

**Baker
McKenzie.**

Update on Draft National Power Development Plan #8 (PDP8)

Thanh-Hai Nguyen, Special Counsel | 25 April 2022



Agenda

1 Highlights of Draft April 2022 PDP8 Prime Minister Decision

2 12 groups of key measures for implementing PDP8

3 List of priority projects

4 Q&A

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Highlights of Draft April 2022 PDP8 Prime Minister Decision

1a

Key highlights of April 2022 PDP8 Draft

Key contents of April 2022 Draft

Guiding points of view



To improve the autonomy of the electricity industry and minimize the dependence on foreign countries



To ensure the implementation of the commitments of the Prime Minister (PM) at COP26 on carbon neutrality by 2050



To increase direct imports of electricity from neighboring countries in the medium and long term and invest in exploiting power sources abroad



To increase the proportion of electricity produced from renewable energy sources (including hydropower) to about 28.9%-33.4% by 2030 and about 44.5%-54.3% by 2045



To diversify investment forms and sources of investment capital to develop power sources



To diversify fuel sources used for power generation and harmonize between domestic and imported fuel



To diversify types of power sources and continue to develop renewable energy sources (especially, offshore wind power), new energy and power using domestic gas

Key contents of April 2022 Draft

LNG-to-power and gas



To **prioritize** the use of **all domestically exploited gas** that can be supplied for electricity production **to increase autonomy in electricity production**, when necessary, burning with hydrogen.



To have a suitable roadmap to **gradually switch LNG-to-power sources to use hydrogen**.

Key contents of April 2022 Draft

Coal-fired thermal power



To minimize coal-fired thermal power plants to minimize CO2 emissions



No development of new coal-fired thermal power plants



To consider converting some power plants using coal to use LNG



To have a suitable roadmap to gradually switch from coal-fired thermal power sources to use biomass or ammonia



To stop considering planning for a number of coal-fired thermal power projects approved in the PDP but not supported by the local authorities or not eligible for development



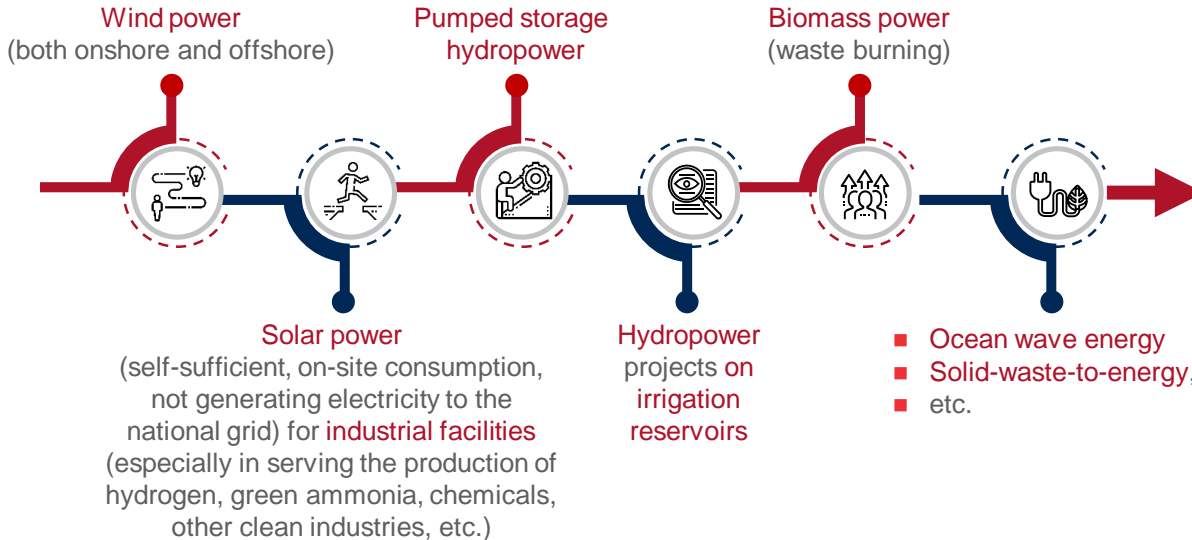
To promote the use of coal mixed between domestic and imported coal to supply coal-fired thermal power plants

Key contents of April 2022 Draft

Other power sources



To promote the development of the following power sources:



To **study** the possibility of developing **nuclear power** in the future

1b

More Details on April 2022 PDP8 Draft

Planned installed capacity for the period of 2025-2045

Unit: MW

Target/Year	2025	2030	2045
Total installed capacity (excluding rooftop solar power and cogeneration)	93,862 - 98,394	120,995 - 145,930	284,660 - 387,875
Hydropower (incl. small-scale)	25,779 - 26,795	26,795 - 28,946	33,319 - 35,139
Coal-fired thermal power	28,867	37,467	37,467
Gas thermal power (incl. LNG)	14,947	29,880 - 38,980	58,930 - 73,630
Renewable energy (wind, solar, biomass, etc.)	20,416 - 23,332	21,666 - 33,087	129,851 - 201,647
Imported power	3,853 - 4,453	3,937 - 5,000	9,743 - 11,042

