Terminal Evaluation of UNDP/GEF 'Advancing Indonesia's Lighting Market to High-Efficient Technologies' (ADLIGHT Project) (PIMS 5721).

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Project title: Terminal Evaluation of UNDP/GEF 'Advancing Indonesia's Lighting Market to High-Efficient Technologies' (ADLIGHT Project).	**UNDP PIMS ID number:** 5721 **GEF ID number**: 9493
Evaluation timeframe: February-March 2024	GEF focal area: Climate Change Mitigation - CC-1 Program 1 & 2 GEF-7
GEF executing agency: United Nations Development Programme (UNDP). **Implementing partner**: Ministry of Energy and Mineral Resources (MEMR)	Project start date: 18 May 2020 (UNDP) Jan 2021 (UNEP), End date: Extended to 18 May 2024 (originally May 2023), and to October 2024 for outcome 2 - UNEP.
GEF funding: $2.633 mil (UNDP) & $1.262 mil (UNEP) **Country**: Indonesia	The project aims to increase the penetration of high-quality energy efficient lighting technologies in Indonesia.

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Disclaimer

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Acronyms and Abbreviations

ADLIGHT	Advancing Indonesia's Lighting Market to High Efficient Technologies Project	DEC	Directorate of Energy Conservation
AILKI[2]	*Asosiasi Industri Luminer & Kelistrikan Indonesia (*Association of Indonesia Luminaires and Electricity Industry*)*	DGEED	Directorate General of Electricity and Energy Development
ALINDO	*Asosiasi Luminer Indonesia (*Indonesia Luminaires Association*)*	DGNREEC	Directorate General of New-Renewable Energy and Energy Conservation
ALINDO	*Asosiasi Luminer Indonesia* (Indonesian Luminaire Association)	EBTKE	Directorate General of New and Renewable Energy and Energy Conservation of the Ministry of Energy and Mineral Resources
APAEC	ASEAN Plan of Action Energy Cooperation (2016-2025)	EE	Energy efficiency
APERLINDO	*Asosiasi Industri Perlampuan Listrik Indonesia* or Indonesian Electrical Lighting Industry Association	EECCHI	Energy Efficiency and Conservation Clearing House Indonesia
APR	Annual Progress Report	EEL	Energy Efficient Lighting
ASEAN-SHINE	Association of Southeast Asian Nations - Standards Harmonization Initiative for Energy Efficiency	EOP	End of Project
ASKRINDO	*PT Asuransi Kredit Indonesia or* Credit Insurance Company	EPC	Energy Performance Contract
BAPPENAS	*Badan Perencanaan Pembangunan Nasional* (National Development Planning Agency)	ESCO	Energy Service Company
BAU	Business-as-Usual	*ESDM*	*Energi Sumber Daya Mineral* (Energy and Mineral Resources)
BLU	*Badan Layanan Umum* (Public Service agency)	FGDs	Focused group discussions
BMP	*Bobot Manfaat Perusahaan* (Weight-based company benefit)	FSP	Full Sized Project
BPD	*Bank Pembangunan Daerah* or Regional Development Banks	*GAMAT RINDO*	*Gabungan Industri Manufaktur Lampu Terpadu Indonesia* (Indonesian Integrated-Lamp Manufacturing Industry Association)
BPPT	*Badan Pengkajian dan Penerapan Teknologi* (Research Agency for Technology Development and Implementation)	GEF	Global Environment Facility

BRESL	Barrier Removal to the Cost-Effective Development and Implementation of Energy Efficiency Standards and Labeling	GEFSEC	Global Environment Facility Secretariat
BRI	Bank Rakyat Indonesia	GHG	Greenhouse gas
BSI	Bank Syariah Indonesia	GIZ	Die Deutsche Gesellschaft für Internationale Zusammenarbeit (German Agency for International Development)
BSN	*Badan Standardisasi National* (National Standardization Agency)		
CFL	Compact Florescent Lamp		

Project information table

Project Title	Advancing Indonesia's Lighting Market to High Efficient Technologies (Indonesia ADLIGHT Project)		
UNDP Project ID (PIMS #):	5721	PIF Approval Date:	Jun 8, 2016
GEF Project ID (PMIS #):	9493	CEO Endorsement Date:	Feb 13, 2020
ATLAS Business Unit, Award # Project. ID:	00101814	Project Document (ProDoc) Signature Date (date project began):	May 18, 2020 – UNDP Jan 2021 - UNEP
Country(ies):	Indonesia	Date project manager hired:	Sep, 2020
Region:	Asia and the Pacific	Inception Workshop date:	Sep 1, 2020
Focal Area:	Climate Change Mitigation	Midterm Review completion date:	Nov 18, 2021
GEF Focal Area Strategic Objective:	FA Objective #1 for GEF 7: FA Objective #2 for GEF 7	Planned closing date:	May 18, 2023
Trust Fund [indicate GEF TF, LDCF, SCCF, NPIF]:	GEF	If revised, proposed op. closing date:	18 May 2024 for UNDP and October 2024 for UNEP (component 2)
Executing Agency/ Implementing Partner:	Directorate General of New Renewable Energy and Energy Conservation (EBTKE) under the Ministry of Energy and Mineral Resources		
Other execution partners:	NA		
Project Financing	at CEO endorsement (US$)	at TE (US$)	
[1] GEF financing:	2.633 (UNDP) 1.262 (UNEP)	2.633 (UNDP) 1.262 (UNEP)	
[2] UNDP contribution:	0.140	0.084	
[3] Government:	27.889	59.49	
[4] Other partners:	9.065	16.06	
[5] Total co-financing [2 + 3+ 4]:	37.049	75.64	
PROJECT TOTAL COSTS [1 + 5]	40.990	79.6	

Executive summary

Project Description

The main objective of the ADLIGHT Project is to "increase the penetration of high-quality energy efficient lighting technologies in Indonesia through the transformation of the national market, thereby reducing electricity demand and the related greenhouse gas (GHG) emissions". Although LED penetration is gradually increasing in Indonesia, these are often low-quality products thereby harming consumer confidence in LEDs. With Indonesia being an archipelago that leads to a situation where it is very easy for low quality products to enter the market, it is challenging to create a market for high quality LED lighting that is affordable to consumers and progresses gender equality. The outputs of the ADLIGHT Project are described below designed to bring about the intended outcomes:

The ADLIGHT project is implemented by the Indonesian Ministry of Energy and Mineral Resources (MEMR) following UNDP's National Implementation Modality (NIM). The GEF funding is US 3,859,872 (both UNDP and UNEP) over the initially 3 years started in May 2020 and extended for 12 months to be closed in May 2024 for UNDP and started in January 2021 and extended to October 2024 in case of UNEP.

Evaluation scope

The Terminal Evaluation (TE) of the ADLIGHT project assessed the achievement of expected project results, including both the accomplishments and the areas for improvement to enhance the sustainability of benefits and contribute to better future programming. The evaluation adhered to the UNDP/GEF Evaluation Guidelines. The TE aimed to foster accountability, transparency, and provide evidence-based insights to gauge the project's success in addressing the identified needs during its design phase. Conducted with a blend of face-to-face and online engagements, specifically in Indonesia between February and March 2024, the evaluation utilized mixed methods to gather a robust combination of qualitative and quantitative data, enhancing the reliability and credibility of its findings.

The methodology of the TE encompassed a comprehensive desk review of project documentation, semi-structured interviews with key stakeholders, and field visits to significant project sites like the Energy Efficiency Lighting Pilots to collect firsthand evidence. This mixed-method approach allowed for data triangulation, increasing accuracy and informing the reliability of the evaluation results. Throughout the process, purposive sampling aimed to capture a diverse range of stakeholder perspectives, ensuring gender responsiveness and inclusivity in data collection and analysis. Analytical techniques included descriptive analysis, content analysis, thematic analysis, and quantitative analysis, all aimed at identifying common trends, themes, and quantifiable project impacts.

Evaluation Ratings Table

Table 1: Evaluation rating table

Monitoring & Evaluation (M&E)	Rating
M&E design at entry	Satisfactory (S)

M&E Plan Implementation	Moderately Unsatisfactory (MU)
Overall Quality of M&E	Moderately Satisfactory (MS)
Implementation & Execution	Rating
Quality of UNDP/UNEP Implementation/Oversight	Satisfactory (S)
Quality of Implementing Partner Execution	Satisfactory (S)
Overall quality of Implementation/Execution	Satisfactory (S)
Assessment of Outcomes	Rating
Progress towards objective, expected outcomes and impacts	Satisfactory (S)
Relevance	Satisfactory (S)
Effectiveness	Satisfactory (S)
Efficiency	Moderately Unsatisfactory (MU)
Overall Project Outcome Rating	Satisfactory (S)
Sustainability	Rating
Financial	Moderately Unlikely (MU)
Institutional Framework and governance	Moderately Likely (ML)
Socio-political	Likely (L)
Environmental	Moderately Unlikely (MU)
Overall Likelihood of Sustainability	Moderately Unlikely (MU)

Key conclusions & rating justification

Project achievement and market transformation: The ADLIGHT project has successfully met its core objectives, significantly contributing to energy savings and GHG emissions reduction in Indonesia. It has played a crucial role in transforming the national market by increasing the penetration of high-quality energy-efficient lighting technologies and introducing critical MEPS and regulatory changes. These efforts mark a significant step forward in Indonesia's transition to energy-efficient lighting, setting a foundation for future market demand growth as standards continue to evolve.

Challenges and areas for improvement: Despite these achievements, the project faced notable challenges, particularly regarding financing models and electricity subsidies, which have slowed down replication efforts and dampened investment enthusiasm. Additionally, the limited impact on behavioural shifts towards energy efficiency underscores the need for stronger initiatives to promote the adoption and proper use of energy-efficient lights.

Technical assistance and capacity building: Through the market surveys and technical assistance to local LED manufacturers, the ADLIGHT project has laid a adequate groundwork for promoting energy-efficient lighting in Indonesia. However, the pending approval of business transformation proposals from financial institutions highlights the necessity for more streamlined processes and improved collaboration between project beneficiaries and financial stakeholders.

Regulatory advances and challenges: The development of decrees for MEPS and labelling represents a milestone in regulatory progress, yet the project's efforts in market surveillance and product registration underline ongoing challenges in implementing a comprehensive and effective approach for MVE of energy-efficient products.

Environmental considerations and waste management: The project has made advances in lamp waste management by engaging in training and pilot activities for safe disposal practices. However, the absence of concrete strategies for the environmentally safe disposal of old lamps across all sites presents a significant oversight, posing risks to both human health and the environment.

Pilot demonstrations and financial models: The implementation of pilot demonstrations has showcased the potential benefits of energy-efficient lighting, leading to replication efforts. Yet, the cautious adoption of financing schemes by local governments and limited interest from financial institutions in energy-efficient lighting projects indicate a need for more robust models and incentives to support such initiatives.

Alignment with national and global goals: The ADLIGHT project stands as a pivotal initiative in supporting Indonesia's commitment to climate change mitigation and energy efficiency, aligning closely with the country's NDCs and the broader goal of achieving net-zero emissions by 2060. Its focus on efficient street lighting not only contributes to Indonesia's National Energy Plan but also resonates with global efforts to enhance energy efficiency, supporting Sustainable Development Goal 7.

Comprehensive design and strategic approach: The project design is comprehensive, which provides a clear roadmap for transforming the energy-efficient lighting industry in Indonesia. By addressing the entire LED lighting value chain and focusing on sustainable environmental improvements, ADLIGHT's strategy effectively tackles identified barriers, from policy and regulatory gaps to the need for greater manufacturer capacity and more robust mechanisms for monitoring, verification, and enforcement. Through a design process, ADLIGHT has successfully identified the primary obstacles hindering the widespread adoption of energy-efficient lighting in Indonesia. ADLIGHT's approach of piloting, testing, learning, and then upscaling exemplifies a dynamic and adaptive model for project implementation.

Challenges*:* The ADLIGHT project encountered several challenges that affected its progress. Electricity subsidies and a flat rate tariff policy reduced the economic incentive for energy efficiency investments. Financing models for the project were new and met with skepticism, while financial institutions showed limited interest due to perceived risks. Lengthy procurement processes and limited consumer awareness further hindered progress. Despite the superior quality of local products, consumer confidence remained low, necessitating additional promotional efforts. These obstacles highlighted the need for adaptive strategies, broader engagement, and innovative solutions to advance energy efficiency initiatives.

Success factor: The effectiveness of the ADLIGHT project was significantly supported by a strong consultative process and the favorable political climate stemming from Indonesia's enhanced NDCs. The project utilized Focus Group Discussions (FGDs) as a crucial platform for stakeholder consultation and collaboration, bringing together participants with diverse backgrounds and expertise. The effectiveness of this ADLIGHT project can be rated as S (Satisfactory) since it met expectations as to the degree of the outcomes are achieved. Objective level targets are largely met, but finance mechanisms are instrumental sustainability elements in advancing the EE lighting in the future.

Efficiency*:* The ADLIGHT project has demonstrated efficiency in achieving its outcomes, offering value for money by delivering results within budget and agreed disbursements. It has effectively leveraged investments and in-kind support from external sources, including significant co-funding for EE lighting programs of $16 million in private sector investments.

