Executive Summary - Initial Environmental and Social Examination Report

Lien Lap Wind Power Project, Huong Hoa District, Quang Tri Province

Power Construction JSC No. 1

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EXECUTIVE SUMMARY

This Initial Environment and Social Examination (IESE) presents an assessment of the potential environment and social impacts of a proposed 48MW wind power development in Tan Lap and Tan Lien Communes, Huong Hoa District, Quang Tri Province, Vietnam.

Lien Lap Wind Power Project will be developed and operated by Lien Lap Wind Farm Joint Stock Company (hereafter as "Lien Lap JSC"). PCC1 is the major shareholder who contributes 55% of total investment to Lien Lap JSC. The location and components of the Project is shown in the figure below:

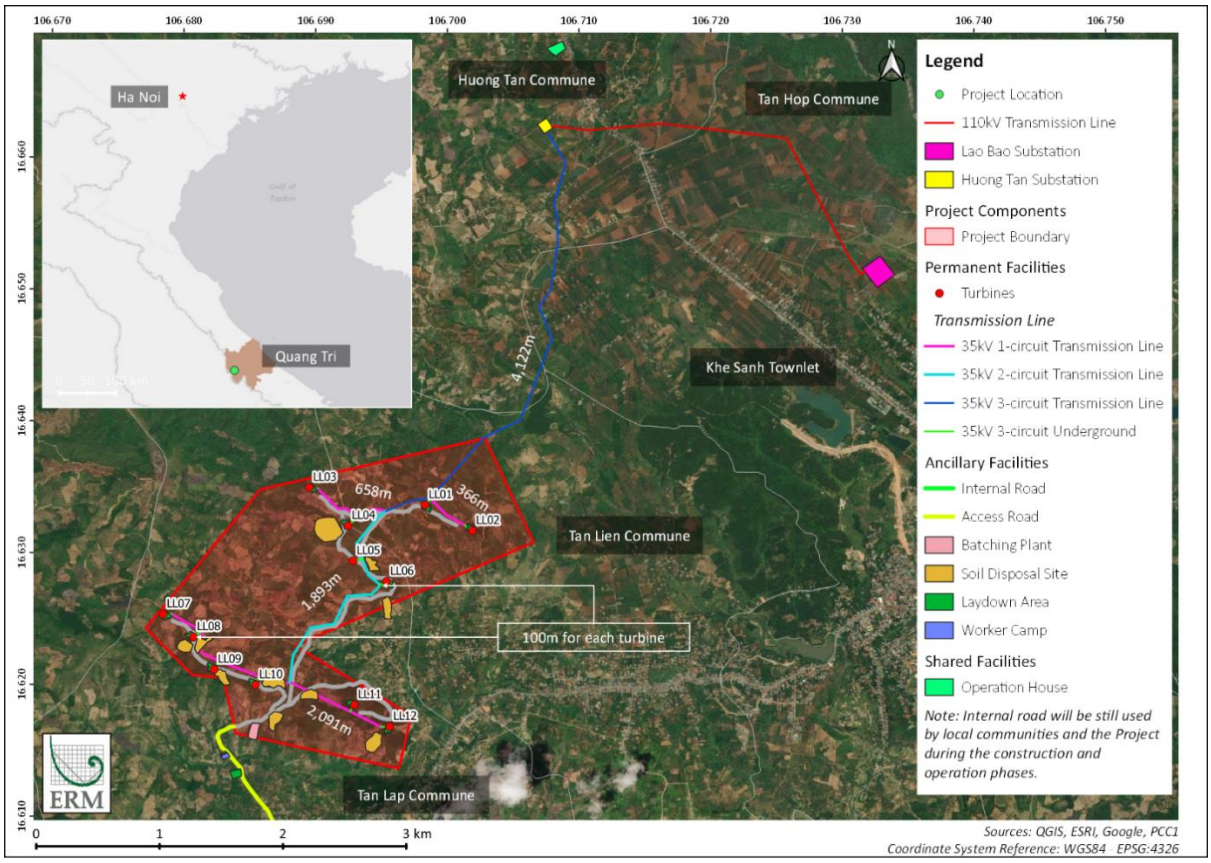

Figure 0.1 Project Location

The Project comprises twelve (12) 4 MW wind turbine generators (WTGs) with total installed capacity of 48MW and associate infrastructure including: 10,330m overhead and underground 35kV transmission line. The construction of the Project has been commenced in May 2020 and expected to commence its commercial operation in Quarter 3 of 2021.

