



Executive Summary

**Roadmap for the Commission for Management of State Capital
toward
Net-Zero Emission in Energy State-Owned Enterprises in Vietnam**

November 2022

This summary is a part of the second deliverable Technical and Financial report that has been prepared for and submitted to ETP managed by the United Nations Office for Project Services (UNOPS), as part of the consultancy services titled: “ROADMAP FOR THE COMMISSION FOR MANAGEMENT OF STATE CAPITAL TOWARD NET-ZERO EMISSION IN ENERGY STATE-OWNED ENTERPRISES IN VIETNAM”.

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Last edited: November 2022

Status: Final version

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Prime Minister Pham Minh Chinh's announcement at COP26 in November 2021 on a Net-zero emission (NZE) target by 2050 has concretized Vietnam's commitment to climate protection. Being an emerging economy with greenhouse gas (GHG) emissions nearly doubled from 264 MtCO₂ in 2010¹ to 513 MtCO₂eq in 2020², strong actions are required in all sectors to achieve such an ambitious goal. Energy is a key sector to focus on since it accounts for the largest part of GHG emissions in 2020, with 347.5 MtCO₂ (68% of total emissions), of which, the power sector emitted nearly 215 MtCO₂e (42% of total emissions)². Since the power sector is still fossil fuel dependent (coal accounted for 32.5% of installed capacity and 46% of generation, while oil and gas accounted for 11.6% and 11%, respectively), it is crucial for Vietnam to speed up decarbonizing the power sector toward the NZE target.

The three State-owned Enterprises – SOEs in Vietnam (Electricity of Vietnam - EVN, PetroVietnam - PVN and Vietnam National Coal - Mineral Industries Holding Corporation Limited - VINACOMIN) are playing a vital role in ensuring national energy security. They also own the majority of the coal power capacity (67% of ~25 GW of existing coal power installed capacity in 2021). Therefore, they are the key factors participating in the energy transition toward Vietnam's Net-zero target.

The Commission for State Capital Management (CMSC), in charge of managing the Vietnam government's capital in these back-bone SOEs, is cooperating with the Southeast Asian Energy Transition Partnership (ETP) to support and strengthen energy SOEs towards coal transition, better governance, profitable and sustainable business while facilitating a transparent and sustainable development of energy market and renewable energy, with the initial assignment on developing a "roadmap for the Commission for Management of State Capital toward net-zero emission in energy State-owned Enterprises in Vietnam" to:

- Study and propose a suitable Roadmap for CMSC supporting SOEs in coal-fired power plants transition to meet Net-Zero emission target while ensuring the energy security of the power supply;
- Identify the legal, financial and social conditions for SOEs to realise the roadmap;
- Evaluate the impact of roadmap implementation, including the associated costs to realise the roadmap; and
- Propose recommendations to CMSC and SOEs (as well as key stakeholders in the decision-making process) to accelerate the roadmap implementation.

¹ MONRE 2020. Vietnam Third biennial updated report to the United Nations Framework Convention on Climate Change

² MONRE 2022. Technical report for Developing National Strategy for Climate Change

In this report, the Consultants (Vietnam Initiative for Energy Transition - VIETSE, Economica, NHQuang&Associate and Carbon Trust) provide the initial findings on the assessment of the technical, financial and legal aspects of the existing coal-fired power plants (CFPPs) in Vietnam under the three SOEs.

The analyses within this report are intended to be based on the outcomes of the mission conducted by the Consultants from 13 September to 11 October 2022. The Consultants had meetings with EVN, PVN and VINACOMIN, as well as 06 selected CFPPs of the three SOEs, including site visits to:

- introduce the assignment;
- discussion on the methodology and inputs for the study, which the Consultants expected to be acquired from the SOEs and CFPPs for the analyses; the data request template has been sent to the SOEs and CFPPs prior to the meetings;
- discussion on the current technical/financial/legal circumstances of the CFPPs;
- energy transition strategy of the SOEs and CFPPs;
- difficulties and needs for technical/financial assistance to implement an energy transition strategy.

