

REPORT

ON THE IMPLEMENTATION PROGRESS OF POWER PROJECTS IN THE REVISED POWER DEVELOPMENT PLAN 7

I. UPDATE ON POWER SUPPLY AND DEMAND IN 2018

- The total yield of power generated and purchased in 2018 was 212.9 billion kWh, increasing by 10.36% compared to 2017.
- The total yield of commercial power in 2018 was 192.93 billion kWh, rising by 10.47% compared to 2017.
- The total installed capacity in 2018 was 48,563MW, including 17,031MW of hydropower (35.1%), 3,466MW of renewable energy (7.1%), 18,516MW of coal-fired thermal power (38.1%), 8,978MW of gas and oil power (18.5%), and 572MW of imported power (1.2%).
- Power supply in 2018 remained stable, adequate, and reliable for the local economy.

II. POWER CAPACITY AND STRUCTURE OF POWER SOURCES AS PER THE REVISED POWER DEVELOPMENT PLAN 7 (REVISED PDP7)

According to the revised PDP7, a total number of 116 power projects would be operationalized in the period of 2016-2030 (not including renewable energy sources on which the project has not had its name specified or not been planned), i.e. 43 hydropower, 57 thermal power, 11 renewable energy, 3 pumped storage hydropower, and 2 nuclear power projects.

1. The period until 2020

By 2020, the total capacity of power plants will have reached about 60,000MW, in which large hydropower and pumped storage hydropower account for about 30.1%, coal-fired thermal power and gas power make up about 57.6%, renewable power (small hydropower, wind power, solar power, and biomass energy) represents about 9.9%, and imported power forms about 2.4%.

Between 2016 and 2020, a total capacity of 21,651MW will be operationalized, in which the total capacity of thermal power projects is 13,845MW (63.95%), hydropower of 4,084MW (16.86%), and renewable energy of 3,722MW (17.19%).

2. The period until 2025

By 2025, the total capacity of power plants will have reached about 96,500MW, in which large hydropower and pumped storage hydropower account for about 21.1%, coal-fired thermal power and gas power make up about 64.9%, renewable energy (small hydropower, wind power, solar power, and biomass power) represents about 12.5%, and imported power forms about 1.5%.

Between 2021 and 2025, a total capacity of 38,010MW will be operationalized, in which the total capacity of thermal power projects is 29,365MW (77.3%), hydropower and pumped storage hydropower 2,355MW (6.2%), and renewable energy of 6,290MW (16.5%).

3. The period until 2030

By 2030, the total capacity of power plants will have reached about 129,500MW, in which large hydropower and pumped storage hydropower account for about 16.9%, coal-fired thermal power and gas power make up about 57.3%, renewable power (small hydropower, wind power, solar power, and biomass power) represents about 21%, and imported power forms about 1.2%.

Between 2026 and 2030, a total capacity of 36,192MW will be operationalized, in which the total capacity of thermal power projects is 14,350MW (39.6%), hydropower and pumped storage hydropower of 2,052MW (5.7%), renewable power of 15,190MW (42.0%), and nuclear power of 4,600MW (12.7%).

III. IMPLEMENTATION PROGRESS OF POWER PROJECTS IN THE REVISED PDP7

1. Status of load and power supply

- According to the revised PDP7, the yield of commercial power by 2020 is forecasted to be 235 billion kWh as in the base scenario and 245 billion kWh as in the high scenario with the average annual growth rate of commercial power of 10.34% and 11.26% respectively in the period of 2016-2020.
- In fact, EVN has ensured adequate power supply for socio-economic development and domestic use in the past years at the annual average growth of commercial power in the period of 2016-2018 of 10.3%. In 2017, the actual load growth was about 1.5 billion kWh less than the forecasted in the base scenario of the revised PDP7. According to the updated calculation, a decrease of the load growth (base scenario) is expected to happen, with reduction of 3-4 billion kWh between 2018 and 2020, of about 5.5 billion kWh in 2025, and nearly 9 billion kWh in 2030 compared to the original forecast in the revised PDP7.
- Between 2019 and 2020, about 6,900MW is expected to be operationalized, in which coal-fired thermal power plants account for 2,488MW, hydropower plants (above 30MW) form 592MW, and renewable energy projects make up about 3,800MW (solar power about 2,500MW and wind power 350MW). The power demand nationwide is likely to be met. However, it is important to mobilize oil-fired thermal generation of ~1.7 billion kWh in 2019 and 5.2 billion kWh in 2020. Should generating units perform unreliably or fuel (coal and gas) supply fall short, Vietnam may encounter power shortage in 2020.
- Between 2021 and 2025, despite maximization of oil-fired generation, the power network eventually would fail to meet the load demand and undergo power shortage in the South. The power shortage would increase to 10 billion kWh (2022) from 3.7 billion kWh (2021), peak at about 12 billion kWh (2023), and gradually reduce to 7 billion kWh in 2024 and 3.5 billion kWh in 2025.
- The total capacity of all power sources likely to be operationalized over the course of 15 years (2016-2030) is expected to reach about 80,500MW, around over 15,200MW less than the forecasted in the revised PDP7. Power shortage is primarily observed between 2018 and 2022 (with the total capacity of 17,000MW). Many power supply projects in this period,

