Public Disclosure Authorized

Project Information Document (PID)

Concept Stage | Date Prepared/Updated: 07-Dec-2020 | Report No: PIDC30678

BASIC INFORMATION

A. Basic Project Data

Country	Project ID	Parent Project ID (if any)	Project Name
Vietnam	P174460		Vietnam Renewable Energy Accelerating Change (REACH) (P174460)
Region	**Estimated Appraisal Date**	**Estimated Board Date**	**Practice Area (Lead)**
EAST ASIA AND PACIFIC	Apr 15, 2021	Jun 24, 2021	Energy & Extractives
Financing Instrument	**Borrower(s)**	**Implementing Agency**	
Investment Project Financing	Ministry of Finance	Vietnam Electricity	

Proposed Development Objective(s)

The development objective is to improve the capacity of the electricity grid to integrate private sector led variable renewable energy generation projects.

PROJECT FINANCING DATA (US$, Millions)

SUMMARY

Total Project Cost	350.00
Total Financing	350.00
of which IBRD/IDA	160.00
Financing Gap	0.00

DETAILS

World Bank Group Financing

International Bank for Reconstruction and Development (IBRD)	160.00

Non-World Bank Group Financing

Counterpart Funding	100.00
Borrowing Agency	100.00

Trust Funds	40.00
CA- Dept of Foreign Affairs, Trade and Devlp (former CIDA)	40.00
Commercial Financing	50.00
Unguaranteed Commercial Financing	50.00

Environmental and Social Risk Classification	Concept Review Decision
High	Track I-The review did authorize the preparation to continue

B. Introduction and Context

Country Context

1. Comprehensive reforms since 1986 (known as 'Đổi Mới') have led Vietnam along a stable economic growth pathway, transforming the country from a low- to a middle-income economy in one generation. Vietnam has had one of the fastest GDP per capita growth rates (averaging 5.5 percent a year) since the early 1990s, yielding a three-and-a-half-fold increase in average income. Economic growth has brought dramatic structural transformations, with the agricultural sector's share in GDP falling from more than 40 percent in the late 1980s to less than 20 percent in recent years. Looking to the future, it is expected that the domestic private sector will continue to drive economic development and job-creation, particularly as state-owned enterprise reforms progress, and as Vietnam continues on a path towards its longer-term aspirations of being a 'modern and industrialized nation moving toward becoming a prosperous, creative, equitable, and demographic society' (Vietnam 2035).

2. Vietnam is also one of the best performing countries worldwide in terms of poverty reduction and shared prosperity. More than 40 million people were lifted out of poverty between 1990 and 2014; extreme poverty (US$ 1.90 per day) fell from 50 percent in 1993 to less than 3 percent today; and consumption for the bottom 40 percent of the population grew by 6.8 percent annually over the same period. Access to basic infrastructure has also improved substantially. Electricity is now available to almost all households, up from less than half in 1993. Access to clean drinking water and improved sanitation in urban areas has risen from less than 20 percent of all households in 1999 to more than 90 percent and 88 percent, respectively, in 2015[1]. By the World Bank's measure of shared prosperity (i.e., the income growth of the bottom 40 percent of the population), Vietnam is one of the most noteworthy cases of long-term shared prosperity globally.

3. Vietnam has been ranked among the top five countries globally most affected by natural disasters and climate change. This is due to the concentration of a high proportion of its population and economic assets in vulnerable coastal lowlands and deltas. Specifically, 70 percent of the population is at risk from typhoons, floods, droughts, sea-water intrusion, landslides, forest fires, and occasional earthquakes. Climate change will increase the impact of weather-related hazards in terms of frequency and intensity of hydro-meteorological events[2]. In deltaic regions drainage and groundwater

[1] Progress on Drinking Water, Sanitation and Hygiene. WHO-UNICEF Joint Monitoring Report, 2017
[2] Official climate change scenarios from MONRE project annual mean temperature increases of 0.6°C to 1.2°C by 2040 relative to 1980-1999. Sea level rise of 0.22m

extraction will exacerbate land subsidence[3] and increase the threat of coastal flooding. Coastal cities will be affected by flooding from increased intensity of tropical cyclones as well as to sea-level rise. It is estimated that Vietnam's average annual disaster-related losses are currently approximately US$2.4 billion, or almost 1.5 percent of GDP[4]. As Vietnam strives to become a modern, industrialized economy by 2035, economic growth will need to adapt to become more resource efficient and therefore less vulnerable to climate shocks on resource availability as well as to address other consequences of climate change.

