PRIME MINISTER

No. 500/QD-TTg

SOCIALIST REPUBLIC OF VIETNAM
Independence - Freedom – Happiness

Hanoi, 15 May 2023

DECISION
Approving the national power development plan for the period of 2021 - 2030, with a vision to 2050

PRIME MINISTER

Pursuant to the Law on Government Organization dated June 19, 2015; The Law amending and supplementing a number of articles of the Law on Government Organization and the Law on Organization of Local Government dated November 22, 2019;

Pursuant to the Law on Planning dated November 24, 2017;

Pursuant to the Electricity Law dated December 3, 2004; The Law amending and supplementing a number of articles of the Electricity Law dated November 20, 2012;

Pursuant to Resolution 61/2022/QH15 dated June 16, 2022 of the National Assembly on continuing to strengthen the effectiveness and efficiency of the implementation of policies and laws on planning and a number of solutions to remove difficulties and obstacles , accelerate the formulation and improve the quality of planning for the period 2021 - 2030;

Pursuant to Resolution No. 81/2023/QH15 dated January 9, 2023 of the National Assembly on the National Master Plan for the period 2021 - 2030, with a vision to 2050;

Pursuant to Decree No. 37/2019/ND-CP dated May 7, 2019 of the Government detailing the implementation of a number of articles of the Law on Planning;

Pursuant to the Government's Decree No. 137/2013/ND-CP dated October 21, 2013 detailing the implementation of a number of articles of the Electricity Law and the Law amending and supplementing a number of articles of the Electricity Law;

At the proposal of the Ministry of Industry and Trade in Report No. 2842/TTr-BCT dated May 14, 2023 and Letter No. 2851 / BCT- D dated May 15, 2023; Appraisal Report No. 62/BC-HDDQHD dated May 13, 2023 of the Appraisal Council of the National Electricity Development Planning for the period of 2021 - 2030, with a vision to 2050.

DECIDES

Article 1. To approve the national power development plan for the period of 2021 - 2030, with a vision to 2050 (referred to as the Power Development Plan VIII) with the following main contents:

I. SCOPE, BOUNDARY OF THE PLANNING

Planning on development of power sources and transmission grid at voltage level of 220 kV or higher, industry and services in renewable energy, new energy in the territory of Vietnam in the period of 2021 - 2030, with a vision to 2050, including works to connect the grid with neighboring countries.

II. DEVELOPMENT PERSPECTIVES AND OBJECTIVES

1. Development perspectives

a) Electricity is an important infrastructure sector, electricity development must go ahead to create a foundation for promoting rapid and sustainable development of the country, building an independent and self-reliant economy, improving the people's living standards and improving the quality of life and ensure national defense and security. The power development plan must have a long-term, effective, sustainable vision and put the interests of the nation and nation first and foremost.

b) Develop electricity according to the principle of overall optimization of the factors of power source, power transmission, distribution, economical and efficient use of electricity, with an appropriate roadmap coupled with resource protection, environment and economic model transformation, ensuring national energy security at the lowest cost.

c) Power development plan must be based on science, inheritance, dynamic and open, but do not legitimize mistakes. Exploiting and effectively using domestic energy resources, combining with reasonable import and export, economical and efficient use of energy. Considering the development of renewable energy and new energy as an opportunity to develop the entire energy industry ecosystem.

d) The State focuses on investing in and encouraging all economic sectors to rapidly develop the electricity sector on the principle of healthy competition and implementation of the market mechanism on electricity selling prices, ensuring the harmony of interests of power owners participating in the investment, use of electricity and meet the development requirements of areas and regions.

dd) Power development must follow the development trend of science and technology in the world, especially in renewable energy and new energy, in association with the transition of the country's economy towards a green economy, circular economy, low carbon economy. Energy transition must be in line with international trends and ensure sustainability, fairness and justice.

2. Development goals

a) Overall goal

- Firmly ensure national energy security, meet the requirements of socioeconomic development and industrialization and modernization of the country.

- Successfully implementing equitable energy transition in association with production modernization, smart grid construction, advanced power system management, in line with

the trend of green transition, emission reduction, scientific development, etc. technology of the world.

- Forming an overall energy industry ecosystem based on renewable energy, new energy.

b) Specific goals

- Regarding assurance of national energy security:

+ Supplying enough electricity demand in the country, meeting socio-economic development goals with an average GDP growth of about 7%/year in the period 2021-2030, about 6.5-7.5%/year years in the period 2031-2050:

- Commercial electricity: By 2025 about 335.0 billion kWh; by 2030 about 505.2 billion kWh; by 2050 about 1,114.1-1,254.6 billion kWh.
- Electricity production and import: By 2025 about 378.3 billion kWh; by 2030 about 567.0 billion kWh; by 2050 about 1,224.3 - 1,378.7 billion kWh.
- Maximum capacity: By 2025 about 59,318 MW; by 2030 about 90,512 MW; by 2050 about 185,187-208,555 MW.

+ Ensuring safe and reliable power supply, meeting criteria N-1 for important load areas and N-2 for particularly important load areas. By 2030, the reliability of electricity supply will be in the group of 4 leading countries in ASEAN, the electricity access index will be in the group of 3 leading countries in ASEAN.

+ Striving to have 50% of office buildings and 50% of residential houses by 2030 using self-produced and self-dissipating rooftop solar power (for on-site consumption, not selling electricity into the national electricity system).

- Regarding fair energy conversion:

+ Strongly developing renewable energy sources for electricity production, reaching the rate of about 30.9-39.2% by 2030, towards the target of 47% renewable energy rate, provided that commitments are made. According to the Political Declaration on the establishment of the Fair Energy Transition Partnership with Vietnam (JETP) fully and substantively implemented by international partners. Orientation to 2050 renewable energy rate up to 67.5- 71.5%.

+ Controlling greenhouse gas emissions from electricity production to reach about 204-254 million tons in 2030 and around 27-31 million tons in 2050. Aim to reach peak emissions of no more than 170 million tons by 2030 with condition that commitments under JETP are fully and substantively implemented by international partners.

+ Building a smart grid system, capable of integrating and safely operating large-scale renewable energy sources.

- Regarding the development of the industrial ecosystem and renewable energy services:

+ It is expected that by 2030, to form 2 inter-regional renewable energy industrial and service centers including electricity production, transmission and consumption; renewable energy equipment manufacturing industry, construction, installation, related services, building renewable energy industry ecosystem in areas with great potential such as the North, the South Central, the South when there are favorable conditions.

+ Developing power sources from renewable energy and producing new energy for export. Striving to 2030, the scale of electricity export capacity will reach about 5,000-

10,000 MW.

III. PLAN FOR NATIONAL POWER DEVELOPMENT

1. Power-source development plan

a) Development orientation

- Synchronously developing and diversifying types of power sources with a reasonable structure to ensure energy security, improving the autonomy of the electricity industry, and reducing dependence on imported fuels.

- Continuing to promote the development of renewable energy sources (hydroelectricity, onshore and offshore wind power, solar, biomass...), new energy, clean energy (hydrogen, green ammonia...) suitable with the ability to ensure system safety with reasonable electricity prices, especially self-generated, self-dissipating and rooftop solar power sources.

- Efficiently exploiting and using domestic fossil energy sources in combination with imports: Gradually reducing the proportion of coal-fired thermal power, prioritizing the development of domestic gas power, developing imported LNG gas power sources with suitable tissue. Implementing energy transition in line with the trend of technology development and cost in the world.

- Developing a balanced power source by area and region, aiming to balance supply and demand in the region. Reasonable arrangement of power sources in localities in the region in order to efficiently exploit power sources, ensure reliable power supply on the spot, reduce technical losses, and reduce power transmission over long distances.

- Developing new power sources with modern technology coupled with technological innovation of operating plants. Towards cessation of factories that do not meet environmental standards.

- Diversifying forms of investment and development of power sources in order to enhance competition and improve economic efficiency.

b) Development plan

- Accelerating the development of power sources from renewable energy (wind power, solar power, biomass power...), continuing to increase the proportion of renewable energy in the structure of power sources and production power:

+ Promoting the development of onshore and offshore wind power, solar power in accordance with the system's absorptive capacity, capacity to release capacity of the grid, reasonable electricity and transmission costs associated with ensure operation safety and general economy of the power system, make full use of existing grid infrastructure. Giving priority to and encouraging the development of wind power, self-produced and self-consumption solar power (including solar power on people's roofs and construction works' roofs, solar power at production and business establishments, and on-site consumption, without connecting or selling electricity to the national grid). Solar power development orientation must be combined with battery storage when the price is suitable.

* By 2030, onshore wind power capacity will reach 21,880 MW (Vietnam's total technical potential is about 221,000 MW).

* Taking fullest advantage of the technical potential of offshore wind power (about 600,000 MW) to produce electricity and new energy.

By 2030, offshore wind power capacity to serve domestic electricity demand will reach about 6,000 MW; scale can be further increased in case of rapid technology development and reasonable electricity and transmission costs. Orientation to 2050 reaches 70,000-91,500 MW.

Orientation to strongly develop offshore wind power in combination with other forms of renewable energy (solar power, onshore wind power...) to produce new energy (hydrogen, green ammonia.) to serve domestic demand and export. Renewable energy power sources producing new energy for domestic demand and export are prioritized/allowed for unlimited development on the basis of ensuring national defense and energy security and bringing about high economic efficiency, becoming a new economic sector of the country.

It is estimated that offshore wind power capacity for new energy production is about 15,000 MW by 2035 and about 240,000 MW by 2050.

+ Vietnam's solar power potential is about 963,000 MW (about 837,400 MW on the ground, about 77,400 MW on the water surface and about 48,200 MW on the roof). From now to 2030, the total capacity of solar power sources is expected to increase 4,100 MW; oriented to 2050, with a total capacity of 168,594-189,294 MW, producing 252.1-291.5 billion kWh. In which:

* Prioritizing and adopting breakthrough policies to promote the development of solar power on the roofs of people’s houses and construction works, especially in areas at risk of power shortage such as: the North and self-produced and self-consumption solar power. From now to 2030, the capacity of these power sources is estimated to increase by 2,600 MW. This type of power source is prioritized for unlimited capacity development, provided it is reasonably priced and makes use of the existing power grid, without having to upgrade.

+ Prioritizing and encouraging the development of various types of biomass electricity (potentially about 7,000 MW), electricity produced from garbage and solid waste (potentially about 1,800 MW) in order to utilize agricultural, forestry and processing by-products, timber, promote afforestation, and treat the environment in Vietnam. In 2030, the capacity of these power sources will reach 2,270 MW, with a vision to reach 6,015 MW in 2050. It is possible to develop a larger scale if there are enough raw materials, high land use efficiency, environmental treatment requirements, grid conditions, electricity prices and reasonable transmission costs.

- Maximizing the potential of hydropower sources (total potential of Vietnam is about 40,000 MW) on the basis of ensuring the environment, forest protection and water source security. Studying and selectively expanding the existing hydropower plants to reserve capacity; exploiting hydroelectricity on irrigation lakes and reservoirs to take advantage of hydroelectricity. By 2030, the total capacity of hydropower sources, including small hydroelectricity is expected to reach 29,346 MW, producing 101.7 billion kWh, which can be further developed if economic and technical conditions allow (see consider potential projects in Appendix III). Oriented to 2050, the total capacity will reach 36,016 MW, producing 114.8 billion kWh.

- Storage power source:

+ Developing storage hydroelectric power plants with a capacity of about 2,400 MW by 2030 to regulate the load, reserve capacity and support the integration of large-scale renewable energy sources.

+ Storage batteries are developed when they are reasonably priced, distributed in close proximity to wind and solar power sources or load centers. By 2030, it is expected to reach

a capacity of about 300 MW.

+ Oriented to 2050, the capacity of hydroelectricity and storage batteries will reach 30,650-45,550 MW to match the high proportion of renewable energy.

- Prioritizing and encouraging the development of cogeneration power plants, power plants using residual heat, blast furnace gas, and by-products of technological chains in industrial establishments. In 2030, the capacity of these sources is expected to reach 2,700 MW and in 2050, it is expected to be about 4,500 MW. The scale of this type of development may be higher, in line with the demand and potential of industrial facilities throughout the country in order to increase energy efficiency.

- Coal-fired power plants: Continuing to implement projects already in the adjusted Power Development Plan VII and under construction until 2030. Orientation to convert fuel to biomass and ammonia with plants already in operation 20 years of service when the price is right. Stopping operation of plants with a lifespan of more than 40 years if fuel conversion is not possible.

+ By 2030, the total capacity of factories in operation and projects under construction, which will be completed and put into operation is about 30,127 MW. 6 projects of 6,125 MW under construction have been urgently completed: Na Duong II, An Khanh - Bac Giang, Vung Ang II, Quang Trach I, Van Phong I, Long Phu I. No 13,220 MW of coal-fired power: Quang Ninh III, Cam Pha III, Hai Phong III, Quynh Lap I, II, Vung Ang III, Quang Trach II, Long Phu II, III, Tan Phuoc I, II. Switch Quang Trach II project to use LNG before 2030.

+ Orientation to 2050, no longer using coal for power generation, completely converting fuel to biomass and ammonia, with a total capacity of 25,632-32,432 MW, producing 72.5-80.9 billion kWh.

- Gas thermal power: Prioritizing the maximum use of domestic gas for power generation. In case the domestic gas production decreases, the import will be supplemented with natural gas or LNG. Develop projects using LNG and synchronous LNG import infrastructure with appropriate scale, using modern technology. Implement a fuel-to-hydrogen conversion roadmap when the technology is commercialized and the cost is affordable.

+ Domestic gas-fired thermal power plants: Focusing on speeding up the implementation of the chain of gas and electricity projects in Block B, Ca Voi Xanh, in which investing in building 6,900 MW of gas thermal power plants: O Mon II, III, IV (3,150 MW), Central I, II and Dung Quat I, II, III (3,750 MW); converting O Mon I (660 MW) to using Block B gas. Implementing a mixed gas turbine plant (TBKHH) in Quang Tri (340 MW) using gas from Bao Vang field. Accelerate the exploration and evaluation of the Ken Bau gas field to plan the development of the gas field and supplement the downstream power plants (oriented in Hai Lang - Quang Tri, Chan May - Thua Thien Hue) if conditions allow. Kien Giang 1 and 2 projects (2x750 MW) were not implemented due to unidentified fuel sources.

Southeast region: Implementing the solutions, focusing on infrastructure construction, research on domestic and regional connections serving the import of natural gas and LNG to ensure gas sources for Phu My power plants, Ba Ria, Nhon Trach.

Southwest region: Implementing the solutions, investing in infrastructure construction, research domestic and regional connections to serve the import of natural gas and LNG to ensure gas sources for power plants in Ca Mau.

In 2030, the total capacity of domestic gas-using plants will reach 14,930 MW,

producing 73 billion kWh. By 2050, about 7,900 MW will continue to use domestic gas or switch to LNG, producing 55.9-56.9 billion kWh of electricity; 7,030 MW is expected to switch to completely hydrogen, producing 31.6-31.9 billion kWh of electricity.

+ LNG thermal power: Limit the development of power sources using LNG if there is an alternative to reduce dependence on imported fuels, delay the progress of the Long Son LNG project (1,500 MW) which has been additionally approved. Power development plan VII adjusted to the period 2031-2035. By 2030, the total maximum capacity of LNG power sources will reach 22,400 MW, producing 83.5 billion kWh. By 2050, plants using LNG will gradually switch to using hydrogen, with a total capacity of 25,400 MW, producing 129.6-136.7 billion kWh.

Continuing to implement LNG import warehouse and port projects at Thi Vai (supplying gas to Nhon Trach 3 and 4 and supplementing gas to factories in the Southeast region), Son My (supplying gas to Son My I, II). Develop a system of warehouses and LNG import ports synchronously with power plants in the planning.

- Flexible power source (quick start-up): Investing in the development of flexible power sources to regulate the load, maintain the stability of the power system to absorb large-scale renewable energy. In 2030, it is expected to develop 300 MW. By 2050 up to 30,900-46,200 MW.

- Import and export of electricity: Effectively connecting and exchanging electricity with countries in the region, ensuring the interests of the parties, enhancing the safety of the power system; to step up the import of electricity from Southeast Asian countries (ASEAN) and the Greater Mekong Subregion (GMS) with hydropower potential. Interested in investing and exploiting power sources in foreign countries to supply electricity to Vietnam. In 2030, import about 5,000 MW from Laos under the Agreement between the two Governments, producing 18.8 billion kWh; could increase to 8,000 MW. By 2050, import about 11,000 MW, produce 37 billion kWh on a balanced basis with exports to ensure overall optimal efficiency.

Prioritizing the unlimited capacity development of renewable energy sources for export and new energy production (hydrogen, green ammonia, ...) on the basis of ensuring energy security and bringing high economic efficiency. Striving to 2030, the scale of electricity export capacity will reach about 5,000-10,000 MW.

Continuing to implement the small hydroelectricity projects, wind power, cogeneration power source, power source using residual heat, blast furnace gas, by-products of technological lines in industrial facilities, biomass power, etc. biogas, electricity produced from waste, solid waste and connection alternatives have been approved in the planning but must comply with the provisions of law, requirements on criteria, priority project arguments.

Medium and large coal, gas and hydroelectric power projects in the revised Power Development Plan VII that have not yet been put into operation, are adjusted in this Plan.

For solar power projects that have been approved for planning, approved by a competent authority and assigned to the investor, the specific progress will be considered in the Implementation Plan of the Power Development Plan VIII according to the provisions of the law on planning, the law on investment and other relevant laws, ensuring security, balancing sources and loads, being suitable for the grid infrastructure, and economic efficiency, reasonable power price and transmission cost. Solar power projects that have been included in the Plan for the period of 2021-2030 but have not been assigned to investors are not allowed to be implemented but considered after 2030, except in the case of

deployment in the form of self-production and self-consumption on the basis of informality if there are violations of planning, land and other regulations of the laws (Appendix IV).

c) Power source structure

- By 2030

Total capacity of power plants serving domestic demand is 150,489 MW (excluding export, existing rooftop solar power, renewable energy to produce new energy), of which:

+ Onshore wind power 21,880 MW (14.5% of total capacity of power plants);

+ Offshore wind power of 6,000 MW (4.0%), in case where the technology develops quickly, electricity prices and transmission costs are reasonable, the scale will be higher;

+ Solar power 12,836 MW (8.5%, excluding existing rooftop solar power), including 10,236 MW concentrated solar power sources, self-produced and self- consumption solar power about 2,600 MW. Self-produced and self- consumption solar power sources are prioritized for unlimited capacity development;

+ Biomass electricity, electricity produced from waste 2,270 MW (1.5%), in case of sufficient raw materials, high land use efficiency, environmental treatment requirements, allowable grid infrastructure, electricity price and reasonable transmission costs, the larger scale development;

+ Hydropower of 29,346 MW (19.5%), which can be further developed if economic - technical conditions allow;

+ Pumped-storage hydroelectricity 2,400 MW (1.6%);

+ Storage battery 300 MW (0.2%);

+ Co-generation electricity, using residual heat, blast furnace gas, byproducts of the technological chain in industrial facilities 2,700 MW (1.8%), the scale can be increased in accordance with the capacity of the industrial facilities;

+ Coal thermal power 30,127 MW (20.0%), except for the projects in Table 3 Appendix II;

+ Domestic gas thermal power 14,930 MW (9.9%);

+ LNG thermal power 22,400 MW (14.9%);

+ Flexible power source 300 MW (0.2%);

+ Import of electricity 5,000 MW (3.3%), can be up to 8,000 MW.

With coal power sources that are having difficulty in implementation, the treatment process will be updated to replace it with LNG or renewable energy sources.

- Orientation to the year 2050

Total capacity of power plants 490,529-573,129 MW (excluding export, renewable energy for new energy production), of which:

+ Onshore wind power 60,050-77,050 MW (12.2-13.4%);

+ Offshore wind power 70,000-91,500 MW (14.3-16%);

+ Solar power 168,594-189,294 MW (33.0-34.4%);

+ Biomass electricity, electricity produced from waste 6,015 MW (1-1.2%);

+ Hydropower 36,016 MW (6.3-7.3%);

+ Power storage 30,650-45,550 MW (6.2-7.9%);

+ Co-generation electricity, using residual heat, blast furnace gas, byproducts of technological chains in industrial facilities 4,500 MW (0.8-0.9%);

+ Coal thermal power 0 MW (0%), no longer using coal for power generation;

+ Thermal power using biomass and ammonia 25,632-32,432 MW (4.56.6%);

+ Domestic gas-fired thermal power and converting to LNG 7,900 MW (1.4-16%);

+ Domestic gas-fired thermal power converting to run entirely by hydrogen 7,030 MW (1.2-1.4%);

+ Hydrogen-fired LNG thermal power 4,500-9,000 MW (0.8-1.8%);

+ LNG thermal power plant converted entirely by hydrogen 16,400-20,900 MW (3.3-3.6%);

+ Flexible power source 30,900-46,200 MW (6.3-8.1%);

+ Import of electricity 11,042 MW (1.9-2.3%).

2. Plan for power grid development

a) Development orientation

- Developing the power transmission system in sync with the progress of power sources, the needs of local load development, using modern technology, ensuring international standards, ready to connect the region. Developing smart grids to integrate renewable energy sources on a large scale, meeting the requirements of safe, stable and economic power system operation.

- Developing 500 kV and 220 kV transmission grids to ensure the capacity to release the capacity of power plants, improve the reliability of power supply, reduce power loss, and meet the N-1 criteria for important load areas and N-2 for particularly important load areas. Develop power transmission grids with long-term backup, increase the use of multi-circuit poles and multiple voltage levels in order to reduce the land occupied area. Encourage the construction of transmission substations that combine to supply electricity to neighboring loads.

- The 500 kV transmission grid plays a pivotal role in connecting regional power systems and exchanging electricity with countries in the region. Limit interregional transmission at a reasonable level, reduce power transmission over long distances, and minimize the construction of new inter-regional transmission lines before 2030.

- Building a reliable 220kV power grid, transformer stations in areas with high load density are designed according to the scheme to ensure flexible operation. Building 220 kV substations that are eligible for automatic and unmanned operation. Promote the construction of GIS substations, 220/22 kV substations, underground stations at load centers.

