MINISTRY OF INDUSTRY AND TRADE

VIETNAM'S HYDROGEN ENERGY DEVELOPMENT STRATEGY AND LNG POWER DEVELOPMENT PLAN IN LINE WITH THE NATIONAL ENERGY MASTER PLAN

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1. VIETNAM'S HYDROGEN ENERGY DEVELOPMENT STRATEGY UNTIL 2030, WITH A VISION TO 2050

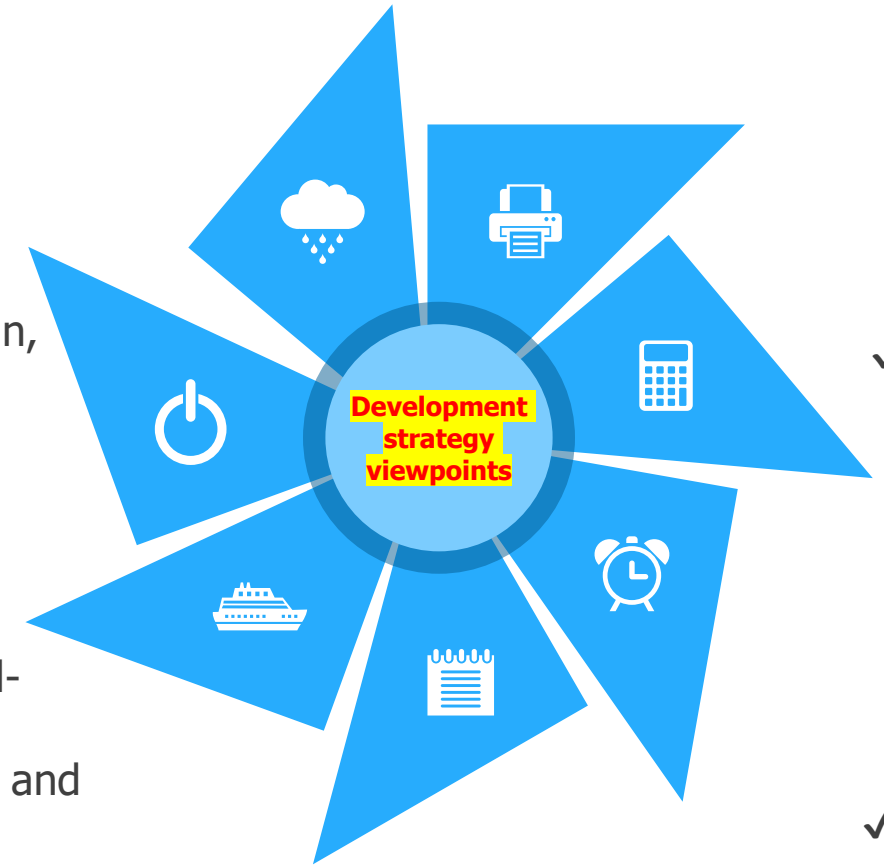
(Decision No. 165/QD-TTG dated 07 February 2024)

1.1 Hydrogen energy development strategy viewpoints

✓ Ensure coherence and consistency with relevant Strategies and Plans, Have flexibility and adaptability to the country context and the global energy transition trends.

✓ Develop hydrogen energy value chain, contributing to ensuring energy security and GHG emissions, promoting green and circular economies and hydrogen economy.

✓Develop hydrogen energy with a well-defined roadmap that aligns with Vietnam's energy transition roadmap and stays abreast of global technological advancements.



✓Leverage and use of natural resources efficiently and sustainably to produce hydrogen energy for both domestic consumption and export while ensuring energy security, national defense, environmental protection and ecological preservation.

✓Encourage widespread adoption of hydrogen energy across all economic sectors. Develop policies and incentive mechanisms to accelerate its use in high-emitting sectors.

✓Strengthen international cooperation, and leverage international support effectively.

1.2 Objective and directions

Overall objective

- To establish a hydrogen energy ecosystem encompassing production, storage, transportation, distribution and consumption of hydrogen energy underpinned by a synchronized, advanced infrastructure, based on renewable energy.
- To contribute to ensuring energy security, and achieving the national goals on climate change, green growth and net-zero emissions by 2050 in accordance with its roadmap and commitments to a sustainable, equitable and just energy transition.