4. To ensure continued rapid growth, the GOV is investing substantially in infrastructure development. The draft SEDP for 2021-30 calls for total investments to reach 33-35 percent of GDP, which would be in the range of US$ 60-70 billion. Investments will target key bottlenecks to development which includes core infrastructure services such as transport, energy, water, and digital. Investments to strengthen climate and disaster resilience are also being prioritized, including scaled up investments in renewable energy and energy efficiency.

Box 1: COVID-19 Pandemic in Vietnam

Vietnam's economy, whilst impacted, has shown resilience in dealing with the negative effects of the COVID-19. GDP growth rate was 1.8 percent from January to June and is expected to increase to 2.8 percent by 2020-year end. The most significant impacts have been on service activities and manufacturing exports (due to lower demand). In contrast, the agricultural sector has continued to perform at its pre-crisis level, boosted by higher rice prices - the country's main crop - on both the domestic and international markets. The economy's resilience has been bolstered by the accommodative fiscal and monetary stance to help mitigate the impact of the crisis. This included provision of social assistance and tax payments deferrals. The balance of payments remained positive in the first eight months of 2020, export grew, and FDI inflow remained resilient. Vietnam's success, thus far, in managing the COVID-19 pandemic also gives it a competitive advantage in positioning itself as an integral part of global value chains and accelerate the pathways to a green and sustainable recovery.

Sectoral and Institutional Context

5. Over the past decades, energy sector has been a fundamental enabler of inclusive economic development. Vietnam's electrification program has been a global success story for its ability to provide near universal electrification in record pace (electricity access rate increased from 14 percent in 1993 to about 99 percent in 2020).[5] In just 25 years, more than 14 million households (representing 60 million people) were connected to the grid. The sector has been able to successfully handle double-digit growth rates which has powered industry and commerce as well as the increasing energy needs of the growing middle-class population in urban centers (per capita consumption now stands at about 1,800 kWh). The installed capacity of the power sector has increased over ten-fold in the past two decades (from 5 GW in 2000 to 55 GW in 2020).[6]

6. Energy sector's institutional and administrative arrangements were able to successfully manage growth. Under the leadership of the Ministry of Industry and Trade (MOIT), national policies and targets were developed which focused on service delivery at the grassroot levels. The strong political commitment of the high-level authorities was executed by the vertically integrated, state-owned enterprise (SOE), Vietnam Electricity (EVN). Over the years, steady legal and regulatory reform was carried out to gradually introduce competition and to ensure long-term sustainability without

and an increase in rainfall of between 12.4 percent and 33.3 percent are expected by 2030 and will further increase flood levels.
[3] For example, in the Mekong delta region land subsidence is 6mm per year
[4] UNISDR (2014) Prevention Web: Basic country statistics and indicators. Available at: https://www.preventionweb.net/countries
[5] Data from Ministry of Industry and Trade
[6] Data from Vietnam Electricity

jeopardizing security of supply for the fast-growing economy. This included, unbundling of EVN into sub-segment specialized utilities (while still maintaining state-ownership), setting prices that better reflect costs (average retail tariff stands at about US$ 0.09/kWh which covers current costs)[7], promotion of private investment in power generation, and establishment of the Electricity Regulatory Authority of Vietnam (ERAV) which oversees the implementation framework towards a competitive power market with a single-buyer (pilot phase of the wholesale electricity market was launched in 2020, while plans for retail electricity market are being prepared).