Delays: The project faced considerable delays, from the PIF approval in June 2016 to the Project Document Signature in May 2020 (UNDP) and Jan 2021 (UNEP), and further delays in establishing the Project Management Unit (PMU) and starting key assignments, compounded by the impact of COVID-19 on in-person engagements. In response to these delays, a 12-month extension at no cost was recommended and approved, allowing for continued progress towards project targets. UNEP's component of the project is set to extend beyond the UNDP project closure until October 2024, to accommodate additional activities.

Financial delivery: As of December 2023, the project reported 68 % financial delivery, with a significant portion of the budget, around $1.2 million, allocated for 2024, particularly for activities under UNEP's extended timeline. Co-financing target has been outperformed. Co-financing has largely come from MEMR contributions through parallel programs and investments in the laboratory settings, and the second largest contribution comes from the private sector, particularly investment by local manufacturers made in meeting the new MEPS. There's a risk that a considerable portion of the GEF funding for the UNDP component may remain unspent by the project's end, with the exact amount to be returned to the GEF depending on 2024 expenditures. Therefore, the overall ranking of efficiency is Moderately Unsatisfactory (MU).

Utilisation of unspent resources: The project applied adaptive measures in relation to the project extension and budget reallocations to support pilot demonstrations, this decision was approved by the project board, however, the decision to allocate budget savings under component 2 to support the development of MEPS for products outside the original scope of EE lighting raised questions about staying within the project's primary focus.

M&E design: The design of the ADLIGHT project's M&E framework is adjudged to be comprehensive and robust, aligning well with the standards expected for projects of its scale and complexity. With sufficient resources allocated ($205,000 in total) and clear delineation of roles and responsibilities, the M&E design effectively supports the project's needs for monitoring results and tracking progress towards its objectives, earning it a satisfactory rating.

M&E implementation: The implementation phase revealed critical areas for improvement, particularly the insufficient monitoring of key indicators and environmental risks. This gap in effective implementation, highlighted

by the lack of data for three specified indicators in the PRF and limited tracking of environmental impacts, highlights the need for more rigorous and comprehensive monitoring practices. Consequently, the implementation aspect of M&E is rated as moderately unsatisfactory, leading to an overall M&E quality rating of moderately satisfactory.

Effective support and oversight by UNDP and UNEP: The ADLIGHT project benefited significantly from the vigilant support and oversight of UNDP and UNEP, with UNDP monitoring financial transactions to ensure efficiency and accountability, conducting audits, and facilitating essential project reviews and meetings to track progress and resolve issues. Similarly, UNEP's active involvement, including through engaging U4E team, in providing technical support and capacity-building initiatives, such as training sessions on testing methods and the development of standards, contributed to the project's ability to meet its objectives. This comprehensive support framework resulted in a satisfactory rating for the quality of UNDP/UNEP implementation and oversight.

Effective project ownership and execution by MEMR: The implementation of the NIM modality by MEMR ensured that the ADLIGHT project was deeply integrated within the national administrative and operational frameworks, fostering a strong sense of ownership and commitment to the project's success. Despite challenges such as delays in recruitment and procurement processes, the effective integration of the PMU within MEMR and the active engagement with the project's goals and processes underscore the effectiveness of MEMR's execution of its responsibilities. This level of integration and commitment has led to a satisfactory rating for the quality of implementing partner execution, contributing to a satisfactory overall rating for project implementation and execution.

Social and Environmental Safeguards: The ADLIGHT project took important steps to address environmental risks associated with the disposal of mercury-containing lamps, integrating UNDP's Social and Environmental Standards (SES) and conducting targeted training on waste management and recycling. However, there has been limited monitoring of environmental risks among the pilot projects, which highlights a crucial area for enhancement. Ensuring rigorous and systematic compliance checks is essential for preventing the reuse or inadequate storage of hazardous materials, thereby safeguarding environmental sustainability and health in the transition to energy-efficient lighting solutions.

Stakeholder engagement: A crucial component of the ADLIGHT project has been its ongoing engagement with stakeholders through Focus Group Discussions (FGDs), which have facilitated deep technical discussions and collaborative problem-solving among participants from diverse backgrounds. Despite the project's inclusive approach, engagement with the Ministry of the Environment and Forestry (MoEF) was noted as limited, especially concerning hazardous waste management.

Gender mainstreaming: The ADLIGHT project presented a good commitment to gender equality by integrating gender considerations throughout its lifecycle, from design to implementation. Through targeted strategies like equal capacity-building opportunities, gender-disaggregated data collection, and the promotion of gender-balanced participation, the project successfully fosters an inclusive environment that addresses gender-specific needs and challenges. This approach ensures equitable access to resources and opportunities in the energy-

efficient lighting sector, marking a significant step forward in promoting gender equality within the context of sustainable development initiatives.

Financial sustainability: The ADLIGHT project's efforts to promote energy-efficient lighting in Indonesia face significant challenges in financial model adoption and market penetration due to governmental reluctance towards unproven models, limited financial institution interest, and existing electricity pricing strategies. The subsidized and flat-rate electricity tariffs diminish the motivation for adopting LED and energy-saving technologies, impacting the financial sustainability and widespread adoption of such initiatives. Consequently, the project's potential for achieving long-term financial sustainability and incentivizing energy efficiency on a broader scale is assessed as Moderately Unlikely (MU), highlighting the need for innovative approaches to overcome these barriers.

Institutional/governance sustainability: The sustainability of the ADLIGHT project is anchored in Indonesia's robust energy efficiency and conservation policies, benefiting from governmental support and the endorsement of MEPS. This backing, alongside active engagement with the local energy-efficient lighting manufacturing industry, fosters a conducive environment for sustainable market transformation. The project's focus on capacity building further strengthens the potential for long-term success and sustainability of energy-efficient initiatives. However, challenges in market surveillance and the enforcement of standards present potential risks to maintaining the consistency and reliability of energy-efficient products. These issues could affect consumer confidence and the overall market acceptance of such technologies. Given these dynamics, the project's institutional and governance sustainability is considered moderately likely, reflecting a balanced outlook that recognizes both its solid foundation and the areas requiring further attention.

Socio – political sustainability: The ADLIGHT contributed to increase level of awareness of the public as well as local authorities effectively. Also, the ADLIGHT Project appears to have effective relationships with all stakeholders that are mapped in the project document, and these relationships are expected to pursue beyond the project completion date. Therefore, the ranking for socio – political sustainability is Likely (L).

Environmental sustainability: During the pilot stage, pre-existing lighting units were either repurposed in alternative locations or stored in a repository close to the facility. Currently, there are no concrete strategies for the environmentally safe disposal of these old lamps. The ADLIGHT pilots have not been assessed if they comply with the B3 waste requirements as outlined in the relevant national policies and regulations. The project input to this matter was limited to two training sessions and supporting 1 pilot (in central Java) to safely dispose old lamps by contracting a specialized waste company. Therefore, the ranking for environmental sustainability is Moderately Unlikely (MU).

Lessons learned (details in section 4.2)

- Establishing a robust policy-regulatory framework is crucial for transitioning the market towards more energy-efficient consumer technologies, like LED lighting.
- LED Street lighting is increasingly cost-effective, making it an affordable option with a rapid return on investment.

- Proper disposal and recycling of old lighting technologies are crucial.
- Effective engagement and communication with stakeholders are essential for success.

Integrating stakeholders surveys into the monitoring system is crucial for tracking project indicators systematically.

Recommendations summary table

Below recommendations take into account the timeframe available to implement recommendation. In case of UNDP, the project is so close to be operationally closed at the time of drafting this TE evaluation report, while UNEP have longer time until October 2024 to operationally close the project. Accordingly, the following are a mix of recommendations for corrective actions and forward-looking recommendations/ lesson learned focussed on future programming: **more details on the recommendations available in section 4.2**.

Table 2: recommendations table

#	TE Recommendation	Entity Responsible	Timeframe
1	1. **Enhance the capacity of stakeholders in implementing market surveillance on EE lighting**: ○ 1.1 Establishing a Market Surveillance Framework. ○ 1.2 Capacity Building through Training on Market Surveillance.	UNEP/PMU	April-Oct 24
2	2. **Promote successful EE lighting pilot projects results through broad targeted demonstration.** ○ 2.1 Implement targeted demonstration for local authorities at the local and provincial level. ○ 2.2 Promoting financial models developed to finance EE lighting projects.	PMU	April-Oct 24
3	3. **Strengthen the application of environmentally sound management.** ○ 3.1 Undertake thorough assessment of how pilot and replication projects comply with Indonesian environmental legislation. ○ 3.2 Develop concrete strategies for the environmentally safe disposal of these old lamps in all sites. ○ 3.3 Facilitate engagement between the Ministry of Environment and Forestry and local authorities to ensure technical support, monitoring, evaluation and compliance.	UNEP/PMU	April-Oct 24

1. Introduction

1.1 Purpose & scope

The Terminal Evaluation (TE) assessed the achievement of project results against what was expected to be achieved and drew lessons that can both improve the sustainability of benefits from this project, and aid in the overall enhancement of future UNDP/UNEP programming. It measures the extent to which the Project has contributed to solve the needs identified in the design phase and degree to which implementation, efficiency and quality delivered on expected results (outputs) and specific objectives (outcomes), against what was originally planned or officially revised, thus, the TE report promotes accountability and transparency and assesses the extent of project accomplishments.

The TE assessed project performance against expectations set out in the project's Logical Framework/Results Framework and results according to the criteria outlined in the Guidance for Conducting Terminal Evaluations of UNDP-Supported, GEF-Financed Projects'[1]

The TE provides evidence-based information that is credible, reliable and useful and comply with the UNDP/GEF Evaluation Guidelines. The TE was undertaken in line with UNEG principles concerning independence, credibility, utility, impartiality, transparency, disclosure, ethical, participation, competencies and capacities. The evaluation process has been independent of UNDP and project partners. The opinions and recommendations in the evaluation are those of the Evaluator and do not necessarily reflect the position of any stakeholders.

The TE was carried out between February-March 2024 with a mix of face-to-face engagement in Indonesia and online engagement where needed.

1.2 TE Approach

The primary phases of the TE Implementation included the development and presentation of the TE Inception Report, TE mission for primary data collection, presentation of initial TE findings to key stakeholders and reporting.

TE inception phase

The purpose of the inception report was to define the overall approach and set out the conceptual framework to be applied in the evaluation. The inception report included the understanding of the evaluation objectives, evaluation questions and possible evidence to be generated, defined the methodology, and provides information on data sources and collection, sampling, and key indicators.

This phase included a review of project documentation, review of evaluation questions, and the establishment of criteria for assessing project outcomes. Stakeholder analysis have also been conducted to identify all parties relevant to the evaluation. The inception report has been crucial for ensuring that all parties have a clear understanding of the evaluation scope, methods, and expected deliverables.

[1] UNDP-Supported, GEF-Financed Guidance for conducting terminal evaluations, 2020. Available here.

TE mission for collecting primary data

The objective of this phase was to gather first-hand data from project sites, beneficiaries, and other stakeholders. The TE evaluation team conducted a filed visit to key project sites including the Energy Efficiency Lighting Pilots to observe work done on the ground and engage directly with the project beneficiaries.

The data collected during this mission forms the backbone of the evaluation, providing essential insights into the project's implementation and effectiveness.

Presentation of initial TE findings to key stakeholders

This phase aimed to share preliminary findings with stakeholders to validate the information and gather additional feedback. A Mission wrap-up meeting & presentation of initial findings was conducted at the end of the TE mission to present preliminary findings, assessments, conclusions and emerging recommendations. The session was attended by the participating agencies and UN agencies and aimed to obtain their feedback to be incorporated in the early drafts of the report.

Feedback from stakeholders during this phase was used to refine and finalize the evaluation report, ensuring it accurately reflects the project's outcomes and the perspectives of those involved.

Drafting evaluation report

The final phase involved compiling this comprehensive evaluation report which includes detailed findings, conclusions, and recommendations. The report integrates all data and analyses from the evaluation process and is crafted to provide clear evidence-based conclusions about the project's effectiveness and impact. The final report is essential for accountability and learning. It is used to inform future projects, improve ongoing strategies, and fulfill reporting obligations to donors or other key entities.

Mixed methods[2] were used for the TE to generate mix of qualitative and quantitative data. The use of mixed methods has the advantage of supporting data triangulation across multiple sources, which creates the potential for increased data accuracy and credibility to inform the reliability of the evaluation results. Methods are explained in more detail below.

1.3 Methods

Data collection methods

To strengthen the robustness of the evaluation evidence, a mix method was used to generate qualitative and quantitative data to best describe project results based on the on the results framework as outlined in the project document. The evaluation used methods of document review and interviews for data collection to obtain answer all of the evaluation questions outlined in the TOR. The evaluation had three levels of data collection and validation of information:

[2] Mixed methods involve desk review and semi-structured interviews for data collection, and also descriptive analysis, content analysis, thematic analysis and simple quantitative data analysis in excel for quantitative indicators for data analysis.

- A desk review of project documentation where both qualitative and quantitative data have been collected.
- Semi-structured interviews with key stakeholders for qualitative data collection (Annex7 list of xx persons interviewed).
- Filed visit to key project sites including the Energy Efficiency Lighting Pilots.

