Ex-Ante Evaluation (for Japanese ODA Loan)

Private Sector Investment Finance Division,
Private Sector Partnership and Finance Department, JICA

1. Name of the Project

(1) Country: Lao People's Democratic Republic ("Lao PDR" or "the Country")
(2) Project site / Target area: Sekong and Attapeu Provinces
(3) Project: Monsoon Wind Power Project ("the Project")
Loan Agreement: February 25, 2023

2. Background and Necessity of the Project

(1) Current State and Issues of the the Electric Power Sector in Lao PDR

Lao PDR defines the development of power resources as a major source of foreign currencies on the back of ample hydropower resources of the Mekong River and other water sources. Of the country's installed generation capacity of 6,917 MW (as of 2020), some 40% or about 2,800 MW have been developed for export, according to JICA. Around 6% of the country's revenue comes from power sales. These figures are expected to increase. Vision 2030, which lays out the Country's development goals, includes the goal of promoting grid interconnections in the ASEAN region, according to the IMF.

In its Ninth National Socioeconomic Development Plan for 2021–2025, the Lao government charts the direction toward more diversified power sources. Specifically, it aims to change the energy mix in which hydraulic power accounted for 80%, thermal power 19%, and other sources 0.4% in 2021 to an energy mix in which hydraulic represents 65%, thermal 30%, and renewable 5% by 2025 with a total installed capacity of 10,218 MW, according to JETRO and JICA. More than 60% of power supply in Lao PDR comes from independent power producers, according to Nomura Research Institute. The country's development plan predicts that private funds will account for 85% of the total power supply.

Lao PDR exports power mainly to Thailand, Vietnam, and Cambodia. In 2021, the country sold 572 MW of power to Vietnam Electricity (EVN). The Lao and Vietnamese governments have agreed that Lao PDR will sell to Vietnam up to 3,000 MW of power by 2025 and up to 5,000 MW of power by 2030 based on the memorandum of cooperation they signed in September 2016.

It is under these circumstances that the Project will construct and operate

Lao PDR' first facilities for wind power generation by IPPs. Its contribution to the country will include increased generation by renewables through the development of a new power source, climate change mitigation through the promotion of renewable energy, and private investment stimulation. The Project is thus aligned with the policy of the Lao government. The Project is mentioned in the power generation plan of the Vietnamese government. It is expected to contribute to alleviating power crunches and combating climate change in Vietnam. In its Nationally Determined Contribution (NDC), the Vietnamese government has set a target of reducing greenhouse gas emissions by 25% by 2030 compared with the business-as-usual scenario. The draft National Electricity Master Plan VIII (PDP8) of Vietnam aims to sharply increase the country's wind power capacity among other targets, from 630 MW in 2020 to 18,010 MW by 2030. The NDC states that international support is crucial to attain these targets. The Project is expected to help the Vietnamese government achieve them as well. The Project will also help strengthen connectivity in the Mekong region, since it involves cross-border power sales to Vietnam.

(2) Japan and JICA's Policy and Operations in the Electricity Sector

Japan's Country Assistance Policy for Lao People's Democratic Republic of April 2019 states that Japan will support more power interchange with the the neighboring countries in the priority area of "strengthening connectivity with countries in the region on the tangible and intangible fronts" based on the Japan-Lao PDR Joint Development Cooperation Plan. The JICA Country Analysis Paper for Lao People's Democratic Republic of March 2015 defines electric power development as one of the priorities in the category of socioeconomic infrastructure development. From 2017 to 2020, JICA conducted the technical cooperation project titled "Project on Power System Master Plan" to support power interchange and stable power supply in the Mekong region as well as to help Lao PDR increase its power exports. This project assisted in the formulation of a road map and a grid plan, both of which were aimed at expanding power interchange through a system of broad-based cooperation with neighboring countries. JICA is now supporting the Lao Ministry of Energy and Mines in building the capacity to develop and implement its policies through the "Power Policy Advisor" project (September 2022 – August 2024). In Vietnam, JICA plans to implement a technical cooperation project titled "capacity development project for power

grid operation toward massive deployment of variable renewable electricity" from June 2023 to June 2026. The aim is to build the country's grid operation capacity in anticipation of more deployment of renewables in the country. JICA focuses on assistance aimed at effectively encouraging the low- and de-carbonization of energy based on JICA Global Agenda on Energy and Mining. It also promotes co-benefit climate change measures designed to address development issues and take climate actions at the same time. The Project will contribute to strengthening power interchange between Lao PDR and Vietnam and achieving carbon reduction at the same time by building and operating a wind farm in Lao PDR, which in turn will support power supply in Vietnam.

(3) Other Donors' Activity

The World Bank and the ADB supports the electric sector in Lao PDR with focus on power generation and distribution, and rural electrification. Major donors, including JICA, coordinate their assistance as necessary through information exchanges and other measures.

3. Project Description

(1) Project Description

① Project Objective

The objective of the Project is to increase power generation from renewable energy sources in Lao PDR through the construction and operation of a wind farm and related facilities in Sekong and Attapeu Provinces, thereby contributing to alleviating power crunches and reducing greenhouse gas emissions in the neighboring country.

