

Ex-Ante Evaluation (for PSIF Loan)

Private Sector Investment Finance Division 1 Private Sector Partnership and Finance Department Japan International Cooperation Agency

1. Name of the Project

- (1) Country: Democratic Republic of Timor-Leste
- (2) Project Site / Target Area: Manatuto
- (3) Project Name: Timor Solar Independent Power Project
- (4) Borrower: Manatuto Renewables Power S.A. (hereinafter referred to as the “Borrower”)
- (5) Loan Agreement: June 16th, 2026

2. Background and Necessity of the Project

- (1) Current Status and Challenges of the Power Sector in the Country and Positioning of the Project

Timor-Leste was under Portuguese colonial rule from the 18th century, followed by Indonesian occupation from 1975, and regained independence in May 2002 after a period of conflict and reconstruction. Since independence, the country has received substantial assistance from Japan and other development partners to support reconstruction and development. Supported by revenues from oil and natural gas resources, Timor-Leste subsequently experienced economic growth and entered a development phase. However, compared with other member states of the Association of Southeast Asian Nations (ASEAN), the country continues to face a number of political and economic challenges, including a vulnerable economic structure heavily dependent on petroleum revenues, uncertainty regarding the sustainability of such revenues, and a lack of industrial development.

In the power sector, the country has an installed generation capacity of approximately 300 MW against a peak demand of only 87 MW, and has achieved nearly 100% electrification. On the other hand, approximately 99.8% of annual electricity generation is supplied by diesel-fired power plants (IRENA, 2022), resulting in concerns regarding environmental impacts and high generation costs.

Future electricity demand is expected to increase as electrification progresses in rural areas where stable electricity access has not yet been fully secured. The

government estimates that peak demand will reach approximately 506 MW. At the same time, however, considering the country's relatively small population, limited industrial base, and the fact that major electricity consumers are largely confined to hotels and supermarkets, a rapid surge in demand is not anticipated in the near term, and there are currently no significant concerns regarding supply shortages.

On the other hand, the majority of electricity supply is generated by thermal power plants fueled by imported diesel, which is expensive. While these power plants can technically be converted from diesel to heavy fuel oil, which is less expensive, and eventually to natural gas, the necessary facilities for handling and storing heavy fuel oil have not yet been developed. Furthermore, conversion to natural gas has been deferred due to the substantial investment and long lead time required. As a result, similar to many Small Island Developing States (SIDS), Timor-Leste faces some of the highest electricity generation costs in the world.

Electricidade de Timor-Leste (EDTL), the state-owned power utility of Timor-Leste (hereinafter referred to as “EDTL”), incurs annual fuel costs exceeding USD 100 million, accounting for approximately 90% of its operating expenses. Since electricity tariffs are set below the cost of generation, EDTL operates at a deficit and relies on government budget support, thereby placing a significant fiscal burden on the Government of Timor-Leste (ADB, 2016).

(2) Japan's and JICA's Cooperation Policy for the Power Sector in Timor-Leste and Positioning of the Project

This Project supports the development of renewable energy in Timor-Leste and contributes to the second pillar of the Free and Open Indo-Pacific (FOIP), namely “Addressing Challenges in an Indo-Pacific Way,” particularly in the areas of climate change, environmental sustainability, and energy security.

The Project is also consistent with Japan's Country Development Cooperation Policy for Timor-Leste (September 2024), especially the priority area of “Strengthening the Foundation for Economic Growth and Industrial Diversification,” and contributes to the corresponding Cooperation Program for Infrastructure Development.

In addition, the JICA Country Analysis Paper for Timor-Leste (March 2023) identifies “Strengthening the Foundation for Growth” as a key priority area and highlights the importance of supporting decarbonization through the use of cleaner energy sources. Furthermore, JICA's Global Agenda on “Resources and

Energy” promotes the realization of an energy transition and the advancement of decarbonization measures. Accordingly, the Project is fully aligned with these policies and analytical frameworks.