An evaluation matrix was developed as a base for gathering of qualitative inputs for analysis. The evaluation matrix defined the objective for gathering non-biased, valid, reliable, precise, and useful data with integrity to answer the evaluation questions.

Desk review*:* The initial stage involved the review of project documentation and associated documents. An information package was provided by the PROJECT management team to the TE team. The evaluators reviewed all relevant sources of information, such as the project document, project reports – including annual reports, progress reports, project files, previous evaluations, national strategic and policy documents, and any other materials that the evaluator considers useful for an evidence-based evaluation assessment. See annex 2 for list of documents reviewed.

The key output of the desktop review was to collect data and information as potential evidence that underpin evaluation and also help the evaluator to familiarize with the work context in details. Annex 2 includes full list of documents to be reviewed.

Semi-structured interviews*:* Engaging stakeholders has been critical for the success of the evaluation. The project involved multi-stakeholders and teams in different capacities and the TE engaged with various stakeholders to cover different perspectives taking into account the principle of gender responsiveness. The TE team has taken into account the geographical coverage, representative diversity, gender balance etc. and inclusivity of key stakeholders and beneficiaries in designing the interview schedule and locations that were visited. Engaging stakeholders was done mainly based on face-to-face interviews in Indonesia, and where face-to-face engagement was not possible, an online engagement has been organised.

The main purpose of the engagement was to collect evidence that support TE process and findings and gain sufficient understanding of their perspectives on the program successes and challenges. All interviews were undertaken in full confidentiality.

Field visit: The TE evaluation team conducted a filed visit to key project sites including the Energy Efficiency Lighting Pilots to observe work done on the ground and engage directly with the project beneficiaries.

Sampling: Purposive sampling was used to achieve the level of rigor that is required for a robust evaluation. The evaluation responded to the existing diversity across the project stakeholder groups. In essence, the purposive approach to sampling was used to identify the key informants who are best suited to provide detailed responses to the evaluation questions, to accurately reflect given elements of the work experience. This also allowed for additional data generation at any stage of the evaluation, to facilitate results reliability and completeness.

Gender responsiveness has been integrated throughout the evaluation process including gender balance during the engagement with stakeholders by ensuring both genders are engaged, and assessing the gender integration in the project design and delivery, and ensuring that data collection and analysis are gender sensitive. The evaluation used gender-disaggregated data of personnel engaged by the project to identify barriers and differentiate roles that may be more suited to each gender. The evaluation also checked whether all "people count" indicators are gender segregated and if the project had reported women ratio in related indicators.

Data analysis methods

Data analysis was based on observed facts, evidence, and data. Findings are specific, concise, and supported by quantitative and/or qualitative information that is reliable, valid and generalizable.

Information was analysed and consulted with project team or commissioning unit., and then an evaluation report draft was developed. All analysis must be based on observed facts, evidence and data. Findings should be specific, concise and supported by quantitative and/or qualitative information that is reliable, valid and generalizable. The broad range of data provides strong opportunities for triangulation. This process is essential to ensure a comprehensive and coherent understanding of the data sets, which was generated by the evaluation.

The data analysis method involved:

Descriptive analysis: A descriptive analysis of the PROJECT was used to understand and describe its main components, including related activities; partnerships; modalities of delivery; etc. Descriptive analysis preceded more interpretative approaches during the evaluation.

Content analysis: A content analysis of relevant documents and the literature was conducted to identify common trends and themes, and patterns for each of the key evaluation issues (as the main units of analysis). Content analysis was used to flag diverging views and opposite trends and determine whether there was need for additional data generation.

Thematic analysis: Responses collected from semi-structured interviews and field visit observations were analyzed through thematic analysis, this is a method of analyzing qualitative data. The evaluator has closely examined the data to identify common themes – topics, ideas and patterns of meaning that come up repeatedly from interviews and other sources.

Quantitative analysis: A simplified analysis was conducted on all quantitative measures (for example energy savings and GHGs) by reviewing and validating project datasets on quantitative indicators. The generated statistics were used to develop emergent findings and inform the triangulation process.

Triangulation: In this evaluation, triangulation involved validation of data through cross verification from at least two sources, and evaluation findings and conclusions were synthesized based on triangulated evidence from the desktop review and interviews. This process was essential to ensure a comprehensive and coherent understanding of the data sets, which will be generated by the evaluation.

Evaluation criteria and ratings: The different scales for rating various criteria are shown in the table below in accordance with GEF-financed, UNDP Implemented Terminal Evaluation Guidelines.

Table 3: TE Rating Scales & Evaluation Ratings Table

TE Rating Scales	
Ratings for Outcomes, Effectiveness, Efficiency, M&E, Implementation/Oversight, Execution, Relevance	**Sustainability ratings:**
6 = Highly Satisfactory (HS): exceeds expectations and/or no shortcomings 5 = Satisfactory (S): meets expectations and/or no or minor shortcomings 4 = Moderately Satisfactory (MS): more or less meets expectations and/or some shortcomings 3 = Moderately Unsatisfactory (MU): somewhat below expectations and/or significant shortcomings 2 = Unsatisfactory (U): substantially below expectations and/or major shortcomings 1 = Highly Unsatisfactory (HU): severe shortcomings Unable to Assess (U/A): available information does not allow an assessment.	4 = Likely (L): negligible risks to sustainability 3 = Moderately Likely (ML): moderate risks to sustainability 2 = Moderately Unlikely (MU): significant risks to sustainability 1 = Unlikely (U): severe risks to sustainability Unable to Assess (U/A): Unable to assess the expected incidence and magnitude of risks to sustainability.

1.4 Ethical Considerations

The TE consultant was held to the highest ethical standards and was required to sign a code of conduct upon acceptance of the assignment. This evaluation was conducted in accordance with the principles outlined in the UNEG 'Ethical Guidelines for Evaluation'[3]. The evaluator ensured to safeguard the rights and confidentiality of information providers, interviewees, and stakeholders through measures to ensure compliance with legal and other relevant codes governing collection of data and reporting on data. The evaluator also ensured security of collected information before and after the evaluation and protocols to ensure anonymity and confidentiality of sources of information where that is expected. The information knowledge and data gathered in the evaluation process has been solely used for the evaluation and not be used for other purposes without the express authorization of UNDP and partners.

[3] UNEG Ethical Guidelines for Evaluation, 2020, available here.

1.5 Limitations

The main limitations faced during the evaluation were related to the geographical distribution of the project activities and stakeholders over across Indonesia, this meant that the evaluator was not able to travel to all local areas in person and undertake filed visits. Alternatively, the evaluator conducted the visits for some sites, and engaged with the rest of the stakeholders in other cities virtually where appropriate. Also, some of the project materials (deliverables, minutes of meetings, others) have been made available only in Indonesian language (Bahasa) with no translation available, this has been limiting factor to access detailed information on project written outputs.

1.6 Structure of the Report

The TE draft report follows the format suggested by the UNDP-GEF TE guidelines, with a description of the methodology, a description of the project and findings organized around: i) Project Design/Formulation; ii) Project Implementation; iii) Project Results and Impact. Conclusions, Recommendations and Lessons Learnt complete the report. Consistently with requirements, certain aspects of the Project are rated, according to the rating scale of the Guidelines. Co-financing information is presented in the chapter under financial management; and the updated Scorecard and core indicators are included in Annex 11. Comments addressed have been documented in an Audit Trail, prepared as a separate annex 12 to the TE Report.

2. Project Description

2.1 Development context

With a population of over 275 million[4] and an economic growth rate of over 5.3% in 2022[5], Indonesia is facing a high growth rate in its energy demand (4.9% per year)[6]. Though the rate of access to electricity has improved to 98.9% of the population, the national electrical generation capacity is failing to keep pace resulting frequent power cuts and brownouts and many others with only restricted electricity. This has a negative impact on entrepreneurship, education, health and safety. Furthermore, Indonesia's over-reliance on fossil fuels, which accounts for 88% of the country's energy mix[7], results in rising greenhouse gas emissions.

Energy efficient and affordable lighting is important to Indonesia because of the significance of indoor or outdoor lighting in the lives of women and men, and in all sectors of the economy. As such, access to energy efficient lighting (EEL) products and systems has been very relevant to national development priorities and global environmental issues. The ADLIGHT Project responds to a number of sustainable development goals (SDGs): #7 -

[4] As of 2022 – source world bank data here.

[5] As of 2022 – source world bank data here.

[6] National Electric Generation Plan for 2021-2030 (RUPTL)

[7] Indonesia Energy Transition Outlook 2023

Affordable and clean energy; #9 - Industry, innovation and infrastructure; #11 - Sustainable cities and communities; and #12 - Responsible consumption and production.

Indonesia's ratification of the Paris Agreement through Law No.16/2016 was a critical event for global climate action in the country. Indonesia submitted its Enhanced NDC to the UNFCCC Secretariat by 23 September 2022 with increased emission reduction target from 29% in First NDC to NDC to 31.89% unconditionally, and from 41% in the Updated NDC to 43.20% conditionally. The Enhanced NDC is the transition towards Indonesia's Second NDC which will be aligned with the Long-Term Low Carbon and Climate Resilience Strategy (LTS-LCCR) 2050 with a vision to achieve net-zero emission by 2060 or sooner[8].

In consideration of the aforementioned issues, the Government of Indonesia (GoI) signed off on a project entitled "Advancing Indonesia's Lighting Market to Highly Efficient Technologies (ADLIGHT)" funded by the Global Environmental Facility (GEF) through the United Nations Development Programme (UNDP) and the United Nations Environment Programme (UNEP). The ADLIGHT Project aims to promote the increased deployment of high efficiency lighting technologies in Indonesia through the transformation of the national market, thereby reducing electricity demand and the related greenhouse gas (GHG) emissions. The Project is expected to lead to increased market penetration of high efficiency lighting through capacity building for the country's lighting industry thereby enhancing local manufacturing capability to locally-produce highly quality lighting systems in line with minimum energy performance standard (MEPS), through introducing quality and minimum energy performance regulations, procurement policies and improved customs procedures, and through introduction of new business models and awareness raising.

The ADLIGHT Project also receives support through an integrated policy approach (under a multi- country arrangement) under a UNEP-GEF project: "Leapfrogging Markets to High Efficiency Products Program" that is supposed to include lighting appliances and electrical equipment, and another GEF-supported program "the Global Leapfrogging Program (GLP)". GLP contributes to the UN Secretary General's Sustainable Energy for All (SE4ALL) initiative's "Lighting and Appliance & Equipment Accelerators". The SE4ALL Global Project has formed a global partnership, "United for Efficiency" (U4E), which is a global effort supporting developing countries and emerging economies to move their markets to energy efficient appliances and equipment. By the end of the SE4ALL project, this project should have the commitment from at least thirty developing countries and emerging economies, including Indonesia, to transform their markets to energy efficient lighting, appliances, and equipment.

2.2 Problems that Project Seeks to Address

Primary barriers to advancing Indonesia's lighting market to highly efficient technologies such as LEDs are listed:

- *Limited capacity of lighting manufacturers*: In Indonesia, it was thought that most local manufacturers have limited capacity to meet standards for energy efficiency and quality, and

[8] Indonesia Enhanced NDC. Available here.

do not have the technical and financial capacity to innovate. This reduces their capabilities to produce lower cost, high-quality LEDs that would meet future MEPS standards. Local businessmen do not seem to be capable of developing business transformation plans for shifting from conventional lighting manufacture to lower-cost high efficiency LED systems. Without such plans in place, financial institutions develop risk-averse perceptions to fund upgraded production lines for local lighting manufacturers.

- *Absence of MEPS for LEDs*: Indonesia did not have any MEPS in place for lighting products other than CFLs. Indonesian consumers will buy any lamp available in the market which usually leads to purchasing low cost, albeit inefficient lamps. At the same time, there is still limited capacity with the Customs officers and Ministry of Trade staff to curtail the import of inefficient lamps into the country even as the adoption of MEPS for CFLs has already started. As long as the lighting standards are low cost, low quality of lighting standards will continue to be distributed. This discourages local manufacturers to produce high energy efficient lighting products at affordable prices.
- *Absence of guidelines for public procurement*: Due to a lack of guidelines for public procurement, street lighting is often quite inefficient in Indonesia. By having a standard MEPS requirement available in the guidelines for public procurement, consumers, manufacturers and importers of LED lights in Indonesia will have a reference in complying with standards. Therefore, the quality of LED lighting to be made available in Indonesia can be monitored, verified and enforced (in an MVE system). With the standard minimum quality that is aligned with MEPS and international standards, local LED manufacturers are supposed to have the chance for their products to be included for public procurement as listed in the e-Catalogue.
- *Absence of regulatory mechanisms for MVE and lack of capacity of testing laboratories*: There were no regulatory mechanisms for efficient MVE in Indonesia. Initial steps were taken towards a measurement, reporting and verification system with a lack of institutional capacity for its implementation[3]. In addition, there was also a reported lack of testing laboratory capacity which combined with the absence of MEPS for LEDs, leading to Indonesian consumers being able to buy any lamp available in the market which usually leads to the purchase of low cost, inefficient lamps.
- *Limited available business models for energy efficient lighting products*: This results in a small market share for locally produced EE lighting products. In guidelines for procurement of EEL products, the existence of a standard minimum quality requirement that is aligned with MEPS and other international standards should allow the quality of LEDs in Indonesia to be monitored, verified and enforced within an MVE system. This will benefit consumers, manufacturers and importers of LED lights in Indonesia.

