher price negotiations, especially when the competitive retail market is shaping up.

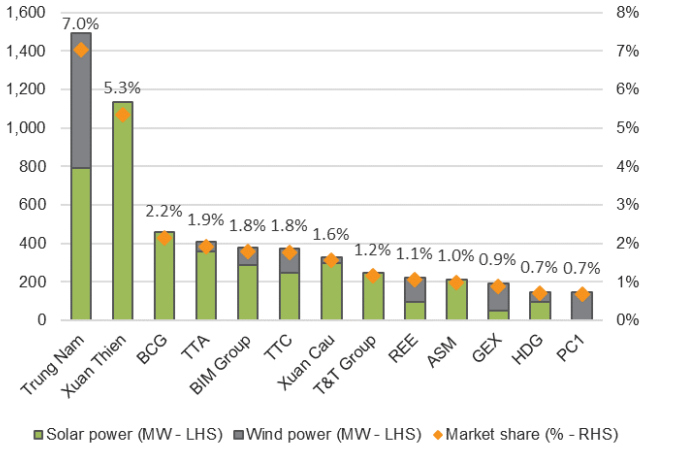
Enterprises with wealth of experience in developing and operating RE plants will hold larger bidding ability thanks to cost-saving capability and easier access to varied capital sources with low cost.

Figure 8: Top 10 Vietnam's current largest renewable projects by capacity (Unit: MW)



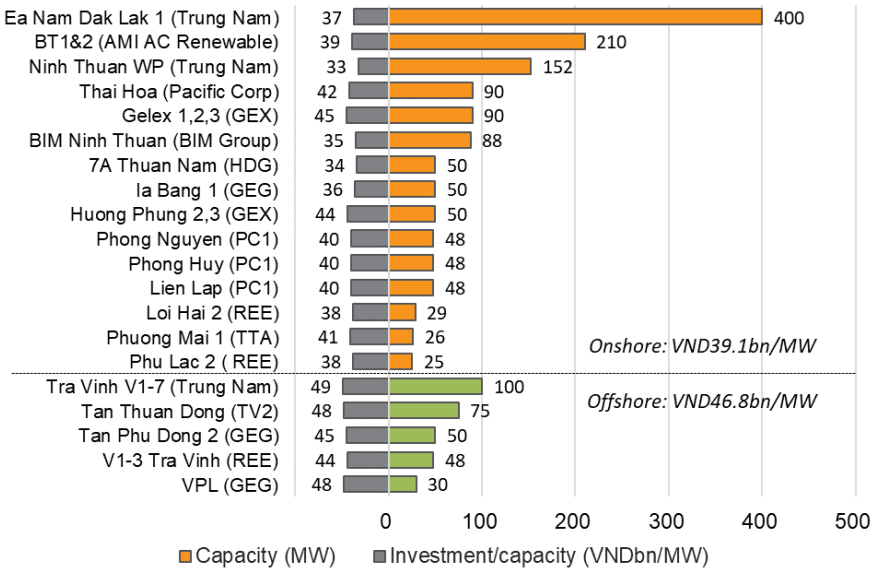
Source: COMPANY REPORT, VNDIRECT RESEARCH

Figure 9: Top local RE players in the market



Source: COMPANY REPORT, VNDIRECT RESEARCH

Figure 10: We see companies exposed with high wind power portfolios will stay ahead in the post-FIT race



Source: COMPANY REPORT, VNDIRECT RESEARCH

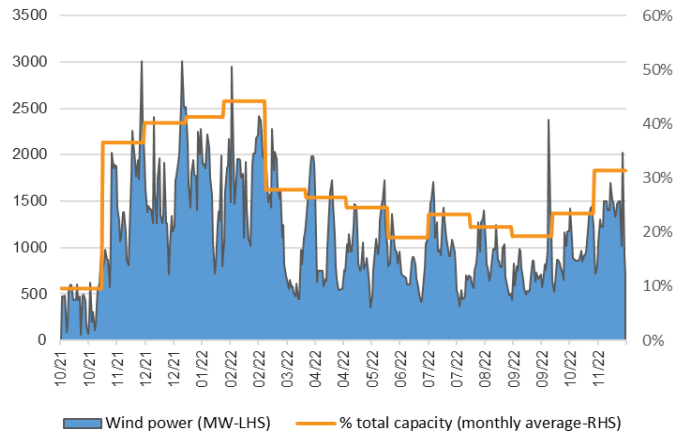
As wind power is no doubt to be the most vibrant sector in 2022-30F, regarding the firm orientation from the government, and supported by fast downtrend in investment cost, we see companies that satisfy the above categories will be benefited from this trend. We note down some of the top players with experience from large RE exposure in the FIT-time, as well as the ambition to expand its portfolio including BCG, GEG, PC1, TTA and GEX.

M&A is opportunity for RE players to refinance

Additionally, we see the trend of mergers and acquisitions (M&A) will play a vital role, in shaping Vietnam's energy market in the post-FIT period. As international investors have basically all seen the huge potential of Vietnam RE industries, several giants from Thailand, Philippines such as BCPG and AC Energy has lurked in our market through flexible investment forms either buying shares from operated plants or cooperating with domestic entities to invest new projects with no intention hiding their lust to own a "green asset" in Vietnam. As the energy picture is getting clearer, with RE power will become mainstream, we see more intense M&A activities in the following years. The competition level at this stage will be higher with various investors from several countries joining the market, domestic enterprises must prepare enough resources to be ready for the rapid growth of upcoming period.

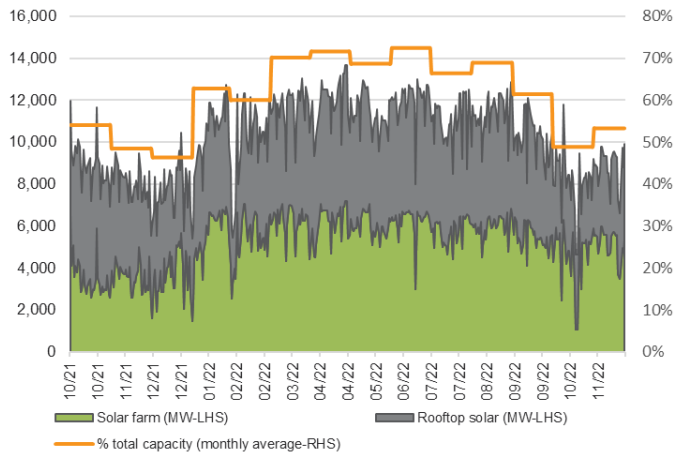
2023-24F outlook: we see a lighter curtailment for RE power from 2023F while 2024F outlook relies on the new price mechanism

Figure 11: Wind power is mobilized at a more intense rate during the monsoon season from November to March



Source: NLDC, VNDIRECT RESEARCH

Figure 12: Solar power capacity mobilization recorded thinner cutdown in 10M22



Source: NLDC, VNDIRECT RESEARCH

According to the data from National Load Dispatch Centre (NLDC) about the expected daily capacity mobilization by power sources, 9M22 solar capacity mobilized at around 60%-70% total capacity, higher than the level of around 50% total capacity in 4Q21. We see the strong increase of electricity demand in the upcoming years will gradually absorb the excess capacity in the South helping RE power to be mobilized at a more optimal rate. Besides, it noted that the fourth and first quarters to be the ideal times for higher mobilized wind power output. Usually, November to March is the time of monsoon season – a season with higher wind speed and denser windy hours, helping wind turbines operate at higher capacity and generate a major amount of electricity during this period. Therefore, we see 4Q22 and 1Q23F as usually an excellent time for wind power investors such as PC1, GEG, REE, GEX to record positive output results.

