Phong Nguyen Wind Farm JSC

Executive Summary - Initial Environmental and Social Examination

Phong Nguyen Wind Farm Project, Quang Tri Province, Vietnam

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EXECUTIVE SUMMARY

The present Initial Environmental and Social Examination (IESE) presents an assessment of the potential environment and social impacts of Phong Nguyen Wind Power Project, a proposed 48MW wind power development in Huong Phung and Tan Thanh Communes, Huong Hoa District, Quang Tri Province, Vietnam. The IESE aimed to assess Project-related impacts regarding to environmental and social aspects against ADB Safeguard Policy Statement (SPS) (2009), ADB Social Protection Strategy (2001), ADB Gender and Development Policy (1998), JICA's Environmental and Social Guidelines and associated World Bank Group (WBG) Environmental, Health and Safety (EHS) Guidelines.

Phong Nguyen Wind Power Project will be developed and operated by Phong Nguyen Windfarm Joint Stock Company (hereafter as "Phong Nguyen JSC"). PCC1 is the major shareholder who contributes 55% of total investment to Phong Nguyen JSC. The Project comprises twelve (12) 4.2 MW wind turbine generators (WTGs) with the total installed capacity of 48MW and associate infrastructure including 10,924m overhead and underground 35kV transmission line. The location and components of the Project is shown in Figure 0.1.