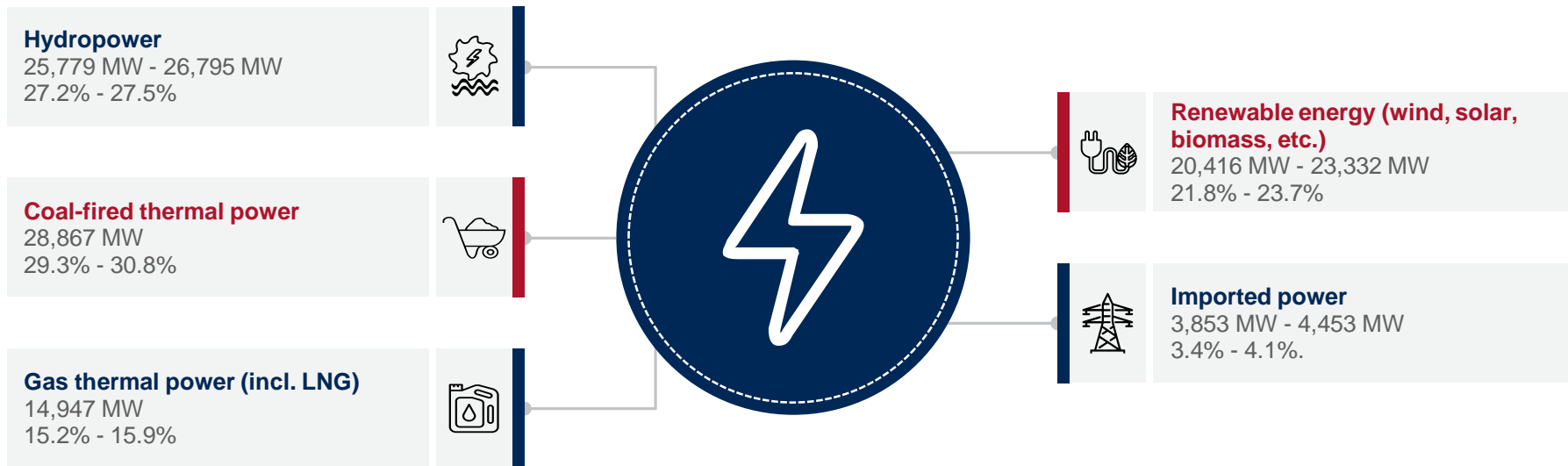
Vietnam power mix by 2025

April 2022 Draft



Installed capacity*: **93,862 MW - 98,394 MW**

* Excluding rooftop solar power and cogeneration



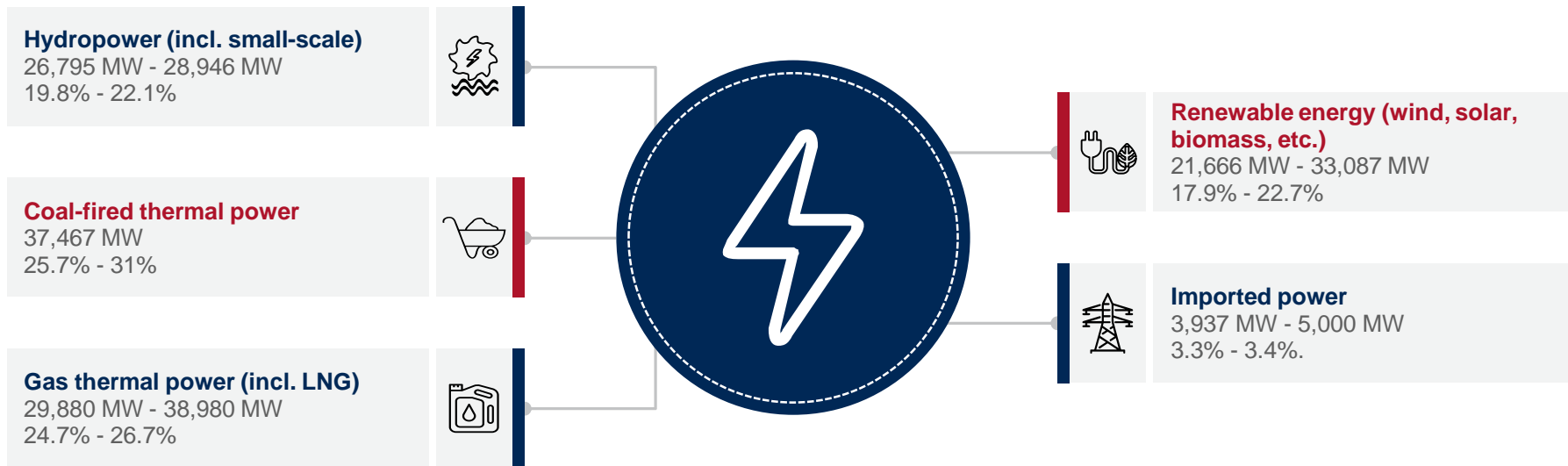
Vietnam power mix by 2030

April 2022 Draft



Installed capacity*: **120,995 MW - 145,930 MW**

* Excluding rooftop solar power and cogeneration



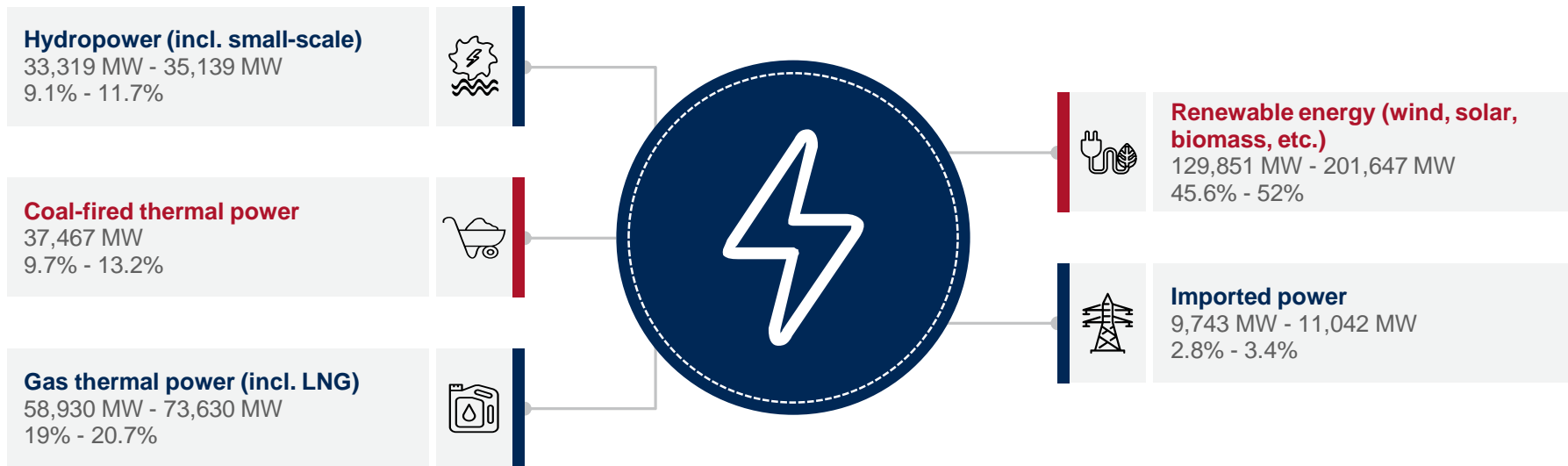
Vietnam power mix by 2045

April 2022 Draft



Installed capacity*: **284,660 MW - 387,875 MW**

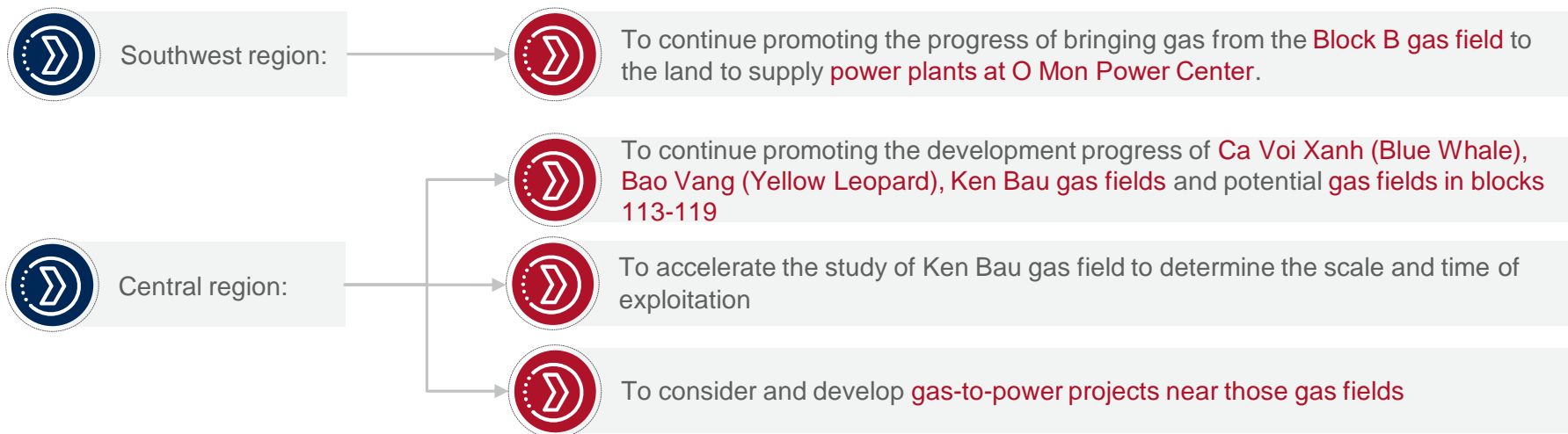
* Excluding rooftop solar power and cogeneration



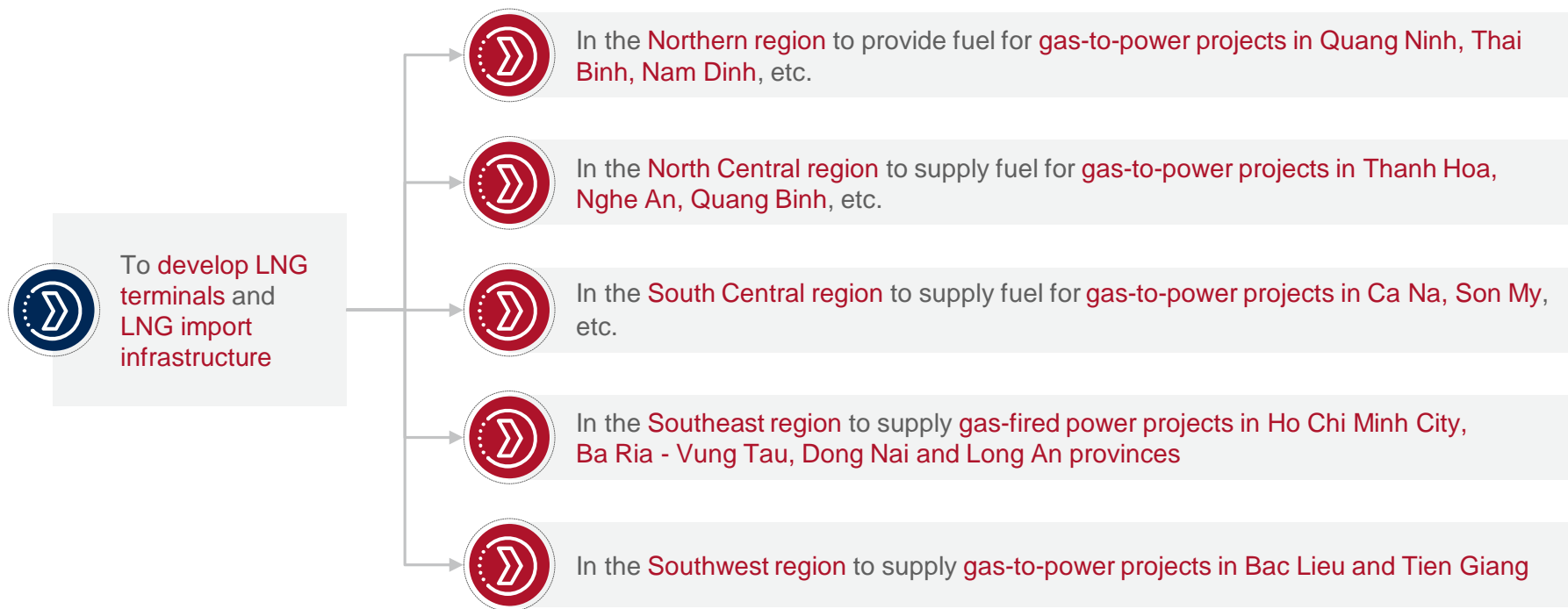
LNG-to-power and domestic gas thermal power

Unit: MW

Items	Year	
	2030	2045
Domestic gas thermal power (incl. gas turbine running on diesel) and LNG-to-power (excl. flexible source running on LNG)	29,730 – 38,830	43,330 – 46,330 +7,500 to +13,600 (compared to 2030)



LNG-to-power and domestic gas thermal power



Wind power

Unit: MW

Items	Year		
	2025	2030	2045
Onshore wind power	10,700 – 13,616	11,700 - 16,121 +1,000 to +2,505 (compared to 2025)	36,170 - 55,950 +24,470 to +39,829 (compared to 2030)
Offshore wind power	-	about 7,000* +7,000 (compared to 2025)	30,000 - 64,500 +23,000 to +57,500 (compared to 2030)

* When the economic and technical conditions (e.g., electricity price and connection infrastructure) are allowed, the scale of offshore wind power by 2030 **may be larger than 7,000 MW**.

Solar power

Unit: MW

Items	Year		
	2025	2030	2045
Solar power*	16,491	16,491 +0 (compared to 2025)	74,741 - 96,666 +58,250 to +80,175 (compared to 2030)

* Including ground-mounted solar power projects, floating solar power projects and rooftop solar power projects

Wind and solar power



Encourage the development of projects that serve **on-site loads**, not generate electricity to the national grid, and **serve the production of new forms of energy** such as green hydrogen and ammonia.



The **area, location** and **capacity of specific projects** will be determined based on the results of a detailed assessment of the potential, construction conditions and capacity of the synchronous grid.



The **selection of investors** for the projects must comply with the provisions of the **Investment Law, Bidding Law** and **other relevant regulations**.



The capacity of these projects is **not limited** (e.g., by the sources structure under the PDP8).



These projects can **be supplemented to the PDP8** when there is a feasible proposal.