- *Lack of gender-analysis on the LED lighting market in Indonesia*. This limits gender-sensitive approaches to the lighting market, further limiting LED market penetration.

These barriers serve as the baseline scenario to the ADLIGHT Project.

2.3 Project Description and Strategy

The main objective of the ADLIGHT Project is to "increase the penetration of high-quality energy efficient lighting technologies in Indonesia through the transformation of the national market, thereby reducing electricity demand and the related greenhouse gas (GHG) emissions". Although LED penetration is gradually increasing in Indonesia, these are often low-quality products thereby harming consumer confidence in LEDs. With Indonesia being an archipelago that leads to a situation where it is very easy for low quality products to enter the market, it is challenging to create a market for high quality LED lighting that is affordable to consumers and progresses gender equality. The outputs of the ADLIGHT Project are described below designed to bring about the intended outcomes:

For Outcome 1: Improved quality, energy efficient and affordable locally produced EEL products and systems, the following outputs are to be delivered:

- Output 1.1: Establishment of knowledge center and systems that helps manufacturers in their production planning and policy makers in reviewing enabling environment.
- Output 1.2: Adopted and implemented business transformation plans of selected local lighting manufacturers to produce high quality energy efficient lighting which meet future MEPS.
- Output 1.3: Completed capacity development program for banking/financial institutions on the evaluation and financing of lighting industry modernization projects.

For Outcome 2: Improved conditions for fair market competition of EE lighting products, informed by robust policy and institutional framework:

- Output 2.1: Minimum Energy Performance Standards (MEPS) and energy labels in place for high energy efficient lighting products in line with the ASEAN regional approach.
- Output 2.2: Policy and guideline for public procurement of LED lighting products (residential, commercial and outdoor) developed and process for adaptation initiated, including environmentally safe waste disposal and recycling practices.
- Output 2.3: Regulatory mechanisms for efficient lighting monitoring, verification and enforcement (MVE) including testing standard defined and implemented by relevant agencies at the national and local levels.
- Output 2.4: Completed capacity development for policy makers, enforcement & custom officials and other relevant government agencies on market control procedures.
- Output 2.5: Completed capacity development program for lamp testing laboratory personnel on LED testing.

For Outcome 3: Increased penetration of high quality and efficient lighting, the following are to be delivered:

- Output 3.1: Development of an innovative financial model enabling accelerated penetration of advanced lighting systems, focusing on the development of ESCO business models.

- Output 3.2: Pilot demonstrations for accelerated LED lamp deployment in buildings and for street lighting in the context of sustainable cities as well as in residential sector.
- Output 3.3: Implemented awareness and promotion program and information system explaining the benefits of high energy efficient lighting technologies, taking into account gender specific aspects in developing and implementing the programmes.

The ADLIGHT project is a three-year project started in May 2020 that was extended to May 2024 in case of UNDP, and from Jan 2021 extended to October 2024 in case of UNEP. The project is funded by the GEF USD 3,895,872 split between UNDP $2,633,372 for component 1 and 3 and UNEP$1,262,500 for component 2.

2.4 Theory of change

The overall goal of the ADLIGHT project is to reduce the growth rate of annual GHG emissions from lighting energy use by means of reducing electricity consumption in the energy end-use sectors. This is done with a gender-responsive approach, responding to the needs and capacity of women and men.

The project objective of ADLIGHT is to increase the penetration of high-quality energy-efficient lighting technologies in Indonesia through the transformation of the national market, thereby reducing electricity demand and the related greenhouse gas (GHG) emissions. Although LED penetration is gradually increasing in Indonesia, these are often low-quality products thereby harming the consumer confidence in LED.

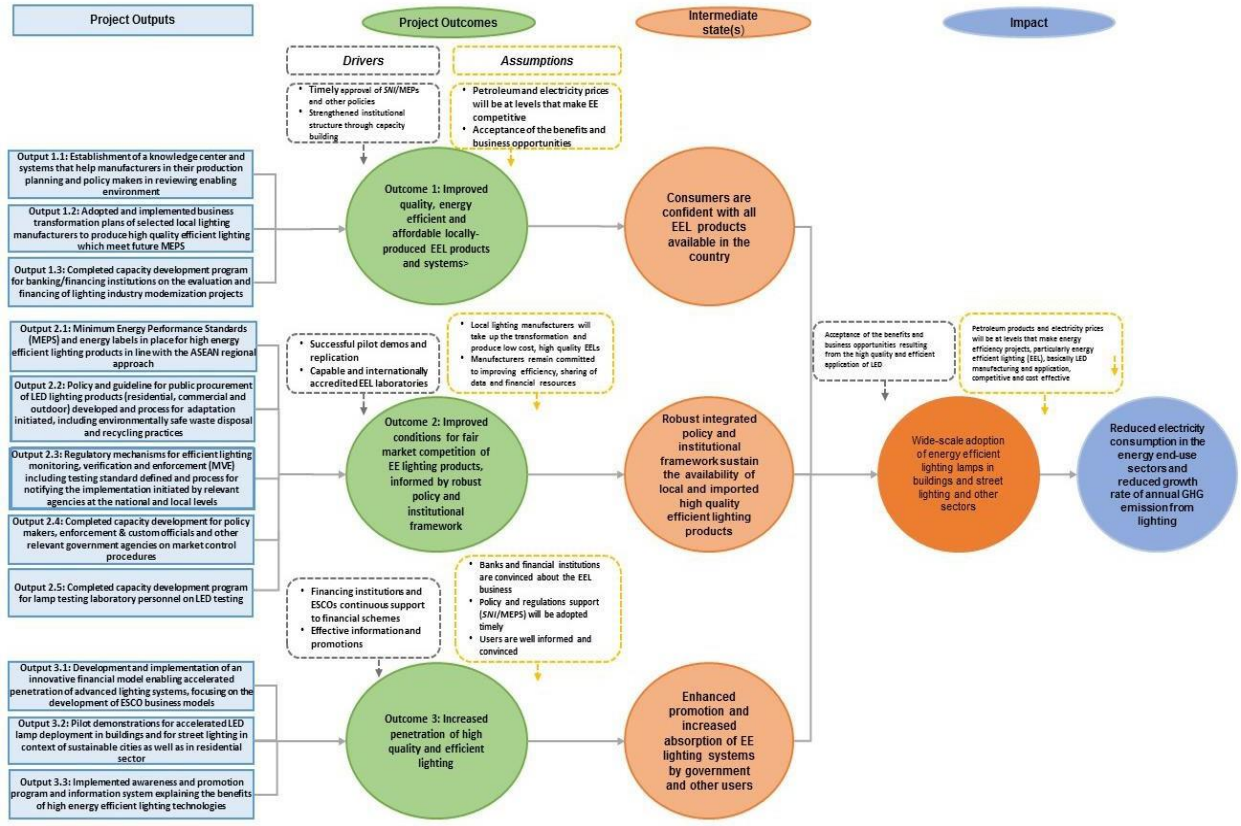
Barriers	**Solutions**
Limited capacity of local lighting manufacturers to produce affordable, high quality energy efficient lighting which meet future MEPS and can lead to higher penetration of these products	**Support to local lighting industry** to improve the quality and efficiency of lamps and ballasts: The project collaborates with the Indonesian lamp manufacturing associations to provide support to Indonesian lighting manufacturers to increase their capacity to produce high quality energy efficient lighting that can meet MEPS designed and implemented as part of the project. The strategy focuses mainly on increasing the capability of local manufacturers to expand their production lines e.g. by making them capable of developing good business transformation plans and submitting good bankable proposals to local commercial banks. Since the local manufacturers need financial resources to upgrade their production lines, the proposed project will help them to develop high quality business transformation plans.
Lack of clear policy, regulatory mechanisms and institutional support to promote import, manufacturing and application of highly efficient lighting technology	**Regulatory mechanisms and market monitoring, verification, and enforcement** (MVE): The project capitalizes on the initiatives in place and support MEMR to develop and implement minimum energy performance standards (MEPS) in coordination with the Ministry of Industry (MoI) and the national standards organization regulatory mechanisms. The project supports Indonesia in developing a well-functioning system of monitoring, surveillance, control, and testing facilities for effective implementation of the MEPs and improved public procurement procedures to higher uptake of LED lighting. When it comes to the enforcement of testing standards for high efficiency lighting systems, the project works closely with the lamp

	manufacturing associations and respective local industries to educate them on the applicable national and regional standards to be followed in terms of quality and efficiency and enforced by the relevant government agencies and customs authorities in the numerous ports that is characteristic of the unique porous archipelagic situation of the country. This ensures products comply with MEPS and reduce the number of non-compliant products entering the market to an absolute minimum in collaboration with Ministry of Industry and Ministry of Trade.
Limited demand and available business models for energy efficient lighting products resulting in a small market share for locally produced EE lighting products. Lack of gender-analysis on the LED lighting market in Indonesia, and therefore lack of gender- sensitive approaches within the market.	**High efficiency lighting technology penetration**: The proposed project is meant to assess available financial mechanisms and explore for their suitability in the project. The pilot projects will concentrate on the ESCO business models (both guaranteed and shared savings model) as well as develop guidelines for public and private procurement procedures as a gateway to higher uptake of efficient lighting products (residential, commercial and outdoor) in support of the most beneficial business approaches. Since there is a large scope for reducing the energy demand for public lighting. The technical and financial assistance that the project provides to building owners and city governments in the demos will aid in their conversion to efficient street lighting. These will involve such upfront costs in formulating and initiating the EE program that usually become barriers affecting possible EE investment initiatives in view of the potential benefits that have been identified.
	Association to introduce high-efficient street lighting. Innovative financial mechanisms built around approaches such as ESCO models to stimulate the deployment of efficient street lighting in wider Indonesian cities. While the project will focus on commercial buildings and street lighting in most of the demonstration and replication activities, it also recognizes the big potential of the high efficiency lighting systems in the residential applications which will need different approaches for the necessary promotion and market penetration. The project focuses on developing and applying business/financing models through ESCOs that can be relevant in commercial buildings, street lighting, whereas the residential market will be addressed in the project's demonstration, communication and marketing campaigns to bolster overall EEL market penetration.

The project removes these barriers and pave the way to follow this developmental route for more efficient and sustainable operations. Once these developmental concerns are addressed, the EE lighting program will be put in place for MEMR to follow through and sustain through the effective implementation of the replication plan that will be initiated within the project period.

Below figure shows the project theory of change illustrating how the three strategies (three project Outcomes) lead to addressing the problems and realizing the three main Outcomes towards the achievement of the Project Objective and Goal.

Figure 1: Project theory of change diagram.



2.5 Main stakeholders

There are many stakeholders for the ADLIGHT Project with the main stakeholder being the Implementing Partner, MEMR, specifically DGNREEC who are responsible for responsible for the overall management and monitoring of Project implementation and results. To achieve the specific ADLIGHT Project objective of "increase the penetration of high-quality energy-efficient lighting technologies in Indonesia through the transformation of the national market", the ADLIGHT Project needed to engage a wide range of stakeholders in Indonesia (as specified in the ProDoc) and summarized in the following Paras.

Table 4: Key stakeholders of the ADLIGHT project

Partners	Role in Project Implementation
Ministry of Energy and Mineral Resources (MEMR)	Provides overall direction and oversight as the Executing Agency; acts as Chairman of the National Steering Committee; provide the lead role in coordinating with other ministries and agencies in pushing forward the goals and objectives of the efficient lighting industry program and resolving inter-ministry barriers
Directorate General of New- Renewable Energy and Energy Conservation (DGNREEC)	Acts as the Responsible Party for the project and leads the Project Management Unit for the day-to-day operations and resolution of issues to ensure smooth implementation of the project; provides technical support for the technology programs. And coordinates with other government agencies as well as UNDP and UNEP
MEMR P3TK EBTKE (Research and Development of DGNREEC)	Provides technical support and laboratory services for the needs of the LED industry; leads the capacity building and accreditation of laboratory facilities in meeting the MEPS/*SNI* standard requirement, benchmarking and round-robin testing
Min of Development Planning (*Badan Perencanaan Pembangunan Nasional or BAPPENAS)*	Acts as the integrator of the related government programs within the overarching objectives of the EEL program which crosses many sectoral boundaries and policy/organizational areas. considering overall national interest
Public Procurement Agency – *Lembaga Kebijakan Pengadaan Barang/Jasa Pemerintah* (LKPP)	Acts as main resource agency for the development and adoption of government procurement policies in order to hasten the market penetration of locally produced high efficiency and affordable lighting products
Financial Service Authority (*Otoritas Jasa Keuangan* or *OJK*)	Coordinates among financial institutions and banks and provides overall policy direction and guidance in implementation of financing mechanisms that will be adopted by the project
PT Sarana Multi Infrastruktur - Persero (PT SMI)	Acts as resource group for green banking and green infrastructure as it applies to buildings and street lighting finance
City Government – Smart Cities	Act as pilot demonstration hosts in EEL application in street lighting and the evaluation of the impacts of the transformation toward EELs
Energy Service Company (ESCO)	Provides the main link between the EEL manufacturers and users and facilities project development, financing and EPC requirements
State Owned Banks & Financial Institution	Acts as catalysts in the development and implementation of the business transformation plans to transform the industry to produce and market EELs locally and potentially abroad

Perusahaan Listrik Negara (*PLN*) State Electricity Company)	Acts as resource organization on energy supply, pricing, and policy in support of the increased market for EELs and transition from the conventional lamps as well as possible participation in piloting LED distribution schemes and billing systems through

3. Findings

3.1 Project Design/Formulation

The TE Team found the design of ADLIGHT project to be generally sound and comprehensive, providing a detailed step by step roadmap to facilitate the transformation of the EE lighting industry in Indonesia. A notable aspect of the design is its all-encompassing approach, addressing the complete LED lighting value chain, from production to end-user, with a specific emphasis on enhancing the overall enabling environment in a sustainable approach.

