Mid-Term Evaluation Report

Project Title:

Accelerating Clean Energy Access to Reduce Inequality (ACCESS) Project

Project ID: 00126434 (ACCESS IDN) 00126532 (ACCESS TL)

Project Countries: Indonesia and Timor-Leste

MTE time frame: January 5th, 2023 – June 13th 2023

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ACRONYMS AND ABBREVIATIONS

ACCESS	Accelerating Clean Energy Access to Reduce Inequality
BAKTI-MOIC	*Badan Aksesibilitas Komunikasi dan Teknologi Informasi*/Technology and Accessibility Agency – Ministry of Communication and Informatics
B2TKE	*Balai Besar Teknologi Konversi Energi*/Center for Energy Conversion Technology
BPPT	*Badan Pengkajian Dan Penerapan Teknologi*/Agency for the Assessment and Application of Technology
BRIN	*Badan Riset dan Inovasi Nasional*/National Research and Innovation Agency
BTL, E.P.	*Bee Timor-Leste, Empressa Pública*
BUMDes	*Badan Usaha Milik Desa*/Village Owned Enterprise
DFS	Detailed Feasibility Study
DG REEC	Directorate General of Renewable Energy and Energy Conservation
EBT	New and Renewable Energy
EDTL, E.P.	*Eletricidade de Timor-Leste, Empressa Pública*
EPC	Engineering, Procurement, and Construction
EoI	Expression of Interests
FPIC	Free, Prior and Informed Consent
FMG	Facility Management Group
GESI	Gender Equality and Social Inclusion
GoTL	Government of Timor-Leste
GPU	Global Procurement Unit
IDN	Indonesia
KDS	Korean Institute for Development Strategy
KOICA	Korean International Cooperation Agency
LTSHE	*Lampu Tenaga Surya Hemat Energi*/Highly Efficient Solar Lamp System
MEMR	Ministry of Energy and Mineral Resources, Indonesia
MPW	Ministry of Public Works
MSA	Ministry of State Administration, Timor-Leste
MTE	Mid-Term Evaluation
MPW	Ministry of Public Works, Timor-Leste
MoCI	Ministry of Communication and Informatics, Indonesia
NREP	National Rural Electrification Plan
PATS	*Pompa Air Tenaga Surya*/Solar Powered Water Pump
PEAP	Patriot Energy ACCESS Program
PLN	*PT. Perusahaan Listrik Negara (Persero)*/State Electricity Company
PLTMH	Micro-Hydro Power plant
PLTS	*Pembangkit Listrik Tenaga Surya*/Solar Power Plant
PMU	Project Management Unit
POPP	Programme and Operations Policies and Procedures
PPSDM-KEBTKE	*Pusat Diklat Ketenagalistrikan, Energi Baru, Terbarukan dan Konservasi Energi***/**Centre for Human Resources Development in New, and Renewable, and Energy Conservation
RBAP	Regional Bureau for Asia-Pacific
RESCO	Renewable Energy Service Company/Institution
RUED	*Rencana Umum Energi Daerah*/Local Energy General Plan
RUEN	*Rencana Umum Energi Nasional*/National Energy General Plan
SDP	Strategic Development Plan
SSTC	South-South and Triangular Cooperation
TOR	Terms of Reference
TL	Timor-Leste
UNDP	United Nations Development Programme
UPLD	*Unit Pengelola Listrik Desa*/Electricity Service Unit

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We would also like to extend our heartfelt thanks to all the respondents who generously dedicated their time to meet with the evaluators. Their insights, feedback, and perspectives on the project's performance and results were essential in providing a comprehensive assessment. Their willingness to share their knowledge and experiences played a vital role in enriching the evaluation findings and recommendations.

Furthermore, we would like to acknowledge the efforts of the project team members, stakeholders, and partners who were involved in the implementation of the ACCESS project. Their dedication, hard work, and contributions have been instrumental in achieving the project's objectives and making a positive impact on the communities in Indonesia and Timor-Leste.

Finally, we express our appreciation to all individuals and organizations who provided support and guidance during the evaluation process. Their expertise, input, and collaboration were invaluable in ensuring the credibility and rigor of the evaluation.

PROJECT SUMMARY TABLE

Reporting Period	Mid-Term Evaluation
Donor	Korea International Cooperation Agency (KOICA)
Country/ies	Indonesia and Timor-Leste
Project Title	Accelerating Clean Energy Access to Reduce Inequality (ACCESS)
Project ID	00126434 (ACCESS IDN) 00126532 (ACCESS TL)
Project Outcomes & Outputs	Outcomes: 1. Localized implementation of SDGs No.7 Affordable & Clean Energy through the provision of access to renewable-based electricity. 2. Strengthened South-South and Triangular Cooperation (SSTC) between Indonesia and Timor-Leste in promoting the use of clean energy in rural areas. Outputs: 1. Renewable-based power plants built to provide sustainable access to electricity for remote villagers in Indonesia with institutional and local capacity in place. 2. Under SSTC between Indonesia and Timor-Leste: solar PV water pumps and Highly Efficient Solar Lamp System (LTSHE) are installed in remote villages in Timor-Leste providing sustainable access to clean water and lighting.
Strategic Plan and/or CPD Outcomes	**Strategic Plan Output 2.1.1** Low emission and climate resilient objectives addressed in national, sub-national, and sectoral development plans and policies to promote economic diversification and green growth. **CPD (2021-2025) Outcome 2** Institutions and people contribute more effectively to advance a higher value-added and inclusive economic transformation. **CPD Outcome Indicator 2.6** Percentage of renewable energy in national energy mix; Baseline: 8.55% (2019); Target: 23% (2025). **CPD Output 2.3** Low emission and climate-resilient objectives addressed in development plans and policies to promote economic diversification and green growth (Strategic Plan Output 2.1.1).
Implementing Agency/Partner(s)	Indonesia: UNDP Indonesia, Ministry of Energy and Mineral Resources (MEMR). Timor-Leste: UNDP Timor-Leste, Ministry of State Administration (MSA).
Project Start Date	01 May 2020
Project End Date	31 December 2023
Total Resources Required	KOICA: USD 18,028,059 (allocation for Indonesia: USD 15,028,509 and for Timor-Leste: USD 3,000,000)

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1. Executive Summary

The ACCESS (Accelerating Clean Energy Access to Reduce Inequality) Project is a partnership between Indonesia's Ministry of Energy and Mineral Resources, Timor-Leste's Ministry of State Administration, and the United Nations Development Programme (UNDP) in Indonesia and Timor-Leste. The project aligns with and supports the accelerated electrification efforts in rural areas through the funding provided by KOICA (Korea International Cooperation Agency). The funding is directed towards the development of solar PV power plants (PLTS), solar water pumps (PATS), and Highly Efficient Solar Lamp Systems (LTSHE). These initiatives aimed to increase the number of communities with access to self-generated energy, contributing to the overall goal of expanding electricity availability in rural locations. ACCESS, with its focus on renewable energy solutions, plays a vital role in promoting sustainable and efficient electrification in these underserved areas. In Indonesia, the ACCESS project are located in 23 villages in East Nusa Tenggara, West Sulawesi, Southeast Sulawesi, and Central Kalimantan Provinces, while in Timor-Leste in 25 villages in Atauro, Bobonaro, and Manatuto municipalities.

This Mid-Term Evaluation (MTE) was commissioned by the UNDP Indonesia and Timor-Leste Country Offices. The objective of this MTE was to assess progress towards the achievement of the project objectives and outcomes as specified in the Project Document. It identified early signs of project success or failure with the goal of identifying the necessary changes to be made to set the project on-track to achieve its intended results. The MTE also reviewed the project's strategy and its risks to sustainability. The scope of the MTE covers project implementation from May 2020 to February 2023.

This evaluation utilized a combination of qualitative and quantitative approaches, employing various data collection methods such as desk review, key informant interviews (KII), focus group discussions (FGD), and field observations. This was based on their suitability for obtaining a comprehensive and thorough understanding of the evaluation's target audiences. Desk review preceded KII, FGD, and field observation in selected target locations in the two countries.

The summary of the findings is elaborated below.

Project Relevance

The ACCESS project was relevant to the social, economic, and political environment in both Indonesia and Timor-Leste. It helped address the demand for electricity, particularly in the eastern part of Indonesia where electrification is a priority. Through South-South Triangular Cooperation (SSTC) between the Republic of Korea, Indonesia, and Timor-Leste, the project responded to the demand for access to clean water supply and electricity in the rural part of Timor-Leste's municipalities where basic infrastructure was lacking.

Project Progress

The ACCESS project in Indonesia achieved its overall targets for Activity 1.2 (Local capacity building for operation and maintenance of the built energy infrastructures), 1.3 (Local institution establishment to enhance sustainability and scaled-up use of built energy infrastructures), and 1.4 (Results dissemination and planning for scaling up). These activities achieved "Satisfactory" rating (Activity 1.3 and Activity 1.4) and "Highly Satisfactory" (Activity 1.2). However, during the MTE period, the project did not fully achieve the target for Activity 1.1 (Renewable-based energy infrastructures construction that provides access to electricity for households in targeted villages in Indonesia that can be monitored remotely) which only achieved "Moderately Unsatisfactory" rating due to the extended procurement process for the Solar PV Power Plant). There were various aspects that contributed to the delay such as Covid-19 pandemic, global crisis which caused the price to increase, and the internal arrangement of EPC contractor which delayed implementation.

Similarly, the ACCESS project implementation in Timor-Leste faced delays in the implementation of clean water component of Activity 2.1 (Renewable-based energy infrastructure construction that provide access to clean water for households and installation of Highly Efficient Solar Lamp System or LTSHE in targeted villages in Timor-Leste) and Activity 2.3 (Establishment of viable operations and maintenance mechanism to ensure service sustainability) due to procurement challenges. Nevertheless, The LTSHE component of the Activity 2.1. has been achieved. As a result, the activity 2.1 only achieved a "Moderately Satisfactory" rating.

Activity 2.3 achieved "Moderately Unsatisfactory" because the project has not formally established O&M of PATS groups in beneficiary aldeias. This rating can be attributed to the prolonged procurement process of solar water pumps for output 2.1, while output 2.3 is reliant on the successful completion of output 2.1 before progressing further. Meanwhile the target for Activity 2.2 (Local Operator training) has been achieved with a minor shortcoming and therefore achieved "Satisfactory" rating.

Effectiveness and efficiency

In terms of project management effectiveness and efficiency, this evaluation found the governance structure of the ACCESS project for both Indonesia and Timor-Leste to be adequate in supporting its objectives, as the project achieved most of its activity targets. The Project Board and Project Management Unit (PMU) were effective in providing strategic directions and solutions to the challenges encountered during project implementation. They also applied adaptive management to address delays due to Covid-19 pandemic restrictions, procurement, staff turnover. Additionally, the M&E system, along with routine and specialized reports, gender studies, and action plans, proved to be an effective tool for tracking progress, evaluating impact, and ensuring that ACCESS remained committed to its objectives.

Risk to sustainability

Furthermore, the MTE report analysed the risk identification and mitigation measures in place for the ACCESS project. External risks at various levels that may impede the achievement of project objectives were identified, such as the COVID-19 pandemic and its impact on slowing down the project activities, as well as risks at the regional, national, and local levels. The management team was proactive in identifying risks and taking mitigation measures, such as developing a pandemic response plan, conducting periodic risk assessments, and establishing an emergency response mechanism. However, both PMUs seemed to pay little attention to the risks caused by internal process for procurement and did not properly record it. This might have led to a prolonged procurement process which in turn caused low disbursement rate and delays. The overall rating for the project sustainability risk was "Moderately Likely".

Spare part and technician availability was a major concern, and stakeholders in Indonesia (eg. provincial government in target areas) were worried that this problem will persist even after the after-sales service guarantee provided by the contractor expired. In the case of Timor-Leste, some households started to express their concern about the absence of the particular LTSHE's market and service availability in the country. Governance in each village was another significant risk that could threaten the sustainability of PLTS in Indonesia. In several villages, a strong patron-client relationship between the village head and the community created governance with power centered on the village head. This situation could cause accountability issues in PLTS management. The project mitigated this by involving a variety of stakeholders in the village in decision making process and the PLTS management structure. However, further strengthening is needed in the future by involving external actors (eg. district government). In Timor-Leste, similar risk on village governance was mitigated by PMU through clear communication and building trust-based relationships with local leaders and community members (e.g., properly executing plan that has been developed, providing accurate information, refraining from making empty promises).

Other risks, such as environmental and social concerns, threatened the sustainability of PLTS infrastructure in Indonesia and the PATS system in Timor-Leste. Lightning is a common cause of damage to PLTS infrastructure in many areas in Indonesia, and proactive measures such as the installation of active lightning rods can help reduce the risk of damage. In Timor-Leste, there was environmental risk associated with the uncontrolled disposal of batteries and inefficient use of water resources. In addition, community unwillingness to pay tariff and security concerns such as theft could occur. Compensation to the locals could be provided to ensure the security of PLTS, primarily during the night. Collaborative efforts between the government, private sectors, and local communities were essential to mitigate these risks.

GEDSI

The ACCESS project implemented a comprehensive strategy to ensure the inclusion of gender and human rights in its operations in both countries. The project had a balanced gender representation in its management team and field-level activities, and it actively involved women in decision-making processes through separate meetings and affirmative action. The project also extended its benefits to vulnerable groups

such as poor families, women-headed households, and people with disabilities, by offering flexible payment systems and discounts on electricity contributions. Access to electricity reduced the economic burden on households, especially those headed by women, and improve their livelihoods. However, the potential challenges of increased working hours for women due to electric lighting should be carefully considered to ensure that women are not overburdened with household and income-generating activities.

The followings are ratings for progress towards result for each project activity, rating for project implementation and adaptive management, and project risks/sustainability in Indonesia and Timor-Leste.

Table 1. MTE Ratings & Achievement Summary Table

Measure	MTE Rating	Description
Progress Towards Results	**Activity 1.1.** **Achievement Rating: 3 (Moderately Unsatisfactory)**	Prolonged procurement process resulted in the PLTS construction not being carried out as targeted due to internal and external factors such as technical and financial evaluation, COVID-19 pandemic, and price increase due to global economic instability. This raised concerns among stakeholders (eg, provincial government in target areas) regarding the lack of information on the procurement and development process of the PLTS.
	Activity 1.2. **Achievement Rating: 6 (Highly Satisfactory)**	ACCESS successfully developed training curriculums and modules for PLTS and solar-powered water pumps. The project also recruited, trained and certified selected local operators with affirmative action to ensure female representation in each village. The prolonged procurement process for the PLTS resulted in a gap of more than a year between the training and construction phases, leading to a loss of knowledge retention among some local operators.
	Activity 1.3. **Achievement Rating: 5 (Satisfactory)**	ACCESS established and revitalized 21 BUMDes and RESCOs in Q2 2022, with 16 BUMDes in the basic stage and 5 in the developing stage. PEAP has provided assistance in establishing a responsible financial management system and a flexible payment model for electricity fees. However, the governance structure in several villages, characterized by a patron-client relationship between the village head and the community, posed a significant threat to the project's sustainability.
	Activity 1.4. **Achievement Rating: 5 (Satisfactory)**	The project successfully presented at the Youth SDGs Conference, published reports, organized a Business Plan Competition, and established a social media presence to engage with a wider audience. However, the lack of communication regarding the PLTS infrastructure's progress caused anxiety among beneficiaries who cleared land for the construction.
	Activity 2.1. Achievement Rating: 4 (Moderately Satisfactory)	The project faced delays in the implementation of clean water components in 2022 due to procurement challenges. All necessary works were expected to take place between May 2023 and March 2024. Nevertheless, starting from 2022, the project distributed 1,000 full units of LTSHE to 1,000 households and decreased the number of Timor-Leste's rural *succos* (villages) without access to electricity by 9.2%. Field visits revealed that some LTSHE units were damaged and in need of maintenance/replacement service.
	Activity 2.2. **Achievement Rating: 5 (Satisfactory)**	The project facilitated a training and certification of qualified operators by the formal certifying institution on PATS operation and maintenance (O&M) in Indonesia. Around 30 local operators (27% women) from Atauro, Bobonaro, and Manatuto attended the training and passed the competency certification. However, the delay with the installation of the PATS system created a time gap between capacity building for operators and the implementation of O&M activity. As a result, less knowledge and skills were retained as the time gap widens.
	Activity 2.3. **Achievement Rating: 3 (Moderately Unsatisfactory)**	The project had not formally established O&M of PATS groups in beneficiary *aldeia* (sub villages). It was evident that the delay in achieving output 2.1 impacted the formation of the group. The project planned to tap on the existing Facility Management Group (FMG or GMF) in project sites who were already familiar with GMF's functions and responsibility to conduct maintenance works and collect monthly tariffs. Nevertheless, past experiences have shown that most of the GMFs only last for short duration due to lack of users' commitment to pay tariff and the free rider problem. The project had not come up with a clear plan to address this sustainability issue.
Project Implementation & Adaptive Management	**Achievement Rating: 4 (Moderately Satisfactory)**	The governance structure of the ACCESS project was adequate in supporting its objectives, as the project achieved most of its activity targets. The Project Board and PMU were effective in providing strategic directions and solutions to the challenges encountered during project implementation. The management team was proactive in identifying risks and taking mitigation measures, such as developing a pandemic response plan, conducting periodic risk assessments, and establishing an emergency response mechanism. However, PMU seemed to pay little attention to and did not properly record the risks caused by internal process for procurement which might have led to prolonged procurement process. This in turn caused low disbursement rate and delays.
Sustainability/ Risk	**Achievement Rating: 3 (Moderately Likely)**	The availability of spare parts and technicians was a concern for stakeholders, with worries that this problem may persist beyond the contractor's after-sales service guarantee. Governance in each location posed a risk to the sustainability of PLTS, PATS and LTSHE, as power is centered around the village head, potentially leading to accountability issues. Social risks such as unwillingness to pay tariff and theft as well as

		environmental risks such as lightning, discharge of batteries, and inefficient use of water threatened the long-term operation of the infrastructures.

Conclusion

The ACCESS Project aimed to enhance access to clean and affordable energy through the construction of solar PLTS and PATS and the distribution of LTSHE. Despite procurement challenges causing delays in certain activities, the project showed effective governance and went in the right direction. Risks and sustainability issues such as spare part availability, governance issues, environmental concerns, and security threats were mitigated through proactive measures. In the aspect of gender inclusion, the project promoted women's representation (both on activity involvement and decision making process) and addressed the specific needs of vulnerable groups i.e, poor and women-headed households and people with disabilities. Overall, the ACCESS Project made a significant progress in expanding clean energy access and promoting sustainable development in rural areas.

Recommendations

The MTE provides the recommendations which aims to enhance project's relevance with the development context of both countries, its effectiveness to achieve the two outputs and the sustainability of its results.

For ACCESS Project Indonesia, it is recommended that the PMU expedite the construction process, purchase of goods, and plan for better maintenance of PLTS (warranty, supply chain, disposal), and involve broader strategic stakeholders (e.g., private sector, MEMR, district and provincial government) for sustainability. The PMU also needs to ensure the condition in the village is conducive (land status are verified, risk for land conflict are minimized, local supports are secured, etc.) for PLTS construction and continuous operation. Lastly, to enhance the project's relevance with provincial development plant, the ACCEE Project Indonesia needs to have plan for the possibility of electricity expansion for broader utilisation beyond lighting purposes. Options can be explored such as initiating steps for integrating with PLN grid, the future use plan of currently existing community-based electricity generation and managing current unused PLTS built by non ACCES.