Hydropower

Unit: MW

Items	Year		
	2025	2030	2045
Hydropower	25,779 - 26,795	26,795 - 28,946 +1,016 to +2,151 (compared to 2025)	33,319 - 35,139 +6,193 to +6,524 (compared to 2030)

Imported power

Unit: MW

Items	Year		
	2025	2030	2045
Imported power	3,853 - 4,453	3,937 - 5,000* +84 to +547 (compared to 2025)	9,743 - 11,042* +5,806 to +6,042 (compared to 2030)

* Imported capacity can be increased if there is a reasonable selling price and suitable interconnection. The import of electricity from neighboring countries is encouraged.

Other power sources

Unit: MW

	Total accumulated capacity	
	2030	2045
Flexible sources (ICE+SCGT)	150	27,300 +27,150 (compared to 2030)
Biomass and other renewable energy	1,230	5,210 +3,980 (compared to 2030)
Pumped-storage source	2,450	28,950 +26,500 (compared to 2030)

Other power sources

To **prioritize** the development of these following power projects that are suitable to the input raw materials of each region:



Waste-to-energy power plants
(waste-burning)



Biomass power plants



The capacity of these projects is **not limited** (e.g., by the power source structure under the PDP8).



These projects **can be supplemented to the PDP8** when there is a feasible proposal.

Volume of power transmission system to be newly constructed

No.	Items	Unit	Period				Total volume 2021-2030	Total volume 2031-2045
			2021-2025	2026-2030	2031-2035	2036-2045		
High-load operation plan								
1.	500 kV substation							
	New construction	MVA	34,350	12,300	35,100	19,800	11,700	46,650
	To be improved	MVA	16,950	20,850	27,150	35,100	37,200	37,800
2.	500 kV transmission line							
	New construction	km	7,263	5,227	4,373	2,565	822	12,490
	To be improved	km	86	1,238	720	81	-	1,324

Volume of power transmission system to be newly constructed

No.	Items	Unit	Period				Total volume 2021-2030	Total volume 2031-2045
			2021-2025	2026-2030	2031-2035	2036-2045		
3.	220 kV substation							
	New construction	MVA	52,150	22,125	34,500	23,875	25,750	74,275
	To be improved	MVA	12,185	22,312	27,625	28,750	26,250	34,497
4.	220 kV transmission line							
	New construction	km	12,011	4,050	4,664	2,055	1,525	16,061
	To be improved	km	5,404	1,080	224	80	-	6,484

Estimated demand for investment capital for the period of 2021-2045

Unit: billion USD

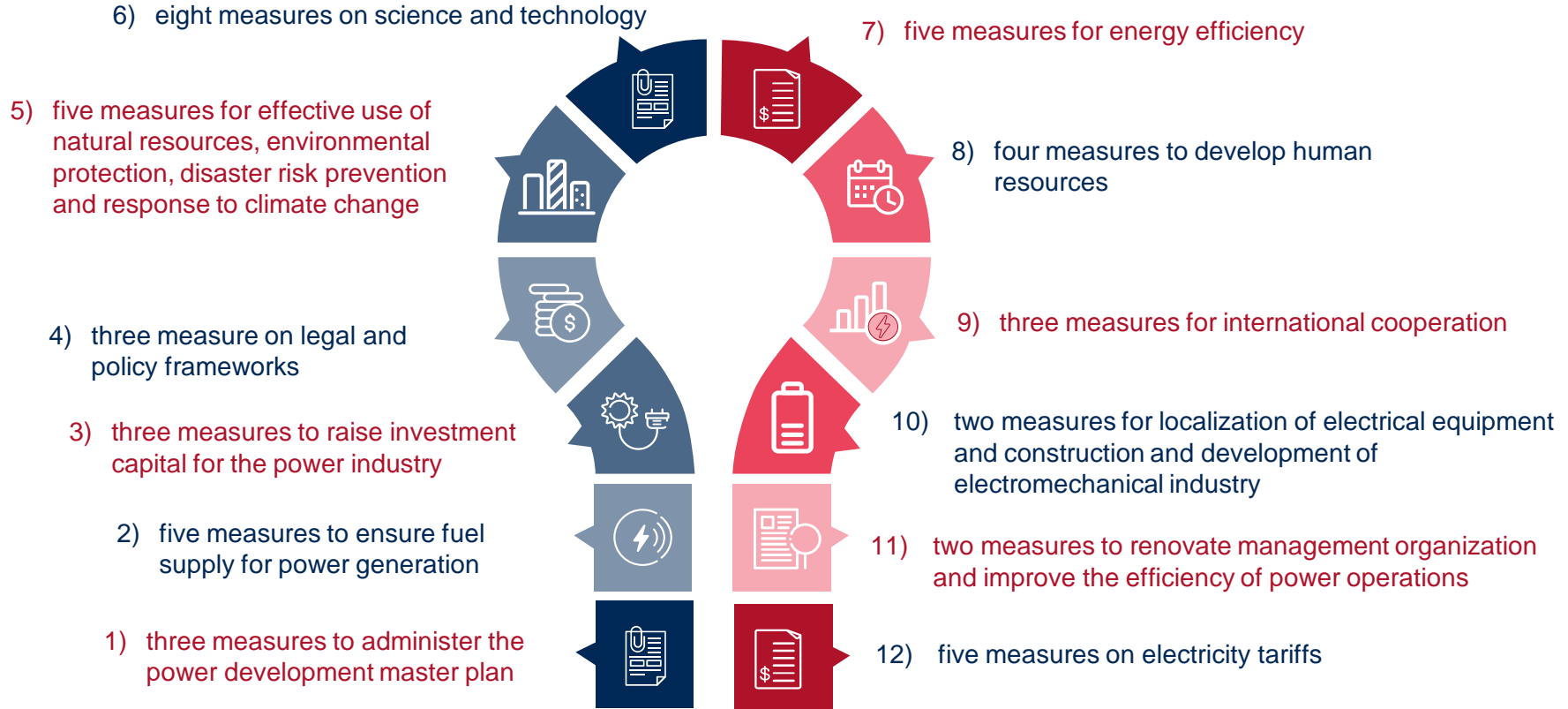
Period	Investment in power sources	Investment in power transmission system	Total
2021-2030	85.7 - 101.55	13.58 - 14.41	107.1 - 146.5
2031-2045	163.14 - 208.89	16.93 - 18.49	225.5 - 345.9

The background features a dark blue gradient with dynamic, glowing waves of red and blue particles. These particles form a sense of motion and depth, resembling a digital or data visualization. The overall aesthetic is modern and high-tech.

