MINISTRY OF INDUSTRY AND TRADE

ELECTRICITY DEPARTMENT

EVALUATION REPORT

NATIONAL ELECTRICITY DEVELOPMENT PLAN

Hanoi, January 2026

I. Current status of electricity demand and supply capacity

1. Current status of national electricity consumption

The national electricity consumption trend for the 2015–2025 period is illustrated in the figure below. Throughout this period, national commercial electricity generation and peak power (Pmax) grew at an average rate of over 7% per year. By 2025, national commercial electricity generation and peak power (Pmax) are projected to reach approximately 288 billion kWh and 54 GW, respectively.

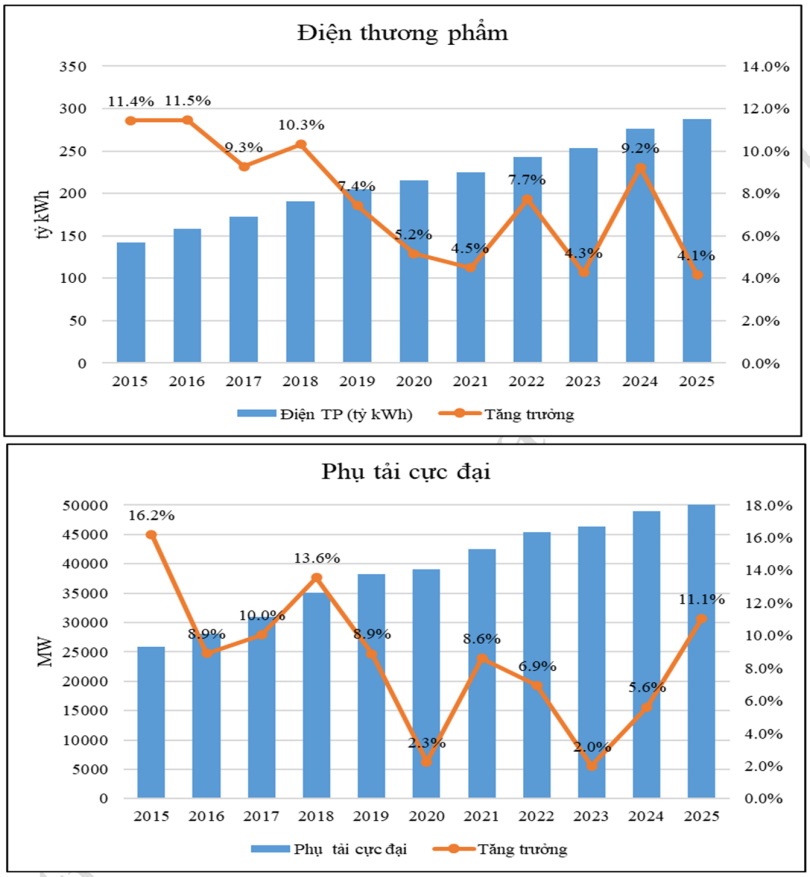

Figure: National electricity demand growth trends for the 2015–2025 period

At the regional level, the electricity consumption trends for the 2016–2025 period are presented in the figure below. The North and South are the two main load centres of the country, with the total commercial electricity generation of these two regions accounting for approximately 91% of national electricity demand. Commercial electricity in the Central Region accounts for only around 9%. Prior to 2014, the South accounted for approximately 50% of the country's total electricity demand. From 2015 onwards, electricity demand in the North grew strongly; consequently, the North's share in the national electricity consumption structure has gradually increased year on year, and has been almost on a par with the South since 2017. By 2025, commercial electricity generation in the North and South will reach 133 billion kWh and 128 billion kWh

respectively, whilst the Central region will reach approximately 27 billion kWh; peak load in the North and South will reach approximately 28 GW and 22 GW respectively, whilst peak load in the Central region will exceed 6 GW.