7. EVN has been able to transform into one of the best performing power utilities in the region. The successful development outcomes achieved by the energy sector would not be possible without its focus on capable institutions. Today, EVN is a well-management corporation and its skilled labor force runs the sector with technical, operational, and commercial acumen. Reliability of the power system has been steadily improving (in 2020, momentary average interruption frequency index (MAIFI) is 1.38 per customer), technical losses are nearing global benchmarks (about 6 percent in 2020), and billing and collection rates are consistently near 100 percent. With US$ 15 billion in annual revenues, EVN is a profitable corporation and has a credit rating of 'BB', with stable outlook (assessed by Fitch Ratings), which is at par with the sovereign credit rating.

8. However, as Vietnam plans its next phase of growth, energy sector stands at an inflexion point. Given the rapidly evolving nature of Vietnam's economy, the coming decades would require a strong focus by the energy sector on the 'quality', and not just the 'quantity' of growth. The key challenges confronting the sector include: (i) managing the transition to clean-energy based power system, (ii) ensuring energy security under the new growth factors, and (iii) bringing in modern efficiencies and new technologies which keep pace with the changing nature of the energy industry. Adapting to these new challenges would once again require bold vision of the authorities as well as a strong reform agenda capable of reshaping the sector and its institutional landscape.

9. Heavy reliance on coal means that the sector's success has come at the cost of environmental degradation. While initial growth was fueled mainly by domestic hydropower resources, in the past decade, coal-based energy has become the dominant source. Installed capacity of coal-fired power plants increased four-folds (from 5 GW in 2010 to 20 GW in 2020). The annual consumption of coal stands at about 85 million tons (over three-quarter of the coal consumed is used for power production). During this period, Vietnam's per capita greenhouse gas (GHG) emissions have increased at about 5 percent annually (highest in the world).[8] Two-thirds of these GHG emissions have come from the power sector alone. In the business as usual scenario (BAU), i.e. under the Seventh Power Sector Development Plan (PSDP 7), coal-based power, largely reliant on imports, was expected to increase three-folds (from 20 GW in 2020 to 60 GW in 2030). GHG emissions per year would double from 300 to over 600 mtCO2 equivalent. Unless course correction to cleaner energy sources is carried out, highly negatively impacts will occur on climate change, local pollution, quality of life, and overall socio-economic well-being of the country.

10. Clean energy transition must be carried out while balancing the dynamics of supply, demand, and cost. In the coming decade, the demand for energy is expected to continue to grow at about 7 to 8 percent annually (COVID-19 has slowed the demand growth in 2020 to about 4 percent). This would mean that the energy sector needs to double in size in just 10 years (from 55 GW in 2020 to over 120 GW in 2030). This phase of anticipated rapid growth will require an estimated US$ 10 billion in annual investments (US$ 100 billion between 2020 and 2030). There is consensus amongst authorities that the traditional delivery mechanisms focusing on SOE-led public investments will not be able to meet this need. Aggressive reforms must be carried out to improve planning, transparency, competitiveness, and financial viability (continued tariff reforms) of the sector to crowd in private sector investments, knowhow, and efficiencies.

[7] Data from Electricity Regulatory Authority of Vietnam. The tariff reforms need to continue to include cost of future investments (i.e. full cost recovery).
[8] World Bank's Low Carbon Pathways Study

11. Clean energy transition also calls for adoption of modernized standards and technologies. Vietnam is fast becoming one of the most energy intensive economies in the region (energy elasticity to GDP is nearly 2). Pivoting towards improved energy efficiency (EE), especially in consumption patterns, is necessary. This can lead to effective decarbonization of the industrial, commercial, and residential segments while lowering the overall costs. In addition, clean energy transition also brings forward the opportunity of mainstreaming disruptive technologies within the energy ecosystem. This includes development of smart grid systems, system-wide digitalization, enhanced use of distributed generation (such as rooftop solar systems), etc. The green economy spurred by the clean energy transition can have positive side-effects of creating high-paying jobs and further development of Vietnam as a regional hub for this emerging industry.