As the PDP8 has to be approved by the parliament, we expect the RE mechanism to be officially published in the soonest 3Q23F, triggering by the final PDP8. We see 2023F to be the steppingstone, marking a new development phase of RE power and setting the stage for new projects to start operating from 2024F. We note that the price mechanism is making not much progress and staying fuzzy at the moment. However, we see the pressure on the authorities to urgently come up with a new policy as soon as possible in order to meet the strong RE growth target.

Gas-fired output will improve in 2023-24F, underpin by strong power demand growth

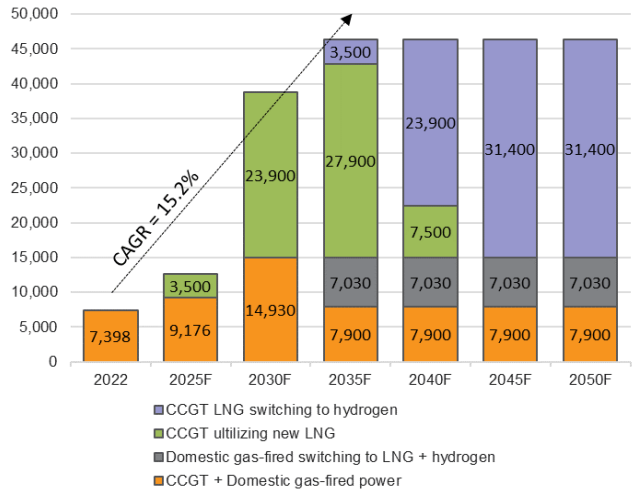
Following the newest PDP8 draft, gas-fired continued to be the highlight in 2022-35F period, before cutting off from 2035F

Figure 13: Some of the outstanding projects under the PDP8 draft

Power plant	2021-2025	2026-2030	Investment value	Investor
LNG power plant	**MW**	**MW**	**US$m**	
Nhon Trach 3&4	1,600		1,400	PVPower
LNG Hiep Phuoc I	1,200		820	Hai Linh Company Limited
LNG Bac Lieu	800	2,400	4,000	Delta Offshore Energy
LNG Quang Ninh I		1,500	1,880	PVPower - Colavi - Tokyo Gas - Marubeni
LNG Thai Binh		1,500	NA	TTVN Group - Tokyo Gas - Kyuden
LNG Nghi Son		1,500	NA	Milennium (USA)
LNG Quynh Lap		1,500	NA	Bidding
LNG Quang Trach		1,500	2,094	EVN
LNG Hai Lang		1,500	2,300	T&T Group - Hanwha - Kospo - Kogas
LNG Ca Na		1,500	3,850	Bidding
LNG Son My II		2,250	1,800	AES Group
LNG Sơn Mỹ I		2,250	2,000	EDF - Sojitz - Kyushu - Pacific Group
LNG Long Son		1,500	3,780	PGV - TTC - TV2 - Mitsubitshi - GE - GTPP
Domestic gas-fired power plant				
O Mon I* (Lo B)	660		NA	EVN (Genco 2)
O Mon III, IV (Lo B)	2,100		2,504	EVN (Genco 2)
O Mon II (Lo B)	1,050		1,310	Vietracimex - Marubeni
Dung Quat I, II, III (CVX)		2,250	2,348	NA
Mien Trung I, II (CVX)		1,500	1,674	PVN

Source: PDP8 draft, VNDIRECT RESEARCH

Figure 14: Gas-fired will grow at a fast pace in 2022-30F before cutting off from 2035F (Unit: MW)



Source: PDP8 draft, VNDIRECT RESEARCH

Under the direction of the latest PDP8 draft, 2022-35F period will be a strong development phase for gas-fired power after stop developing in the post-2035F period. Total gas-fired capacity will surge from 7,300MW in 2022 to 46,330MW in 2035F with an estimated CAGR of 15.2%.

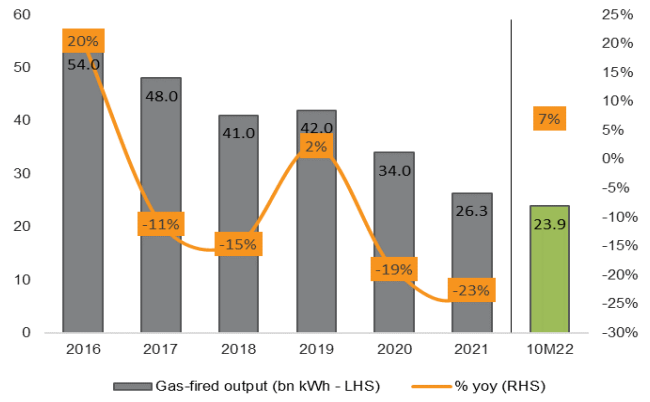
Domestic gas-fired power will double to 14,930MW in 2030F with major contributions from the O Mon cluster (3,810MW), Dung Quat (2,250MW), and Mien Trung cluster (1,500MW). However, under sharp clean energy transition will, domestic gas-fired power must gradually convert to LNG + Hydrogen input after 10 years of operation. LNG power capacity also rises sharply, initiating with 3,500MW in 2025F and then surging up to 27,900MW in 2035F. Furthermore, similar to domestic gas-fired power, the new LNG plants also convert to partly used hydrogen after 10 years and then gradually switch to combust entirely by hydrogen after 20 years of operation. During the blooming phase of gas-fired power, several domestic corporations will ride on this trend, led by POW with Nhon Trach 3&4 – the first Vietnam's LNG gas-fired power. Besides, several ambitious projects with the participation of domestic enterprises are being actively implemented, including LNG Quang Ninh (POW), LNG Hai Lang (T&T Group), LNG Long Son (PGV, TV2).