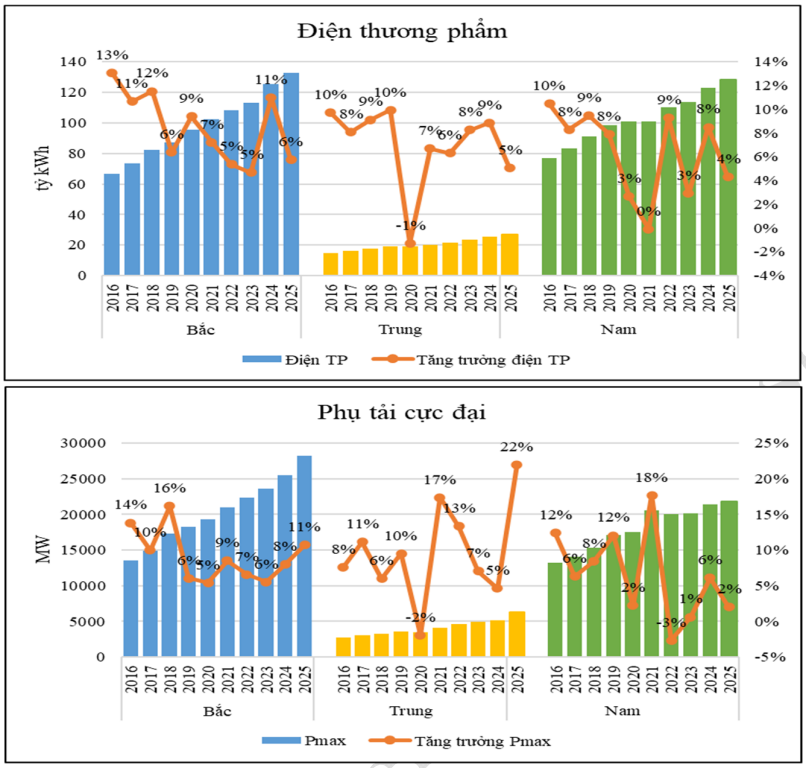

Figure: Electricity load growth trends across regions for the 2016–2025 period

1.2. Current status of power generation

1.2.1. Installed Capacity

The growth in national installed capacity during the 2015–2025 period is illustrated in the figure below. During this period, the total installed capacity of power sources within the system more than doubled, rising from approximately 39 GW to approximately 89 GW. Prior to 2019, Vietnam's power generation was predominantly from conventional power plants such as coal-fired, gas-fired and hydroelectric plants. Since 2019, driven by the Government's incentive mechanisms for renewable energy development, solar and wind power have seen significant growth. By 2025, Vietnam's power system had over 16 GW of solar power (including rooftop solar) and nearly 6 GW of wind power. Traditional power sources had a total installed capacity of approximately 64 GW, comprising nearly 29 GW of coal-fired power, 24 GW of hydropower and 9 GW of gas turbines. The reserve margin for the entire power system in 2025 is approximately 64%. However, if renewable energy sources such as wind and solar power are excluded, the system's reserve margin drops to around 22%.

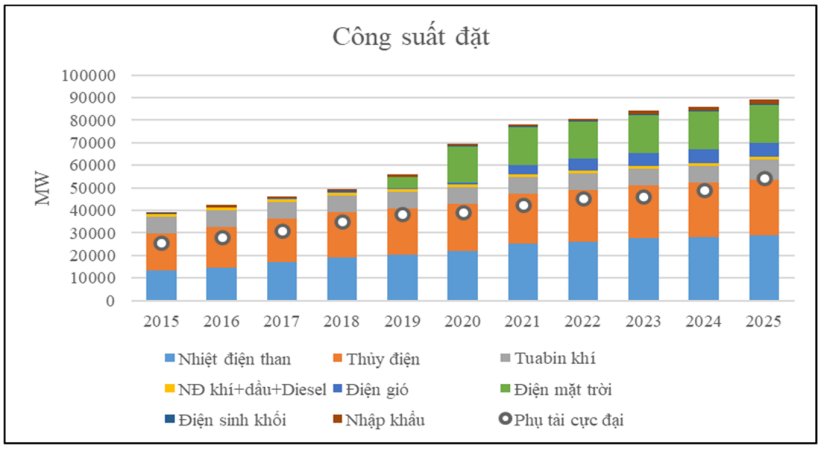

Figure: Growth in installed power capacity of the power system during the 2015–2025 period

The national installed power capacity structure by type for the 2015–2025 period is presented in the figure below. The proportion of hydropower sources (including small hydropower) is trending downwards as hydropower potential has been largely exhausted. By 2025, hydropower will account for only around 28% of the national power mix. Meanwhile, since 2015, coal-fired power has continued to account for over 30% due to the commissioning of numerous power plants during this period. The shares of solar and wind power have risen from nearly 0% in 2018 to 19% and 7% respectively by 2025. Gas turbine power has decreased from 22% in 2014 to 10% in 2025. Other power sources currently account for a small proportion of the national power mix.

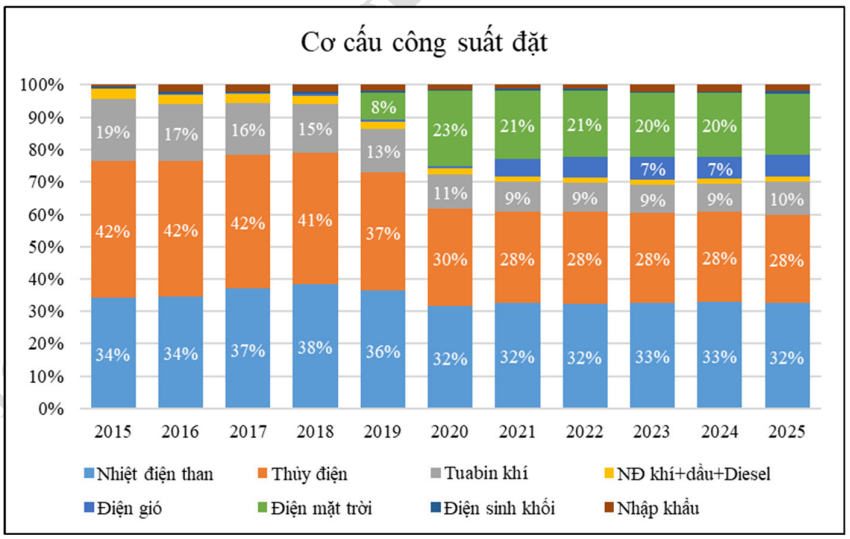

Figure: National installed power capacity structure by source type, 2015–2025

At the regional level, the growth in installed capacity (excluding rooftop solar) during the 2016–2025 period is illustrated in the figure below. During this period, the installed capacity of the Northern region's power generation will increase by approximately 1.5 times, from 21 GW in 2016 to 32 GW in 2025. The Northern region's

power sources are primarily coal-fired thermal power and hydropower, which together account for 95% of the region's total power mix.