12. The Government is now demonstrating strong commitment to renewable energy and energy efficiency. The Polit Bureau recently adopted 'Resolution 55' which lays out the vision towards a low-carbon development pathway for the energy sector which would be primarily led by the private sector (EVN is expected to own just about 20 percent of power generation assets by 2030). The upcoming Eighth Power Sector Development Plan (PSDP 8) builds on this vision and is expected to reduce the footprint of planned coal-based power generation by about 65 percent while scaling-up variable renewable energy (VRE) technologies by over 400 percent making it the largest installed capacity category. Further emphasis is also being given to regional power trade (excess hydropower import from Laos and China) and for developing the natural gas (especially, Liquified Natural Gas, LNG) sector as a vital bridging fuel for balancing the system. The Government has also launched the Vietnam National Energy Efficiency Plan (VNEEP) which aims to improve overall EE by 8-10 percent by 2030. If implemented, the new plan will reduce the sector's GHG emission by 30 percent by 2030 (compared with BAU scenario). However, continued efforts are necessary to execute this vision by implementing several specific measures across the energy sector value chain, while also focusing on improved investment climate for the private sector.

13. Solar and wind energy is already showing signs of early success. The Government is incentivizing private investments in RE (solar, wind, biomass, mini-hydro) generation through a feed-in-tariff (FIT) policy. The premium purchase pricing under the FIT policies has driven strong growth of the RE generation segment with total installed capacity of over 6 GW. Particularly, nearly 4.5 GW of grid-connected solar photovoltaic (PV) based power plants were installed in just the past two years (mainly through local private sector led investments) making it one of the fastest growing markets in the region (in fact, nearly as much new solar energy capacity was added in Vietnam as all of the rest of South-East Asian countries). As the sector grows and has the goal of scaling to 36 GW of VRE capacity by 2030, the GOV aims to transition to a competitive selection of independent power producers (IPPs). This move away from the FIT policy together with improvements in the risk allocation (and therefore, the bankability) of the power purchase agreements (PPAs) will bring economic benefit to the sector and the consumers by attracting more experienced developers, lowering the cost of capital, reducing the construction and equipment cost, as well as the cost of overall prices for VRE projects. The World Bank has supported the development of the first-ever framework for competitive bidding for solar and is now providing transaction advisory support for pilot phase (500 MW) solar auctions which are planned to be launched in 2021 under the ongoing Global Infrastructure Facility (GIF) financed Vietnam Solar Transaction Accelerator (P172974) Project.

14. However, rapid expansion of solar and wind energy is being constraint by the limitations of the power grid. The existing public sector managed grid network has not been able to keep pace with the private sector led RE supply and will fall further behind the planned scenario unless urgent investments are carried out. The main challenges related to the integration of VRE include the limited power transfer capacity of the grid (from production to consumption locations) as well as ability of the grid operators to balance the intermittent nature of the VRE supply with automated tools and ancillary arrangements. As a result, despite positive outlook of VRE supply being made available, large curtailment (inability of the

system to utilize all available generation when available, i.e. sun is shining, or wind is blowing) is already being observed (frequently, for about 40 percent of solar capacity). Public investment in grid capacity integration and new technologies is required to support the gradual transition into a 'VRE-friendly' grid which significantly reduces integration costs in the long-term. Grid reinforcements supporting VRE integration (as per the least-cost transmission plan) in Vietnam include: (i) addition and/or replacement of transmission lines and substations, (ii) equipment for smoothing the voltage and frequency issues, such as capacitor banks, battery storage, and reactive power compensators, together with flexible alternating current transmission systems (FACT), and (iii) equipment for faster and more efficient grid operation, such as monitoring systems, demand and production forecasting systems, and automats for controlling generation units and grid operations through automatic generation control and automatic voltage control with a strong supervisory control and data acquisition (SCADA) system.