The effectiveness of ACCESS Project Timor-Leste can be enhanced by focusing on mobilizing resources to expedite the PATS construction process which requires compliance with standard procedure (i.e., SESP, environmental licensing, etc.). Moreover, the project needs to develop plans for better maintenance of the LTSHE (i.e., warranty, supply of spare parts, disposal) in collaboration with local leaders and Quelebo. In additional, the PMU in Timor-Leste should strengthen the project's partnership with the Ministry of Public Work to explore existing support systems for GMF (Ex. support from EDTL E.P. and BTL E.P.), and formalize the establishment/reaction of GMF groups.

In term of maintaining the sustainability of the operation of the infrastructure/facilities, it is crucial that PMU in Indonesia and Timor-Leste develop strategies to improve improved knowledge of local operators and RESCO boards (Indonesia)/GMF (TL) after project closure. This can be achieved through setting up channels and networks among LOs and among RESCOs/GMF with relevant national and local government and other agencies as well as preparing accessible resources/materials for LOs that can help maintain their knowledge and skills. In addition, there needs to be more effort to strengthen and implement the accountability mechanism for RESCO/GMF management through community-based oversight mechanism. This mechanism will allow local communities to actively participate in monitoring of the operation and safety of the built infrastructures.

To enhance the project's effectiveness, the MTE recommends that PMU in Indonesia and Timor-Leste establish and/or strengthen existing communication channels and feedback mechanism to address concerns on the project's progress update to beneficiaries. Alternative communication channels that are suitable for target communities and worth considering are community meetings, public announcements, or printed materials distributed through community leaders. This will allow beneficiaries to share their views and provide feedback on the project's progress for improvement.

The SSTC modality adopted by the project has provided ample opportunities for partnership and collaboration at the regional level. Achieving the end of project outcomes still requires collaboration between Indonesia and Timor-Leste government. Such collaboration can be further enhanced by improving the involvement of Timor-Leste's PMU during the remaining project period.

Lastly, there was a clear indication that several target outputs have not been achieved within the deadline. A no-cost extension is needed for a period up to six months or based on budget availability. The project is still seven months away from the proposed end date which means that there is a possibility to make a formal request for extension.

2. Introduction

2.1. Evaluation Purpose

A mid-term evaluation (MTE) examines progress towards accomplishing objectives and desired outcomes outlined in the project document. Its purpose is to detect initial indications of project success or failure and to determine necessary adjustments required to ensure the project stays on track to achieve the desired results. The MTE also takes into account project's strategy and potential risks to sustainability.The progress under evaluation encompasses the following aspects:

- Project strategy: project design and results framework/log frame;
- Progress towards results (outcomes);
- Project implementation and adaptive management: management arrangements, work planning, finance and co-finance, project-level monitoring and evaluation (M&E) systems, stakeholder engagement, social and environmental standards, reporting, and communication and knowledge management; and
- Sustainability: financial, socio-economic, environmental, institutional framework and governance risks to sustainability.
- Project structure
- Monitoring and evaluation approaches of the project

The objective of this MTE was to examine the progress of ACCESS against its expected outputs/outcomes/results, identify areas for improvement and, given the changing governance context, identify new opportunities, and recommend changes to update the project plan and approach.The scope of the MTE covered project implementation from May 2020 to February 2023 which included the following criteria to assess:

- Relevance, effectiveness, and efficiency of project
- Risks to sustainability
- Extent to which gender equality and social inclusion and human rights aspects were considered
- Project structure
- Monitoring and evaluation approaches of the project

2.2 Methodology

The evaluation was conducted as a joint evaluation by 3 parties: UNDP Indonesia, UNDP Timor-Leste, and KOICA (through Korean Institute for Development Strategy). In this case, 1 evaluator was recruited by Indonesia Country Office, 1 evaluator was recruited by Timor-Leste and KOICA hired KDS. For the process of analysis and writing the report, the evaluator hired by Indonesia Country Office played role as the lead evaluator. This evaluation employed a mixture of qualitative and quantitative methods and used several data collection methods, i.e., desk review, key informant interviews (KII), focus group discussions (FGD), and field observation. The quantitative and qualitative research methods were selected for their viability in gaining an in-depth understanding of the evaluation target audiences.

2.2.1 Desk Review

The evaluators reviewed all relevant sources of information provided since the preparation phase (e.g., Project Documents, Project Inception report/PIR, UNDP Initiation Plan, UNDP Social and Environmental Screening Procedure), project reports including Annual Project Review/Project Annual Report/PARs, project budget revisions, national strategic and legal documents, and any other materials that the team considered useful for this evidence-based review).

2.2.2 Qualitative Approach

Key Informant Interviews (KIIs), Focus Group Discussions (FGDs), and field observation were used for qualitative data collection and analysis. KII and FGD were guided by semi-structured interview/discussion guidelines. Key informants and participants were selected purposively in the selected areas based on their involvement in the project with gender balance consideration. KII and FGD were conducted both in face-to-face and online meetings, depending on the informant's availability. In total, 41 key informants were interviewed, with 24 males (59%) and 17 females (41%), and 221 FGD participants, with 136 males (62%) and 85 females (38%) for Indonesia and Timor-Leste, equally distributed across intervention areas with the following details:

Table 2. Key informants distribution (gender disagregated)

Province/Municipalities	Institution/Organisation	Number of informants	Male	Female
Indonesia				
Jakarta (National level)	Indonesian PMU (National project manager, M&E Specialist), Ministry of Energy and Mineral Resources	3	2	1
South East Sulawesi	BUMDes, RESCO, Operator, Household	5	3	2
West Sulawesi	Household	1	1	0
Central Kalimantan	Provincial Government (Bappeda, MEMR Office, Village Development Office), District Government (Village Development Office), District Secretary Office	5	2	3
NTT	Operator, Head of Village, BUMDes	3	2	1
Timor-Leste				
Dili	Ministry of State Administration, Ministry of Public Works (EDTL E.P.), Timor-Leste PMU	11	7	4
Ataúro	Municipality Coordinator, local leader, Potential O&M member, household	11	6	5
Bobonaro	Local leaders	2	1	1
Total		**41**	**24 (59%)**	**17 (41%)**

In Indonesia, FGDs were organized at the provincial and village levels for each target area. The discussions involved representatives of stakeholders from village, sub-district, district, and provincial level governments, as well as community members and relevant stakeholders. Meanwhile, in Timor-Leste, the FGDs were held at the municipality and suco (village) level with representatives from municipal governments, village governments, and stakeholders, including local leaders, women-headed households, and potential O&M members.Details of the FGD participants for each province/municipality are as follows:

Table 3. FGD participants (gender disagregated)

Province/ Municipalities	Participants	Number of Participants	M	F
Indonesia				
National	PMU Indonesia (National project manager, Finance manager, M&E analyst, Technical Engineer & Analyst, and Technical Officers).	9	4	5
South East Sulawesi	Provincial level (Provincial government, district government, sub-district government, field facilitator)	20	15	5
	Village level (Village government, BUMDes, RESCO, operator, villagers)	47	32	15
West Sulawesi	Provincial level (Provincial government, district government, sub-district government, field facilitator)	13	9	4
	FGD 1 at Village level (Village government, BUMDes, RESCO, operator, villagers)	7	6	1
	FGD 2 with sub-village government, villagers	12	12	0
Central Kalimantan	Village level (Village government, BUMDes, RESCO, operator, villagers)	21	12	9
NTT	Provincial level (Provincial government, district government, sub-district government, field facilitator)	21	16	5
Timor-Leste				
Ataúro	Local leaders, potential O&M members, villagers	22	11	11
Bobonaro	Villagers (women-headed households, children)	6	1	5
Manatuto	Local leader, potential O&M members, villagers (including women-headed households)	52	27	25
Total		**221**	**136 (62%)**	**85 (38%)**

Onsite observations were conducted during field visits to evaluate the achievements of project activities conducted by village-level stakeholders (BUMDes/RESCO and village government) and to gain an in-depth understanding of

the impact of the project's results on beneficiaries' livelihoods. These observations helped the evaluators gather crucial data on social dynamics, including gender roles.2.2.3 Quantitative Approach

To support qualitative approach, quantitative analysis was carried out over baseline and midline survey data. Quantitative approach was used to confirm qualitative findings or as triangulation. Quantitative analysis relied on available data gathered by the project for baseline and midline surveys. Analysis was based on the above-mentioned evaluation criteria.2.2.4. Stages of Evaluation and Timeline. The MTE was conducted from January 2023 to June 2023 with the following stages and timeline:

Table 4. MTE activity and timeline

Timeframe (2023)	Activity
9 Jan (IDN) 27 Jan (TL)	Selection and contract issuance
18 Jan (IDN) – 10.30	Preparation period for mid-term evaluation team (handover of project documents) Kick off meeting-review docs
23 Jan (IDN)	Document review and preparation of mid-term evaluation inception report
20 February	Consultancy meeting with KDS, TL consultant
3 Feb (IDN)	Finalization and submission of mid-term evaluation inception report
26 Feb – 21 Mar (IDN)	Mid-term field visit: FGDs, KII, field observation, etc.
5 April 2023	Mission wrap-up meeting & presentation of initial findings; earliest end of mid-term evaluation mission in Jakarta
5 April – 2 May	Preparation of draft mid-term evaluation report
May	Circulation of draft mid-term evaluation report for comments
May	Incorporation of comments on draft mid-term evaluation report, mid-term evaluation audit trail & finalization of mid-term evaluation report
	Preparation and issuance of management response by implementing partner, concluding Stakeholder Workshop/PBM
31 May	Expected date of full mid-term evaluation completion

2.2.4 MTE Challenges

In general, no significant challenges were encountered during the MTE implementation. Throughout the whole process, there was a maximum support from PMUs and coordinators from national down to the village level which further reduced the level of challenges. FGDs and KIIs were conducted through both direct, face-to-face meetings in target areas and online. The MTE did not encounter any restrictions on social activities in target areas because the pandemic is over. In addition, access to project sites in both countries was not hindered by safety-related obstacles such as extreme weather conditions and/or civil unrests. As a result, all MTE activities were implemented as scheduled.

2.3. Report Structure

The structure of this MTE report adheres to the guidelines outlined in Annex B of the Terms of Reference (ToR), specifically the "Guidelines on contents for the Midterm Review Report."

Section 1 serves as the executive summary which captures a concise overview of project's information, findings, MTE ratings, conclusions and recommendations.

Section 2 serves as the introduction, reiterating the purposes and objectives of the MTE, outlining the scope and methodology being employed, and discussing the underlying assumptions.

Following the introduction, Section 3 provides a comprehensive description of the project and its background, elaborating contextual information essential for understanding the subsequent sections.

Section 4 presents findings on project strategy, progress towards results, project implementation and adaptive management, and sustainability. It is supported by detail MTE ratings and achievement summary.

Section 5 concludes the MTE report by highlighting the project's strengths, weaknesses and results. It then provides recommendations with corrective actions for the design, implementation, monitoring and evaluation of the project. It also proposes follow up actions and future directions.

By adhering to this format, the MTE report provides a systematic assessment of the project's progress and provides valuable insights for further improvement and decision-making by the project team.

3. Project Description and Background Context

3.1 Development Context and Problems that the Project Sought to Address

3.1.1 Indonesia

Indonesia faces challenges in providing electricity access to its 82,000 villages due to geographical constraints and limited government budget. Approximately 2,500 villages, mainly in the eastern provinces, lack electricity. To address this, Indonesia aims to have a 23% renewable energy portion in its primary energy mix by 2025, aligning with its commitments under the Paris Agreement.To accelerate rural electrification and promote renewable energy, the government allocated a Special Budget for Small Scale Energy infrastructures.

However, not all proposals received funding, thereby creating uncertainties. The State Electricity Company, the institution in charge of rural electrification, was struggling due to economic considerations and limited internal funding. In response, the Highly-Efficient Solar-PV Lamps were deployed to reach remote households. These solar-powered systems provided a more sustainable and reliable electricity solution.Despite all the rural electrification attempts in Indonesia, the remaining challenges are:

- limited funding capacity of government and utility company leave the last-mile communities in remote villages and small islands without access to electricity service.
- sustainability issue due to lack of local personnel and institutional capacity to operate and maintain the infrastructure and manage the electricity business professionally; and
- low utilization of renewable resources in rural power generation.

3.1.2 Timor-Leste

After gaining independence in 2002, Timor-Leste faced extensive infrastructure damage, with nearly 90% destroyed. While significant progress was made in rebuilding roads, health facilities, and irrigation systems, challenges remained in rural electrification and clean water access.

To meet energy demands, two major power plants were installed in the north and south coast regions, supplying energy to all twelve municipalities. However, rural areas still lacked electricity access, and existing power plants relied on expensive diesel fuel imports. The annual operating cost for these diesel-based plants amounted to USD 126 million, resulting in high electricity prices for consumers. Investment in renewable energy, including ground-mounted solar PV power plants and conversion of diesel plants to operate on liquefied natural gas (LNG), was being explored as a means to reduce costs and dependence on imports.

Water supply infrastructure in Timor-Leste required substantial investment to provide reliable access, particularly during the dry season. While urban areas saw improvements, only 60% of the population had access to water. Efforts were being made to enhance water distribution through the management of reservoirs, pump systems, and surface water systems. However, operating costs remained high and revenue recovery through tariffs was insufficient. Measures to increase revenue and improve operational efficiency include installation of water meters and addressing illegal connections and leakages. Development of the renewable energy sector, specifically solar PV, was expected to contribute to cost reduction and efficiency in the water sector.

Challenges to address Timor-Leste’s development priorities to provide electricity and clean water access to all the population were as follows:

- Lack of proven approach and sustainable technology for providing access to clean water and lighting for households as they are scattered and far away from the centre of the village or national electricity grid;
- Lack of personnel and institutional capacity at the local level to operate and maintain the built-PV water pump infrastructure; and

Difficulties in finding appropriate technology and approaches that reflect the local context particularly in terms of the direct impact on communities. 3.2 Project Description and StrategyThe ACCESS project's objective was for the poor and most vulnerable communities to have equitable and sustainable access to basic services required for improving livelihoods. In Indonesia, the ACCESS project were located in 23 villages in East Nusa Tenggara, West Sulawesi, Southeast Sulawesi, and Central Kalimantan Provinces, while in Timor-Leste in 25 villages in Ataúro, Bobonaro and Manatuto municipalities. ACCESS project was designed with the following outcomes, outputs and activities:

Outcomes:

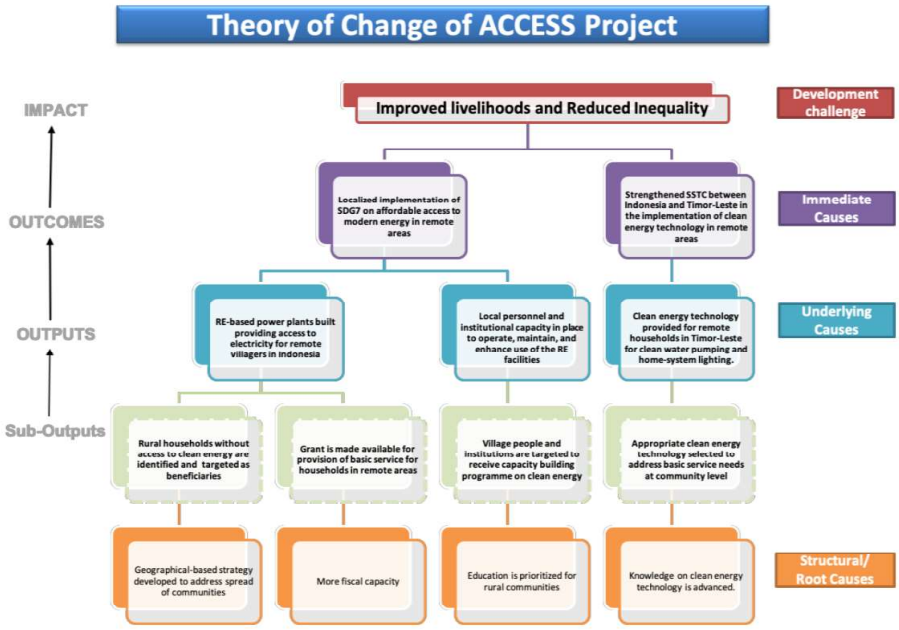
1) Localized implementation of SDGs No.7 Affordable & Clean Energy through the provision of access to renewable-based electricity.
2) Strengthened South-South and Triangular Cooperation (SSTC) between Indonesia and Timor-Leste in promoting the use of clean energy in rural areas.
3) These outcomes consisted of the following outputs and activities:

Table 5. Project Output, Activities and Indicators

Outputs	Activities	Indicators/Target	Target
1. Renewable-based power plants built providing sustainable access to electricity for remote villagers in Indonesia with institutional and local capacity in place.	Activity 1.1: Renewable-based energy infrastructures construction that providesing access to electricity for households in targeted villages in Indonesia that can be monitored remotely	1.1.1. Number of households in targeted villages getting electricity supply generated from solar PV (disaggregated by gender, women-headed household), cumulative. 1.1.2. Amount of generated electricity per month (kWh/month), annually. Target: 684 kWh/month	3,025 Households
	Activity 1.2: Local capacity building for operation and maintenance of the built energy infrastructures.	1.2.1. Number of qualified local people certified as solar PV operators (disaggregated by gender), cumulative.	50 people (30% women)
	Activity 1.3: Local institution establishment to enhance sustainability and scaled-up use of built energy infrastructures.	1.3.1. Establishment of village electricity enterprise (BUMDES Listrik Desa) or Renewable Energy Service Cooperative (RESCO), cumulative.	21 BUMDes/ RESCO
	Activity 1.4: Results dissemination through knowledge sharing workshops	1.4.1. Number of participants from stakeholder's institutions (government, private, donors, NGOs, regional development banks) receiving dissemination products, cumulative.	600 participants
2. Under SSTC between Indonesia and Timor-Leste: Solar PV water pumps and Highly Efficient Solar Lamp System (LTSHE) are installed in remote villages in Timor-Leste providing sustainable access to clean water and highly efficient lighting.	Activity 2.1: Renewable-based energy infrastructure construction that provides access to clean water and energy efficient solar lights in targeted villages in Timor-Leste.	2.1.1 Number of households in targeted *Sucos*/villages getting clean water from solar PV water pumps (disaggregated by gender, women headed household.2.1.2 Numbers of solar PV water pumps installed in target locations that meet quality standards. 2.1.3 Number of households in targeted *Sucos*/villages with access to lighting from solar lamp system (LTSHE) (disaggregated by gender, women headed household).	684 households10 PATS1,000 LTSHE
	Activity 2.2: Local capacity building for operation and maintenance of the built energy infrastructures	2.2.1 Numbers of local people trained and certified on operation & maintenance of solar water pump (disaggregated by gender), cumulative.	30 people (30% women)
	Activity 2.3: Establishment of viable operations and maintenance mechanisms to ensure service sustainability.	2.3.1 Establishment of the sustainable operating mechanism for solar water pumps.	in all locations

The Theory of Change underpinning the ACCESS Project interventions was that people who lived in remote locations regardless of gender were at risk of being left behind because of limited financial support, low education, and lack of technology options. The provision of equitable and sustainable (available, accessible, and affordable) electricity and clean water services will enable them to manage the facilities, improve their livelihoods and reduce inequality in the long term. In addition, the appropriate clean energy technology may also be introduced to the surrounding regions.

Figure 1. Theory of Change of ACCESS ProjecT



3.2.1 Strategy for ACCESS Project in Indonesia

The ACCESS project in Indonesia aimed to address rural electrification challenges by building communal solar-PV power plants in locations not funded by the government's special allocation for Small Scale Energy. These plants expanded access to electricity in remote villages with low electrification rates, using renewable resources and complementing existing programs.