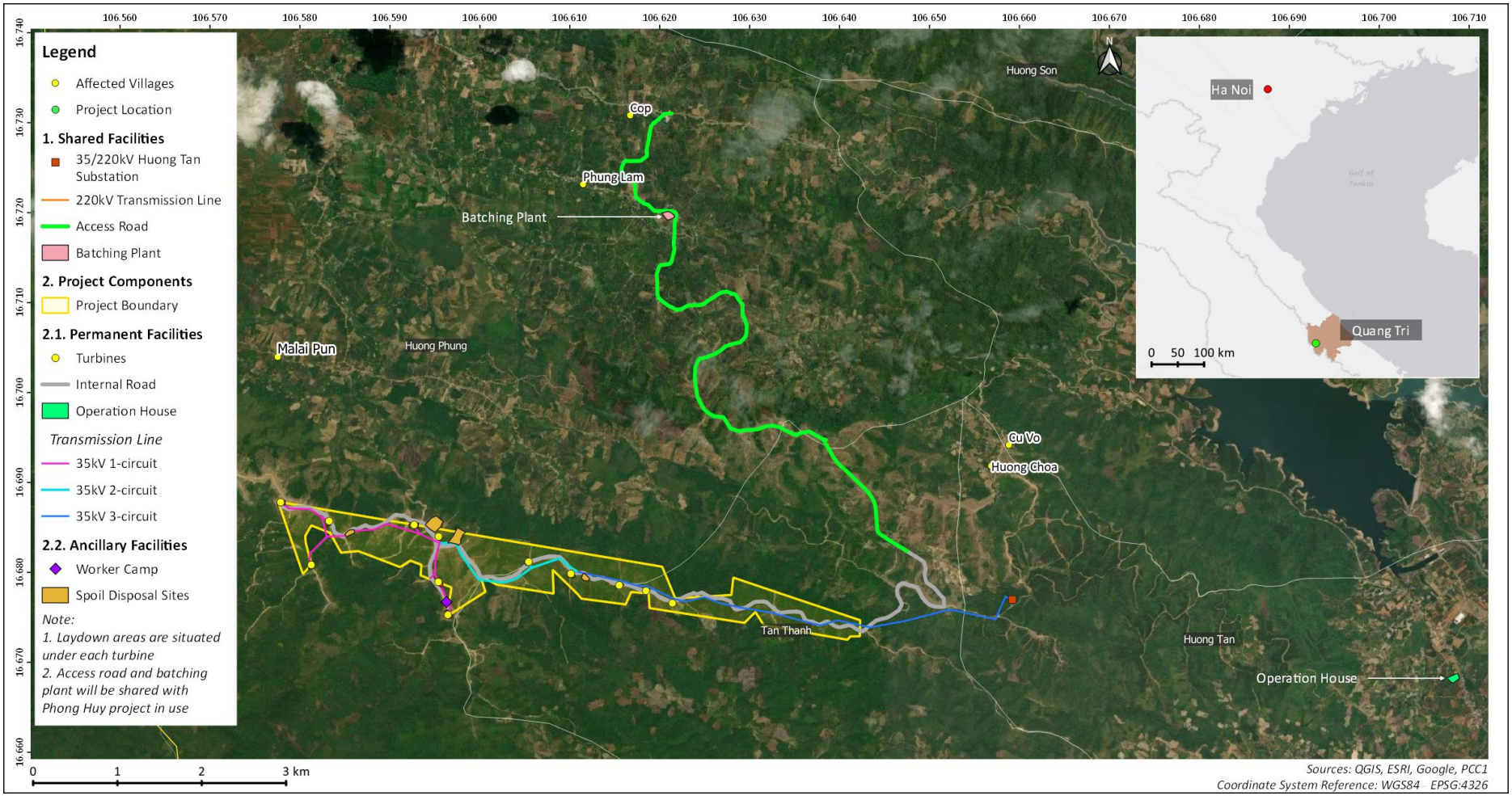

Figure 0.1 Project Location

The Phong Nguyen Wind Power Project has received the approval for its Feasibility Study in 2020 and its local Environmental Impact Assessment (EIA) in April 2020. The construction of the Project has commenced in October 2020, and its commercial operation date is expected to be in the third quarter of 2021.

The IESE has been prepared based on multiple sources of information, including but not limited to:

(i) Project documents: Feasibility Study, Site Investigation Report, Wind Measuring report, local EIA;

(ii) Information on Project's update and progress; and

(iii) Findings of primary environmental and social baseline surveys, such as socio-economic baseline surveys of affected communities, noise and physical environmental monitoring within and around the Project area, and biodiversity surveys (including bird, bat, terrestrial fauna and flora surveys).

This IESE has been undertaken following a systematic process that evaluates the potential impacts that the Project could have on the following aspects: physical, biological, socio-economic and cultural environment; identifies preliminary measures that the Project will take to avoid, minimise, mitigate, offset or compensate for potential adverse impacts; and identifies measures to enhance potential positive impacts where possible. The outcomes of the IESE, including mitigation measures and monitoring requirements are summarised in the Environmental and Social Management Plan (ESMP). The ESMP combines the management and monitoring requirements identified in the local EIA and the IESE to provide comprehensive future environmental and social commitments of this Project.

The IESE is comprised of three main volumes (herein 15 chapters), including:

Volume 1: **Introduction** includes the project description with detailed information on the Project's components and areas; project alternatives to discuss alternatives in terms of power generation type, site selection and technology; applicable regulations and international standards; and methodology used for the impact assessment and the scope of the IESE report.

Volume 2: **Baseline Information** provides adequate environmental and socio-economic background information to identify key issues, and to present the outcomes of the stakeholder engagement process during the initial IESE development.

Volume 3: **Impact Assessment** assesses the potential impacts and consequences related on each of the key receptors within the Project's area of influence. The assessment also identifies the significance of impacts based on the existing controls in place and recommends additional mitigation measures and monitoring to satisfy ADB SPS 2009 standards and other international guidelines.

Project Categorisation

Environment

Environmental and social impacts of the Project during the construction phase may result in increased noise level, changes in air quality, impacts on water quality, impacts on soil erosion, terrestrial ecology, community health and safety, occupational health and safety during the construction phase. For operation phase, the potential impacts may be identified on water quality that relates mainly on residual impacts from construction, impacts from shadow flicker, traffic impacts, and biodiversity impacts (e.g. birds / bats).