10M22 gas-fired output grew humbly due to lower-than-expected power consumption growth

Gas-fired power segment recorded a decreasing trend in output mobilization from 2016 to 2021 due to the gradual gas depletion while the new gas fields have more complicated exploitation, leading to higher gas input prices. However, we see the breakpoint in 2022, after gas-fired output reached low-base in 2021 when suffered from the modest power demand during Covid-19. Therefore, although gas-fired power output has not recovered as sharply as expected due to lower-than-expected power consumption growth and

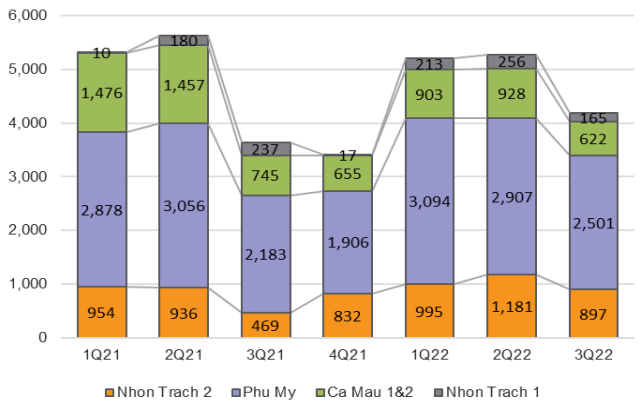
remained high gas price, its output still slightly rose 7% yoy to 23.9bn kWh, with a clear segregation between power plants. Nhon Trach 2 recorded a strong output mobilization in 9M22 thanks to the plant's high efficiency. Nhon Trach 1 while still suffering from low output mobilization, it still recorded a high output rebound from a very low level in 2021. On the other hand, Ca Mau 1&2 output declined significantly due to a large overhaul schedule and gas shortage.

Figure 15: 10M22 gas-fired mobilization edged up modestly 7% yoy due to lower-than-expected power demand growth



Source: EVN, VNDIRECT RESEARCH

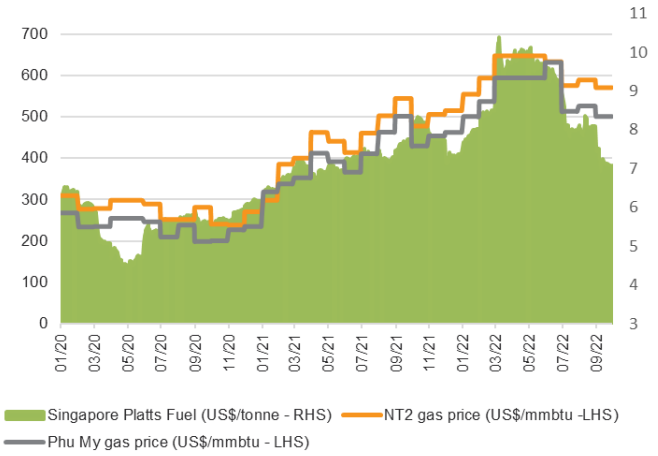
Figure 16: Several gas-fired power plants recorded a solid output improvement in 9M22 from humble mobilization on 2H21



Source: COMPANY REPORT, VNDIRECT RESEARCH

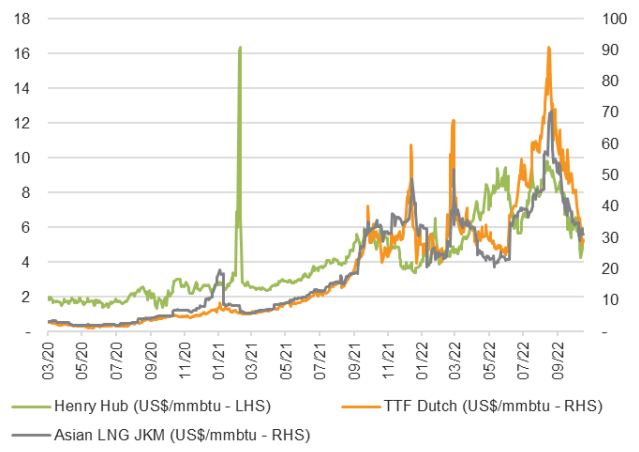
2023-24F outlook: Gas price will be more favorable for the industry

Figure 17: Domestic gas-fired price drop following the downtrend of the Singapore Platt FO



Source: GENCO3, BLOOMBERG, VNDIRECT RESEARCH

Figure 18: International gas price drop thanks to a solid effort from Europe to stock gas as well as expected warmer winter



Source: BLOOMBERG, VNDIRECT RESEARCH

The Singapore Platts Fuel oil price has dropped 54% from its peak to US$380/tonne in September, the lowest point since 2022. Accordingly, Vietnam's domestic gas price, which calculates based on the Singapore Platts Fuel oil (46%*FO) has dropped correspondingly. In particular, we see NT2 and Phu My gas price decline 14% and 16% from the May peak to 9.08US$/mmbtu and 8.35US$/mmbtu in September. Besides, after a bullish run from 2020, following several supply disruptions events, including Covid-19 and the recent Ukraine-Russia conflict, the international gas price has dropped from mid-22 peak following the EU effort for gas stocking and lower demand from warmer-than-expected winter.

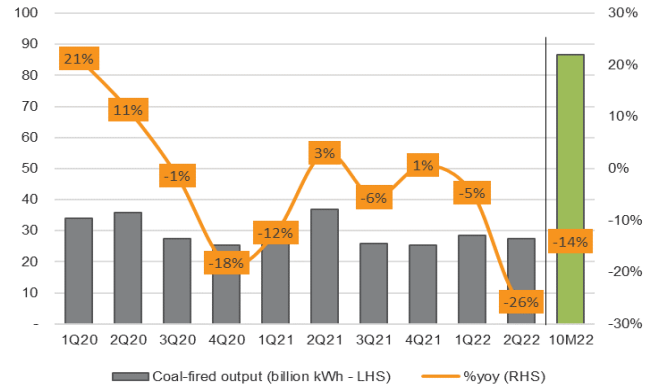
Following the gas price downtrend, we see this to be a positive new for gas-fired power segment in term of output mobilization as well as upcoming project implementation. Generally, the domestic gas price is anchored on the FO and moves closely with the Brent oil price. Therefore, we see lower Brent forecasted of US$90/barrel and US$80/barrel to release pressure on the price competitiveness of gas-fired power. Although domestic gas price is still locating at high level comparing to the 2-years average level, the price drop will narrow the price gap between gas-fired power and coal-fired power, especially in the context of international coal price hike. We expect higher demand for gas-fired power in 2023-24F, underpin by strong power consumption growth of 8.2% and lower hydropower output after coming out of its favorable weather condition. Besides, we believe that lower international gas price will be the opportunity for smoother price negotiation of the upcoming project, which has struggled in the past period.