The ADLIGHT project design has successfully captured the barriers towards to implementation of programs in the local manufacturing and application of energy efficient lighting systems in Indonesia, and in response the project design presented well-structured components to remove the identified barriers with specific activities leading to specific outputs and outcomes. The design is underpinned by robust analysis and consultations during the PPG stage and include SMART indicators to track and measure progress. The design offers guidance on various crucial aspects, including the identification of potential key stakeholders, an indicative implementation schedule, risk assessment, total budget, and work plan. It also outlines the institutional framework and incorporates an M&E Framework.

The project design has identified the root causes and key barriers towards increasing market penetration of high efficiency lighting, including the policy and regulatory gaps, limited manufacturers capacities, absence of MEPS for LED, absence of regulatory mechanisms for MVE and lack of capacity of testing laboratories and absence of guidelines for public procurement that support energy efficient lighting.

The project design offers an integrated solution to achieve a sustainable market transformation of the Indonesian market by supporting local lighting industry to transform the market for high quality, highly efficient lighting systems, developing regulatory mechanisms and market monitoring, verification, and enforcement, and developing business models and awareness raising for high efficiency lighting technology penetration.

The project design incorporates the piloting, testing, learning and then upscaling approach in rolling out the EE light program. The demonstration phase involved working on pilot projects to demonstrate financial models and actual large-scale deployment of LEDs. The impact of pilots and dissemination of information on regulations and the pilots are meant to boost public and investor confidence in ADLIGHT interventions, and eventually leading to LED investments.

Results Framework Analysis: project logic and strategy, indicators

This section provides a critical assessment of the Project Results Framework (PRF) in terms of clarity, feasibility and logical sequence of the project outcomes/outputs and their links to the project objective. It also examines the specific indicators and their target values in terms of the SMART[9] criteria.

Generally, Indicators and targets are found to meet the "SMART" criteria (Specific, Measurable, Achievable, Relevant, Time-bound), the objective- level targets are appropriate and give a good sense of the scope and all that

[9] SMART stands for Specific, Measurable, Attainable, Relevant, Time-bound.

the Project intends to achieve from the outset. The PRF is found to be fit for purpose, and indicators provide a clear description of the intended target with an economy of words, and targets are largely broken down by MTR/EOP timeframe. The simplicity of the indicators provide clarity to the PMU in terms of the activities to be monitored and targets to be reached. The project's results framework monitoring system is composed of 15 indicators with its respective baseline, MTR and end of project targets (3 objective level, 4 for outcome 1, 4 for outcome 2, and 4 for outcome 3).

The indicators integrated gender disaggregation requirements where possible to open the door for gender disaggregated data collection of LED industry, allowing for more effective policies and strategies that respond to the entire population.

Nevertheless, the PRF included several indicators that are reliant on conducting surveys. While the monitoring plan (Annex B of the prodoc) outlined the data collection method, there was limited guidance on how to operationalize these surveys. It lacked clear instructions on what questions should be posed, to whom, and at what specific times. This lack of guidance may have contributed to the incomplete and insufficient monitoring of some survey-based indicators.

Assumptions and Risks

Assumptions and risks were articulated in project planning documents. The stated risks were logical and robust at the time. The prodoc defines 9 key risks that are supported with a proper assessment based on impacts and livelihood and backed with relevant mitigation measures. The prodoc anticipated the key risks that the project may encounter during the implementation, including, the likelihood of local lighting manufacturers not be interested to upgrade the lighting production facilities due to increased investments, disruption to operation and business priorities, this was assessed to have direct negative impact on achieving the project objective, so it required close coordination and collaboration with local manufacturers and banks to facilitate investments; facilitate through ESCOs.

Assumptions are clearly articulated in the PRF and ToC, they capture key assumptions underpinning the achievement of the outcomes, for example the assumption that "petroleum and electricity prices will be at levels that make EE competitive", and "policy and regulation support (SNI/MEPS) will be adopted in a timely manner". Impact drivers included "acceptance of the benefits and business opportunities resulting from high quality and efficient application of LEDs". However, there is no mention as to how these assumptions will be monitored and tested during the project implementation. This is not unique to this project, in fact the GEF-UNDP project document template allows for the assumptions to be captured in the PRF and ToC, but it doesn't include information as to how these assumptions, at least the key ones, are going to be tested and/or monitored.

Lessons from other relevant projects

The prodoc references number of relevant projects identified at the time of PPG, the relevant projects have been mapped in a matrix with information as to how ADLIGHT project is going to build on and complement the scope of other related projects.

- Market Transformation through Design and Implementation of Appropriate Mitigation Actions in the Energy Sector (MTRE3)-UNDP
- ASEAN SHINE
- UNEP en.lighten Initiative.
- Super-Efficient Equipment and Appliance Deployment (SEAD) Initiative - Clean Energy Ministerial and the International Partnership for Energy Efficiency Cooperation.
- Indonesia Clean Energy Development (ICED) Phase II - USAID
- AFD EE street Lighting - Agence Française de Développement (AFD)
- LED Street Lighting Project in Indonesia – Asian Development Bank
- Smart Street Lighting Initiative (SSLI) NAMA Indonesia - Die Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ)
- Environmental Support Program Phase 3 (ESP3) - Danish International Development Agency (DANIDA)
- Green Banking - PT Sarana Multi Infrastruktur - Persero (PT SMI) in partnership with MTRE3 Project
- Synergy Efficiency Solutions (SES) – Private Company
- Promoting Industrial Energy Efficiency through System Optimization and Energy Management Standards in Indonesia –UNIDO/GEF
- Private Financing Advisory Network (PFAN) – USAID
- Climate Technology Initiative (CTI) and UNFCCC Expert Group on Technology Transfer

Among the main initiatives identified was the Switch-Asia project ASEAN SHINE which was implemented under the steering of the ASEAN Member States and has been recognized as a key Dialogue Partner by the ASEAN Ministers of Energy Meeting (AMEM). ASEAN SHINE adopts a holistic approach to market transformation, by using mechanisms including policy, regulations, capacity building along the supply chain, and awareness raising among end-users. The ASEAN SHINE lighting-regional market assessment has been done by International Institute for Energy Conservation (IIEC) in year 2015 in all ASEAN member states, and ADLIGHT project used lessons learned and outputs of the assessment to inform the design of the project.

Also, ADLIGHT project has used lessons learned and experience form UNEP En.lighten initiative that examined the status of the efficient lighting MVE activities and programs in six ASEAN countries including Indonesia.

Planned stakeholder participation

The project document outlines a long list of stakeholders and maps out their contributions and relevant to the project activities/outputs. The prodoc identified stakeholders including partners and companies throughout the lighting value chain, financial institutions, academic institutions and laboratory and research centers who will work together in the three-year project which is co-implemented by UNDP and UNEP with the MEMR as the project executing agency. Notably, the private sector partners have also been identified upfront which is key element of stakeholder's participation in a project like ADLIGHT due to the significant role private sector would play in the EE light value chain.

Gender responsiveness of project design

During the project design, a Gender Analysis and Action Planning were conducted focusing on several areas for consideration in the ADLIGHT project. The main outcomes of the gender analysis concluded that in Indonesia, women face limited access to information in the male-dominated energy industry, which hampers their

participation and contribution to shaping policies. In addition, gender gaps related to access to energy, finances, training, employment, and entrepreneurship require attention in Indonesia.

The project design acknowledges that women and men hold different perceptions regarding what constitutes adequate illumination and the sense of safety it provides on a particular street. Men tend to perceive the illumination as adequate, while women often claim it is not bright enough, for example, increasing the energy efficiency of street lighting provides gender-sensitive results by improving nigh-time safety in cities.

The gender action plan provided specific actions and recommendations to be integrated into the project design and implementation with clear management arrangements specifically suggested for this purpose.

The ADLIGHT project has been rated as GEN 2, which implies that 'gender equality' is not the main objective of the expected output, but the output promotes gender equality in a significant and consistent way.

Social and Environmental Safeguards

UNDP Social and Environmental and Social Screening (SESP) has been delivered during the PPG stage. The SESP of the project provides a clear definition of how the project incorporates overarching principles to enhance Social and Environmental Sustainability. It outlines the integration of a human-rights based approach and gender equality through awareness campaigns, empowering women to participate to ensure equality of opportunity and contributing to more stable job opportunities for the communities.

According to the SESP, the environmental risk (pollution) from the waste/obsolete energy equipment and lamps that may result from replacing inefficient lamps with new EE lights particularly mercury from replaced fluorescent lamps/CFL has been rated as moderate. In response to this, the project's Activity 2.4.5: 'Design, planning and conduct of training on waste management and recycling of components and materials of conventional lighting replaced by LED' has been included to address this issue.

Management arrangements

The ADLIGHT Project was implemented following UNDP's National Implementation Modality (NIM), The main implementing partner of the ADLIGHT Project is the Directorate General of New and Renewable Energy and Energy Conservation (EBTKE) of the Ministry of Energy and Mineral Resources (MEMR).

UNDP, as the Implementing Agency of GEF for Components 1 and 3, manages the funding allocated by GEF to UNDP in relation to components 1 and 3, under the NIM implementing modality and based on its own policies and procedures. UNDP is accountable to the GEF for the implementation of this project. This includes oversight of project execution to ensure that the project is being carried out in accordance with agreed standards and provisions. UNDP is responsible for delivering GEF project cycle management services comprising project approval and start-up, project supervision and oversight, and project completion and evaluation.

Management of the funds allocated by GEF to UNEP in relation to the implementation of Component 2 is the exclusive responsibility of UNEP and is managed by UNEP in accordance with the terms and conditions set out in the Project Cooperation Agreement (PCA) signed between UNEP and the Government of Indonesia.

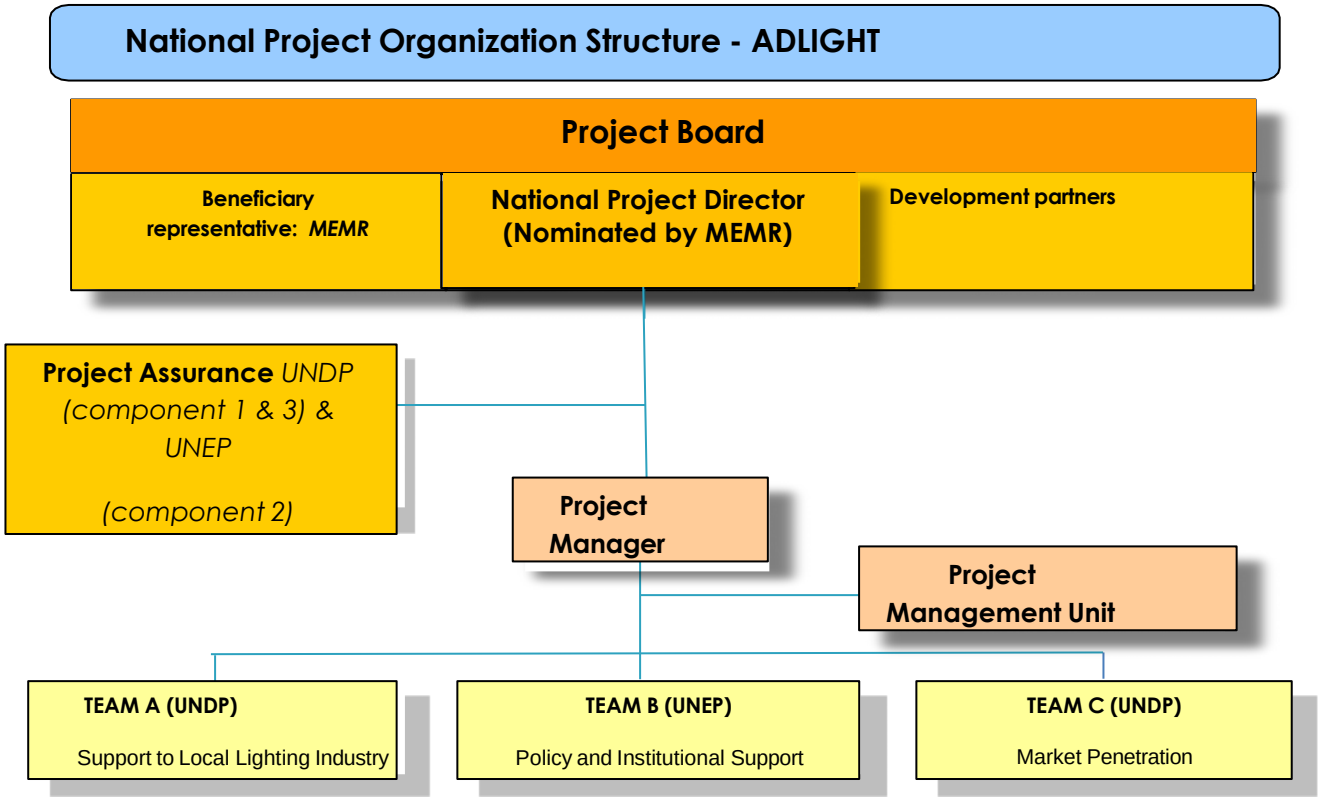
Although designated as a lead agency, UNDP is not held accountable in relation to such funds allocated by GEF to UNEP in relation to Component 2.