- Researching and applying Back-to-Back system, flexible power transmission equipment to improve transmission capacity, reduce land occupation. Organization of research on AC and DC power transmission technology with voltage over 500 kV.

- Orientation after 2030 will develop one-way super high-voltage transmission lines connecting the Central, South Central and Northern regions to strongly exploit the potential of offshore wind power. Research on Trans- Asia-Pacific connections.

The transmission grid projects in the revised Power Development Plan VII that have not yet been put into operation are adjusted in this Plan.

b) Construction volume of transmission network

- Period 2021-2030 : New construction of 49,350 MVA and renovation of 38,168 MVA of 500 kV substation; new construction of 12,300 km and renovation of 1,324 km of 500 kV transmission line; new construction of 78,525 MVA and renovation of 34,997 MVA of 220 kV substation; new construction of 16,285 km and renovation of 6,484 km of 220 kV transmission line.

- Orientation for the period 2031-2050*:* New construction of 40,000-60,000 MW with capacity of HVDC stations and 5,200-8,300 km of HVDC transmission lines; new construction of 90,900-105,400 MVA and renovation of 117,900-120,150 MVA of 500 kV substation; new construction of 9,400-11,152 km and renovation of 801 km of 500 kV transmission line; new construction of 124,875-134,125 MVA and renovation of 105,375-106,750 MVA of 220 kV substation; new construction of 11,395-11,703 km, renovation of 504-654 km of 220 kV transmission line. The volume of the power grid in the period 2031-2050 will be accurate in the power plans in the next period.

3. Connection of the power grid with countries in the region

- Continuing to study cooperation, connect the power grid with the countries of the Mekong sub-region and ASEAN countries at voltage levels of 500 kV and 220 kV to enhance the ability to connect the system, exchange electricity, make full advantage of the natural resources of countries.

- Connecting the power grid with Laos with 500kV and 220kV transmission lines to import electricity from power plants in Laos according to the memorandum of understanding signed between the two Governments.

- Maintaining the connection to the electricity grid with neighboring countries through the existing voltage levels of 220 kV, 110 kV and medium voltage; research and implement solutions for asynchronous harmonization between power systems by a DC-AC converter station at voltage level of 220-500 kV.

- Building works connecting electricity export projects with high economic efficiency on the basis of ensuring energy security and national defense security.

4. Orientation for rural electricity development

To build a new program on electricity supply in rural, mountainous and island areas to provide electricity to households without electricity and to renovate the existing rural electricity grid. Provide electricity from the national grid, combined with electricity supply from renewable energy sources for rural, mountainous and island areas; strive for 100% of rural households to have electricity by 2025.

5. Orientation to develop renewable energy industry and service ecosystem

- It is expected that by 2030, to form two inter-regional renewable energy industrial and service centers in areas with great potential such as the North, the South Central and the South when conditions permit.

- The inter-regional renewable energy industry and service center is expected to include renewable energy power plants with a capacity of 2,000-4,000MW (mainly offshore wind power); factories producing renewable energy equipment and new energy production equipment; equipment and means of transportation, construction and installation of renewable energy equipment; ancillary services; green, low-carbon industrial parks; research centers, training institutions on renewable energy.

6. Demand for investment capital

- 2021-2030 Period: It is estimated that total investment in development of power source and transmission grid is equivalent to 134.7 billion USD, of which investment in power source is about USD 119.8 billion (average USD 12.0 billion)/year), the transmission grid is about USD 15.0 billion (average USD 1.5 billion/year).

- Orientation for the period 2031-2050: It is estimated that the need for investment capital to develop the equivalent power source and transmission grid equivalent to USD

399.2-523.1 billion, of which investment for power source is about USD 364.4-511.2 billion (average USD 18.2-24.2 billion/year), transmission grid is about USD 34, 8-38.6 billion (average USD 1.7-1.9 billion /year), will be accurate in the next planning.

IV. ORIENTATION ON LAND USE ARRANGEMENT FOR THE DEVELOPMENT OF ELECTRICITY PROJECTS AND ACTIVITIES OF ENVIRONMENTAL PROTECTION, RESPONSE TO CLIMATE CHANGE AND ECOLOGICAL CONSERVATION, LANDSCAPE AND MONUMENTS

1. Land use arrangement for electricity development

Land demand for development of electricity infrastructure structure is about 89.9-93.36 thousand hecta in the period 2021-2030 and about 169.8 - 195.15 thousand hecta in the period 2031-2050, suitable with the land allocation target in Resolution 39/ 2021/QH15, to ensure the implementation of electricity development goals.

2. Activities of environmental protection, response to climate change and conservation of ecology, landscape and relics.

Implement a strong energy transition from fossil fuels to renewable and new energy to reduce emissions of pollutants and greenhouse gases, meeting the net zero emissions target by 2050.

Apply new and modern technologies in the direction of shifting to a low- carbon economy, reduce energy consumption, reduce emissions, and aim to meet regulations on carbon emissions per unit of product exports and carbon markets.

Avoid and minimize the development of energy facilities and energy infrastructure in locations that pose a risk to forests, nature reserves and biodiversity, natural heritage, monuments and listed cultural heritage.

It is necessary to take into account solutions to combat climate change and respond to extreme weather phenomena such as droughts, floods, storms, floods, landslides, heat, rainfall, sea level rise... during the implementation process of power projects to operate safely and stably, minimizing risks and damages.

V. THE LIST OF IMPORTANT PROJECTS, INVESTMENT PRIORITIES OF THE POWER SECTOR AND THE ORDER OF PRIORITY FOR IMPLEMENTATION

1. Criteria and evaluations for making a list of important and prioritized projects of the power industry

The list of important projects with investment priorities of the power sector is made on the basis of the following criteria and evaluations:

- Projects play an important role in the balance of electricity supply and demand in the country and in important areas, regions, and load centers to ensure the security of electricity supply and meet the needs of socio-economic development.

- Projects ensure national security; projects ensure economic benefits combined with defense and security.

- Projects that need to be implemented to ensure the synchronization between the electricity development planning and other energy plans.

- Projects increase power sources for areas at risk of power shortage.

- Projects ensure the safety and security of the national power system between the background power source, renewable energy source and load (Pumped-storage hydroelectricity, energy storage battery...).

- Projects contribute to climate change adaptation, greenhouse gas emissions

reduction, environment protection (biomass, power produced from garbage, solid waste, cogeneration, using residual gas...), fulfilment of climate commitments.

- Self-produced and self-consumption projects.
- Projects contribute to creating an overall ecosystem of renewable energy industry and services.
- Projects to export electricity and export energy newly produced from renewable energy.
- Project using the land effectively
- Power grid projects of 500 kV and 220 kV.
- Feasibility in implementation.
- Applying advanced technology, environmentally friendly.
- High socio-economic efficiency.

2. List of important projects with investment priority

The list of important projects, prioritized for investment is stated in Appendices I and II.

VI. SOLUTIONS, RESOURCES FOR IMPLEMENTATION OF THE PLANNING

1. Solutions to ensure the security of power supply

- Diversifying fuel sources used for power generation, harmoniously combining domestic and imported primary energy sources.
- To step up search and exploration in order to increase the reserves and output of domestic coal and oil exploitation for electricity production in order to reduce dependence on imported fuels.
- Invest in technical infrastructure for the import of natural gas, LNG, and coal, in accordance with the structure of thermal power sources and the trend of energy transition.
- Strongly develop renewable energy sources in order to maximally replace fossil energy sources. Timely update scientific - technological progress in the world on new energy sources (hydrogen, ammonia...) to use for power generation.
- Research and apply technology to convert fuel from coal-fired power plants, gas to biomass fuels, ammonia, hydrogen...
- Research and evaluate potential non-conventional energy sources.

2. Solutions for creating capital sources and mobilizing investment capital for development of the power industry

- Research and complete financial mechanisms and mobilize capital for investment and development of the power industry.
- Diversify capital sources, capital mobilization forms, effectively attract domestic and foreign capital sources into electricity development, ensure national defense, security and competition in the electricity market. Strengthen calling for and effective use of international support commitments (JETP, AZEC...), green credit sources, climate credit, green bonds...
- Diversify investment forms (state, private, public-private partnership, etc.) for power projects. Promote the role of state-owned enterprises, strongly attract domestic and foreign private sectors to participate in electricity development investment. Continue to negotiate, effectively use funding sources, support capital arrangement of international partners in the process of energy transition and towards “zero” net emissions of Vietnam.
- Encourage people and businesses to invest in the development of rooftop solar power, self-produced and self- consumption electricity.

- Create a favorable, transparent, attractive and encouraging environment for the private sector to invest in and develop power projects.

- Gradually increase the financial mobilization capacity of enterprises in the electricity sector at the request of domestic and international financial institutions.

- Implement flexible and effective credit policies, creating favorable conditions for businesses to access capital sources for the development of power projects.

3. Legal and policy solutions

- Completing the policy and legal framework on electricity development, renewable energy development (including rooftop solar power, self-produced and self-consumption solar power), economical and efficient use of electricity and other relevant regulations:

+ Formulate an amended Electricity Law to perfect policies on investment, planning and administration of electricity prices, develop a competitive electricity market, handle obstacles, institutionalize development mechanisms, and create breakthroughs and strongly encourage and promote the development of electricity sources using renewable energy; separate the role of state management from production and business of enterprises.

+ Researching and developing an auction mechanism, bidding to select investors with electricity prices in the process of amending the Electricity Law and perfecting the competitive electricity market model.

+ Research and concretize policies on socialization of investment in transmission grid.

+ Promulgating a pilot, proceeding to officially build a mechanism for direct electricity purchase and sale contracts between renewable energy power producers and consumers in sync with the amendment of the Electricity Law and the implementation roadmap of competitive electricity market. Research and develop regulations on fee collection for direct power purchase and sale contracts (DPPA).

+ Continue to improve the electricity price management mechanism according to the market mechanism with the State’s regulation, ensuring a harmonious combination between the State's political - economic - social goals and production- business goals and financial autonomy of electricity enterprises. The electricity price ensures full cost recovery, reasonable profit, attracts investment in electricity development, encourages competition in the stages of production, transmission, distribution, retail, electricity use, and waste prevention. Continue to improve and complete the current electricity tariff. Research and implement two-component electricity prices at an appropriate time. Continue to implement transparency electricity price

+ Research, develop and promulgate the Law on Renewable Energy.

+ Amending the Law on Economical and Efficient Use of Energy to make a drastic change in reducing the energy intensity of the economy, promulgating sanctions and mandatory standards and regulations on efficient use energy.

- Develop mechanisms and policies to encourage domestic enterprises to participate in renewable energy development, renewable energy industry development, new energy for domestic and export service, and development of electrical equipment manufacturing industry.

- Develop policies to increase the localization rate in the electricity industry to improve independence and reduce costs.

- Develop mechanisms and policies to promote electricity imports, especially from

Laos through Agreements and Memorandums of Understanding between the two Governments...

4. Solutions for environmental protection, natural disaster prevention and control

- Implement the energy transition, in which the focus is on the transition from fossil fuels to renewable and new energy; increase the size of the sink and promote the application of carbon capture technology.

- Research, apply and develop waste treatment technology, especially from the renewable energy industry according to the principle of reduction, recovery, reuse and recycling to minimize waste, make full use of using waste materials as raw materials for other economic sectors.

- Implement solutions to prevent and control natural disasters, respond to climate change and extreme weather phenomena right from the process of selecting project location, design, construction to production and operation.

- To minimize the development of electrical works and infrastructure in locations with risks of affecting natural forests, nature reserves and biodiversity, natural heritage, relics and cultural heritage has been ranked, in accordance with the national environmental protection zoning.

5. Science and technology solutions

- Investing in research and development (R&D) on electricity. Establishing basic research centers and development centers on renewable energy, new energy, carbon storage technology in Vietnam to improve qualifications, technology reception and transfer, governance to accelerate and expand the scale of renewable energy deployment and clean power system management in Vietnam and the region.

- Using modern technology for new construction electrical works; step by step upgrade, renovate and transform existing works.

- Renovating and upgrading the power transmission and distribution system, improving reliability, reducing power loss. Accelerating the smart grid construction roadmap.

- Modernize information and data systems, automation and control systems to serve the dispatching and operation of the power system and the electricity market. Access to new scientific and technological achievements, artificial intelligence, connection of things, including digital transformation in the electricity industry.

- Step by step applying measures to encourage and compel public innovation technology and equipment of economic sectors that use a lot of electricity.

6. Solutions for economical and efficient use of electricity

- Raising awareness of economical and efficient use of energy, environmental protection is an important national policy and responsibility of the whole society as in the spirit of Resolution No. 55-NQ/TW dated February 11, 2020 of the Ministry of Politics.

- Encouraging investment in and use of energy-saving technologies and equipment; strengthening energy audits; promoting the deployment of the model of energy service companies.

- Applying mandatory standards and regulations together with sanctions on efficient use of electricity to fields and industries with high electricity consumption.

- Promoting the implementation of Power Demand Management (DSM) economical and efficient energy using programs.

7. Solutions on human resource development

- Develop high-quality human resources, especially in the fields of power generation, transmission, distribution, dispatching, electricity market, smart grid...

- Build a team of highly qualified experts and scientists in the field of electricity; building strong units in electricity science - technology.

- Organize training and re-training of technical and managerial staff of the electricity industry on a par with other countries in the region and the world.

- Innovate training programs and contents, diversifying forms of human resource training, training associated with actual production, ensuring sufficient capacity to operate large-scale power systems, high-density integration of renewable energy sources, application of smart grid technology.

8. Solutions for international cooperation

- Actively and effectively implementing the contents of the Political Declaration to establish a Just Energy Transition Partnership (JETP) with international partners, taking full advantage of the support of international partners in technology transfer, administration, human resource training, and financial provision, considering JETP as an important solution for the energy transition in

Vietnam.

- Implementing an energy and climate foreign policy which is flexible, efficient, equal, and mutually beneficial. Expanding and deepening energy cooperation with strategic partners and important partners.

- Promoting cooperation in research and deployment of power grid connection with neighboring countries, countries in Southeast Asia, and countries in the Greater Mekong Sub-region (GMS).

- Expanding international cooperation in scientific research and development of electricity technology, taking advantage of technology transfer and capital sources from foreign partners.

9. Solutions for strengthening domestic capacity, localizing electrical equipment, building and developing the electromechanical industry

- Establishing renewable energy industrial centers, creating a complete renewable energy industrial ecosystem, associated with production and manufacturing, auxiliary services, and concentrated industrial parks.

- Focusing on developing the industry of manufacturing renewable energy equipment, power storage equipment, technology for recovering, absorbing, storing and using carbon... in the country to actively exploit available potential of our country, increasing independence and autonomy, reducing the cost of electricity production from renewable energy.

- Encouraging domestic enterprises to implement complex and high-tech power projects. Improving the capacity of design, procurement, project management and administration of domestic enterprises, capable of taking on the role of general contractor for large-scale power projects.

- Improving the capacity to design and manufacture domestic equipment to increase the ratio of domestic equipment in power source and grid projects; improving the capacity of repair, maintenance and inspection of domestic electrical equipment.

10. Solutions for organization and management, improving efficiency of electricity activities

- Strongly renovate the management of the electricity industry in the direction of openness, transparency, competition, efficiency, increase labor productivity, reduce cost of all stages, in line with the socialist-oriented market economy institution.

- Carry out restructuring of the electricity industry in accordance with the approved roadmap for building a competitive electricity market.

- Innovate and improve the efficiency of state-owned enterprises in the electricity sector, applying advanced governance models and practices, improving the international credit coefficient, implementing publicity and transparency in the activities.

11. Solutions for organization of implementation and supervision of implementation of the planning

V, Expeditiously developing the plan for implementation of the planning after the Electricity Master Plan VIII is approved. Selection of priority projects is based on the criteria and arguments stated in Clause 1, Section V, Article 1 of this Decision.

- Building a database of the electricity sector, including data on planning and organizing the implementation of the planning, to serve as a basis for monitoring the implementation of the planning. Regularly review the national and local load development situation, the progress of the power source and grid projects to propose solutions to adjust the power- source structure and progress if necessary, to ensure the electricity supply and demand of the economy.

- Effectively managing the development of self-produced and self-consumption power sources, cogeneration power sources, power sources using residual heat, blast furnace gas, by-products of the technological chain in industrial facilities, rooftop solar power and other power sources which are directly negotiated between the generating units and the electricity buyers.

- Further promoting the role of the National Steering Committee on Electricity Development in inspecting and urging key electricity projects, promptly removing difficulties and obstacles.

- Developing and applying institutions on discipline and compliance in organizing the implementation of Power Master Plan VIII for investors, ministries, branches, the Committee for the management of state capital at enterprises and localities. Developing sanctions for handling and withdrawing projects that are slow, not implemented according to the assigned schedule.

Article 2. Implementation organization

1.Ministry of Industry and Trade

a) Take responsibility for the accuracy of data, documents, diagrams, maps and databases in the planning dossier, ensuring consistency with the contents of this Decision.

b) Organize the announcement of the planning according to regulations and the implementation of this Decision in association with performance of socio-economic development tasks in accordance with the law; develop a plan for implementation of the planning based on the criteria and arguments specified in this Decision to implement the objectives and tasks set out in the planning; organize the assessment of the implementation of the planning in accordance with the provisions of the Law on Planning. Completing and submitting to the Prime Minister the plan for implementation of the planning in June 2023.

c) Assume the prime responsibility for, and coordinate with ministries, branches and localities in, completing and submitting to the Government the revised Electricity Law and the Law on Renewable Energy for submission to the National Assembly in 2024. Submitting

to the Government for promulgation of policies on direct electricity purchase and sale .

d) Assume the prime responsibility for, and coordinate with ministries, branches and People's Committees of provinces and centrally run cities in continuing to work with investors, carefully reviewing legal provisions, commitments, agreement between the parties to completely handle the projects in Table 3 Appendix II that are facing difficulties in implementation, and report to the Prime Minister any issues beyond their authority.

2. Ministries, branches and committees for management of state capital at enterprises

Fully perform functions, tasks and powers to implement on schedule projects in Power Development Plan VIII; propose mechanisms, policies and solutions to remove obstacles to effectively implement the objectives of the master plan, ensure consistency and synchronization with the implementation of the 10-year socioeconomic development strategy in 2021- 2030, socio-economic development plans of each sector and locality.

3. People's Committees of provinces and centrally run cities

Organize the selection of investors for power projects, to arrange land fund for the development of electricity works in accordance with the laws; assume the prime responsibility for, and closely coordinate with investors in, performing site clearance, compensation, migration and resettlement for power source and grid projects according to regulations.

4. Vietnam Electricity

- Play a key role in ensuring stable and safe electricity supply for socioeconomic development. Invest in power source and transmission grid projects according to assigned tasks.

- Regularly review and evaluate the balance of electricity supply - demand, the situation of the national and regional electricity system operation, and report to the competent authorities.

- Take all solutions for innovation of corporate governance, improvement of production and business efficiency, increase of labor productivity, reduction of energy loss, saving and reduction of costs.

5. Vietnam Oil and Gas Group

- Intensify the search, exploration and exploitation of domestic gas sources to supply for power generation, in line with the demand for electricity loads . Quickly and effectively deploy the gas fields of Block B, Ca Voi Xanh, Ken Bau... according to the approved schedule.

- Implement solutions to build warehouse and port infrastructure, connect
The domestic gas system and the area serving the import of natural gas and LNG
to ensure gas sources for power plants.

- Implement the schedule of the assigned power projects.

6. Vietnam Coal and Mineral Industries Group, Northeast Corporation

- Play a key role in ensuring coal supply for power generation in line with the energy transition roadmap. In the near future, improve domestic coal production capacity, combine with coal import to provide fuel for power plants.

- Invest in power source projects according to assigned tasks.

Article 3. This Decision takes effect from the date of signing for promulgation.

Article 4. Ministers, heads of ministerial-level agencies, heads of agencies under the Government; Chairmen of People's Committees of provinces and centrally run cities; Chairmen of the Members' Councils, General Directors of Vietnam Electricity, Vietnam Oil and Gas Group, Vietnam Coal and Mineral Industries Group; The Chairman, General Director of Northeast Corporation and related agencies are responsible for the implementation of this Decision./.

Recipients:
- Secretariat of the Party Central Committee;
- Prime Minister, Deputy Prime Ministers;
- Ministries, ministerial-level agencies, Governmental agencies;
- People's Councils and People's Committees of provinces and centrally run cities ;
- Central Office and Party Committees ;
- Office of the General Secretary;
- Office of the President; - Ethnic Council and Committees of the National Assembly;
- Office of the National Assembly; - Supreme People's Court;
- Supreme People's Procuracy;
- State audit ;
- National Financial Supervisory Commission;
- Bank for Social Policy;
- Vietnam Development Bank;
- Central Committee of the Vietnam Fatherland Front;
- Central body of unions;
- Groups: Vietnam Electricity, Vietnam Oil and Gas, Vietnam Coal - Mineral Industries;
- Northeast Corporation ;
- Office of Government: BTCN, PCNs, Assistant to Prime Minister, -General Director of the Portal, Bureaus, Departments, Official Gazette;

-Save: VT, CN (3)

FOR AND ON BEHALF OF
PRIME MINISTER
DEPUTY PRIME MINISTER
(Signed and sealed)
Tran Hong Ha

Appendix I

LIST OF PRIORITY SCHEME/PROJECTS ON FINALIZING LAW POLICIES AND INCREASE CAPACITY OF THE POWER INDUSTRY

(Attached to Decision No.500 /QD-TTg dated 15 May 2023 of Prime Minister)

1. Schemes/projects to develop and finalize policies and laws.

2. Schemes/projects on strengthening scientific and technological capacity, building basic research centers and development centers include:

- Center for scientific and technological research on renewable energy and new energy;

- Research Center for Energy and Climate Change;

- Center for Nuclear power research and development;

- Study the scheme on establishing an inter-regional renewable energy service and industry center.