15. The proposed operation is part of World Bank's comprehensive clean energy transition support program. The Renewable Energy Accelerating Change (REACH) Project mobilizes much needed public financing to address the grid capacity constraints specifically targeted to sustainably increase the penetration of VRE. While investments directly supported under the proposed operation are not the entirety of required investments for grid capacity improvements, it lays a strong foundation for VRE-friendly orientation of the transmission investments. The technical assistance support of the World Bank has influenced the reprioritization of planning and reinforcement of the grid towards long-term development focusing on Vietnam's clean energy transition. In addition, the Bank is providing analytical and advisory services for policy development, legal and regulatory reform, advancing investments through improved competition and long-term financial viability of the sector, and is providing financing through investment projects, credit facilities, and guarantees for scaling up VRE and EE technologies in Vietnam. Strong collaboration with International Finance Corporation (IFC) and Multilateral Investment Guarantee Agency (MIGA) continues in the energy sector, for instance, the Bank's targeted public investments in grid capacity enhancement will support IFC's private investment in solar and wind energy projects.

Relationship to CPF

16. The REACH Project is fully aligned with the Vietnam Country Partnership Framework (CPF) for the period FY18-FY22[9] and supports the World Bank's twin goals of poverty reduction and shared prosperity. In the Vietnam CPF, the Focus Area 3: Ensure Environmental Sustainability and Resilience promotes low carbon energy generation, including renewables and energy efficiency and reduction of GHG emissions. The World Bank has committed to support the Government of Vietnam in harnessing its domestic renewable resources. The deployment of renewable energy enables a reduction in the country's dependence over fossil fuels and can have a key role in reducing the cost of electricity as well as in mitigating the impacts of climate change.

17. The REACH Project is also aligned with the World Bank's corporate objectives under the regional Climate Change Action Plan, Private Capital Mobilization (PCM), and Maximizing Finance for Development (MFD). The REACH Project aims to contribute to the development of an enabling framework to leverage private financing for the development and operation of utility-scale solar, and onshore and offshore wind projects. The REACH Project also integrates the standardized methodology that was developed in partnership with the French Development Agency (AFD), International Renewable Energy Agency (IRENA), and the International Solar Alliance (ISA) under the Sustainable Renewables Risk Mitigation Initiative (SRMI), to support countries in designing and implementing sustainable RE programs that will attract private investments and reduce reliance on public finances.

18. Moreover, the long-term growth potential of the Project is significant and will help to ensure that the economy

[9] Country Partnership Framework for the Socialist Republic of Vietnam for the Period FY18-FY22, May 4, 2017, report number 111771-VN

will rebound stronger and better after the COVID-19 pandemic. For instance, the deployment of solar and wind generation is labor intensive and can be a catalyst for new and high paying jobs as well as for overall socio-economic development. The Project will help to build resilience to future shocks with interventions focusing on mitigation of climate change related impacts and will assist the country cope with and recover from external shocks, like COVID-19 today, but also other forms of natural disasters and future climate change impacts.

C. Proposed Development Objective(s)

19. **The development objective** is to improve the capacity of the electricity grid to integrate private sector led variable renewable energy generation projects.

Key Results (From PCN)

20. **The Project's** expected **results are:**

a. Additional power transfer capacity supported in Project areas (at least 80 percent);
b. VRE projects provided with new or improved power transfer capacity (up to 800 MW);
c. GHG emissions reduced from increased consumption of renewable energy (up to 50 mtCO2); and
d. Amount of new private sector investment in VRE projects enabled (approximately US$ 1,200 million).

D. Concept Description

21. **The REACH Project mobilizes public financing to alleviate grid constraints hampering deployment of VRE**. The scope of the proposed project has been crafted to focus on the most urgent transmission and system needs that are complementary to ongoing and planned investments in VRE generation. The electricity grid needs to be upgraded to: (i) sustainably integrate without curtailment existing privately-owned VRE projects, and (ii) unlock GWs of new privately-owned VRE projects. The projected VRE deployment growth will require continuous investments to modernize and transition the system for successfully adopting these new disruptive technologies. The REACH Project is also part (finances a sub-set of these investments) of the public investments for grid capacity upgrades that are being proposed under PSDP 8. Additional investments needed to upgrade the grid capacity under the plan would be mobilized through EVN's own resources or through borrowing from local and international partners. This could also include follow-on financing from the World Bank in the coming years.