The Implementing Partner (Executing Agency) for this project is the Ministry of Energy and Mineral Resource (MEMR) with the Directorate General of New Renewable Energy and Energy Conservation (DG- NREEC), under the same Ministry as the key technical partner. For UNDP, in relation to Components 1 and 3 of the Project, the Implementing Partner is the entity to which the UNDP Administrator has entrusted the implementation of UNDP assistance specified in this signed project document along with the assumption of full responsibility and accountability for the effective use of UNDP resources and the delivery of outputs.

The Implementing Partner is responsible for executing this project including project planning, coordination, management, monitoring, evaluation and reporting, and designating a high-ranking official as the National Project Director who will assume responsibility for the Project on behalf of the National Government.

The Project Board (PB, also called Project Steering Committee) is responsible for making management decisions for the Project including agreeing the annual project work plan, in particular when guidance is required by the Portfolio Manager and where important issues related to adaptive management need to be discussed and agreed. Key members of the PB are the Project Executive is the Director of Energy Conservation (DEC) of DG NREEC, Ministry of Energy and Mineral Resources (MEMR)/DG-NREEC, UNDP, UNEP, and a range of participating stakeholders and line ministries including Ministry of Trade, Ministry of Industry, Ministry of Finance, Ministry of Environment and others.

Figure 2: ADLIGHT project organizational structure[10]



3.2 Project Implementation

Assessment element	Rating
Monitoring & Evaluation (M&E) Design	Satisfactory (S)
Monitoring and Evaluation (M&E) implementation	Moderately Satisfactory (MS)
The overall assessment of the M&E	Moderately Satisfactory (MS)
Quality of UNDP/UNEP Implementation /Oversight	Satisfactory (S)
Quality of Implementing Partner Execution	Satisfactory (S)
Overall project implementation/execution	Satisfactory (S)

Adaptive management

GEF evaluations assess adaptive management in terms of the ability to direct the project design and implementation to adapt to changing political, regulatory, environmental, and other conditions outside of the control of the project implementing teams. The adaptive approach involves exploring alternative ways to navigate the projects towards meeting the planned objectives using one or more of these alternatives.

[10] Source: Project document

Adaptive management is defined as the project's ability to adapt to changes to the project design (project objective, outcomes, or outputs) during implementation resulting from: (a) original objectives that were not sufficiently articulated; (b) exogenous conditions that changed, due to which change was needed; (c) the project's restructuring because the original expectations were overambitious; or (d) the project's restructuring because of a lack of progress.

The extension of the project was a strategic decision to adapt to the various setbacks encountered during its implementation, including the delayed recruitment of the project team, disruptions caused by the COVID-19 pandemic, and slowdowns in the procurement process necessary for acquiring project resources. These challenges collectively impeded the project's progress, necessitating an adjustment to the timeline to ensure the achievement of its objectives. The justification for extending the project timeline was well-founded, considering the unforeseen and external nature of these delays. By granting additional time, the project was provided with a valuable opportunity to recalibrate and refocus its efforts towards meeting the established End of Project targets. This extension was not merely a response to the delays but a proactive measure to ensure that the project could fulfill its intended outcomes despite the hurdles.

The budget allocations for pilots were not enough to achieve the energy savings and subsequently the GHGs targets from only 5 pilots, this shortfall presented a significant challenge in meeting the set targets for energy savings and GHG emissions reductions. As ana adaptive response measure, the project utilised the cost savings that resulted mainly from inability to convene events during COVID 19 restrictions for almost 18 months and reallocated these resources to the piloting budget line to help achieving the targets, and this ended up in increasing the number LED lights purchased and distributed to local authorities. This adjustment not only compensated for the initial budgetary inadequacies but also exemplified adaptive management and resourcefulness in the face of unforeseen challenges.

On other side, the budget savings under component 2 of the ADLIGHT project were reallocated to support MEPS development for washing machines, water dispensers and electric motors, and the substantive amount of funding was allocated for setting up a laboratory for testing the electric motors, this decision was approved by the project board, however, this has taken the project activities beyond the boundaries of EE lighting as stated in the project title, objective and outcome statements. The TE believes that there have been better opportunities to invest these resources within the EE lighting domain, for example by strengthening the market surveillance capacities, supporting compliance to environmental disposal of old lamps, supporting local manufacturers or expanding on the piloting activities, such activities would have helped to retain the focus on achieving EE light outcomes in line with the ADLIGHT project objectives.

Actual stakeholder participation and partnership arrangements

As established in the Project Document, a broad framework for stakeholder analysis was carried out at design. The main partnership arrangements with relevant stakeholders to be involved was established. The perspectives of those who would be affected by project decisions, those who could affect the outcomes, and those who could contribute information or other resources to the process were amply supported to be included in design process.

The Project Documents contains evidence that captures the broad levels of participation that took place at design, including a Logical Framework Analysis (LFA) Workshop conducted in May 22-23, 2017, in Bali, Indonesia during the PPG stage of the ADLIGHT project development.

However, stakeholders' engagement was critical in the ADLIGHT project given that the project has been working across wide spectrum of agencies to cover the policy, legislation, testing, manufacturing, and financing agencies. From design onward the ADLIGHT project has a had a healthy inclusion of some stakeholders and beneficiaries.

The ADLIGHT project has consistently utilized Focus Group Discussions (FGDs) as a key platform for consultation and collaboration. These discussions serve as a vital forum for stakeholders to engage in detailed dialogues about the technical facets of the project. Through these FGDs, participants from various backgrounds and expertise come together to exchange ideas, provide insights, and deliberate on the technical challenges and solutions associated with the project's implementation. This collaborative approach ensures that a wide range of perspectives and technical knowledge are considered, contributing to a more comprehensive and informed decision-making process. The emphasis on maintaining these discussions underlines the project's commitment to transparency, stakeholder engagement, and leveraging collective expertise to achieve its objectives.

However, the engagement of the Ministry of the Environment and Forestry seems to have been limited particularly when it comes to hazardous waste management. Effective engagement of the MoEF would have resulted in early identification of the need to adhere to the waste management legislations in Indonesia and could have positively contributed to this line of actions.

Indicator 3 under outcome 3 is specifically measuring number of stakeholders engaged: municipalities, clients (project developers/ building owners), technology providers, financial institutions. The project reported 40 cities/regencies, 7 building clients, 17 technology providers and 4 financial institutions engaged so far in the project. See details about the engagement outcome in section 3.3.

The project has been effective in coordinating, and building coherent partnership, with relevant organisations such as ministry of trade, ministry of industry, local governments, and private sector including, financing institutions, EE lights manufacturers and ESCOs in Indonesia.

Project Finance and Co-finance

The Project had a total planned project cost of USD $40,990,209. Planned GEF financing was to be USD 3,895,872 spilt between UNDP $2,633,372 for component 1 and 3 and UNEP$1,262,500 for component 2 and planned co-financing of USD $ 37,094,337.

The project reported a total of USD 75,648,104 of secured co-finance by the TE stage, this brings the total project cost to USD $79,648,104 (assuming full consumption of GEF resources). Co-financing has largely come from MEMR contributions through parallel programs and investments in the laboratory settings, and the second largest contribution comes from the private sector, particularly investment by local manufacturers made in meeting the new MEPS. Co-financing has generally been well-documented through official letters from the co-financing agencies.

Table 5: Finance and co-finance table

Co-financing (type/source)	UNDP own financing (mill. US$)		Government (Mill. US$)		Partner Agency (NGOs partners) (Mill. US$)		Private sector (Mill. US$)		Total (Mill. US$)	
	Planned	Actual	Planned	Actual	Planned	Actual	Planned	Actual	Planned	Actual
Grants	0.08[11] 0.06[12]	0.084 00	27.88	59.34			9.06	16.06	40.99	75.64
Loans/Concessions										
• In-kind support				0.15						
• Other										
Total	0.14	0.84	27.88	59.49			9.06	16.06	**40.99**	75.64

As of December 2023, the project reports that 68 percent delivery, leaving quite substantial amount of funding for 2024 of $1.2 million, nearly half of which for component 2 where UNEP has longer timeframe for delivery until October 2024. There will be a risk that there is a high possibility that a large amount of the GEF funding remains unspent by the end of the project for UNDP component, the exact amount to be the returned to the GEF depends on the expenditures in 2024. See table 10 in the efficiency section for details. The budget for 2024 is set at $1.4 million, with $900,000 dedicated to Component 2, overseen by UNEP until October 2024. The remaining $500,000 is allocated to UNDP for activities under Components 1 and 3, including project management costs, with delivery expected by May 2024. Approximately 70% of the UNDP's $500,000 budget is earmarked for the execution of pilot projects under Component 3. These pilots are progressing within the procurement and installation of LED lights, which must comply with government regulations, as this is part of the ADLIGHT Full NIM project. The PMU has been instrumental in expediting this process to ensure the full utilization of the unused GEF funds. UNEP has longer timeframe to utilize the unspent resources (i.e until October 2024), and with a plan to support EE outside the lighting scope, as explained above under 'adaptive management' section. Regarding financial management, the project has gone through a mandated audit twice. The first audit has been delivered by an independent party and found that expenditure statement in accordance with the UNDP accounting policies and in conformity with the approved budget. The second audit is underway at the time of this TE report is drafted.

[11] UNDP contribution

[12] UNEP Contribution

Monitoring & Evaluation: design at entry, implementation, and overall assessment of M&E

Assessment element	Rating
Monitoring & Evaluation (M&E) Design	Satisfactory (S)
Monitoring and Evaluation (M&E) implementation	Moderately Unsatisfactory (MU)
The overall assessment of the M&E	Moderately Satisfactory (MS)

The M&E Framework was described in detail in Section 7 of the Project Document. It comprises standard M&E items for UNDP-GEF project such as the Inception Workshop (IW), meetings of the project board, annual Project Implementation Reviews (PIRs), audit, Mid-Term Review (MTR), Terminal Evaluation (TE), UNDP / GEF Tracking Tools and the final report. Annex B of the prodoc includes a Monitoring Plan that defines data collection process for the defined indicators in the PRF including data collection methods, frequency, means of verification, assumptions and responsibility for data collection, and Annex C covers on the evaluation plan (primarily MTR and TE).

The M&E makes no mention of the exit strategy, although it is not a standard UNDP-GEF requirement, it is however, greatly needed to demonstrate continuity between projects ending and the post project period, especially to formally confirm post project arrangements with MEMR to continue delivering on the EE lighting programme.

Nonetheless, the overall design of M&E framework meets the standard M&E template for projects of this size and complexity. Overall, the evaluator found the M&E design adequate for monitoring the project results and tracking the progress toward achieving the objectives. The M&E design is backed with adequate resources (a total of US$ 205,000 including USD$ 135,000 allocated for monitoring and $ 70,000 for evaluations) and clearly defined roles and responsibilities. **Therefore, the M&E design is rated Satisfactory (S).**

Monitoring and Evaluation (M&E) implementation: The project board was activated in 2021, it met for the first time in March 2021, and since then, it has been regularly held twice per year. In total, the board met 6 times since the launch of the project and has been providing strategic guidance on oversight based on the progress made, and the board approved endorsed the project extension as suggested by the MTR in 2022. The ADLIGHT project board meetings highlight a focused effort on extending the project to further its impact in improving Indonesia's lighting market efficiency. These meetings address critical operational aspects such as financial sustainability, measuring project impacts, and enhancing stakeholder engagement. The decision to extend the project and prepare an annual work plan highlights the commitment to overcoming these challenges and maximizing the project's success.

The project submitted 3 PIRs in total, the first one was in 2021. For some indicators, the PIRs had presented brief details on what has been achieved and the scope of key deliverables and their impacts, other parts of the PIRs were generally fairly detailed to monitor the performance of the project.

Some indicators defined in the PRF have not been monitored properly and have no data directly addressing the indicator needs, which can lead to a gap in understanding of the project's effectiveness and areas for

improvement. In particular, those needed surveys to obtain data were not adequately monitored despite the engagement opportunities during the project implementation that allowed for surveys to take place instantly such as training and business forums. Improving the monitoring of these indicators through surveys is vital for generating accurate and actionable insights that can guide the project towards achieving its desired outcomes. Specifically, indicator the following indicators have not been monitored properly:

- Indicator 1.4: Ratio of women and men who believe they have the capacity to submit (local manufacturers) & approve (banks) investment grade proposal for business transformation plans.
- Indicator 2.4: Ratio of women and men employees in relevant government institutions who believe they have the capacity to monitor verify and enforce high quality efficiency lighting systems.
- Indicator 3.4: Women's and men's level of satisfaction with EEL systems provided (reliability, affordability, convenience, efficiency).