Most of these impacts are limited to the wind farm components and their immediate vicinity, and can be minimised through application of mitigation measures as proposed in the ESMP. As such, the environmental impact of the Project is categorized as B.

Involuntary Resettlement

It was confirmed by the local authorities and the Project owner through the socio-economic baseline survey that only change of land use purpose was required, and no involuntary land acquisition from

local households would occur for all of the Project's components (i.e. turbine layout, internal road, transmission line) given that all acquired land was being managed by the Huong Hoa – Dakrong Protection Forest Management Board (PFMB). As such, the categorisation for Involuntary Resettlement of the Project is Category C.

Indigenous Peoples

As the Project's screening and confirmation, Van Kieu People was defined as Indigenous Peoples based on ADB SPS SR3. However, the Project is likely to have limited impacts on Indigenous Peoples (Van Kieu people). As such, the project is categorised as B, and an IPP, including an assessment of social impacts and resource requirements for addressing impact is required.

Environmental Context

Phong Nguyen Wind Power Project is located in the western mountainous part of Quang Tri province and situated in Truong Son mountain range. The topography of the study area is mainly hilly, with an elevation from 150-1000m above sea level and much divided by small stream networks. There are number of small creeks nearby the Project area, which is seasonal flow. These creeks are relatively small/ dried in the dry season and quite abundant in the rainy season. Baseline monitoring of physical environment condition showed that ambient environmental quality (air, noise, fresh water ground water, sediment, and soil) is relatively met the allowable permits of Vietnamese National Technical regulations.

The project's permanent components and ancillary facilities footprint covers 21.88 ha; in which i) 20.94 ha of protection forest (modified habitat) (under the management of Dakrong Huong Hoa Protection Forest Management Board[1]) in Huong Phung and Tan Thanh Communes, Huong Hoa District, Quang Tri Province; ii) 0.64 ha of agricultural land in Huong Tan Commune; and iii) 0.3 ha of residential land in Huong Tan Commune.

Social Context

Land acquired for the Project is mainly protection forest land under the management of Huong Hoa – Dakrong Protection Forest Management Board. No land acquisition from local households occurred for any project component, only change of land use purpose was required.

The Project has conducted several engagement activities with key stakeholders, including affected communities in May, September, November and recently December 2020. At the time of survey, ethnic minority (Van Kieu group) was recorded living near the Project site. The nearest house is approximately 1.8 km from the turbine No. 9 to the North, which is located in Ma Lai Pun village, Huong Phung commune.

Impact Assessment

A summary of impact assessment outcomes for each environmental and social aspect identified in the Scoping Study are summarised in table below. A brief description of each aspect is provided hereafter.

[1] For clarification, this land area is managed by Dakrong Huong Hoa Protection Forest Management Board while that land area is located in the administrative boundary of Huong Phung and Tan Thanh Communes.

Key Impacts	Applicable ADB standards	Phase	Significance of Impact	
			Before Mitigation	With Mitigation
Environmental Impacts				
Air quality	SPS 1	Construction	High risk/ Medium risk/ Low risk and Negligible	Negligible
Noise Emissions	SR 1	Construction	Moderate	Minor
		Operation	Negligible	Negligible
Water resource competition	SR 1	Construction	Negligible	Negligible
Water quality	SR 1	Construction	Moderate	Minor
		Operation	Minor	Negligible
Soil Compaction and Erosion	SR 1	Construction	Moderate	Minor
Soil Contamination	SR 1	Construction	Minor	Negligible
		Operation	Minor	Negligible
Direct Loss of Terrestrial habitat	SR 1	Construction	Moderate	Minor
Disturbance of displacement impacts on terrestrial fauna species	SR 1	Construction	Moderate	Minor
Barrier creation, fragmentation and edge effects - Terrestrial	SR 1	Construction	Moderate	Minor
Degradation of Habitat impacts	SR 1	Construction	Moderate	Minor
Mortality impacts - birds	SR 1	Operation	Minor	Minor
Mortality impacts - bats	SR 1	Operation	Minor	Minor
Mortality impacts – other fauna	SR 1	Construction/ Operation	Moderate	Minor
Impacts of Project’s activities to Climate change	SR 1	Construction	Not significant	Negligible
Impacts of Climate change to the Project	SR 1	Operation	Moderate	Minor
Traffic Density and Road Infrastructure	SR 1	Construction	Minor	Negligible