Coal-fired power outlook faded after drastic cut in the PDP8 draft

10M22 coal-fired output dropped owing to the coal price hike

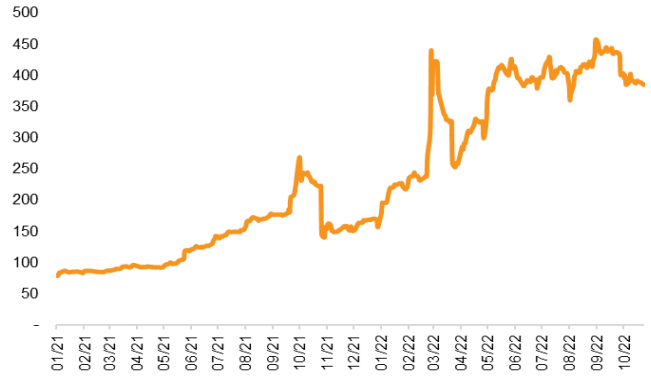
Coal-fired power output fell 14% yoy to 86.5bn kWh in 10M22 due to 1) Power demand grew below forecasted level, following cooler hot season and electricity-incentive sector such as steel cutting down capacity because of lower demand; 2) Coal price hike regarding the supply disruption during the Ukraine – Russia conflict, thus, making it difficult for new imported and mixed coal power plant to compete with the other cheaper power source, especially in the context of favorable hydrology and additional RE capacity. We see the differentiation between Northern and Southern power plants, of which, the North such as QTP, HND, Mong Duong (PGV) recorded positive output while due to the excess capacity situation in the South, some of the plants in this region suffered from the lower output, including Vung Ang, Vinh Tan.

Figure 19: 10M22 Coal-fired power output dropped 14% yoy, following coal price hike, and 1H22 coal shortage



Source: EVN, VNDIRECT RESEARCH

Figure 20: Coal price hike following a series of events, led by the China lockdown and Ukraine-Russia conflict (Unit: US$/tonne)



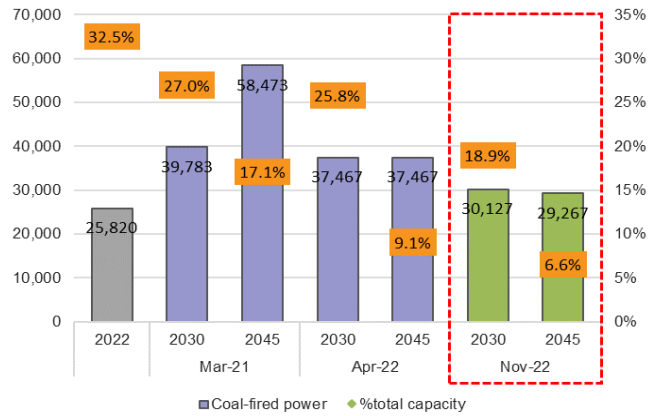
Source: BLOOMBERG, VNDIRECT RESEARCH

Coal-fired power is facing both short-term and long-term issues

In the context of remained high imported coal prices, it is hard to expect a sharp output recovery of this sector from 2023F, especially for new operated coal-fired power plants using imported coal such as Nghi Son II, Song Hau I thermal. However, we see a brighter prospect for coal-fired power plants using domestic and mixed coal for combustion in 2023-24F, as we see a lighter pressure in terms of price on these plants. Besides, we expect coal-fired power plants in the North will record denser mobilization regarding the strong forecasted power consumption growth of this region in the following years, while the Southern power plants might be faced more intense competition due to the excess

capacity situation in this region. Coal-fired power still plays an essential role as a reliable background source with cheap prices in short and medium term to ensure the adequacy of the power system and we see QTP and HND might be benefited from this trend.

Figure 21: Coal-fired capacity continues to drop 6,800MW after being reviewed and addressed in the new PDP8 draft (Unit: MW)



Source: PDP8 draft, VNDIRECT RESEARCH

Figure 22: Outstanding coal-fired power under the PDP8

Power plant	Capacity (MW)	Progress	Investor	Note
Na Duong II thermal	110	2021-25	TKV	
An Khanh - Bac Giang	650	2021-25	NA	
Thai Binh II thermal	1,200	2021-25	PVN	Overall finished 94%
Nghi Son II thermal	1,330	2021-25	Kepco - Marubeni	Operating from July, 2022
Vung Ang II thermal	665	2021-30	Kepco - Misubishi	
Van Phong I thermal	1,432	2021-25	Sumitomo Corp	Finished at Dec-22
Duyen Hai II thermal	1,320	2021-25	Janakuasa	Operating from 2021
Long Phu I thermal	1,200	2021-25	PVN	
Song Hau I thermal	1,200	2021-25	PVN	Operating from April, 2022
Quang Trach I thermal	1,200	2021-25	GENCO 2	Extended to 1400MW

Source: PDP8 draft, VNDIRECT RESEARCH

After several iterations, coal-fired power capacity is constantly reduced following the firmed government effort for clean energy transition. Accordingly, after the bold move to stop coal-fired after 2030F in the April-22 draft, the Oct-22 version continued to erase 5 projects (6,800MW) out of the plan due to difficulties in capital arrangement. However, in practice, it is very difficult to eliminate these projects due to legal problems, compensation, and litigation. Therefore, even though these are projects with a high probability of not being able to arrange capital, they will still have to be considered for development. Therefore, 2030F coal-fired power capacity will only shift up to 30,127MW, accounting for 18.9% total capacity after narrowing down to only 6.6% in 2045F. We noted down some of the outstanding plants that expected to keep developing in 2022-30F period, and some of the domestic giants could benefit thanks to the capacity expansion, including TKV, PVN, and GENCO2. At the moment, several pending coal-fired projects in the remained list still facing funding issues, and the recent coal prices hike has raised concerns about the "cheap" element of this energy. Along with the global efforts to reduce emissions, we see coal-fired power outlook is fading with tougher access to capital, following the boycotts from several funds. However, we anticipate that the continuation of coal-fired power in the Central and the North to be a crucial action to meet the region's fast power demand growth in the upcoming years, especially when the development potential of RE power in this area is modest.