Lien Lap Wind Power Project has received approval for Feasibility Study and the local Environmental Protection Plan (EPP) in 2020. The IESE aimed to assess the Project-related impacts regarding to environmental and social aspect against ADB Safeguard Policy Statement (ADB SPS, 2009), ADB Social Protection Strategy (2001), ADB Gender and Development Policy (1998), JICA's Environmental and Social Guidelines and associated World Bank Environmental, Health and Safety (EHS) Guidelines. The IESE is prepared based on:

(i) information provided by Client such as Feasibility Study, Site Investigation Report, Wind Measuring report, local EPP;

(ii) desktop review of reliable sources; and

(iii) additional primary baseline survey to collect data from socio-economic surveys of affected communities, noise and physical environmental baseline monitoring within and around the

Project area and biodiversity surveys (including bird, bat, terrestrial fauna and flora surveys).

The outcomes of the IESE, including mitigation measures and monitoring are summarized in the Environmental and Social Management Plan (ESMP). The ESMP will combine the mitigation and monitoring requirements identified in the local EPP and the IESE to provide an overview of future environmental and social commitments of this Project.

The IESE is comprised of three volumes (herein 13 chapters), including:

Volume 1: Introduction to describe the Project Description with detailed information of its component and area; Project Alternatives to discuss alternatives in term of power generation type, site selection and technology; applicable regulations and international standards, methodology used for the impact assessment and the scope of the IESE report.

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

Volume 3: Impact Assessment to assess the potential impacts and consequences related on each of the key receptors within the area. 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 and other International Guidelines.

Project Categorization

Environment

Environmental impacts of the Project during the construction phase will increase noise level, changes in air quality, impacts on water quality, impacts on soil erosion, terrestrial ecology, community health and safety, occupational health and safety, etc. and operational impacts on water quality that relates mainly on residual impacts from construction, impacts from shadow flicker, traffic impacts, birds/ bats impacts. Most of these impacts are limited to the wind farm components and their immediate vicinity and can be minimized through application of mitigation measures as proposed in the ESMP. As such the environmental impact of the Project is categorized as B.

Involuntary Resettlement

The resettlement of the Project is government-led and involuntary process with gaps against ADB Safeguard Requirement (SR) 2. A Land Acquisition Audit report was conducted for the Project to identify and analyse the gaps. Total number of economically affected households by the Lien Lap Project is 100 households; in which the number of households losing 10% production land or more is 22 households (120 people). It was also confirmed that there was no physical displacement for this Project. The Project is classified as Category B as per ADB SPS SR 2 for Involuntary Resettlement.

Indigenous Peoples

The Project is assessed to have limited impacts on Indigenous Peoples (Van Kieu people), i.e. Category B. As such, as required by ADB, a Livelihood Restoration and Ethnic Minorities Development Plan (LREMDP) was developed to address the gaps associated with the involuntary resettlement and the and the adverse and beneficial impacts on Indigenous Peoples.

Environmental Context

Lien Lap Wind Power Project is located in the Western and North-western part of Quang Tri province and situated in low-hilly areas that are sloping from Southwest to Northeast. The area has an elevation from 450 – 520 m above sea level. Ta Nong stream traverses the Project site that joins the Tan Tai stream, meandering south of the Project area. Baseline monitoring of physical environment condition showed that ambient environmental quality (air, noise, fresh water ground water, sediment, and soil) is relatively within the allowable standards of Vietnamese National Technical regulations.

The Project footprint is located in modified habitat including agricultural land (41.6%) and bare land of production forest (58.4%). The density of vegetation is considered low that is dominated mainly by mixed plantation area and acacia hybrid plantation. Only a small portion of the the 35 kV transmission line footprints outside of the Project's boundary footing passes through the protection forest.

Social Context

The Project's main components are located in the two communes of Tan Lap and Tan Lien of Huong Hoa District, Quang Tri Province, Vietnam. This is a mountainous area with low population density. Agriculture and forestry land comprise nearly 80% of the land use in the district. At the time of the IESE development, land at the Project site area are mainly utilized for agricultural production, including annual crops (coffee, cassava, rice, and banana) and perennial crops (acacia). No households are located on the Project site.

The directly affected communes are home to two ethnic grou ps including Kinh and Van Kieu people. Based on the social assessment, the Van Kieu ethnic minority meets the criteria in ADB's SPS SR 3 to be considered as Indigenous Peoples.