To ensure sustainability, the project recruited and trained local operators, including women, for the solar-PV power plants. A remote monitoring system detected and responded to technical issues promptly. The project also aimed to establish renewable energy service companies/cooperatives (RESCO) in the project locations, build their capacity and enable them to contribute to sustainable operations.

Gender considerations were integral to the project, promoting access to clean energy for poor households, especially women-headed households. Women's groups were involved in decision-making processes and given a 30% quota for local operators who received training and certification. The project aligns with UNDP's objectives for low emissions, climate resilience, and economic diversification.

3.2.2 Strategy for ACCESS Project in Timor-Leste

The ACCESS project in Timor-Leste addressed the development challenges in rural electrification and clean water access by facilitating the exchange of best practices with Indonesia under the SSTC framework for the following activities:

1. The exchange of technical standards, skills and experience from Indonesia, particularly from water source identification, engineering, procurement, and installation of solar PV water pumps in targeted *Sucos*.
2. The exchange of technical specification and procurement terms for LTSHE from Indonesia to address challenges in providing lighting access for households living in isolated areas.
3. Training and certification of Solar-PV operators in the targeted locations in Timor-Leste through collaboration with the vocational training centre at the MEMR.
4. The exchange of approach for the establishment of RESCO with a viable model to ensure the operationalization of LTSHE and clean water service locally in Timor-Leste

3.3 Project Implementation Arrangements

3.3.1 Indonesia

UNDP Indonesia is the implementing partner of KOICA for the ACCESS project. The Ministry of Energy and Mineral Resources (MEMR) and KOICA Indonesia are the main counterparts. Under overall project management oversight by UNDP Indonesia, UNDP Timor-Leste is responsible for producing Output 2 under South-South Triangular Cooperation (SSTC) activities with Indonesia in the form of clean energy technology and technical certification for local operators.

For the project implementation, the ACCESS project is supported by the PMU in Indonesia. The PMU is administered by one senior Advisor for Sustainable Energy Strategic Programme & Policies, a full time National Project Manager supported by one Technical Engineer, one Technical Analyst, two Technical Officers for local capacity and institutional development, one Monitoring and Evaluation Analyst, one Project Associate and two operational Admin staff and one Intern.

3.3.2 Timor-Leste

UNDP Timor-Leste is the implementing agency for the ACCESS project in Timor-Leste. The Ministry of State Administration (MSA) and KOICA Timor-Leste are the main counterparts who are project board members, steering and providing strategic direction to the PMU. In Timor-Leste, the project is delivered through the Direct Implementation (DIM) modality, in close partnership with MSA.

ACCESS in Timor-Leste is administered by a full-time Project Manager and supported by full- time Financial/Administrative Officer, Project Facilitator and Engineer, and three full-time project technicians/municipality coordinators. Previously, there was also a Chief Technical Advisor (CTA).

3.4 Project Timing and Milestones

The Project was officially launched on 10th September 2020 preceded by Pre-Feasibility Study (PFS) in 2019. The planned closing date is 31 December 2023, after a more than 3-year period.

During the MTE, there was a clear indication that several target outputs have not been achieved. Hence, there is a likelihood that the project will not complete operations within the deadline. There have been discussions on the opportunity to request a project extension to complete project activities which were hampered by difficulties in procurement processes for PLTS and PATS. This MTE supports a no-cost extension for a period of four to six months, based on budget availability. The project is still seven months away from the proposed end date which means that there is a possibility to make a formal request for extension.

3.5. Main Stakeholders and Partners

The project supported the meaningful participation and inclusion of all stakeholders, during the design, implementation, monitoring, and adaptive collaborative management of the activities.

Table 6. Project Stakeholders

Type of stakeholder	Role/Type of Collaboration
Ministry of Energy and Mineral Resources, Indonesia	The MEMR's mandate in national electrification and promoting renewable energy is in line with the project's objective.
Centre of Human Resources Development in Electricity, New Renewable Energy, and Energy Conservation, Indonesia	MEMR’s vocational training centre on renewable energy has long experience in rural electrification. It provides inputs for the ACCESS project.
Ministry of Villages and Disadvantaged Regions	Building and assisting village enterprises (BUMDes) for economic Development in Indonesia.
Ministry of Communication and Informatics	Providing telecommunication and internet access to regions in Indonesia, which is essential for the operationalization of remote monitoring system of the built power plants.
Ministry of State Administration, Timor-Leste	The Directorate General of Administrative Decentralization of the Ministry of State Administration (MSA) is the principal national partner for the implementation of the

	project. MSA lends on their extensive coordination experience on small-scale infrastructure development programmes in Timor-Leste to support the PMU on effective mobilization of support at municipality, *suco* and *aldeia* levels.
Ministry of Public Works, Timor-Leste	As the host of two public enterprises, EDTL E.P. and BTL E.P., the MPW provides extensive technical support, standard specifications, and coordination at municipality level for the project.
UNDP Global Procurement Unit (GPU), Denmark	This specialized procurement unit has dedicated teams of procurement specialists offering procurement services within three thematic areas, namely crisis recovery, energy and environment (CREE), Health, and Elections.
Private Sectors	Provision of extensive supply of services and goods for various project activities.

4. Findings

4.1. Project Relevance

4.1.1. Indonesia

This section aims to assess the ACCESS project's responsiveness to beneficiaries' needs and relevance to the social, economic, and political environment at the regional, sub-regional, and national levels. Additionally, this section will also examine the appropriateness and relevance of the project's theory of change and objectives at the outcome and output levels in achieving the overall objective.

International and Regional level:

The Indonesian government demonstrated its commitment to the global Sustainable Development Goals (SDGs), which aim to end poverty, protect the environment, and promote peace and prosperity for all by 2030. In line with this commitment, the government emphasized the importance of leaving no one behind and prioritizing the advancement of those who are furthest behind.

The ACCESS Project focuses on achieving SDG 7: ensuring access to affordable, reliable, sustainable, and modern energy for all and SDG 1: ending poverty in all its forms everywhere. By granting people in remote areas access to basic electricity services, the project assisted in poverty eradication efforts. Priority was given to vulnerable groups, including women-headed households, to ensure equitable access to energy services in addition to creating new economic opportunities. Overall, the ACCESS Project demonstrated a concerted efforts where the Indonesian and Timor-Leste government as well as UNDP were committed to achieving the SDGs.

National level:

Indonesia made significant progress in improving its electrification rate, reaching 99.20 percent in 2020 and 99.63 percent as of 2022 (see Table.1). However, remote areas in the eastern part of the country still lacked access to electricity. To address this, the national government prioritized increasing electrification in the eastern region, aligning with the objectives of the ACCESS Project. By installing off-grid solar PV power plants (PLTS) and establishing mini-grids, the project aimed to provide localized electricity sources for communities with limited or no access to the national grid. This initiative supports the government's goal of achieving 100 percent electrification nationwide. The Ministry of Energy and Mineral Resources (MEMR) outlined a strategy that involved expanding the PLN network, constructing Electric Energy Charging Stations (SPEL), and Electrical Power Distribution Equipment (APDAL) to ensure comprehensive electrification. These efforts highlighted the commitment to improve electricity access and the vital role of projects like ACCESS in achieving this objective.[1]

Table 7. Electrification ratio (%)

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Indonesia	72.95	76.56	80.51	84.35	88.30	91.16	93.35	98.30	98.89	99.20

Source: Statistics of Directorate of Electricity and Electricity Construction Program, Ministry of Energy and Mineral Resources

In terms of target areas, ACCESS focused its efforts on areas with limited access to electricity. The project targeted provinces with a low percentage of households that had access to electricity from PLN, according to data from BPS. As of 2022, Central Kalimantan had the 3rd lowest percentage of households with PLN electricity access at 85.36 percent out of 33 provinces. Similarly, NTT province had 85.58 percent (4th lowest), West Sulawesi had 92.85 percent (7th lowest), and Southeast Sulawesi had 97.02 percent (14th lowest).

Table 8. Percentage of household with electricity sources from PLN[2]

	2017	2018	2019	2020	2021	2022
Southeast Sulawesi	88.88	93.23	94.02	95.47	96.76	97.02
West Sulawesi	77.80	83.18	84.83	87.80	91.75	92.85

[1] (Ministry of Energy and Mineral Resources expected to complete 100% Electrification Ratio in 2022, n.d.)
[2] (*Statistics Indonesia*, n.d.)

East Nusa Tenggara	66.02	69.37	70.07	74.05	81.12	85.58
Central Kalimantan	81.75	82.79	84.45	85.73	83.52	85.36
Indonesia	95.99	96.52	96.73	96.95	97.26	97.73

Moreover, the contribution of ACCESS towards renewable energy aligned with the National Energy General Plan (RUEN), which was reducing greenhouse gas emissions using renewable energy sources such as solar, wind, hydro, geothermal, and biomass energy while also decreasing dependence on fossil fuels. ACCESS project strategy also aligned with the current government efforts to enhance village autonomy and promote economic growth through the strengthening of BUMDes at the village level. Additionally, the project design took into account the obstacles faced in the development of PLTS by the Ministry of Energy and Mineral Resources thus far. This information was shared during an interview with the respondent from MEMR.

The ACCESS project, funded by KOICA and implemented by UNDP, exemplified the harmonization of national and international objectives with regional development in meeting emission reduction targets through renewable energy initiatives in Indonesia and Timor-Leste. The project is a part of the South-South Triangular Cooperation (SSTC).

Provincial level:

To translate RUEN at the sub-national level, all 4 provinces in the ACCESS working area had RUED (Sub-national Energy General Plan). Based on the RUED documents, key strategic issues related to energy in the ACCESS intervention provinces were: Dependence on fossil energy; Limited energy access and infrastructure; Not optimal planning, management and utilization of New and Renewable Energy (EBT) potential; Limited resources for research and innovation in the field of energy management and development; Absence of regulations governing energy management in the regions; and energy utilization that did not pay attention to environmental issues and their impact on global climate change.

By constructing a communal Solar-PV power plant, ACCESS mitigated the issue of reliance on fossil fuels for electricity supply. The project's targeted areas in remote villages without access to the PLN electricity network or the national government program improved electricity accessibility in hard-to-reach regions. This initiative also increased the electrification rate in provinces with low rates of access to electricity.The approach taken by ACCESS to empower the community, BUMDes, and RESCO (Electricity Service Unit under BUMDES) institutions aimed to tackle the issue of limited capacity building and management skills among the local population. This enabled them to efficiently plan, manage, and utilize renewable energy potential.

District level:

The energy sector fell outside the jurisdiction of the district government, which was limited to coordinating permits with the provincial and national governments. Therefore, the district government cannot directly assist in managing and maintaining PLTS built by either the national government or ACCESS at the village level. To develop centralized PLTS, the district government submitted proposals through the Special Grant (DAK) program to the Ministry of Energy and Mineral Resources via the provincial EMR office. Additionally, to increase access, the district government provided electricity subsidies for impoverished communities.

Despite lacking authority, the district governments in areas targeted by ACCESS were dedicated to promote the use of renewable energy sources, including solar and micro-hydro power. Furthermore, the district government was committed to expanding electrification in rural areas and for disadvantaged communities. For example, in the Konawe Selatan district, Southeast Sulawesi, the government launched a program to refurbish PLTS in 19 villages located in the Laonti sub-district. However, budget constraints and remote locations posed a challenge to the government in implementing this program. Similarly, the Muna district government devised plans to construct a micro-hydro power plant (PLTMH) in East Muna and install solar panels for street lighting. Additionally, the government initiated a program to provide electricity to 100 households and offer free electricity to poor families in collaboration with PLN.

The ACCESS approach of empowering BUMDes and their business units as PLTS operators was also relevant to the district government's jurisdiction of reinforcing village governments and BUMDes. This encompassed devising policies and strategies for advancing BUMDes within the district, providing training, guidance, technical assistance, and facilitating funding.

Village level:

Based on the FGDs and KII conducted at the village level, the MTE found that ACCESS project was also in line with government's policy in ACCESS target villages to provide electricity to their citizens based on the capacity of each village. In 2017, the Watu Karere Village allocated IDR 500 million from the village fund to connect to the PLN electricity network. However, this amount was not sufficient as the total required amount for connection was IDR 5 billion. Consequently, the provision of PLTS by ACCESS was more relevant for the Watu Karere Village government. Therefore, the village government committed to invest in BUMDes, which managed the PLTS constructed by ACCESS.

At the community level, efforts were also made to gain access to electricity. Although three of the four visited villages had electricity, the community believed that this source of electrical energy was still expensive and unreliable. This highlighted the relevance of the provision of PLTS by ACCESS at the community level.

Wangkolabu Village, for instance, had an electricity network to every house, powered by a generator managed by the village government. However, the power supplied to each household was still inadequate as it was only sufficient for lighting and was unreliable. Several households had LTSHE, which they received through a government assistance program, with solar panels installed on their roofs. However, the power generated was only enough to run a few lights. The majority of Muara Ripung Village residents relied on their own electric generators for power, which costed them hundreds of thousands to millions of rupiah per month for operation and maintenance. In addition, obtaining fuel to run these generators also posed a challenge for the residents.

Communities in Buntu Lalong hamlet owned a micro-hydro power plant (PLTMH) for more than 7 years. This PLTMH was managed in groups by the hamlet community. There were at least 3 groups of PLTMH in Buntu Lalong hamlet. It is not clear how much electricity a PLTMH can supply for each house, but they used the electricity for lighting, television and cooking rice. To access electricity each house must pay 25-30 thousand rupiahs per month depending on how many appliances were used. Even though the people of Buntu Lalong had access to electricity, they considered that the electricity they got from the PLTMH to not meet their needs because it was still limited. PLTMH was also considered unstable because the electricity generated depends on the season which affected the water discharge.

It should be noted that several ACCESS villages, such as Leling Utara and Watu Karere, were located near the PLN electricity network. As a result, the PLN network is likely to expand to the hamlets that are covered by ACCESS soon, necessitating a plan for integrating the PLN network with the PLTS system offered by ACCESS. Therefore, ACCESS equipped its PLTS with features to enable it to integrate with the PLN networks and to be interoperable with the PLN power grid.

Economic Relevance:

In economic terms, the electricity generated by the PLTS provided by ACCESS eased the beneficiaries' financial burden as they spent less on electricity and lighting than they previously had. The cost of electricity varied in each ACCESS village based on the operational and maintenance needs of the PLTS infrastructure. The community, including women's groups, participated in a discussion on how they could cover the cost.

KII and FGDs conducted during the MTE indicated that the agreed-upon electricity fees in each village were affordable for the community. The cost was also less expensive than what they had previously paid for electricity. For instance, in Wangkolabu Village, Southeast Sulawesi, they paid IDR 91,000 per month, which was 50% less than their current electricity bill of IDR 180.000. In Ekapata, villagers spent more than IDR 200,000 per month on kerosene to light their lanterns and they only paid IDR 90.000 per month for electricity bill using the PLTS.

In contrast to the high costs and challenges faced by villagers who used their own power generators, the contribution for PLTS electricity provided by ACCESS was much more affordable. In fact, in some cases, the contribution was only a fraction of what villagers used to spend on gasoline for their generators. For instance, in Muara Ripung, Central Kalimantan, villagers spent ten times more on gasoline for their generators than for the PLTS contribution of IDR. 58.000 per month, which can be paid in cash or plantation commodities.

Moreover, the introduction of PLTS electricity by ACCESS created new business opportunities for both BUMDes and individuals in the community. For example, women in Wangkolabu Village planned to increase their income by selling flavored shaved ice using electric blender. Fishermen groups hoped to produce ice cubes or store their catch in a freezer. In Ekapata village, women aspired to weave at night using electric lights to increase their production and income, while the men's group in Ekapata and Watu Karere were interested in opening a furniture production shop using saws and electric planers.

Looking at such a large demand for commercial use, it was very important to have a response plan for peak power as well as active power. Equipment capacity and power distribution should be sufficiently reviewed, taking into account:

- Maintenance of phase balance according to load regulation during distribution work for electricity supply.
- Appropriateness of Power Conversion System (PCS) capacity setting considering the power factor of the load.

The community and BUMDes explored various other business opportunities that can be developed with the operation of PLTS. Marlin, a member of the formulation team formed by ACCESS and a former head of Wangkolabu village, stated that several businesses can be developed by BUMDes once the PLTS was in operation. These included producing ice, refilling oxygen cylinders for divers, and providing internet access.

4.1.2. Timor-Leste

International and regional level:

Faced with the task of rebuilding public infrastructure – including roads, ports and airports, water and sanitation systems, government facilities – and institutional frameworks, Timor-Leste made significant progress in key areas since the restoration of independence in 2002 (World Bank, 2022). A 2014 report by the World Bank showed that 42% of the country's 1.3 million population lived below the national poverty line.

As stated in the project's results framework, the ACCESS project's intervention in Timor-Leste focused on improving access to clean energy and clean water supply for rural households in three target municipalities. The project contributed to the United Nations Development Assistance Framework (UNDAF) Timor-Leste strategic outcome 2 (SO2) on the infrastructure sector, particularly the SO2.3.[3] The project outcomes were strongly linked to the following four SDGs, namely SDG 6: clean water and sanitation, SDG 7: affordable and clean energy, SDG 3: good health and well-being, and SDG 1: no poverty. Outcomes of the ACCESS project were strongly linked to KOICA's Country Program (CP) to help the Government of Timor-Leste (GoTL) achieve its Strategic Development Plan (SDP) 2011-2030, particularly the infrastructure development sector.

The ACCESS project in Timor-Leste was realized through a south-south triangular cooperation (SSTC) between the Republic of Korea, Republic of Indonesia, and UNDP Indonesia - Timo-Leste. Timor-Leste is a low-income country which recently obtained its ASEAN observer status in 2022, thanks to the solid endorsement from Indonesia. The renewable energy in the country is under-developed although its SDP 2011-2030 has outlined the plan to provide renewable energy supplies to more remote areas unable to access the national electricity grid. Hence, the SSTC provides more platforms for both countries to continue pursuing their individual and/or shared national capacity development objectives through exchanges of knowledge, skills, resources, and technical know-how and through regional and inter-regional collective actions. In particular, the SSTC intends to replicate the application of highly efficient solar PV-lamp produced in Indonesia, exchange technical knowledge in clean water resources, and provide training and certification by Indonesian agency.

National and Municipal Levels:

<u>Clean water supply</u>

The project contributed to improved clean water supply in Timor-Leste. Out of 11% of children under 5 years of age (about 19,300 children), seven percent were affected by diarrhoea in 2015, which was attributed to unsafe water and poor sanitation and hygiene. Furthermore, a key to prevent COVID-19 transmission is good personal hygiene, particularly hand washing. Therefore, the GoTL was committed to ensure that everyone had access to clean water supply as outlined in the SDP (2011-2030) that by *2020, 75% of Timor-Leste's rural population had access to safe, reliable, and sustainable water*.

The 2015 census indicated that 73% of the urban population and 68% of the rural population had access to water. The country-wide improvement was largely because of better access in rural areas, which rose from 57.2% in 2010. The encouraging figures did not correspond with quality, reliability, or sustainability of services. According to data from the Department of Water and Sanitation of Ataúro Municipality, only 12% of Atauro's 2,454 households had access to sufficient clean water. This was exacerbated by the fact that 320 units of solar PV water pumps installed by the Ministry of Public Works (MPW) were no longer in operation due to lack of technical capacity and maintenance.

Alternative water sources were essential to meet daily water requirements, especially in rural sub-village in Manatuto, Bobonaro and Ataúro municipality which were not connected to both piped water supply systems and national electricity grid. Oftentimes, piped water supply systems provide poor service because of high leakage, inadequate metering, and illegal connections. However, alternative sources were not always easily

[3] SO2.3: Women and men in Timor-Leste, in particular school children and people living in rural areas, have increased access to – and utilize – safe and reliable water and improved sanitation and hygiene services, in an equitable and sustainable manner.

available, as seen in the case of Atauro, and water quality was highly variable. Most of the remote *aldeias* relied on spring water, wells and limited supply of local piped water systems which were in dire need of maintenance. In several *aldeias* in Atauro, several households relied on rainwater collecting. When most of these water sources dry out during periods of dry season (July-November), many villagers become more vulnerable to water scarcity issues.