In the Central region, installed power capacity is expected to grow by an average of 12% per year, rising from 6 GW in 2016 to 17 GW in 2025. Prior to 2019, the Central Region relied almost exclusively on hydropower, which accounted for approximately 86% of the region's power mix. Since 2019, the Central Region has seen a significant addition of solar and wind power. By 2025, these two sources are projected to account for approximately 38% of the region's total power mix.

In the South, the installed capacity of power sources is growing at an average rate of 9% per year, from approximately 15 GW in 2016 to 34 GW in 2025. Prior to 2019, the South's power sources were primarily gas turbines and coal-fired power. Since 2019, the South has seen a significant addition of solar and wind power. By 2025, these two types of generation will account for approximately 27% of the region's total power mix.

Regarding the reserve margin, the Central region has the highest reserve margin in the country due to low demand and a high concentration of power generation capacity. The reserve margin for the entire power generation capacity in the Central region in 2025 is approximately 171%. Excluding renewable energy sources such as wind and solar power, the Central region's reserve margin stands at 68%. The reserve margin in the North is approximately 12% when wind and solar power are included. Excluding these sources, the reserve margin for the North is around 11%. The reserve margin for the entire Southern power sector in 2025 is approximately 54%, but this would fall to just 12% if wind and solar power are excluded.

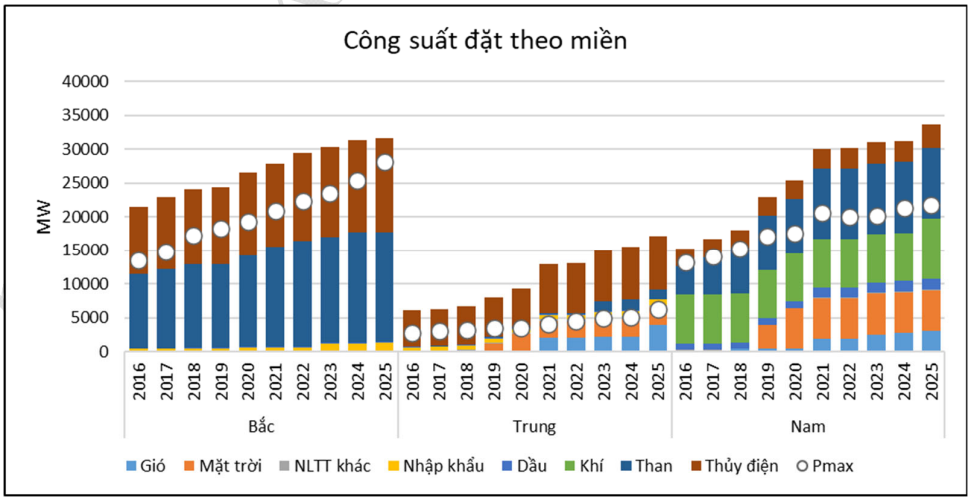

Figure 2-5. Installed power capacity by region for the period 2016–2025

1.2.2. Electricity generation

The growth trend in national electricity generation for the 2015–2025 period is presented in the figure below. During this period, national electricity generation is

projected to grow at an average rate of 7% per year, rising from approximately 163 billion kWh in 2015 to 322 billion kWh in 2025. Coal-fired thermal power and hydropower are the two main types of power generation utilised during this period, accounting for approximately 65–80% of total electricity production. Meanwhile, gas-fired thermal power is not prioritised due to the declining availability of gas supplies and high electricity production costs. The share of gas-fired power in the electricity generation mix has fallen from 29% in 2015 to 6% in 2025. The share of electricity generated from renewable energy sources has increased significantly in recent years, currently accounting for around 13% of the national electricity generation mix.