3. Schemes/projects on training and improving the quality of human resources.

Appendix II

LIST AND PROGRESS OF IMPORTANT POWER SOURCES AND NETWORK PROJECTS, INVESTMENT PRIORITY OF THE POWER INDUSTRY

(Attached to Decision No.500 /QD-TTg dated 15 May 2023 of Prime Minister)

Table 1: List of LNG thermal power plants

No.	Project	Capacity (MW)	Stage	Note
1	LNG Quang Ninh	1500	2021-2030	Already included in revised PDP VII
2	LNG Thai Binh	1500	2021-2030	
3	LNG Nghi Son	1500	2021-2030	
4	LNG Quang Trach II	1500	2021-2030	Has been approved by the Government to convert to LNG at Notice No. 54/TB-VPCP dated February 25, 2022
5	LNG Quynh Lap/Nghi Son	1500	2021-2030	Considered in the Implementation Plan of the Planning of potential locations in Quynh Lap - Nghe An, Nghi Son - Thanh Hoa areas
6	LNG Hai Lang Phase 1	1500	2021-2030	Already included in revised PDP VII
7	LNG Ca Na	1500	2021-2030	Already included in revised PDP VII
8	Son My II thermal power plant	2250	2021-2030	Already included in revised PDP VII
9	Son My I BOT thermal power plant	2250	2021-2030	Already included in revised PDP VII
10	LNG Long Son	1500	2031-2035	Already included in revised PDP VII to adjust and extend the schedule, Notice No. 64/TB-VPCP dated May 1, 2023 of the Government Office
11	Nhon Trach 3 and Nhon Trach 4 power plants	1624	2021-2030	Already included in revised PDP VII
12	LNG Hiep Phuoc Phase I	1200	2021-2030	Already included in revised PDP VII
13	LNG Long An I	1500	2021-2030	Already included in revised PDP VII
14	LNG Long An II	1500	2031-2035	Already included in revised PDP VII under Document No. 1080/TTg-CN dated August 13, 2020
15	LNG Bac Lieu	3200	2021-2030	Already included in revised PDP VII
	Potential locations, backup for projects that are behind schedule or cannot be implemented			Thai Binh, Nam Dinh, Nghi Son, Quynh Lap, Vung Ang, Chan May, Mui Ke Ga, Hiep Phuoc 2, Tan Phuoc, Ben Tre, Ca Mau...

Note:

- The exact scale of the power plants will be determined specifically, in accordance with the capacity of the unit in the project implementation phase.

- During the implementation of Power Development Plan VIII, if the projects in this list encounter difficulties, obstacles and cannot be implemented, the Ministry of Industry and Trade shall report to the Prime Minister to speed up the progress of the planning phase projects and/or select alternative projects at potential locations to ensure the security of power supply.

Table 2: List of coal-fired thermal power plants under construction

No.	Project	Capacity (MW)	Stage	Note
1	Na Duong II thermal power plant	110	2021-2030	Already included in revised PDP VII
2	An Khanh - Bac Giang thermal power plant	650	2021-2030	Already included in revised PDP VII
3	Vung Ang II thermal power plant	1330	2021-2030	Already included in revised PDP VII
4	Quang Trach I thermal power plant	1 403	2021-2030	Already in the revised PDP VII, EVN has bid for EPC
5	Van Phong I thermal power plant	1432	2021-2030	Already included in revised PDP VII
6	Long Phu INĐ thermal power plant	1200	2021-2030	Already included in revised PDP VII

Table 3: List of coal-fired thermal power projects behind schedule, facing difficulties in changing shareholders, arranging capital

No.	Project	Capacity (MW)	Stage	Note
1	Cong Thanh thermal power	600	2021-2030	The Ministry of Industry and Trade works with investors, allowing it to be extended until June 2024, if it cannot be implemented, it must be considered for termination in accordance with the law.
2	Nam Dinh I thermal power plant	1200	2021-2030	
3	Quang Tri thermal power plant	1320	2021-2030	
4	Vinh Tan III thermal power plant	1980	2021-2030	
5	Song Hau II thermal power plant	2120	2021-2030	

Table 4: List of cogeneration power sources, power sources using residual heat, blast furnace gas, by-products of technological lines in industrial facilities

No.	Project	Capacity (MW)	Stage	Note
1	Hai Ha 1 cogeneration plant	300	2021-2030	Already included in revised PDP VII
2	Hai Ha 2 cogeneration plant	600	2031-2035	Already in PDP VII to adjust and extend the progress
3	Hai Ha 3 cogeneration plant	600	2031-2035	Already in PDP VII to adjust and extend the progress
4	Hai Ha 4 cogeneration plant	600	2031-2035	Already in PDP VII to adjust and extend the progress
5	Duc Giang cogeneration plant	100	2021-2030	Already included in revised PDP VII
6	Formosa HT2	650	2021-2030	Already included in revised PDP VII
7	Hoa Phat II residual gas plant	300	2021-2030	
8	Other projects	Prioritize and encourage the development of this type to produce electricity in order to increase energy efficiency. The total capacity of this type is developed without limitation in accordance with the needs and potentials of industrial facilities.		

Table 5: List of domestic gas thermal power plants

No.	Project	Capacity (MW)	Stage	Notes
1	O Mon I thermal power*	660	2021-2030	Using gas Block B
2	O Mon II thermal power plant	1050	2021-2030	
3	O Mon III thermal power plant	1050	2021-2030	
4	O Mon IV thermal power plant	1050	2021-2030	
5	Dung Quat I combined gas turbine power	750	2021-2030	Using gas Blue Whale
6	Dung Quat II combined gas turbine power	750	2021-2030	
7	Dung Quat III combined gas turbine power	750	2021-2030	
8	Central Region I combined gas turbine power	750	2021-2030	
9	Central Region II combined gas turbine power	750	2021-2030	
10	Quang Tri combined gas turbine power	340	2021-2030	Using gas from Yellow Leopard mines

Note:

- (*) Existing power plants switch to using gas Block B;

- The exact scale of the power plants will be determined specifically, in accordance with the capacity of the unit in the project implementation phase.

- When the reserves and progress of the Ken Bau gas field are clearly determined, the orientation will be to develop more power sources using Ken Bau gas in the areas of Hai Lang - Quang Tri, Chan May - Thua Thien Hue. paragraph 2031-2035)

Table 6: List of medium and large hydropower sources - MW

No.	Project	Capacity (MW)	Stage	Note
1	Hoa Binh MR hydropower plant	480	2021-2030	Already included in revised PDP VII
2	Long Tao hydropower plant	44	2021-2030	
3	Yen Son hydropower plant	90	2021-2030	
4	Song Lo 6 hydropower plant	60	2021-2030	
5	Song Lo 7 hydropower plant	36	2021-2030	
6	Pac Ma hydropower plant	160	2021-2030	
7	Nam Cum 1,4,5 hydropower plant	95.8	2021-2030	
8	Nam Cum 2,3,6 hydropower plant	79.5	2021-2030	
9	Thanh Son hydropower plant	40	2021-2030	
10	Cam Thuy 2 hydropower plant	38	2021-2030	
11	Suoi Sap 2A hydropower plant	49.6	2021-2030	
12	Hoi Xuan hydropower plant	102	2021-2030	
13	Song Hieu (Mong village) hydropower plant	45	2021-2030	
14	My Ly hydropower plant (*)	120	2021-2030	
15	Nam Mo 1 hydropower plant (Vietnam) (*)	51	2021-2030	
16	Dak Mi 2 hydropower plant	147	2021-2030	
17	Song Tranh 4 hydropower plant	48	2021-2030	
18	Ialy MR hydropower plant	360	2021-2030	
19	Dak Mi 1 hydropower plant	84	2021-2030	
20	Upper Kon Tum hydropower plant	220	2021-2030	
21	Tri An MR hydropower plant	200	2021-2030	
22	Phu Tan 2 hydropower plant	93	2021-2030	
23	Duc Thanh hydropower plant	40	2021-2030	
24	La Ngau hydropower plant (**)	46	2021-2030	
25	Phu Tho low-head hydropower plant	105	2021-2030	

Note:

- *(*) My Ly (180 MW) and Nam Mo 1 (90 MW) hydropower projects have been approved for planning. The investor has Document No. 200/MLNM-TD dated August 24, 2022, proposing to adjust the capacity of My Ly hydropower plant to 120 MW and Nam Mo 1 hydropower plant to 51 MW.*

- (**) La Ngau hydropower project was approved in the revised Power Master Plan VII, has been granted an Investment Certificate, a Land Use Right Certificate. The People's Committee of Binh Thuan province has Document No. 21/UBND-KT dated January 3, 2020 proposing to remove the La Ngau hydropower project from the planning. The Ministry of Industry and Trade has issued Document No. 1986/BCT-DL dated March 20, 2020 requesting the People's Committee of Binh Thuan province to completely handle the contents mentioned in Notice No. 193/TB-VPCP of the Government Office, reporting to the Prime Minister.

Table 7: List of stored hydropower plants - MW

No.	Project	Capacity (MW)	Stage	Note
1	Bac Ai pumped storage hydropower	1200	2021-2030	Already included in revised PDP VII
2	Phuoc Hoa pumped storage hydropower	1200	2021-2030	
3	Dong Phu Yen pumped storage hydropower	900	2031-2035	Already included in revised PDP VII
4	Don Duong #1 pumped storage hydropower	300	2031-2035	Already included in revised PDP VII

	Other projects	Some localities proposed more storage hydroelectric projects: Dien Bien, Lai Chau, Quang Tri, Kon Tum, Khanh Hoa, Dak Nong,... However, the number of projects, capacity, location , the need to be further assessed based on system requirements to report to the Prime Minister.

Table 8: List of newly built and renovated 500 kV substations in the North and put into operation in the period of 2021 - 2030

No.	Name of substation	Capacity (MVA)	Note
1	West of Hanoi	1,800	Renovations
2	Long Bien	1,800	New construction
3	Son Tay	900	New construction
4	Dan Phuong	1,800	New construction
5	South of Hanoi	900	New construction
6	Hai Phong	1,800	New construction
7	Gia Loc	900	New construction
8	Pho Noi	1,800	Renovations
9	Hung Yen	900	New construction
10	Nam Dinh	2,700	New construction, land reserve for 220kV connecting stations in the future.
11	Thai Binh	1,200	New construction
12	Nho Quan	1,800	Renovation, energizing has been done
13	Hoa Binh 2	Cutting station	New construction of Laos electricity connection and cutting station
14	Lao Cai	2,700	New construction, consider installing M3 according to the situation of small hydropower development and purchasing electricity from China
15	Thai Nguyen	900	New construction
16	Viet Tri	1,800	Renovations
17	Vinh Yen	1,800	New construction
18	Bac Giang	900	New construction
19	Yen The	900	New construction
20	Bac Ninh	1,800	New construction
21	Quang Ninh	1,200	Renovations
22	Lai Chau	2,700	Renovate and synchronize regional power sources and sources imported from Laos
23	Son La	2,700	Renovate, increase capacity, synchronize with power sources imported from Laos and regional sources
24	Hoa Binh	1,800	Renovations
25	Thanh Hoa	1,800	New construction
26	Nghi Son	1,800	Renovations

27	Nam Cam		500 kV cut-off station, relay connection on 01 circuit of 500 kV Vung Ang - Nho Quan transmission line (new)
28	Quynh Luu	1,800	New construction
29	North Region 1 (**)	1,800	New construction, synchronously according to the scale and progress of regional power sources
30	North Region 2 (**)	1,800	New construction, synchronously according to the scale and progress of regional power sources
31	North Region 3 (**)	900	New construction, synchronously according to the scale and progress of regional power sources
32	Lang Son (*)	1,800	New construction, synchronously according to the scale and progress of regional power sources
33	Provision for arising 500kV substations for new construction, renovation and capacity improvement	1,800	Provision for load growth and power source development
	Works and projects to improve control and operation of power stations and power systems		Including but not limited to projects: Replacement, installation of reactors, capacitors, SVC, SVG, FACTS equipment, BESS, synchronous compensators...; expand the substations' compartments, renovate and complete the diagrams of substations in a flexible direction; install short-circuit current limiting devices, replace and upgrade equipment to ensure short-circuit current capacity, set up automatic circuits; installation, replacement of equipment, control systems, SCADA/EMS, SCADA/DMS systems, station automation,...

Table 9: List of newly built and renovated 500 kV transmission lines in the Northern region and put into operation in the period of 2021 – 2030

No.	Name of transmission line	Number circuit	x	km	Note
1	West of Hanoi - Thuong Tin	2	x	40	New construction, connection of 500kV substation west of Hanoi
2	Circuit 2 Nho Quan - Thuong Tin	1	x	75	New construction, renovation of one circuit into two circuits
3	Hai Phong - Thai Binh	2	x	35	New construction, connection to Hai Phong 500 kV substation
4	Nam Dinh I thermal power plant - Pho Noi	2	x	123	New construction and connection of Nam Dinh I Thermal Power Plant, in case Nam Dinh I thermal power is behind schedule, consider pre-construction of 500 kV SPP and 500 kV substation of Nam Dinh I thermal power or switch to connect Thanh Hoa - Nam Dinh I thermal power- Thai Binh - Pho Noi to ensure operation
5	Nam Dinh I thermal power plant - Thanh Hoa	2	x	73	New construction
6	Thai Binh - Turn to Nam				New construction, connection to

	Dinh I thermal power plant - Pho Noi	4	x	2	Thai Binh 500 kV substation
7	Lao Cai - Vinh Yen	2	x	210	New construction, connection of 500kV Lao Cai substation, clearing of power plants and provision for Chinese power purchase
8	Vinh Yen - Turn to Son La - Hiep Hoa and Viet Tri - Hiep Hoa	4	x	5	New construction, connection to Vinh Yen 500 kV substation
9	Bac Ninh - Turn to Dong Anh - Pho Noi	2	x	3	New construction, connection of 500 kV Bac Ninh substation
10	Connecting to Hoa Binh MR hydropower plant	2	x	2	New construction, synchronously Hoa Binh MR, transitional Hoa Binh - Nho Quan
11	Thanh Hoa – Turn to Nho Quan - Ha Tinh	2	x	5	New construction, temporary connection of 500 kV Thanh Hoa substation, ensuring power supply
12	Cong Thanh Palace – Turn to Nghi Son - Nho Quan	2	x	5	New construction, connecting Cong Thanh thermal power plant, synchronizing power supply
13	Quynh Luu - Thanh Hoa	2	x	91	New construction, strengthening transmission capacity of North Central - North, replacing Quynh Lap - Thanh Hoa transission line
14	Quang Trach - Quynh Luu	2	x	226	New construction, strengthening North Central Region – North Region transmission capacity, replacing 500kV Vung Ang 3 - Quynh Lap transmission line
15	Vung Ang - Turn Ha Tinh - Da Nang (M3.4)	2	x	16	New construction, transition to 500kV Ha Tinh - Da Nang transmission line, circuit 2
16	Vung Ang - Quang Trach	2	x	33	New construction
17	Long Bien - Turn to Pho Noi - Thuong Tin	2	x	5	New construction, connection to Long Bien 500 kV substation
18	West of Hanoi - Vinh Yen	2	x	44	New construction
19	South of Hanoi – Turn to Nho Quan - Thuong Tin	4	x	5	New construction, connection to South of Hanoi 500kV substation
20	Dan Phuong – Turn to West of Hanoi - Vinh Yen	4	x	5	New construction, connection to Dan Phuong 500 kV substation
21	Son Tay - Dan Phuong	2	x	20	New construction, connection to Son Tay 500 kV substation
22	Gia Loc - Turn to Thai Binh - Pho Noi	4	x	13	New construction, connection to Gia Loc 500kV substation
23	Hung Yen - Turn to LNG Nghi Son - Long Bien	4	x	5	New construction, connection to substation 500 kV Hung Yen
24	Hoa Binh 2 500 kV cut-off station – Turn to Hoa Binh - Nho Quan	4	x	5	Connecting Hoa Binh 2 500kV cut-off station
25	Sam Nuea - Hoa Binh 2 500 kV cut-off station	2	x	110	New construction, connection to Laos power source, length on the territory of Vietnam is about 110km

26	500kV Hoa Binh 2 cut-off station - West Hanoi	2	x	80	New construction, release the capacity of Lao hydropower plant
27	Lang Son - Turn to North Region 3 - Thai Nguyen (*)	4	x	5	New construction, synchronously according to scale and progress of regional power sources. In case the Northern Line 3 - Thai Nguyen 500kV line is behind schedule, Lang Son - Yen The 500kV dual-circuit line is built in advance, with the length of 110 km.
28	Hiep Hoa – Thai Nguyen	2	x	34	New construction, connection of Bac Giang 500 kV substation
29	Bac Giang - Bac Ninh	2	x	40	New construction
30	Bac Giang - Turn to Quang Ninh - Hiep Hoa	4	x	5	New construction, connection of Bac Giang 500 kV substation
31	Yen The - Turn to North Region 3 - Thai Nguyen	4	x	ten	New construction, connection to Yen The 500 kV substation. In the case the 500kV Northern Line 3 - Thai Nguyen is behind schedule, the 500kV dual-circuit power line Yen The - Thai Nguyen is built in advance, with a length of 70 km.
32	LNG Quang Ninh I - Quang Ninh	2	x	30	New construction, synchronous LNG Quang Ninh I
33	Improvement of Vung Ang - Nho Quan (circuit 1)	2	x	360	Renovating the existing 500 kV line into 02 circuits, considering switching connections to Hoa Binh 2 500 kV cut-off station
34	Nam Cam - Turn to Vung Ang - Nho Quan	2	x	12	New construction, relay on Vung Ang - Nho Quan single circuit line
35	LNG Quang Trach II - Quang Trach	2	x	1	New construction, synchronous LNG Quang Trach II
36	North Region 1 - Hai Phong (*)	2	x	25	New construction, synchronously according to scale and progress of regional power sources
37	North Region 3 - Thai Nguyen (*)	2	x	250	New construction, synchronously according to the scale and progress of regional power sources. In case Lang Son 500kV substation, deploy first and build a new 500kV transmission line with a double circuit of Bac Bo 3 - Lang Son with a length of 80km.
38	North Region 2 - Thai Binh (*)	2	x	50	New construction, synchronously according to the scale and progress of regional power sources

39	LNG Nghi Son - Long Bien	2 x 212	New construction, synchronous LNG Nghi Son
40	LNG Nghi Son - LNG Quynh Lap	2 x 25	New construction, synchronous LNG Nghi Son
41	Connecting LNG in the North (Quynh Lap/Nghi Son)	40	Newly built, synchronously North LNG (Quynh Lap/Nghi Son). The specific plan will be specified in the implementation plan for Master Plan
	Provision for arising renovation and new construction of 500kV transmission line	400	Provision for load growth and power source development

Table 10: List of 220 kV substations newly built and renovated in the North and put into operation in the period of 2021 - 2030

No.	Name of substation	Capacity (MVA)	Note
1	Van Tri	750	Renovations
2	West of Hanoi	750	Renovations
3	Long Bien	750	Renovations
4	Thanh Xuan	750	New construction
5	Dai Mo (My Dinh)	750	New construction
6	Hoa Lac	500	New construction
7	Me Linh	500	New construction
8	Van Dien	750	New construction
9	Long Bien 2 (Gia Lam)	750	New construction
10	Soc Son 2	500	New construction
11	Phu Xuyen	500	New construction
12	Hoa Lac 2	500	New construction
13	Dan Phuong	500	New construction, connection to the 500kV Dan Phuong station
14	Chuong My	250	New construction
15	Cau Giay	500	New construction
16	Hai Ba Trung	500	New construction
17	Ung Hoa	500	New construction
18	Vat Cach	500	Renovations
19	Hai Phong thermal power	500	Renovations
20	Thuy Nguyen	500	Renovations
21	Duong Kinh	500	New construction
22	An Lao	500	New construction, consider machine 3 if necessary
23	Cat Hai	500	New construction
24	Dai Ban	250	New construction
25	Do Son	250	New construction
26	Tien Lang	250	New construction
27	Gia Loc	500	New construction
28	Tan Viet	500	New construction
29	Pha Lai thermal power	750	Renovations
30	Thanh Ha	250	New construction
31	Hai Duong thermal power	500	Renovations
32	Tu Ky	250	New construction
33	Nhi Chieu	250	New construction
34	My Yen	500	New construction
35	Pho Noi 500 kV connection level	500	New construction