mostly thermal power ones in the South, were postponed to the period of 2026-2030. Consequently, from keeping 20-30% as backup in the period of 2015-2016 and almost no backup in 2018-2019, the power network suffers from supply deficiency in the period of 2021-2025.

- The total capacity of power sources operationalized in the period of 2021-2030 is expected to be about 64,200MW, which is 10,000MW less than that provided in the revised PDP7 (72,202MW).
- The main explanation for power shortage in the South escalating compared to previous calculations is that (i) the progress of the Lot B and Blue Whale gas projects is delayed by 9 months to one year, (ii) the progress of the Kien Giang 1&2 thermal power projects are delayed beyond 2030, failing to be completed in the period of 2021-2025 as scheduled, and (iii) the O Mon III project is delayed until 2025. If the Long Phu 1 thermal power project fails to be completed in 2023 as planned, power shortage in the South would be exacerbated between 2024 and 2025.

Expected capacity of power sources completed between 2019 and 2030

Year/Period	Total capacity operationalized (MW)		Difference (MW)
	As per the revised PDP7	Post review	
2019	6,230	3,650	-2,580
2020	4,571	3,230	-1,341
Period of 2021-2025	38,010	30,485	-7,525
2021	9,435	4,520	-4,915
2022	10,290	3,890	-6,400
2023	7,185	6,635	-550
2024	5,250	8,170	2,920
2025	5,850	7,270	1,420
Period of 2025-2030	36,192	34,382	-1,810
2026	6,482	7,792	1,310
2027	5,660	6,270	610
2028	7,890	8,340	450
2029	8,950	7,310	-1,640
2030	7,210	4,670	-2,540

2. Investment in power supply development

According to the revised PDP7, the total capacity of power sources operationalized is expected to be 21,650MW in the period of 2016-2020 across the network, in which 7,185MW (33.2%) is invested in by EVN and 14,465MW (66.8%) is invested in by other businesses.

There are three types of investment in power supply projects: state-owned enterprises (EVN, PVN, and TKV) as project owners, BOT, and IPP. Reviewing the progress of 62 projects with a capacity of more than 200MW found that 15 projects are on the right track while the

remaining 47 either are behind schedule or have not had their progress benchmarked against the revised PDP7, elaborated as follows:

2.1. Projects undertaken by Vietnam Electricity (EVN)

- There are 23 projects undertaken by EVN providing a total capacity of 14,809MW, including 12 projects in the period of 2016-2020 and 11 projects in the period of 2021-2030. 10 projects are on track while 13 are behind schedule or delayed:
 - + Completed construction and operationalized: 8 projects. Seven projects were on schedule and one was delayed (the Bung River 2 hydropower project was delayed by 1.5 years).
 - + Under construction: 4 projects. Three projects are expected to be on track and one is delayed (the Da Nhim hydropower expansion project is delayed by 6 months).
 - + Undertaking construction investment procedures: 11 projects. Two generation projects are expected to be on track; seven projects delayed (four projects have to be delayed in order to match the progress of the Lot B and Blue Whale gas projects and three projects would be delayed by 2-3 years); and two unidentified-progress projects (location planning for the Tan Phuoc I and II thermal power plants is being submitted to the National Assembly).
- Between 2016 and 2018 (3 years), EVN completed 8 power supply projects with a total capacity of 4,540MW, in which 4,440MW was generated between 2016 and 2017, 1,145MW (or 35%) more than the assigned volume in two years. In 2018 alone, two generating units of Bung River 2 hydropower plant were operationalized (100MW).
 - + In 2019, EVN expects to complete 4 power supply projects with a total capacity of 1,560MW (Duyen Hai 3 thermal power expansion, Vinh Tan 4 thermal power expansion, Da Nhim hydropower expansion, and Thuong Kon Tum hydropower).