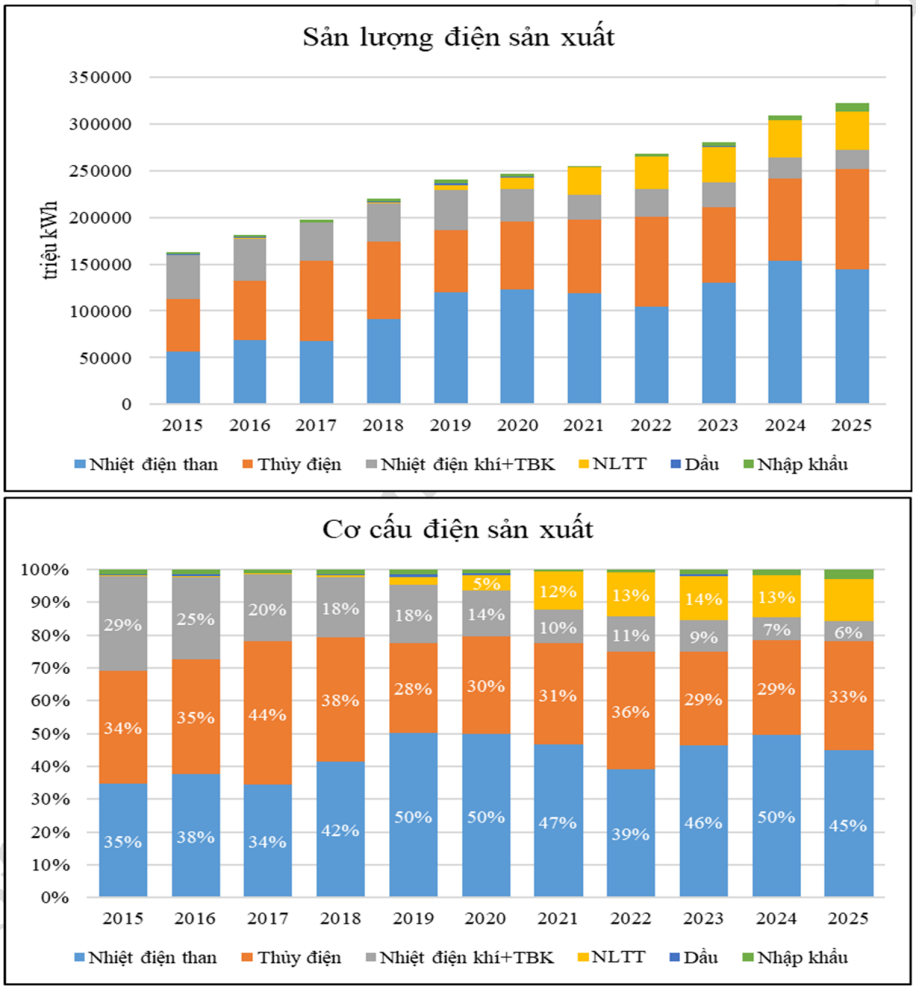

Figure: Electricity production growth trends for the 2015–2025 period

1.3. Current status of the transmission grid

1.3.1. Statistics on the transmission grid

The statistics on the 500–220 kV transmission grid nationwide for the period 2021–2025 are presented in the table below. By 2025, the country will have a total of over 151,000 MVA of 500–220 kV substations and over 35,000 km of 500–220 kV transmission lines.

Overall, the national transmission grid generally meets the transmission and power supply needs for the country's socio-economic development. However, in some areas, localised congestion and overloading still occur at certain times due to high generation output or sudden spikes in load demand.

Table: Transmission grid capacity for the 2021–2025 period

Year	500 kV	220 kV	500 kV	220 kV
	Power lines (km)		Transformers (MVA)	
2021	8,973	19,449	43,200	73,614
2022	10,118	19,823	46,650	78,073
2023	10,691	20,640	47,400	80,654
2024	11,752	21,193	487,50	84,565
2025	13,042	22,111	63,150	88,481

1.3.2 Electricity generation and transmission

With the continuous growth of Vietnam's electricity demand, the volume of electricity transmitted has correspondingly increased year on year. The electricity transmission volumes between the North, Central and South regions in recent years are summarised in the figure below. Prior to 2019, the transmission trend was from the North to the Central region and from the Central region to the South, due to high growth in Southern demand, whilst major power generation projects in the South had not yet come online.

Since 2019, the Central and Southern regions have been supplemented with a significant amount of power generation capacity, particularly from renewable energy sources, whilst rapid load growth in the North has significantly altered the inter-regional transmission trends. The primary transmission trend in recent years has been from Central to North and from Central to South. During the summer months, high demand in the North due to extreme heat, combined with high utilisation of renewable energy plants in the Central and Southern regions, has resulted in periods where transmission flows from the South to the Central and Northern regions have occurred.

Transmission volumes in the North-Central direction have fallen sharply from around 9 billion kWh in 2019 to approximately 7 billion kWh by 2025. Conversely, transmission volume from the Central to the Northern regions is projected to rise from approximately 1.5 billion kWh in 2019 to around 12 billion kWh by 2025. This indicates that the Northern region's capacity to balance electricity supply and demand is gradually diminishing.

Regarding the Central–Southern interconnection, electricity transmission between the Central and Southern regions is growing in both directions, reflecting continuous changes in operational patterns throughout the day. However, the primary transmission direction remains from the Central to the Southern region. Transmission volume in the Central–Southern direction is set to rise from 11 billion kWh in 2019 to approximately 27 billion kWh by 2025. Electricity tends to be transmitted from the Central to the Southern region during the evening peak, when renewable energy generation is low and the mobilisation of thermal power sources in the Central and Southern regions is limited (due to high fuel costs and long start-up times), and from the Southern to the Central region during the midday off-peak period, when renewable energy generation is high

II. Assessment of the implementation of the power development programme

1. Traditional thermal power sources in the North- region

1.1. Coal-fired power

According to Decision No. 768/QĐ-TTg, by 2030, Vietnam could develop a total of 9 additional coal-fired power projects with a combined capacity of 11,313 MW. Currently, five projects are under construction with a total capacity of 4,693 MW, including the Na Duong II, An Khanh – Bac Giang, Vung Ang II, Quang Trach I and Long Phu I power plants. The remaining 4 projects, with a total capacity of 6,620 MW, are in the investment preparation phase but are facing difficulties in securing funding, including the Nam Dinh I Power Plant, the Vinh Tan III Power Plant, and the Song Hau II Power Plant. To date, the Ministry of Industry and Trade has issued Document No. 4579/BCT-ĐL dated 1 July 2024 regarding the termination of the BOT contract for the Song Hau II Thermal Power Plant project. Regarding the Quang Tri Thermal Power Plant project, the Ministry of Industry and Trade has issued Document No. 4640/BCT-ĐL dated 3 July 2024 regarding the suspension of the Quang Tri Thermal Power Plant project under the BOT model; EVN is proposing that the Ministry of Industry and Trade and the People's Committee of Quang Tri Province approve its appointment as the project's investor.