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12 groups of key measures for implementing PDP8

12 groups of key measures for implementing PDP8



12 groups of key measures for implementing PDP8

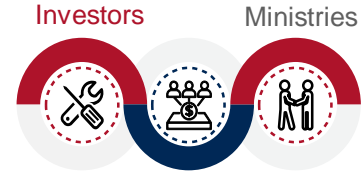
1. three measures to administer the power development master plan



To formulate and implement a **discipline and compliance framework**



Applicable entities:



Commission for the Management of State Capital at Enterprises



To promote the roles of the **National Steering Committee** on electricity development

e.g.

- 1) To regularly and irregularly **hold meetings**, especially to **review the progress of key projects**
- 2) To **urge** the progress of key power projects
- 3) To **promptly help investors to solve difficulties and obstacles**



The **MOIT** regularly **scrutinizes** the power projects approved under the PDP8.



What are the **measures applicable to delayed projects?**

12 groups of key measures for implementing PDP8

1. three measures to administer the power development master plan



For the projects that are approved under the PDP8 and for which the investors have been selected:

What are the measures applicable to delayed projects?

Projects that are implemented behind schedule for **more than 24 months**:

Projects that are implemented behind schedule for **less than 24 months**:



1st review

To propose to adjust the project progress to the **next five-year cycle**



2nd review

- If the project has **no actual progress**, the following actions may be conducted:
 - 1) Reporting to the relevant State authority to consider **stopping or terminating** the project operation
 - 2) **Assigning the investment rights to a new investor**
- The damage (if any) is **borne by the previous investor**.

To continue proposing to adjust the project progress to the **next five-year cycle**




3rd review

- If the project has **no additional actual progress**, it may be reported to the relevant State authority to consider **stopping or terminating** the project operation.
- The damage (if any) is **borne by the previous investor**.

12 groups of key measures for implementing PDP8

1. three measures to administer the power development master plan

What are the measures applicable to delayed projects?


 Projects for which investors have not yet been selected or projects that have not yet been assigned to any investors:


If the projects are not implemented/ progressed:




The relevant provincial people's committee is obligated ...

... to report to the Prime Minister to propose replacement projects from the list of projects under the approved PDP8

 For projects in which the investment is conducted in the public-private partnership (PPP) form

 The time limit for investor selection is up to 18 months from the date when the project is approved under the master plan.

 If the project fails to comply with this time limit, the relevant State authority is responsible for reporting to the PM for considering a replacement project from the list of projects approved under the PDP8.

12 groups of key measures for implementing PDP8

2. five measures to ensure fuel supply for power generation



To **diversify** sources of raw materials and **harmoniously use** domestic and imported raw materials



To look for **additional sources** of gas and coal



To build **infrastructure of LNG terminals** and a **gas distribution pipeline system** for the upcoming period



To expand **international cooperation** related to coal and gas exploitation



To study and build a **coal transshipment terminal**

12 groups of key measures for implementing PDP8

3. three measures to raise investment capital for the power industry



To improve the ability of enterprises operating in the power sector to mobilize financial resources (e.g., to ensure the financial health and reasonable financial profits of the enterprises)



To diversify capital sources and forms of capital mobilization and effectively attract domestic and foreign capital sources into electricity development



Encourage organizations and individuals of all economic components to invest in electricity generation, wholesale and retail according to the roadmap for building the electricity market.



Bank credit



ODA



Stock market



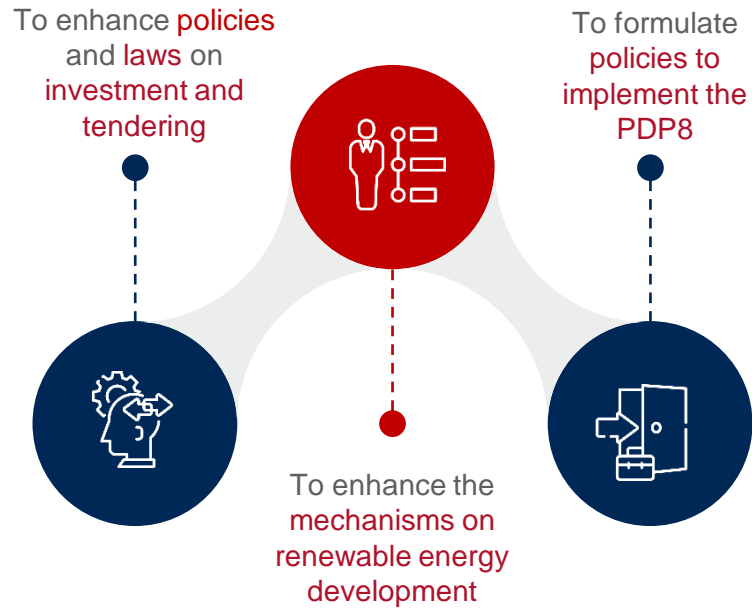
Green credit



Green bond

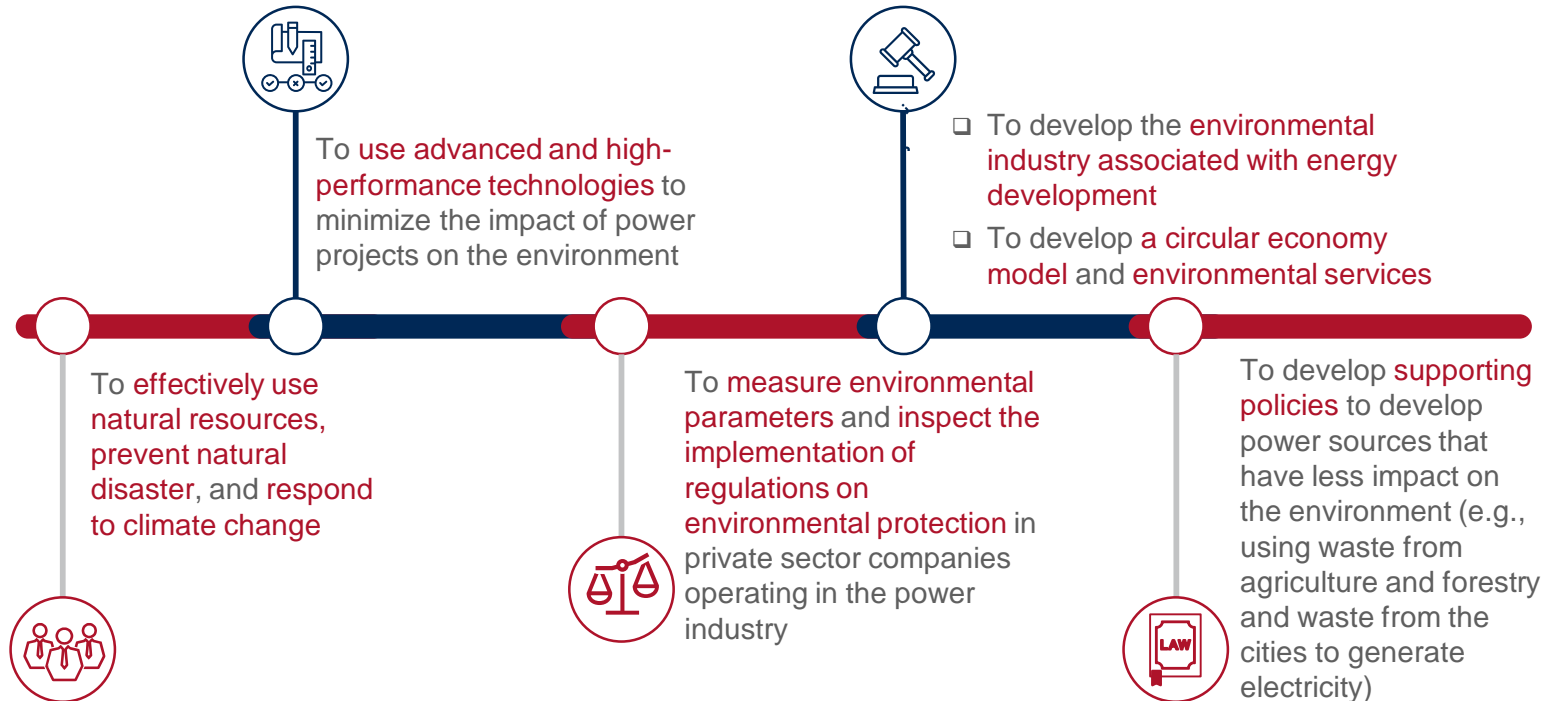
12 groups of key measures for implementing PDP8