(See Annex attached)

2.2. Projects undertaken by Vietnam Oil and Gas Group (PVN)

PVN is assigned as the project owner of 8 key power supply projects with a total capacity of 11,400MW, including 3 in the period of 2016-2020 and 5 in the period of 2021-2025. So far, all 8 projects have encountered challenges and are unlikely to be completed on schedule as planned in the revised PDP7:

- Under construction: 3 projects. All 3 are delayed by 2-3 years.
- Undertaking construction investment procedures: 4 projects. All are expected to be delayed by 2.5-3.5 years compared to what is required by the revised PDP7.
- One project has been requested to be transferred to another project owner (Long Phu III).

(See Annex attached)

2.3. Projects undertaken by Vietnam National Coal - Mineral Industries Holding Corporation Limited (TKV)

TKV has undertaken 4 projects with a total capacity of 2,950MW, including 2 in the period of 2016-2020 and 2 in the period of 2021-2030. All 4 projects are now delayed by at least 2 years:

- Undertaking investment preparation procedures: 3 projects, in which one has not found a project location and one is in the middle of changing its project owner.

- Not yet undertaking investment preparation procedures: 1 project (Hai Phong III).

(See Annex attached)

2.4. BOT projects

There are 15 BOT projects, including 1 in the period of 2016-2020 and 14 in the period of 2021-2030. Three projects are on track (particularly Vinh Tan 1 started power generation 6 months earlier than planned) and 12 are either delayed or unidentified due to certain obstacles in negotiation.

(See Annex attached)

2.5. IPP projects

There are 8 IPP projects with a total capacity of 7,390MW, in which one was completed and operationalized on schedule (Thang Long thermal power), two are likely to be on track in the period of 2016-2020, and the remaining are either delayed or even unidentified when they are going to be completed (Hai Ha co-generation and Quynh Lap 2).

(See Annex attached)

2.6. Projects that have not been assigned to any project owner: 5 projects. All are conducted in the period of 2021-2030, in which one has been removed from the Plan (Bac Lieu thermal power) and 4 unidentified (but likely to be delayed due to the absence of project owners).

(See Annex attached)

2.7. Development of renewable energy

As far as renewable energy is concerned, the Prime Minister and MOIT have so far approved the supplementation of 130 solar power projects with a total capacity of about 10,600MWp (more than 8,500MW) and wind power projects with a total capacity of about 2,000MW into the plan. What wind power and solar power projects have in common is that they primarily are concentrated where there is a low on-site load demand. Therefore, where utility-scale wind power and solar power projects have been supplemented into the plan, most of their generation capacity is to be collected, grid-connected, and transmitted to areas of large load demand. However, the 110-500kV grid infrastructures in these areas have not managed to meet the demand for transmitting such capacity from new projects supplemented into the plan despite recent upgrades.

Based on EVN's calculation, MOIT submitted a number of projects on 220-500kV transmission lines in Binh Thuan and Ninh Thuan to the Prime Minister and got his approval for incorporating such projects into the Plan to help relieve the capacity of renewable power projects. EVN is doing further research in order to propose new projects.

3. Power Grids

In the period of 2016-2018, EVN completed 117 projects of 500-220kV power grids.

EVN is now deploying power grid projects in accordance with the approved Plan in order to enhance the performance of transmission lines and meet subnational power demand, including the Vung Ang – Quang Trach – Doc Soi – Pleiku 2 500kV transmission line expected to be operationalized by Quarter II/2020 to foster power supply to the South.

EVN has also directed its member units to accelerate grid projects serving power supply projects, especially solar power projects recently supplemented into the plan as an additional national power supply.

In 2018, EVN began the construction of 40 works and completed 52 500-220kV grid projects, in which key projects have been operationalized, e.g. Lai Chau 500kV substation; capacity improvement of 500kV substations in Son La and Tan Dinh and 220kV substations in Phu Tho, Nong Cong, Dak Nong, Phong Dien, etc.; capacity upgradation of many other 220kV substations; and load improvement of 220kV transmission lines of Ha Dong - Phu Ly, Nho Quan - Thanh Hoa, Cao Lanh - Thot Not, Long An - Cai Lay, and so on. Key projects have been begun construction, namely Thuong Tin - Western Hanoi 500kV transmission line, Nho Quan - Phu Ly - Thuong Tin 500/220kV transmission line, Chon Thanh 500kV substation, 500kV triple-circuit transmission lines, etc.