Given the actual implementation status of the above projects, the projected timelines for the coal-fired thermal power projects are summarised in the table below.

Table: Projected Timeline for Coal-Fired Power Projects for the 2026–2030 Period

No.	Power Plant Name	Installed Capacity (MW)	Operational Phase per Plan	Expected Year of Operation
I	**Coal-fired power plants currently under construction**	**6125**		
1	An Khánh Power Plant (Bắc Giang)	650	2025–2030	2030
2	Na Duong II	110	2025–2030	2027

3	Quang Trach I Power Plant	1403	2025–2030	2026
4	Vung Ang II #1	665	2025–2030	2025
5	Vung Ang II Power Plant #2	665	2025–2030	2026
6	Long Phu I Power Plant	1,200	2025–2030	2028

1.2. Domestic gas-fired power

According to Decision 768/QĐ-TTg, by 2030, Vietnam could develop a total of nine new domestic gas-fired power projects with a combined capacity of 7,240 MW, including the Ô Môn II, III and IV power projects using gas from Block B; the Dung Quất I, II and III power projects using gas from Cá Voi Xanh; the Central Region I and II gas-fired power plants using Cá Voi Xanh gas; and the Quảng Trị gas-fired power plant using gas from the Báo Vàng field. In addition, the Ô Môn I oil-fired power plant (660 MW) is also expected to switch to using gas from Block B.

The progress of thermal power projects using domestic gas is currently subject to significant uncertainty due to numerous obstacles in the upstream gas extraction process.

1.3. LNG Thermal Power

According to Decision 768/QĐ-TTg, Vietnam may develop a total of 15 LNG power projects with a combined capacity exceeding 25,624 MW by 2030, and six LNG power projects with a combined capacity of 10,700 MW during the 2031–2035 period. Of these, the Nhon Trach 3 and Nhon Trach 4 power plant projects were completed in 2025. The LNG projects are currently facing difficulties in negotiating power purchase agreements and challenges in procuring turbines due to rising global demand.

1.4. Hydropower and pumped-storage hydropower

According to Decision No. 768/QĐ-TTg, by 2030, the system could develop a further 24 large hydropower projects, with a total installed capacity of 2,958 MW; and 14 pumped-storage hydropower projects with a total capacity of 6,277 MW.

1.5. Small and medium-sized hydropower

According to Decisions No. 262/QĐ-TTg, 1682/QĐ-TTg, 768/QĐ-TTg, 1509/QĐ-BCT and information gathered from provinces/cities and power companies, during the 2026–2030 period, approximately 6,000 MW of small hydropower capacity is expected to be brought into operation.

1.6. Concentrated solar power

According to Decisions No. 768/QĐ-TTg, 1509/QĐ-BCT and information gathered from provinces/cities, during the 2026–2030 period, approximately 25,000 MW of concentrated solar power sources are expected to be brought into operation. The

regions expected to see significant development of concentrated solar power include the Northwest, the Central Highlands and the South Central Coast.

1.7. Offshore wind power

According to Decision No. 768/QĐ-TTg, by 2030, the country could develop a total of 6,000 MW of offshore wind power. However, the policy framework, development roadmap and pricing mechanism for offshore wind power investment have not yet been established. Furthermore, based on international experience, it takes approximately 7–10 years to develop each offshore wind project. Consequently, by 2030, it is highly unlikely that any offshore wind projects will have been commissioned.
1.8. Electricity imports

As of the end of December 2025, a total of 35 power plant projects in Laos with a combined installed capacity of nearly 6,500 MW have been approved for electricity import into Vietnam. The list of electricity import projects from Laos is presented in the table below.

In addition, EVN is currently conducting negotiations to import a further 3,600 MW of electricity from China by 2030. Of this, approximately 3,000 MW is expected to be imported via a Back-to-Back substation along the 500 kV Lao Cai – Vinh Yen transmission line, and approximately 600 MW via the 220 kV grid connected to the 220 kV Mong Cai substation. However, the plan to import 3,000 MW via the Back-to-Back substation is currently facing difficulties regarding the demarcation of investment boundaries; consequently, it is likely that this will only be implemented after 2030. As for the plan to import 600 MW via the 220 kV Mong Cai substation, it is expected to come into operation from 2027.

III. Power Grid Development Programme

1. Electricity Transmission Volume and Transmission Losses

The aggregate transmission volume and electricity loss rates on the transmission grid for the years 2015–2025 are shown in the table below. The volume of electricity transmitted has been increasing steadily in recent years. However, the rate of growth has slowed somewhat since 2019, partly due to the increase in distributed renewable energy sources on distribution grids of 110 kV and below, leading to a reduction in transmission demand. Transmission electricity generation in 2025 is projected to be approximately 256.5 billion kWh, nearly double that of 2015.