22. **The design of the REACH Project is based on strong analytical underpinnings**.[10] The World Bank and other development partners have been providing technical assistance support to EVN for carrying out detailed network studies and load flow simulations to identify system-wide bottlenecks which are causing significant curtailment of existing renewable energy generation capacity and is also preventing new projects from coming online. The global expertise mobilized to support EVN not only identified physical infrastructure upgrade needs, but also need to improve grid management systems and the capacity of the utilities to dispatch VRE effectively. This has led to development of systematic approach to grid planning for VRE management which is another positive side-effect of engagement under the REACH Project. The approach to VRE informed transmission and distribution network planning has also been integrated into the sector master planning framework (PSDP 8).

[10] The analysis conducted to identify the investments needed focused on five regions: Middle Central (Quang Tri, Quang Binh, Hue, Da Nang, Quang Nam, Quang Ngai), South Central (Binh Dinh, Phu Yen, Khanh Hoa, Ninh Thuan, Binh Thuan), Highlands (Dak Nong, Dak Lak, Kon Tum, Gia Lai, Lam Dong), South East (Ba Ria Vung Tau, Tay Ninh, Binh Duong, Binh Phuoc, Dong Nai), and South West (Long An, Tien Giang, Ben Tre, Can Tho, Hau Giang, Soc Trang, An Giang, Kien Giang, Vinh Long, Tra Vinh, Dong Thap, Bac Lieu, Ca Mau)

23. The REACH Project has two components: (i) Component 1: Grid Strengthening for VRE Integration; and (ii) Dispatch Management. The investments financed under the project aim at reducing existing and future curtailment of VRE projects (785 MW of which 300 MW of onshore wind and 485 MWp of solar) and unlocking the space in the grid for new VRE projects (2,240 MW of which 980 of onshore wind and 1,260 MW of offshore wind). Based on the analysis conducted, the sub-projects being proposed are the ones that support bulk transfer of renewable energy and would have the most immediate impact on expanding VRE integration capacity of the grid. More precisely:

24. Component 1: Grid Strengthening for VRE Integration (US$ 330 million of which US$182 million from WB and US$ 142 million from EVN). Component 1 provides financing for power grid's physical infrastructure (transmission lines and substations) upgrades and development. It will also incorporate World Bank's guidance on investments in power grid infrastructure focusing on resilience to climate change. A brief description of the physical infrastructure investments is included below:

a. **Sub-Component 1.1: Transmission Backbone (500 kV) (US$ 318 million of which US$ 174 million from WB and US$ 144 million from EVN)**. Sub-Component 1.1 provides financing for construction of two new 500 kV transmission lines and substations which are critical for evacuating power from renewable energy producing centers to the demand centers. This investment in backbone transmission grid strengthening will enable a better integration of around 543 MW of existing/under construction solar and wind energy projects and unlock around 2.3 GW of new generation (see *Table 2*). The new unlocked generation is expected to mobilize US$ 1.2 billion in private investments in the short-term, and another US$ 3.7 billion in private investments in the medium-term. It is anticipated that all these new VRE projects will directly replace new coal power plants as per the draft PSDP 8. In addition, it will enable a reduction in transmission losses in those regions.

    i. **500 kV North Chau Duc Transmission Line and Substation**. This includes 10 km long quad-circuit 500 kV transmission line (TL). In addition, substation (SS) capacity of 950 MVA will be added as part of this sub-project. The location of the sub-project is in the Ba Ria - Vung Tau Province in the Southern region of Vietnam. Total estimated cost of this sub-project would be US$ 75 million, of which US$ 41 million would be mobilized by the World Bank and the remainder by EVN.