Hereunder is the specific progress of key grid projects:

- 500kV triple-circuit transmission line: The Central Vietnam Power Projects Management Board (NPT/AMT) have selected contractors and signed construction and installation contracts for all three projects (Quang Trach - Doc Soi, Quang Trach - Vung Ang, and Doc Soi - Pleiku 2). The project began construction in December 18, 2018.
- Synchronous grid of Vinh Tan Power Center: (i) 500kV transmission line from Vinh Tan, Song May to Tan Uyen: Power poles have been erected and the project is working towards completing cable installation in December 2018. However, it could not be operationalized because houses and structures present in the corridor; (ii) 220kV transmission line of Song May - Tan Uyen: in the process of completing the documentation enabling forced construction.
- 220 kV double-circuit transmission line from Dong Hoi, Dong Ha to Hue: 474/518 (~92%) poles have been erected and 63.1/185.9km (~34%) of cable have been installed.
- 220kV transmission line of Binh Long - Tay Ninh: casting of foundation for 168/223 locations; pole erection of 118/223 locations; 26/223 locations have not had its site handed over.

IV. Factors influencing power supply in the period until 2030

1. Delayed operationalization of power supply projects, especially thermal power ones in the South.

- The Thai Binh II, Long Phu 1 and Hau River 1 thermal power projects have been delayed by two years. If their problems are not completely resolved, they are likely to be delayed further.
- BOT power supply projects: There is little likelihood that the signed BOT projects are going to be delayed. However, there is a potential risk of delay among negotiating BOT projects (e.g. Son My 1, Hau River 2, Long Phu 2, Nam Dinh 1, Quang Tri 1, etc.).
- A number of large-scale power supply projects have not been assigned to any project owner (e.g. Long Phu 3, Quynh Lap 2, etc.) so they are unlikely to be completed by 2030.

2. Potential risk in the adequacy of fuel supply for power generation

- Coal supply: TKV is reported to have ceased the project on the coal trans-shipment port in the Mekong Delta due to the failure to negotiate a project location and to find any solution to going forward. The Long Phu 1 and Hau River 1 thermal power plants are expected to supply coal via Go Da port by means of trans-shipment. An option for coal transportation has not been specified for the Long Phu 2 and Hau River 2 thermal power plants. The coal supply has not met the demand of power plants in terms of quantity and type of coal. Even though the yield of coal-fired thermal power was lower than the planned in 2018, the last months of 2018 experienced coal shortage.
- Gas supply: Gas supply to the Phu My thermal power cluster in the South Eastern Region is likely to decrease after 2020 and experience from an annual shortage of about 2 - 3 billion m³ between 2023 and 2024 and an annual shortage of over 10 billion m³ in 2030. Therefore, if the Son My port is not operationalized by 2023, the Phu My - Ba Ria thermal power cluster will suffer from a gas supply shortage equivalent to about 13 billion kWh in 2023. There is also a shortage of gas supply (0.5 - 1 billion m³) to the Ca Mau thermal power cluster in the South Western Region from 2019. PVN is now negotiating with a Malaysian counterpart to purchase additional gas supply.
- The O Mon thermal power cluster is facing an issue of high gas price leading to high electricity tariff. These are crucial power supply projects to the South until 2025. The use of gas or LNG in power generation is inevitable after 2023. It is important to find a solution to improve the efficiency of O Mon 3 and 4 thermal power plants towards lowering electricity price.
- LNG-fueled thermal power plants such as Nhon Trach 3 and 4: here is a gas supply shortage in the South Eastern, which must be compensated by LNG after 2022. Thus, it is necessary to put Thi Vai and Son My LNG ports into use in 2023 to supply additional gas to the Phu My thermal power cluster and to Nhon Trach 3 and 4 thermal power plants. An LNG port in Cai Mep is under construction with a capacity of about 2-3 million tons/year. If the Thi Vai and Son My ports are delayed, it is possible to consider Cai Mep port an alternative to supply additional gas to the South Eastern or to consider the construction of a new LNG fueled power plants in the area.

3. Other factors influencing the operation and power supply

- The 500kV triple-circuit transmission line (Vung Ang – Quang Trach – Doc Soi – Pleiku 2 line) aimed to strengthen the North - South transmission performance has been delayed by almost one year. Failure to complete this transmission line by early 2020 would pose a threat of power shortage to the Southern area.
- As there is also no backup across the network between 2021 and 2025, any unreliable performance of thermal power generating units or coal supply shortage will also jeopardize the power supply.

V. KEY DIFFICULTIES AND BOTTLENECKS

1. Planning

- Even though the Law on Planning took effect on January 01, 2019, no by-law documents have been promulgated to provide specific guidance on how to implement the Law.

- Inconsistency between the plan of power development and the plans of other infrastructures (i.e. traffic planning, land use planning, and urban planning) leads to difficulties in positioning substations and determining alignment of transmission lines and to planning overlapping. Certain projects even had to have its plan revised multiple times.
- During project implementation, a number of projects have had their plans supplemented or revised because of load demand and the need for relieving the capacity of hydropower plants. Moreover, the difference between the revised PDP7 and subnational PDPs in terms of timeline and scale requires reporting to the Prime Minister for approval of adjustment. It usually takes time for MOIT and competent levels of authorities to submit the revised and supplemented plans to the Prime Minister for approval, which affects the progress of projects.