Electricity

In general, ACCESS project design was strongly relevant to Timor-Leste's infrastructure development vision formulated in the SDP (2011-2030) which stated that by 2020 at least half of Timor-Leste energy needs were met from renewable energy sources. Additionally, the project contributed to Timor-Leste's National Rural Electrification Plan which aimed to ensure that all people had access to electricity 24 hours a day. According to the plan, this can be achieved through either connecting small local area networks to the national grid or offering renewable energy sources. According to existing data, the GoTL had not achieved the SDP on rural infrastructure set for 2020 as well as the target set for National Rural Electrification. More investments were required to meet the target.

There was inconsistency with the actual data on the progress of the national electrification plan in the country due to lack of proper database management. According to a 2018 official government figure, of the 452 sucos (villages), 76% of them had access to electricity. To date, around 71 (out of 453) sucos with a total of around 291 aldeias (sub-villages) remain disconnected from the national electrification grid system. National census (2015) estimated that about 29,000 families in remote areas of the country obtained their energy supply through various uses of renewable energy resources. Lacking access to electricity, even since the Indonesian occupation period, forced villagers to resort to kerosene lamps and other traditional methods (a mixture of seed powder and threads lumped together and set on palm fiber sticks) to provide light. While these alternative methods allowed them to perform household chores and other activities (handicraft, weaving, sorting betel nuts, and baking) in the evening, they also posed health risks, especially to new-borns and children, as well as high level of hazard (fire) because most of the rural houses were constructed from highly flammable materials such as palm leaves and palm stalks.

The installation of two main power plants in Hera (north coast) in 2011 and Betano (south coast) in 2013 with a combined power of 256.1 MW by EDTL E.P., a state-owned company in the electricity and energy sector, made it possible to supply energy to the twelve (12) municipalities. Additionally, there was an existing 17.3 MW plant in the enclave of Oecusse and another 2.6 MW plant in Ataúto island. However, the existing power plants still do not reach many rural areas of the country. To run these power plants, Timor-Leste imports expensive supplies of diesel fuel, which price is subject to the volatility of global oil markets. The annual cost for operating the four diesel-based power plants (USD 0.42/KWh) is estimated to be USD 126 million. The cost of electricity for consumers remains high (USD 0.12/KWh) although 85% of that operating costs is subsidized by the GoTL. The amount of subsidy required in the near future will grow as more households become connected to the national grid. Hence, investment in renewable energy such as ground mounted solar PV plants as well as conversion of one of the diesel plants to operate on LNG are seen as alternative.

4.2. Project Strategy

Overall, the project design was relevant and appropriate. It directly responded to the urgent need to improve access to basic community infrastructures in rural parts of Indonesia and Timor-Leste. The project's selection of solar-energy as the chosen renewable energy to be introduced in the target sites corresponded well with the local context (i.e. both countries have tropical climates with high levels of solar radiance and Indonesia's solar energy market is expanding). The use of SSTC modality to achieve project outcome fits the purpose of enhancing development cooperation between countries of the global south. Furthermore, the project applied educational and capacity building mechanisms to empower local users with relevant knowledge and technical skills while at the same time building a strong sense of ownership of the project output (i.e., units PLTS, PATS and LTSHE).4.2.1 Results Frameworks Analysis: Project Logic, Strategy and Indicators

The Theory of Change laid out the overarching development challenges which the project aimed to address: livelihoods and inequality. It underlined how the project intervention addressed structural root causes, underlying causes, and immediate causes of unequal development which tended to leave behind people living in remote locations. The Project Result Framework (PRF) was designed to encompass the common and distinct needs of Indonesia and Timor-Leste. It comprised two outcomes with their corresponding outputs, a total of seven outputs, reasonably well connected through logical linkages (i.e., inputs → activity → activities → outcomes → impacts). Each outcome was assigned to each country with the first one under ACCESS project Indonesia's target and responsibility and the second one under ACCESS project Timor-Leste's target and responsibility.

The first component/outcome responded to the need to elevate renewable energy development in Indonesia through the construction of PLTS. The second component/outcome, implemented through SSTC modality, responded the need to introduce renewable energy development in Timor-Leste through the construction of PATS and distribution of LTSHE. Both outcomes were supported by the institutional and local capacity development to enhance the sustainability of access to electricity and provision of service, including operation and maintenance, in remote villages. The project objective was clearly formulated but without its own separate indicators as seen in many standard project logical frameworks. The PRF seemed to opt for assigning indicators directly under the activities for each output.

4.2.2 Assumptions and risks

The project document listed a number of external and internal risks which the project may face during its implementation and proposed a number of mitigation measures (see table 10; However, it did not list impact (1 - negligible, 2- minor, 3 - intermediate, 4 - extensive, 5- extreme) and probability (1 - not likely, 2 - low likelihood, 3-moderately likely, 4-highly likely, 5-expected) as outlined in UNDP ERM (Enterprise Risk Management). The APRs only reported each risk as either high or low with a "YES" or "NO" marking. This seemed to make it difficult to calculate the level of impact of probability of each risk.

Table 9. List of Project Risks and Assumptions

Risk type	Risk categories	Mitigation
External	*Political instability between Indonesia and Timor-Leste will risk the implementation of SSTC component activities.*	Close coordination with the Ministry of Foreign Affairs in both countries since initiation of the project to ensure correct SSTC protocol.
	Natural disasters in targeted locations.	Early coordination with the National Disaster Agency to obtain information on all target locations' potential risks. During construction, ensuring compliance of environmental safeguard standard for construction.
	Built facilities are stolen/destroyed.	Consulting and engaging communities since the project's planning process, establishing village rules to anticipate unwanted actions.
	Socio-cultural risk in the targeted locations, whereby it is not common for women to take part in public activities such as to be local operators.	Consultative meeting were conducted with the elders, women-respected representatives and head of village to explain the roles of local operators and to seek support.
	Social and environmental risks	(No mitigation listed)
Internal	*Failing in procuring qualified Engineering, Procurement, and Construction (EPC) company*	Conducting market sounding in the early stage to obtain feedback on suppliers' interest and contract terms and conditions.
	No local people pass the certification test as solar PV operators.	Engaging potential operator candidates during construction and plan for longer training duration before entering the certification process.
	Cost overruns during construction	Ensuring the quality of engineering design, adding insurance clause in the EPC contract, and allocating contingency budget to cover a reasonable level of cost adjustment.

4.2.3 Planned stakeholder participation and gender responsiveness of project design

The project design promoted participation of diverse stakeholders in all phases of the project's cycle, including capacity development activities, training, and design of outputs. During the project formulation phase, consultations were held with a broad range of stakeholders, including representatives of local communities. Consultations helped to build an understanding of the baseline as well as establishing trust-based relationships between PMU and local leaders/community members. In Timor-Leste, consultation was an essential step to obtain support for local actors to identify the most vulnerable households that deserved to be in the beneficiary list. Field visits showed that community members understood the project's objectives, its limitations in terms of the number of units of LTSHE to be distributed, and the selection criteria for beneficiary groups.

Addressing gender issues was one of the strategies employed by ACCESS Project. This was clearly reflected in a number of project outputs which set a 30% quota for female participants in project activities and prioritized female-led households during the identification of beneficiary groups. This was in line with UNDP's commitment to mainstream gender issues in all UNDP supported activities as shown in the UNDP Gender Equality Strategy 2018-2021.

4.3 Progress towards results

4.3.1 Progress towards outcomes analysis

The project is approaching its proposed end date with clear indications that it will not reach all of its outcomes and objectives without an extension of four to six months. Based on the analysis of the APRs, quarterly reports, consultant reports, and information collected through interviews and FGDs with relevant stakeholders, it is fair to argue that the project is still on track to achieve all its target outcomes; However, it will not achieve all target outputs within the current proposed end date (31 December 2023). The following sub-sections elaborate progress towards outcomes for ACCESS Project Indonesia and Timor-Leste.

4.3.1.1 Output 1: Renewable-based power plants built providing sustainable access to electricity for remote villagers in Indonesia with institutional and local capacity in place.

Activity 1.1.: Renewable-based energy infrastructure construction that provides access to electricity for households in targeted villages in Indonesia that can be monitored remotely.

Achievements:

By Q3/2022 project management signed agreements with 3 EPC contractors: P3TEK for Lot 1 West Sulawesi and Lot 3 East Nusa Tenggara through LoA (Letter of Agreement) modality, JGH for Lot 2 South East Sulawesi through SLA (Service Level Agreement), and CAA for Lot 4 Central Kalimantan were signed in Q3/2022. All EPC contractors conducted site surveys at all 23 locations to verify data for the Detailed Engineering Design. Site survey reports for all 23 locations were completed. PV main components for Lot 2 South East Sulawesi and Lot 4 Central Kalimantan were approved and ordered.

As a supporting system for the power plant, during the same period BAKTi-MoCI installed internet network in 16 villages in Central Kalimantan and East Nusa Tenggara. The facilities were temporarily installed at the village offices while waiting for the power-plant construction and were utilized by villagers in the sites for communication and daily activities.

During Q1 2023 when the MTE was conducted, components for Lot 2 and Lot 4 arrived in Jakarta and waited for customs process. Meanwhile, the project management undertook measures to speed up construction process by urging contractors to conduct field preparation to start civil construction process in Southeast Sulawesi and Central Kalimantan. At the construction sites, all of the target villages provided lands for the construction of the Solar PV power plant (PLTS). 21 lands were provided as grants, while the other two locations use rented lands.

Activity 1.2 : Local capacity building for operation and maintenance of the built energy infrastructures.

For Activity 1.2., the project completed the development of training curriculums and modules for the PLTS and solar-powered water pumps. These curriculums and modules were discussed and developed in a series of FGDs with PPSDM EBTKE and relevant experts. Eight modules for the PLTSs and nine modules for solar-powered water pumps were completed and translated into English and Tetun.

Furthermore, the project completed the recruitment and selection of local operators through a transparent mechanism with affirmative action to ensure that there were female operators in each village. The ACCESS village facilitators (Patriot Energy ACCESS Program/PEAP) received 172 applicants from 23 villages and shortlisted five potential candidates from each target village, resulting in a total of 110 candidates. From these candidates, 46 local operators (50% of whom were women) were selected for solar-PV power plants in 23 villages. All of the operators obtained certificates from PPSDM EBTKE in March – June 2022.

Field training for the operators of the Solar PV Power Plant were held from March to June 2022 in Pulau Tunda (in three batches), while field training PATS operators by PPSDM KEBTKE were held from August to October 2022 in Rambatan Village, Kuningan District, West Java (in 2 batches).

Even though the recruitment of female operators was carried out as a form of affirmative action, it did not mean ignoring the quality of the female operators who were recruited as it was shown that female operators from Mata Wee Lima 1 Village were participants with the best results during field training. FGDs and KIIs result involving local operators showed that both male and female operators demonstrated relatively equal capacity.

Activity 1.3: Local institution establishment to enhance sustainability and scaled-up use of built energy infrastructures.

During Q2 2022, ACCESS successfully achieved its goal of establishing and revitalizing 21 BUMDes (village government-owned enterprises) and RESCOs (renewable energy service companies) – an electricity business unit under BUMDes. Women were provided the opportunity to take part as BUMDes and RESCO board members. Among 124 BUMDes Board members appointed, 35 members were women (22%), while out of 43 RESCO board members, 21 members were women (49%). All 21 BUMDes received legal certificates from the Ministry of Law and Human Rights.

Currently, 16 BUMDes are in the "Basic" phase and are working towards the "Developing" phase. They completed the initial institutional foundation in terms of management structure, institutional regulations, and legality, and started running their first businesses. Meanwhile, 5 BUMDes are at the "Developing" stage, where they established a business, although it may not necessarily be profitable. None of the BUMDes reached the "Advanced" and "Mature" phases yet, where they may generate sufficient income and profits that can be distributed to the BUMDes and the Village Government for community development initiatives.

PEAP/village facilitator provided assistance to BUMDes and RESCO in establishing a responsible financial management system. Among the mechanisms established was the creation of a dedicated bank account for the management of community contributions. In addition, as part of the established financial SOPs, bank accounts were signed by two authorized people such as the director and treasurer of BUMDes. With such mechanism, the management of RESCO accounts were expected to be more accountable. This accountable financial management system played a crucial role in ensuring the sustainability of the electricity service provided by the PLTS. An initiative to strengthen BUMDes and RESCO accountability was also undertaken by RESCO management. The director of Watu Karere BUMDes had a plan to establish an independent monitoring team whose members comprised community leaders to supervise the BUMDes and RESCO that managed the PLTS.

Apart from raising awareness among villagers on the significance of their contributions for the sustainability of the PLTS operations, PEAP devised a flexible payment model for electricity fees that aligned with the community's financial capacity. For instance, in Wangkolabu Village, electricity dues were collected on a daily basis since the residents' earnings were generated on a daily basis, and monthly payments were considered difficult for them to afford. In Muara Ripung Village, electricity dues were not only collected in cash, but also in the form of commodities like candlenut, which were collected and sold by BUMDes. This payment approach can reinforce the trading business of BUMDes while collecting electricity dues.

Activity 1.4: Results dissemination through knowledge sharing workshop

Activity 1.4 of the ACCESS project entailed the dissemination of results and planning for scaling up. The project successfully delivered a keynote presentation at the Youth SDGs Conference held by AIESEC UPN Veteran Yogyakarta in June 2022. This presentation provided an opportunity for the project to showcase its results and discussed its potential to contribute to achieving the Sustainable Development Goals. The conference was an excellent platform to engage with youth and empower them to be a part of the project's efforts towards sustainable energy access.

Furthermore, the project effectively disseminated its findings to its stakeholders through the publication of diverse reports. This included bi-monthly newsletters, quarterly, mid-year, and annual report. These reports provided comprehensive information on the project's progress, challenges, and future plans. Additionally, the project organized a Business Plan Competition in Renewable Energy for university students across Indonesia. This competition aimed to engage the youth and inspire them to develop innovative solutions to address renewable energy challenges. Four winning proposals were selected from 34 submissions and shared with the community members.

To reach a broader audience, the project developed its social media accounts on platforms such as LinkedIn, Facebook, and Instagram, and a website (www.accesstoenergy.org) in June 2021. This initiative aimed to increase the project's visibility and promote its activities and results to a wider audience. The project's presence on various social media platforms, as well as publication on UN and UNDP Indonesia websites, was an effective way to raise awareness and engage with stakeholders interested in the project's activities.

4.3.1.2 Output 2: Under SSTC between Indonesia and Timor-Leste: Solar PV water pumps and Highly Efficient Solar Lamp System (LTSHE) are installed in remote villages in Timor-Leste providing sustainable access to clean water and highly efficient lighting.

Activity 2.1. Renewable-based energy infrastructure construction that provides access to clean water for households and installation of LTSHE in targeted villages in Timor-Leste.

Solar water pumps (PATS)

The project continued to face delay in the implementation of activities 2.1.1. and 2.1.2 up to 2022 mainly due to procurement challenges. As a result, access to clean water supply for target beneficiary in 10 selected aldeias comprising 684 households, was not achieved. To address this situation, in January 2023 PMU worked closely with its Global Procurement Unit (GPU) in Copenhagen, Denmark to procure a competent international company that can supply the solar PV water pumps (PATS) through GPU's Long-Term Agreement (LTA).

In March 2023, the project selected a France-based company, Enviroearth, as the winner of the bid. Enviroearth subcontracted a Timor-based company, Elzalira & Domin Timor Diak, as its partner for conducting further site assessment, equipment supply and delivery, and installation of the units. In April 2023, PMU conducted two kick-off meetings with both Enviroearth and Elzalira & Domin Timor Diak to start planning for the next phase. All necessary works (i.e., site surveys, detailed engineering, environmental licensing, procurement and delivery of equipment, site preparatory, civil works, and installation) were expected to take place between May 2023 and March 2024. User acceptance testing (UAT), commissioning, and training will follow suit before handover to UNDP in April 2024.

There was some progress with prerequisite works for the PATS. Early in 2022, the Project commissioned the National Research and Innovation Agency (BRIN, Indonesia) and the Universidade Nacional Timor Lorosa'e (UNTL, Timor-Leste) to conduct a feasibility study to assess the PATS construction's technical, social, economic, and environmental feasibility. This again highlights the SSTC feature embedded in the project. The BRIN-UNTL joint team finalized the Detailed Feasibility Study (DFS) for installing the PATS system in Manatuto, Bobonaro, and Atauro. The study was adopted to develop the ToR of the procurement process. For the legal status of the land, the project facilitated meetings with 30 Landowners and ten water source owners to obtain their agreement. An acquisition statement was signed by them in front of local authorities in Ataúro, Bobonaro, and Manatuto in 2022.

Highly-Efficient Solar-PV Lamps (LTSHE)

Target for this output was fully achieved in early 2023. Since the beginning of 2022, the project started the distribution of 1,000 full units of Highly-Efficient Solar-PV Lamps (LTSHE) (see *table 11 for detail specification and components of the LTSHE*) to 1,000 households which consists of over 2,530 men (56%) and 2,011 women (44%). The distribution of 992 units of LTSHE in Ataúro (9 *aldeias*), Bobonaro (6 *aldeias*), and Manatuto (12 *aldeias*) was completed at the end of 2022. The project then delivered the remaining unit in early 2023 to complete the final target. Through the distribution of 1,000 units of solar PV lamps in 27 rural sub-villages, ACCESS project decreased the number of Timor-Leste's rural *aldeias* without access to electricity by 9.2% (see table).

Table 10. Number of aldeias with and without access to electricity before and after ACCESS project's intervention

Total *aldeias* in Timor-Leste		**2,233**	
Timeline	**Data**	**In number**	**In percentage**
Before project intervention	*Aldeias* with access to electricity based on 2018 data	1,942	87%
	Aldeias without access to electricity based on 2018 data	291	13%
Project intervention	*Aldeias* without access electricity where ACCESS project distributed 1,000 LTSHE units in 2022/2023	27	9.2%
After project intervention	*Aldeias* with access to electricity in 2023*	1,969	88.2%
	Aldeias without access electricity in 2023*	264	11.8%
* This is only a rough estimate which has not factored in figures from EDTL E.P.			

Based on an interview with the PMU, it was difficult to deliver the LTSHE units to project sites due to road conditions. Most of the project sites were in the most rural areas of the country where access was hindered by

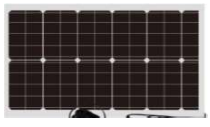
natural barriers such as riverbeds and high elevations. In Ataúro municipality, some of the villages were only reachable by foot or via boats. Additionally, the number and capacity of personnel of the installation company, Quelebo L.D.A., to deliver the work in villages scattered around all three municipalities were limited.

LTSHE was adopted from Indonesia and provided by the Indonesian and Timor-Leste joint companies (Quelebo L.D.A.), reflecting the SSTC aspect of the project. The field observation in seven (out of 27) sub-villages across three municipalities revealed that community members were grateful to the project for providing them with alternative access to electricity. Many confessed that having lights in the house enabled them to prepare dinners with less hassle, conduct more livelihood activities (handicrafts, bakery, and cracking betel nuts for women and fishing for men) and socialize with family members and neighbours. They were able to work for a few more extra hours in the evening to produce products that can be sold in local markets. They also emphasized that their children can now study better in the evening. Additionally, they stopped relying on kerosene lamps which posed health risks and required monthly additional expenditure of around USD 10 for the kerosene.