1.2 Objective and directions

Specific goals and directions for each hydrogen energy production subsector

Hydrogen energy production

Until 2030

- To adopt global technological advancements in hydrogen energy production in Viet Nam.
- To implement cutting-edge global technologies for carbon storage/use (CCS/CCUS) alongside hydrogen energy production from other energy sources (such as coal, oil and gas, etc.)
- Target hydrogen energy production capacity of approximately 100,000 to 500,000 tonnes per year by 2030, utilising both renewable energy sources and carbon capture processes.

A vision to 2050

- Improve and master the cutting-edge technologies for green hydrogen energy production in Viet Nam.
- Acquire and master the cutting-edge technologies for carbon storage/use (CCS/CCUS) alongside hydrogen energy production from other energy sources (such as coal, oil and gas, etc.)
- Target hydrogen energy production capacity of approximately 10 to 20 million tonnes per year by 2050, utilising both renewable energy sources and carbon capture processes.

1.2 Objective and directions

Specific goals and directions for each hydrogen energy production subsector

Hydrogen energy use

Until 2030

- Phase in a hydrogen energy market, aligning it with the national fuel transition roadmaps in energy-using economic sectors, including power production, transportation (road, rail, marine, air), industry (steel cement, chemicals, refining, etc.), commercial and residential applications.
- Pilot hydrogen energy use in selected sectors that can leverage existing infrastructure, ensuring system safety and cost effectiveness, i.e., electricity generation, transportation, and industry.

A vision to 2050

- Drive widespread adoption of hydrogen energy and hydrogen-based fuels across all energy-using sectors to decarbonize the economy and contribute significantly to achieving net-zero emissions by 2050.
- Form and establish a hydrogen-based energy market based on market principles, and fair competition with other energy sources.
- Target hydrogen energy and hydrogen-based fuels share of approximately 10% of final energy demand.

1.2 Objective and directions

Specific goals and directions for each hydrogen energy production subsector

Hydrogen energy storage, transport and distribution

Until 2030

- Research and pilot the use of existing energy infrastructure for hydrogen energy storage, transport, and distribution, prioritizing system safety and cost-efficiency.
- Research to pilot centers/manufacturing facilities for specialized equipment for hydrogen energy storage, transport and distribution.
- Research to pilot hydrogen energy distribution systems in transportation sector at routes and areas with optimal conditions.

A vision to 2050

- Develop and complete a hydrogen energy infrastructure for storage, transport, distribution and use, aiming for a market scale of approximately 10 to 20 million tonnes per year.
- Expand and refine hydrogen energy distribution systems for the transportation sector nationwide, aligning with global trends.

1.2 Objective and directions

Specific goals and directions for each hydrogen energy production subsector

Hydrogen energy export

Until 2030

- Leverage rich assets of renewable energy (wind, solar, etc.) and optimal geographic conditions; encourage investments in hydrogen energy production for export while ensuring the national defense and energy security, and economic benefits.

A vision to 2050

- Establish overall energy industry ecosystems powered by renewable energy, new energy, green hydrogen energy, aiming for becoming a new center for clean energy production and exporting in the region.

1.3 Tasks and solutions

On Policies and mechanisms

- Develop, supplement contents of regulations on renewable energy development including hydrogen energy source in the Law on Electricity (revised).
- Facilitate mechanisms and legal frameworks for fossil fuels production and consumption facilities to transition actively to hydrogen energy use.
- Issue regulations on the competent authority of investment policies approval for offshore wind projects, ammoniac/hydrogen energy exporting projects powered by renewable energy.
- Develop and issue mechanisms, incentives (tax, fees, land use, etc.) to attract investments in hydrogen energy development.

On investment and financing

- Prioritise research and investment in small-scale pilot projects for green hydrogen production, then scale up to large-scale ones in areas with high renewable energy potential, proximity to consumers, and favorable export opportunities.
- Diversify investment capitals, forms of capital mobilization, and effectively attract domestic and international capital sources (green credit funds, climate credit funds, green bonds, etc.).
- Diversify investment forms to develop hydrogen-derived energy projects.