3. Project Description

(1) Project Description

① Project Objective

The Project aims to reduce Timor-Leste's dependence on fossil fuels and contribute to the reduction of greenhouse gas emissions through the construction and operation of a 73.7 MWac solar photovoltaic power plant and an 80.2 MWh battery energy storage system (BESS), together with associated facilities, in Manatuto Municipality, Timor-Leste.

② Project Components

The Project consists of the construction and operation of the following facilities:

- A 73.7 MWac solar photovoltaic power plant;
- An 80.2 MWh battery energy storage system (BESS); and
- Associated facilities, including a substation and related transmission infrastructure.

③ Project Beneficiaries (Target Group): The citizens of Timor-Leste.

(2) Estimated Project Cost

Approximately 107.1 million USD (JICA loan: Approximately 12.2 million USD)

(3) Schedule

Construction commencement in 3Q 2026; construction completion scheduled for 3Q 2028; final loan repayment due in 3Q 2046.

(4) Project Implementation Structure

- 1) Borrower: Manatuto Renewables Power S.A.
- 2) Guarantor: NA
- 3) Executing Agency: Manatuto Renewables Power S.A.
- 4) Operation and Maintenance System: I-Environment Investments Pacific Pty. Ltd., a wholly owned subsidiary of Itochu Corporation, and EDF Power Solutions S.A., a subsidiary of EDF.

(5) Collaboration and Sharing of Roles with Other Donors

JICA has been working with the International Cooperation Department (ICD) of the Research and Training Institute which belongs to the Ministry of Justice of

Japan since 2009 to support the development of the country's legal system. As a result of these efforts, a Decree-Law for the management and use of State-owned real estate was enacted in 2025, making the use of state-owned land by the private sector possible. This Project is also being implemented on the basis of that legal framework.

(6) Environmental and Social Consideration

- ① Category: B
- ② Reason for Categorization: This project is deemed to have minimal adverse impacts on the environment and society under the “JICA Guidelines for Environmental and Social Considerations” (promulgated in January 2022).
- ③ Environmental Permits: The Environmental and Social Impact Assessment (ESIA) Report for the Project was approved by the Secretary of State for Environment of the Democratic Republic of Timor-Leste in January 2025.
- ④ Pollution Control Measures: Potential impacts such as dust, noise, and waste generation may arise from land development and civil works during construction. To mitigate impacts on surrounding communities, topsoil removed during site preparation will be collected and progressively restored, and other appropriate mitigation measures will be implemented. Environmental impacts are therefore expected to be minimal.
- ⑤ Natural Environment: Although coral reefs, mangrove forests, and wetlands exist in the vicinity of the Project area, the Project site does not overlap with such environmentally sensitive areas. Accordingly, adverse impacts on the natural environment are expected to be minimal.
- ⑥ Social Environment: The Project site is located on state-owned land in Timor-Leste, which will be leased to the Borrower. The Project will not involve involuntary resettlement.
- ⑦ Other (Monitoring): During both the construction and operation phases, monitoring of air quality, noise, and other environmental parameters will be conducted by EDTL, the Project Offtaker.

(7) Cross-Sectoral Issues: N/A

(8) Gender Category: [Gender Project] GI(S) Gender Activity Integration Project

<Reason for Categorization>

In Timor-Leste, violence against women and girls and gender-based violence (GBV) remains serious social issues. While measures for prevention and response have been developed primarily by government agencies and public

service providers, efforts to address workplace violence and harassment within the private sector, including the energy sector, remain insufficient.

The Project explicitly adopts a zero-tolerance policy toward all forms of violence and harassment. The Borrower will establish secure and accessible reporting channels, ensure access to support services such as counseling and leave arrangements, and develop and implement policies addressing domestic and family violence affecting employees.

These measures are expected to contribute to the prevention of intimate partner violence (IPV) and domestic violence (DV), protect survivors, and strengthen mechanisms for reporting, support, and response. Through these efforts, the Project is expected to raise awareness of harmful behavior and promote positive changes in workplace culture.