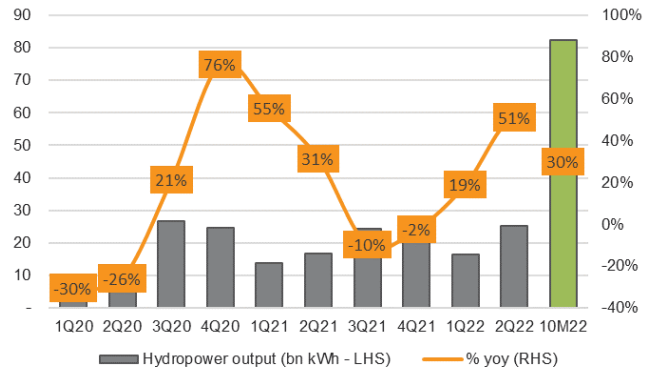
Hydropower will come out of its peak in 2023-24F

We see a gloomier output for hydropower in 2023-24F after a vibrant 2022

The weather went through the La Nina phase from 4Q21. According to EVN, 9M22 weather recorded unpredictability with cooler hot season and heavy rainfall even during the dry season. Therefore, hydropower is preferred with high mobilization output thanks to its cheap ASP. Total hydropower output rose 30% yoy to 82bn kWh, grabbing 36.6% total output. Several hydropower plants took advantage from ideal hydrology and record impressive 9M22 business results, named by DNH, VSH, SBH, HNA, TMP and CHP. We see a continuation of vibrant output mobilization for hydropower to last through the rest of 2022F following the ENSO estimation from IRI. Accordingly, the La Nina phase will stay to Jan-23 with higher possibility after coming out of its peak and

switching to the Neutral phase in 2023F. We see 2022F to be the high-base for hydropower as the La Nina phase has lasted for a higher-than-expected time.

Figure 23: 10M22 hydropower output rise thanks to favorable hydrology with longer-than-expected La Nina phase…



Source: EVN, VNDIRECT RESEARCH

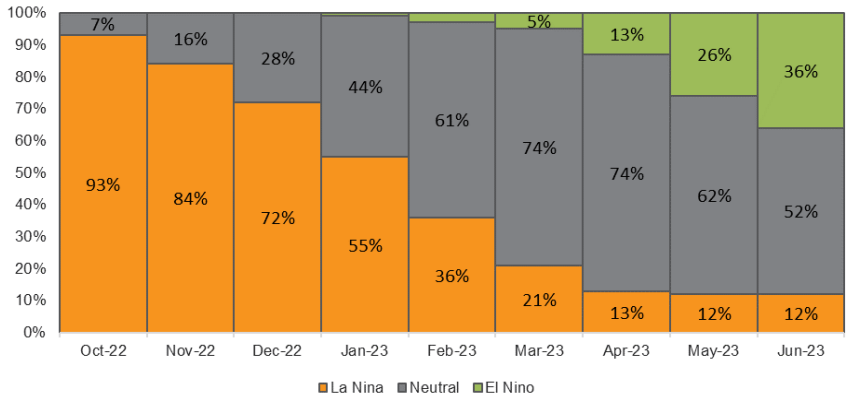
Figure 24: …Therefore, several hydropower companies record vibrant 9M22 (Unit: VNDbn)

Company code	Market cap	9M22 Revenue	%yoy	9M22 NPAT	% yoy
DNH	19,008.0	2,251.02	36%	1,356.08	55%
VSH	6,591.1	2,121.83	117%	881.54	353%
SBH	4,347.9	673.33	86%	358.46	175%
HNA	3,951.9	842.37	72%	410.17	383%
TMP	3,703.0	801.78	57%	437.99	81%
CHP	3,452.4	724.71	96%	317.49	2003%
AVC	2,814.5	744.13	76%	453.69	140%
SHP	2,656.7	559.78	27%	276.51	64%
TBC	1,841.5	538.24	40%	295.00	71%
SEB	1,724.8	269.18	35%	151.71	49%
S4A	1,531.9	208.45	20%	81.25	24%
SBA	1,425.7	299.42	74%	144.80	170%
SJD	1,055.7	362.85	26%	145.30	29%
ISH	904.9	191.08	23%	85.17	43%
HJS	732.9	139.22	11%	48.31	24%

Source: COMPANY REPORT, VNDIRECT RESEARCH

We believe the possibility for a longer La Nina phase might be hard to occur. Thus, hydropower likely to deliver lower output into 2023-24F, leaving space for more intense mobilization of other sources. In terms of ASP, we see the higher band price for thermal power will also drive on higher mobilization price of hydropower in the following years.

Figure 25: The newest ENSO forecast a continuation of La Nina phase for the rest of 2022F after switching to the Neutral phase from Jan 23F (Unit: %)



Source: IRI, VNDIRECT RESEARCH

We see limited growth space for hydropower in the long-term

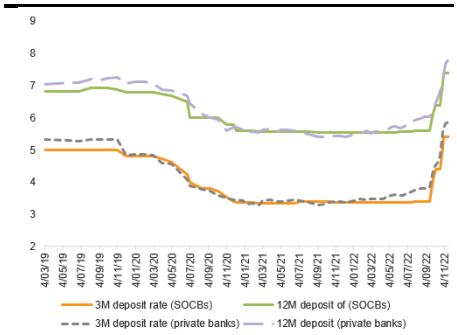
We believe the development prospect of hydropower is no longer available as its exploitation potential is basically reach limit. Excluding the capacity expansion projects, Thuong Kontum – VSH's power plant (220MW) appeared to be among the last large-medium size hydropower to be built, putting an end for the development of this power source. We see the remained room for small hydropower (< 30MW) of around 6,000MW. Small hydropower plant is listed on the RE power category thanks to no fossil input and minimal impact on the surrounding landscape. Although small hydropower depends heavily on weather condition, and poorly water regulation, the power source enjoy 20-30% higher ASP than large hydropower plants due to the government's avoidable

cost policy. We see some of the heavy contestants continue to expand their small hydropower portfolio will take advantage including PC1, GEG, REE.

Investment risks

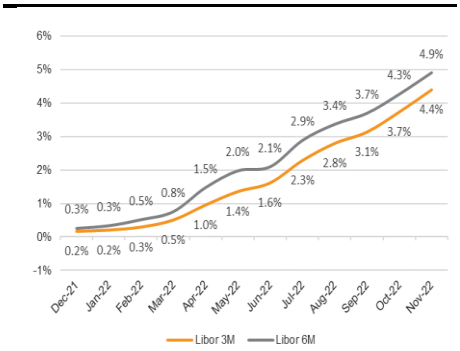
We see the duo effect from exchange rate loss and interest expense rise among power enterprises

Figure 26: Vietnam deposit rate surge (Unit: %)



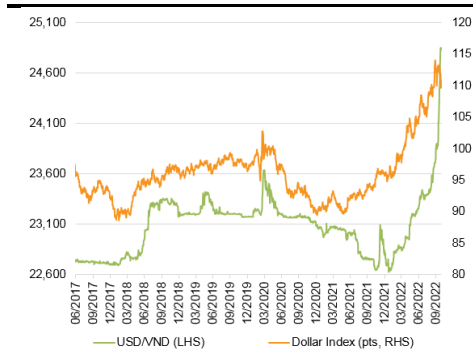
Source: VNDIRECT Research

Figure 27: LIBOR 3 + 6M rose, following the Fed fund rate hike (Unit: %)