The Consultants have received detailed data from VINACOMIN Power, a company with 100% capital owned by VINACOMIN, that owns or has the majority share of 6 CFPPs. However, by the time this report is written, the Consultants have not yet received the data for CFPPs of EVN and PVN. To fill in the gaps, the Consultants have been collecting data from other sources, for example, the published financial reports, auditor's reports of the joint stock companies which are made available to the public.

The main findings from the technical, financial and legal analysis of the existing CFPPs under SOEs management are summarised below:

- **Technical**
 - The coal fleet of Vietnam is quite young, with 47 coal units (63%) being built within the last 10 years. However, most of Vietnam's CFPPs (28/35) is deploying the Subcritical technology because Vietnamese anthracite coal has low volatile matters, is difficult to ignite and is not easy to use in higher efficiency boilers that have Supercritical technology (7 plants). Some plants have high heat rates than average, exceeding 11,000 kJ/kWh (meaning they consume more coal to produce the same unit of electricity and emit more GHG).
 - Flexibility is crucial in assessing the operation capability of power plants in the system, especially when the share of renewables is increasing. Plants with high flexibility will have a higher ramp-up/ramp-down rate and lower startup time and minimum load. A review of the flexibility parameters from several CFPPs shows that there is significant room for improvement in their flexible operation ability.

- With the increasing capacity of renewable energy in the system, CFPPs have slightly changed their operating regime from peaking the power generation during daytime to night time. Daily increases and decreases in generation capacity impact the heat rate and equipment lifetime. However, the peak generation at night time also provides a positive effect on the plants' efficiency as the cooling water temperature is lower than in day time.
- With the domestic coal production for power generation peaking and not sufficient for all CFPPs to run, the share of imported coal in total coal consumption increases, exposing the CFPPs that use imported coal or a mixture of domestic/imported coal to the price of the international coal market. The impact of the current global energy crisis leading to off-the-chart prices and supply shortage has put significant pressure on CFPPs operation and financial situation.
- The existing CFPPs have been invested in air pollutants control measures (Electrostatics Precipitator, DeNO_x and DeSO_x) and monitoring systems to send data to provincial Departments of Natural Resources and Environment. So far, they have met the national standards. However, many of the CFPPs are located in cities that are being upgraded in their urban categories, hence they will face stricter regulations. That will require additional investments, which (according to the plant owners) is not yet a mechanism for them to recover these investments through electricity selling as they are not able to pass the cost to the electricity selling price.
- Currently, coal-fired power plants in Vietnam do not apply CO₂ recovery technologies because of the low readiness of these technologies in Vietnam. These technologies in the world are currently in the research, development, and testing stage with very high investment costs, so they have not been considered for application in the next ten years. There is not yet a policy mandating the plants to deploy carbon removal technologies and the carbon market will not operate before 2028.

- **Finance**

- Financially, EVN, VINACONMIN and PVN (SOEs) own CFPPs in one of the following three manners: (i) owning and managing CFPPs in a direct manner; (ii) owning and managing CFPPs through a company owned 100% by the SOE; and (iii) owning and managing CFPPs through a company owned partially by the SOE. As such, the SOE's decision on the investment to implement energy transition projects are different from one case to another.
- Unlike EVN, VINACOMIN and PVN have different sources of income other than from power generation. In 2021, the total revenue of EVN was billion 426,000 VND, earning the enterprise a gross profit of VND 38,000 billion. The lion share of the revenue is from power-related business. Meanwhile, VINACONMIN had a revenue of VND 113,173 billion and with a profit of 5,288 billion. Of the revenue, VND 73,508 billion are from coal exploitation, VND 17,496 billion from mining. Power generation (mostly coal-fired) account for 11% of the revenue. In the case of PVN, the enterprise generated a total revenue of 620,000 billion in 2021 and

a before tax profit of VND 45,000 billion. Of the total revenue of PVN, only VND 25,175 billion are from power generation (mostly by PVPower).