The portability feature of the lamp (once fully charged, lamps may be unplugged from the cable) had an added value. This feature made this lamp more distinguishable than other solar lamps which were stationary. Family members shared that the convenience and practicality of the LTSHE portability allowed them to conduct activities outside of the house safely. They can also easily lend the lamps to their neighbours, community centres and churches during any social, religious and cultural gatherings. This helped tighten their social bond.

To ensure that users had basic knowledge and proper utilization of the LTSHE, Quelebo L.D.A. provided a short demo session for each head or representative of the household where they installed the unit. The company also shared information on basic operation and maintenance of the solar PV module. They also advised that apart from cell phones, users should not charge other devices, such as speakers and power banks, on the charging stations. This information was crucial for the majority of households which had limited or no exposure to solar PV systems in the past. Field visit revealed that some community members were keen to learn more about the basic principle of the solar PV system as the demo session was too short and less technical.

Table 11. Total number of component of LTSHE distributed to 1,000 households

Component	Picture	Number of Units per HH	Total number of units for 1,000 HH
Lamp		4	4,000
Connector		1	1,000
Remote controller		1	1,000
5 meter lamp cable		4	4,000
Charger cable		1	1,000
Lamp battery		4	4,000
Solar PV panel		1	1,000

Activity 2.2. Local capacity building for operation and maintenance of the built energy infrastructures.

In terms of capacity building for local villagers who were in charge of the operation and maintenance (O&M) of the built energy infrastructure, the project facilitated a training and certification of qualified operators by the formal certifying institution on PATS operation and maintenance. Under the South-South Triangular Cooperation (SSTC) Framework, this activity was conducted by the Center of Human Resource Development on Electricity, New and Renewable Energy, and Energy Conservation under the Ministry of Energy and Mineral Resources of Indonesia in Jakarta. Around 30 local operators (with 27% women) from Atauro, Bobonaro, and Manatuto attended the training and passed the competency certification conducted by the Center for Human Resource Development (PPSDM) of Electricity, New Energy, Renewable Energy, and Energy Conservation (KEBTKE) in Ciracas, Jakarta at the end of November 2022.

Most of the Timor-Leste certified operators came from different backgrounds in their community. While some assumed the position chief of *suco (village)* and chief of *aldeia* (sub-village), others came from existing O&M groups (i.e., facility management group). Some of them were female community members who wanted to take such an untraditional position in their village. During field visits, a few certified O&M personnel shared their appreciation for the capacity building opportunity and emphasized the importance of commencing installation work for the PATS system in their respective *aldeias*. Once the work was completed, it allowed them to put in practice the technical knowledge and skills on O&M which they obtained in Jakarta. It was also observed that several certified female operators were keen to become involved in the O&M structure.

Activity 2.3. Establishment of viable operation and maintenance mechanisms to ensure service sustainability.

Another equally important component of output 2.3.1 was the establishment of the sustainable operating mechanism for solar water pumps. Although the project talked to several potential members and groups for O&M of PATS and certified a handful of operators, it had not formally established such a group in the target *aldeias*. It was evident that the delay in achieving output 2.1.2. impacted the formation of the group.

In almost all ten project sites selected for the solar PV water pumps, there were Facility Management Groups (FMG or GMF) from previous small-scale infrastructure projects. Most of them were familiar with GMF's functions and responsibility to conduct maintenance works and collect monthly tariffs. FGDs and interviews revealed that all previous GMFs operated on a voluntary basis. This was an opportunity that the project should capitalize on to ensure the sustainability of low-cost operation and maintenance of the facility in the long run. Luckily, the project started engaging with some existing/inactive GMF groups to capture lessons learned from previous operations and secure their participation in the soon-to-be-established O&M for PATS. Field visits revealed that these groups were willing to come together and support ACCESSS project's intervention in their *aldeias*.

4.3.2 Remaining barriers to achieve the project objective

The MTE identified the following issues pertaining to each project activity as barriers to achieve the overall project objective:

Activity 1.1. Renewable-based energy infrastructure construction that provides access to electricity for households in targeted villages in Indonesia that can be monitored remotely.

Due to the prolonged tender process, the Solar PV power plant (PLTS) construction was carried out as targeted by the project. Both internal and external factors caused the prolonged tender process. Internally, the technical and financial evaluation of the 39 proposals and the approval process took 6 months (Q3-Q4 2021), which resulted in the disqualification of the tender winner for Lot 1 & 3 and retendering process.

Meanwhile several external factors such as COVID-19 pandemic and price increase due to global economic instability also contributed to the prolonged procurement process. COVID-19 pandemic which started in early 2020 slowed down all business processes for all institutions around the world. Social restrictions imposed by the government limited all business processes. Price increase due to global economic instability caused the prices offered by the tender participants to exceed the budget allocation.

The prolonged procurement process raised a number of concerns that the project management team need to address. Stakeholders ranging from the national to village level, including MEMR, questioned when the PLTS construction was going to take place. This indicated that these stakeholders lacked adequate information regarding the progress of the procurement of the PLTS that ACCESS was undertaking.

An additional concern pertained to the duration of the PEAP service period. The period needed to be prolonged to provide support at the village level during the construction and post-construction phases. This assistance was crucial to ensure that BUMDes, RESCO, and local operators carry out their roles effectively in accordance with

the previously established mechanism. Extending the PEAP's tenure, however, had financial implications for the project budget, which was a separate matter that the project management team needed to address.

There was also a potential conflict on plots that were provided based on a grant letter, especially in situations where there was a conflict of interest, as in the case of Milla Ate Village in NTT where the landowner, who also served as the village head, revoked his grant after losing the village head election.

Activity 1.2. Local capacity building for operation and maintenance of the built energy infrastructures

As a result of the extended procurement process for the PLTS, there was a time gap of over a year between the training and construction phases, which caused some of the operators who had received training to forget their knowledge and skills they acquired from the training.

Activity 1.3: Local institution establishment to enhance sustainability and scaled-up use of built energy infrastructures.

One of the significant threats to the project result sustainability was the governance structure in each village. In several villages, there was a strong patron-client relationship between the village head and the community, leading to a power-centered governance structure. For instance, in Wangkolabu Village, the village head's son-in-law was the village secretary, which gave the village head significant power in the village administration. Similarly, in Ekapata Village, the BUMDes director was the wife of the village head, while the BPD head was a close relative of the village head, giving the village head a stronger position.

In a village with a small population, almost everyone was related to each other. However, appointing a family member as the BUMDes manager, as seen in the case of Watu Karere Village, may lead to accountability issues in the PLTS management. The decisions made would primarily benefit the village head's family, which could jeopardize the project's efforts to create a transparent and accountable management structure from an operational and financial perspective.

Activity 1.4: Results dissemination and planning for scaling up

Beneficiaries of the PLTS project experienced anxiety due to lack of communication regarding the project's progress. During the FGDs, villagers and the village government repeatedly asked when the PLTS infrastructure would be built as they were aware that the construction was scheduled to begin a year before the MTE was carried out. In villages like Wangkolabu and Muara Ripung, residents cleared land in preparation for the construction of the PLTS. However, the lack of regular communication from the project has left them uncertain about the status of the project.

Unfortunately, the project's online social media channels were not suitable for these communities as most of the target villages had limited internet access. As a result, the project needed to identify and utilize other communication channels to keep the communities informed about the progress of the PLTS project. Lack of communication not only lead to anxiety and uncertainty but also affected the trust that the community had in the project. Therefore, it was essential to establish regular communication channels to build trust and transparency in the PLTS project (eg. enhancing the roles and functions of the PEAP).

Activity 2.1. Renewable-based energy infrastructure construction that provides access to clean water for households and installation of LTSHE in targeted villages in Timor-Leste.

The delay in the procurement process for PATS stemmed from the fact that to accommodate a water distribution system that suited Timor-Leste terrain in ten selected sites, cutting-edge solar water pump technology was required. Such technology was not commonly available in the regional market, let alone the local market where basic components of solar PV units were mainly imported from neighbouring countries. Hence, the procurement process had to rely heavily on global suppliers.

During field visits, several households reported technical issues with some components of the installed LTSHE system. PMU worked with the *aldeia* chiefs to list down households which had such issues (see Table 13). Based on the preliminary assessment by the project team, the main causes were water leakage from the thatched roof, negligence (circuits overloads when devices which require more power are charged), and rodents chewing through wires. In addition, report by UNDP TL showed that some parts were broken even from installation stage such as mal-functioning lamp or old batteries. This implied the possibility of manufacture defects. Therefore, the project was expected to contact Quelebo L.D.A. to assess the conditions of those lamps and discuss measures to address this issue based on the existing contract.

Table 12. Number of broken parts of the LTSHE collected from three municipalities.

Components	Number of damaged units	Percentage

Lamp	363	9%
Connector	130	13%
Remote controller	162	16%
Lamp cable	79	2%
Charger	76	7%
Battery	150	4%
Solar PV panel	2	0.2%

Activity 2.2. Local capacity building for operation and maintenance of the built energy infrastructures.

The delay with the installation of the PATS system in the ten target *succos* created a significant time gap between capacity building for operators and the implementation of the O&M activity. Less knowledge and skills were retained as the time gap increases. This was one of the O&M personnel concerns as they started to notice the lack of O&M operational activity after returning from the capacity building session in November 2022. Additionally, many operators complained that they were not able to share the knowledge and skills with potential O&M members since their facilities to practice relevant O&M work were not yet available.

Activity 2.3. Establishment of viable operations and maintenance mechanisms to ensure service sustainability.

Past experiences showed that most of the GMFs only lasted for short duration due to lack of users' commitment to pay for the tariff. Without the tariff system, it was difficult to purchase materials and logistics for O&M purposes. This eventually diminished GMF members' commitment to perform O&M services. In some cases, there were free riders which tended to gradually discourage other users from contributing financially.

4.4 Project Implementation and Adaptive Management

4.4.1 Project Effectiveness and Efficiency

The ACCESS project is a large-scale intervention aimed at improving energy access and promoting sustainable development in Indonesia and Timor-Leste. As with any project of this scale, it is important to assess the effectiveness of the project's governance structure, coordination and collaboration efforts, monitoring and evaluation system, resource allocation, and overall progress towards achieving intended outcomes. Additionally, it is essential to examine the supporting and constraining factors that contribute to the project's success or hinder its progress.

The following section will be split into two parts. The first will focus on evaluating the project's effectiveness, assessing what has been accomplished for each output and identifying any outstanding issues or concerns. The second part will concentrate on evaluating the efficiency and effectiveness of the project management system. This will entail reviewing factors that facilitate the achievement of output results, and identifying any outstanding issues or concerns that still need to be addressed.

4.4.1.1 Effectiveness of the Project

Apart from Activity 1, the project management team successfully achieved its target output. This was a positive sign that the project was progressing in the right direction and that the team was making good use of the available resources. It also indicated that the project management team had a clear understanding of the project objectives and was capable of executing the project plan effectively. By achieving the target output, the project management team took a step towards achieving the overall goal of the project, which is an important milestone in any project.

4.4.1.2 Effectiveness and Efficiency of the Management System

The effectiveness of any intervention is closely linked to the governance structure that directs its implementation. In the case of ACCESS, a crucial question arose: was the governance structure conducive to achieving results at scale and speed? This question needed a comprehensive analysis of the division of roles and responsibilities, coordination and collaboration with internal and external parties, and the financial arrangements in place. Moreover, it was equally critical to determine if the associated risks at the regional,

national, and local levels were adequately anticipated and addressed. This section seeks to explore these questions to provide a holistic understanding of the effectiveness of ACCESS's governance structure.

INDONESIA

a. Project Governance

The ACCESS project's governance structure was effective in achieving its activity targets. The Project Board, consisting of KOICA, MEMR, MSA, and UNDP, provided strategic guidance and solutions during implementation. The Project Management Unit (PMU) had a supportive staff and partner structure, with technical experts and officers assisting in different activities. The roles between the PMU and implementing partners, such as PPSDM KEBTKE and PT. Cakrabuana, were well-defined and successful.

PPSDM KEBTKE strengthened electricity technical management through training and certification of local operators. PT. Cakrabuana played a crucial role in recruiting and supporting the facilitators at the community level, contributing to the establishment and strengthening of village governments, BUMDes, and preparing RESCO for the upcoming solar-PV power plant.

The coordination system within the project was well-organized, involving regular meetings at various levels to address technical and strategic issues. Biweekly meetings at each PMU, monthly meetings between PMUs from Indonesia and Timor-Leste, and quarterly meetings with the Project Board facilitate project implementation. For priority matters, more intensive coordination mechanisms, such as meetings with implementing partners like P3TEK for EPC, were established to expedite procurement processes. Overall, the ACCESS project's governance structure and coordination mechanisms proved to be effective in achieving results and addressing project-related challenges.

b. Project M&E System

ACCESS project's monitoring and evaluation (M&E) system provided ample data and information on the overall project achievements and dynamics. The M&E framework was developed during the project planning phase and adapted to suit the conditions of project implementation. The PMU effectively carried out monitoring and evaluation processes according to the monitoring plan, making the M&E system a crucial tool for project management.

To track progress, the PMU regularly produced data on the achievement of results for each output and activity, which was compiled into quarterly and annual reports. These reports were presented to the project board and key stakeholders at both national and regional levels. This routine reporting was complemented by baseline and midline reports, which document changes in beneficiaries following the project intervention. These reports were essential for conducting the Mid-Term Evaluation and evaluating the project's impact.

To promote gender mainstreaming in project implementation, the PMU conducted gender studies and prepared gender action plans to guide the team in integrating a gender perspective into every project activity. This approach aligned with ACCESS's commitment to promoting gender equality and empowering women. The gender studies and action plans served as references for the team to ensure that project activities were gender-sensitive and responsive.

In addition to above, the project team collaborated with a consultant team to conduct performance management for ACCESS hired by KOICA. KDS conducted series of online/offline workshops with UNDP to review existing Theory of Change, Logical Framework and performance indicators. The result was a revised Project Design Matrix focusing on key performance indicators which was approved during the Project Board Meeting in December 2022.

Overall, the M&E system, along with routine and specialized reports, gender studies, and action plans, proved to be an effective tool for tracking progress, evaluating impact, and ensuring that ACCESS remained committed to its objectives. The comprehensive M&E system provided ample data and information, enabling the project to respond promptly to both technical and strategic issues in project implementation.

c. Risk Identification and Mitigation

After reviewing the ACCESS project risk register, the management team identified external risks at various levels that may impede the achievement of project objectives. At the global level, the management team identified the COVID-19 pandemic and its impact on slowing down the project activities as a major risk. This was identified in early 2020 when social distancing policies began to be implemented both at the national and global levels. The

impact of the pandemic, along with the Ukraine crisis, on the rising prices for PLTS components were also identified, and mitigation efforts were prepared.

At the community level, several risks were identified, such as the lack of clarity regarding the status of land to be used for construction, infrastructure security, and barriers to women's participation in the project. Additionally, the MTE conducted revealed several other risks at the local level, such as accountability and transparency in BUMDes and RESCO management, as well as the availability of post-project technicians and spare parts.

To mitigate these risks, the ACCESS management team developed various strategies and measures such as closely monitoring the situation of the COVID-19 pandemic and its impact on project activities, establishing clear communication channels with communities to resolve any land issues, ensuring security measures for the infrastructure, and implementing gender-sensitive approaches to encourage women's participation. Moreover, the management team also worked to strengthen the accountability and transparency of BUMDes and RESCO management through training and capacity building activities. Additionally, measures were taken to ensure the availability of post-project technicians and spare parts to ensure the sustainability of the project outcomes.

The management team of the ACCESS project was able to identify and mitigate external risks, but they appeared to be less capable of anticipating internal risks, particularly those associated with the procurement process. The risks that could potentially result in a prolonged procurement process were identified and discussed in technical and ACCESS board meetings.

During the Internal Project Appraisal Committee meeting on 15 September 2020, the UNDP Procurement Analyst and Operations Manager provided feedback regarding the protracted procurement process, which required ACP approval and necessitated the involvement of technical experts. They also suggested engaging the foreign ministries of both countries to oversee the procurement process and combining the procurement process between Indonesia and Timor-Leste to expedite the process.

During a meeting with DG EBTKE on 13 January 2021, Mr. Halim Sari Wardana, Secretary of EBTKE, enquired whether the ACCESS project had considered the risks associated with limited bids from contractors and construction delays due to the pandemic. Unlike external risks, internal risks and corresponding mitigation strategies were not recorded in the project's Risk Register or incorporated into the implementation process.

d. Project Efficiency

To measure project efficiency, this MTE used Earned Value Management (EVM)[4] which revolved around three key metrics. The first one, planned value, signified the total value to be achieved at a specific point on the project timeline. The second metric, earned value, referred to the total value that was actually attained at that particular point on the project timeline. Finally, actual cost was the amount of resources that were expended for achieving a certain value. The scope requirements of a project is achieved when its earned value matches the planned value.

Consequently, comparing the planned value against the earned value allowed a project manager to determine if a project was progressing on schedule. On the other hand, comparing the earned value to the actual cost enabled the project manager to evaluate if the project was operating within the budget.

In general, the achievement of ACCESS up to Q3 of 2022 for Output 1 (Indonesia) was 75% percent of the target with the following details:

Table 13. Achievement of Output 1 (Q3/2022)

Activity	Target	Achievement	%
1.1. Renewable-based energy infrastructures construction that providing access to electricity for households in targeted villages in Indonesia that can be monitored remotely.	3,025	0	0
1.2. Local capacity building for operation and maintenance of the built energy infrastructures.	50	50	100
1.3. Local institution establishment to enhance sustainability and scaled-up use of built energy infrastructures.	21	21	100
1.4. Results dissemination through knowledge sharing workshops.	600 participants	65 attendees 649 recipients	100

[4] (*How to Pick an Earned Value Management System | Smartsheet*, n.d.)

		= 714	
Average			**75**

Note: Target based on PDM ACCESS Project version 17 January 2023. Meanwhile, the budget spent for each activity until the end of 2022 were as follows:

Table 14. Total budget vs expenditure Q4/2022 (Indonesia)

Activity	Budget (US$)	Expenditure (US$)
1.1 Renewable-based energy infrastructures construction that providing access to electricity for households in targeted villages in Indonesia that can be monitored remotely.	11,674,061	1,375,621
1.2. Local capacity building for operation and maintenance of the built energy infrastructures.	1,197,700	652,842
1.3. Local institution establishment to enhance sustainability and scaled-up use of built energy infrastructures.		
1.4. Results dissemination		
Project Management & Monitoring	2,007,951	411,892
Balance from Pre-FS	17,160	
Total	**14,896,872**	**2,440,355**

Using EVM Framework, it can be calculated that by the end of 2022, the **Cost Performance Index** of the project was 1.32 or >1.0 which indicated low disbursement rate. Meanwhile, the **Schedule Variance Index** of the project was 0.22 or <1.0 which indicated that the project was behind schedule.

Table 15. Project Cost Performance Index (Indonesia)

Concepts	Formula	Value ($)
Budget At Completion (BAC)	= The total expenditure that went into completing a project	14,896,872
Planned value (PV)	= percent planned (100%) X BAC	14,896,872
Earned Value (EV)	= percent complete (75%) X BAC	3,222,811
Estimate To Complete (ETC)	= BAC – EV	10,298,440
Actual Cost (AC)	= The total amount of money spent by a certain point in a project. (by end 2022)	2,440,435
Estimate At Completion (EAC 1):	= AC + ETC	13,049,682
Estimate At Completion (EAC 2):	= AC + ETC	11,674,061
Cost variance (CV)	= EV – AC	782.376
Cost performance index (CPI)	**= EV/AC**	**1.32**
Schedule variance (SV)	= EV – PV	-11.674.061
Schedule performance index (SVI)	**= EV/PV**	**0.22**

e. Issues

The implementation of the ACCESS project involved institutions outside the Project Board members, such as the Ministry of Villages and PLN to strengthen BUMDes and RESCO, and integrate PLTS with the PLN network. Therefore, PBM needed to create a mechanism to involve other ministries and institutions in project board meetings to address strategic project issues.