Key Impacts	Applicable ADB standards	Phase	Significance of Impact	
			Before Mitigation	With Mitigation
Traffic Safety	SR 1	Construction	Moderate	Minor
Electromagnetic Interference (Overhead Line)	SR 1	Operation	Minor	Negligible
Electromagnetic Interference (Underground Line)	SR 1	Operation	Minor	Negligible
Impact of EMF (Wind Turbines)	SR 1	Operation	Negligible	Negligible
Shadow flicker impacts	SR 1	Operation	Minor	Negligible
Visual impacts	SR 1	Operation	Major/Minor/ Negligible	Negligible
Social impacts				
Impacts on livelihoods	SR 2	Construction	Minor	Negligible
Disturbance to agriculture production	SR 2	Construction/ Operation	Minor	Negligible
Community Health, Safety and Security impacts during Construction	SR 1	Construction	Moderate	Minor
Impacts Associated with Construction Workers	SR 2	Construction	Moderate	Minor
Benefits to local communities		Construction/ Operation	Positive	
General disturbance to local community	SR 2	Operation	Minor	Negligible
Indigenous Peoples	SR 3	Construction/ Operation	Moderate	Minor
Gender	ADB Gender and Development Policy (1998)	Construction/ Operation	Moderate	Minor

Key Impacts	Applicable ADB standards	Phase	Significance of Impact	
			Before Mitigation	With Mitigation
Unplanned events (Risk assessment)				
Leakage and spill		Construction (Workers and Communities and Environment)	Minor	Minor
		Operation (Workers and Communities/ Environment)	Moderate	Minor
Traffic Accidents		Construction (Communities)	Major	Moderate
		Construction (Communties – Livestock)	Moderate	Minor
Fire and explosion		Construction (Workers and Communities/ Environment)	Major	Minor
		Operation (Workers and Communities)	Major	Moderate
		Operation (Environment)	Moderate	Minor
Transmission line snapping and transmission pylon collapse		Construction/ Operation	Major	Moderate
Blade throw		Operation (Communities/ Environment)	Moderate	Minor
Natural Hazards		Construction/ Operation	Major	Moderate