    ii. **500 kV Krong Buk Tay Ninh 1 Transmission Line**. This includes nearly 300 km long double circuit 500 kV transmission line. The physical footprint of this transmission line will traverse several provinces from the central highlights of Dak Lak to the South Eastern province of Tay Ninh. The total estimated cost of this sub-project would be US$ 243 million, of which US$ 133 million would be mobilized by the World Bank and the remainder by EVN.

b. **Sub-Component 1.2: Curtailment Reduction (220 kV) (US$ 12 million of which US$ 8 million from WB and US$ 4 million from EVN).** Sub-Component 1.2 provides financing for rehabilitation of 220 kV network of the existing grid infrastructure targeting curtailment reduction of VRE projects.

    i. **220 kV Phuoc Dong Substation**. This includes upgrade of 250 MVA of substation capacity and associated equipment. The location of the sub-project is in the Tay Ninh province in the South East of Vietnam. Total estimated cost of this sub-project would be US$ 12 million, of which US$ 8 million would be mobilized by the World Bank and the remainder by EVN.

25. Component 2: Dispatch Management (US$ 20 million of which US$ 12 million from WB and US$ 8 million from EVN). Component 2 finances system management infrastructure (sensors, hardware, and software) for the power grid operator to digitize and automate the tasks for VRE integration. As the volume of VRE increases in the generation mix, the number of power plants is expected to dramatically increase (for instance, the number of solar power plants has increased from about a dozen a few years ago to over 150 today). This created difficulties for the National Load Dispatch Center (NLDC) to visualize, monitor, and control the network. In addition, the variability of the solar and wind energy also requires additional sensitivity in management of operations with regards to efficient forecasting of supply and demand as well as faster response to voltage and frequency changes. The investment supported under this component will be part of the new state-of-the-art NLDC Control Center which is being setup by EVN with the anticipated enhancements required for grid management needs.

i. **Control Center Automation.** A SCADA with Automatic Generation Control (AGC) for frequency and Automatic Voltage Control (AVC) for voltage management will be financed to improve the reliability of the grid and the integration of VRE. This financing will be used to acquire specialized set of latest Energy Management System (EMS) applications and information technology systems whose role is to gather and analyze real time data and to apply the AGC and AVC to ensure system stability. This component will provide cutting-edge digital and disruptive technologies and will support ongoing modernization efforts of the power grid for monitoring, control, and dispatch towards greater usage of VRE. Total estimated cost of this sub-project would be US$ 20 million, of which $18 would be mobilized by the World Bank and the remainder by EVN.

26. Preliminary project costs and financing plan. The estimated total cost of all the components at the concept stage is US$ 350 million. Of this, US$ 200 million will be mobilized by the World Bank using IBRD and other concessional financing resources. These include the Canada Facility and potentially others such as the Green Climate Fund (GCF) and the Transformative Carbon Asset Facility (TCAF). Discussions are ongoing with financiers and the detailed financing plan will be finalized by appraisal. In addition, EVN is expected to raise commercial financing of around US$ 50 million (out of the US$ 150 million self-financed contributions of EVN) from local banks and other institutions. This qualifies for PCM under World Bank guidelines as commercial capital mobilized for project related expenditures.

Legal Operational Policies	Triggered?
Projects on International Waterways OP 7.50	No
Projects in Disputed Areas OP 7.60	No

Summary of Screening of Environmental and Social Risks and Impacts

27. Environmental and Social. REACH is directly financing high-voltage transmission lines, substations, and grid management system. In addition, it is expected to spur investments in solar and wind energy projects. The following Environmental and Social Standards (ESS)'s are relevant to the Project: ESS1 (Assessment and Management of Environmental and Social Risks and Impacts), ESS2 (Labor and Working Conditions), ESS3 (Resource Efficiency and Pollution Prevention and Management), ESS4 (Community Health and Safety), ESS5 (Land Acquisition, Restrictions of Land Use and Involuntary Resettlement), ESS6 (Biodiversity Conservation and Sustainable Management of Living Natural Resources), ESS7 (Indigenous People), ESS8 (Cultural Heritage), and ESS10 (Stakeholder Engagement and Information Disclosure).