- Though making profit in 2021, the financial health of the three SOEs are not stable. E.g. the profit of Vinacomin fluctuated widely between 2019-2021 with many of its subsidiary companies losing money.
- The importance of CFPPs to the business strategy and financial health of three SOEs. While the business strategy and financial health of EVN are much more dependent on CFPPs, it is less important as in the case of Vinacomin and PVN.
- All the three SOEs were making profit in 2021. CFPPs under the three SOEs were making profit as well as they were all generating power under stable sale contracts.
- The three SOEs are also heavily indebted. For example, total debt (loan and lease liability) of EVN reached VND 351,000 billion in 2021. While total debt of PVN reached more than VND 90,000 billion, and Vinacomin VND 47,070 billion.
- Financially, the three SOEs can make contribution to the phase out or phase-down of CFPPs. However, they are unable to afford the full costs for the phase out or phase down of CFPPs. The funds available by the three SOEs are not available for such plans as early retirement of CFPPs. Besides, given the indebtedness of the three SOEs, borrowing to finance the early retirement of CFPPs under the three SOEs do not seem to be the feasible solutions for them.

- **Legal assessment**

- *Ownership*: The CFPPs are under different types of ownership structures in which the SOEs are involved. Corresponding to each CFPPs ownership structure, SOEs will directly or indirectly (through their subsidiaries/affiliates) hold, in whole or in part, the decision-making power on phasing out/phasing down the CFPPs. Among the CFPPs, there are 12 CFPPs whose phase out/phase down are under the complete impact (100%) of the SOEs, either directly or through their subsidiaries/affiliates (EVN: 09 CFPPs; PVN: 03 CFPPs); 15 CFPPs are under joint stock companies and, depending on specific regulations of their charters, the decision-making authority will be delegated to different levels of internal management (GMS or the BOD) which affects the ability of SOEs to influence phasing out/phasing down decisions correspondingly; there is 01 CFPP where the SOEs (VINACOMIN) do not have control over the decision on phasing out/phasing down the CFPPs.
- *Commercial input and output contracts*: The Consultants focus on assessing two (02) main contracts during the CFPPs' operation which are Power Purchase Agreement - PPA (output contract) and the coal supply contract (input contract). The PPA is executed pursuant to the model PPA stipulated by 03 circulars of the Ministry of Industry and Trade, while the coal supply contract does not have by-law model contract like the PPA. SOEs and their subsidiaries may have to proceed (i) bidding procedures and/or (ii) internal approvals prior to signing the commercial contracts. Among other basic contractual terms and conditions i.e. term, price and breach remedies, the Consultants have found that both PPA and coal supply contract

stipulate some cases of early termination whose applicability needs to be carefully assessed because the phase-down/phase-out procedures potentially affect/interrupt the obligation performance of a party and lead to the possibility of early contract termination.

- *Loan/capital agreement:* Currently, most of CFPPs are supposed to be in good conditions in term of loan facilities. The interview results show that most of long-term loan contracts financing for CFPPs are paid off and terminated. Outstanding short- and medium-terms loans are all secured and being paid off before the plan to cut work volume/close CFPPs from 2030 to 2050.
- *Labor:* During the survey, the Consultants found out that CFPPs fully complied with employees' rights and interests in accordance with labor laws through the promulgation and publication of their internal labor regulations. The grassroots trade unions at all CFPPs are established and operated in accordance with the Vietnam Trade Union's Charter to ensure legitimate rights and interests of employees.
- *Properties:* In the case of CFPPs implementing energy transition plans (immediate closure, phased closure, transition on a reduced path from current all coal burning to co-firing, or other fuels, or implementation of projects to reduce emissions...), issues related to assets need to be handled by SOEs in accordance with the law.
 - (i) Regarding the land use right: When a CFPP terminates its operation, within 24 months from the date of the termination, the SOE who owns such CFPP is entitled to settle CFPP's assets attached to the land. The local government will take the land where such CFPP is located. The local government can give the land to the buyer who bought the CFPP's assets attached to the land under the new lease agreement.
 - (ii) Regarding other assets: EVN, PVN and VINACOMIN have the right to transfer, sell, and liquidate assets that are damaged, technically outdated, poor quality, non-utilized, or cannot be used to recover capital according to the principles of publicity, transparency and state capital preservation. In addition, these SOEs have the right to transfer assets including electricity system, materials and equipment directly serving electricity production and business which are belonging to such SOEs fully owned enterprises to serve its production and business or its restructuring plan which is decided by the Prime Minister.
- *Industrial safety (power plant dismantling) and environment:* When implementing energy transition options for CFPPs such as: energy transition towards sustainable development, building a roadmap to gradually reduce coal power, or promote the development of clean energy, SOEs will need to carry out administration procedures related to safety techniques and environment.
 - (i) Land use: For the energy transition plan in the direction of promoting clean energy leading to changes in the structure and operation of CFPPs, land users must fulfill the obligations of environmental restoration, improvement, and remediation in accordance with the law.
 - (ii) Safety techniques and environment: In case the energy transition requires dismantling CFPPs, SOEs need to comply with the regulations on construction, working safety and health (OSH), environmental protection, regulations in