4. three measures on legal and policy frameworks



12 groups of key measures for implementing PDP8

5. five measures for effective use of natural resources, environmental protection, disaster risk prevention and response to climate change



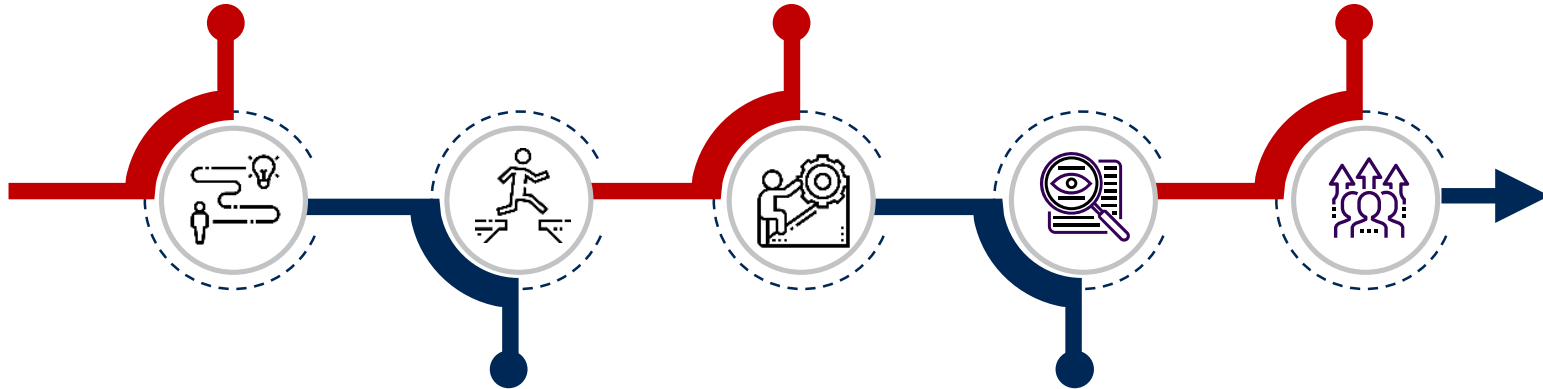
12 groups of key measures for implementing PDP8

7. five measures on energy efficiency

To propagate, disseminate and implement the **law on energy efficiency**

To enhance/complete mechanisms and policies (e.g., financial mechanism) to encourage customers and utilities to participate in **energy efficiency and energy demand management programs**

To study mechanisms and policies to encourage **investment projects** that make **optimal use of non-polluting energy and natural resources**



To implement some programs such as **the demand-side-management (DSM) program, the energy efficiency program, etc.**

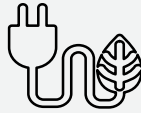
To study, develop and produce **equipment, applications and solutions** for energy efficiency

12 groups of key measures for implementing PDP8

9. three measures for international cooperation



Grid connection with neighboring countries and countries in the ASEAN region



To expand international cooperation in scientific research and technology development

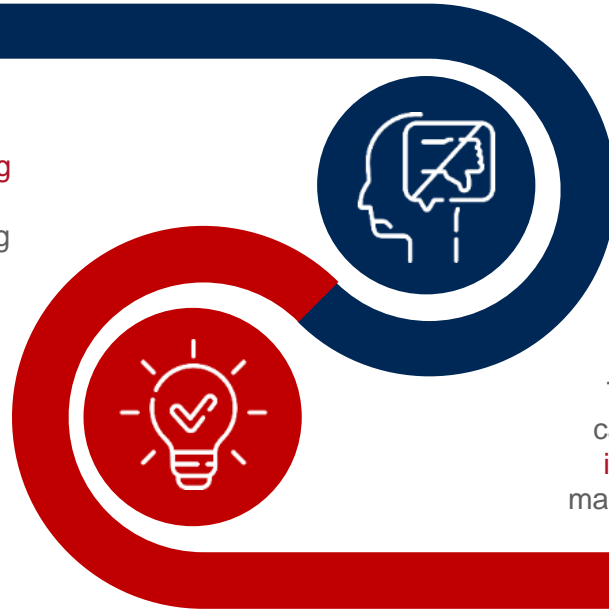


To diversify cooperation methods to take advantage of technology transfer and funding sources from foreign partners

12 groups of key measures for implementing PDP8

10. two measures for localization of electrical equipment and construction and development of electromechanical industry