② Project Component

Construction and operation of a wind farm with a rated capacity of 600 MW), and transmission, conversion, and other facilities

③ Project Beneficiaries (Target Group)

Neighboring Vietnam, a recipient of electricity generated by the Project

(2) Total Project Cost: 988.4 million US dollars (of which 120 million US dollars are financed by JICA)

(3) Project Implementation Schedule (Cooperation Period):

The construction will start in March 2023 and will be completed in December 2025

(4) Project Implementation Structure

1) Borrower: 2) Guarantor: None

3) Executing Agency:

4) Operation and Maintenance Agency:

(5) Collaboration and Sharing of Roles with Other Projects and Donors: None in particular

(6) Environmental and Social Consideration

1) Environmental and Social Consideration

① Category: A

② Reason for Categorization: The Project falls into the categories of "sensitive characteristics" and "sensitive areas" as per the JICA Guidelines for Environmental and Social Considerations of January 2022.

③ Environmental Approval: The domestic laws of Lao PDR require the implementation of a social and environmental impact assessment (ESIA) for the Project. In July 2022, the Project obtained a license related to environmental and social considerations from Lao government authorities.

④ Pollution Control: Air pollution, noise, water pollution, waste, and shadow-flicker caused by the construction work and during operation will be mitigated by measures that meet the Country's and international standards.

⑤ Natural Environment: The site of the Project is situated near areas that are thought to require careful considerations for the host country or region. Specifically, these areas include Dakchung Plateau (Important Bird Area (IBA)) and Phou Ahyon (Alliance for Zero Extinction (AZE) site). Precious species have been confirmed to exist in these areas, which have been confirmed to be home to precious species on the Red List of the International Union for Conservation of Nature and Natural Resources (IUCN). Specifically, they include precious birds (2 VU species and 8 NT species), precious mammals (4 CR species, 7 EN species, and 10 VU species), herptiles (4 EN species, 6 VU species, and 1 NT species), fishes (5 EN species), and plants (1 EN species, 1 VU species, and 3 NT species). Species that may be new species have also been found in these areas, which are thus thought to fall under the category of critical habitats. The requirements for formulating and implementing a project in a critical habitat have been

confirmed. A number of measures have been proposed to alleviate the impact. These include installing turbines as far away from a primary forest habitat, monitoring contact and fatal accidents involving wild animals, and attaching balls or bird diverters of a dominant color to power lines to highlight their existence .

⑥ Social Environment: The Project will involve the acquisition of some 1,260 hectares of land (of which 195.9 hectares of land will be acquired permanently and the remaining 1,064.1 hectares will be acquired temporarily). It will not involve, however, involuntary relocations of residents, because the layouts of the facilities, including access roads and power lines, are designed to avoid physical relocations. Four ethnic groups reside in the project site. They fall under the category of indigenous peoples in the JICA Guidelines for Environmental and Social Considerations. Accordingly, it has been confirmed that measures will be taken in line with the JICA Guidelines. The Project will affect local farmland and forest resources. It has thus been confirmed that appropriate compensation will be made and livelihood recovery support will be provided.

⑦ Other/Monitoring: During the construction and operational phases, the EPC contactors and sponsors will monitor the impact of the Project, including the noise and shadow flicker it will generate, on the local ecosystems and socioeconomic conditions.

(7) Cross-Sectoral Issues: None in particular

(8) Gender Category:

[Gender issues] ■GI (S) (Gender Activities Integration Project)

<Reason for Categorization> The ADB has established a set of performance indicators from the gender perspective in its gender action plan for the Project. One such indicator shows at least 30% of the jobs during operations held by women. The Project plans to apply for 2X Challenge recognition (Financing for Women) as it meets 2X Challenge's two direct criteria for employment. The Project meets one of the two criteria because some 30% of the jobs created will go to businesses by female entrepreneurs, and it also meets the other criterion: 3B, one "quality" indicator beyond compliance..

(9) Other Important Issues: None in particular.

4. Targeted Outcomes

(1) Quantitative Effect

1) Outcomes (operation and effects indicators)

Indicator	Baseline (2022 results)	Target (2028) (Three years after completion of the Project]
Capacity factor (%)		29.2
Total maximum output (MW)		600
Net electric energy production (GWh/year)		1,536
CO_2 emissions reductions (ton/year)		757,741

(2) Qualitative Effects

The diversification of power sources, the promotion of private investment, and the alleviation of power crunches in neighboring countries

5. External Factors and Risk Control

None in particular

6. Lessons Learned from Past Projects

The ex-post evaluation of a past renewable energy project of a similar kind noted that aging grid facilities failed to meet soaring demand. This resulted in an inadequate capacity of the existing facilities upon connection to the central energy system, temporarily affecting the amount of electricity transmitted. The lesson learned for future projects is that it will be useful to analyze the grid capacity via a feasibility study or similar study and take such analyses into account during project feasibility assessment. Learning from this lesson, the project appraisal assessed the installed transmission capacity and confirmed that the power grid will not be affected.

7. Evaluation Results

The Project is consistent with the Country's development issues and policies, as well as Japan and JICA's cooperation policies and analyses. It will contribute to achieving two SDGs: Goal 7 (sustainable energy) and Goal 13 (climate action). It will also contribute to strengthening connectivity in the Mekong region in the electricity sector, which in turn will support the

pursuit of economic prosperity, one of the three pillars of the FOIP vision. Therefore, it is highly necessary for JICA to provide assistance through the Project.

8. Plan for Future Evaluation

(1) Indicators to be used:

As shown in Section 4

(2) Timing:

Ex-post evaluation

Three years after the completion of the Project

END