The project procurement procedures caused prolonged procurement processes and delays in achieving output on Activity 1. The management team had not recorded risks related to procurement, especially internal risks, as explained in the section above.

PEAP had limited information on the prolonged process of solar-PV power plant procurement and construction, and therefore was not able to provide sufficient information to the community and local stakeholders.

In regard to project efficiency, ACCESS had low disbursement rate and was behind schedule, which was mostly caused by project delay to achieve output for Activity 1.1.

TIMOR-LESTE

a. Project governance

The ACCESS project in Timor-Leste was implemented by UNDP through direct implementation modality (DIM). The Directorate General of Administrative Decentralization of the Ministry of State Administration (MSA) was the principal national partner for the implementation of the project. As the lead development agency in the country, UNDP earned trust-based relationships with various government agencies, including MSA. In DIM modality, UNDP had the technical and administrative capacity to assume the responsibility for mobilizing and effectively applying the required inputs in order to reach the expected outputs. UNDP assumed overall management responsibility and accountability for project implementation. DIM was ideal for effective and efficient project management of the project. It reduced the unnecessary bureaucratic process for decision making which was common in government agencies.

Project Steering Committee or Project Board for ACCESS project were co-chaired by representatives from National Government (MEMR and MSA), KOICA and UNDP from both Indonesia and Timor-Leste. The Project Board members in Timor-Leste maintained regular coordination meetings (Project Board Meetings) with their Indonesia counterpart. To date, they have conducted several project board meetings for various project oversight, assessments, revisions, and decision-making purposes. Regular technical meetings between PMU Indonesia and Timor-Leste were frequently conducted for different purposes.

The Project Management Unit (PMU) in Timor-Leste was responsible for management and operations at activity level. Originally PMU was led by a project manager and was previously supported by a chief technical advisor (CTA). The PMU was also supported by a total of seven (7) personnel with the following positions: administration and finance (1 person); project facilitator and engineer (1 person); municipality technicians (3 persons); and driver (2 persons). The field coordinators play crucial roles in coordinating and implementing project activities in target areas. The project also hired short-term IC (individual contractors) to perform relevant technical works.

The ACCESS project was originally managed under UNDP Timor-Leste's Governance Unit due to the unit's affiliation with the National Suco Development Programme (PNDS), a small infrastructure programme under the supervision of the Ministry of State Administration (MSA). This structure had the advantage of effective mobilization of support at municipality, *suco* and *aldeia* levels. In acknowledging the strong linkage between the project's outcomes to climate change mitigation and sustainability of the planet, UNDP Timor-Leste made a decision to transfer the project to its Climate Change and Sustainable Ecosystems Unit during Q4 of 2022. This decision allowed the project to tap on support and inputs from adequate UNDP Timor-Leste's human resources with highly relevant academic and professional background while still maintaining the full support from MSA.

b. Project M&E System

In general, the ACCESS project Timor-Leste's M&E system was integrated into that of the ACCESS project Indonesia. Together, they track the project's achievement for all outputs outlined in the Project Results Framework (PRF). Timor-Leste's portion of the M&E focuses on **output 2** and its three (3) main activities which were further divided into five (5) sub-activities (see Access Project PRF).

The project three annual reports (2020, 2021, & 2022) elaborated progress and achievement as well as challenges and lessons learned for both countries. Field reports and BTORs (Back to Office Reports) were the main M&E reporting tools which helped quarterly and annual activities, outputs, challenges and lessons learned.

c. Risk identification and Mitigation

The ACCESS project implementation started off in 2020 in the midst of a global pandemic, Covid-19, which restricted office activities and travelling. Regardless of the restricted situation, the project adopted adaptive management mechanism to keep pace with the Indonesian counterpart. Some Project Board and technical meetings took place remotely via Zoom despite low internet connectivity in the country. Luckily, the insignificant time difference between Seoul, Jakarta and Dili made it easier to agree on meeting time.

Towards the second and last quarter of 2022, ACCESS project Timor-Leste experienced staff turnover with the resignation of four personnel, including the former project manager, the CTA, and Bobonaro field coordinator. To minimize its impact on the project implementation timeline, the UNDP country office decided to conduct

internal recruitment for project manager and UNV recruitment for field coordinator. This has enabled the project to regain almost a full team by the first quarter of 2023.

Many roads infrastructure that connected Dili, where the PMU office was based, to rural parts of Timor-Leste was in poor condition and was not climate resilient. During the rainy season or windy season, travel to those remote locations by cars and boats are not recommended. Hence, the project learned to maximize opportunities to conduct its activities in those locations when weather conditions permit. This enabled PMU to expedite the distribution and installation of the 1,000 units in close collaboration with the contractor, Quelebo Lda., across the three municipalities.

The country's 2023 parliamentary election which were held on the 21 May was seen as a potential risk for a smooth implementation of the remaining project activity. If the same government stayed in power, the implementation was not expected to face significant hassles provided that the project dealt with the same representatives from the government partners (DG of Administration Decentralisation from MSA and BTL E.P. and EDTL E.P. from MPW) who had been supporting the project's activities. If the opposite happened, the project needed to reinvest in partnership building to reorient new representatives and secure their full support. In the case of the latter, UNDP's reputation as a reliable development partner and PMU's familiarity with TL's political dynamic were expected to come in handy.

d. Project Efficiency

The MTE identified a few examples which showcased PMU's efficiency. The first and foremost was its ability to coordinate and implement activities in various remote sites even with a small number of staff. The project manager and staff extensive experience with UNDP's work environment and familiarity with local context contributed to this efficiency. In addition, a strong level of internal support and flexibility within UNDP TL's Governance Unit allowed PMU to tap on support from staff of other projects to fill in important functions such as M&E and communication associates. These characteristics in turn enabled the PMU to reduce project operational cost.

The strong field presence of PMU helped the project secure trust-based relationships and mutual-respect with local leaders and community members. Field coordinators work with chiefs of s*ucos* and *aldeias* as partners to complement each other. This was evident during the successful distribution of Solar PV lamps (LTSHE) where the local leaders supported PMU with identification of beneficiary households, distribution of the units, and monitoring of conditions of the units. Additionally, the project established a direct communication line with local leaders through instant messaging (i.e., Whatsapp) which allowed more remote coordination during rainy seasons when road/sea conditions limited their travel.

The MTE identified a lack of efficiency for capacity building activities because of the delay with the installation of the PATS system in the target areas. A long hiatus between certified operators' capacity building activity in 2022 and the operationalization of O&M activities possibly in Q3 of 2023 might affect the level of knowledge retention. As a result, the project will have to spend time and financial resource to retrain the operators in the future.

e. Issues

The Directorate General of Administrative Decentralization of the Ministry of State Administration (MSA) was the principal national partner for the implementation of the project due to its affiliation with management for small scale infrastructure development in *suco*. However, the project document also listed the Ministry of Public Work (MPW) as another relevant national partner. This was consistent with MPW's responsibility in delivering clean water and electricity services to all territories in the country. Additionally, they hosted the two state-owned enterprises, EDTL E.P. and BTL E.P. During implementation, the ACCESS project seemed to have limited participation from MPW representatives. This arrangement created a less conducive environment for PMU to partner up with MPW and explore potential synergies.

The procurement process for PATS was only finalized in March 2023 when the ACCESS project is approaching its closing phase scheduled for late 2024. This means that Enviroearth and its partner company are required to expedite the installation work in ten selected sites while maintaining the quality of work. The weather conditions will be favourable for installation work during the dry season (June – November) but will be challenging during the rainy season (December – May).

The technical guidelines for LTSHE in *Bahasa Indonesia* was provided by Quelebo L.D.A. to each household. While a large portion of the Timorese population understand the language, it was still necessary to translate the material into Tetun to reach a wider audience (most children born in late 90s did not learn *Bahasa Indonesia* at school). It was also important to customize it to make it more user-friendly (i.e., provide graphics). This helped

ensure that illiterate members of the family can also understand basic maintenance rules and procedure for troubleshooting.

4.5 Risk and Support to Sustainability

4.5.1 Indonesia

4.5.1.1 Risks To Sustainability

Cost, Spare part and Technician Availability:

The availability of spare parts and technicians became a major concern among various stakeholders at the district and provincial levels. The government's failure to provide sufficient technicians and spare parts resulted in several government funded PLTS unable to function after sustaining damage. This issue was raised during the Focus Group Discussions (FGD) conducted with various stakeholders in the regions.

To address this concern, the ACCESS PLTS contractors included a remote-monitoring and an after-sales service guarantee for two years after the PLTS was built. However, stakeholders remained worried that the problem of spare parts and technicians persisted even after the guarantee expired. They highlighted that this was a long-term issue that needed to be resolved by ensuring the availability of spare parts and skilled technicians for PLTS maintenance and repair.

The success of PLTS in providing sustainable and reliable energy to communities depended on the availability of spare parts and skilled technicians for maintenance and repair. While the after-sales service guarantee provided by the ACCESS PLTS contractor was a step towards ensuring sustainability, it was not a long-term solution. Therefore, stakeholders must work together to ensure that there are enough spare parts and skilled technicians available to support PLTS systems even after the guarantee expired. This may require collaborative efforts between the government, private sector, and local communities to establish a reliable supply chain for spare parts and train technicians for maintenance and repair.

Other aspects that needed to be considered was the cost of operation that should be fully considered and determined. Costs of operation included factors such as labor costs and management costs, and the following situations should be fully considered in relation to the technical aspects.

- Losses due to the cost of cooling and air conditioning in the electrical room, about 10%.
- Cost of parts and parts management costs to perform O&M: adequate inventory supply
- should be checked.
- Replacement costs due to deterioration and age of equipment: a warranty for the
- lifetime of storage batteries should be secured.

To ensure the sustainability of the installed PV plant, special attention should be paid to the ESS PCS and PV INVs that convert power, as these devices had the highest failure rate and were most affected by other devices or factors. Since they typically account for more than 90% of all system failures, a skilled technician should be the one to test and evaluate the power conversion devices and make the following recommendations.

Recommendations based on the equipment being installed:

Item	Contents	Parts
Power converters (ESS PCS, PV INV)	- Manufacture parts that need to be regularly maintained - Receive and manage details from the manufacturer - Request that maintenance parts be replaceable to facilitate maintenance - Request that components be divided into modules for easy replacement and repair	Exhaust filters Air conditioning fan Condenser module Power stack Control module
	- Request a user manual from the manufacturer for regular care. - Request a troubleshooting manual and request a manual for restarting after repair. - Confirm with the manufacturer the history of faults and how to manage them when they occur.	Product specifications Operation manual Maintenance manual
Reviewing ambient impact	- Review based on grid connections	Earth Leakage Current Surge

	- Review in conjunction with PV Plant	Earth Leakage Current Surge
	- Review in conjunction with ESS Battery	Short Leakage Current Surge

Attention to external influences

Item	Check List	Remark
Leakage Current	- Securing stability by leakage current - Purchase of EMC-related certified products - Verification of stable system operation	Secure the fastening structure Install an anti-theft sensor
Lighting	- Inspect the installation environment - Prepare countermeasures against landmines	Make sure the fastening structure is secure
PV Surplus	- Need for alternatives to system stability - Define PV//ESS coupled operating modes	Ensure grounding Verify grounding resistance to IEC standards
Earth	- Different soils are affected by grounding issues and require attention - Grounding work should be done prior to electrical room construction.	Design according to IEC grounding standards
Load	- Design electrical wiring to take into account starting loads, power distribution phase balancing, etc. - Design and build distribution networks with attention to load types, load usage habits - Designing and building a distribution network with attention to load types, load usage habits, etc.	Receive EPC contractor materials Review this and take further measures and related reviews will be conducted
Equipment	- Mutual Interference by linkage (PV INV, Battery Charger, PCS)	EMC Test Link Test

Village Governance:

One of the most significant risks that threatened the sustainability of the PLTS was the governance in each village. In several villages a strong patron-client relationship between the village head and the community created governance with power being centered on the village head. In Wangkolabu Village for example, the village secretary was the son-in-law of the village head, so the village head had a fairly strong position in the village administration. Moreover, Ekapata Village head had a stronger position where the BUMDes director was the wife of the village head while the BPD head was still a close relative of the village head.

In a village with a relatively small population, almost the entire population had kinship relations. However, choosing a close family as BUMDes manager, as in the case of Watu Karere Village, was highly likely to raise accountability issues in PLTS management where decisions were centered on the village head's family.

The project's efforts to build a transparent and accountable management from an operational and financial perspective may fail when decisions are determined dominantly by the village head.

Community awareness:

Requiring the community to pay for electricity was a crucial factor to ensure the sustainability of the PLTS infrastructure. The experience in several ACCESS villages and government-intervened villages highlights this point. In one example, a PLTS was built in a hamlet of the village of Watu Karere by the government. However, the street lighting in the hamlet was non-functional due to power inverter damage. Unfortunately, the village government was not able to repair the inverter, as they did not have the necessary funds of IDR 35 million, nor were they able to allocate village funds for repairs. The people in the hamlet were reluctant to pay electricity fees because they perceived the PLTS as national government assistance. As a result, the PLTS had no operators to operate and maintain it since the village government cannot afford to pay them.

The above scenario was not an isolated incident and could happen in ACCESS intervention hamlets or villages if the residents lack awareness of the importance of paying contributions. Therefore, it was crucial to educate the community about the necessity of paying for the electricity they use. The sustainability of PLTS infrastructure depended on community participation and willingness to pay for the electricity they use. This participation was expected to help maintain the PLTS infrastructure and prevented it from becoming non-functional due to lack of funds for repairs or maintenance. Furthermore, community awareness of the importance of paying contributions can also help develop a sense of ownership and responsibility towards the PLTS infrastructure, ultimately ensuring its long-term sustainability.

Environment:

Lightning is a common cause of damage to PLTS infrastructure in many areas in Indonesia, including in South Barito District, Central Kalimantan Province. The local government and residents in South Barito were aware of this risk and considered it to be quite a high risk. As a result, the government suggested the installation of active lightning rods to prevent damage from lightning strikes[5].

The use of active lightning rods can help reduce the risk of damage to PLTS infrastructure caused by lightning strikes. By taking proactive measures to address this potential issue, the South Barito government hoped to ensure the sustainability of the PLTS infrastructure and avoid the need for costly repairs due to lightning damage. This risk was addressed by ACCESS in the PLTS design.

Disposal of lithium batteries after use requires proper handling and disposal methods to prevent environmental pollution and potential safety hazards. Here are some disposal methods that may be taken into account:

- Recycling: The most responsible way to dispose of lithium batteries is through recycling. Lithium batteries can be recycled to recover valuable metals and other materials, reducing the environmental impact of their disposal. Many countries have established battery recycling programs that may be accessed.
- Safe disposal: If recycling is not an option, the batteries should be disposed in a responsible manner. It is recommended to check with local authorities for safe disposal methods. Some areas have specific battery disposal programs that allow battery disposal in a designated bin or drop-off location.
- Avoid incineration: Lithium batteries should never be incinerated or placed in the trash, as they can release harmful chemicals into the air and soil.
- Transport: Lithium batteries must be securely packaged and labeled as hazardous waste before being transported. This will ensure that they are safely transported to a recycling or disposal facility.

It is important to follow proper disposal methods to ensure a safe and environmentally friendly disposal of lithium batteries after use.

Security:

In Muara Ripung Village, there was a possibility of theft of the PLTS facility. To address this issue, BUMDes Muara Ripung intended to provide compensation to the locals residing in the vicinity of the PLTS. The compensation was for ensuring the security of the PLTS, primarily during night time. Other villages resolved this issue by coordinating with village level police officers to secure the upcoming electricity infrastructure.

Vandalism:

Vandalism by children or other person which occurred to the solar PV panel at Watu Karere village was a risk considered by village governments. The government of Wangkolabu Village was worried about this type of damage and intended to increase the distance between the PLTS infrastructure and the road. The government of Ekapata village also planned to build one of its PLTS (Ekapata 2) below the elementary school complex. However, it was unclear how they would deal with the same risk faced by the PLTS located close to the primary school in Watu Karere.

4.5.1.2. Support to Sustainability

In addition to the risks to sustainability mentioned earlier, there were certain factors at the community and government levels that can support the sustainability of a project. For instance, the people of Wangkolabu Village in Southeast Sulawesi had expertise in managing electricity services using an electric generator, which was overseen by the village government. Similarly, the community of Buntu Lalong hamlet in West Sulawesi had experience in managing a Micro hydro power plant (PLTMH) in groups, with residents contributing to operational

[5] (*PLTS Watmasa was damaged by lightning - ANTARA News Ambon, Maluku*, n.d.)

and maintenance costs. Moreover, the people of Buntu Lalong had experience in managing clean water services at the hamlet level.

These community experiences and commitments in managing public services for electricity and clean water were considered as social capital that may be utilized for managing PLTS constructed through ACCESS. Conversely, the negative experience or failure in managing PLTS in Watu Karere Village provided a lesson for the village government and BUMDes that the sustainability of the PLTS mainly depended on community involvement, particularly in paying electricity fees to fund the operations and maintenance of the PLTS.

Facilitated by the provincial government, BUMDes forums and operators at the sub-national level can also offer support for sustainability. These forums can provide a platform for RESCO, BUMDes and operators established and assisted by ACCESS to exchange experiences and insights on managing and maintaining PLTS.

4.5.2. Timor-Leste

Interviews and field visits in target areas led to the identification of four categories of risks which might affect project's sustainability and actual achievement of the outputs in the field. The MTE also identified management strategies adopted by PMU and UNDP Timor-Leste to mitigate the risks.

4.5.2.1. Conflict of Interest

The first risk was related to potential conflict of interest during the identification and distribution of LTSHE and PATS units to project beneficiaries. There was a risk that local leaders may prioritize their immediate family and relatives, disregarding the criteria and excluding others who were in dire need of support. Manipulation of data to allocate multiple LTSHE units to a single household could occur, either for personal use or for profit by selling them to the neighbors. This risk was heightened as EDTL E.P. also started distributing units to households without electricity in the same target areas as the UNDP Access project.

To mitigate this risk, the PMU implemented a management strategy centered on clear communication and building trust-based relationships with local leaders and community members. The project objectives were clearly outlined during consultations, and together with the local leaders and community members, selection criteria for beneficiary groups were developed. Priority was given to women-led households and households with school children, while those with stable incomes and veteran backgrounds were not included. Field visits were conducted to ensure proper identification and inclusion of target households. The PMU's strategy also effectively prevented double distribution of LTSHE units.

4.5.2.2. Environment

The second risk was associated with the uncontrolled disposal of batteries and inefficient use of water resources which had negative impacts on the environment. There was a high probability that households randomly disposed broken batteries to the local environment when there was no proper collection system in place. Toxic chemicals and heavy metals (copper, lead, nickel, and zinc) released by batteries into the environment tended to pose a massive environmental (terrestrial and marine) and public health hazard. Likewise, if households which benefited from the clean water supply system did not use the water efficiently (i.e., over-watering of gardens and leakage in residential tanks) during dry season, they can easily deplete the water table. This in turn affected the water availability for many households in more than one *aldeias* and *sucos*.