36	Pho Cao	500	New construction
37	Bai Say	500	New construction
38	Hung Yen connecting level (Hung Yen city)	250	New construction
39	Van Giang	250	New construction
40	Dong Van	500	New construction
41	Ly Nhan	500	New construction
42	Hai Hau	500	New construction
43	Nam Dinh 3	750	New construction, synchronized with the development progress of specialized loads
44	Nam Dinh 2	250	New construction
45	Nghia Hung	250	New construction
46	Thai Thuy	500	Renovations
47	Vu Thu	500	New construction
48	Quynh Phu	250	New construction
49	Thai Binh 500 kV connection level	250	New construction
50	Nho Quan 500 kV connection level	500	Renovations
51	Ninh Binh 2	500	New construction
52	Tam Diep	250	New construction
53	Gia Vien	500	New construction, implemented in case of relocation of 220kV Ninh Binh substation
54	Bac Quang	500	New construction
55	Ha Giang	375	Renovations
56	Cao Bang	500	Renovations
57	Bat Xat	500	New construction
58	Lao Cai 500 kV connection level	500	New construction
59	Van Ban	250	New construction
60	Bac Ha	250	New construction
61	Bac Kan	375	Renovations
62	Dong Mo	250	New construction
63	Lang Son	500	New construction
64	Lang Son 1 (*)	500	New construction, synchronously according to the scale and progress of regional power sources
65	Lang Son 2 (*)	500	New construction, synchronously according to the scale and progress of regional power sources
66	Tuyen Quang	500	Renovations
67	Nghia Lo	250	New construction
68	Luc Yen	250	New construction
69	Yen Bai	500	Renovations
70	Luu Xa	500	Renovations
71	Song Cong	250	New construction
72	Phu Binh 2	750	New construction
73	Dai Tu	250	New construction
74	Bac Giang 1 (*)	500	New construction, synchronously according to

			the scale and progress of regional power sources
75	Viet Tri 500 kV connection level	500	New construction
76	Phu Tho 2	500	New construction
77	Phu Tho 3	250	New construction
78	Vinh Tuong	500	Renovations
79	Ba Thien	500	New construction
80	Phuc Yen	250	New construction
81	Chan Hung	250	New construction
82	Tam Duong	500	New construction
83	Yen Dung	500	New construction
84	Lang Giang	500	New construction
85	Hiep Hoa 2	250	New construction
86	Bac Giang 500 kV connection level	250	New construction
87	Viet Yen	250	New construction
88	Tan Yen	250	New construction
89	Bac Ninh 6	500	New construction
90	Bac Ninh 4	500	New construction
91	Bac Ninh 500 kV connection level	500	New construction
92	Bac Ninh 7	250	New construction
93	Bac Ninh 5	500	New construction
94	Trang Bach	500	Renovations
95	Hoanh Bo	500	Renovations
96	Quang Ninh 500 kV connection level	500	Renovations
97	Hai Ha	500	Renovations
98	Yen Hung	750	New construction
99	Cong Hoa	250	New construction
100	Khe Than	126	New construction, synchronized with the development progress of specialized loads
101	Mong Cai	250	New construction
102	Cam Pha	500	Renovations
103	Nam Hoa	500	New construction
104	Hai Ha Industrial Park	500	New construction, 2 standby machines for high development, Hai Ha Industrial Park
105	Quang Ninh 1 (*)	500	New construction, synchronously according to the scale and progress of regional power sources
106	Muong Te	750	Renovations
107	Than Uyen	750	Renovations
108	Sin Ho	250	New construction, liberation of the North
109	Phong Tho	750	New construction, liberation of the North
110	Pac Ma	750	New construction, liberation of the North
111	Dien Bien	500	New construction, renovation
112	Dien Bien 1 (*)	500	New construction, synchronously according to

			the scale and progress of regional power sources
113	Muong La	500	Renovations
114	Suoi Sap 2A	200	New construction and release of hydropower capacity according to Document No. 136/TTg-CN dated January 29, 2021
115	Phu Yen	375	New construction, specialized load power supply
116	Moc Chau	250	New construction
117	Song Ma	250	New construction, synchronously according to the scale and progress of regional power sources
118	Son La 1 (*)	500	New construction, synchronously according to the scale and progress of regional power sources
119	Yen Thuy	250	New construction
120	Hoa Binh	500	Renovations
121	Tan Lac	250	New construction
122	Bim Son	500	Renovations
123	Nong Cong	500	Renovations
124	Nghi Son EZ	750	New construction
125	Tinh Gia	500	New construction
126	Sam Son	500	New construction
127	Hau Loc	500	New construction
128	Thieu Hoa	250	New construction, replacement of Thanh Hoa 220 kV substation connecting level
129	Ba Thuoc	250	New construction
130	Thanh Hoa 1 (*)	250	New construction, synchronously according to the scale and progress of regional power sources
131	Dong Vang	500	New construction
132	Thieu Yen	250	New construction
133	Tuong Duong	250	New construction, liberation of the North
134	Nam Cam	500	New construction
135	Quy Hop	250	New construction, liberation of the North
136	Do Luong	500	Renovations
137	Ha Tinh	500	Renovations
138	Vung Ang	500	New construction
139	Vung Ang 2	500	New construction, synchronized with the development progress of specialized loads
140	Can Loc	250	New construction
141	Nghi Son 2	500	New construction, synchronized with the development progress of specialized loads
142	Ha Tinh 1 (*)	500	New construction, synchronously according to the scale and progress of regional power sources
143	Provision for generating new 220kV substations, renovating and increasing capacity	2,000	Provision for load growth and power source development
144	Flexible layout design of 4 busbar segments including but not limited to 220kV distribution yards of Thai Binh Substation, Quynh Luu, Vinh Yen, Long Bien, Hai Phong,		Limit short circuit current, increase power supply reliability

	220kV Hai Ba Trung and Nghia Hung substations , Hau Loc, Tam Diep, Bac Ninh 4, Dong Ky, Cat Hai, Nam Hoa, Long Bien 2, Hoa Lac, Tan Viet, Hiep Hoa 2, Phu Binh 2, Dong Van, Ly Nhan, Duong Kinh, Pho Cao		
145	Install short-circuit current limiting resistors at busbars 220 kV substation 500 kV Pho Noi, West Hanoi, Hiep Hoa, Dan Phuong, Bac Ninh, Pha Lai and Trang Bach thermal power plants		Short circuit current limitation
146	Renovating the flexible 220 kV busbar diagram, 4 busbar segments at 500 kV Nho Quan, Son La, Dong Anh substations and 220 kV stations Van Tri, Vat Cach, Long Bien, Truc Ninh, Thai Binh, Ha Dong, Thanh Nghi, Bac Ninh 2, Hai Duong Province		Limit short circuit current, increase power supply reliability
	Works and projects to improve control andoperation of power stations and power systems		Including but not limited to projects: Replacement, installation of reactors, capacitors, SVC, SVG, FACTS equipment, BESS, synchronous compensators...; expand the substations' compartments, renovate and complete the diagrams of substations in a flexible direction; install short-circuit current limiting devices, replace and upgrade equipment to ensure short-circuit current capacity, set up automatic circuits; installation, replacement of equipment, control systems, SCADA/EMS, SCADA/DMS systems, station automation,...

Table 11: List of newly built and renovated 220 kV transmission lines in the North and put into operation in the period of 2021 - 2030

No.	Name of transmission line	Number of circuits x km	Note
1	Van Dien – Turn to Ha Dong - Thuong Tin	4 x 4	New construction and connection of Van Dien 220 kV substation, including switching and connecting Van Dien
2	West of Hanoi - Thanh Xuan	4 x 16	substation to Van Dien - Hoa Binh; Van Dien - Xuan Mai
3	500 kV Dong Anh - Van Tri	2 x 13	New construction, connection to Thanh Xuan 220 kV substation
4	Improve loading capacity Hoa Binh - Chem	1 x 74	Renovating, increasing load capacity, ensuring Hanoi power supply
5	Improve loading capacity Ha Dong - Chem	1 x 16	Renovating, increasing load capacity, ensuring Hanoi power supply
6	Dai Mo (My Dinh) - Turn West Hanoi - Thanh Xuan	4 x 2	New construction, connection to Dai Mo 220 kV substation
7	Me Linh - Turn Soc Son - Van Tri	2 x 2	New construction, connection to Me Linh 220 kV substation
8	500 kV West of Hanoi - Hoa Lac	2 x 14	New construction, connection to Hoa Lac 220 kV substation

9	Ung Hoa - Turn to Ha Dong - Phu Ly	2	x	4	New construction, connection to Ung Hoa 220 kV substation
10	Circuit 2 Ha Dong - Ung Hoa - Phu Ly	2	x	40	New construction, renovation of one circuit into two circuits, expansion of 02 compartments at 220 kV Ung Hoa station
11	Improve loading capacity Hiep Hoa - Soc Son	2	x	10	Increase the load capacity of two 220kV Hiep Hoa - Soc Son lines, remove the remaining two circuits to limit the short circuit current
12	Improve loading capacity Ha Dong - Thuong Tin	2	x	16	Renovating, increasing the load capacity
13	Renovating the Son Tay - Vinh Yen 220 kV line from 1 circuit to 2 circuits	2	x	30	New construction, renovation of one circuit into two circuits, and at the same time converting the connection to a 2-circuit line Son Tay - Vinh Yen
14	Long Bien - Mai Dong	2	x	16	New construction, underground cable
15	Long Bien 2 - Turn Mai Dong - Long Bien	4	x	3	New construction, connection to Long Bien 220kV substation 2
16	Increase loading capacity of Thuong Tin - Pho Noi	2	x	33	Renovating and raising load capacity 1 circuit of Thuong Tin - 220kV Pho Noi substation, 1 circuit of Thuong Tin - 500kV Pho Noi substation
17	Improve loading capacity Xuan Mai - Ha Dong	1	x	25	Renovating, increasing the load capacity
18	Improve loading capacity Van Tri - Tay Ho - Chem	2	x	20	Renovating, increasing load capacity, ensuring Hanoi power supply
19	An Lao - Turn Dong Hoa - Thai Binh	4	x	2	New construction, connection to An Lao 220 kV substation
20	Cat Hai - Dinh Vu	2	x	12	New construction, in case it is not possible to expand the Dinh Vu 220kV substation, consider the transition of 1 circuit of the 220kV Dinh Vu - Duong Kinh transmission line.
21	Duong Kinh - Turn Dong Hoa - Dinh Vu	4	x	3	New construction, connection to Duong Kinh 220kV substation, and at the same time switch connecting Hai Duong 2 - Dong Hoa and Dong Hoa - Dinh Vu to Hai Duong 2 - Dinh Vu
22	Nam Hoa - Cat Hai	2	x	12	New construction
23	Hai Duong - Pho Noi thermal power plant 500 kV	2	x	60	New construction
24	Gia Loc - Turn to Hai Duong thermal power - Pho Noi	4	x	5	New construction, connection to substation 220 kV Gia Loc
25	Bai Say - Kim Dong	2	x	12	New construction, connection to Bai Say 220 kV substation
26	500 kV Hai Phong - Gia Loc	2	x	35	New construction
27	Thanh Ha - Turn 500 kV Hai Phong - Gia Loc	2	x	7	New construction, connection to Thanh Ha 220 kV substation
28	Tan Viet (Binh Giang) - Turn to Gia Loc - Pho Noi	4	x	3	New construction, connection to Tan Viet 220 kV substation
29	Yen My - Turn to Pho Noi 500 kV - Thuong Tin 500 kV	2	x	2	New construction, connection to Yen My 220 kV substation
30	High Street - Turn to Thai Binh - Kim Dong	4	x	1	New construction, connection to Pho Cao 220kV substation
31	Circuit 2 Nho Quan - Phu Ly	2	x	27	New construction and renovation of 1 circuit into two circuits

32	Ly Nhan - Turn to Thanh Nghi - Thai Binh	4	x	2	New construction, connection to Ly Nhan 220 kV substation
33	Dong Van - Phu Ly	2	x	15	New construction, connection to Dong Van 220kV substation, in case Phu Ly cannot be expanded, it is considered to be a transitional connection between Ha Dong and Phu Ly.
34	Nam Dinh power plant 500 kV - Ninh Binh 2	2	x	30	New construction, large cross-sectional phase separation wire
35	Hai Hau - Truc Ninh	2	x	16	New construction, connection to Hai Hau 220 kV substation
36	Nam Dinh thermal power 500 kV - Hai Hau	2	x	ten	New construction, connection to substation 500 kV Nam Dinh thermal power
37	Nam Dinh thermal power 500 kV - Hau Loc	2	x	48	New construction, connection to substation 500 kV Nam Dinh thermal power
38	Nam Dinh thermal power 500 kV - Nam Dinh 3	2	x	18	New construction, synchronized with the development progress of specialized loads
39	Vu Thu - Turn to Thai Binh - Nam Dinh and Thai Binh - Ninh Binh	4	x	2	New construction, connection to Vu Thu 220 kV substation
40	Improve loading capacity Dong Hoa - Thai Binh	2	x	53	Renovating, increasing the load capacity
41	Thai Binh 500 kV - Thanh Nghi	2	x	60	New construction
42	Thai Binh 500 kV - Turn to Thai Binh - Kim Dong	4	x	5	New construction, connecting 220 kV Thai Binh 500 kV . side
43	Tam Diep - Turn to Bim Son - Ninh Binh	4	x	5	New construction, connect 220 kV Tam Diep substation on one circuit first, connect the other circuit synchronously with Gia Vien - Tam Diep - Bim Son 220 kV line
44	Gia Vien - Turn to Nho Quan 500 kV - Ninh Binh	4	x	2	New construction, connection to Gia Vien 220 kV substation
45	Gia Vien - Nam Dinh	2	x	7	New construction, transfer to Gia Vien - Nam Dinh connection, implemented in case of moving 220kV Ninh Binh substation
46	Increased capacity of 500 kV Nho Quan load - Ninh Binh	2	x	26	Renovating, increasing the load capacity
47	Renovating the Tam Diep - Gia Vien - Bim Son 220 kV transmission line from 01 circuit to 02 circuits	2	x	34	Renovating 1 circuit transmission line into 2 circuits, implemented in the case of recovering the Ninh Binh 220 kV substation, replacing the Ninh Binh - Tam Diep - Bim Son 220 kV transmission line
48	Ninh Binh 2 - Turn to Ninh Binh - Thai Binh	2	x	19	New construction, connection to Ninh Binh 220 kV substation 2
49	Bac Quang - Turn Bao Thang - Yen Bai (Bac Quang - Luc Yen)	2	x	43	New construction, connection to Bac Quang 220kV substation, increase power purchase from China
50	Hanging circuit 2 Ha Giang - Vietnam - China border	1	x	30	Increase electricity purchase in China
51	Bac Quang - Vietnam - China border (in the territory of Ha Giang province)	2	x	55	New construction, increased electricity purchase in China
52	Increasing load capacity Ha Giang – Turn to Bac Me hydropower plant and Ha Giang - Thai Nguyen	42	+	51	Renovating and raising the load capacity of AC410 sections on Ha Giang - Bac Me hydropower plant (42km) and Ha Giang - Thai Nguyen (51km)

53	Hanging circuit 2 Cao Bang - Bac Kan	1	x	71	Hanging circuit 2 Cao Bang - Bac Kan
54	Lao Cai - Bao Thang	2	x	18	New construction
55	Connecting 500 kV Lao Cai	4	x	5	New construction, connect 500kV Lao Cai substation, turn Bao Thang - Yen Bai
56	Bat Xat - 500 kV Lao Cai	2	x	42	New construction, connection to Bat Xat 220 kV substation
57	Than Uyen - 500 kV Lao Cai	2	x	65	New construction, connecting 220kV Than Uyen substation, clearing small hydroelectricity
58	500kV Lao Cai substation - Vietnam - China border	2	x	40	New construction, increased electricity purchase in China
59	Bac Ha hydropower plant - Switching to 500 kV Lao Cai	1	x	5	Reduce load of 220kV Bao Thang - Lao Cai transmission line 500 kV
60	Bac Giang - Lang Son	2	x	102	New construction, connection to substation 220 kV Lang Son
61	Dong Mo - Turn Bac Giang - Lang Son	4	x	3	New construction, connection to Dong Mo 220kV substation
62	Yen Son hydropower plant - Turn to Tuyen Quang road - Tuyen Quang	2	x	8	New construction, synchronously Yen Son hydropower plant
63	Improve loading capacity Yen Bai - Viet Tri	2	x	67	Renovating, increasing the load capacity
64	Huoi Quang - Nghia Lo	2	x	103	New construction, small hydroelectricity clearance
65	Nghia Lo - Viet Tri (500 kV Viet Tri)	2	x	93	New construction, small hydroelectricity clearance
66	Luc Yen - Turn to Lao Cai - Yen Bai	4	x	5	New construction, connection to Luc Yen 220 kV substation
67	Switch connection between Bac Quang - Luc Yen	2	x	1	New construction, switch connection from Bac Quang to Luc Yen
68	Improve loading capacity Yen Bai - Tuyen Quang	2	x	36	Renovate, increase the load capacity, increase the purchase of electricity from China
69	Improve loading capacity Luc Yen - Yen Bai	2	x	58	Renovate, increase the load capacity, increase the purchase of electricity from China
70	500 kV Hiep Hoa - Phu Binh 2	2	x	14	New construction, connection to Phu Binh 220kV substation 2
71	Song Cong – Turn to Tuyen Quang - Phu Binh	2	x	2	New construction, connection to 220kV Song Cong substation
72	Phu Binh 2 - Turn to Thai Nguyen - Bac Giang	2	x	13	New construction, connection to Phu Binh 220kV substation 2
73	Improve loading capacity Hiep Hoa - Phu Binh	1	x	10	Renovating, increasing the load capacity of ACSR410 circuit
74	Improve loading capacity Thai Nguyen - Luu Xa - Phu Binh	1	x	30	Renovating, increasing the load capacity
75	500 kV Viet Tri - Viet Tri	2	x	10	Renovating, increasing the load capacity
76	Increase load capacity of 500 kV Viet Tri - Vinh Tuong	1	x	27	Renovating, increasing the load capacity
77	Increase load capacity of 500 kV Viet Tri - Vinh Yen	1	x	36	Renovating, increasing the load capacity
78	500 kV Viet Tri - Ba Thien (500 kV Vinh Yen)	2	x	43	New construction
79	Phu Tho 2 - Turn to Son La - Viet Tri	2	x	1	New construction, connection to Phu Tho 220kV substation 2

80	Ba Thien (Vinh Yen 500 kV) - Turn to Vinh Yen - Soc Son	2	x	13	New construction, connection to Ba Thien 220 kV substation.Combined with renovating and increasing the load capacity of the existing section from Vinh Yen 220kV to the intersection.
81	Tam Duong - Turn to 500 kV Viet Tri - Ba Thien (500 kV Vinh Yen)	4	x	2	New construction, connection to Tam Duong 220 kV substation
82	Vinh Yen 500 kV - Me Linh	2	x	25	New construction.
83	Me Linh - Turn Soc Son -Van Tri (circuit 2)	2	x	2	New construction, switching and connecting 220kV Vinh Yen 500kV - Me Linh and Me Linh - Van Tri lines to Vinh Yen - Van Tri to limit short-circuit currents
84	Vinh Tuong - Vinh Yen	2	x	8	New construction and renovation, switching connection to a 2-circuit transmission line Vinh Tuong - Vinh Yen
85	Circuit 2 Pha Lai Thermal Power Plant - Bac Giang	2	x	27	Convert 1 circuit into 2 circuits
86	Connecting An Khanh thermal power plant Bac Giang	4	x	14	New and synchronous construction of An Khanh Bac Giang Thermal Power Plant, connecting on 220kV Bac Giang - Lang Son line
87	Lang Giang – Turn to Bac Giang - Thai Nguyen	2	x	2	New construction, connection of 220 kV Lang Giang substation
88	Yen Dung - Turn to Pha Lai thermal power - Quang Chau	2	x	2	New construction, connection to Yen Dung 220 kV substation
89	Bac Ninh 4 - Dong Anh	2	x	11	New construction, Connecting to 220kV Bac Ninh substation 4
90	Bac Ninh 5 - Turn to Bac Ninh 500 kV - Pho Noi	2	x	4	New construction, connection to Bac Ninh 220kV substation 5
91	Bac Ninh 6 - Turn to Pha Lai - 500 kV Pho Noi	2	x	3	New construction, connection of 220 kV Bac Ninh 6 substation, consider using columns with 04 suspended circuits before 02 circuits
92	Bac Ninh 500 kV - Turn to Bac Ninh 2 - Pho Noi	4	x	3	New construction, connection to 220 kV Bac Ninh 500 kV . side
93	Bac Ninh 500 kV - Bac Ninh 4	2	x	13	New construction
94	Khe Than - Turn to Trang Bach - Hoanh Bo	2	x	2	New construction, connection to Khe Than 220 kV substation
95	Cong Hoa - Turn to Cam Pha - Hai Ha	2	x	2	Newly built 04 circuits, 2 circuits in front, connected to Cong Hoa 220 kV substation
96	Yen Hung - Turn to Uong Bi power plant - Trang Bach	2	x	12	New construction, connection to Yen Hung 220 kV substation
97	Yen Hung - Nam Hoa	2	x	30	New construction, connection to Nam Hoa 220 kV substation
98	Hai Ha - Mong Cai	2	x	40	New construction
99	Phong Tho - Than Uyen	2	x	65	New construction, small hydroelectricity clearance
100	Muong Te - Lai Chau	2	x	50	New construction, hydropower clearance, power on February 2021
101	Pac Ma - Muong Te	2	x	36	New construction, hydropower clearance
					New construction, connection to Nam Ou 5, 6, and 7 hydropower plants (Laos). The

102	Nam Ou 7 - Lai Chau	2	x	65	whole route is 2x97km, in the territory of Vietnam 2x65km. Synchronize the hydropower source from Laos.
103	Nam Ou 5 - Dien Bien	2	x	22	New construction, connection to Nam Ou 5, 6, and 7 hydropower plants (Laos). The whole route is 2x73km, in the territory of
104	Improve loading capacity Son La - Viet Tri	1	x	167	Renovating, increasing the load capacity
105	500 kV Son La - Dien Bien	2	x	133	New construction, connection substation 220 kV Dien Bien
106	Increased load capacity of 500 kV Son La - Son La	1	x	41	Renovating, increasing the load capacity, synchronizing according to the size and progress of regional power sources
107	Increased load capacity of 500 kV Son La - Muong La	1	x	21	Renovating, increasing the load capacity, synchronizing according to the size and progress of regional power sources
108	Increase the loading capacity of Muong La - Son La	1	x	32	Renovating, increasing the load capacity, synchronizing according to the size and progress of regional power sources
109	Suoi Sap 2A - Turn to Son La - Viet Tri	2	x	5	New construction and release hydropower capacity according Document No. 136/TTg-CN dated January 29, 2021
110	Phu Yen - Turn to Son La - Viet Tri	2	x	7	New construction, connection to Phu Yen 220 kV substation (specialized load power supply)
111	Yen Thuy - Turn to Hoa Binh - Nho Quan	2	x	2	New construction, connection to Yen Thuy 220 kV substation
112	Nghi Son Economic Zone - Turn to Nghi Son - Nghi Son thermal power	4	x	2	New construction, connection substation 220 kV Nghi Son EZ
113	Nghi Son 2 - Turn to Nghi Son thermal power - Nong Cong	4	x	2	New construction, connection of 220kV Nghi Son 2 station, synchronized with the progress of specialized load development
114	Thanh Hoa 500 kV - Sam Son	2	x	36	New construction, connection to Sam Son 220 kV substation
115	500 kV Thanh Hoa - Turn to Nong Cong - Thanh Hoa	4	x	7	New construction, connecting 220 kV side of 500 kV Thanh Hoa substation
116	500 kV Thanh Hoa - Hau Loc	2	x	35	New construction, connection to Hau Loc 220 kV substation
117	Thanh Hoa 500kV - Bim Son	1	x	36	New construction, renovation of 1 circuit into 2 circuits of 220 kV Ba Che - Bim Son transmission line
118	Nam Sum Power Plant (Laos) - Nong Cong	2	x	129	New construction, synchronously Nam Sum Lao hydropower plant
119	Circuit 3 Thanh Hoa - Nghi Son - Quynh Luu	1	x	83	Hanging circuit 2
120	Lifting load capacity of Nong Cong - 500 kV Thanh Hoa	2	x	26	Renovation in case of clearance of Nghi Son 2 thermal power through 220 kV power grid.