28. Since the exact location of Project activities will not be known by appraisal, the Borrower will prepare an Environmental and Social Commitment Plan (ESCP), Environmental and Social Management Framework (ESMF), Resettlement Planning Framework (RPF), Ethnic Minorities Planning Framework (EMPF), and Stakeholder Engagement Plan (SEP) for the Bank's review, comments, and clearance. Site specific environmental and social assessments and plans will be prepared once the location and specific risks and impacts associated with the sub-project activities are known. All environmental and social instruments will be subject to public disclosure and consultation per requirements of ESS10.

29. REACH is expected to have positive direct and indirect social and environmental impacts, including improved electricity supply, reduction in GHG emissions, and employment generation. REACH is expected to bring substantial direct environmental benefits by increasing the deployment of renewable energy. Transitioning to a higher percentage of renewable energy in the electricity mix has benefits for Vietnam's GHG emissions, air and water pollution, and use of water resources. REACH is likely to result in significant employment generation, including construction jobs, followed by a smaller number of long-term jobs associated with operation and maintenance (O&M) activities. In addition, there will be substantial opportunities to promote female employment (direct and indirect) through training and specific incentives.

30. The direct negative impacts are expected to be limited to high voltage transmission lines; however, the downstream results would also need to be considered. Given the project investment type, location, sensitivity and scale, and the nature and impact/risks magnitude, the project environmental and social risks at the concept stage are classified as 'high'. This risk rating will be revisited during project preparation upon availability of more information and analysis.

31. The potential environmental risks impacts would chiefly be associated with construction and operation of the investments under Component 1 and are attributed to construction of the 500 kV and 220 kV transmission lines, which will span over five provinces with rich biodiversity and critical and natural habitats. Construction of the transmission lines may result in loss and segmentation of critical and natural habitats, adversely affecting species and biodiversity in the project area. Significant risks during construction would also be the risks of unexploded ordnances left after the war, working at height, and electricity risk during transmission line testing. Other construction related risks and impacts can be rated as substantial. The potential significant risks and impacts during operation would be the effects associated with exposure to electric and magnetic fields from high voltage power lines and substations, worker safety during maintenance, and related community health and safety. There are also risks and impacts related to oil leakages, fire and explosion, and electrocution and collision risks to certain bird species.

32. The social risks of the proposed project relate to the magnitude of potential land acquisition impact, causing physical and economic displacement to affected households. This impact is primarily related to the implementation of Sub-Component 1.1 'transmission backbone' which consists of 500/220 kV sub-projects. While the land taking impact caused by substation sub-projects is straight forward and concentrated, that induced by the 500 kV transmission line (TL) will be more significant. Per the existing regulations, all structures, houses, and (tall) trees under its right-of-way (ROW) - (7m from the outermost wire) - must be demolished or removed. The width of affected areas could be up to 28 meters wide. With the length of 314.4 km, the proposed 500 kV Dak Nong Tay Ninh TL (under Sub-Component 1.1) may require a significant amount of land acquisition and relocation. In addition, acquiring land and resettlement arrangement in linear investment is always challenging, especially in the context of Vietnam where the implementation process is a highly decentralized. With the TL stretching over 5 provinces, a major challenge for the implementing agencies will be to ensure consistency of application of the management measures required for the project. Other social risks include the presence in the project area of vulnerable population such as ethnic minority people, the presence of sensitive sites of tangible and intangible cultural heritage, and the need to mobilize a workers to be deployed across a wide geographic area. Ethnic minority communities tend to be poorer and more reliant for their livelihoods and cultural wellbeing on the land and resources impacted by the project and require specialized forms of engagement. The presence of workers (and their influx)

may cause certain level of turbulence (cultural norms violation, relationship with community) in ethnic minority communities. Lastly, the cost of this TL accounts for nearly half of the project budget, hence, without proper planning and implementation, delay in implementing land acquisition, compensation and resettlement would negatively influence the overall Project achievement.

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