Source: Global rate, VNDIRECT Research

Figure 28: The US$/VND exchange rate has depreciated 8% from the start of 2022

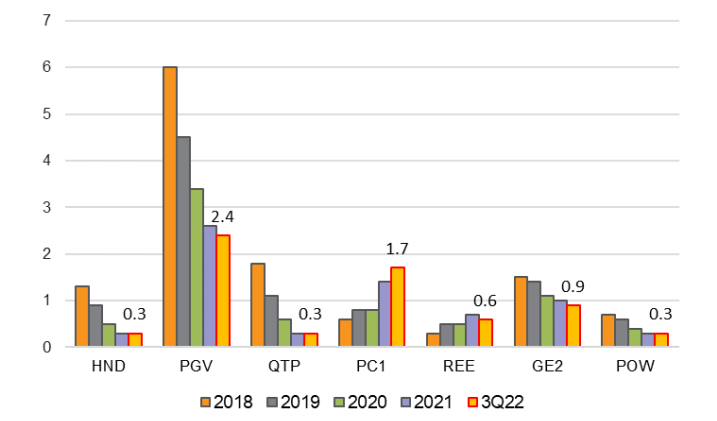


Source: Bloomberg, VNDIRECT Research

From 2Q22, the interest rate environment has surged significantly following the solid effort of the Fed to control its historic high inflation. Therefore, the interest rate raising policy has caused in overall interest rate hike including the Libor and Vietnam deposit rates, which is usually the bend mark for power loans. Besides, the interest rate surge has put pressure on the US$/VND exchange rate, and now, the VND has depreciated by around 8% compared to the US$. Therefore, it created a duo effect on several power companies and hindered its 9M22 business results. PC1, GE2, PGV and REE record a financial expense surge due to higher exchange rate loss and interest expense hikes.

We see the remained pressure from the exchange rate and interest rate hike following the continuation of the interest rate raising roadmap from the Fed to last through soonest 2H23F. However, we see the magnitude of the effect to be varied based on the portion of US$ debt and the interest rate policy. We see power companies with a high portion of US$ debt such as PGV, with interest rate policy mainly based on the Libor to be harmed the most.

Figure 29: Debt/equity ratio from several power companies (Unit: x)



Source: Company report, VNDIRECT RESEARCH

Figure 30: We note down some of the power companies that expose to US$ loans

Company	Total USD debt (VNDbn)	Total debt (VNDbn)	%USD debt/ total debt	Financial expense (VNDbn)	%yoy
HND	1,588.0	1,588.0	100.0%	153.8	27%
PGV*	35,679.1	41,199.9	86.6%	2,208.6	135%
QTP*	819.4	1,833.1	44.7%	161.0	6%
PC1	3,997.0	11,348.2	35.2%	601.5	173%
REE	2,121.8	11,520.0	18.4%	696.1	38%
GE2*	6,553.2	18,611.0	35.2%	814.0	590%
POW	2,701.0	9,950.6	27.1%	541.2	7%

(*)Estimating based on latest data

Source: Company report, VNDIRECT RESEARCH

We also see some of the other risks lurking into the power sector

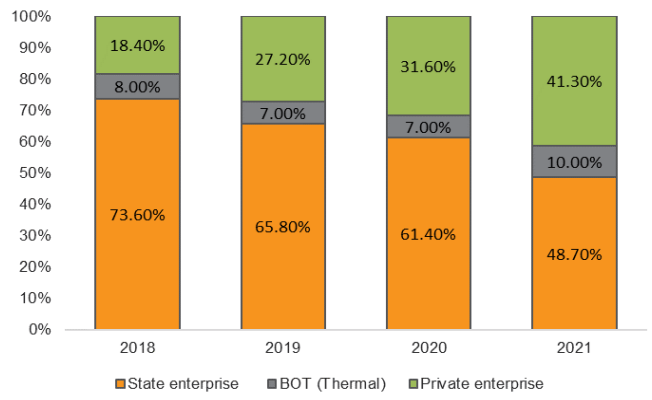
- We see the risk from input price rise is still presented. Gas price is dropping following the warmer-than-expected winter in Europe. However, we see the supply cuts from Russia – the number one European supplier, which may put pressure on sourcing alternatives in the short-term.
- We see the opening of China to rise demand for coal, putting pressure on the remained high price of this commodity.
- We see the postponement of the most Vietnam electricity-intensive industry like steel sector to be the major traction for power consumption growth to reach the planned target.
- The longer delay of PDP8 and RE price mechanism issuance will further weigh on the outlook of the industry.

We see power sector will go through a robust transition in the upcoming years. Our top picks include PC1, POW

We see the picture of Vietnam power sector is clearer, favoring toward RE and gas-fired power after the government determination in the COP26. Under the high portion of RE power in the following years, we see the companion of gas-fired power will serve as a reliable support for power systems. We noted down several Vietnam companies to be benefited in the gas-fired power chain, such as POW, PGV and GAS.

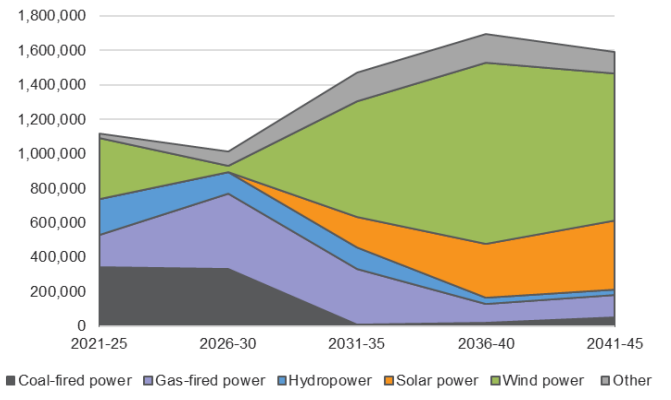
The postponement of RE price mechanism is major headwind, hampering RE capacity development. We see the untie of this bottleneck to open up an enormous playground for large investors. Although the FIT period has attracted large private capital flows into this sector, we expect the post-FIT period to be more competitive in a healthier manner. We put great faith on enterprises with large scale, strong cost management, and project implementation to grab larger opportunities to expand its RE capacity in this phase. We see the ESG flow with attractive cost of capital is emerging worldwide, and gradually creeping into Vietnam. Therefore, companies that seize this opportunity will stay ahead in the RE race. We named some of the heavyweight contestants including BCG, GEG, PC1, and REE.