2. Site clearance and compensation

- Most power projects have struggled with site clearance that makes serious impacts on the construction progress, namely Quang Trach Power Center, Vinh Tan 4 thermal power expansion, and power grid projects, especially transmission lines. This is the main reason for delayed timeline. Certain transmission line projects have even failed to get alignment agreement because the lines cross numerous localities.
- The location planning of certain projects such as Long An I and II thermal power projects have failed to be approved by provincial governments as a result from disagreement with the provincial government on coal-fired thermal power development policy even though the Prime Minister has approved these projects as part of the national power development plan.
- The 2013 Land Law had many changes so stakeholders have been waiting for the promulgation of Decrees, Circulars and Decisions guiding the steps, procedures and policies from provincial People's Committees. District compensation councils have struggled to apply the Law in practice due to multiple policy gaps. Land valuation takes time due to the wait for the promulgation of implementation guidelines.
- That the transmission lines pass many localities and many locations adversely affects the progress and timeline of site survey and land valuation among certain projects (e.g. 500kV transmission line from Vinh Tan, Song May to Tan Uyen). Moreover, most households have refused the compensation and complained that the compensation price and monetary support are too low. Several projects have clashed with other local constructions, etc.

3. Financing arrangements

Domestic corporations and project owners have struggled to finance projects since the Government put the loan guarantee policy on hold. There is only a limited source of ODA and concession loans invested in power projects. Sometimes though loan commitments of international banks and financial institutions had been obtained, state management authorities disapproved. It is very difficult to mobilize local sources of finance because most local banks have exceeded their credit limits to the project owners and relevant stakeholders.

4. Construction investment procedures

- A number of prevailing provisions on construction investment are inconsistent and overlapping, presenting challenges to some extent and leading to prolonged investment preparation (e.g. Hoa Binh hydropower expansion, Ialy expansion, 500kV/220kV transmission lines, etc.). Despite having investments executed, certain projects have had to re-submit their investment policy for approval as they are governed by newly promulgated legal documents (e.g. O Mon III and IV thermal power projects, etc.).
- The steps and procedures of dossier submission, steps and procedures of issuing the Prime Minister's Decision on investment policies stipulated by the Law on Investment, tasks of the investment registration agency and MPI's project dossier appraisal were not properly implemented in practice. There was not a consistent appraisal focal point, which made it time-consuming for businesses to submit investment policies for approval (e.g. Hoa Binh hydropower plant expansion and Ialy hydropower plant expansion). The verification and approval of investment projects, technical designs and total budget estimates were prolonged (e.g. the 500kV triple-circuit transmission line project). As new regulations came into force, investment preparation, construction preparation and bidding took time since it was required to submit dossiers to multiple levels of authority for verification, appraisal and approval, which affected the timeline of the projects.
- The negotiation of BOT contracts and investment license issuance took time due to the complex involvement of many sectoral ministries. Obstacles were mainly incentive policies, foreign exchange, early termination of contract, etc. It usually took a long time for other state management authorities than MOIT to review and provide comments. MOIT was not able to take control of the contract negotiation and signing. BOT plants such as Vung Ang 2, Vinh Tan 3, Long Phu 2, Hau River 2, etc. are facing such problem.

5. Capacity of Project owners

The financial, technical and human resources of certain project owners prove inadequate. Some are even inexperienced in power plant investment and operation. Going forward, existing project owners may need to transfer part of the investment capital to other investors. This process takes time as it is required to submit proposals to competent levels of authorities for approval, leading to potential risk of delay. Some instances are Nam Dinh 1, Vinh Tan 3, and Son My 1.

Certain EPC contractors have limited financial and technical capacity as well as experience in project implementation (e.g. Thai Binh 2 and Long Phu 1), causing the projects to be delayed.

6. Other difficulties and bottlenecks

- Projects affecting natural forests and protection forests must comply with the procedure stipulated by Directive 13 of the Secretariat and Notice 191 of the Prime Minister, so many projects suffered from delayed EIA approval or failure in construction (e.g. 500kV triple-circuit transmission line, Nghia Lo 220kV substation, Nghia Lo - Viet Tri 220kV transmission line, and Thuong Kon Tum - Quang Ngai 220kV triple-circuit transmission line). In accordance with the request of MONRE, the Project owner (EVNNPT) is the agency to submit EIA reports (previously the Board A was the agency to directly submit EIA reports). That the procedure involves multiple levels of authority makes it difficult to get control of the EIA submission and approval.