121	Nghi Son thermal power – Turn to Nong Cong - Quynh Luu	2	x	10	New construction, switch connection Nong Cong - Nghi Son and Nghi Son - Quynh Luu into Nong Cong - Quynh Luu. Replacing 220kV transmission line Nghi Son thermal power – Turn to Nghi Son - Vinh
122	Nong Cong - Nghi Son - switch to connect Nghi Son thermal power	2	x	42	Phase 2 of Nghi Son thermal power road - Turning Nong Cong - Quynh Luu, returning the current status of 220 kV Nong Cong - Quynh Luu power line
123	Tinh Gia - Turn to Nong Cong - Nghi Son	2	x	8	New construction, connection to Tinh Gia 220 kV substation
124	My Ly – Ban Ve	1	x	72	New construction, synchronized My Ly power plant
125	Dong Vang - Turn to Nghi Son thermal power plant - Nong Cong	4	x	4	New construction, synchronized with the load development progress
126	Nam Cam – Turn to Quynh Luu - Hung Dong	4	x	3	New construction, connection to Nam Cam 220kV substation
127	Quy Hop - Quynh Luu 500 kV	2	x	62	New construction, connection to Quy Hop 220 kV substation, release the capacity of the power plant.
128	Connecting 500kV Quynh Luu substation	4	x	5	New construction, connecting 220 kV side of Quynh Luu 500 kV
129	Do Luong – Nam Cam	2	x	32	Release the capacity of the Lao hydropower plant and the West of Nghe An hydropower plant
130	Improve loading capacity Hung Dong - Quynh Luu - Nghi Son	2	x	100	Renovating and raising the load capacity of 2 circuits, releasing the capacity of the Laos and West of Nghe An hydropower plant
131	Nam Mo 2 (Laos) - Tuong Duong	2	x	77	New and synchronous construction of Nam Mo hydropower plant (Laos)
132	Tuong Duong - Do Luong	2	x	100	New and synchronous construction of Nam Mo hydropower plant (Laos)
133	Tuong Duong - Turn to Ban Ve hydropower plant - Do Luong	2	x	3	New construction, connection to Tuong Duong 220 kV substation
134	Vung Ang - 500 kV Vung Ang thermal power	2	x	13	New construction, connection to Vung Ang 220 kV substation
135	Vung Ang 2 - Turn to Vung Ang - 500 kV Vung Ang thermal power	2	x	2	New construction, connection to Vung Ang 2 220 kV substation, synchronized with the development progress of specialized loads
136	Improve loading capacity Ha Tinh - Hung Dong	2(3)	x	66	Renovate, increase the load capacity, prevent overload in the dry season. Consider renovating Circuit 1 of the transmission line operated since 1990 into 2 circuits, removing or keeping the remaining circuit if it is possible to expand the 220 kV line at 500 kV Ha Tinh substation and Hung Dong 220 kV substation.

137	500 kV Dan Phuong - Me Linh	2	x	15	New construction, consider switching the connection into dual circuit Van Tri - Soc Son and dual circuit Vinh Yen 500 kV - Me Linh - Dan Phuong 500 kV
138	Connecting 500 kV Dan Phuong	4	x	11	Turning to Chem - Van Tri and Chem - Tay Ho
139	Soc Son 2 - Turn to Hiep Hoa - Dong Anh	2	x	3	New construction, connection of 220 kV Soc Son substation 2
140	500 kV Son Tay - Hoa Lac 2	2	x	15	New construction, connection to Hoa Lac 220kV substation 2
141	500 kV Son Tay - Hoa Lac	2	x	12	New construction, connection to the 220 kV side of 500 kV Son Tay substation
142	500 kV Son Tay - Turn to Son Tay - Vinh Yen	4	x	5	New construction, connection to the 220 kV side of 500 kV Son Tay substation
143	Dan Phuong 500 kV - Cau Giay	2	x	20	New construction, overhead line and underground cable (inner city), connection to Cau Giay 220 kV substation
144	Hai Ba Trung – Thanh Cong	2	x	5	New construction, underground cable, connection to substation 220 kV Hai Ba Trung
145	Hai Ba Trung - Mai Dong	2	x	3	New construction, underground cable, connection to substation 220 kV Hai Ba Trung
146	Chapter My - Turn to Hoa Binh - Ha Dong	2	x	2	New construction, connection to Chuong My 220 kV substation
147	South of Hanoi 500 kV - Phu Xuyen	2	x	15	New construction, connection to Phu Xuyen 220 kV substation
148	Connecting 500 kV South of Hanoi	2	x	15	New construction, connecting 500kV substation south of Hanoi, turning to Ha Dong Phu Ly and Ung Hoa - Phu Ly
149	Long Bien 500 kV - Turn to Long Bien 2 - Mai Dong	4	x	10	New construction, connection to the 220 kV side of the 500 kV Long Bien substation
150	Hai Phong 500 kV - Duong Kinh	2	x	8	New construction
151	Hai Phong 500 kV - Tien Lang	2	x	14	New construction, connection to Tien Lang 220 kV substation
152	North Region 1 - Do Son	2	x	10	New construction, synchronously according to the scale and progress of regional power sources
153	North Region 3 - Hai Ha	2	x	20	New construction, synchronously according to the scale and progress of regional power sources
154	Do Son - Duong Kinh	2	x	8	New construction, connection to Do Son 220 kV substation
155	Dai Ban - Turn to Hai Duong 2 - Duong Kinh	4	x	2	New construction, connection to Dai Ban 220 kV substation

156	Nhi Chieu – Turn to Mao Khe - Hai Duong 2	4	x	2	New construction, connection to substation 220 kV Nhi Chieu
157	Tu Ky - Turn to 500 kV Hai Phong - Gia Loc	4	x	4	New construction, connection to Tu Ky 220kV substation
158	Gia Loc 500 kV – Turn to Gia Loc - Hai Phong 500kV	4	x	5	New construction, connection to Gia Loc 500 kV substation, in case it is not possible to arrange a land fund to connect Gia Loc 220 kV level
159	Hung Yen 500 kV - Dong Van	2	x	14	New construction, connection to substation 500 kV Hung Yen
160	Van Giang - Turn to Long Bien 500 kV - Thuong Tin 500 kV	4	x	2	New construction, connection to Van Giang 220 kV substation
161	Hung Yen 500 kV (Hung Yen City) – Turn to Kim Dong - High Street	4	x	5	New construction, connection to Hung Yen 500 kV substation
162	Nam Dinh 2 – Turn to Truc Ninh - Ninh Binh and Truc Ninh - Nam Dinh	2	x	2	New construction, connection to Nam Dinh 2 220kV substation
163	LNG Thai Binh - Tien Lang	2	x	56	New construction, synchronous LNG Thai Binh
164	LNG Thai Binh - Truc Ninh	2	x	50	New construction, synchronous LNG Thai Binh
165	Nghia Hung - Turn to 500kV Nam Dinh thermal power - Hau Loc	4	x	2	New construction, connection to Nghia Hung 220 kV substation
166	Quynh Phu - Turn to Thai Binh - Dong Hoa	4	x	2	New construction, connection to Quynh Phu 220 kV substation
167	Cao Bang - Lang Son	2	x	120	New construction
168	Bao Lam - Bac Me	2	x	30	New construction, releasing Ha Giang small hydropower capacity
169	Van Ban - Turn to Than Uyen - Lao Cai 500 kV	4	x	10	New construction, connection to Van Ban 220 kV substation, releasing small hydropower capacity
170	Lang Son 1 - Dong Mo (*)	2	x	60	New construction, synchronously according to the scale and progress of regional power sources
171	Lang Son 2 - Lang Son 1 500kV (*)	2	x	20	New construction, synchronously according to the scale and progress of regional power sources
172	Hiep Hoa 2 - Turn to Hiep Hoa 500kV - Phu Binh 2	4	x	5	New construction, connection to Hiep Hoa 2 220kV substation
173	500 kV Thai Nguyen - Turn Malungtang - Thai Nguyen	2	x	12	New construction, connecting 220 kV side of Thai Nguyen 500 kV substation
174	500 kV Thai Nguyen - Turn to Tuyen Quang (substation) - Phu Binh	2	x	12	New construction, connecting 220 kV side of Thai Nguyen 500 kV substation

175	500 kV Thai Nguyen – Turn to Luu Xa - Phu Binh	2	x	9	New construction, connecting 220 kV side of Thai Nguyen 500 kV substation
176	Dai Tu - Turn Ha Giang - Thai Nguyen 500 kV and Tuyen Quang - Thai Nguyen 500 kV	4	x	2	New construction, connection to Dai Tu 220 kV substation
177	Phu Tho 3 – Turn to Nghia Lo - 500 kV Viet Tri	4	x	5	New construction, connection to Phu Tho 3 220 kV substation
178	Bac Giang 500 kV - Turn to An Khanh Bac Giang thermal power plant - Lang Son	4	x	8	New construction, connection to the 220kV side of Bac Giang 500kV substation
179	Connecting 500 kV Yen The	4	x	4	New construction, transition on 02 circuits Phu Binh 2 turn to Lang Giang - Thai Nguyen
180	Yen The 500 kV - Viet Yen	2	x	25	New construction, connection to Viet Yen 220 kV substation
181	Tan Yen – Turn to Yen The - Viet Yen	4	x	5	New construction, connection to Tan Yen 220 kV substation
182	Phuc Yen - Turn to 500 kV Vinh Yen - 220 kV Vinh Yen	2	x	2	New construction, connection to Phuc Yen 220 kV substation
183	Chan Hung – Turn to 500 kV Viet Tri - 220 kV Vinh Yen	2	x	2	New construction, connection to Chan Hung 220 kV substation
184	Bac Giang 1 - Lang Son 1 (*)	2	x	35	New construction, synchronously according to the scale and progress of regional power sources
185	Dong Mo - Son Dong	2	x	60	New construction
186	Bac Ninh 7 – Turn to 500 kV Dong Anh - Bac Ninh 4	4	x	2	New construction, connection to Bac Ninh 7 220kV substation
187	Bac Ninh 500 kV - Bac Ninh	2	x	ten	New construction, synchronized with Pha Lai - Bac Ninh and Bac Ninh - Quang Chau 220kV transmission lines to Pha Lai - Quang Chau to limit short-circuit current
188	Hai Ha Industrial Park - Hai Ha	2	x	ten	New construction, ensuring electricity supply for Hai Ha Industrial Park and releasing Hai Ha cogeneration thermal capacity in case of increasing the capacity to sell electricity to the grid.
189	Improve loading capacity Quang Ninh - Hoanh Bo	2	x	20	New construction
190	Quang Ninh 1 - Turn to Hoanh Bo - Son Dong thermal power and Hoanh Bo - Trang Bach (*)	4	x	5	New construction, synchronously according to the scale and progress of regional power sources
191	Lai Chau 500 kV - Phong Tho	2	x	60	New construction, release of power generation capacity, reduce load of 500 kV Lai Chau substation, large cross-section phase division wire

192	Sin Ho - Turn to Lai Chau 500 kV - Phong Tho	4	x	5	New construction, connection to Sin Ho 220 kV substation, releasing area's power source
193	Muong Te - Sin Ho	2	x	35	Releasing the capacity of thermal power plants in Muong Te area
194	Dien Bien 1 - Dien Bien (*)	2	x	23	New construction, synchronously according to the scale and progress of regional power sources
195	Dien Bien 1 - Lai Chau (*)	2	x	52	New construction, synchronously according to the scale and progress of regional power sources
196	Moc Chau - Turn to connect Trung Son thermal power	2	x	35	New construction, connection to Moc Chau 220 kV substation
197	Song Ma - Son La 500 kV	2	x	83	New construction, releasing small hydropower capacity
198	Son La 1 - Turn to Son La - Suoi Sap 2A (*)	2	x	4	New construction, synchronously according to the scale and progress of regional power sources
199	Connecting Tan Lac	6	x	5	New construction, Tan Lac - Turn Hoa Binh - Yen Thuy and switch to connect Trung Son Power Plant, forming the 220 kV dual-circuit transmission lines Hoa Binh - Tan Lac, Tan Lac - Yen Thuy and Tan Lac - Trung Son thermal power – Hoi Xuan thermal power
200	Thieu Hoa - Thanh Hoa 500 kV	2	x	5	New construction, connection to Thieu Hoa 220 kV substation
201	Thieu Hoa - Thieu Yen	2	x	25	New construction, connection to Thieu Yen 220 kV substation
202	Hoi Xuan thermal power - Ba Thuoc	2	x	30	New construction, connection to Ba Thuoc 220 kV substation
203	Thanh Hoa 1 – Turn to Nghi Son - Nong Cong (*)	4	x	2	New construction, synchronously according to the scale and progress of regional power sources
204	Tuong Duong - Quy Hop	2	x	80	New construction, releasing power plant and increasing electricity importation of Laos
205	Nam Mo 1 thermal power - Turn to My Ly – Ban Ve	2	x	18	New and synchronous construction of Nam Mo 1 hydropower plant (Vietnam)
206	Can Loc - Turn to Ha Tinh - Hung Dong	4	x	2	New construction, connection to Can Loc 220 kV substation
207	Ha Tinh 1 - Turn to Vung Ang - Ha Tinh (*)	4	x	4	New construction, synchronously according to the scale and progress of regional power sources
208	Provision for arising of 220 kV line for renovation and new construction	350			Provision for load growth and power source development

Table 12: List of newly built and renovated 500 kV substations in Central Vietnam and put into operation in the period of 2021 - 2030

No.	Name of substation	Capacity (MVA)	Note
1	Lao Bao (Huong Hoa)	1,800	New construction, releasing electricity in the area. Proposal to design the backup land for future expansion
2	Quang Tri cutting station 2	Cutting station	New construction of circuit breaker and relay stations 3, 4 (Quang Trach - Doc Soi)
3	Quang Tri	900	New construction
4	Quang Binh (*)	900	New construction, synchronizing regional power supply
5	Thanh My	1,800	Renovations
6	Doc Soi	1,200	Renovations
7	Binh Dinh	900	New construction, anti-overload, release regional power
8	Van Phong	1,800	New construction, connection to Van Phong I thermal power plant SPP
9	Pleiku 2	1,800	Improve, prevent overload, release power
10	Krong Buk	1,800	New construction, anti-overload, release power capacity
11	Dak Nong	1,800	Improve, prevent overload, release power
12	Danang	1,800	Renovations
13	Dung Quat	900	New construction,
14	Kon Tum	Cutting station	500kV cut-off station connecting Laos electricity in case of increasing electricity import in South of Laos
15	Nhon Hoa	1,800	New construction, expected to put into operation Machine 1 in the period 2024-2025.
	Provision for arising 500kV substations for new construction, renovation and capacity improvement	1,800	Provision for load growth and power source development
	Works and projects to improve control and operation of power stations and power systems		Including but not limited to projects: Replacement, installation of reactors, capacitors, SVC, SVG, FACTS equipment, BESS, synchronous compensators...; expand the substations' compartments, renovate and complete the diagrams of substations in a flexible direction; install short-circuit current limiting devices, replace and upgrade equipment to ensure short-circuit current capacity, set up automatic circuits; installation, replacement of equipment, control systems, SCADA/EMS, SCADA/DMS systems, station automation,...

Table 13: List of 500kV transmission lines newly built and renovated in the Central region and put into operation in the period of 2021 - 2030

No.	Name of transmission line	Circuit number	x	kilometer	Note
1	Quang Trach - Doc Soi	2	x	500	New construction
2	Quang Tri - Turn to Vung Ang - Da Nang	4	x	6	New construction, connection to Quang Tri 500 kV substation
3	Quang Tri 2 cutt-off station - Quang Trach - Doc Soi	4	x	5	New construction, connecting Quang Tri 2 cutting station
4	Lao Bao - Quang Tri 2 500kV cut-off station	2	x	31	New construction, connection to Lao Bao 500 kV substation
5	Quang Binh - Turn to Vung Ang - Quang Tri (*)	4	x	5	New construction, connection to Quang Binh 500 kV substation
6	Monsoon - Thanh My	2	x	45	New construction, synchronization of Monsoon (Laos)
7	Thanh My - Turn to Quang Trach - Doc Soi	4	x	35	New construction, connection to Thanh My 500kV substation
8	Dung Quat combined gas turbine power - Doc Soi	2	x	8	New construction
9	Dung Quat combined gas turbine power - Binh Dinh	2	x	200	New construction, release capacity of Dung Quat combined gas turbine power.
10	Binh Dinh - Krong Buk	2	x	216	Newly built, synchronously Binh Dinh 500 kV substation
11	Van Phong I thermal power plant - Thuan Nam	2	x	157	New and synchronous construction of Van Phong I thermal power plant
12	Ialy MR hydropower plant – Ialy hydropower plant	1	x	2	New construction, synchronized with Ialy MR hydropower plant

13	Nhon Hoa - Turn to Pleiku - Dak Nong	2	x	4	New construction and connection of Nhon Hoa 500kV substation (operation period 2024-2025) to gather RE plants including Nhon Hoa 1 (50 MW), Nhon Hoa 2 (50 MW) and neighboring RE sources. Approved according to Document No. 323/TTg-CN dated March 17, 2021 of the Prime Minister and Document No. 1301/BCT-DL dated March 11, 2021 of the Ministry of Industry and Trade
14	Krong Buk - Turn to Pleiku 2 - Chon Thanh	4	x	2	New construction, synchronous Krong Buk 500 kV substation
15	Quang Tri thermal power plant - Quang Tri	2	x	17	New construction, connection to Quang Tri thermal power plant, synchronizing power supply
16	Xebanghieng thermal power plant complex (Laos) - 500 kV Lao Bao	2	x	20	New and synchronous construction of Xebanghieng thermal power plant complex (Laos), whole route 45km, part on territory of Vietnam is 20km
17	Central Region combined gas turbine power - Doc Soi	2	x	18	Newly built, synchronized Central Region combined gas turbine power
18	Van Phong - Binh Dinh	2	x	224	New construction
19	Hatsan (Laos) - Kon Tum	2	x	100	New construction, increased purchase of electricity in Laos
20	Kon Tum - Turn to Thanh My - Pleiku 2	4	x	5	New construction, connection of 500 kV Kon Tum cut-off station, in case of increased power purchase from Laos
21	Renovating Thanh My - Pleiku 2 into 2 circuits	2	x	199	New construction, renovation of circuit 1, transfer of connection to 500 kV Pleiku substation. Strengthen transmission capacity, backup power connection from Laos
22	Krong Buk - Tay Ninh 1	2	x	313	New construction
23	Circuit 2 Da Nang - Doc Soi	2	x	100	New construction of circuit 2, renovation of circuit 1, in case of failure to expand Doc Soi highway, switch the connection of circuit 2 to Central Central District.
24	LNG Hai Lang - Quang Tri thermal power plant	2	x	6	New and synchronous construction of Hai Lang LNG Phase 1, in case Quang Tri thermal power plant is behind schedule, build in advance LNG Hai Lang - Quang Tri transmission line with a length of about 23km connecting Hai

			Lang LNG Phase 1
25	Provision for arising 500kV transmission line renovation and new construction	336	Provision for load growth and power source development

Table 14: List of newly built and renovated 220 kV substations in the Central region and put into operation in the period of 2021 - 2030

No.	Name of substation	Capacity (MVA)	Note
1	Dong Hoi	375	Renovations
2	Le Thuy (*)	500	New construction, freeing up regional power capacity
3	Ba Don	500	Renovations
4	Huong Linh (*)	250	New construction, freeing up regional power capacity
5	Huong Tan (*)	500	New construction, freeing up regional power capacity
6	Dong Ha	500	Renovations
7	Dong Nam	250	New construction
8	Lao Bao	750	Renovations
9	Phong Dien	375	Renovations
10	Chan May	250	New construction
11	Huong Thuy	250	New construction
12	Ngu Hanh Son	500	Renovations
13	Hai Chau	250	New construction
14	Lien Chieu	500	New construction
15	Danang airport	250	New construction
16	Tien Sa (An Don)	250	New construction
17	220 kV Dak Ooc cut-off station	Cutting station	Laos hydroelectric power connection and cut-off station
18	Duy Xuyen	250	New construction
19	Tam Hiep	250	New construction
20	Thanh My	500	Renovations

No.	Substation name	Capacity (MVA)	Note
21	Tam Ky	500	Renovations
22	Dien Ban	250	New construction
23	Nam Hoi An	250	New construction
24	Dung Quat 2	500	New construction
25	Doc Soi	500	Renovations
26	Quang Ngai 2	250	New construction
27	Nhon Hoi	500	New construction
28	Phuoc An	500	Renovations
29	Phu My	375	Renovations
30	Phu My 2	450	New construction, synchronized development progress of specialized loads
31	Tuy Hoa	500	Renovations
32	Song Cau	500	New construction
33	Nam Phu Yen	250	New construction
34	Van Phong	500	Renovations
35	Cam Ranh	500	New construction
36	Van Ninh	500	New construction
37	Cam Thinh	250	New construction
38	Bo Y 220 kV cut-off station	Cutting station	Laos hydroelectric power connection and cut-off station
39	Bo Y	250	New construction
40	Kon Tum	500	Renovations
41	Nuoc Long Power Plant	175	Renovating and expanding to release the capacity of the hydropower cluster according to Document No. 136/TTg-CN dated January 29, 2021
42	Chu Se	250	New construction
43	An Khe	250	New construction
44	Pleiku 2 500 kV connection	250	New construction
45	Krong Pa	250	New construction, clearing the area's power source
46	Gia Lai 1 (*)	250	New construction, synchronously according to the scale and progress of regional power sources
47	Krong Ana	375	New construction
48	Krong Buk 500 kV connection (Cu M'Gar)	500	New construction
49	Ea Kar	250	New construction
50	Dak Nong	500	Renovations
51	Dak Nong 2	250	New construction
52	Aluminum electrolysis	1.184	New construction, synchronized development progress of specialized loads

No.	Substation name	Capacity (MVA)	Note
53	Provision for generating new Substation 220kV substations, renovating and increasing capacity	500	Provision for load growth and power source development
54	Renovating flexible 220 kV busbar diagram, 4 busbar segments at 500kV Doc Soi substation		Short circuit current limitation
55	Install short-circuit current limiting resistance at 220 kV Dung Quat mixed gas turbine (resistance to 220kV Doc Soi line - Dung Quat mixed gas turbine)		Short circuit current limitation
	Works and projects to improve control and operation of power stations and power systems		Including but not limited to projects: Replacement, installation of reactors, capacitors, SVC, SVG, FACTS equipment, BESS, synchronous compensators...; expand the substations' compartments, renovate and complete the diagrams of substations in a flexible direction; install short-circuit current limiting devices, replace and upgrade equipment to ensure short-circuit current capacity, set up automatic circuits; installation, replacement of equipment, control systems, SCADA/EMS, SCADA/DMSsystems, station automation,...

