

# **Strategic development orientation of the power industry to achieve Net-zero targets in 2050**

*Mr. Hoang Tien Dung*

*Electricity and Renewable Energy Agency, MOIT*

Respectfully addressed to:

- H.E. Nguyễn Đức Hải, Member of the Central Committee of the Party, Vice Chairman of the National Assembly,
- H.E. Guido Hildner, Ambassador of the Federal Republic of Germany to Viet Nam,
- Mr. Lê Quang Huy, Member of the Central Committee of the Party, Chairman of the National Assembly's Committee on Science, Technology and Environment,
- Ladies and gentlemen,

First of all, I would like to sincerely thank the Standing Office of the National Assembly's Committee on Science, Technology and Environment for inviting me to attend this workshop and present the topic of strategic development orientation of the power industry to achieve net-zero targets by 2050.

Viet Nam's power industry has been constantly developing for decades. The capacity of the power system and the demand for commercial electricity increased steadily year by year with the average growth rate of commercial electricity in the 2011-2020 period reached 10.5%/year. Statistics show that electricity production increased 2.3 times after 10 years, from 93 billion kWh generated in 2011 to 215 billion kWh in 2020. In the 2011-2016 period, the growth rate reached 10.9%/year and in the period of 2016-2020 the growth rate was about 10.1% (only 3.4% in 2020 due to the impact of the COVID-19 pandemic). The power system is continuously being invested, upgraded and operational skills are improved to help reduce the rate of power loss of the whole system. Renewable energy has thrived in recent years, bringing the proportion of wind and solar power sources to account for about 25% of the total installed capacity of the entire power system, contributing to the diversification of power sources, which is recognised and appreciated by many international organisations.

However, the development picture of the power industry not only has bright and positive colors, there are still many difficulties and challenges in ensuring electricity supply for socio-economic development, especially in the context that there are

worldwide experiences of many unpredictable changes, potentially risks in primary energy supply; the efficiency of utilising and usage of energy is still low, the infrastructure is inadequate and not synchronous; there are shortcomings related to energy pricing policies which is not fully in line with the market mechanisms; Large power sources continue to be delayed behind schedule, grid development is facing difficulties due to increasingly complicated site clearance,... In addition, the current power structure is highly dependent on fossil fuel power sources (coal-fired power alone accounts for about 45% of the system's total electricity output). These are sources of electricity that emit a lot of CO<sub>2</sub>. In 2020, the power sector will emit about 115 million tons of CO<sub>2</sub>, of which coal-fired thermal power accounts for about 60%, causing a great impact on the environment.

Currently, the Ministry of Industry and Trade is urgently implementing the development strategy of Viet Nam's power industry in the period of 2021-2030, with a vision to 2050 and a national power development plan for the period of 2021-2030, with a vision to 2050. These strategic documents closely follow the guidelines and orientations of the Party and the Government in order to ensure the goal of supplying sufficient electricity at a reasonable cost and meeting environmental requirements; ensuring rapid and sustainable development of the power industry; prioritising the full and efficient utilisation and usage of new and renewable energy sources,...; contributing to fulfilling Viet Nam's commitment to "net-zero" emissions by 2050.

The power development plan VIII (PDP8) has been being built since 2020 with widely consultation, posted publicly, thoroughly appraised, and is basically completed at the moment. The power development perspectives of the PDP8 have many new features, specifically as follows:

- Adhering to the guidelines and orientations regulated in Resolution 55-NQ/TW dated February 11, 2020 of the Politburo on the orientation of Viet Nam's National Energy Development Strategy to 2030, vision to 2045, ensuring sufficient electricity supply for socio-economic development and people's daily life, ensuring the national defense and security.

- Improving the autonomy of the power sector, fully utilising domestic primary energy resources for electricity production, and minimising dependence on foreign countries.

- Promoting the development of renewable energy sources (wind power, solar power, etc.) with reasonable prices associated with ensuring operational safety and general economy of the power system. Prioritising the development of renewable

energy sources for on-site consumption, no grid connection or selling of electricity to the national grid.

- Prioritising the development of biomass electricity, cogeneration electricity, electricity produced from general waste and solid waste in order to utilise agricultural and forestry by-products and wood processing residues, promoting afforestation and increasing efficiency in energy usage and environmental treatment.

- Maximising the country's hydropower potential on the basis of conserving environment, ensuring forest protection and water security. Promoting the development of pumped hydropower, hydropower on irrigation lakes and reservoirs to regulate loads, reserve capacity, and take advantage of hydropower sources. Researching other types of renewable energy such as geothermal, ocean waves, ...