Figure 31: Private capital gradual rise during FIT period (Unit: %)



Source: KPMG, VNDIRECT RESEARCH

Figure 32: We see high capital requirement for RE investment in the 2022-45F (Unit: VNDbn)



Source: PDP8 draft, VNDIRECT RESEARCH

Figure 33: Investment ideas

No	Ticker	1-year TP (VND/share)	Rating	Investment thesis
1	PC1	30,800	ADD	(1) FY23–24F will be a profitable break period for PC1 following a series of new business expansions in multiple industries within the company's ecosystem, including, Nickel mineral mining hydropower, residential property, and industrial park (IP). We expect a sharp EPS growth of 163% yoy and 33% yoy in FY23-24F, respectively. (2) We see the official announcement of PDP8 and RE mechanism will trigger PC1 M&E segment in both wind power EPC and transmission grid contracting activities. (3) We see PC1 will continue to expand its RE portfolio, including 81MW small hydropower in sight. Besides, the company is also conducting surveys of more than 1,000MW of wind power and finding opportunity to reach the 350MW additional RE power ambition in 2025F. (4) PC1 wind power is one of the outstanding plants, fully ensuring ESG standard and financed by a green loan with very attractive interest rates of around 5-6%, much lower than than average domestic loan of around 10-11%. We see this to be the advantage for PC1 to achieve cheaper capital for its future projects.
2	POW	18,400	ADD	(1) We see POW – top gas-fired power enterprise will enjoy the sharp gas-fired capacity developing trend under the clear orientation in the PDP8 draft. The company owns a pipeline of two projects including 100% ownership in LNG Nhon Trach 3&4 (1,600MW), and 33% share of the LNG Quang Ninh (1,500MW). While Nhon Trach 3&4 expected to operate from 4Q24 and 2Q25F, LNG Quang Ninh will run from 2025-30F period. (2) For FY23-24F, we see a more intense mobilization rate for the company's gas-fired power segment thanks to 1) Power consumption expected to rise at 9.2% CAGR while the development of new power sources in the North is slow down; 2) Lower input price following lower Brent oil assumption of US$90/80 per barrel, releasing competitive pressure for gas-fired plants especially in the context of remained high coal price; 3) We see lower output mobilization for hydropower will create large space for thermal output to enjoy a more intense mobilization rate. (3) We forecast a strong recovery from coal-fired power segment thanks to the comeback of Vung Ang 1 unit 1 (600MW) from 1Q23F after went through the repair from 4Q21.
3	NT2	31,300	ADD	(1) In FY23F, NT2 will go through a large overhaul schedule, usually around 45 days, we see output lost will result in lower revenue and gross profit of 16% yoy and 23% yoy, respectively, after recover 13% yoy and 28% yoy respectively. (2) We see the main outlook for NT2 is not about growth ability but a healthy financial performance and strong dividend policy. NT2 has paid entirely its long-term debt from 2021, and at the moment, the company record a very strong cash flow and healthy financial situation. We are looking forward a more intense cash dividend payment from NT2 of at least 15%/year. (3) We see NT2 has remained its defensive element and will be a suitable choice under the macro uncertainty situation as right now.
4	REE	85,500	ADD	(1) REE is one of the largest conglomerates, with M&E is the traditional sector. The company has also invested in several cash cow segment with strong cash flow including Power, water, and office leasing. Therefore, REE usually remained a very healthy CFO/revenue ratio of around and a stable dividend yield of 5%, except for FY21, when the company intensively invested in new wind power. (2) In FY22F, REE is maintaining its financial health and growing robustly even in the very challenging period of the market thanks to positive results among its cash cow business and ideal hydrology. We see REE will remain EPS growth of 15-20% and stable ROE% of around 15% in FY23-25F. The company is focusing on developing and M&A rooftop solar as well as small hydropower power plants, expected to be the main growth engine for the company power segment in the context of hydropower will come out of its peak in FY23F. (3) We see REE has a conservative business view, the company will not have too many ambitious plans in near future but focus on a healthy financial performance with stable dividend stream.

5	HDG	43,800	ADD	(1) HDG is among top four largest listed companies in terms of renewable energy (RE) capacity by end-2022 which allows the company to ride on the country 's priority in RE development. In the period FY23-25F, the company planned to add 444MW capacity to bring its total RE capacity to 922MW. We see that with lower investment costs, HDG's power plants often run at higher utilisation rates than peers. (2) We believe this valuation is relatively attractive for a RE developers with sizeable capacity and proven track record.
6	BCG	NA	NA	(1) BCG is the largest listed RE company, and has put into operation 581.4 MW through four projects namely BCG Long An 1, BCG Long An 2, Phu My, BCG Vinh Long and rooftop projects. (2) At the same time, the company is implementing two wind power projects including Khai Long Ca Mau (Phase 1) and Tra Vinh project (Phase 1) with a total capacity of 180 MW. We see this to be the main engine for its RE segment to shine in FY23-24F. (3) We see the current price mechanism draft for the transitional RE project from EVN to benefit BCG the most following its delayed solar project Phu My 2. In the latest PDP8 draft, the Phu My solar farm will be among the 726MW transitional project that suggested to keep developing in the 2022-30F.
7	GEG	NA	NA	(1) GEG is among top RE companies with total capacity of 456MW, including 81MW small hydropower, 245MW solar power and 130MW wind power. (2) The company also has a pipeline of 130MW wind power including VPL2 Ben Tre (30MW) and Tan Phu Dong 1 (100MW). We see the official announcement of new RE price mechanism will activate faster profit growth for the company from FY23F.
8	QTP	NA	NA	(1) We see QTP will set a same trend as NT2, including gradual drop in debt and healthy dividend payments. (2) We expect thermal power in the North such as QTP will record higher mobilization in the FY23-24F, thanks to 1) Power demand in the North will rise sharply in the following years while additional power sources stay at low growth rate, 2) QTP benefited from ideal location, near coal mine and record low transportation cost, besides, the plants has ensured a long-term domestic coal price contract from TKV – the company major shareholder.

Source: VNDIRECT RESEARCH

Figure 34: FY22-24F earnings forecasts of stocks under coverage

	PC1			POW			NT2		
	2022F	2023F	2024F	2022F	2023F	2024F	2022F	2023F	2024F
Revenue (VNDbn)	9,949	14,722	16,753	27,368	34,008	42,049	8,932	7,437	8,415
% growth	*1.2%*	*48.0%*	*13.8%*	*11.4%*	*24.3%*	*23.6%*	*45.2%*	*-16.7%*	*13.1%*
Gross margin (%)	*17.3%*	*19.3%*	*19.0%*	*12.0%*	*13.5%*	*14.3%*	*15.0%*	*13.9%*	*15.6%*
EBITDA margin (%)	*18.9%*	*19.8%*	*19.1%*	*21.3%*	*20.7%*	*21.2%*	*21.7%*	*22.2%*	*22.8%*
Net profit (VNDbn)	437	1,149	1,523	1,711	2,767	3,197	1,105	848	1,090
% growth	*-37.1%*	*162.7%*	*32.6%*	*-3.8%*	*61.7%*	*15.5%*	*107.0%*	*-23.3%*	*28.5%*
EPS (VND/share)	1,616	4,247	5,631	731	1,182	1,365	3,838	2,945	3,785
BVPS (VND/share)	21,490	27,078	34,487	13,473	14,885	16,535	17,052	18,064	19,951
Net cash/share (VND/share)	-31,023	-36,076	-34,306	-1,019	-2,704	-5,060	2,694	6,286	10,340
D/E (x)	2.28	2.27	1.95	0.63	0.82	1.04	0.54	0.44	0.44
Dividend yield (%)	0.0%	0.0%	0.0%	0.4%	0.4%	0.4%	8.6%	7.0%	8.6%
ROAE (%)	9.2%	21.5%	23.9%	5.4%	7.9%	8.3%	22.5%	16.3%	19.0%
ROAA (%)	2.2%	4.8%	5.7%	3.1%	4.4%	4.1%	15.6%	11.3%	13.8%