On technology

- Stay updated with the latest advancements in new energy sources for electricity generation, transportation, and industry.
- Strengthen R&D and technology transfer of hydrogen-deprived energy production and fuel transition in power plants from coal and gas to biomass, ammoniac, hydrogen, etc.
- Establish incentive mechanisms for domestic enterprises to invest in R&D for hydrogen energy; accelerate innovations in hydrogen-based energy field.

On capacity training and human resources development

- Develop and conduct training and human resources development plans for key technology fields.
- Strengthen cooperation with reputation training organisations nationally and internationally, leverage international support in human resource development.
- Offer competitive remuneration packages to attract top talent in the field of hydrogen energy.
- Leverage the opportunities of investment projects to receive training and knowledge of advanced technologies.

1.3 Tasks and solutions

On environmental protection and sustainable development

- Accelerate energy transition from fossil fuels to hydrogen-based energy to reduce pollutions and GHG, contributing to achieving the goal of net-zero emissions by 2050, protecting the environment and ensuring sustainable development.
- Promote the adoption of advanced technologies to accelerate the transition to a low-carbon economy, circular economy, reduce energy consumption and mitigate emissions, aiming to meet the regulations on carbon emission per unit of exported goods and carbon markets.
- Implement hydrogen-based energy projects and infrastructure with ensuring the compliance with regulations on environmental protection, biodiversity preservation, etc.; ensure their safe, stable operating capacity to mitigate risks and losses and damages due to climate change.

On international cooperation

- Strengthen international cooperation in technology R&D for hydrogen energy production, storage, transport, distribution and consumption.
- Establish strategic partnerships in the field of hydrogen energy.
- Actively and effectively implement the international commitments (COP, JETP, AZEC, etc.) with international partners, leverage the support in technology transfer, governance, human resources development and finance.

On communication

- Disseminate the needs and benefits of developing clean energy and hydrogen energy alongside hydrogen energy value chain in Vietnam's green growth economy.
- Encourage organisations and individuals to cooperate with the governmental authorities in communication, education and awareness-raising programs to raise public awareness on the benefits of hydrogen economy and the GoV's directions and policies for clean energy

1.4 List of prioritized green hydrogen energy investment projects

No.	Name of project	Expected capacity (1,000 tonnes/year)	Potential location
I	**Period of 2026-2030**		
1	Northern hydrogen energy production	100 - 200	Northern region
2	Central hydrogen energy production	200 - 400	Central region
3	Southern hydrogen energy production	200 - 400	Southern region
II	**Period of 2031-2050**		
1	Northern hydrogen energy production	1,000 – 6,000	Northern region
2	Central hydrogen energy production	3,000 – 12,000	Central region
3	Southern hydrogen energy production	3,000 – 12,000	Southern region

2. Direction and plan for LNG development in line with the National Energy Master Plan

2.1. Directions

The National Energy Master Plan for the period of 2021 - 2030 with a vision to 2050 (Decision No. 893/QD-TTg dated 26 July, 2023)

Specific goals

Gas industry

- Maximize the gathering of associated gas from LNG blocks/fields exploited by PVN and other contractors in Viet Nam.
- Ensure sufficient infrastructure to provide 100% gas demand for electricity generation and other applications, in which LNG import capacity reaches about 15.7-18.2 billion m^3 by 2030 and projected to 10.6 – 12.2 billion m^3 by 2050.
- Target LNG market scale of 30.7 – 33.2 billion m^3/year by 2030 with a a projection to 20 - 22 billion m^3 by 2050.