Table 15: List of newly built and renovated 220 kV transmission lines in the Central region and put into operation in the period of 2021 - 2030

No.	Line name	Circuit number	x	kilometer	Note
1	Ba Don - Turn to Vung Ang - Dong Hoi	2	x	3	New construction, switching on the remaining circuit, in case the power supply in the area connects to 220 kV Ba Don station increases
2	Wind power B&T1 - Turning Dong Hoi - Dong Ha circuit 2	2	x	10	New construction and addition of B&T wind power connection works to ensure N-1
3	Connecting 500 kV Quang Tri	6	x	2	New construction, turn to Dong Ha - Hue and Dong Ha - Phong Dien
4	Dong Ha - Hue circuit 3	1	x	78	Hanging circuit 3 on the existing 220 kV Dong Ha - Hue line, circuit 2
5	WP TNC Quang Tri 1 - Huong Tan	1	x	11	New construction, synchronous wind power TNC Quang Tri 1,2, connection plan approved according to Document 911/TTg-CN dated 15/07/2020
6	Huong Linh - Lao Bao (*)	1	x	12	New construction, wind power clearance, proposal to use phase

No.	Line name	Circuit number	x	kilometer	Note
					splitter wire, large cross-section, approved according to Document 911/TTg-CN dated 15/07/2020
7	WP LIG Huong Hoa 1 - Huong Tan	1	x	13	New construction, synchronized wind power LIG Huong Hoa 1, approved according to Document 911/TTg-CN dated 15/07/2020
8	WP LIG Huong Hoa 2 - LIG Huong Hoa 1	1	x	8	New construction, synchronized wind power LIG Huong Hoa 2, approved according to Document 911/TTg-CN dated 15/07/2020
9	WP Tai Tam - Lao Bao	1	x	12	New construction, wind power clearance, proposal to use phase splitter wire, large cross-section, approved according to Document 911/TTg-CN dated 15/07/2020
10	Huong Tan - Lao Bao (*)	1	x	12	New construction, wind power clearance, proposal to use phase splitter wire, large cross-section, approved according to Document 911/TTg-CN dated 15/07/2020
11	WP Amacao - Lao Bao	1	x	8	New construction, wind power clearance, proposal to use phase splitter wire, large cross-section, approved according to Document 911/TTg-CN dated 15/07/2020
12	500 kV Lao Bao - Turn to Lao Bao - Dong Ha	4	x	5	New construction, connection to the 220 kV side of 500 kV Lao Bao substation
13	500 kV Lao Bao – Turn to Tai Tam - Lao Bao	2	x	5	New construction, connection to the 220 kV side of 500 kV Lao Bao substation
14	Phong Dien – Turn to Dong Ha - Hue (circuit 2)	2	x	5	New construction, relay connector one more circuit, increase capacity to release power from 220 kV Phong Dien substation; currently only relayon 01 circuit
15	Chan May – Turn to Hoa Khanh - Hue	4	x	5	New construction, connection to Chan May 220 kV substation
16	Hai Chau - Hoa Khanh	2	x	10	New construction, consider transitioning a circuit Da Nang - Hoa Khanh
17	Hai Chau – Marble Mountains	2	x	10	New construction
18	Duy Xuyen – Turn to Da Nang - Tam Ky	4	x	2	New construction, connection to Duy Xuyen 220 kV substation
19	500 kV Thanh My - Duy Xuyen	2	x	69	New construction
20	Tam Hiep – Turn to Tam Ky - Doc Soi	4	x	1	New construction, Tam Hiep 220 kV substation connector
21	Lien Chieu – Turn to Hoa Khanh - Hue	4	x	3	New construction, connection to 220 kV Lien Chieu substation

No.	Line name	Circuit number	x	kilometer	Note
22	Dak Mi 2 - Re Dak My 3 - Dak My 4A	2	x	5	New construction, synchronized Dak Mi 2 power plant
23	Nam Emoun Power Plant - Dak Ooc cutting station	2	x	51	New construction, synchronously Nam Emoun Power Plant (Laos), front suspension 1 circuit
24	220 kV Dak Ooc cut-off station – Re Xekaman 3 - Thanh My	4	x	2	New construction, connection to 220 kV Dak Ooc cut-off station, synchronized with Nam Emoun Laos Power Plant
25	Dak Ooc 220 kV cut-off station - Song Bung 2 Power Plant	2	x	10	New construction frees up capacity imported from Laos
26	Improve loading capacity Dak Ooc - Thanh My	2	x	31	Renovating, increasing the loading capacity, freeing up the imported source capacity from Laos
27	Circuit 2 Quang Ngai - Quy Nhon (Phuoc An)	2	x	142	Hanging circuit 2, replacing the phase divider wire of circuit 1, enhancing the ability to release power supply
28	Phuoc An - Turn An Khe - Quy Nhon (circuit 1)	2	x	2	New construction
29	Increase loading capacity of Doc Soi - Dung Quat	2	x	8	Improve and increase the load capacity. Considering the plan to build a new section of Doc Soi - Dung Quat substation, accelerate the progress of Dung Quat SPP to reduce the time of power cut off 220 kV Doc Soi - Dung Quatline.
30	Dung Quat Mixed Gas Turbine - Dung Quat 2	2	x	3	Power supply for Dung Quat 220 kV substation 2
31	Dung Quat Mixed Gas Turbine - Re Doc Soi - Dung Quat	4	x	3	Connection to 220 kV SPP Dung Quat BHK substation
32	Hanging circuit 2 Doc Soi - Quang Ngai	2	x	59	Hanging circuit 2, consider using superheater wire for both circuits in case of developing regional renewable energy and power plants (Kon Plong power plant, Dak Re power plant cluster, Nuoc Long power plant cluster)
33	Nuoc Long Hydropower Cluster - Re Thuong Kon Tum - Quang Ngai	2	x	4	New construction and release of hydropower capacity according to Document No. 136/TTg-CNdated January 29, 2021
34	Improve download capacity Pleiku 2 - Phuoc An	1	x	151	Build a new circuit 2 or replace the superheater wire
35	Phuoc An - Nhon Hoi	2	x	15	New construction, connection to Nhon Hoi 220 kV substation
36	Binh Dinh 500 kV - Re Phuoc An - Phu My	4	x	5	New construction, connection to the 220 kV side of 500 kV Binh Dinh substation

No.	Line name	Circuit number	x	kilometer	Note
37	Binh Dinh 500 kV - Re An Khe - Quy Nhon and Pleiku 2 - Phuoc An	4	x	35	New construction, connection to the 220 kV side of 500 kV Binh Dinh substation
38	Phu My - Turn to Phuoc An - Quang Ngai (circuit 2)	2	x	2	New construction, relay connector add 01 more circuit, increase the capacity to release power from 220kV Phu My substation; currently only relayon 01 circuit
39	Bo Y - Kon Tum	2	x	28	New construction, connection to Bo Y 220 kV substation
40	Dak Mi 1 Power Plant - Dak My 2 Power Plant	1	x	15	New construction, synchronized Dak Mi 1 Power Plant
41	Nam Kong 3 - Bo Y . 220 kV cut-off station	2	x	76	New construction, synchronized construction of Nam Kong 1,2,3 hydropower plants (Laos)
42	220 kV Bo Y - Turn Xekaman 1 - Pleiku 2	4	x	2	New construction, connection to Bo Y cutting station, synchronized Nam Kong 1,2,3 Lao PDR
43	Kon Plong Wind Power - Turn to Thuong Kon Tum Road - Quang Ngai	2	x	19	New construction, synchronized construction of Kon Plong, the connection plan has been approved according to Document 911/TTg-CN dated 15/07/2020
44	Dak Power Plant Lot 3 – Turn to Thuong Kon Tum - Quang Ngai	4	x	1	New construction and release of hydropower capacity according to Document No. 136/TTg-CNdated January 29, 2021
45	Improve download capacity Kon Tum - Pleiku (*)	2	x	36	Renovating, increasing the load capacity
46	Increase the loading capacity of Pleiku - An Khe transmission line - An Khe power station	1	x	98	Renovating, increasing the load capacity
47	Chu Se - Turn to Pleiku 2 - Krong Buk	4	x	2	New construction, connection to 220kV Chu Se substation, relaying on both circuits
48	Circuit 2 Pleiku 2 - Krong Buk	1	x	141	New construction, renovation of one circuit into two circuits
49	Krong Pa - Chu Se	2	x	63	New construction, connection to substation 220 kV Krong Pa
50	Nhon Hoa 1 - Turn to Krong Buk - Pleiku 2	4	x	4	New construction, connection to power station Nhon Hoa 1, 2; The connection plan has been approved according to Document 911/TTg-CN dated 15/07/2020. After Nhon Hoa 500kV substation is put into operation, Nhon Hoa 1,2 power station will switch the connection to Nhon Hoa 500kV substation, remove the connection

No.	Line name	Circuit number x kilometer	Note
			on both circuits and return the current status of the Krong Buk - Pleiku 2 220kV line according to the Document. No. 323/TTg-CN dated March 17, 2021 of the Prime Minister and Document No. 1301/BCT-DL dated March 11, 2021 of the Ministry of Industry and Trade.
51	WP Ia Pet Dak Doa - Pleiku 3	2 x 23	New and synchronous construction of Ia Pet - Dak Doa, the connection plan has been approved according to Document 911/TTg-CN dated 15/07/2020
52	Ia Le 1 - Turn to Krong Buk - Pleiku 2	2 x 6	New construction, synchronized WP Ia Le 1, the connection plan has been approved according to Document 911/TTg-CN dated 15/07/2020
53	WP Ia Boong - Chu Prong - Nhon Hoa 1	1 x 8	New and synchronous construction of Ia Boong - Chu Prong Power Plant has been completed. Location and adjustment connection plan of Ia Boong - Chu Prong Power Plant are proposed in Document No. 3225/BCT-DL dated 09/6/2022, Document No. 4776/BCT- DL dated 11/8/2022, Document No. 6660/BCT-DL dated 26/10/2022 of the Ministry of Industry and Trade and Document No. 835/TTg-CN dated 22/9/2022 of the Prime Minister.
54	WP Hung Hai Gia Lai – Turn to Pleiku 2 - An Khe Road	2 x 14	New and synchronous construction of Hung Hai Gia Lai, the connection plan has been approved according to Document 911/TTg-CN dated 15/07/2020
55	WP Yang Trung – Turn to Pleiku 2 - An Khe Town	2 x 25	New construction, synchronized WP Yang Trung power line, replacing 220kV transmission line WP Yang Trung – Turn to Pleiku 2 - An Khe approved in accordance with Document 911/TTg-CN dated 15/07/2020. In case Yang Trung power line enters before Hung Hai Gia Lai power line, it is necessary to investin synchronously the 220 kV transmission line Yang Trung - Pleiku 2 - An Khe. WP Hung Hai Gia Lai will make a relay connection on two 220 kV

No.	Line name	Circuit number	x	kilometer	Note
					lines of power line WP Yang Trung – Turn to Pleiku 2 - An Khe.
56	An Khe - Turn to Pleiku 2 - Phuoc An	2	x	1	New construction, connection to 220kV substation An Khe
57	Krong Ana - Turn to Krong Buk - Buon Kuop	2	x	22	New construction, connection to Krong Ana 220kV substation
58	Krong Buk 500 kV - Krong Buk	2	x	27	Newly built, connected to Krong Buk 220 kV station, phased line
59	Circuit 2 Krong Buk - Nha Trang	1	x	151	New construction, renovation of one circuit into two circuits
60	WP Krong Buk - Turning Krong Buk - Pleiku 2	2	x	2	New and synchronous construction of Krong Buk 1,2, Cu Ne wind power 1,2, connection plan approved according to Document 911/TTg-CN dated 15/07/2020
61	Improve loading capacity of Srepok 3 - Buon Kuop	1	x	28	Renovate, increase the load capacity, release the power source capacity
62	Power Plant Ba Ha River - Krong Buk 500 kV	2	x	113	New construction, enhance capacity to release power source
63	Increase the load capacity of Buon Kuop - Buon Tua Shra - Dak Nong 500 kV	1	x	112	Renovate, increase the load capacity, release the power source capacity
64	Dak Hoa – Turn to Buon Kuop - Dak Nong 500 kV	2	x	2	New construction, connection to Dak Hoa power line, the connection plan has been approved according to Document 911/TTg-CN dated 15/07/2020
65	Dak ND'rung 1, 2, 3 - Dak Nong 500 kV	2	x	18	New and synchronous construction of Dak ND'rung 1, 2, and 3, the connection plan has been approved according to Document 911/TTg-CN dated 15/07/2020
66	Aluminum Electrolysis - Turn to Binh Long - Dak Nong 500 kV	4	x	3	Hanging rope, synchronized with the load
67	Aluminum Electrolysis - Turn to Buon Kuop - Dak Nong 500 kV	2	x	6	Hanging rope, synchronized with the load
68	Improve loading capacity Tuy Hoa - Van Phong - Nha Trang	2	x	118	Renovating, increasing the load capacity, enhancing the capacity to release the power supply capacity
69	Tuy Hoa - Phuoc An	2	x	95	New construction, enhance capacity to release power source
70	HBRE An Tho - Tuy Hoa (*)	1	x	16	Renovating, increasing loading capacity, synchronizing WP An Tho
71	Improve loading capacity Tuy Hoa - Quy Nhon	1	x	93	Renovating, increasing the load capacity, enhancing the capacity

No.	Line name	Circuit number	x	kilometer	Note
					to release the power supply capacity
72	220kV Song Cau substation connector	4	x	5	New construction, connection to Song Cau 220kV substation, Phase 1: Transition connection on the existing 220kV Tuy Hoa - Quy Nhon line. Phase 2: Switching to the relay connection on 02 220kV transmission circuits Tuy Hoa - Phuoc An after this line is put into operation.
73	Nha Trang - Thap Cham	2	x	89	New construction
74	Cam Ranh – Turn to Nha Trang - Thap Cham	4	x	1	New construction, connection to Cam Ranh 220 kV substation
75	Van Ninh - Turn to Van Phong - Tuy Hoa	4	x	2	New construction, connection to Van Ninh 220 kV substation
76	500 kV Van Phong - Turn toTuy Hoa - Van Phong 220 kV (circuit 1)	2	x	26	New construction, connection to the 220 kV side of Van Phong 500 kV substation
77	500 kV Van Phong - Turning Tuy Hoa - Van Phong 220 kV (circuit 2)	2	x	26	New construction, connection to the 220 kV side of Van Phong 500 kV substation
78	Le Thuy – Turn to Dong Hoi - Dong Ha	4	x	2	New construction, synchronously according to the scale and progress of regional power sources, connection to Quang Binh 500 kV substation
79	Improve loading capacity Dong Hoi - Dong Ha	2	x	108	Renovating, increasing the load capacity, the case of Quang Tri wind power is highly developed
80	Quang Tri Mixed Gas Turbin- Turn to Southeast - 500 kV Quang Tri	2	x	5	New and synchronous construction of Quang Tri Scientific and Technological Equipment
81	500 kV Quang Tri - Dong Nam	2	x	27	New construction, connection to Southeast 220 kV substation
82	Huong Thuy - Turn to Hue - Hoa Khanh	4	x	2	New construction, connection to Huong Thuy 220 kV substation
83	Improve loading capacity Hue - Hoa Khanh	2	x	82	Renovating, increasing the load capacity
84	Improve loading capacity Da Nang - Tam Ky - Doc Soi	2	x	100	Renovating, increasing the load capacity
85	Tien Sa - Turn to Hai Chau - Ngu Hanh Son	2	x	4	New construction, connection to Tien Sa 220 kV substation
86	Da Nang Airport - turn Hoa Khanh - Da Nang	2	x	5	New construction, underground cable line connecting 220kV substation to Da Nang Airport
87	Dung Quat - Dung Quat 2	2	x	3	Guaranteed N-1
88	Dien Ban - Nam Hoi An	2	x	24	New construction, connection to South Hoi An 220 kV substation

No.	Line name	Circuit number	x	kilometer	Note
89	Da Nang 500 kV - Dien Ban	2	x	12	New construction, connection to Dien Ban 220 kV substation
90	Quang Ngai 2 - Turn to Doc Soi - Quang Ngai	4	x	2	New construction, connection to Quang Ngai 220kV substation 2
91	Phu My 2 - Phu My	2	x	20	New construction, synchronized with the development progress of specialized loads
92	Nam Phu Yen - Turn to Nha Trang - Tuy Hoa	4	x	4	New construction, connection to substation 220 kV Nam Phu Yen
93	Van Phong 500 kV - Van Phong 220 kV	2	x	20	New construction
94	Cam Thinh - Turn Cam Ranh - Thap Cham	4	x	3	New construction, connection to Cam Thinh 220 kV substation
95	Bo Y - Bo Y 220 kV cut-off station	2	x	30	New construction
96	Upper Kon Tum - Kon Tum	2	x	83	New construction, release of hydro and wind power capacity, strengthen linkages
97	Ea Kar - Turn to Krong Buk - Nha Trang	4	x	2	New construction, connection to substation 220 kV Ea Kar
98	Gia Lai 1 - Pleiku 3	2	x	20	New construction, synchronously according to the scale and progress of regional power sources
99	Dak Nong 2 - Turn to Buon Kuop - Buon Tua Srah	2	x	10	New construction, connection to 220 kV substation Dak Nong 2
100	Provision for arising of 220 kV line for renovation and new construction	550			Provision for load growth and power source development

Table 16: List of newly built and renovated 500 kV substations in the South and put into operation in the period of 2021 - 2030

No.	Substation name	Capacity (MVA)	Note
1	Ninh Son	1,800	New construction, clearing the area's power source
2	Son My	900	New construction, communication transformer in Son My Power Center, synchronized with Son My II Thermal Power Plant
3	Hong Phong (*)	900	New construction, synchronously according to the scale and progress of regional power sources
4	South Central Coast 1 (*)	1,800	New construction, synchronously according to the scale and progress of regional power sources
5	South Central Region 2 (*)	1,800	New construction, synchronously according to the scale and progress of regional power sources
6	Cu Chi	1,800	New construction
7	Tay Ninh 1	1,800	New construction

No.	Substation name	Capacity (MVA)	Note
8	Tay Ninh 2	900	New construction
9	Binh Duong 1	1,800	New construction
10	Long Thanh	1,800	New construction
11	Dong Nai 2	1,800	New construction
12	North Chau Duc	1,800	New construction
13	Long An	1,800	New construction
14	Tien Giang	900	New construction
15	Thot Not	1,800	New construction
16	Long Phu	1,500	New construction, clearing the area's power source
17	Bac Lieu (*)	1,800	New construction, synchronously according to the scale and progress of regional power sources
18	Di Linh	1,800	Renovating and clearing the area's power source
19	Thuan Nam	2,700	Renovating and clearing the area's power source
20	Nha Be	1,800	Renovations
21	Cau Bong	2,700	Renovations
22	Chon Thanh	1,800	Renovations
23	Tan Uyen	2,700	Renovations
24	Tan Dinh	2,700	Renovations
25	Song May	2,700	Renovations
26	Phu My	900	Renovations
27	Duc Hoa	1,800	Renovations
28	O Mon	1,800	Renovations
29	Duyen Hai	900	Renovation and clearing the area's power source
30	Provision for arising 500kV substation for new construction, renovation and capacity improvement	2,100	Provision for load growth and power source development
	Flexible schematic design of busbar segment for 500 kV LNG Ca Na distribution yard		Limit short circuit current, increase power supply reliability
	Works and projects to improve control and operation of power stations and power systems		Including but not limited to projects: Replacement, installation of reactors, capacitors, SVC, SVG, FACTS equipment, BESS, synchronous compensators...; expand the substations' compartments, renovate and complete the diagrams of substations in a flexible direction; install short-circuit current limiting devices, replace and upgrade equipment to ensure short-circuit current capacity, set up automatic circuits; installation, replacement of equipment,

No.	Substation name	Capacity (MVA)	Note
			control systems, SCADA/EMS, SCADA/DMS systems, station automation,...