- The transmission of renewable energy projects' capacity in high potential areas (i.e. Ninh Thuan, Binh Thuan, Khanh Hoa, etc.) is being faced with challenges in the coming years because transmission grid projects in the revised PDP7 and 110 kV grid projects in subnational PDPs have not been taken into account the feed-in capacity of renewable energy projects newly supplemented. Most decisions approving the supplementation of renewable energy projects into the plan only included additional grid projects serving the connection to individual projects and made no mention of the supplementation to grid projects as a whole in a consistent manner. Therefore, it is impossible to meet the demand for feeding in the capacity of renewable energy projects.
- The 2017 Law on Planning, taking force on January 01, 2019, will make a significant impact on the planning, appraisal and supplementation of power projects. Should there be no specific and feasible guidelines, the execution progress of power projects will be prolonged, affecting power supply to national socio-economic development.
- Since 2016, as directed by the Prime Minister, MOIT has developed an exclusive mechanism to ensure the investment and construction progress of power projects under the PDP ('exclusive mechanism' for short). However, after many revisions, the exclusive mechanism has not been promulgated; or if it is refined in a way that eliminates exclusive provisions, the mechanism will make little difference.
- Local leaders do not support the idea of coal-fired thermal power development in their localities although these projects are listed in the revised PDP7. Such conflict has caused delay in project implementation, negative public responses and consequences on power supply for socio-economic development, especially in the South

VI. SOLUTIONS TO POWER SUPPLY

- To accelerate the exploitation of smaller mines in the South Western as an additional source for the Ca Mau thermal power cluster between 2019 and 2021 when the Lot B gas project has not been operationalized, prioritize gas supply for power generation in the period of 2018-2021, and develop and select the most rational option for LNG importation in the South Western when the Kien Giang gas-fired power project begins construction. Concurrently, to consider the supplementation of LNG-fueled power plants proposed by several provincial People's Committees and investors, i.e. Long Son (Ba Ria-Vung Tau) and Ca Na (Ninh Thuan) as an alternative to the power supply from delayed or at-risk ones (several coal-fired thermal power plants).
- To put appropriate mechanisms (gas and power offtake) in place to accelerate the progress of Nhon Trach III and IV LNG-fueled power plants and Thi Vai port, enabling them to be operationalized in 2022 and 2023. To push up the progress of Son My gas-fired power plants; To consider the use of the LNG port in Cai Mep (under construction with a capacity of about 2 million tons/year) as a supplementary source of gas supply to the South Eastern in case of any delay in the imported LNG port, and construction of a new power plant in this area if the gas supply is adequate, reliable and reasonably priced.
- To urge and keep the Blue Whale gas project and the thermal power cluster in the Central region on track to be operationalized in 2023 and 2024; To keep close track of the progress of the series of projects; To facilitate the tasks of gas-fired power plants using gas from the Blue Whale basin; To urge and put mechanisms in place to ensure the progress of bringing

the Lot B's gas onshore as a reliable supply to O Mon II and IV gas-fired thermal power plants expected to be operationalized in 2023.

- To explore and do calculations on the options of purchasing power from Laos and China as a supplementary capacity to the local power network, providing a secure and reliable power supply to the economy; To allow EVN to negotiate with CSG to increase power importation from China via the existing 220kV transmission lines and coordinate with CSG to invest in a back-to-back network to improve power purchase from 2022 without the need for grid segregation; To study the feasibility of buying electricity through the 500kV lines system to enable power purchase from 2025 and approve the policy of further importing power from China in the upcoming time; And to assign EVN to negotiate and reach a consensus with CSG on the importation plan, commercial terms, and tariffs phase by phase.
- Solutions to control load demand:
 - + To improve power conservation and actively implement energy auditing programs and so on, especially in the South.
 - + To encourage the development of rooftop solar power projects, especially in the South, to relieve the pressure on power supply.
 - + To direct subnational governments to promote power conservation in production and consumption.
- Solutions to meet the demand for power supply and feed in the capacity of power sources:
 - + To approve the supplementation of solar power projects submitted into the plan, in order to enable their project owners to roll out the projects on schedule.
 - + To keep developing and promulgating new mechanisms in support of developing renewable energies (wind, solar, and biomass); To put simple, easy and attractive mechanisms and procedures in place to purchase power from neighboring countries; To develop a reasonable FIT mechanism that is attractive enough for investors, especially domestic ones, to make investment in power supply development in the long run.
 - + To enable project owners of solar power projects in particular and renewable energy projects in general to keep their projects on track as proposed; To allow the supplementation of grid expansion projects into the plan to feed in the capacity of renewable energy (e.g. accelerating the progress of some certain 220kV substations, upgrading the capacity of the Vinh Tan 500kV substation, constructing new Thuan Nam 500kV substation and 500kV transmission line connected to Vinh Tan as well as to the South, etc.).
- MPI should after having done thorough research quickly submit the Decree guiding the Law on Planning to the Prime Minister which introduces specific and feasible provisions in order to timely adjust and supplement power supply and grid expansion projects into the plan to secure adequate power supply for national and subnational socio-economic development.
- To select capable investors and EPC contractors, and to strictly revoke the projects or replace them with capable contractors if they fail to prove their capacity.
- The Commission for the Management of State Capital at Enterprises (CMSC) directs and urges project owners and EPC contractors within their powers to handle arising problems on capital, EPC contract, total capital expenditure, project efficiency and progress...; and