2.1. Directions

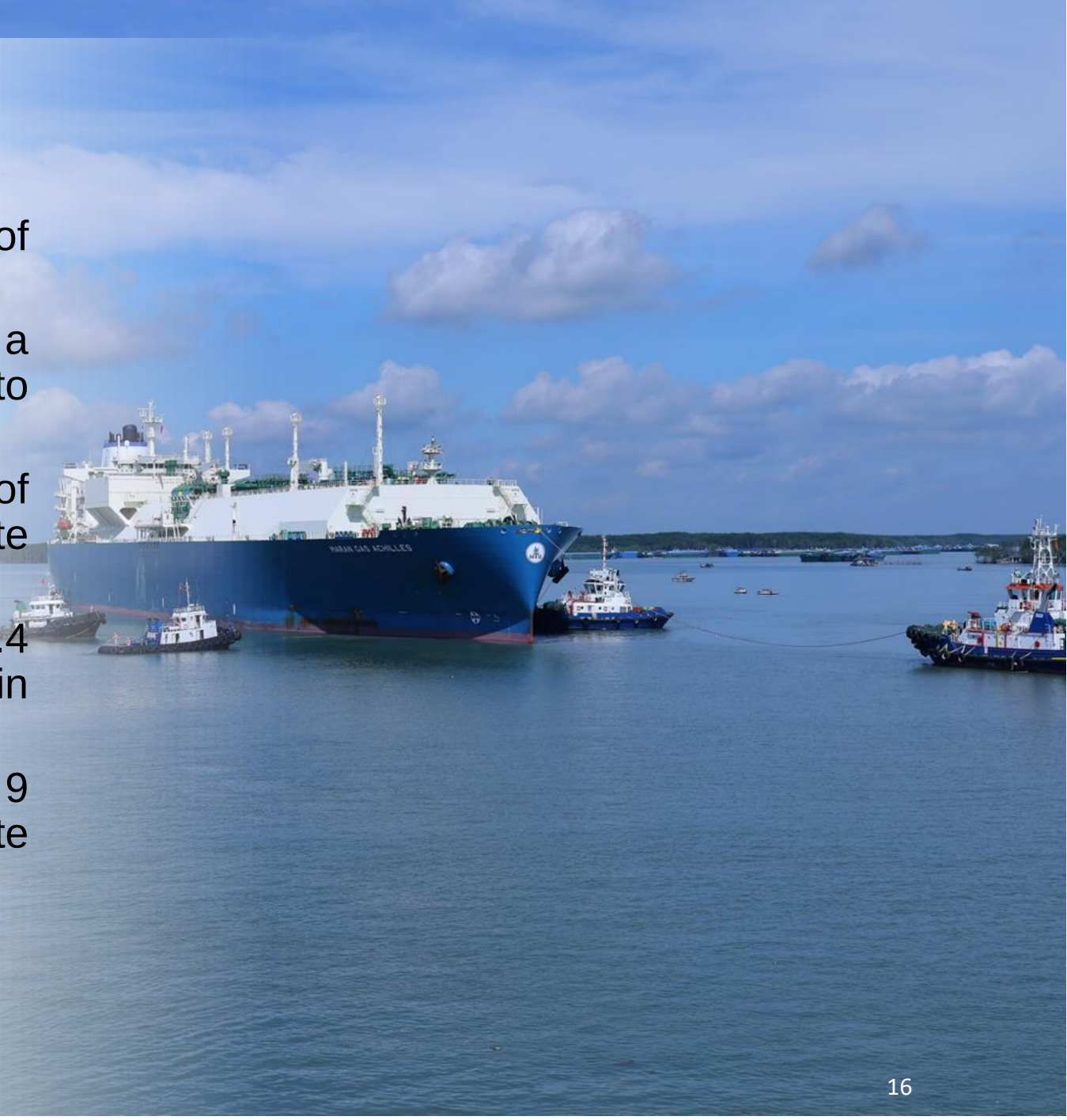
- Develop a complete and synchronized LNG field from exploitation – collection – transport – processing – storage – distribution and export of gas products.

- Establish LNG infrastructure and import natural gas (LNG, CNG) to meeting the demand for electricity generation, industry and residential applications while exploring gas sources (LNG, CNG) through international relations strengthening with countries that have optimal gas sources and transports.

- Develop a complete and synchronized system of supplying natural gas, LNG, CNG, LPG, DME nationwide to meet the fuel demand for energy, fertilizers, industry, transportation and residential applications.