Source: VNDIRECT RESEARCH

Figure 35: FY22-24F earnings forecasts of stocks under coverage

	REE			HDG		
	2022F	2023F	2024F	2022F	2023F	2024F
Revenue (VNDbn)	9,342	10,548	12,065	3,935	3,662	3,195
% growth	*60.6%*	*12.9%*	*14.4%*	*4.2%*	*-7.0%*	*12.8%*
Gross margin (%)	*36.8%*	*32.9%*	*32.6%*	*69.1%*	*67.4%*	*65.1%*
EBITDA margin (%)	*39.9%*	*35.2%*	*33.9%*	*80.1%*	*80.7%*	*81.5%*
Net profit (VNDbn)	2537	2578	2985	1,389	1,301	1,009
% growth	*36.8%*	*1.6%*	*15.8%*	*26.6%*	*-6.3%*	*-22.4%*
EPS (VND/share)	8,183	8,316	9,629	5,677	5,318	4,126
BVPS (VND/share)	57,183	65,760	75,848	23,941	27,630	30,035
Net cash/share (VND/share)	-26,050	-21,759	-13,440	-20,520	-15,834	-13,585
D/E (x)	0.83	0.76	0.69	1.03	0.71	0.25
Dividend yield (%)	2.1%	2.1%	2.1%	5.4%	5.4%	5.4%
ROAE (%)	17.5%	15.5%	15.8%	27.3%	20.6%	14.3%
ROAA (%)	7.6%	7.0%	7.4%	8.7%	8.3%	6.7%

Source: VNDIRECT RESEARCH

Figure 36: Peer comparison

Company name	Ticker	Price	Target price	Recom.	Mkt Cap	P/E(x)		P/BV(x)		EV/EBITDA (x)		ROE (%)	
	Bloomberg	LC$	LC$		US$m	FY22F	FY23F	FY22F	FY23F	FY22F	FY23F	FY22F	FY23F
Gas-fired power peer													
PVPower	POW VN Equity	11,350	18,400	ADD	1,113.3	21.9	12.2	NA	NA	NA	NA	6.0	7.5
GENCO 3	PGV VN Equity	17,900	NA	NR	842.3	7.5	7.5	1.1	1.1	6.1	5.8	14.6	14.3
PetroVietnam Nhon Trach 2 JSC	NT2 VN Equity	27,300	31,700	ADD	329.2	9.4	8.3	NA	NA	NA	NA	20.8	15.0
Ba Ria Thermal Power JSC	BTP VN Equity	13,000	NA	NR	34.2	NA	NA	NA	NA	NA	NA	NA	NA
Average						*12.9*	*9.3*	*1.1*	*1.1*	*6.1*	*5.8*	*13.8*	*12.3*
Median						*9.4*	*8.3*	*1.1*	*1.1*	*6.1*	*5.8*	*14.6*	*14.3*
Coal-fired power peer													
Vinacomin - Power Holding Corp	DTK VN Equity	9,000	NA	NR	257.4	NA	NA	NA	NA	NA	NA	NA	NA
HAI Phong Thermal Power JSC	HND VN Equity	13,400	NA	NR	280.6	9.2	7.2	1.1	1.0	NA	NA	11.6	127.3
Quang Ninh Thermal Power JSC	QTP VN Equity	13,400	NA	NR	252.6	7.2	7.0	1.0	0.9	2.7	3.1	14.0	15.2
Pha Lai Thermal Power JSC	PPC VN Equity	13,500	NA	NR	181.3	14.9	7.6	NA	NA	NA	NA	6.2	11.7
Average						*10.4*	*7.3*	*1.0*	*NA*	*2.7*	*NA*	*10.6*	*51.4*
Median						*9.2*	*7.2*	*1.0*	*1.0*	*2.7*	*3.1*	*11.6*	*15.2*
Hydropower peer													
Vinh Son - Song Hinh Hydropower	VSH VN Equity	31,900	NA	NR	315.6	6.4	12.7	1.5	1.4	NA	NA	25.1	11.5
Hua Na Hydropower JSC	HNA VN Equity	16,300	NA	NR	160.6	NA	NA	NA	NA	NA	NA	NA	NA
Thac Ba HydroPower JSC	TBC VN Equity	29,150	NA	NR	77.5	NA	NA	NA	NA	NA	NA	NA	NA
Average						*6.4*	*14.5*	*1.5*	*NA*	*NA*	*NA*	*25.1*	*11.5*
Median						*6.4*	*12.7*	*1.5*	*1.4*	*NA*	*NA*	*25.1*	*11.5*
RE power peer													
Gia Lai Electricity JSC	GEG VN Equity	13,400	NA	NR	180.7	13.8	11.6	1.1	1.1	8.9	7.4	8.6	9.3
Multi-segment peer													
REE Corp	REE VN Equity	77,600	85,500	ADD	1,155.1	9.7	9.6	1.4	1.2	7.9	7.9	17.5	15.5
Ha Do Group JSC	HDG VN Equity	31,900	43,800	ADD	326.8	4.8	5.1	1.1	1.0	3.7	3.2	20.6	14.3
PC1 Group JSC	PC1 VN Equity	19,750	30,800	ADD	223.7	4.8	5.1	1.1	1.0	3.7	3.2	9.2	21.5
Bamboo Capital Group JSC	BCG VN Equity	7,640	NA	ADD	170.7	1.9	1.0	0.4	0.3	NA	NA	30.1	36.0
Average						*5.3*	*5.2*	*1.0*	*0.9*	*5.1*	*4.8*	*19.4*	*21.8*
Median						*4.2*	*4.1*	*0.9*	*0.8*	*4.2*	*3.7*	*19.8*	*23.4*

Source: VNDIRECT RESEARCH, BLOOMBERG (Data as of Dec 08, 2022)

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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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