works with MOIT to direct and urge project owners and local governments to solve problems on site clearance and compensation once and for all./.

Recipients:

- Minister of MoIT, Vice Chairman of National Steering Committee for Power Development (NSCPD) for report;
- MOF, MPI;
- CMSC;
- EVN, PVN; TKV;
- Archive: Office file, Electricity Division
(3)

P.P. MINISTER

VICE MINISTER

Hoang Quoc Vuong

(signed and sealed)

Unofficial GZ translation - for reference only

ANNEX 1

Implementation progress of a number of key projects in the revised PDP7

No.	Project	Capacity (MW)	Project owner	Timeline as per the revised PDP7	Review	
					Review of progress	Compared to the revised PDP7
I	Projects of EVN					
1	Huoi Quang #2 hydropower plant	260	EVN	2016	2016	Operationalized On track
2	Lai Chau #2, 3 hydropower plants	2x400	EVN	2016	2016	Operationalized On track
3	Trung Son hydropower plant	4x65	EVN	2016-2017	2017	Unit 1, 2 delayed by 3 months; Unit 3, 4 On track
4	Duyen Hai III thermal power plant	2x622	EVN	2016-2017	2016	Operationalized 6 months earlier
5	Thai Binh I thermal power plant	2x300	EVN	2017	2017	Operationalized On track
6	Vinh Tan IV thermal power plant	2x600	EVN	2018	2017-2018	Operationalized 3 months earlier
7	Thac Mo hydropower plant expansion	75	EVN	2017	2017	Operationalized On track
8	Bung River 2 hydropower plant	2 x 50	EVN	2016	2018	Operationalized, delayed by 1,5 years
9	Duyen Hai III thermal power plant expansion	660	EVN	2019	2019	On track
10	Da Nhim hydropower plant expansion	80	EVN	2018	2019	Delayed by 6 months. Generated 40MW
11	Thuong Kon Tum hydropower plant	2 x 110	EVN	2019	2019	On track
12	Vinh Tan 4 thermal power plant expansion	600	EVN	2019	2019	On track
13	O Mon III combined cycle power plant	1x750	EVN (ODA)	2020	2025	Delayed by 5 years (matching the progress of Lot B

No.	Project	Capacity (MW)	Project owner	Timeline as per the revised PDP7	Review	
					Review of progress	Compared to the revised PDP7
14	O Mon IV combined cycle power plant	1x750	EVN	2021	2023	Delayed by 3 years (matching the progress of Lot B)
15	Tan Phuoc I thermal power plant	2x600	EVN	2027-2028		Submitted the location plan of the power center
16	Tan Phuoc II thermal power plant	2x600	EVN	2028-2029		Submitted the location plan of the power center
17	Quang Trach I thermal power plant	2x600	EVN	2021-2022	2022 -2023	Delayed by 1 year (From PVN to EVN as project owner)
18	Quang Trach II thermal power plant	2x600	EVN	2028-2029	2026	EVN asked to be authorized to deploy quickly
19	Dung Quat I combined cycle power plant	750	EVN	2023	2024	Delayed by 1 year (matching CVX)
20	Dung Quat III combined cycle power plant	750	EVN	2026	2025	Likely to be on track (matching CVX)
21	Hoa Binh hydropower plant expansion	2x240	EVN	2021-2022	2023	Delayed by 2 years
22	Ialy hydropower plant expansion	2x180	EVN	2020	2023	Delayed by 3 years
23	Tri An hydropower plant expansion	200	EVN	2025	2025	On schedule
II	Projects of PVN					
1	Thai Binh II thermal power plant	2x600	PVN	2017-2018	2021	Delayed by 3 years and under risk of further delay
2	Long Phu I thermal power plant	2x600	PVN	2018-2019	2023	Delayed by up to 48 months or more due to US embargo
3	Hau River I thermal power plant	2x600	PVN	2019	2021	Delayed by 2 years
4	Long Phu 3 thermal power plant	3x600	PVN	2021-2022		PVN proposed to transfer to another project owner