The proportion of electricity used for transmission has generally remained above 2% annually. EVNNPT's transmission ratio for 2025 stands at 2.77%, exceeding the EVN-assigned target by 0.37%.

Table: Electricity generation, transmission and power loss rates for the period 2015–2025

Year	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025

Total electricity generation HTĐ (billion kWh)	163.4	182	197.4	221	240.1	255.9	256.5	268.4	280.6	308.7	322.8
Transmission electricity (billion kWh)	139.8	156.2	166.2	184.5	199.8	203.7	200.9	211.5	222.7	246.7	256.5
Percentage of electricity used for transmission (%)	2.34	2.36	2.45	2.45	2.15	2.23	2.29	2.54	2.4	2.62	2.77

Transmission grid development targets under the LTT 2025 plan

According to the assigned plan, the projected transmission grid development targets for 2025 are as follows:

Transmission electricity generation: 255.4 billion kWh.

Commissioning of a total of 55 500–220 kV power grid projects, comprising 16 500 kV projects and 39 220 kV projects.

2. Assessment of transmission volume in 2025

Transmission electricity generation in 2025 is expected to reach approximately 256.5 billion kWh, an increase of 4% compared to 2024. The aforementioned transmission volume represents approximately 96% of the forecast results in the 2025 Transmission Grid Development Plan, taking into account the period up to 2029. Compared to the transmission volume of assigned by EVN, the actual transmission volume achieved 100.45% of the assigned plan.

3. Assessment of the implementation of the 2025 Transmission Investment Plan

The results of EVNNPT's implementation of the 2025 LTT Investment Plan are as follows:

500 kV power grid: 13 out of 16 projects have been energised, achieving 81%. Key 500 kV grid projects that have been energised include the construction of new 500 kV substations at Vinh Yen and Quang Tri; capacity upgrades at the 500 kV substations in Pleiku 2, Lai Chau, West Hanoi, Hoa Binh, Viet Tri and Chon Thanh; and the construction of a new 500 kV transmission line connecting the 500 kV Quang Tri substation.

220 kV power grid: 33 out of 39 projects have been energised, achieving 85%. Key 220 kV power grid projects that have been energised include the construction of new 220 kV substations at Ba Thien, Gia Loc, Vu Thu, Phu Tho 2, Duong Kinh, and Phu My 3 Industrial Zone…; capacity upgrades at the 220 kV substations in Nam Cam, Ha Tinh, Tuy Hoa, Long Xuyen, etc.; construction of new 220 kV transmission lines including Hoi Quang – Nghia Lo, Nghia Lo – Viet Tri, Tuong Duong – Do Luong,

Nhon Trach 3 Power Plant – Long Thanh, and Nhon Trach 3 Power Plant – My Xuan – Cat Lai, etc.

IV Assessment of the implementation of the 2025 Power Development Plan ( )

According to the revised 8th Power Development Plan, by the end of 2025, it can be seen that national electricity demand is relatively close to the forecast in the 8th Power Development Plan. By 2025, national commercial electricity generation and peak load will reach 91% and 93%, respectively, of the forecasts in the 8th Power Development Plan and the revised 8th Power Development Plan. A detailed assessment of this content will require a sufficient period of 12 months to evaluate specific indicators.

V. Assessment of strengths, weaknesses and lessons learnt during the implementation of Power Plan 8 and the revised Power Plan 8

Since its approval in May 2023, the 8th Power Development Plan has been vigorously implemented. The strengths and weaknesses in the implementation of the 8th Power Development Plan are as follows:

1. Regarding the strengths, immediately following the issuance of the 8th Power Development Plan, the Ministry of Industry and Trade and the consulting firm actively developed and finalised the Implementation Plan for the 8th Power Development Plan, which was submitted to the Government for approval via Decision No. 262/QĐ-TTg dated 1 April 2024 and Decision No. 1682/QĐ-TTg dated 28 December 2024. The Ministry of Industry and Trade has actively drafted and submitted to the National Assembly and the Government for issuance key legal frameworks, including the amended Electricity Law, Decrees on the mechanism for direct electricity trading, and mechanisms and policies to encourage the development of rooftop solar power for self-generation and self-consumption. Subsequently, the Ministry of Industry and Trade submitted proposals to the competent authorities for the issuance of Decision No. 768/QĐ-TTg dated 15 April 2025 by the Prime Minister on the Adjustment of the National Power Development Master Plan (the Revised Power Plan VIII) and Decision No. 1509/QĐ-BCT of 2025 approving the Implementation Plan for the National Power Development Master Plan for the period 2021–2030, with a vision to 2050, as a basis for localities and investors to implement

2. Regarding shortcomings, the results of investment in power generation and transmission projects have not yet met the targets set out in the Revised Power Development Plan VIII and the Implementation Plan for the Revised Power Development Plan VIII, leading to the risk of power shortages in the coming years. The reasons for the delays in implementing power generation and transmission projects under the Revised Power Development Plan VIII are as follows:

- The global situation is developing in an unpredictable manner due to wars, military conflicts and trade disputes, which are having a significant impact on the prices of raw materials and inputs for electricity generation; there is a risk that major projects

involving technology transfer and the application of science and technology in electricity generation may face delays; The geopolitical landscape is characterised by intensifying competition among global powers, leading to instability in the supply and pricing of primary energy sources for electricity generation in many countries, including Vietnam.