Furthermore, the involvement of a project company supported by development finance institutions and sponsored by major international companies is expected to facilitate the introduction of similar policies and practices by other private-sector entities in Timor-Leste. In addition, the Project is considering collaboration with local schools and local NGOs to provide capacity-building opportunities.

(9) Other Important Issues: N/A

4 . Targeted Outcomes

(1) Quantitative Effects

Outcomes (Operation and Effect Indicators)

Indicator	Baseline (FY2025 Actual)	Target (FY2029) 2 years after the Completion
Solar PV Plant Capacity Utilization Rate (%)	-	21.5%
Maximum Output of Solar PV Plant (MW)	-	73.7MW
Electricity Delivered at Transmission End (GWh/year)	-	135GWh
GHG Emission Reduction from Solar PV (t/year, CO ₂ eq.)	-	93,785t
BESS Rated Active Power (MW)	-	36MW

Number of jobs created during construction	-	100
Number of jobs created during operations	-	10

(2) Qualitative Effects

Stable and diversified electricity supply through renewable energy that is not dependent on diesel-based power generation; promotion of private-sector investment in the renewable energy sector; and improvement of the home environment of employees through the development and implementation of policies addressing domestic and family violence.

5 . External Factors and Risk Control

N/A

6 . Lessons Learned from Past Projects

In similar renewable energy projects implemented in the past, expansion of generation capacity did not keep pace with rapidly increasing demand due to aging power system infrastructure. As a result, transmission and distribution constraints emerged after commissioning, temporarily limiting the utilization of generated electricity. A key lesson learned from these experiences is the importance of conducting a thorough analysis of transmission and distribution system capacity at the feasibility study (F/S) stage and incorporating the results into project design and appraisal.

For the Project, due diligence confirmed that electricity generated by the Project can be transmitted without constraint. Timor-Leste currently has approximately 300 MW of installed generation capacity and peak demand of about 90 MW, leaving a relatively comfortable reserve margin. Existing generation, transmission, and distribution facilities were developed mainly in the early 2010s, and given that the typical design life of major infrastructure is around 40 years, substantial remaining service life is expected. Although the National Dispatch Center (NDC) currently relies on manual operation despite the introduction of a SCADA system, the Asian Development Bank (ADB) is supporting the installation of a Distribution Automation System (DAS). In addition, ADB is providing capacity-building support and additional training for EDTL to facilitate the integration of renewable energy into the power system. Accordingly, no significant concerns have been identified regarding system operation and

reliability.

In a post-evaluation of a solar power project implemented in Timor-Leste in the past which is unrelated to the current Project at the Manatuto site, damage to solar panels was reported because local residents continued hunting in the project area after construction, as the site had previously been used as a hunting ground. The evaluation highlighted the importance of engaging local stakeholders during project preparation and obtaining community understanding of land use changes and project impacts.

In response to this lesson, the Project has conducted multiple stakeholder consultations, including with local communities, during project preparation. Construction schedules as well as environmental and social management plans have been disclosed and discussed with local stakeholders. Furthermore, because the Project will be comprehensively managed by experienced Japanese and French sponsors, its implementation structure, design, and operation differ significantly from those of grant-funded projects, reducing the likelihood of similar issues. During appraisal, it was also confirmed that physical access by local residents will be restricted through the installation of fences and security measures and that a mechanism will be in place to ensure prompt repair by the Project Company in the event of any damage.

7 . Evaluation Results

As described above, the Project is consistent with the development challenges and policies of Timor-Leste, as well as Japan's cooperation policy. Given the Project's necessity, the adequacy of its design, and the strong likelihood of achieving its intended objectives, JICA's support through Overseas Investment and Loan (OIL) is considered highly relevant.

8 . Plan for Future Evaluation

(1) Indicators to be Used

As indicated in Section 4.

(2) Future Evaluation Schedule

Ex-post evaluation: 2 years after the Completion

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