Table 17: List of newly built and renovated 500 kV transmission lines in the South and put into operation in the period of 2021 - 2030

No.	Line name	Circuit number	x	kilometer	Note
first	Ninh Son - Turn to Van Phong I Thermal Power Plant - Thuan Nam	4	x	18	New construction, connection to Ninh Son 500kV substation
2	Ninh Son - Chon Thanh	2	x	275	New construction, release of power source capacity. Replacing the 500kV transmission line Thuan Nam - Chon Thanh line approved in Document No. 1891/TTg-CN dated 27/12/2018 to facilitate construction investment, management and operation.
3	Cu Chi - Turn to Chon Thanh - Duc Hoa	2	x	16	New construction, connection to Cu Chi 500 kV substation
4	Tay Ninh 1 - Turn to Chon Thanh - Duc Hoa	4	x	2	New construction, connection to Tay Ninh 500kV substation 1
5	Binh Duong 1 - Turn to Song May - Tan Dinh	2	x	35	New construction, connection to 500kV substation Binh Duong 1
6	Binh Duong 1 - Chon Thanh	2	x	17	New construction, creating a loop, improving the reliability of power supply in the Southeast region
7	Long Thanh - Turn to Phu My - Song May	2	x	17	New construction, connection to Long Thanh 500 kV substation
8	Dong Nai 2 - Turn to Vinh Tan - Song May	4	x	5	New construction, transition on circuit 3.4, 500 kV Vinh Tan - Turn Song May - Tan Uyen
9	Nhon Trach 4 Power Plant - Turn to Phu My - Nha Be	2	x	4	New and synchronous construction of Nhon Trach 4 Power Plant; Proposal to choose conductor cross-section suitable to 500 kV Phu My - Nha Be power line after renovation to improve load capacity
10	North Chau Duc - Turn Phu My - Song May and Phu My - Long Thanh	4	x	11	New construction, connection to North Chau Duc 500 kV substation
11	Hau River - Duc Hoa (phase 2)	2	x	97	New and synchronous construction of Song Hau I thermal power plant; Phase 1 completed in 2020
12	Duc Hoa - Chon Thanh	2	x	104	New construction, transfer to connect My Tho - Chon Thanh
13	500 kV Duc Hoa - Turn to Phu Lam - Cau Bong (circuit 2)	2	x	13	New construction, connection of Duc Hoa 500kV substation to be relayed on the remaining circuit of Phu Lam - Cau Bong 500kV

No.	Line name	Circuit number	x	kilometer	Note
14	Long An – Turn to Nha Be - My Tho	2	x	1	New construction, connection to Long An 500 kV substation
15	O Mon - Thot Not	2	x	35	New construction and strengthening of transmission network in the Southwest region; release capacity of O Mon Power Center
16	LNG Bac Lieu - Thot Not	2	x	130	New construction, synchronized LNG Bac Lieu
17	Bac Ai Pumped-Storage Hydroelectricity - Ninh Son	2	x	25	New and synchronous construction of Bac Ai Thermal Power Plant, replacing Bac Ai 500kV Power Plant - Turn to Van Phong - Thuan Nam
18	South Central Pumped-Storage Hydroelectricity Connector	30			New and synchronous construction of Southern Central Pumped-Storage Hydroelectricity
19	LNG Ca Na - Thuan Nam	2	x	30	New construction, synchronous LNG Ca Na. Design proposal for 500 kV LNG Ca Na distribution yard with flexible operation scheme, with busbar segment
20	LNG Ca Na - Binh Duong 1	2	x	280	New and synchronous construction of LNG Ca Na; release LNG Ca Na capacity and regional power source
21	Hong Phong - Turn Vinh Tan - Song May (*)	4	x	10	New construction, synchronously according to the scale and progress of regional power sources
22	Son My - North Chau Duc	2	x	80	New and synchronous construction of Son My II Thermal Power Plant
23	South Central 1 - Thuan Nam (*)	2	x	20	New construction, synchronously according to the scale and progress of regional power sources
24	South Central 2 - Thuan Nam (*)	2	x	50	New construction, synchronously according to the scale and progress of regional power sources
25	Increase the load capacity of 500 kV North Chau Duc - Song May transmission line	1	x	58	Improving load capacity, synchronizing Son My Power Center
26	Increase the load capacity of North Chau Duc - Long Thanh - Song May 500 kV transmission line	1	x	92	Improving load capacity, synchronizing Son My Power Center
27	Long Thanh - Turn to North Chau Duc - Song May	2	x	17	New construction, increased power transmission in the area. Proposal to choose the appropriate cross-section for the North Chau Duc - Song May 500kV substation after renovation to increase the load capacity

No.	Line name	Circuit number	x	kilometer	Note
28	Increase the load capacity of Phu My - Nha Be and Phu My - Nhon Trach 4 - Nha Be 500 kV transmission line	2	x	43	Improving the load capacity, enhancing the capacity to release the power of the area
29	Tay Ninh 2 - Turn to Chon Thanh - Tay Ninh 1	4	x	30	New construction, connection 500kV station to Tay Ninh 2
30	Tien Giang - Turn to O Mon - My Tho	4	x	5	New construction, connection to Tien Giang 500kV substation
31	Thot Not - Duc Hoa	2	x	135	New and synchronous construction of unit 2 of LNG Bac Lieu; consider the plan to renovate and install more busbar segmentation breakers at Duc Hoa 500kV distribution yard and operate busbar separation in the direction of direct power transmission from Thot Not to Cau Bong; or build a 500 kV Thot Not - Duc Hoa telephone line, switch the connection to Cau Bong to limit short-circuit currents
32	Increase the load capacity of Duc Hoa - Cau Bong 500kV transmission line	2	x	24	Renovating and improving the loading capacity, synchronizing unit 2 of LNG Bac Lieu, releasing Bac Lieu LNG and the Southwest renewable energy source
33	Bac Lieu 500kV substation – Turn to LNG Bac Lieu - Thot Not	2	x	20	New construction, connection to Bac Lieu 500 kV substation
34	Vinh Tan III - Vinh Tan Thermal Power Plant	2	x	1	New and synchronous construction of Vinh Tan III Thermal Power Plant
35	Song Hau II Thermal Power Plant - Song Hau	2	x	1	New and synchronous construction of Song Hau II Thermal Power Plant
36	Provision for arising of 500 kV lines for renovation and new construction	440			Provision for load growth and power source development

Table 18: List of newly built and renovated 220 kV substations in the South and put into operation in the period of 2021 - 2030

No.	Substation name	Capacity (MVA)	Note
1	Ta Nang (*)	500	New construction, synchronously according to the scale and progress of regional power sources
2	Da Nhim cut-off station	Cut-off station	New construction, clearing the area's power source, because the Da Nhim 220 kV power station cannot expand the 220 kV road

No.	Substation name	Capacity (MVA)	Note
3	Ca Na	500	New construction
4	Dong QuanThe	480	New construction, synchronized with the development progress of specialized loads
5	Ham Thuan Nam	500	New construction
6	Vinh Hao (*)	500	New construction, synchronously according to the scale and progress of regional power sources
7	Hoa Thang (*)	500	New construction, synchronously according to the scale and progress of regional power sources
8	Hong Phong (*)	500	New construction, synchronously according to the scale and progress of regional power sources
9	Ham Cuong (*)	250	New construction, synchronously according to the scale and progress of regional power sources
10	Wind power 1 Binh Thuan (*)	250	New construction, synchronously according to the scale and progress of regional power sources
11	Tan Cang	500	New construction
12	Tan Son Nhat	500	New construction
13	Dam Sen	500	New construction
14	Thu Thiem	500	New construction
15	Binh Chanh 1	500	New construction
16	Ba Queo (Vinh Loc)	500	New construction
17	District 7	500	New construction
18	Nam Hiep Phuoc	500	New construction
19	District 9	500	New construction
20	Northwest Cu Chi	250	New construction
21	Phu Hoa Dong	250	New construction
22	Binh Chanh 2	250	New construction
23	Phuoc Long	500	New construction
24	East Binh Phuoc (*)	500	New construction, synchronously according to the scale and progress of regional power sources
25	Dong Xoai	250	New construction
26	Tan Bien	500	New construction
27	Phuoc Dong	500	New construction
28	Ben Cau	250	New construction
29	Tay Ninh 3	250	New construction
30	Tan Chau 1 (*)	500	New construction, synchronously according to the scale and progress of regional power sources
31	Ben Cat 2	500	New construction
32	Tan Dinh 2	500	New construction

No.	Substation name	Capacity (MVA)	Note
33	An Thanh (VSIP)	500	New construction
34	Binh My	500	New construction
35	Northern Tan Uyen	500	New construction
36	Lai Uyen	500	New construction
37	An Phuoc	500	New construction
38	Tam Phuoc	500	New construction
39	Thong Nhat	500	New construction
40	Nhon Trach Industrial Park	500	New construction
41	Dinh Quan	500	New construction
42	Long Khanh	500	New construction
43	Ho Nai	500	New construction
44	Dau Giay	500	New construction
45	Bien Hoa	500	New construction
46	Dong Nai 3 (*)	500	New construction, synchronously according to the scale and progress of regional power sources
47	Phu My 3 Industrial Park	500	New construction
48	Phuoc Thuan (Dat Do)	500	New construction
49	Long Son	250	New construction
50	Hoa Binh (*)	500	New construction, synchronously according to the scale and progress of regional power sources
51	Phu My City	250	New construction
52	Ben Luc	500	New construction
53	Duc Hoa 2	500	New construction
54	Duc Hoa 500 kV connection level	500	New construction
55	Duc Hoa 3	500	New construction
56	Tan Lap	250	New construction
57	Can Giuoc	250	New construction
58	Lap Vo	250	New construction
59	Hong Ngu	250	New construction
60	Cho Moi	250	New construction
61	Chau Thanh (An Giang)	250	New construction
62	Tan Phuoc (Cai Be)	500	New construction, another name of Cai Be 220 kV station in PDP VII Adjustment approved in Decision No. 428/QD-TTg dated 18/03/2016 of the Prime Minister
63	Go Cong	500	New construction
64	Vinh Long 3	500	New construction

No.	Substation name	Capacity (MVA)	Note
65	Binh Dai (*)	500	New construction, synchronously according to the scale and progress of regional power sources
66	Thanh Phu (*)	500	New construction, synchronously according to the scale and progress of regional power sources
67	An Bien (Vinh Thuan)	500	New construction, another name of 220 kV Vinh Thuan station in the revised PDP VII approved in Decision No. 428/QD-TTg dated March 18, 2016 of the Prime Minister
68	Phu Quoc	500	New construction
69	Duyen Hai	250	New construction
70	Tra Vinh 3 (*)	450	New construction, synchronized with the development progress of specialized loads
71	Ca Mau 3 (*)	450	New construction, synchronized with the development progress of specialized loads
72	Vinh Chau (*)	500	New construction, synchronously according to the scale and progress of regional power sources
73	Tran De (*)	500	New construction, synchronously according to the scale and progress of regional power sources
74	Bac Lieu 3 (*)	750	New construction, synchronously according to the scale and progress of regional power sources
75	Bac Lieu 4 (*)	750	New construction, synchronously according to the scale and progress of regional power sources
76	Nam Can	500	New construction
77	Duc Trong	500	Renovations
78	Bao Loc	500	Renovations
79	Da Nhim Power Plant	375	Renovations
80	Phuoc Thai (*)	625	Renovating and clearing the area's power source
81	Ham Thuan Power Plant	125	Renovations
82	Dai Ninh Power Plant	250	Renovations
83	Nha Be	750	Renovations
84	Binh Tan	750	Renovations
85	Chon Thanh 500 kV connection level	500	Renovations
86	Tay Ninh 2	500	Renovations
87	Tan Dinh	750	Renovations
88	Tri An Power Plant	500	Renovations
89	Chau Duc	500	Renovations
90	Ba Ria	250	Renovations

No.	Substation name	Capacity (MVA)	Note
91	Can Duoc	500	Renovations
92	Sa Dec	500	Renovations
93	Long Xuyen	500	Renovations
94	My Tho	500	Renovations
95	Cai Lay	500	Renovations
96	Mo Cay	500	Renovations
97	Can Tho	500	Renovations
98	O Mon	500	Renovations
99	Thot Not	375	Renovations
100	Tra Noc	500	Renovations
101	Chau Thanh (Hau Giang)	500	Renovations
102	Tra Vinh	500	Renovations
103	Gia Rai	250	Renovations
104	Bac Lieu	375	Renovations
105	Provision for generating new 220kV substations, renovating and increasing capacity	2.125	Provision for load growth and power source development
	Flexible schematic design of busbar segment including but not limited to 220 kV distribution yards 500 kV substations Long Thanh, Chon Thanh, Ninh Son, Dong Nai 2, Thot Not, Ba Queo 220 kV substations, Tan Cang , Nam Hiep Phuoc, Tam Phuoc, Tan Dinh 2, Phu My 3 Industrial Park, Phu My City, Binh My, Binh Chanh 2, Phu Hoa Dong, An Phuoc, Binh My		Limit short circuit current, increase power supply reliability
	Install short-circuit current limiting resistance at busbars 220 kV 500 kV substation Vinh Tan, Bac Chau Duc substations, 220 kV Ba Queo substations (220kV resistance lines Ba Queo - Dam Sen)		Short circuit current limitation
	Renovating flexible 220 kV busbar diagram, busbar segmentation at 500 kV substations Duc Hoa, O Mon, 220 kV Ninh Phuoc, Long Thanh, Cu Chi substations		Limit short circuit current, increase power supply reliability
	Works and projects to improve control and operation of power stations and power systems		Including but not limited to projects: Replacement, installation of reactors, capacitors, SVC, SVG, FACTS equipment, BESS, synchronous compensators...; expand the substations'

No.	Substation name	Capacity (MVA)	Note
			compartments, renovate and complete the diagrams of substations in a flexible direction; install short-circuit current limiting devices, replace and upgrade equipment to ensure short-circuit current capacity, set up automatic circuits; installation, replacement of equipment, control systems, SCADA/EMS, SCADA/DMS systems, station automation,...

Table 19: List of newly built and renovated 220 kV transmission lines in the South and put into operation in the period of 2021 - 2030

No.	Line name	Circuit number	x	kilometer	Note
1	Circuit 2 Bao Loc - Song May	2	x	118	Improve circuit 1, build circuit 2, improve reliability
2	Da Nhim 220kV cut-off station – Turn to Thap Cham - Da Nhim	2	x	1	New construction, synchronized Da Nhim 220 kV cut-off station
3	220kV Da Nhim - Duc Trong - Di Linh 220kV cut-off station	2	x	85	New construction, clearing the regional power source; replacement for the renovation project of Da Nhim - Duc Trong - Di Linh 220kV substation from 01 circuit to 02 circuits due to difficulties in powering off the existing line and not being able to expand the Da Nhim 220 kV substation.
4	Dong Nai 2 Power Plant – Turn to Duc Trong - Di Linh and switching connections (Duc Trong - Dong Nai 2 Power Plant instead of Duc Trong - Di Linh), improving and increasing the load capacity of Dong Nai 2 - Di Linh 220 kV transmission line	1	x	15	New construction and renovation, formation of line Duc Trong - Dong Nai 2 - Di Linh single-circuit 220 kV substation instead of 220 kV dual circuit Dong Nai 2 - Di Linh power plant
5	Duc Trong - Turn to Da Nhim - Di Linh 220 kV cut-off station	2	x	1	New construction, clearing the area's power source
6	Nha Trang - Thap Cham	2	x	88	New construction
7	500 kV Ninh Son - Turn to Thap Cham - Ninh Phuoc	4	x	22	New construction, connection to Ninh Son 500kV substation
8	500 kV Ninh Son - Ninh Phuoc	2	x	35	New construction, replacing 220 kV Ninh Phuoc - Vinh Tan line due to difficulties in alignment

No.	Line name	Circuit number	x	kilometer	Note
9	500 kV Ninh Son - Da Nhim 220 kV cut-off station	2	x	18	New construction, clearing the area's power source
10	Thap Cham - Da Nhim 220 kV cut-off station	2	x	forty six	New construction, clearing the area's power source
11	500 kV Vinh Tan - Ca Na	2	x	14	New construction, connection to Ca Na 220 kV station
12	Ninh Phuoc - 500 kV Thuan Nam	2	x	25	New construction, clearing the area's power source
13	Ham Tan – Turn to Phan Thiet - Chau Duc (circuit 2)	2	x	6	Connection to 220kV Ham Tan station to relay more on the remaining circuit of Phan Thiet - Tan Thanh 220kV transmission line
14	Ham Thuan Nam - Turn to Phan Thiet - Ham Tan	4	x	4	New construction, connection to Ham Thuan Nam 220 kV substation
15	Vinh Hao - Turn to Vinh Tan - Phan Ri	2	x	2	New construction, connection to Vinh Hao 220 kV substation
16	Hoa Thang – Turn to Phan Thiet - Phan Ri	2	x	7	New construction, connection to Hoa Thang 220 kV substation
17	Improve loading capacity Ham Thuan - Da My - Xuan Loc	2	x	95	Improved load capacity
18	Increased loading capacity Phan Thiet - Ham Thuan	1	x	55	Improved load capacity
19	Cat Lai - Tan Cang	2	x	15	New construction
20	Binh Chanh 1 - Cau Bong	2	x	13	New construction
21	Thuan An - Tan Son Nhat	2	x	15	New construction
22	Tan Son Nhat - Turn to Hoc Mon - Thu Duc	2	x	9	New construction
23	Phu Lam - Dam Sen	2	x	6	New construction
24	Dam Sen - Ba Queo - Tan Son Nhat	2	x	10	New construction
25	500 kV Long Thanh - High Technology	2	x	25	New construction
26	500 kV Cu Chi – Turn to Cu Chi - Trang Bang	4	x	1	New construction, switching to 220kV transmission line Cu Chi 500kV - Trang Bang and Cu Chi 500kV - Tan Dinh
27	500 kV Cu Chi – Turn to Cu Chi - Tan Dinh	2	x	1	New construction, switching to 220kV transmission line Cu Chi 500kV – 220kV Cu Chi
28	Thu Thiem - Turn to Cat Lai - Tan Cang	4	x	1	New construction
29	Tao Dan - Tan Cang	2	x	7	New construction
30	District 7 - Nha Be and expansion of 220 kV interchange at 500 kV Nha Be station	2	x	6	New construction, connection to District 7 220 kV station, in case it is not possible to expand 220 kV line at Nha Be 500 kV station, consider connecting District 7 - Nhon Trach 1 & 2 - Nha Be power station (2x7km), using economical large area

No.	Line name	Circuit number	x	kilometer	Note
31	District 9 - Turn to Long Thanh - High-tech	4	x	5	New construction
32	LNG Hiep Phuoc Phase I - Turn to Phu My – Can Duoc	4	x	3	New and synchronous construction of LNG Hiep Phuoc Phase I
33	Improve loading capacity Phu My - Can Duoc	2	x	57	Improving loading capacity, synchronizing LNG Hiep Phuoc phase I
34	South Hiep Phuoc - Turn to Phu My - Can Duoc	4	x	2	New construction, connection to Nam Hiep Phuoc 220 kV station. It is recommended to choose the appropriate cross-section for the Phu My - Can Duoc 220 kV transmission line after renovation
35	Increase download capacity Thu Duc - Tan Uyen - Long Binh	2	x	44	Renovate and raise the load capacity, consider the appropriate load capacity of the existing underground cable
36	Improve loading capacity Binh Long - Chon Thanh	2	x	32	Improve load capacity, release regional power
37	Phuoc Long - Turn to Binh Long - Dak Nong	2	x	5	New construction
38	Dinh Quan - Turn to Bao Loc - Song May	4	x	1	New construction
39	Tan Bien - Tay Ninh	2	x	25	New construction
40	500 kV Tay Ninh 1 - Turn to Tay Ninh 2 - Trang Bang	4	x	8	New construction, connection to 500kV substation Tay Ninh 1
41	500 kV Tay Ninh 1 - Phuoc Dong	2	x	8	New construction
42	Chon Thanh - Ben Cat	2	x	28	New construction
43	Ben Cat 2 - Turn to Tan Dinh - Cu Chi	4	x	1	New construction
44	Ben Cat 2 - Chon Thanh - Ben Cat	2	x	20	New construction and relay connection to 01 220kV transmission line circuit Chon Thanh - Ben Cat
45	Tan Dinh 2 – Turn to My Phuoc - Ben Cat	4	x	11	New construction
46	500 kV Binh Duong 1 - Turn to Uyen Hung - Song May	4	x	40	New construction, connection to 500kV substation Binh Duong 1
47	An Thanh (VSIP) – Turn to Tan Uyen - Thuan An	4	x	3	New construction
48	Binh My - Turn to Binh Duong 1 - Song May	4	x	3	New construction
49	Lai Uyen - Chon Thanh - Ben Cat	4	x	1	New construction
50	North Tan Uyen - Turn to Binh My - Song May	2	x	7	New construction
51	Song May - Tam Phuoc	2	x	14	New construction
52	An Phuoc - Turn to Long Binh - Long Thanh	4	x	1	New construction

TT	Line name	Circuit number	x	kilometer	Note
53	Tam Phuoc - Turn to Long Binh - Long Thanh	4	x	1	New construction
54	500 kV Long Thanh – Turn to Long Binh - Long Thanh	4	x	10	New construction, connection to Long Thanh 500 kV substation
55	500 kV Dong Nai 2 - Turn to Xuan Loc - Long Thanh	4	x	12	New construction
56	Long Khanh – Turn to Xuan Loc - Long Thanh	4	x	1	New construction
57	Nhon Trach 3 Power Plant – Turn to My Xuan - Cat Lai	2	x	10	New and synchronous construction of Nhon Trach 3 Power Plant; to replace the Nhon Trach 3 - Cat Lai power plant (transfer connection to Thu Duc) due to difficulties in the direction of the line for construction of the transmission line.
58	Power Plant Nhon Trach 3 - 500kV Long Thanh	2	x	44	New and synchronous construction of Nhon Trach 3 Power Plant
59	Nhon Trach Industrial Park - Turn to Power Plant Nhon Trach 3 - 500 kV Long Thanh	4	x	3	New construction, synchronous 220 kV station Nhon Trach Industrial Park. In case Power Plant Nhon Trach 3 is behind schedule, consider building 220kV power plant before Nhon Trach - Long Thanh Industrial Park.
60	Increasing loading capacity Song May - Long Binh (circuit 1)	1	x	16	Improved load capacity
61	Increasing load capacity Song May - Long Binh (circuit 2)	1	x	25	Improved load capacity
62	Thong Nhat - Turn to Bao Loc - Song May	4	x	2	New construction
63	Increase loading capacity Tan Dinh - Binh Hoa	2	x	11	Improved load capacity
64	Tri An Expanded Power Plant - Tri An Power Plant	2	x	1	New construction, synchronously expanded Tri An Power Plant
65	Improve loading capacity Phu My - Tan Thanh	2	x	11	Renovating, increasing the load capacity
66	Improve loading capacity Phu My - Long Thanh	2	x	25	Renovating, increasing the load capacity
67	Phu My 3 Industrial Park - Turn to Tan Thanh - Chau Duc	4	x	1	New construction
68	500 kV North Chau Duc – Turn to Chau Duc - Tan Thanh	4	x	10	New construction
69	Phu My - Tan Thanh circuit 3.4 and switch to	2	x	10	New construction