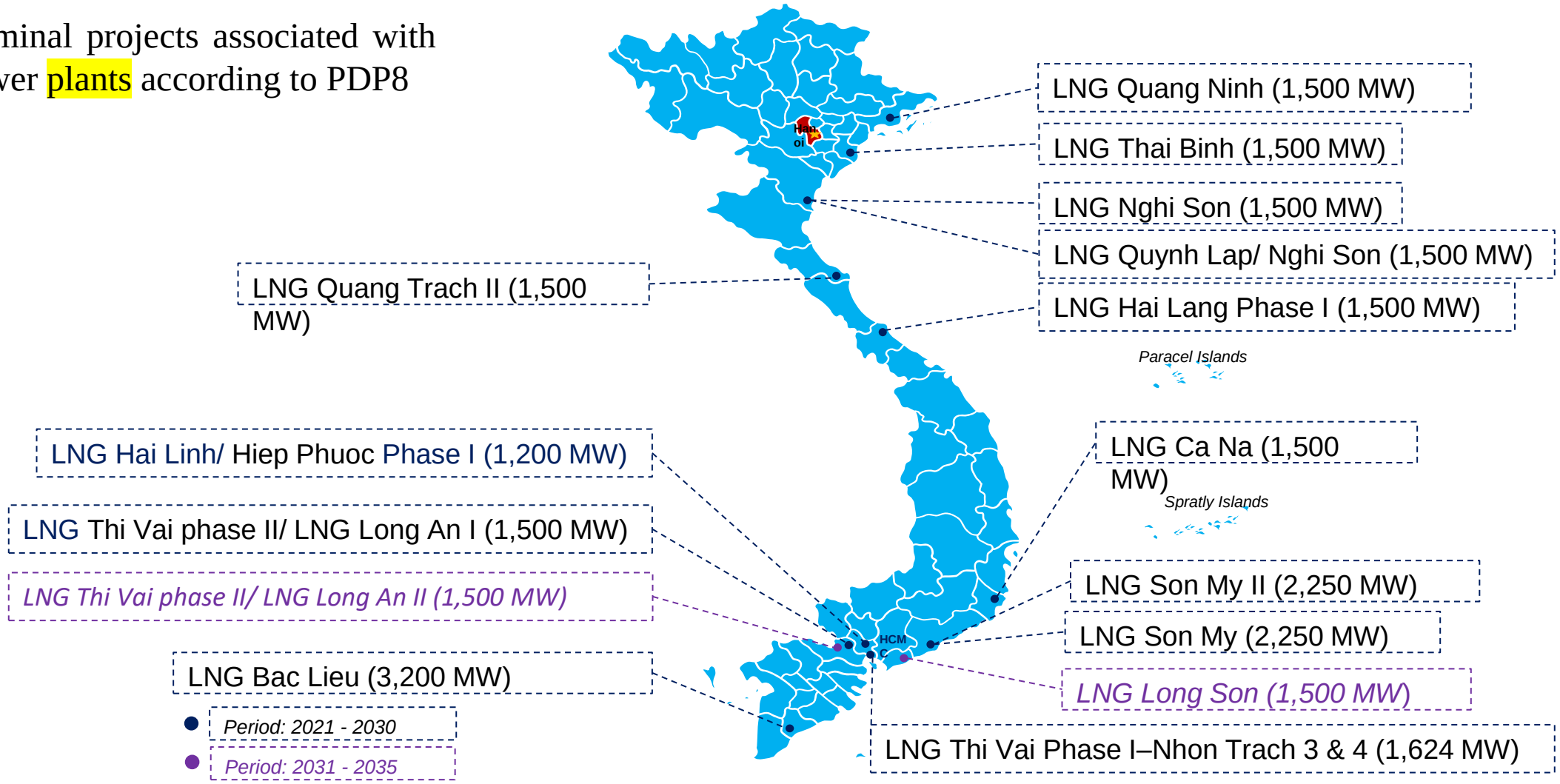
2.1. Directions

- Invest to accelerate the implementation of gas industry projects, including:
- Thi Vai LNG Terminal Phase II to reach a capacity of 3 million tons/per, expected to complete after 2025
- Son My LNG Terminal (with a capacity of 3.6 million tons/year, expected to complete its Phase I in 2026-2027);
- Block B gas project (with a capacity of 6.4 billion m^3/year, expected to complete in 2027);
- Blue Whale project (with a capacity of 7 - 9 billion m^3/year, expected to complete before 2030).



2.2. List of prioritised investment projects

LNG terminal projects associated with LNG power plants according to PDP8



THANK YOU

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