- **Ambient air:** Air emission from land clearing and preparation, construction of transmission line pylons, traffic movement for material transport during construction phase have low risk on human health impact and medium risk on ecological impact on the project area and surrounding area. With mitigation measures, air emission impacts will be reduced to Negligible.
- **Noise:** The noise impacts during the construction phase are assessed to be Moderate given noise level from construction equipment/ heavy-duty vehicle and traffic to the nearest receptor is met the criteria threshold of international and national guidelines. Construction noise levels will be reduced to Minor with the successful implementation of mitigation measures such as ensuring equipment in good condition, movements of vehicles are optimised and restricting night-time construction. The approach to assessing the operational noise is using noise model. The noise model used in this study to predict wind farm noise levels at sensitive receptors is based on ISO 9613-2:1996. During operation phase, with the results of predicted noise level generated by the proposed wind turbine model merely equals to background noise at monitored receptors at normal wind breeze, the operational noise effect is considered as Negligible.
- **Water resource:** The assessment has considered the potential effects of the Project on surface and ground water resources. There is no natural stream that traverses through the Project site, but many creeks flow nearby the Project. Flows of the stream and creeks are seasonal, and become arid during dry season. The Project is planned to source water for construction activities by procuring water from surrounding regions. The impact on water resource conflict caused by Project's activities is considered as Negligible. Regarding water quality, the social baseline survey identified that the water quality of stream/creeks have recently been affected by agricultural activities with pesticides and their residues. It is predicted that Project construction activities will potentially impact water quality through pollution incidents, erosion and sedimentation. The impact on water quality is considered as Moderate. Through the adoption of mitigation measures on site mentioned in ESMP, the potential effects on the water environment will be mitigated and reduced to Minor impact.
- **Soil environment:** The assessment has considered the potential effects of the Project's activities on soil environment in term of soil compaction, erosion and soil contamination. Soil erosion is predicted as Moderate of impact significance due to large amount of excavated soil, of which only 8.23% will be reused for ground levelling. Improper management of excavated materials might potentially result in increased sediment in surface runoff and localised soil erosion to downstream water bodies and farms nearby the Project. Regarding Soil contamination, there is no available fuel, oil stored on site, so risks of leaks or spills of oil, fuel is minor. With effective control in place such as portable toilets installation and effective waste collection and management, the impact of soil contamination due to improper waste disposal and leaks/spills is Minor. Through the adoption of mitigation measures on site mentioned in ESMP, the potential effects on the soil environment will be mitigated and reduced to Minor and Negligible impact.
- **Traffic and transport:** The assessment has considered the potential effects of construction traffic on the road network within the vicinity of Phong Nguyen Wind Farm. The assessment is based on the number of daily movements of heavy and non-heavy good vehicles. With the amount of equipment, materials and fuel needed to transport, only ten (10) movements per day is anticipated. The main transportation route is Ho Chi Minh West Trail, which is currently not much trafficked and its road condition is good. Given good practice and existing/ in-place control measures, Project impacts to traffic density and road infrastructure as a result of increased vehicle movement during the construction phase were assessed as being Minor. In addition, considering substantially higher truck traffic volumes and oversized loads could result in hazards for residents and drivers who are unaccustomed to slow manoeuvring of oversize vehicle in mountainous area. The impact on traffic safety is considered as Moderate. Prior to the commencement of construction, a detailed Traffic Management Plan (TMP) will be developed which will provide details on a range of traffic management measures including timing and routeing of vehicles movements with the aim of reducing the effect of construction traffic.