No.	Line name	Circuit number	x	kilometer	Note
	connect at Tan Thanh 220kV substation				
70	Phuoc Thuan (Dat Do) – Turn to Phan Thiet - Tan Thanh and Ham Tan - Tan Thanh	4	x	6	New construction
71	Long Son - Turn to Chau Duc - Phu My 3 Industrial Park	2	x	8	New construction, consider choosing a cross-section suitable for Chau Duc 220kV transmission line, Phu My 3 Industrial Park after renovation (Phase 2026-2030)
72	Improve loading capacity Tan Thanh - Vung Tau	2	x	30	Improved load capacity
73	Ben Luc – Turn to Phu Lam - Long An (turn circuit 2)	2	x	1	New construction
74	Improve loading capacity Long An - Ben Luc	2	x	14	Improved load capacity
75	Go Cong - Can Duoc	2	x	27	New construction
76	500 kV Duc Hoa - Turn to Phu Lam - Long An (circuit 2)	2	x	20	Connection to the 220 kV side of the Duc Hoa 500 kV station forward on the remaining circuit of the transmission line 220 kV Phu Lam - 500 kV Long An
77	Duc Hoa 2 – Turn to 500kV Duc Hoa – Duc Hoa 1	4	x	10	New construction
78	Duc Hoa 3 relay connection on 220 kV line Duc Hoa 500 kV – Turn to Phu Lam - Long An	4	x	6	New construction
79	Hanging circuit 3.4, 220kV Duc Hoa 500kV - Duc Hoa 1	2	x	25	Consider transferring connection to Northwestern Cu Chi 220 kV station
80	500 kV Long An – Turn to Can Duoc - Phu My	4	x	1	New construction
81	500 kV Thot Not - Lap Vo	2	x	22	New construction
82	Hong Ngu - Chau Doc	2	x	40	New construction
83	Sa Dec – Turn to O Mon - Vinh Long (circuit 2)	2	x	1	Connection to the Sa Dec 220 kV station to be relayed on the remaining circuit of the 220 kV transmission line O Mon - Vinh Long
84	Long Xuyen - Turn to Chau Doc - Thot Not (circuit 2)	2	x	1	Connection to the Long Xuyen 220 kV station to relay on the remaining circuit of the 220kV transmission line Chau Doc - Thot Not
85	Chau Thanh (An Giang) - Turn to Long Xuyen - Chau Doc	4	x	2	New construction
86	Cho Moi - Chau Thanh (An Giang)	2	x	9	New construction
87	Renovating 220 kV Chau Doc - Kien Binh	2	x	75	Renovate 1 circuit transmission line into 2 circuit, improve load capacity

No.	Line name	Circuit number	x	kilometer	Note
	transmission line 1 circuit into 2 circuits				
88	Tan Phuoc (Cai Be) - Turn to 500 kV My Tho - Long An	4	x	7	New construction
89	My Tho - Turn to My Tho 500 kV - Can Duoc (circuit 2)	2	x	4	Connect the My Tho 220 kV station to relay on the remaining circuit of the 220 kV My Tho - 500 kV Can Duoc.
90	Can Duoc - Turn to Phu My 500 kV - My Tho (circuit 2)	2	x	5	Connecting 220 kV Can Duoc station to relay on the remaining circuit of transmission line 220 kV Phu My - 500 kV My Tho telephone
91	Increase the load capacity of My Tho 500 kV - My Tho - Can Duoc	2	x	55	Improved load capacity
92	Vinh Long 3 - Turn to Vinh Long 2 - Tra Vinh	4	x	1	New construction
93	Ben Tre - Binh Dai (*)	2	x	50	New construction, synchronously according to the scale and progress of regional power sources
94	Thanh Phu - Turn to ĐG Hai Phong - Mo Cay (*)	4	x	3	New construction, synchronously according to the scale and progress of regional power sources. In case ĐG Hai Phong enters slowly, it is necessary to build in advance the 220 kV Thanh Phu - Mo Cay dual-circuit transmission line to synchronize the 220 kV Thanh Phu station, and ĐG Hai Phong to connect to the 220 kV Thanh Phu station through the 220 kV dual circuit.
95	Transmission line 220 kV Rach Gia 2 - Kien Binh circuit 2	2	x	74	Renovate 1 circuit transmission line into 2 circuit
96	An Bien (Vinh Thuan) - Turn to Ca Mau Province - Rach Gia	2	x	17	New construction
97	220 kV Duyen Hai – Turn to 500 kV Duyen Hai - Mo Cay	4	x	3	New construction
98	Tra Vinh 3- 500 kV Duyen Hai (*)	2	x	3	New construction, synchronized with 220 kV station Tra Vinh 3
99	Ca Mau 3 - Turn Ca Mau - Nam Can (*)	2	x	26	New construction, synchronized with 220 kV station Ca Mau 3
100	Chau Thanh (Hau Giang) - Turn to O Mon - Soc Trang	4	x	2	New construction
101	Kien Binh - Phu Quoc	2	x	84	New construction
102	Vinh Chau - Turn to Long Phu - Soc Trang (circuit 1)	2	x	20	New construction, connection to Vinh Chau 220 kV station, clearing the area's power source
103	Ca Mau - Nam Can	2	x	58	New construction

No.	Line name	Circuit number	x	kilometer	Note
104	Bac Lieu - Turn to Ca Mau thermal power plant - Soc Trang (circuit 2)	2	x	5	New construction, clearing the regional power source; The exact name of the project is approved in Document No. 441/TTg-CN dated 16/4/2020 "Dual circuit 220 kV line connecting 220 kV Bac Lieu substation to relay on Ca Mau - Bac Lieu transmission line"
105	Phuoc Thai - Turn to Vinh Tan - Thap Cham (circuit 2)	2	x	3	Connecting Phuoc Thai 220 kV station to relay on the remaining circuit of 220 kV Vinh Tan - Thap Cham line, clearing the area's power source
106	ĐG Duc Trong - Turn to Da Nhim - Duc Trong (*)	2	x	1	New and synchronous construction of Duc Trong Thermal Power Plant. Location and adjustment connection plan of Duc Trong Power Plant are proposed in Document No. 3225/BCT-DL dated 09/6/2022, Document No. 4777/BCT-DL dated 11/8/2022, Document No. 6660/BCT-DL dated 26/10/2022 of the Ministry of Industry and Trade and Document No. 835/TTg-CN dated 22/9/2022 of the Prime Minister. Synchronous operation with 220 kV transmission line at Da Nhim - Duc Trong - Di Linh switching station.
107	Phuoc Huu - 220 kV Ninh Phuoc (*)	1	x	2	New construction and connection of Phuoc Huu transmission line, replacing 110kV Phuoc Huu - 110kV Ninh Phuoc transmission line approved in Decision No. 3768/QD-BCT dated 27/07/2011 due to 110 kV power grid's inability relieve. Phuoc Huu 220 kV booster station with a capacity of 63MVA
108	ĐG No. 5 Ninh Thuan - Ninh Phuoc	2	x	2	New construction, synchronized ĐG No. 5 Ninh Thuan
109	ĐG Lac Hoa 2 - ĐG Hoa Dong 2	1	x	6	New construction, clearing of regional power sources, approved connection plan at Document 911/TTg-CN on 24/6/2020
110	ĐG Bac Lieu Phase 3 - Bac Lieu	2	x	18	New and synchronous construction of Bac Lieu substation phase 3, connection plan approved in Decision No. 209/QD-TTg dated 09/02/2018
111	Hoa Binh – Turn to Gia Rai - Bac Lieu	2	x	13	New construction and connection of Hoa Binh 220 kV station (Bac Lieu province) to relay 220 kV Gia Rai - Bac Lieu transmission line, clearing the area's power source
112	Hoa Binh relay connection on 220kV transmission line, connect ĐG Hoa Binh 5	4	x	5	New construction, connecting Hoa Binh 220kV station (Bac Lieu province), clearing regional power source
113	ĐG Vien An - Nam Can	1	x	20	New construction, clearing of regional power sources, approved connection plan at Document 911/TTg-CN on 24/6/2020
114	Cluster ĐG Ca Mau 1 - Ca Mau	2	x	52	New and synchronous construction of Ca Mau 1

No.	Line name	Circuit number	x	kilometer	Note
115	Long My 1 intersection - Turn to Ca Mau Thermal Power- O Mon	2	x	1	New construction, synchronized with Long My 1
116	ĐG No. 19 Ben Tre - Binh Dai	2	x	12	Newly and synchronously construction of ĐG No.19 Ben Tre, clearing capacity of ĐG No.19 Ben Tre, and No.20 Ben Tre. Adjusting the plan compared with VB 911/TTg-CN, replacing 220 kV line 19 Ben Tre - Ben Tre about 50 km long due to difficulty in widening the compartment at 220 kV Ben Tre station.
117	ĐG Hai Phong - Mo Cay	2	x	50	New and synchronous construction of ĐG Hai Phong, the connection plan was approved at VB 911/TTg-CN on 15/07/2020
118	ĐG Dong Hai 1 - Central South Tra Vinh Solar Power	1	x	7	New and synchronized construction of ĐG Dong Hai 1, the connection plan was approved at Document 911/TTg-CN on 24/6/2020
119	ĐG Dong Thanh 1 - 500 kV Duyen Hai	2	x	4	Newly and synchronously building Dong Thanh 1, freeing capacity of Dong Thanh 1, Dong Thanh 2. Adjusting the plan compared to Document 911/TTg-CN, replacing 220 kV Dong Thanh 1 – Turn to Dong Hai 1 - 500 kV Duyen Hai to avoid overloading 220 kV transmission line of Dong Hai 1 - Central South Tra Vinh Solar Power - 500 kV Duyen Hai.
120	ĐG Thang Long - 220 kV Duyen Hai	1	x	12	Newly built, synchronously evaluated Thang Long, the connection plan was approved at Document 911/TTg-CN on 24/6/2020
121	ĐG Soc Trang 4 - Vinh Chau	2	x	5	New construction, synchronized construction of ĐG Soc Trang 4, the connection plan was approved at Document 911/TTg-CN on 24/6/2020
122	ĐG Phu Cuong 1A, 1B - Vinh Chau	2	x	22	New construction, synchronous assessment of Phu Cuong 1A, 1B; The connection plan has been approved at Document 911/TTg-CN on 24/6/2020
123	Ta Nang - Turn to Duc Trong - Di Linh (new construction circuit) (*)	2	x	20	New construction, synchronously according to the scale and progress of regional power sources
124	Dong Quan Ta - Turn to Vinh Tan - Quan The 220 kV cut-off station	2	x	1	New construction, synchronized with the development progress of specialized loads
125	Dong Quan The - Ca Na	1	x	7	New construction, synchronized with the development progress of specialized loads
126	Hong Phong – Turn to Phan Thiet - Phan Ri (*)	2	x	1	New construction, synchronously according to the scale and progress of regional power sources
127	Ham Cuong - Ham Thuan Nam (*)	2	x	7	New construction, synchronously according to the scale and progress of regional power sources

No.	Line name	Circuit number	x	kilometer	Note
128	Wind power 1 Binh Thuan - Turn to Vinh Tan - Phan Thiet (*)	2	x	4	New construction, synchronously according to the scale and progress of regional power sources
129	500 kV Hong Phong - Turn to Phan Ri - Phan Thiet	4	x	5	New construction, connecting Hong Phong 500kV station
130	Tri An Power Plant - Song May 500 kV	1	x	24	Improve and increase the load capacity, ensure the release of power supply capacity
131	Increase the loading capacity of Phan Ri - Phan Thiet	2	x	52	Renovating and lifting the load capacity of the existing ACSR-2x330mm2 section on 220 kV Phan Ri - Phan Thiet to relieve regional power
132	Phan Ri - Dai Ninh Power Station	2	x	40	New construction, enhancing the ability to release electricity in the area
133	Improve loading capacity Ham Tan - Chau Duc and Ham Tan - Da Bac Solar Power - Chau Duc	2	x	60	Improve load capacity, release regional power capacity
134	500 kV Son My - Turn to Ham Tan - Phuoc Thuan (Dat Do)	4	x	4	New construction, connection to Son My 500 kV substation, consider choosing a cross section suitable to the cross section of 220 kV Ham Tan - Chau Duc and Ham Tan - Da Bac - Chau Duc power plants after renovation
135	Northwest Cu Chi - Cu Chi 500 kV	2	x	12	New construction
136	Binh Chanh 1 - Duc Hoa	2	x	10	New construction
137	Phu Hoa Dong - Turn to Cu Chi - Cau Bong	4	x	5	New construction
138	Binh Chanh 2 - Turn to Duc Hoa - Phu Lam	4	x	2	New construction
139	Increasing the loading capacity of Cau Bong - Cu Chi	2	x	22	Improved load capacity
140	Increasing the loading capacity of Cau Bong - Binh Tan - Phu Lam	2	x	34	Improved load capacity
141	Dong Xoai - Chon Thanh	2	x	20	New construction
142	Binh Long - Chon Thanh (circuit 3, 4)	2	x	32	New construction, clearing the area's power source
143	Dong Binh Phuoc - Turn to Binh Long - Electrolysis of aluminum (*)	4	x	12	New construction, synchronously according to the scale and progress of regional power sources
144	Increase the load capacity of 220 kV transmission line Chon Thanh l500 kV - My Phuoc	2	x	45	Improve load capacity, release regional power
145	Increase the load capacity of 220kV transmission line My Phuoc - Tan Dinh 500 kV	2	x	17	Improve load capacity, release regional power

No.	Line name	Circuit number	x	kilometer	Note
146	Tan Chau 1 - Tan Bien (*)	2	x	16	New construction, synchronously according to the scale and progress of regional power sources
147	500 kV Tay Ninh 2 - Turn to Ho Dau Tieng Solar Power - Tay Ninh	4	x	3	New construction, connecting 220 kV side of 500 kV station Tay Ninh 2
148	500 kV Tay Ninh 2 - Tay Ninh (transfer connection to Tan Bien)	2	x	6	New construction, connecting 220 kV side of 500 kV station Tay Ninh 2
149	Tay Ninh 3 - 500kV Tay Ninh 2	2	x	16	New construction
150	Ben Cau - 500 kV Tay Ninh 1	2	x	12	New construction
151	Tan Dinh 2 - Binh My	2	x	14	New construction
152	Bien Hoa – Turn to Tan Uyen - Long Binh	4	x	1	New construction
153	Dau Giay - 500 kV Dong Nai 2	2	x	30	New construction
154	Dau Giay - 500 kV Long Thanh	2	x	12	New construction
155	Dong Nai 3 - Tan Uyen (*)	2	x	55	New construction, synchronously according to the scale and progress of regional power sources
156	Increase the load capacity of 220 kV Long Thanh - An Phuoc - Tam Phuoc	2	x	16	Improved load capacity.
157	Lifting load capacity 500 kV Long Thanh - 220 kV Long Thanh	2	x	19	Improved load capacity
158	Ho Nai - Turn to Song May - Tam Phuoc	4	x	1	New construction
159	Phu My City - Turn to Phu My - Ba Ria	4	x	2	New construction
160	Phu My City - Bac Chau Duc 500 kV	2	x	30	New construction
161	Increase the loading capacity of Ben Luc - Phu Lam	2	x	28	Improved load capacity
162	Tan Lap - Turn to 500kV Duc Hoa - Long An	2	x	9	New construction
163	Can Giuoc - Turn to 500kV Long An - Nam Hiep Phuoc	4	x	3	New construction
164	LNG Long An I - 500 kV Long An	2	x	18	New construction, synchronized with LNG Long An I, depending on the progress of the power source; proposed design of 220 kV LNG Long An I distribution yard with flexible busbar segmentation scheme.
165	LNG Long An I - Ben Luc	2	x	30	New construction, synchronized with LNG Long An I, depending on the progress of the

No.	Line name	Circuit number	x	kilometer	Note
					power source; design proposal for distribution yard 220 kV LNG Long An I with flexible busbar segment scheme
166	Lap Vo - Hong Ngu	2	x	55	New construction
167	500 kV Tien Giang - Turn to Vinh Long - Sa Dec	4	x	15	New construction
168	500 kV Tien Giang – Turn to Cai Lay - Cao Lanh	4	x	4	New construction
169	Improve loading capacity Tra Vinh - Vinh Long 2	2	x	62	Improved load capacity
170	Bac Lieu 3 - 500 kV Bac Lieu (*)	2	x	30	New construction, synchronously according to the scale and progress of regional power sources
171	Bac Lieu 4 - 500 kV Bac Lieu (*)	2	x	10	New construction, synchronously according to the scale and progress of regional power sources
172	Tran De - 500 kV Long Phu	2	x	24	New construction, synchronously according to the scale and progress of regional power sources
173	Mo Cay - 500 kV My Tho (*)	2	x	42	New construction, synchronously according to the scale and progress of regional power sources
174	Vinh Chau - Turn to Long Phu - Soc Trang (circuit 2)	2	x	20	New construction, connection of Vinh Chau 220kV relay station on the remaining circuit of Long Phu - Soc Trang 220 kV line
175	500 kV Bac Lieu - Gia Rai - Hoa Binh	4	x	6	New construction, synchronized Bac Lieu 500kV station
176	Provision for arising of 220 kV line for renovation and new construction	430			Provision for load growth and power source development

Notes :

1. For substation

- The list of substations does not include step-up transformer stations of power source projects. The capacity in the table is the total capacity of the transformers of the station. During the implementation of each stage, the scale of the substation will be selected in accordance with the load demand and the power source capacity release.

- In case there is a sudden increase in the load in some areas, leading to the need to change or supplement the scale, connect the transmission lines and stations, report to the Prime Minister for permission to deploy.

- (*) The progress, scale and location of the substations will be accurate during the formulation of the Planning Implementation Plan, depending on the potential for source development and the actual configuration of the power grid.

2. For line

- Line length will be accurate in the investment preparation stage.

- In case there is a sudden increase in the load in some areas, leading to the need to change or supplement the scale, connect the transmission lines and stations, report to the Prime Minister for permission to deploy.

- (*) The progress and scale of the lines will be accurate during the formulation of the Planning Implementation Plan, depending on the potential for source development and the actual configuration of the power grid.

Appendix III
POTENTIAL HYDROPOWER PROJECTS

(Attached to Decision No.500 /QD-TTg dated 15/5/2023 of the Prime Minister)

No	Name of project	Capacity (MW)
1	Thai An MR Power Plant	41
2	Tuyen Quang MR Power Plant	120
3	Trung Son MR Power Plant	130
4	Srepok 3 MR Power Plant	110
5	Sesan 3 MR Power Plant	130
6	Sesan 4 MR Power Plant	120
7	Buon Kuop MR Power Plant	140
8	Vinh Son MR Power Plant	40
9	Song Hinh MR Power Plant	70
10	Ba Ha River MR Power Plant	60
11	Da Nhim MR 2 Power Plant	80
12	Dak R'lap 1 Power Plant (*)	53
13	Dak R'lap 2 Power Plant (*)	68
14	Dak R'lap 3 Power Plant (*)	82

Note:

- Projects will be considered in the Planning Implementation Plan and later.

- Low-head hydroelectric projects on the main streams of Red River, Ca River, Dong Nai River and other rivers by localities (Lao Cai, Yen Bai, Nghe An, Binh Phuoc, Lam Dong, Dak Nong, etc.)) the proposal will continue to be studied, thoroughly evaluated comprehensively, reported to the Prime Minister for permission to deploy if it meets the requirements on economic - technical, environment, population, infrastructure along the river. , irrigation, water-land transportation,...

- Other expansion hydropower projects proposed by localities will continue to be studied and thoroughly evaluated in terms of economic, technical, environmental, system needs, time of appearance, etc. report to the Prime Minister.

(*) The hydropower projects of Dak R'lap 1, Dak R'lap 2 and Dak R'lap 3 must be carefully considered and assessed in terms of environmental, land, and forest impacts of the project. .

Appendix IV
LIST OF SOLAR POWER PROJECTS TO CONSIDER AFTER 2030 (IMPLEMENTED IN THE PLANNING PERIOD IF IMPLEMENTED IN THE FORM OF SELF-PRODUCTION AND SELF-CONSUMPTION)

(Attached to Decision No. 500/QD-TTg dated 15/5/2023 of Prime Minister)

No	Project	Provice	Unoperated capacity (MW)
1	An Cu Solar Power Plant	An Giang	40
2	Hong Liem 6.1 Solar Power Plant	Binh Thuan	40
3	Ayun Pa Solar Power Plant	Gia Lai	20
4	Ninh Sim Solar Power Plant	Khanh Hoa	32
5	Ia Rsao - Bitexco – ToNa Solar Power Plant	Gia Lai	11.84
6	An Khe Dam Solar Power Plant	Quang Ngai	40
7	Saltwater Lagoon Solar Power Plant	Quang Ngai	40
8	Loc Thanh 1-1	Binh Phuoc	40
9	Hai Ly Binh Phuoc 1 Solar Power Plant	Binh Phuoc	40
10	Binh River	Binh Thuan	200
11	Tan Xuan Solar Power Plant	Binh Thuan	23.61
12	Easeup 1 Solar Power Plant	Dak Lak	40
13	Ia Tire 1 Solar Power Plant	Dak Lak	40
14	KN Tassels Srah	Dak Nong	312
15	Residential Knia	Dak Nong	144
16	Ea Tling	Dak Nong	76
17	Xuyen Ha	Dak Nong	104
18	Tri An KN Floating Solar Power Plant	Dong Nai	928
19	Tri An	Dong Nai	101
20	Phuoc Trung Solar Power Plant	Ninh Thuan	40
21	Phuoc Huu 2 Solar Power Plant	Ninh Thuan	184
22	Song Cau Green Solar Power Plant	Phu Yen	150
23	Khe Go Lake Solar Power Plant	Nghe An	200
24	Vuc Mau Lake Floating Solar Power	Nghe An	160
25	Tam Bo Solar Power Plant	Lam Dong	40
26	Phong Hoa	Hue	40
27	The rest of the Dau Tieng Project	Tay Ninh	1050
	Total capacity		**4.136.25**