Field visits and interviews showed that the PMU had not coordinated with local leaders to come up with a management strategy to prevent this risk from happening and reduce its occurrence. This was mainly due to lack of knowledge on the hazard level of the batteries/electronic components. In addition, they had not foreseen such issues for the time being because the batteries/electronic components were still new and had a long lifespan. To reduce the occurrence of inefficient water use, PMU relied on the O&M group's control and monitoring activities. Additionally, they started to support and encourage community-based initiatives (i.e., reforestation and terracing) that aimed to prevent erosion and protect water sources as seen in Manatuto Municipality.

4.5.2.3. Market and service availability

Several heads of household were aware that they had to take full responsibility of the LTSHE unit which they received for free from the ACCESS project. Although the majority of the units were in full working conditions, they started to wonder where they could go to have damaged units serviced or to purchase replacement in the near future. The particular model of the portable LTSHE distributed by the project is currently not available in Timor-Leste market. A low demand for solar PV lamps and lack of renewable industry in Timor-Leste made it difficult for both suppliers and investors in this sector to bring the business to the country. Hence, they were only

available upon order in large quantities from specific Indonesian markets. This process might take weeks and even months from the time of placing the order until having it delivered to the supplier's office in Dili, Timor-Leste. The condition made it difficult for households to see LTSHE as a long-term solution to their problem with access to electricity. If left unaddressed, many rural *aldeias* will be filled with piles of broken units of solar PV lamps.

Presently, the project might be able to coordinate with Quelebo L.D.A. to supply new components to replace the damaged ones as part of the warranty. However, PMU had not come up with a strategy to address the situation once the project is concluded.

4.5.2.3. Community's lack of ownership

The last risk emerged from the community's refusal to obey common rules and regulations that promote a sense of ownership of outputs (i.e., operational water distribution system) and obligations. Experience showed that water users were not always keen to pay for the tariff which was used for O&M work. Likewise, only few of them were involved in regular maintenance activities such as cleaning water storage tanks and repairing leaking pipes. The free riders tended to discourage more community members from contributing both financially and in-kind for a common good. On top of that, community members in the upstream region frequently tampered with the water distribution network during the dry season to feed livestock and irrigate their fields. This situation threatened the sustainability of the water distribution system in target *aldeias*.

At this stage, PMU had not fully designed a solid management strategy to address this risk. While it facilitated capacity building activity for potential operators in Indonesia, PMU had not completely worked with community members to establish fully operational O&M groups and institutionalize them. This should be PMU's priority in the coming months.

4.6. Gender and Human Rights Inclusion

4.6.1 Women Participation

The ACCESS project developed a strategy to ensure women's voices influence decision making both at the project management team and project implementation. Women representation in PMU for the ACCESS project was 50 % percent for Indonesia and 50 % for Timor-Leste. For Indonesia, the application of gender balance environment was also extended to the field level where 23 out of 46 Local Operators (50%) were female.

The ACCESS Project Indonesia implemented affirmative action by ensuring a quota of female participants in each activity or the management structure of BUMDes, RESCO and operators. Based on this project strategy, PEAPs ensure women participation by involving them as core team members as well as part of the BUMDes and RESCO management team. To ensure that women's voices were heard, PEAP organized separate meetings to capture women's aspirations, which were often neglected in meetings, attended by both genders. PEAP also actively collected women's aspirations outside of formal community meetings. The project succeeded in encouraging women to become operators. Candidates for female operators encountered obstacles to become PLTS operators as their families restricted them from attending training outside of their villages.

The ACCESS Project Timor-Leste put efforts to ensure that women were not just passive beneficiaries of the project's outputs. Aside from prioritizing women-headed households in the list of beneficiaries, PMU also worked closely with LTSHE contractor, Quelebo Lda, and local leaders to ensure that they had equal access to knowledge sharing and capacity building opportunities as their male counterparts. FGD and interviews revealed that women-headed households received the same briefings on basic operation and maintenance of LTSHE from Quelebo during the installation process as the men did. In addition, 27% of 30 participants who attended the certification training on PATS in Jakarta were women.

4.6.2. Men Support

A female operator in Ekapata Village in Indonesia was supported by her husband to attend training outside the village. Her husband also seemed to be enthusiastic to learn together with her and would like to assist her to work as an operator.

During field visits in Timor-Leste, potential female operators expressed their ambitions to participate in O&M activities in their *aldeias*. They also shared that their partners supported them during their participation in ACCESS project activity. Lucia Perreira, the head of *aldeia* Moleana (Bobonaro Municipality), elaborated that the support from her husband enabled her to be fully engaged in her work as a leader of 162 households. The male participants of the FGD (local leaders and potential O&M members) in Manatuto and Atauro expressed the same support during the field visits. This was a significant step forward provided the patriarchal culture that dominated

family structure in Timor-Leste tended to exclude women from local leadership roles as well as technical duties such as electricity installation and plumbing duties.

This is a great example of how supportive male partners can help advance gender equality in rural communities. By taking an active interest in the wife's professional development, the husband helped break down traditional gender roles that can limit women's opportunities for education and career advancement. In addition to providing support and encouragement, the husband's willingness to learn and work alongside the wife can also serve as a powerful role model for other men in the community, demonstrating that gender equality is not just a women's issue, but a societal issue that affects everyone. By promoting the equal participation of women in the workforce, including traditionally male-dominated fields like technology and telecommunications, rural communities like Ekapata (Indonesia) or Moleana (Timor-Leste) can become more economically prosperous and socially inclusive.

4.6.3. Social Inclusion:

ACCESS developed strategies to extend benefits to vulnerable groups i.e. poor family, women headed household and people with disability in target areas. In Muara Ripung Village, its RESCO provided a discount on contributions from poor families, including for female headed households. There were ten household subsidy recipients from 60 households who were registered to receive electricity. In Ekapata Village, NTT, 5 women headed households, out of 65 households, received aid to pay electric contribution. Their contribution was paid using village fund. Meanwhile, Watu Karere Village in NTT also planned to provide discounts of up to 50% for poor families.

As explained in the project effectiveness section, ACCESS also developed a flexible electricity fee payment system according to the socio-economic conditions of the beneficiaries. In Wangkolabu Village, payments for electricity are made per day because the income of the people in the village is obtained daily. Meanwhile, in several villages, such as Ekapata and Muara Ripung, it was possible to make payments using plantation commodities such as candle nuts owned by village residents. This flexible payment system ensured that the benefits of the ACCESS project were enjoyed by all socio-economic layers of society.

4.6.4. Electricity and Women Burden:

Compared to the existing electricity cost (using diesel generators in Wangkolabu Village or using micro hydro in Buntu Lalong Sub-village), electricity from PLTS also reduced the economic burden, especially from the cost of electricity for households headed by women.

Electricity can indeed play a crucial role in easing women's burden in households, especially in rural areas. In addition to allowing women to start working earlier in the kitchen, access to electricity can also improve their livelihoods in many other ways. For instance, women can start small businesses such as tailoring or running a grocery store, which can generate additional income for their families.

Moreover, the cost of electricity from PLTS can be significantly lower than using a diesel generator or micro-hydro, which was particularly beneficial for households headed by women. This was because women often had limited access to financial resources, and any reduction in expenses can ease their economic burden and improve their quality of life.

However, the increased working hours for women due to electric lighting also needed to be carefully considered. Women may end up working longer hours at night, which can negatively impact their health and well-being, and may also lead to a heavier workload for them. For example with electric lighting, women in the villages of Watu Karere and Ekapata increased their hours for weaving at night. However, this also had a positive impact on their overall family economy.

Therefore, it is important to ensure that women were not overburdened with household and income-generating activities, and they had adequate time to rest and take care of their health.

In the rural area of Timor-Leste, women and girls were primarily responsible for collecting fuel (woods) for cooking and preparing lights (either from kerosene lamps or the traditional method using seed powders and thread) on top of the other household chores. This level of overburdened responsibilities tended to limit women and girls from performing income-generating, education, and other self-nurturing activities. Many girls grew up in an environment where they did not have the same opportunities to excel both socially and academically as the boys did.

It was clear that electricity in many rural households provided by the project generated a lot of direct socio-economic and health as well as indirect financial benefits. On the other hand, it might have unintended negative benefits for women due to the fact that they continued to carry more workloads in the evening. Interviews with

female beneficiaries from both women-headed and men-headed households revealed that they can stay up to 10 – 11 pm every night to prepare products (baskets, palm-leaf mats, betel nuts, and bakeries) to sell in the weekly local market now that they had the LTSHE. Prior to that, they could only prepare them during daylight. It was also observed that many women did not see the additional working hours in the evening as a burden but rather as a blessing. More hours of work translated into more products to be sold at the local market. This was especially true for many farmer households living in these semi-arid areas who can only practice subsistence farming. Nevertheless, from an outsider's perspective these women seemed to be overworked and had less time for self-nurturing.

Overall, while access to electricity can bring significant benefits to women's lives, it was important to address the potential challenges that may arise, and ensure that the benefits were distributed equitably among all members of the households.

5. Conclusion and Recommendations

5.1 Conclusion

5.1.1. Indonesia

The success of a development project is highly dependent on how well it can adapt to changes in the social, economic, and political environment in which it operates. The ACCESS project is in alignment with the Indonesian government's objective of achieving complete electrification across the country, particularly in the eastern region. It aims to do so by establishing mini-grids in remote areas with limited access to electricity using renewable energy-based power generators. The project's target areas are provinces with low access to PLN electricity.

Additionally, ACCESS contribution to renewable energy is aligned with Indonesia's National Energy General Plan (RUEN), which focuses on energy efficiency, conservation, diversification, and access. Finally, the ACCESS Project design was aligned with the government's efforts to promote economic growth and strengthen village autonomy through the development of BUMDes at the village level. At the provincial level, the project is aligned with the regional government's efforts to translate the RUEN into RUED for the development of energy sources according to regional potential.

The project management teams in Indonesia and Timor-Leste were successful in achieving almost all target outputs, except Activity 1.1 which during the MTE close to accomplishing the procurement process. However, PLTS in Indonesia and PATS in Timor-Leste had not been constructed during the MTE. The project team demonstrated a clear understanding of the project objectives and executed the project plan effectively. They achieved agreements with three EPC contractors and completed site survey reports for all 23 locations. Additionally, the project installed an internet network in 16 villages in Central Kalimantan and East Nusa Tenggara as a supporting system for the power plant.

However, there were issues related to the prolonged tender process caused by internal and external factors such as COVID-19 pandemic and global economic instability. This raised concerns among stakeholders as to when the PLTS construction was going to take place. There were also concerns related to the duration of the PEAP service period and potential conflicts that may arise from land ownership issues. Nonetheless, the project management team took measures to speed up the construction process by urging contractors to conduct field preparation and continuously addressed these issues to ensure that the project reached its overall goal, which was to provide sustainable access to electricity for remote villagers in Indonesia with institutional and local capacity in place.

The governance structure of the ACCESS project in Indonesia was effective in achieving most of its activity targets. The Project Board provided strategic directions and solutions to challenges encountered during project implementation, and the PMU and implementing partners played their roles effectively. The coordination system of the project was well-organized, and the regular meeting mechanism was deemed adequate to facilitate the implementation of project activities. The training and certification of local operators by implementing partners strengthened the capacity of electricity technical management. Moreover, gender studies and action plans were conducted to promote gender mainstreaming in project implementation. The M&E system proved to be an effective tool for tracking progress, evaluating impact, and ensuring that ACCESS remains committed to its objectives. Additionally, the project identified external risks at various levels that may impede the achievement of project objectives and has developed mitigation measures to address them. Overall, the ACCESS project demonstrated that its governance structure was conducive to achieving results and addressing both technical and strategic issues in project execution.

The sustainability of PLTS infrastructure in the ACCESS target areas of Indonesia depended on several factors such as spare part and technician availability, village governance, community awareness, environment, security, and vandalism. While the government and project contractors made efforts to address these concerns, they remained long-term issues that require collaborative efforts between the government, private sector, and local communities to ensure the availability of spare parts and skilled technicians, transparent and accountable village governance, community awareness of the importance of paying tariffs, protection against environmental risks, security issues and vandalism.

To ensure the sustainability of PLTS infrastructure, it was crucial to educate the community about the necessity of paying for the electricity usage, develop a sense of ownership and responsibility towards the PLTS infrastructure, and prevent it from becoming non-functional due to lack of funds for repairs or maintenance. Moreover, taking

proactive measures such as the installation of active lightning rods and providing compensation for security can also help reduce the risk of damage to PLTS infrastructure and ensure its sustainability.

ACCESS project took important steps to ensure gender and human rights inclusion in its implementation. The project implemented strategies to ensure women's voices are heard and influence decision-making at the project management and field levels. Affirmative action was taken to involve women as core team members, part of the management team of BUMDes and RESCO, and as operators. The project also promoted the support of male partners in advancing gender equality in rural communities.

Moreover, the project developed strategies to extend benefits to vulnerable groups, including poor families, female-headed households, and people with disabilities. Flexible electricity fee payment systems were established to ensure the benefits of the project are enjoyed by all socio-economic layers of society. The project recognized that access to electricity can play a crucial role in easing women's burden in households and improving their livelihoods. However, it was also important to address the potential challenges that may arise and ensure that women were not overburdened with household and income-generating activities.

5.1.2. Timor-Leste

The outputs and outcomes of ACCESS project in Timor-Leste contributed to international, regional, national and local development strategies in the country related to access to basic infrastructure services. Once ACCESS project's installation of solar water pump system in ten selected rural *succos* are completed, it will increase the number of rural population in Timor-Leste with access to water by 0.07%. In addition, through the distribution of 1,000 units of solar PV lamps in 27 rural sub-villages, ACCESS project decreased the number of Timor-Leste's rural *aldeias* without access to electricity by 9.2%. While these figures might look small, they represent the impact generated by the project given limited budget allocation (19.7% of the total ACCESS project cost funded by KOICA). The SSTC allowed both Indonesia and Timor-Leste to continue pursuing their individual and/or shared national capacity development objectives through exchanges of knowledge, skills, resources, and technical know-how and through regional and inter-regional collective actions.

The ACCESS project Timor-Leste's component revolved around Output 2 which was further divided into three main activities and their five sub-activities. During the MTE, the PMU only completed two outputs (2.3 and 2.2) based on the proposed timeline. By the end of 2022/early 2023, the distribution of Highly-Efficient Solar-PV Lamps (LTSHE) to 1,000 households comprising over 2,530 men and 2,011 women (44%) was completed. Additionally, 30 local operators (27% women) from Atauro, Bobonaro, and Manatuto completed the competency certification training on PATS in Indonesia. The project was still on track to achieve the three remaining outputs (2.1.1., 2.1.2, and 2.3.1.). It was projected that the three outputs will be completed by Q3 of 2023.

The ACCESS project in Timor-Leste was implemented by UNDP through direct implementation modality (DIM). The Directorate General of Administrative Decentralization of the Ministry of State Administration (MSA) was the principal national partner for the implementation of the project. This partnership had the advantage of effective mobilization of supports at municipality, *suco* and *aldeia* levels. Although the project document also listed the Ministry of Public Works (MPW) as another relevant national partner, the agency was not involved in the implementation of project activities. This arrangement created a less conducive environment for PMU to partner up with MPW and explore potential synergies.

The MTE identified four risk categories that might affect the project's sustainability and actual achievement of the outputs in the field, namely: conflict of interest, environment, market and service availability, and community's unwillingness to pay tariff. Although PMU adopted management strategies to mitigate the risks, some of them which remain unaddressed require immediate actions.

5.2 Recommendations

5.2.1. Indonesia

- For PLTS operation & Maintenance: expedite the construction process, purchase of goods, and ensure that plan for better maintenance of PLTS (warranty, supply chain, disposal) is well implemented. In addition, the sustainability plan needs to ensure that the project involves broader stakeholders (private sector, MEMR, district and provincial government) and ensure the condition in the village is conducive (land status, local support, etc.) for PLTS construction and operation to be continued.
- The project needs to have plan for the possibility of electricity expansion for broader utilisation beyond lighting purposes. Options can be explored such as initiating steps for integrating with PLN grid, the future use plan of currently existing community based electricity generation, managing current unused PLTS built by non ACCES, etc..

5.2.2. Timor-Leste

- To expedite the PATS construction process which requires compliance with standard procedure (i.e., SESP, environmental licensing, etc.).

- To develop plans for better maintenance of the LTSHE (i.e., warranty, supply of spare parts, disposal) in collaboration with local leaders and Quelebo.

- To strengthen the project's partnership with the Ministry of Public Work to explore existing support systems for GMF (Ex. support from EDTL E.P. and BTL E.P.), and formalize the establishment/reaction of GMF groups.

5.2.2. Indonesia & Timor-Leste

- Strategy for improved knowledge of local operators and RESCO boards (Indonesia)/GMF (TL) after project closure by preparing establishing channel and networks among LOs and among RESCOs/GMFs with relevant national and local government and other agencies as well as preparing accessible resources/materials for LOs that can help maintain their knowledge and skills.
- The need to review, strengthen and implement the accountability mechanism for RESCO/GMF management by strengthening community-based oversight mechanism.
- The project team strengthens communication channels and feedback mechanism to address the concerns on the project's progress update to beneficiaries with more suitable communication channels
- Enhancing the collaboration between Indonesia and Timor-Leste government, by improving the involvement of TL team during the rest of project period.
- A no-cost extension is needed for a period up to six months or based on budget availability to ensure all project outputs are achieved.

ANNEX

A. TOR (attached)

B. Questionnaire/interview guide

1) KII Guide for Household

Kriteria	Household/Beneficiaries
Relevance	Before ACCESS did you have access to electricity? if you have used what? if not what is the cause? How does this household make use of the electricity (and clean water) provided by ACCESS? Describe for what and how much power is used! Apart from lighting needs, what needs can be met by utilizing electricity? How much does it cost to pay for electricity bill? What is the proportion to income? Is the cost considered cheap, moderate or costly?
Effectiveness and Efficiency of Management System	Have you ever made a complaint about the implementation of the ACCESS project? If so, what complaints have you made? how did ACCESS respond to the complaint? Have you ever submitted a complaint about the electricity supply service to RESCO? if so, what are the complaints? and how does BUMDes/RESCO respond to the complaint?
Effectiveness of the project	Do you also use electricity for business purposes? If so, in what way?

	Is there a need to run a business that requires electrical energy? Can this need be met by the electricity provided by ACCESS?
Coherence	
Sustainability	Will you be able to pay your electric bill in the future? Will you keep supporting the sustainability of the power plant?
Human rights	What are the perceived benefits of the availability of electricity (and clean water) provided through the ACCESS project? Did you participate in the determination of electricity tariffs? how do you participate?
Gender equality	What are the perceived benefits of having electricity (and clean water) for family members particularly for women/children/elderly/persons with disabilities? Do you feel that the existing female engineers have the ability to operate and maintain the existing electrical infrastructure?
Environment	Is there any positive/negative impact of providing solar electricity on the environment in this village?