- **Biodiversity impact:** The project is located in a modified habitat which is dominated by the plantation mixed between pine (*Pinus latteri*) [IUCN NT] and *Vernicia montana* [IUCN LC]. In avian fauna terms, the mortality risks of birds due to collisions is considered Minor. Shield-nosed Leaf-nosed Bat (*Hipposideros scutinares*) [IUCN VU] was detected during field survey that is restricted-range species with Extent of Occurrence (EOO) has been estimated approximately 39,000km^2.. Additionally, the Project is unlikely to adversely affect herpetofauna. The Ecologically Appropriate Area for Analysis (EAAA) contains habitat supporting Red-shanked Douc Langur (*Pygathrix nemaeus*) [IUCN CR; VNRB EN] and Pygmy Slow Loris (*Nycticebus pygmaeus*) [IUCN EN; VNRB VU]. Field survey indicates the group of five individuals Red-shanked Douc Langur and low abundance of Pygmy Slow Loris occurring within the Project and its proximity. The existence of the Project appears to reduce the home-range of species there because of habitat loss. The main threat to the mortality of two threatened species and other mammals is illegal hunting and poaching. Therefore, training and raising awareness campaigns for employees and local communities should be organized frequently to ensure zero tolerance on possession of wildlife and forest resources. In addition, though the area has been fragmented by existing roads, fragmentation is likely to be enhanced due to the extend of these facilities. The Biodiversity Managment Plan (BMP) is recommened to exercise care to minimize any further conversion or degradation of modified habitat.
- **Economic and livelihoods:** There is no informal land user in the Project area. Also, there is no economic displacement because the Project will not result in any imposition of involuntary restrictions on the use of resources on people who live around the project area. However, the removal of forest trees, including *trau* for the construction of the Project would cause reduced volume of NTFP collection and income of NTFP dependent households, though at a minor scale. As such, an Ethnic Minority Development Plan (EMDP) is recommended to be developed, with a priority to NTFP women collectors and vulnerable households.
- **Community health and safety:** The impacts on the community health and safety are considered as Moderate during construction phase since it caused an increase on traffic concentration, level of noise and change in ambient air. In addition, construction phase may involve a number of migrant workers that may lead to conflict with local people. Since the construction phase will take place up to 12 months, the impacts will be considered as Moderate, but they will be reduced to Minor with the additional mitigation measures.
- **Impacts associated with influx issues during construction:** Risks relating to influx of construction workforce and Project-induced immigrants to the Project area have been major social concerns. The risks might include potential conflict in cultural practice and living style between the migrant group and the local indigenous people, transmission of communicable diseases, insecurity and burden on the local infrastructure and public services. The Project is likely to employ approximately 92 workers at the peak time of the construction phase. Half of migrant construction workers are expected to stay offsite at local rented houses. Given the small number of construction workforce and no significant issue between local and migrant to date as learnt from previous wind projects such as Huong Linh 1 Wind Farm, the impact is considered to be Moderate due to high vulnerability of local community in terms of local worker's right, health and safety.
- **Positive economic impacts:** The Project was identified to create a variety of employment, both direct and indirect, that brings positive economic impacts on the local economy of Huong Phung, Huong Tan, and Tan Thanh communes. Induced employment opportunities include employment through supply chains, or development of additional business opportunities to provide services to construction works.
- **Indigenous Peoples:** Potential impacts on the Van Kieu ethnic minority include reduced income and livelihoods as well as influx and non-influx community health, safety and security, at a higher significance than the Kinh. Moreover, since the ethnic minority is assessed as a natural resource dependent community, the negative impacts on their land-based livelihood is of Moderate

significance. An EMDP was developed and will be implemented as a key mitigation measure and as a means to enable IPs to access Project benefits.

- **Gender:** Project will likely pose negative impacts on women's livelihoods and health conditions due to their more vulnerable status than men. Such impacts will be most significant during the construction phase, and its consequence will last for long-term. Gender impacts on the Van Kieu ethnic minority women is assessed as of higher significance than the Kinh. Gender mainstreaming measures were emphasized in all of the Project's social management plans to ensure women's participation and benefits from all of Project's activities. The project is also classified as effective gender mainstreaming and a separate Gender Action Plan was prepared.
- **Unplanned events:** Unplanned events such as Leakage and Spill incidents, Traffic accidents, Fire and Explosion, Blade Ejection Failure, Transmission Line snapping and Transmission Pylon Collapse, Natural Hazards will have potential impact ranging from Major to Minor on the environment and community upon their likelihood of occurrence and consequence. While these events are infrequent, mitigation measures have been identified.
- **Cumulative impacts:** Cumulative impacts associated with projects will likely be experienced during the construction and operation phases of the Project, including noise impacts, Bird and bat collision, mortality and habitat loss; Economy and employment; Local Community Livelihood; Community health and safety; Infrastructure and public services; Traffic; and Indigenous Peoples. Cumulative environmental impacts on migratory birds in the area will become a concern when additional wind farms are developed in the area. Cumulative social impacts are mostly considered as Minor.

In conclusion, the construction and operation of the Project will have environmental and social impacts that are mostly of Minor to Moderate significance prior to mitigation. With implementation of the mitigation measures, the residual impacts are considered to be reduced to Negligible to Minor.

To manage and mitigate such impacts, the ESMP has been prepared. The ESMP should be read with reference to this IESE. As part of this report, a range of measures including specific environmental, health safety and social management plans have been developed to reduce the overall impacts to acceptable levels and as low as reasonably practicable to ensure compliance with Project's applicable standards.