- Highest priority are putting on the development of thermal power projects using domestic natural gas sources; Developing power sources using liquefied natural gas (LNG) at an appropriate scale to reduce dependence on imports, using modern technology with high efficiency. No new LNG power generation will be developed after 2035. Power plants using LNG are planned to gradually switch to hydrogen fuel. By 2050, the majority of gas-fired power plants will switch entirely to hydrogen.

- No new coal-fired power plants will be built after 2030. Coal-fired power plants that have run out of economic life and using old technology will stop operating and gradually switch to biomass / ammonia fuel after 20 years of operation. The orientation is to stop using coal for power generation by the year 2050.

- Synchronous development of power sources and grids; towards the highest intra-regional balance, reducing long-distance power transmission, reducing power losses; minimising the construction of new inter-regional power transmission lines; Increasing the direct import of electricity from neighbouring countries in the medium and long term, and paying attention to the investment and exploitation of overseas power sources to supply electricity to Viet Nam. Studying the inter-connection of the power systems at the right time.

- Ensuring the fulfilment of Viet Nam's international commitments regarding climate change combat.

Based on the industry development perspectives mentioned above, the PDP8 develops a power development programme with the highest goal of ensuring power supply security and reaching Net-zero by 2050 with the following power mix:

- By 2030: The total installed capacity of power plants will reach about 121,757-145,989 MW (excluding rooftop solar power, private load supply and cogeneration), of which: hydropower gradually increases from about 21,000 MW today (30% installed capacity, 29% generated output) to 27,353-28,946 MW (19.8-22.5% installed capacity, 17.5-17.6% generated output); coal-fired power from nearly 25,000 MW at the moment (31% installed capacity, 45% generated output) increases to 30,127-36,327 MW (20.6-29.8% installed capacity, 30.6-42.5% generated output), this additional capacity is from power plants which are under construction or being prepared for investment; renewable energy not including hydropower (wind power, solar power, biomass power, ...) will increase from about 17,000 MW today (about 25% installed capacity, 4.5% generated output) to 21,871-39,486 MW (18-27% installed capacity, 11.6-20.2% generated output) and imported electricity will be 4,076-5,000 MW (3.3-3.4% installed capacity, 3.2-4.1% generated output).

- Orientation to 2050: Total installed capacity of power plants is about 368,461-501,608 MW (excluding rooftop solar power, private load supply and cogeneration), of which: hydropower accounts for 35,571-36,016 MW (7.2-9.7% installed capacity, 8.6-10.5% generated output); no more coal-fired power plants; coal-fired power converted to biomass/ammonia fuel will reach 25,632-28,832 MW (5.1-7.8% installed capacity, 6.1-7.6% generated output); renewable energy not including hydropower (wind power, solar power, biomass power, ...) shall be 201,836-295,638 MW (54.9-58.9% installed capacity, 48.2-59.1% generated output); electricity imports will reach 11,042 MW (2.2-3% installed capacity; 2.8-3.5% generated output).

It can be seen that the power mix has a strong shift from using fossil fuels to using renewable, green and sustainable energy sources. About 50-60% of total electricity generation will be supplied from renewable energy sources by 2050. With this power development programme, CO<sub>2</sub> emissions are expected to peak at 240 million tons by 2035 and decrease to 30-35 million tons by 2050, contributing to ensuring international commitments on "net-zero" emissions by 2050.

However, to achieve the set goals above, the total capital for power development is huge:

- The 2021-2030 period: The total investment capital needed to implement the power development programme is about 104.7-142.2 billion USD, of which: investment in power source development is about 89.0-126.1 billion USD (8.9-12.6 billion USD per year), for the transmission grid about 15.2-15.6 billion USD (1.5-1.6 billion USD per year).

- Orientation for the 2031-2050 period: the need for investment capital to implement the power development programme is estimated at 324.6-483.0 billion USD, of which: for power development 302.9-448.0 billion USD (estimated 15.1-22.4 billion USD per year), for the transmission grid 21.7-35.1 billion USD (from 1.1-1.8 billion USD per year). Investment capital needs from 2031-2050 will be accurately adjusted in the next power planning stage.

Ladies and Gentlemen,

Above are some contents about the strategic orientation of Viet Nam's power development in the period of 2021-2030, vision to 2050, clearly showing the energy transition towards clean and green. Although there are still many difficulties and challenges in ensuring electricity supply for socio-economic development and implementing Viet Nam's commitments at COP26, it is certain that the trend of green energy transition is inevitable.

Finally, I wish you good health, happiness and success. I wish our workshop a great success

Thank you!