- Domestic power generation projects are facing difficulties during implementation. Coal-fired thermal power projects are struggling to secure financing due to environmental concerns. Domestic gas-fired power and LNG projects are facing challenges in negotiating gas supply agreements and synchronising the gas-to-power project chain, particularly with Gulf Cooperation Council (GCC) countries and the Americas, which have substantial supply sources.

- Regarding the transmission grid, implementation faces difficulties with procedures for obtaining investment approvals, changes to the designated use of forest land, land acquisition and compensation, and route alignment agreements...

- The merger of local government at two levels from 1 July 2025 will also impact administrative boundary planning and integrated provincial planning; consequently, time is required to align planning across all levels, particularly regarding issues related to land use planning and maritime spatial planning, due to the time required for the the review and approval processes for planning and planning adjustments, leading to difficulties in the implementation of power projects.

- There are currently no binding sanctions to hold investors accountable for delays in implementing key projects (applicable to state-owned enterprises, private enterprises and foreign enterprises)....

- Mobilising investment capital for power generation and grid development faces significant challenges. However, the current electricity pricing mechanism is not sufficiently attractive to investors, making it difficult to secure adequate funding for power generation and grid development.

3. Based on the implementation of the 8th Power Development Plan (PDP VIII) and the revised PDP VIII, the following lessons learned and specific solutions are proposed:

- Diversify the fuel sources used for power generation, harmoniously combining domestic primary energy sources with imports.

- Intensify exploration and prospecting efforts to increase domestic coal and oil and gas reserves and production volumes for electricity generation, thereby reducing reliance on imported fuel.

- Invest in technical infrastructure to facilitate the import of natural gas, LNG and coal, in line with the structure of thermal power generation and energy transition trends.

- Vigorously develop renewable energy sources to maximise the replacement of fossil fuels. Promptly adopt global scientific and technological advancements regarding new energy sources (hydrogen, green ammonia, etc.) for use in power generation.

- Research and apply fuel conversion technologies to convert coal- and gas-fired thermal power plants to biomass, green ammonia and hydrogen fuels.

- Organise research and assessments of the potential of non-conventional energy sources.

a. Solutions for capital generation and investment mobilisation for the development of the electricity sector

- Research and refine financial mechanisms and capital mobilisation for investment in the development of the electricity sector.

- Diversify funding sources and capital mobilisation methods; effectively attract domestic and foreign capital into power sector development, ensuring national defence, security and competitiveness in the electricity market. Strengthen efforts to secure and effectively utilise international support commitments (e.g. JETP, AZEC, etc.), green credit, climate finance, green bonds, etc.

- Diversify investment models (state-owned, private, public-private partnerships, etc.) for power projects. Leverage the role of state-owned enterprises and strongly attract domestic and international private sector participation in power development investment. Continue negotiations and make effective use of funding sources and capital arrangement support from international partners during the implementation of Vietnam's energy transition and its journey towards net-zero emissions.

- Create a favourable, transparent, attractive environment to encourage private sector participation in investment and the development of power projects.

- Gradually enhance the financial mobilisation capacity of enterprises in the electricity sector in line with the requirements of domestic and international financial institutions.

b. Legal and policy solutions

- Refine the electricity pricing mechanism based on a market-oriented approach with state regulation, ensuring a harmonious balance between the state's political, economic and social objectives and the business operations and financial autonomy of enterprises in the electricity sector. Electricity prices shall ensure cost recovery, provide a reasonable profit margin, attract investment in power development, encourage competition across all stages of production, transmission, distribution, retail, and electricity consumption, and combat electricity wastage. Continue to improve and refine the current electricity tariff structure. Study the implementation of a two-part tariff system at an appropriate time. Continue to ensure transparency in electricity pricing.

- Amend the Law on the Efficient and Economical Use of Energy to bring about a significant shift in reducing the economy's energy intensity; issue sanctions and mandatory standards and regulations on energy efficiency, thereby contributing to the transformation of the economy's growth model.

- Develop mechanisms and policies to encourage domestic enterprises to participate in the development of renewable energy, the renewable energy industry, and new energy sources for both domestic use and export, as well as the development of the electrical equipment manufacturing industry.

- Develop policies to increase the level of domestic production in the electricity sector to enhance self-reliance and reduce costs.

- Review the legal framework and relevant legal documents to formulate plans for the development and improvement of the legal basis for nuclear power development. Establish a roadmap for the development of a regulatory framework to ensure nuclear safety.

c. Environmental protection and disaster prevention and mitigation measures

- Implement an energy transition, with a focus on shifting from fossil fuels to renewable and new energy sources; strengthen carbon sinks and research the application of carbon capture technologies.

- Research, apply and develop waste treatment technologies, particularly for waste from renewable energy, based on the principles of minimisation, recovery, reuse and recycling to minimise waste volumes and utilise discarded materials as raw materials for other economic sectors.

- Implement disaster prevention and mitigation measures, as well as responses to climate change and extreme weather events, from the project site selection process through to design, construction, and operational phases.

- Minimise the development of power plants and infrastructure in locations that pose a risk of impacting natural forests, nature reserves and biodiversity, natural heritage sites, and classified cultural heritage sites, in accordance with the national environmental protection zoning.

d. Scientific and technological solutions

- Invest in establishing basic research centres and development centres for renewable energy, new energy sources, and carbon storage technologies in Vietnam to enhance expertise, facilitate technology transfer and adoption, and improve governance, thereby accelerating and scaling up the deployment of renewable energy and the management of clean electricity systems in Vietnam and the region.