No.	Project	Capacity (MW)	Project owner	Timeline as per the revised PDP7	Review	
					Review of progress	Compared to the revised PDP7
5	Nhon Trach 3 & 4 combined cycle power plant	2x750	PVN	2020-2021	2023-2024	Delayed by 3 years
6	Kien Giang 1&2 combined cycle power plant	2x750	PVN	2021-2022	After 2030	Struggling due to fuel shortage
7	Central Region 1,2 combined cycle power plant	2x750	PVN	2023-2024	2024-2025	Delayed by 1 year (matching CVX)
8	Son My II combined cycle power plant	3x750	PVN	2023-2025	2026-2028	Delayed by 3 years
III	Projects of TKV					
1	Na Duong 2 thermal power plant	110	TKV	2019	2022	Delayed by~ 3 years
2	Cam Pha 3 thermal power plant	2x220	TKV	2020	Unknown	No location yet
3	Quynh Lap 1 thermal power plant	2x600	TKV	2022-2023	2026	Delayed by ~ 4 years
4	Hai Phong III thermal power plant	2x600	TKV	2025-2026	2028-2029	Delayed by ~ 3 years
IV	BOT projects					
1	Vinh Tan I thermal power plant	2x600	BOT	2019	2018-2019	7 months earlier
2	Hai Duong thermal power plant	2x600	BOT	2020-2021	2021	Delayed by 1 year
3	Duyen Hai 2 thermal power plant	2x600	BOT	2021	2021-2022	Delayed by 1 year
4	Nam Dinh 1 thermal power plant	2x600	BOT	2021-2022	2024-2025	Delayed by 3 years
5	Nghi Son 2 thermal power plant	2x600	BOT	2021-2022	2022	Delayed by ~ 1 year
6	Vung Ang 2 thermal power plant	2x600	BOT	2021-2022	2023-2024	Delayed by ~ 2 years

No.	Project	Capacity (MW)	Project owner	Timeline as per the revised PDP7	Review	
					Review of progress	Compared to the revised PDP7
7	Hau River 2 thermal power plant	2x1000	BOT	2021-2022	2024	Delayed by ~ 3 years
8	Long Phu II thermal power plant	2x660	BOT	2021-2022	2029-2030	Unknown (likely to be delayed by 8 years)
9	Vinh Tan III thermal power plant	3x660	BOT	2022-2023	2024-2025	Delayed by 2 years
10	Van Phong I thermal power plant	2x660	BOT	2022-2023	2023-2024	Delayed by 1 year
11	Quang Tri I thermal power plant	2x660	BOT	2023-2024	2026-2027	Delayed by 3 years
12	Dung Quat II combined cycle power plant	750	BOT	2024	2026	Unknown, likely to be delayed
13	Vung Ang III thermal power plant	2x600	BOT	2024-2025	After 2030	Unknown, likely to be delayed
14	Quynh Lap II thermal power plant	2x600	BOT	2026-2027	2027-2028	Unknown, likely to be delayed
15	Son My combined cycle power plant	3x750	BOT	2027-2028	2028-2029	Unknown, likely to be delayed
V	IPP projects					
1	Thang Long thermal power plant	2x300	IPP	2017-2018	2017-2018	On schedule, on its way to operationalization
2	Hai Ha 1- 4 thermal cogeneration power plant	2,100	IPP	2019-2030	See Annex 2	
3	Cong Thanh thermal power plant	1x600	IPP	2020	2024	Delayed by 4 years
4	An Khanh thermal power plant (Bac Giang)	1x650	IPP	2022-2023	2023	Delayed by 1 year
5	My Ly hydropower plant	250	IPP	2021	2024	Delayed by 3 years
6	Nam Mo hydropower plant	90	IPP	2021	2026	Delayed by 5 years

No.	Project	Capacity (MW)	Project owner	Timeline as per the revised PDP7	Review	
					Review of progress	Compared to the revised PDP7
VI	Projects that is not assigned to any project owner					
1	Long An I thermal power	2x600		2024-2025		Likely to be delayed (location plan not yet approved)
2	Long An II thermal power plant	2x800		2026-2027		Unknown (location plan not yet approved))
3	O Mon II combined cycle power plant	750		2026		Unknown
4	Quang Ninh III thermal power plant	2x600		2029-2030		Unknown

Unofficial GZ translation - for reference only