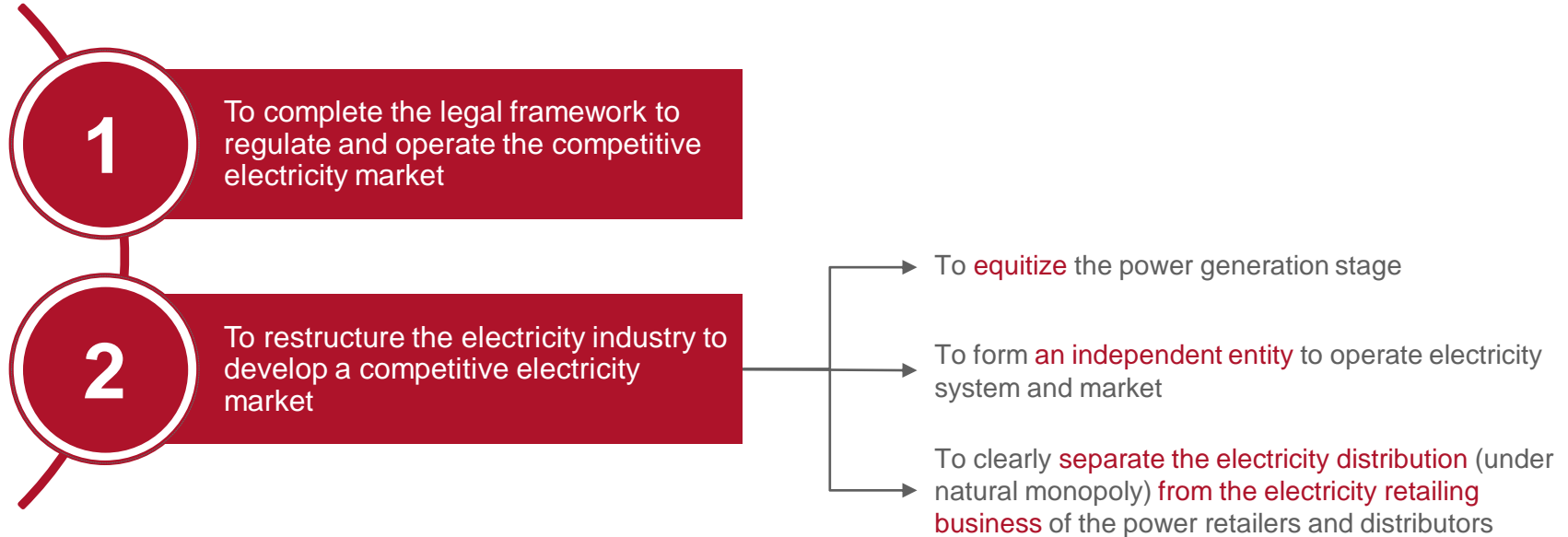
To study on solutions to **develop the industry of manufacturing and supplying electrical equipment** for the domestic market and moving towards export



To increase investment, diversify capital sources and **attract foreign investors** in research, design and manufacture of electrical equipment

12 groups of key measures for implementing PDP8

11. two measures to renovate management organization and improve the efficiency of power operations

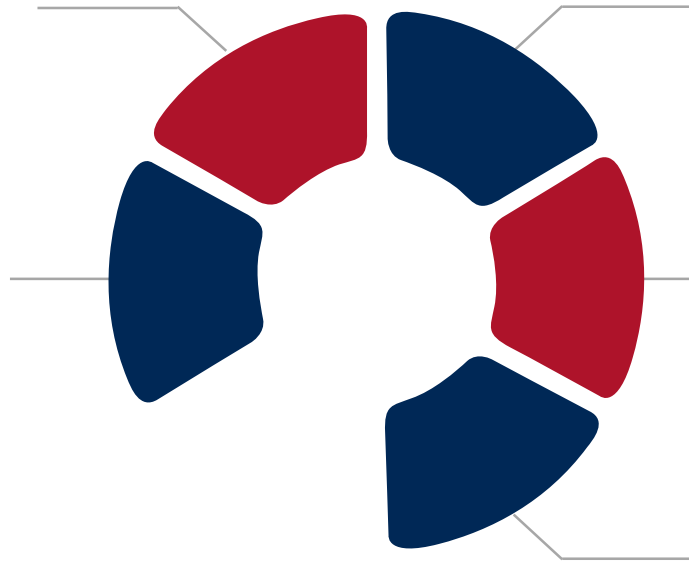


12 groups of key measures for implementing PDP8

12. five measures in respect of electricity tariffs

(ii) To perfect the **electricity tariffs management mechanism** and adjust the **current retail electricity tariff** in the direction towards **non-cross-compensating** between groups of customers, areas and regions

(i) **Principles**: Electricity price according to the **market mechanism** to ensure that it covers all costs and reasonable profits of investors



(iii) To promote **transparency** in electricity price and electricity distribution costs

(iv) To complete the formulation of and operate a **fully competitive electricity market**

(v) To improve the **electricity tariff schedules** to apply at an appropriate time

3

List of “prioritized” key projects

National important power projects and power projects prioritized for investment in the power sector

1. LNG-to-power projects

No.	Project Name / Year	2025	2030	2031-2045	Notes
1	LNG Quang Ninh I		1,500		
2	LNG Thai Binh		1,500		
3	LNG Nghi Son		1,500		
4	LNG Quynh Lap		1,500		
5	LNG Quang Trach 2		1,500		According to Notice No. 54/TB-VPCP dated 25 February 2022
6	Northern LNG-to-power plant(s)			4,500	<p>The following potential locations can be considered in the period of 2031-2045:</p> <ol style="list-style-type: none"> Quynh Lap, Vung Ang III (a coal-fired power plant that has been already included in the revised PDP7, the local authorities are proposing to convert fuel to LNG) Locations: Thai Binh, Nam Dinh, Nghi Son, Thanh Hoa, etc.

National important power projects and power projects prioritized for investment in the power sector

1. LNG-to-power projects

No.	Contents/Year	2025	2030	2031-2045	Notes
7	LNG Hai Lang		1,500		
8	LNG Chan May			1,500	Reserved in case there are projects that are behind schedule or cannot be implemented in practice and/or using domestic gas when Ken Bau field is planned for development.
9	LNG Ca Na		1,500		
10	LNG Son My II		2,250		
11	LNG Son My I		2,250		
12	LNG Long Son		1,500		
13	LNG Nhon Trach 3 & 4	1,500			

National important power projects and power projects prioritized for investment in the power sector

1. LNG-to-power projects

No.	Contents/Year	2025	2030	2031-2045	Notes
14	LNG Hiep Phuoc (phase 1)	1,200			
15	LNG Long An I		1,500		
16	LNG Long An II			1,500	Included into the revised PDP7 under Document No. 1080/TTg-CN dated 13 August 2020
17	LNG Bac Lieu	800	2,400		
18	Southern LNG			1,500	The following potential locations can be considered in the period of 2031-2045: 1. Tan Phuoc (coal-fired power project that has been already included in the revised PDP7 - EVN is proposing to convert fuel to LNG) 2. Locations: Hiep Phuoc 2, Ben Tre, Mui Ke Ga, Ca Mau, etc.