Also, the project had limited monitoring of the environmental risks that may have occurred by replacing lighting in the demonstration pilots, this will have adverse impact on the environmental sustainability of the project.

The inception phase of any project is critical for ensuring the successful future implementation, and usually involves a). an assessment of whether any factors have changed since project development, b). finalization/review of indicators, baseline / target data in PRF if such is needed and the updating / refinement of the original multi-year workplan (plus initial AWP). In case of ADLIGHT, a three-day Inception Workshop took place at the end of August/early September 2020. Its goals were to refamiliarize stakeholders with the objectives, outcomes, and performance metrics of the Project; to establish a shared comprehension among UNDP, UNEP, PMU, and EBTKE concerning each partner's duties and roles; and to pinpoint required revisions to the Project Document.

The project commissioned a Mid-Term Review (MTR) mid 2022, 2 years after the project started (6 months away from the exact mid-point of the project lifecycle), the MTR offered a total of 8 recommendations aiming at achieving corrective actions for the implementation, monitoring and evaluation of the project as well as reinforcing the initial benefits of the project.

In response, the PMU prepared a management response plan articulating how each recommendation will be addressed, but there have been no regular updates on these recommendations documented through regular reporting processes.

The GEF core indicators were carried out during the project development and were updated at the MTR stage and end of the project (Annex 11) as part of this TE.

The evaluator has had access to all the reports presented to date. The format in which the data and information are presented requires careful examination and navigation to extract relevant evidence.

The project monitoring function is critical for the project success and based on shortcomings in M&E implementation in relation to inadequate monitoring of 3 key indicators of the project the **M&E implementation is rated Moderately Unsatisfactory (MU).**

A composite ranking that considers monitoring and evaluation design at entry together with the M & E plan's implementation for the **overall quality of M&E is Moderately *Satisfactory (MS).***

UNDP implementation/oversight (*) and Implementing Partner execution (*), overall project implementation/execution (*), coordination, and operational issues

Assessment element	Rating
Quality of UNDP/UNEP Implementation /Oversight	Satisfactory (S)
Quality of Implementing Partner Execution	Satisfactory (S)
Overall project implementation/execution	Satisfactory (S)

The project has been implemented following UNDP's NIM execution modality. UNDP is the GEF Implementing Agency for the project and as such remains the ultimate responsible party towards the GEF Secretariat and Council with regard to the use of GEF financial resources – and of any cash co-financing passing through UNDP accounts.

UNDP Indonesia has been responsible for the overall supervision and monitoring of the project and has been providing project assurance through the country office and the UNDP-GEF and through active participation in the project board. UNDP has provided direct project services to lead the MTR and TE, but all other procurement and recruitments services have been handled by MEMR as an executing agency for the project.

UNDP CO has been supporting the project with monitoring the financial transactions by the project in terms of delivery, meeting targets and expenditure and ensuring there is no over-expenditure on the project. UNDP has undertaken audit twice and 1 spot check during project implementation. UNDP conducted filed monitoring visit and engaged with the benefactrices on ground facilitated and supported the Project Implementation Reports (PIRs), MTR and TE. UNDP also has deployed a monthly meeting with the project team to track progress and identify issues and help solving them as appropriate.

Similarly, UNEP GEF team and its Task Manager in Bangkok office has been performing monitoring and oversight roles and providing technical backstopping to the PMU when and where necessary. The UNEP facilitated engagement with its global initiative on energy efficiency called United for Efficiency (U4E) which is a global effort supporting developing countries and emerging economies to move their markets to energy efficient appliances and equipment. U4E supported a series of training sessions on round-robin testing, product registration system and, MEPS and Labelling for energy efficient lighting.

Based on this, quality of **UNDP/UNEP implementation/oversight is rated Satisfactory (S)**.

The Implementing Partner for this project is the Ministry of Energy and Mineral Resources (MEMR), particularly the New and Renewable Energy and Energy Conservation (EBTKE) directorate, EBTKE's director has been performing the role of the chair of the Project Board. MEMR has been responsible and accountable for managing this project, including the monitoring and evaluation of project interventions, achieving project outcomes, and for the effective use of UNDP resources.

The full implementation of the NIM modality in the ADLIGHT project meant that the project is totally implemented by MEMR including following the ministry procurement and recruitment procedures. There has been delays in recruitment and procurement processes, mainly recruiting the PMU team which took over 4 months.

A key factor contributing to ownership has been the robust integration of the PMU within the MEMR, fostering a strong sense of ownership within the ministry. The ownership of the Project has been very strong from the start. The NPD (Director of Energy Conservation) has assigned a focal point for each component, in addition to designating a Deputy NPD for the Project, this demonstrates ownership and commitment of the MEMR towards the project and its outcomes.

Based on the above the **quality of Implementing Partner Execution is rated Satisfactory (S).**

A combined rating of **overall project implementation/execution is Satisfactory (S).**

Risk management and Social and Environmental Standards

UNDP's Social and Environmental Standards (SES) screening was carried out at design so that project programming would maximize social and environmental opportunities and benefits. Also, this analysis was carried out for ensuring that adverse social and environmental risks and impacts would be avoided, minimized, mitigated and managed. According to the SESP, the environmental risk (pollution) from the waste/obsolete energy equipment and lamps that may result from replacing inefficient lamps with new EE lights particularly mercury from replaced fluorescent lamps/CFL has been rated as moderate.

In response to this risk, the project's Activity 2.4.5: 'Design, planning and conduct of training on waste management and recycling of components and materials of conventional lighting replaced by LED' has been included to address this issue. In response, the project conducted two training sessions on Management of Electronic Waste and Mercury from Lamps in September and October 2023 targeting different stakeholders in each session. The training aimed at building understanding of the impact of waste generation and hazardous mercury contained in lamps, the result of retrofitting/replacing conventional lamps with LED lamps, and procedures for handling waste lamps from upstream to downstream.

Further to the training, the project has also supported a pilot activity in supporting authorities in Semarang in contracting a specialized company for the safe disposal of old lamps particularly those including mercury in them, however there has been no compliance check on other 21 demonstration projects, and based on the TE engagement process, it is evident that the old lamps are either stored in a repository or reused again in other sites, this environmental risk has not been monitored by the project and will result in impact on the project environmental sustainability – see more details in the sustainability section.

Regarding risk management outside the SESP framework, the project document identified 9 risks that have been monitored throughout the project life cycle. As a standard UNDP requirement, the Project Manager is to monitor risks quarterly and report on the status of risks to the UNDP Country Office. The risks log has been kept up to date through PAR and recorded in ATLAS (and new system so called Quantum). PIRs have limited information on emerging risks and mitigation measures but risks were updated during implementation semi-annually as envisaged the prodoc.

An effective risk management strategy allows the project to identify strengths, weaknesses, opportunities and threats. By planning the right mitigation measures, the project can be ready to respond when needed.

3.3 Project Results

3.3.1 Progress towards objective, expected outcomes and impacts (*)

Assessment element	Rating
Progress towards objective, expected outcomes and impacts	Satisfactory (S)

Overall, ADLIGHT project achieved its overall objective and met the objective-level targets of energy saving and GHGs mitigation, the project has triggered transformation of the national market in Indonesia with evidence of increased penetration of high-quality energy efficient lighting technologies. The combination of EE lights in action through pilots and associated activities to promote the local products of EE lights by the ADLIGHT project has contributed to growing confidence and trust in the locally produced EE lights products as opposed to the imported products. This shift towards local products over imported ones indicates a broader awareness and appreciation for the long-term benefits of energy efficiency and sustainability, as well as a recognition of the quality and reliability of locally manufactured goods.

The ADLIGHT project's introduction of new MEPS and regulatory changes signifies a pivotal move towards EE lighting, with expectations for market demand to grow as standards evolve. However, challenges such as immature financing models and electricity subsidies in Indonesia limit both private and public sector investment enthusiasm and make the replication efforts move at slower pace than anticipated. Local authorities in different regions need to be further motivated for broader adoption.

The ADLIGHT project had limited impact on behavioural shifts towards energy efficiency, particularly in how EE lights are adopted and used, to fully realize the potential benefits of energy efficiency. Behavioural change involves energy-efficient practices into the daily habits of individuals and organizations. While the initial switch to EE lighting represents a critical step forward, maximizing the benefits of energy efficiency requires a sustained commitment to energy-conscious behaviours.

Under Component 1, the ADLIGHT project conducted 2 market surveys to gather data on LED lighting production, sales, and distribution practices within Indonesia in 10 cities in 2022 and 2023 (On average 460 respondent from each city). The surveys provide insights into the LED lighting industry in Indonesia, focusing on production, sales, and distribution data and capture the market condition regarding the needs of the lamp. The surveys highlight challenges and opportunities within the sector, suggesting areas for growth and development. The surveys aim to inform policy and strategy to enhance the industry's competitiveness both domestically and internationally. Based on the survey findings, the project developed EE roadmap with short-, medium- and long-term action plans for promoting EE lights in Indonesia. These plans cover three major objectives environmental protection, increasing local light market share, as well as increasing TKDN and gender equality.

The ADLIGHT project provided technical assistance to seven local LED manufacturers in developing business transformation proposals, the proposals aimed at enhancing the manufacturers capacities to adapt the operations and production lines to better alignment with demand of the EE lights market to ensure they could not only meet but thrive in a market increasingly regulated by MEPS. These proposals have been fully developed following a

thorough process, involving assessments of current manufacturing processes, identification of necessary technological upgrades, workforce training needs, and strategies for supply chain optimization. Upon the completion of these proposals, they were submitted to various financial institutions, however, as of the current status, there has been no final approval from the financial institutions regarding these proposals. This pending state could be attributed to several factors, such as the need for further review of the proposals' feasibility, concerns over financial risks, or the institutions' internal approval processes.

The project held a training event for local LED producers and financial institutions on December 7-8, 2023, in Bandung. It aims to assist local LED manufacturers in developing business proposals and to educate financial institutions on financing schemes and innovative business models for retrofit LED projects, facilitating the transition towards high-efficiency lighting technologies in Indonesia. The training involved local LED producers, representatives from financial institutions, government officials, and other stakeholders in the LED lighting industry. These participants collaborated to understand financing mechanisms, develop business proposals for LED projects, and discuss ways to support the growth of the local LED market through improved access to finance and business development services.

The project convened a number of Energy Efficiency Business Forums to enhance the capacity of local lamp producers by discussing and sharing strategies on financial proposal assessment for energy efficiency, focusing on LED lighting. The forums covered topics like financial technology and human resource preparation for energy efficiency projects, innovative financing by the financial services industry, and best practices in developing the ESCO system. The forums included participation from a wide range of stakeholders, including government officials, industry experts, representatives from financial institutions, ESCOs, and professionals involved in building construction and energy efficiency sectors. These participants came together to share insights, discuss innovative financing and technologies, and explore best practices in the field of energy efficiency for buildings.

The ADLIGHT project convened a series of workshops and exhibitions across the country focused on the promotion and socialization of local LED lighting products through exhibitions and the induction of LED lighting pilot projects in different sites. These events aim at increasing public awareness of energy-efficient LED products made locally, educating consumers on the benefits and selection of efficient LED lighting, and promoting domestic LED brands to enhance their recognition and market share within Indonesia. The exhibition serves as a platform for local manufacturers to showcase their products and connect directly with consumers and industry stakeholders.

Under component 2, the ADLIGHT project developed several decrees aiming to define the MEPS and labeling for EE lights in Indonesia, the MEPS are corner stone element in transforming the local market in Indonesia and set the standards for both local manufacturers as well as imported lights. The MEPS development has been aligned with the ASEAN guidelines and defined LED types, label specifications according to energy saving levels, scheme requirements for MEPS, LED testing requirements, certification policy exceptions, tolerance for discrepancies in LED pick test results. Setting the standard for EE lights in Indonesia has taken into account the capabilities of local manufacturers and the need to balance energy efficiency outcomes without adversely affecting the sustainability of the local manufacturers.

The project also assessed the readiness of the local laboratories for testing the EE lights and defined the testing requirements. The project conduced round robin tests to evaluate testing laboratory proficiency and benchmarking domestic LED lamp products' performance to inform stakeholders, particularly the government, producers, and manufacturers, about testing laboratories' capabilities and the performance of domestic LED lamps for MEPS considerations. The testing was extended to include filed testing of EE lights installed through the demonstration projects to assess the quality of the EE lights within environmental conditions such as humidity and temperature.

The ADLIGHT project conducted local content requirements (TKDN) study to address the issues of the LED industry in Indonesia, in the context of TKDN by setting up the benchmark for EE lights. It aims to enhance investment and advance domestic industries by increasing the use of domestic products. The study emphasizes the need for Indonesia to implement and adhere to local content requirements (TKDN) for the LED industry, to boost the domestic industry, enhance competitiveness, and reduce reliance on imports. The study highlights the importance of strategic government policies, support for local businesses, and investments in technology and innovation to achieve these goals. The study discusses the importance of TKDN certification as a key strategy to support the development of the domestic LED industry in Indonesia. It emphasizes the certification process as crucial for ensuring products meet national standards for local content, which could help foster a competitive local industry, reduce dependence on imports, and promote the use of domestically manufactured components and products in the LED sector.