Impact Assessment

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

Key Impacts	ADB Applicable Standards	Phase	Significance of Impacts	
			Before Mitigation	With mitigation
Environmental Impacts				
Air quality	SR 1	Construction	Low risk / Medium risk	Minor
Noise	SR 1	Construction	Moderate	Minor
		Operation	Minor	Negligible
Water resource competition	SR 1	Construction	Minor	Minor
Water quality	SR 1	Construction	Moderate	Minor
Soil Compaction and Erosion	SR 1	Construction	Moderate	Minor
Soil Contamination	SR 1	Construction	Minor	Minor
		Operation	Moderate	Minor
Direct Loss of Terrestrial habitat	SR 1	Construction	Moderate	Minor
Disturbance of displacement impacts on terrestrial fauna species	SR 1	Construction	Minor	Minor
Barrier creation, fragmentation and edge effects - Terrestrial	SR 1	Construction	Minor/ 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
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	Minor
Traffic Safety	SR 1	Construction	Moderate	Minor
Electromagnetic Interference (Overhead Line)	SR 1	Operation	Minor	Negligible

Key Impacts	ADB Applicable Standards	Phase	Significance of Impacts	
			Before Mitigation	With mitigation
Electromagnetic Interference (Underground Line)	SR 1	Operation	Minor	Negligible
Electromagnetic Interference (Wind turbine)	SR 1	Operation	Negligible	Negligible
Shadow flicker impacts	SR 1	Operation	Moderate	Minor
Visual impacts	SR 1	Operation	Negligible/ Minor/ Moderate	Minor
Social Impacts				
Economic displacement and Loss of Livelihoods	SR 2	Construction	Moderate	Minor
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 1	Construction	Moderate	Minor
Benefit to local community		Construction/ Operation	Positive	Positive
General disturbance to local community	SR 2	Operation	Minor	Negligible
Gender	ADB Gender and Development Policy (1998); ADB SPS	Construction/ Operation	Minor	Minor
Indigenous Peoples	SR 3	Construction/ Operation	Moderate	Minor
Unplanned Event (Risk Assessment)				
Leakage and spill		Construction (Worker and Communities)	Moderate	Minor
		Construction (Environment)	Moderate	Minor
		Operation (Communities and Environment	Moderate	Minor

Key Impacts	ADB Applicable Standards	Phase	Significance of Impacts	
			Before Mitigation	With mitigation
Traffic Accidents		Construction (Workers and Communities)	Major	Major
Fire and explosion		Construction (Workers and Communities/Environment)	Major	Minor
		Operation (Workers and Communities)	Major	Minor
		Operation (Environment)	Moderate	Minor
Transmission line snapping and transmission pylon collapse		Operation (Workers and Communities)	Major	Moderate
Blade throw		Operation (Workers and Communities)	Major	Major
		Operation (Environment)	Moderate	Minor
Natural Hazards		Construction/Operation (Workers and Communities/ Environment)	Major	Moderate

- **Ambient Air**: Air emission from land clearing and preparation, construction of access road and internal road, turbine foundations, 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 implementation of recommended mitigation measures, air emission impacts will be reduced to minor.
- **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. Whilst the approach to assessing the operational noise is using noise model to predict wind farm noise levels at sensitive receptors that 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 (6 m/s), however, the modelling results indicated that nighttime noise may exceed IFC EHS General Guidelines at wind speed above 8 meters per second, this operational noise effect is considered as Minor as it is not expected to occur frequently based on the wind data available. Vesta's also has sound optimizing mode function to reduce noise level, and risks to be Negligible.
- **Shadow Flicker Impact:** The impact of shadow flicker during operation phase is considered to be Moderate as the Project locates at close proximity with residential areas. Based on real case scenario modelling, out of nine receptors, there are five dwellings were identified and will experience shadow flickering from nearest turbines. However, given the building structure and existing surrounding vegetation of such receptors including periodical monitoring, engagement and assessment as part of mitigation measures, the impact is likely to be reduced to be at acceptable level. The five affected households were offered to be relocated but chose to stay in their current dwellings. The relocation option will remain to be available to them in case they choose to relocate once operations starts.
- **Water resource**: The assessment has considered the potential effects of the Project on surface and ground water resources. There is one natural stream traverses through the Project site, namely Ta Nong stream. Ta Nong stream also supports the local community as a source of water supply. However, the Project will source water by procuring water from Khe Sanh Water Supply Company to supply 30 m^3 of water per day. The worker's domestic water requirement will be sourced from groundwater. The impact on water resource conflict caused by Project's activities is considered as Minor. Regarding water quality, the social baseline survey identified that the water quality of stream/creeks have recently affected by agricultural activities with pesticides and their residues. It is predicted that Project construction activities will result in impact on water quality such as 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 6.0% 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 potential impact on changes in soil quality due to accidential fuel spill/leaks and worker's activities such as disposal of waste material and domestic effluents on soil of the surrounding area. 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 impact for both.