- Invest in research and development (R&D) in the electricity sector.

- Use modern technology for new electrical infrastructure projects; gradually upgrade and renovate existing infrastructure.

- Renovate and upgrade the electricity transmission and distribution systems to enhance reliability and reduce power losses. Accelerate the development of a smart grid.

- Modernise data information systems, automation and control systems to support power system dispatch, operation and the electricity market. Adopt new scientific and technological achievements, artificial intelligence and the Internet of Things, including digital transformation within the electricity sector.

- Gradually implement measures to encourage and mandate technological and equipment innovation in energy-intensive economic sectors.

- Successfully implement Resolution No. 57-NQ/TW of 22 December 2024 of the Politburo on breakthroughs in the development of science, technology, innovation and national digital transformation.

- Strengthen the technical support infrastructure and the nation’s scientific and technological capabilities for overall development and to ensure nuclear safety and security for nuclear power.

d. Measures for the efficient and economical use of electricity

- Raise awareness that the efficient and economical use of energy and environmental protection are key national policies and the responsibility of the whole of

society, in line with the spirit of Resolution No. 55-NQ/TW dated 11 February 2020 of the Politburo.

- Encourage investment in and the use of energy-saving technologies and equipment; strengthen energy audits; and promote the implementation of energy service company models.

- Apply mandatory standards and regulations, accompanied by enforcement measures, regarding the efficient use of electricity in sectors and industries with high electricity consumption.

- Intensify the implementation of Demand-Side Management (DSM) programmes and programmes for the efficient and economical use of energy.

e. Solutions for human resource development

- Develop high-quality human resources, particularly in the fields of power generation, transmission, distribution, dispatch, the electricity market, smart grids, etc.

- Build a team of highly qualified experts and scientists in the electricity sector; establish strong units specialising in electricity science and technology.

- Organise training and retraining programmes for technical and managerial staff in the electricity sector to bring them up to the standards of countries in the region and worldwide.

- Innovate training programmes and content, diversify training methods, link training to practical production, and ensure sufficient competence to operate large-scale power systems, integrate a high proportion of renewable energy sources, and apply smart grid technology.

g. Solutions regarding international cooperation

- Actively and effectively implement the provisions of the political declaration establishing the Just Energy Transition Partnership (JETP) with international partners, maximising support from international partners in technology transfer, governance, workforce training and financial provision, and regarding the JETP as a key solution for Vietnam's energy transition.

- Implement a flexible, effective, equitable and mutually beneficial foreign policy on energy and climate. Expand and deepen energy cooperation with strategic and key partners.

- Promote research cooperation and the implementation of power grid interconnections with neighbouring countries, countries in the Southeast Asian region, and countries in the Greater Mekong Subregion.

- Expand international cooperation on scientific research and the development of power technology, and seek technology transfer and capital from foreign partners.

h. Solutions to strengthen domestic capacity, localise electrical equipment, and develop the electrical machinery industry

- Establish renewable energy industrial centres to create a comprehensive renewable energy industrial ecosystem, integrated with manufacturing, ancillary services and concentrated industrial zones.

- Focus on developing the domestic manufacturing industry for renewable energy equipment, energy storage equipment, and technologies for the capture, absorption, storage and utilisation of CO_2 etc., to proactively exploit the country's existing potential, enhance self-reliance, and reduce the production costs of electricity from renewable energy.

- Encourage domestic enterprises to undertake complex, high-tech power projects. Enhance the design, procurement, and project management capabilities of domestic enterprises so that they are capable of acting as main contractors for large-scale power projects.

- Enhance domestic design and manufacturing capabilities to increase the proportion of domestically produced equipment in power generation and transmission projects; improve domestic capabilities in the repair, maintenance and inspection of electrical equipment.

i. Solutions regarding organisational management and improving the efficiency of the electricity sector

- Radically reform the management of the electricity sector towards openness, transparency, competition and efficiency, increasing labour productivity and reducing costs at all stages, in line with the socialist-oriented market economy system.

- Implement the restructuring of the electricity sector in line with the approved roadmap for establishing a competitive electricity market.

- Reform and improve the efficiency of state-owned enterprises in the electricity sector, apply advanced governance models and practices, enhance international credit ratings, and ensure transparency and openness in operations.

k. Measures regarding the organisation, implementation and monitoring of the plan

- Establish an electricity sector database, including data on planning and the implementation of the plan, to serve as a basis for monitoring the implementation of the plan. Regularly review the development of national and regional electricity demand, as well as the progress of power generation and grid projects, to propose adjustments to the power generation mix and timelines where necessary, ensuring the balance between electricity supply and demand for the economy.

- Strictly manage the development of self-generated and self-consumed power sources, co-generation power sources, power sources utilising waste heat, blast furnace gas, by-products from industrial production processes, rooftop solar power, and power sources where power generation and purchasing entities directly negotiate and trade electricity with one another.

- Establish and implement mechanisms to ensure discipline and compliance in the implementation of the Eighth Power Development Plan among project investors, ministries, sectors and local authorities.