Regulation QCVN 18:2021/BXD on safety in construction is issued together with Circular 16/2021/TT-BXD dated December 20, 2021.

- Handling of public assets when CFPP is dismantled in accordance with an energy transition plan: (i) if the CFPP is decided to downsizing which will cause a planning change, CFPP's assets may be withdrawn by the State; (ii) if the CFPP is decided to close, the assets may be withdrawn or transferred to other state designated organizations.
- **Difficulties in building and implementing an energy transition strategy**
 - EVN and PVN have identified energy transition (ET) as an important topic and are in the process of developing their ET strategies. PVN is currently working with 2 consulting firms on ET and emissions reduction, while EVN is sourcing for one. However, at the moment, their progress is still pending for the National Energy Master Plan and Power Development Plan to be approved for more specific orientation to base their ET strategies on.
 - PVN expressed their interest in diversifying their fields of business to include renewable energy investment. However, PVN needs to have approval from Politburo to be able to invest in Renewable energy in general, and in offshore wind in particular.
 - For EVN, finance sources for investment in new power sources will be challenging, especially in meeting the power demand for the next five years.
 - VINACOMIN does not yet have a concrete plan to develop its ET strategy. Instead, the SOE consider the orientation in the Draft PDP8 on fuel conversion in CFPPs (cofiring coal with biomass or ammonia and gradually converting them to use purely clean fuel). They mentioned the difficulties in project assessment and pre-feasibility planning for the fuel transition solutions. VINACOMIN also expressed their concern about the transition's impact on people and communities that are relying on CFPPs and the coal sector as well as energy security.
 - At the CFPPs level, the relatively young coal fleet also implies a challenge for ET.
- **Technical assistance needs:**

From the discussions with three SOEs and 06 plants, the Consultants have synthesized the following technical assistance needs mentioned by the SOEs and CFPPs as follows:

- Technical assistance to the SOEs (or to the one which show strongest interest) in:
 - (i) formulation of a concrete feasibility plan for the transition of their CFPPs with both technology, financing and legal options;
 - (ii) Assist the SOE in reaching out to potential donors, exposing them to different technology options;
 - (iii) Assist the SOE in working on one of their CFPPs as a role model/ demonstration case.
- Improvement of the energy efficiency in existing CFPPs. This TA is expected to help CFPPs in identifying a suitable set of measures to reduce their fuel consumption, hence GHG and air pollutant emissions, while not hampering the generation output.

- Conduct pre-feasibility projects for fuel switching at some specific CFPPs. This TA is expected to help SOEs in identifying suitable CFPPs for deploying fuel switch solutions and to develop a pre-feasibility study for such projects, including detailed techno-economic assessments of the fuel switch option, alternative fuel sources, fuel price and electricity selling price as well as related incentives to make it economically viable.
- Assessment of the impacts of future climate policies (i.e. carbon market, carbon tax...) on the SOEs' financial situation.
- CFPP's operators propose that there should be a mechanism to prioritise the power plants' operators to invest in renewable energy, especially in the North of Vietnam, to address the risk of power shortage in this region.

This list is the preliminary output from the mission with SOEs and CPPs; however, to have a more comprehensive list of technical assistance activities will be developed with close collaboration with CMSC. Next steps consist of (i) developing coal abatement scenarios and coal phasing-down roadmap with technical and financial implications for CFPPs under the SOEs' management; (ii) technical and financial solutions to fill in the gap left by phased-out CFPPs; (iii) detailed recommendations for the net-zero roadmap and (iv) recommended ETP's further technical assistance and capacity building for CMSC and SOEs to realise the identified coal abatement scenarios and coal phasing-down roadmap.



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