National important power projects and power projects prioritized for investment in the power sector

2. Coal-fired thermal power projects (TPP)

No.	Contents/Year	2025	2030	2031-2045	Notes
1	Na Duong II	110			
2	An Khanh (Bac Giang)	650			
3	Thai Binh 2	1,200			
4	Nam Dinh I		1,200		
5	Nghi Son II	1,330			
6	Cong Thanh	600			The investor submitted Document No. 06/NDCT-HDQT dated 19 April 2022 requesting the conversion of fuel to LNG.
7	Quynh Lap I				The local authority proposed to convert fuel to LNG.
8	Quynh Lap II				
9	Vung Ang II		1,200		
10	Vung Ang III				The local authority proposed to convert fuel to LNG.

National important power projects and power projects prioritized for investment in the power sector

2. Coal-fired thermal power projects (TPP)

No.	Contents/Year	2025	2030	2031-2045	Notes
11	Quang Trach I	1,200			
12	Quang Trach II				The local authority proposed to convert fuel to LNG.
13	Quang Tri I		1,200		
14	Van Phong I	1,432			
15	Vinh Tan III		1,800		
16	Duyen Hai II	1,320			
17	Tan Phuoc 1, 2				EVN proposed to convert fuel to LNG.
18	Long Phu I		1,200		

National important power projects and power projects prioritized for investment in the power sector

2. Coal-fired thermal power projects (TPP)

No.	Contents/Year	2025	2030	2031-2045	Notes
19	Long Phu II				The investors have returned the projects, and the local authority proposed to cancel the site planning.
20	Long Phu III				
21	Song Hau I	1,200			
22	Song Hau II		2,000		

Notes:

- Regarding the BOT and IPP coal-fired thermal power projects that have already been included in the approved master plan, if the investor requests to convert fuel to LNG and/or it is able to negotiate with the investor to convert fuel to LNG, [such project] will be prioritized to be considered for development.
- For locations that have been planned for nuclear power development, the site planning will be retained until the time of completion of the formulation and approval of the nuclear power development master plan under the Master Planning Law.

National important power projects and power projects prioritized for investment in the power sector

3. Cogeneration power sources*

No.	Contents/Year	2025	2030	2031-2045
1	Hai Ha 1 thermal power		300	
2	Hai Ha 2 thermal power			600
3	Hai Ha 3 thermal power			600
4	Hai Ha 4 thermal power			600
5	Duc Giang cogeneration plant	100		
6	Formosa HT2		650	
7	Hoa Phat II residual gas plant		300	

* Depending on the progress of electrical load development of factories and industrial parks

National important power projects and power projects prioritized for investment in the power sector

4. Thermal power projects using domestic gas

No.	Contents/Year	2025	2030	2031-2045
1	Dung Quat I (CVX)		750	750
2	Dung Quat III (CVX)		750	750
3	Dung Quat II (CVX)		750	750
4	Central Region I (CVX)		750	750
5	Central Region II (CVX)		750	750
6	Quang Tri (Bao Vang)		340	340
7	O Mon III (Block B)	1,050	1,050	1,050
8	O Mon IV (Block B)	1,050	1,050	1,050
9	O Mon II (Block B)	1,050	1,050	1,050
10	O Mon I*	660	660	660

Notes:

- * Existing power plant switches to using gas from Block B
- When the reserves and progress of Ken Bau gas field are clearly determined, it is expected to develop about 4-6 GW power sources using gas from Ken Bau in the Quang Tri - Thua Thien Hue area (in the period of 2031-2035).

National important power projects and power projects prioritized for investment in the power sector

5. Medium- and large-scale hydropower projects

No.	Projects	Installed capacity (MW)	Proposed progress
I	Period of 2021-2030	3,873.9	
1	Expanded Hoa Binh	480	2021 - 2025
2	Long Tao	44	2021 - 2025
3	Yen Son	90	2021 - 2025
4	Song Lo 6	60	2021 - 2025
5	Song Lo 7	36	2021 - 2025
6	Pac Ma	160	2021 - 2025
7	Nam Cum 1,4,5	95.8	2021 - 2025
8	Nam Cum 2,3,6	79.5	2021 - 2025
9	Thanh Son	40	2021 - 2025
10	Cam Thuy 2	38	2021 - 2025
11	Suoi Sap 2A	49.6	2021 - 2025

National important power projects and power projects prioritized for investment in the power sector

5. Medium- and large-scale hydropower projects

No.	Projects	Installed capacity (MW)	Proposed progress
12	Thai An MR	41	2021 - 2025
13	Hoi Xuan	102	2021 - 2025
14	Song Hieu (Mong village)	45	2021 - 2025
15	My Ly	180	2021 - 2025
16	Nam Mo 1	90	2021 - 2025
17	Dak Mi 2	147	2021 - 2025
18	Song Tranh 4	48	2021 - 2025
19	Ialy MR	360	2021 - 2025
20	Dak Mi 1	84	2021 - 2025
21	Thuong Kon Tum	220	2021 - 2025
22	Da Nhim MR 2	80	2021 - 2025
23	Tri An MR	200	2021 - 2025

National important power projects and power projects prioritized for investment in the power sector

5. Medium- and large-scale hydropower projects

No.	Projects	Installed capacity (MW)	Proposed progress
24	Phu Tan 2	93	2021 - 2025
25	Duc Thanh	40	2021 - 2025
26	La Ngau	46	2021 - 2025
27	Tuyen Quang MR	120	2026 - 2030
28	Phu Tho low water column	105	2026 - 2030
29	Trung Son MR	130	2026 - 2030
30	Buon Kuop MR	140	2026 - 2030
31	Srepok 3 MR	110	2026 - 2030
32	Sesan 3 MR	130	2026 - 2030
33	Sesan 4 MR	120	2026 - 2030
34	Song Hinh MR	70	2026 - 2030

National important power projects and power projects prioritized for investment in the power sector

6. Pumped-storage hydropower

No.	Projects	Installed capacity (MW)	Proposed progress
I	Period of 2026 - 2030	2,400	
1	Bac Ai	1,200	
2	Phuoc Hoa	1,200	
II	Period of 2031 - 2045	2,100	
1	Dong Phu Yen	900	As the Northern region has many hydropower plants, it is not yet necessary to develop pumped-storage hydropower projects in this region until 2030.
2	Don Duong	1,200	It is difficult to connect the pumped-storage hydropower projects in Lam Dong area to the national grid since there is no additional 500 kV transmission line up to 2030.

A large white speech bubble is centered on the left side of the image. The background is dark with glowing, wavy lines of red and blue particles that create a sense of motion and energy. The text 'Q&A' is written in a bold, dark blue font inside the speech bubble.

Q&A

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