2) **KII Guide for Operator/Technician**

Kriteria	**Operator/Teknisi**
Relevance	What training materials did you get as an operator/technician? Is the training material obtained sufficient to carry out the functions as an operator and technician? What other skills are needed now to increase capacity to operate and maintain the electricity infrastructure that ACCESS provides?
Effectiveness and Efficiency of Management System	Do you have and understand the SOP for operation and maintenance issued by the generator provider? Do you apply the SOP? Are there any obstacles or difficulties in implementing it? Is there a solution to the existing obstacles and difficulties?
Effectiveness of the project	How many people attended the training? how many women and men? How many trainees meet the requirements/pass the post-test and have a certificate? Is the training material presented understandable and applicable? Is there material that is poorly understood and cannot be applied? if so, has this been communicated to the coach/assistant?
Coherence	
Sustainability	II there any possibility of difficulty in carrying out maintenance of the existing electrical infrastructure? if so in what way? Has this problem been identified and a solution prepared?
Human rights	
Gender equality	Were there any difficulties/obstacles for women when being selected as an operator? Were there any difficulties/obstacles for women during the training? If so, how can ACCESS provide solutions to these difficulties or obstacles? Are female operators involved in decision-making in the management and maintenance of existing electricity infrastructure? If so, to what extent is the involvement? If not, what's holding you back?
Environment	

C. Evaluation matrix

Project Strategy			Indicator	Baseline Level1	Level in 1st PIR (self-reported)	Midterm Target	End-of project Target	Midterm Level & Assessment	Achievement Rating	Justification for Rating
Outcomes	**Output**	**Activity Activity**								
Outcome 1: Localized implementation of SDGs No.7 Affordable & Clean Energy through the provision of access to renewable-based electricity. This outcomes consists of the following outputs and activities	Output 1: Renewable-based power plants built providing sustainable access to electricity for remote villagers in Indonesia with institutional and local capacity in place.	1.1: Renewable-based energy infrastructures construction that providing access to electricity for households in targeted villages in Indonesia that can be monitored remotely	*Number of households in targeted villages getting electricity supply generated from solar PV (disaggregated by gender, women-headed household), cumulative.*	0	0	3,025	3,025	Achieved of target is delayed. Construction will start in 2023	MU	Prolonged procurement process resulted in the PLTS construction not being carried out as targeted due to internal and external factors such as technical and financial evaluation, COVID-19 pandemic, and price increase due to global economic instability. This has raised concerns among stakeholders regarding the lack of information about the procurement and development process of the PLTS.
			Amount of generated electricity per month (kWh/month), annually.	0	0	123 KWh/month	123 KWh/month	Achieved of target is delayed. Construction will start in 2023		
		1.2: Local capacity building for operation and maintenance of the built energy infrastructures.	*Number of qualified local people certified as solar PV operators (disaggregated by gender), cumulative.*	0	0	50 (30% women)	50 (30% women)	The ACCESS village facilitators (Patriot Energy ACCESS Program/PEAP) received 172 applicants from 23 villages and shortlisted five potential candidates from each target village, resulting in a total of 110 candidates. From these candidates, 50 local operators (30% of whom are women) were selected for	HS	Target fully achieved and even exceeded

								solar-PV power plants in 23 villages. All of the operators has obtained certificate from PPSDM in March – June 2022.		
		1.3: Local institution establishment to enhance sustainability and scaled-up use of built energy infrastructures.	*Establishment of village electricity enterprise (BUMDES Listrik Desa) or Renewable Energy Service Cooperative (RESCO), cumulative.*	7	7	21	21	ACCESS established and revitalized 21 BUMDes and RESCOs in Q2 2022, with 17 BUMDes in the basic stage and 5 in the developing stage. PEAP has provided assistance in establishing a responsible financial management system and a flexible payment model for electricity fees.	S	The governance structure in some villages, characterized by a patron-client relationship between the village head and the community, may pose a significant threat to the project's sustainability.
		1.4: Results dissemination through knowledge sharing workshops	*Number of participants from stakeholder's institutions (government, private, donors, NGOs, regional development banks) receiving dissemination products, cumulative.*	0	200	300	600	The project has achieved the following number to date: - 59 participants during keynote presentation at Youth SDGs Conference - 649 recipients (357 men, 238 women, 9 unidentified) of newsletter, mid-year report and annual report - 152 participants (96 men and 57 women) of Business Plan	**S**	Target achieved and even exceeded

								Competition in Renewable Energy - The website have been visited by 968 visitors and social media reached 18,228 accounts		
Outcome 2: Strengthened South-South and Triangular Cooperation (SSTC) between Indonesia and Timor-Leste in promoting the use of clean energy in rural areas	2: Under SSTC between Indonesia and Timor-Leste: Solar PV water pumps and Highly Efficient Solar Lamp System (LTSHE) are installed in remote villages in Timor-Leste providing sustainable access to clean water and highly efficient lighting.	2.1: Renewable-based energy infrastructure construction that provides access to clean water and energy efficient solar lights in targeted villages in Timor-Leste.	*Number of households in targeted Sucos/villages getting clean water from solar PV water pumps (disaggregated by gender, women-headed household)*	0	0	684	684	Target has not been reached as the project faced delay with procurement process for PATS. It is expected that all necessary works will take place between May 2023 and March 2024.	MS	Delays in procurement has slowed the progress towards achieved target within the given timeline. Additionally, it is reported that some LTSHE units are damaged and in need of maintenance/replacement service.
			Number of Solar PV water pumps installed in target locations that meet quality standard	0	0	5	10	Target has not been reached as the project faced delay with procurement process for PATS. It is expected that all necessary works will take place between May 2023 and March 2024.		
			Number of households in targeted Sucos/villages getting lighting from solar lamp system (LTSHE) (disaggregated by gender,	0	0	500	1,000	the project has distributed 1,000 full units of LTSHE to 1,000 households and brought down the number of Timor-Leste's rural aldeias without access to electricity by a fraction 9.2%.		

			women headed household)							
		2.2: Local capacity building for operation and maintenance of the built energy infrastructures	*Numbers of local people trained and certified in the operation & maintenance of solar water pumps (disaggregated by gender), cumulative.*	0	0	30 (30% women	30 (30% women)	The project facilitated a training and certification of qualified operators by the formal certifying institution on PATS operation and maintenance (O&M) in Indonesia. Around 30 local operators (27% women) from Atauro, Bobonaro, and Manatuto attended the training and passed the competency certification.	S	Although the target has been achieved, the delay with the installation of the PATS system has created a time gap between capacity building for operators and the implementation of O&M activity. As a result, less knowledge and skills are retained as the time gap increases
		2.3: Establishment of viable operations and maintenance mechanisms to ensure service sustainability.	*Establishment of the sustainable operating mechanism for solar water pumps*	0	0	Yes, operationalized	Yes, operationalized	The project has not formally established O&M of PATS groups in beneficiary *aldeias*. It is evident that the delay in achieving output 2.1.2 has impacted the formation of the group. The project is planning to tap on the existing Facility Management Group (FMG or GMF) in project sites who are familiar with GMF's functions and responsibility to conduct maintenance works and collect monthly tariffs.	MU	Past experiences have shown that most of the GMFs only last for short duration due to lack of users' commitment to pay for the tariff and free rider problem. The project has not come up with a clear plan to address this sustainability issue.

D. MTE Ratings & Achievement Summary Table + Ratings Scale

MTE Ratings & Achievement Summary Table for (Project Title)

Measure	MTE Rating	Achievement Description
Project Strategy	N/A	
Progress Towards Results	Objective Achievement Rating: (rate 6 pt. scale)	
	Outcome 1 Achievement Rating: (rate 6 pt. scale)	
	Outcome 2 Achievement Rating: (rate 6 pt. scale)	
	Outcome 3 Achievement Rating: (rate 6 pt. scale)	
	Etc.	
Project Implementation & Adaptive Management	(rate 6 pt. scale)	
Sustainability	(rate 4 pt. scale)	

Ratings for Progress Towards Results: (one rating for each outcome and for the objective)		
6	Highly Satisfactory (HS)	The objective/outcome is expected to achieve or exceed all its end-of-project targets, without major shortcomings. The progress towards the objective/outcome can be presented as "good practice".
5	Satisfactory (S)	The objective/outcome is expected to achieve most of its end-of-project targets, with only minor shortcomings.
4	Moderately Satisfactory (MS)	The objective/outcome is expected to achieve most of its end-of-project targets but with significant shortcomings.
3	Moderately Unsatisfactory (HU)	The objective/outcome is expected to achieve its end-of-project targets with major shortcomings.
2	Unsatisfactory (U)	The objective/outcome is expected not to achieve most of its end-of-project targets.
1	Highly Unsatisfactory (HU)	The objective/outcome has failed to achieve its midterm targets, and is not expected to achieve any of its end-of-project targets.

Ratings for Project Implementation & Adaptive Management: (one overall rating)		
6	Highly Satisfactory (HS)	Implementation of all seven components – management arrangements, work planning, finance and co-finance, project-level monitoring and evaluation systems, stakeholder engagement, reporting, and communications – is leading to efficient and effective project implementation and adaptive management. The project can be presented as "good practice".
5	Satisfactory (S)	Implementation of most of the seven components is leading to efficient and effective project implementation and adaptive management except for only few that are subject to remedial action.
4	Moderately Satisfactory (MS)	Implementation of some of the seven components is leading to efficient and effective project implementation and adaptive management, with some components requiring remedial action.

3	Moderately Unsatisfactory (MU)	Implementation of some of the seven components is not leading to efficient and effective project implementation and adaptive, with most components requiring remedial action.
2	Unsatisfactory (U)	Implementation of most of the seven components is not leading to efficient and effective project implementation and adaptive management.
1	Highly Unsatisfactory (HU)	Implementation of none of the seven components is leading to efficient and effective project implementation and adaptive management.

Ratings for Sustainability: (one overall rating)		
4	Likely (L)	Negligible risks to sustainability, with key outcomes on track to be achieved by the project's closure and expected to continue into the foreseeable future
3	Moderately Likely (ML)	Moderate risks, but expectations that at least some outcomes will be sustained due to the progress towards results on outcomes at the Midterm Review
2	Moderately Unlikely (MU)	Significant risk that key outcomes will not carry on after project closure, although some outputs and activities should carry on
1	Unlikely (U)	Severe risks that project outcomes as well as key outputs will not be sustained

E. MTE Mission Itenary

Indonesia: Southeast Sulawesi

Day/Date	Activities
Monday, 27 february2023 08:00 – 13:30	FGD provincial level in Kendari
Tuesday, 28 February 2023 08.00 – 12:00 13:00 – 15:00 15.00 – 21.00	 Observation and discuss with village people Infrastructure site location visit FGD village level Interview respondents
Wed, 1 March 2023 8:00 - 10:00 10:00 – 11:30 11:30 – 16:30	 Interview respondents Cross the sea from Wangkolabu Travel to Kendari

Indonesia: Sumba East Nusa Tenggara

Day/Date	Time	Agenda	From - To	Activity
Sunday: 19/3/2023	8:30 - 10.00	Data collection in Ekapata Village (observation, FGD, interview)	Hotel- village Ekapata	Travelling
	10.00 - 16.00		Ekapata Village	FGD + interview village
	16:00 - 17.15		Travel back to hotel	Travelling
Monday: 20/3/2023	07.30 - 08.30	FGD & interview District level	hotel to Venue FGD	Travelling
	08:30 - 13.30		Venue FGD (regional MEMR Sumba office)	FGD + interview
	13.30 - 17.00	Data collection and Visit to village Watukarere	regional MEMR Sumba office – Village Watukarere	Interview and observation to PLTS
	17.00 – 20.00	Travel back to hotel	Watukarere village to Tambolaka	Travel

Timor-Leste

Day/Date	Time	From - To	Activity	Venue	Participants
Day 1 - 28/03	8:00 - 12:30	Dili - Maliana	Travelling	-	ACCESS/UNDP TL, IC
	12:30 - 13:30	Maliana	Lunch		ACCESS/UNDP TL, IC
	13:30 - 17:30	Maliana	Organizing data and preparation for next day trip		ACCESS/UNDP TL, IC
Day 2 - 29/03	07:30 - 08:00	Maliana	Breakfast		ACCESS/UNDP TL, IC
	08:00 - 13:00	Maliana - Tepa	Travelling		ACCESS/UNDP TL, IC
	13:00 - 14:00	Tepa	Lunch		ACCESS/UNDP TL, local leaders, households
	14:00 -15:00	Tepa	Interview		ACCESS/UNDP TL, local leaders, households
	15:00 - 18:30	Tepa – Maliana	Travelling		ACCESS/UNDP TL, IC
Day 3 - 30/03	07:30 - 08:00	Maliana	Breakfast	TBC	ACCESS/UNDP TL, IC
	08:00 - 08:30	Maliana - Maliubun	Travelling		ACCESS/UNDP TL, IC
	08:30 - 10:30	Maliubun	Interview and visit to water source	TBC	ACCESS/UNDP TL, local leaders, households
	10:30 - 14:00	Maliubun - Dili	Travelling		ACCESS/UNDP TL, IC

F. List of Persons interviewed

Indonesia:

	Name	Location	Institution/Position	Gender	Interview Date
		Southeast Sulawesi			
1	Hadir		Head of Wangkolabu Village	Male	27/2/2023
2	Masling		Ex-Head of Village Wangkolabu	Male	27/2/2023
3	Juhari		Household Head Wangkolabu village	Female	28/2/2023
4	Harti		Household Head Wangkolabu village	Female	28/2/2023
5	Boni		Local Operartor Wangkolabu village	Male	28/2/2023
		West Sulawesi			
6	Pensi		Household Head	Male	4/3/2023
		Central Kalimantan			
7	Maria Ulfa		Barito Selatan District Village Development Office	Female	15/3/2023
8	Yugo		Barito Selatan Dustrict Secretary Office	Male	15/3/2023
9			Provincial Village Development Office	Female	17/3/2023
10			Provincial Bappeda	Female	17/3/2023
11	Viktor		EMR Provincial Office	male	17/3/2023
		NTT			
12	Rani		Local Operator Ekapata village	Female	19/3/2023
13	Marselinus Tanggu		Head of Ekapata Village	Male	19/3/2023
14			BUMDes Director Watukarere village	Male	20/3/2023
		Jakarta			
15	Mathilde Sari		National Project Manager	Female	27/3/2023
16	Sugi		Monev Analyst	Male	27/3/2023
17	Gatot		MEMR	Male	28/3/2023

G. List of Documents reviewed

No.	Name	Link
1.	ACCESS Project Assurance Report 2020-2022	https://drive.google.com/drive/folders/1NBEaAH7hovm2UlooPDwlfltQGmle1Tva?usp=share_link
2.	ACCESS Project Annual Progress Report 2020-2021	https://drive.google.com/drive/folders/1ozyAwkxxrcs7uQPKoZ9266O40iO6UVxj?usp=share_link
3.	Minutes meeting IPAC ACCESS 15 Sept 2020	https://drive.google.com/drive/folders/1tuB3aJYNRHwVNtQ0UFC3E_rNchoHx-Nx?usp=share_link
4.	ACCESS Project Documents	https://drive.google.com/drive/folders/1tN1fV5wizG3M9FfJ6V75AoO26_ozF911?usp=share_link
5.	ACCESS Project implementation Report	https://drive.google.com/drive/folders/1KXMalkERKfOI3d52F-7DOSD-F46LDpVI?usp=share_link
6.	ACCESS Project Quarterly Project Report and Workplan	https://drive.google.com/drive/folders/1UADcYuy51Mv30_y4zFFCgeNyvLCMK6At?usp=share_link
7.	ACCESS Project Audit Report 2020-2021	https://drive.google.com/drive/folders/1W34D3lOVIeOhQ_pkoSUI24oKG4qaQov4?usp=share_link
8.	Oversight mission reports	https://drive.google.com/drive/folders/1iilTa9kBZh7CNVJudwSWDEhQxj4DLSxX?usp=share_link
9.	Baseline (2021) and Mid line (2023) Monitoring Reports	https://drive.google.com/drive/folders/19NyiZwdTWFL4f694nF44gpJsDJPtd_mu?usp=share_link
10.	Project operational guidelines, manuals, and system	https://drive.google.com/drive/folders/1nQP8cDBOcMfcTfqG-a3rv_anHjwxDMti?usp=share_link
11.	Project ACCESS MoU	https://drive.google.com/drive/folders/1qOiCVMFr1do0isRKcLS2bRzehTEqLfNq?usp=share_link
12.	Project ACCESS LoA	https://drive.google.com/drive/folders/1I2ZE4M8soMgqHDGehC1HDBx92P_5Jb53?usp=share_link
13.	Annual Workplan	https://drive.google.com/drive/folders/1rmiDC3rLzHRu2yQlCmi6vDI9JxHmlpmD?usp=share_link
14.	Risk Register	https://drive.google.com/drive/folders/1u3BbFMuZIqPd6OuUCEbz5RypWVWxp1XW?usp=share_link

H. Signed UNEG Code of Conduct form

Consultant:

1. Must present information that is complete and fair in its assessment of strengths and weaknesses so that decisions or actions taken are well founded.
2. Must disclose the full set of evaluation findings along with information on their limitations and have this accessible to all affected by the evaluation with expressed legal rights to receive results.
3. Should protect the anonymity and confidentiality of individual informants. They should provide maximum notice, minimize demands on time, and respect people's right not to engage. Evaluators must respect people's right to provide information in confidence, and must ensure that sensitive information cannot be traced to its source. Evaluators are not expected to evaluate individuals, and must balance an evaluation of management functions with this general principle.
4. Sometimes uncover evidence of wrongdoing while conducting evaluations. Such cases must be reported discreetly to the appropriate investigative body. Evaluators should consult with other relevant oversight entities when there is any doubt about if and how issues should be reported.
5. Should be sensitive to beliefs, manners and customs and act with integrity and honesty in their relations with all stakeholders. In line with the UN Universal Declaration of Human Rights, evaluators must be sensitive to and address issues of discrimination and gender equality. They should avoid offending the dignity and self-respect of those persons with whom they come in contact in the course of the evaluation. Knowing that evaluation might negatively affect the interests of some stakeholders, evaluators should conduct the evaluation and communicate its purpose and results in a way that clearly respects the stakeholders' dignity and self-worth.
6. Are responsible for their performance and their product(s). They are responsible for the clear, accurate and fair written and/or oral presentation of study limitations, findings and recommendations.
7. Should reflect sound accounting procedures and be prudent in using the resources of the evaluation.
8. Must ensure that independence of judgement is maintained and that evaluation findings and recommendations are independently presented.
9. Must confirm that they have not been involved in designing, executing or advising on the project being evaluated.

MTR Consultant Agreement Form

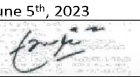
Agreement to abide by the Code of Conduct for Evaluation in the UN System:

Name of Consultant: Achmad An'am Tamrin

Name of Consultancy Organization (where relevant): _____

I confirm that I have received and understood and will abide by the United Nations Code of Conduct for Evaluation.

Signed at June 5th, 2023 (Place) on Yogyakarta
(Date)

Signature: 

Consultant:

1. Must present information that is complete and fair in its assessment of strengths and weaknesses so that decisions or actions taken are well founded.
2. Must disclose the full set of evaluation findings along with information on their limitations and have this accessible to all affected by the evaluation with expressed legal rights to receive results.
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8. Must ensure that independence of judgement is maintained and that evaluation findings and recommendations are independently presented.
9. Must confirm that they have not been involved in designing, executing or advising on the project being evaluated.

MTR Consultant Agreement Form

Agreement to abide by the Code of Conduct for Evaluation in the UN System:

Name of Consultant: Octavio de Araujo

Name of Consultancy Organization (where relevant): _____

I confirm that I have received and understood and will abide by the United Nations Code of Conduct for Evaluation.

Signed at 6 June 2023 (Place) on Dili, Timor-Leste
(Date)

Signature: 

MTR/TE Report Clearance Form

Mid-Term Review/Terminal Evaluation Report for *Accelerating Clean Energy Access to Reduce Inequality (ACCESS) - Project ID: 00126434 (ACCESS IDN) 00126532 (ACCESS TL)*
Reviewed and Cleared By:

Commissioning Unit (M&E Focal Point)

Name: Ari Yahya Pratama (QARE Unit)

Signature: DocuSigned by: A9E92855636D444... Date: _____

Regional Technical Advisor (Nature, Climate and Energy) – for GEF/GCF Project
Resident Representative – for non-GEF/GCF Project

Name: Norimasa Shimomura

Signature: DocuSigned by: Norimasa Shimomura 4B63DD0498CD41A... Date: _____