- **Traffic and Transport:** The assessment has considered the potential effects of construction traffic on the road network within the vicinity of Lien Lap 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, around eight movements per day is anticipated. The main transportation route is National Road No. 9, which is currently lightly trafficked. 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 provides details on a range of traffic management measures including timing and routeing of vehicles movements with the aim of reducing the effect of construction to be Minor for both traffic safety and traffic density and road infrastructure.
- **Avifauna**: the operation of wind turbines potentially poses the collision risk to various bird and bat species, especially whose flights took place in Rotor Swept Zone (RSZ) (30m-180m). All bird species recorded in RSZ are listed as Least Concern in IUCN Red List and Not Listed in Vietnam Red Data Book. There are no restricted-range species and the EAAA appears not to support globally significant concentrations of migratory species. The mortality risks of birds due to collisions is considered Moderate as 49% of the birds recorded, of LC status, have flight heights which fall within the RSZ. Turbines will be prevented from freewheeling during operations to reduce risk for these species. Regarding bat, interview and survey indicated that small colonies of frugivorous insectivorous bats can roost in a few huts or hollow trees/foliage in orchid gardens/plantations. Shield-nosed Leaf-nosed Bat (Hipposideros scutinares) [IUCN VU] was detected during field survey that is restricted-range species with Extent of Occurrence has been estimated approximately 39,000km^2. The species appears to fly and forage under the canopy. Furthermore, the collision risk of this species is considered Low. Non-volant mammal and herpetofauna found within the Project area are not species of conservation interest. The project is unlikely to adversely affect these species. The wind turbines will be equipped with monitoring and deterrent system to reduce impacts.
- **The Ecologically Appropriate Area for Analysis (EAAA)** does not contain Critical Habitat. The flora species were found within the Project area is common excepting for three individuals of Burma Padauk (Pterocarpus macrocarpus) which is listed as Endangered in IUCN Red List and Vietnam Red Data Book.The ESMP includes measures to minimize impact to these individuals. These have not been included in the vegetation cleared for the project.
- **Land Acquisition and Economic Displacement:** The Project development required production forest and agriculture land from organization, households and individual from Bu, Tan Thuan and Tan Tai villages of Tan Lap commune, Tan Hao village of Tan Lien commune, Tan Vinh village of Huong Tan commune, and Residential Group No. 7 of Khe Sanh Town. 100 households were identified as economically displaced by the Project, among whom, 22 households with 120 people lose from 10% of their production land. No physical displacement occurred. Land acquisition followed the Government-led process. Key impacts are associated with the land-based livelihood of the displaced households and assessed as Moderate. Short-term disturbance to agriculture production in the neighbourhood is also expected at Minor significance. In order to mitigate these impacts, a Livelihood Restoration and Ethnic Minority Development Plan (LREMDP) and Stakeholder Engagement Plan (SEP) including Community Grievance Mechanism have been developed. With implementation of the recommended mitigation measures, the residual impacts are expected to remain Minor and Negligible, respectively.
- **Community health and safety:** the Project is likely to employ approximately 92 workers, at the peak time of the construction phase. Of which, only 18% of construction workers are local labourers Half of migrant construction workers are expected to stay offsite in either temporary worker

accommodation or local boarding houses. This is predicted to result in potential conflict and tension due to the difference in culture and living style between two groups. Therefore, the impacts on the community health and safety are considered moderate during construction but they will be reduced to minor with implementation of mitigation measures including Labor Management Plan.

- **Economic Impacts:** Positive economic impacts are expected to local employment and procurement during the construction phase, and impacts on the local economy relating to tax revenue, local employment and tourism development during operation phase. With the application of measures to optimise these benefits such as adopting specific procurement policies and hiring protocols and priorities, the positive impacts on local people in Huong Hoa district will be enhanced.
- **Indigenous Peoples:** Potential impacts on the Van Kieu ethnic minority include the loss of livelihood and income from land, and potential for social conflicts among the community as a result of influx of labor and other economic migrants. Although the scope of land acquired from the Van Kieu people is quite limited, the ethnic minority is assessed as dependant on land-based livelihood, hence the impact is of moderate significance. An LREMDP 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 condition 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 and recommended accordingly.
- **Cumulative impacts**: Cumulative impacts associated with existing and near future neighbouring projects will likely be experienced during the construction and operation phases of the Project, including Noise impacts, Bird and Bat strike 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. The cumulative impacts on visual amenity unlikely generate, so it is considered as Minor. Cumulative social impacts are mostly considered as Small scale negative.

In conclusion, the construction and operation of the Project will have environmental and social impacts 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 impact, 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 Applicable Standards.