In terms of capacity building, with support of the U4E, the project trained 72 (76% male) on the components of a Product Registration System for Energy Efficient Lighting and supported a series of training sessions on round-robin testing, product registration system and, MEPS and Labelling for energy efficient lighting imparted to about 175 Indonesian stakeholders during June-October 2021. Furthermore, a technical study tour to Electrical and Electronics Institute, Thailand during November 22-25, 2022, aimed to advance competent laboratories capable of undertaking the testing required to underpin regulations for energy efficiency of lighting products in Indonesia. The participants included photometric testing laboratory staff and relevant administrative, regulatory and compliance staff from five key stakeholder organizations. In addition, each participating laboratory in Indonesia (with current photometric, colorimetric and electrical measurement capability) was requested to undertake measurement of specific artefacts which then accompanied the participant to EEI where they underwent comparison testing. A document on Recommended Test Methods and Required Test Equipment for performance evaluation of energy efficient LED lighting along with cost particulars was duly provided.

The project worked with LKPP to promote the use of energy-saving products through integrating the EE lights into the E- Catalogue and other energy-efficient products, including air conditioners, refrigerators, rice cookers, and fans. This is aimed at enhancing transparency and efficiency in procurement processes while supporting national energy conservation goals. This included establishing a process for businesses to register and include their energy-saving products and services in the Sectoral E- Catalogue. The final MoU between LKPP and MEMR is in the final

signature stage. UNEP's U4E reviewed the e-catalogue design and duly shared technical inputs based on the U4E public procurement guidelines which were incorporated in the final web version.

The ADLIGHT project developed a registration system allow the manufacturers to register their EE products, this will help to manufacturer to define the efficiency standards of their products, which will then be verified by the concerned authorities by lab testing which will facilitate the enforcement of MEPS in case of non-compliance is detected. However, reliance on a registration system alone is insufficient for a comprehensive and effective approach to MVE of EE products. While the registration system serves as a valuable tool for collecting market information on domestic lighting products, it must be complemented by a systematic testing process to ensure proper enforcement based on a well-structured framework with clear roles and responsibilities delineated among stakeholders. Currently, the market surveillance function appears to lack the necessary systems and skills for effective implementation with roles and responsibilities are not totally defined among the supervisory agencies (MoT, BSN, MoI, MoF, MEMR, Polic and Customs), the ADLIGHT project drafted a concept proposal for Technical Guidelines on Supervision of MEPS and Energy Saving Labels for LED Lamps, but these have not yet been agreed among key stakeholders nor finalized and approved. Also, worth noting that while MEMR plays multiple roles in the market surveillance including testing and certification which may pose a conflict of duties.

In terms of lamp waste management. The project delivered training on waste management and recycling of components and materials of conventional lighting, and also supported a pilot activity by engaging a specialized company for the safe disposal of old lamps particularly those including mercury in them. The project also delivered a study for identifying regulations that encompass various stages such as storage, packaging, collection, transportation, treatment, and disposal. However, throughout the pilot phase, pre-existing lighting units were either repurposed in alternative locations or stored in a repository close to the facility. Currently, there are no concrete strategies for the environmentally safe disposal of these old lamps in all sites. This oversight poses a risk of exposing both humans and the environment to hazardous substances contained within the lighting units. It should be noted that this oversight is relevant to both components 2 and 3 (pilot implementation).

Under component 3: ADLIGHT project implemented 22 pilot demonstrations across the country, the scope of these pilots included provision of lighting units, technical assistance, capacity building, audit and facilitate access to financial resources including for replications. Most of the demonstration projects (19 out of 22) have either replicated or are in the process of replicating the EE lights project based on ADLIGHT support. The project has implemented a few demonstration activities through the local government platforms that are coordinating by the central government, however, it is hard to assume the buy in based on a presentation in a meeting for those regions who have not been engaged, but rather it needs more targeted demonstration activities to showcase the benefits and share lessons learned has led to concerns about the project's ability to motivate replication by other institutions, such as regional authorities and hospitals. Without these practical examples, the potential for broader adoption and scaling in other regions of EE lighting solutions across the board remains challenging and expected to take time.

The ADLIGHT project identified a total of four financing schemes to help government organizations secure finance for EE lights in Indonesia: 1) Multi-year budget scheme (self-funding across multiple years), 2) Central Government Loan (still under development), 3) Public Private Partnership (PPP) and 4) ESCO model. The level of adoption by local governments of these models remains primitive despite some promising individual cases where these models have been applied. Despite the huge potential for these models, the adoption of these models faces several challenges mainly the reluctance of the government organizations to engage in untested models with hesitation to take risks. On the other hand, financial institutions have demonstrated limited interest in EE lighting projects in Indonesia mainly due to the fact that these projects are new, untested and skepticism on the scale of financial risks that these projects may involve.

The project developed guidelines for the preparation of unsolicited public-private partnership (PPP) project proposals, specifically focusing on street lighting projects. The guidelines aimed to assist private entities interested in initiating such projects by outlining the necessary steps for proposal submission. This included conducting preliminary studies, technical assessments, financial and social cost-benefit analyses, and risk evaluations. The guidelines serve as a comprehensive manual to guide potential private sector initiators through the regulatory, institutional, and operational frameworks necessary for successful project proposals in the Indonesian context.

These guidelines were backed by other guidelines to help organizations assessing the PPP proposals, the guidelines represent a comprehensive guide for conducting feasibility studies on PPP projects focused on street lighting improvements through the use of energy-efficient LED technology. And outline the technical, economic, commercial, environmental, social, and risk analysis required to assess the viability and benefits of such projects. The aim is to guide stakeholders through the process of evaluating the feasibility, impact, and sustainability of converting traditional street lighting systems to LED, aligning with broader goals of energy conservation and emission reduction.

Project Objective: To increase the penetration of high quality energy efficient lighting technologies in Indonesia through the transformation of the national market, thereby reducing electricity demand and the related greenhouse gas (GHG) emissions.

Indicator Obj1: Cumulative electricity savings by EOP[13], GWh. Baseline: 0. EOP target: 77.45 GWh (278,820,000 MJ).

Indicator obj 2: Direct project GHG emissions mitigated by EOP[14], kt CO2 (GEF Core Indicator 6.2). Baseline: 0. EoP target: 62.58 kt CO2 (direct by EOP) and 548.77 kt CO2 (Lifetime direct by EOP).

The project reported the following:

[13] Calculated as the difference between the business-as-usual energy consumption on lighting and the actual electricity consumption

[14] Calculated from the cumulative electricity savings multiplied by the applicable emission factor for the year.

Table 6: Energy saving and greenhouse gas emissions indicators.

	Energy saving until May 2024 (GWh)	GHG emissions mitigated until May 2024 (kt CO2)	GHG emissions mitigated for lifetime (kt CO2)
EOP target	77.45	62.58	548.77
Achieved	74.33	75.16	618.65
Percentage delivery	96%	120%	112%

The planned pilot demonstrations are still being undertaken in some sites where installations are still ongoing. Accordingly, direct project GHG emissions mitigated is 75.16 kt CO2.

The GHGs calculation method reported by the project through the PIRs has been challenged by number of factors that may affect the accuracy of the data, including:

- The calculation methodology assumes the safe disposal of old lamps following the installation of new EE lights. However, this assumption has not uniformly applied across all pilot projects. In instances where old lamps were deemed to be in good condition, they were repurposed, despite containing hazardous materials. Consequently, the anticipated energy savings and reductions in GHG emissions from the replacement have not been fully realized. This reuse of old lighting, without addressing the potential risks and inefficiencies, undermines the environmental benefits expected from transitioning to energy-efficient lighting solutions. It is also likely that future replacements will also follow the same approach, which implies a slower transition to EE lights.
- The project management accounted for
    - EE lights that have been provided by the project through the demonstration sites including the ones that have not been fully installed (accounted for the lifetime).
    - Committed replication projects that have not yet been implemented on the ground including where the project provided technical assistance.
- The TE team worked with the ADLIGHT PMU to generate the below table with breakdown of savings and GHGs per pilot and replication project.

Table 7: Breakdown of energy savings and GHGs per pilot

Pilot	Status	Timeframe (when it started operation)	Energy saving until May 2024 (GWh)	GHG emissions mitigated until May 2024 (Ton CO2)	GHG emissions mitigated for lifetime. (Ton CO2)
1. Regency of West Lombok	Completed	2022	17.54	28325.24	113300.96
2. City of Palu	Completed	2023	21.08	12468.00	112212.00
3. City of Banjarmasin,	Completed	2023	6.56	8400.74	75606.66
4. The regency of Wonosobo	Completed	2023	0.62	541.40	4872.60
5. The regency of Banyuwangi	Completed	2022	1.72	2970.78	11883.12
6. The Regency of Donggala	Completed	2023	2.72	2124.79	19123.11

7. Regency of Blitar	Completed	2023	4.01	184.48	1660.32
8. Regency of Dharmasraya	Completed	2023	2.95	2151.00	19359.00
9. City of Bandung	Underway	2024	0.00	0.00	532,402.8
10. Regency of Klaten	Completed	2023	2.11	6263.61	56372.49
11. Regency of Sigi	Completed	2023	14.86	11593.33	104339.97
12. City of Sungai Penuh	Completed	2024	0.00	0.00	12336.80
13. City of Jambi	Completed	2024	0.00	0.00	19240.50
14. Regency of Sumedang	Completed	2024	0.00	0.00	32490.00
15. Regency of Garut	Underway	2024	0.00	0.00	9,190
16. Regency of Sumba Barat Daya	Underway	2024	0.00	0.00	600.00
17. Regency of Lombok Tengah	Underway	2024	0.00	0.00	14367.30
18. Regency of Toba	Underway	2024	0.00	0.00	8465.90
19. Regency of Karo	Underway	2024	0.00	0.00	11460.50
20. Cepu	Completed	2022	0.06	45.78	183.12
21. Government Building of Municipal Secretary in Central Java Province	Completed	2023	0.06	49.33	443.97
22. Hospital of dr. Soeradji Tirtonegoro Klaten	Completed	2023	0.04	36.89	332.01
Total			**74.33**	**75,155.37**	**618,650.33**
				75.16 kt	**618.65 kt**

Indicator obj 3: Number of women and men participating in capacity building trainings throughout the project (GEF Core Indicator 11). Baseline: NA. EoP Target: 60/140.

Achieved: 103 women and 149 men.

The reported numbers represent the number of people participating in various Focus Group Discussions (FGDs) or training workshop. Below is a list of training workshops organized by the ADLIGHT project.

- Formulation of testing procedures for indoor LED and Round Robin Test, 3-4 Feb 2021
- Procedures for streetlighting test, 29 March 2021
- Training on Local Content Calculation, 30 March 2021
- Preliminary training on fundamentals of Photometry and, Lighting standards and uncertainties in measurement on 3rd and 15th November 2022, with the support from U4E.
- International Technical tour for training laboratory personnel and policy makers for LED testing at Electrical and Electronic Institute (EEI), Bangkok Thailand, 22-25 November 2022.

- Energy conservation from lighting system, with University of Multimedia Nusantara, 1 Dec 2020
- Energy conservation from lighting system, with University of Andalas, 15 Dec 2020
- Role of women in conserving energy from lighting, with Koalisi Perempuan Indonesia, 16 Feb 2021
- Women entrepreneurs and energy conservation, 22 April 2021

Outcome 1: Improved quality, energy efficient and affordable locally produced EEL products and systems

Indictaor 1.1: Efficiency of locally produced lighting systems increased, (lm/W) and Production cost decreased from baseline level (%). Baseline: Indoor type: Eff: 70 lm/W, supply chain cost: 100%. Outdoor type: Eff: 100 lm/W, supply chain cost: 100%. EoP targets: Indoor type: Eff: 150 lm/W, supply chain cost: 70% of the baseline. Outdoor type: Eff: 170 lm/W, supply chain cost: 70% of the baseline.

Partially achieved.

- Indoor type Efficacy: Bulb = 80 lm/Watt, Tube = 100 lm/Watt.
- Outdoor type: Eff: 120 lm/Watt
- There is no reduction in supply chain cost.

As per the discussions during the Project Board Meeting held on August 11, 2022, there was a proposal to align the End of Project (EoP) target for the efficiency of locally produced lighting systems with the efficacy outlined in the Ministerial Decree of Energy and Mineral Resources 135.K/EK.07/DJE/2022, specifically addressing Minimum Energy Performance Standards (MEPS) and Labelling. In accordance with the provisions of that Ministerial Decree and in line with ASEAN harmonized MEPS, the updated EoP target for the efficiency level of lighting systems is defined as follows: for indoor Eff: 80 lm/W (bulb); Eff: 100 lm/W (tube); and for outdoor Eff: 120 lm/W.

Setting the standard for lumen per watt has taken into account the capabilities of local manufacturers and the need to balance energy efficiency outcomes without adversely affecting the sustainability of the local manufacturers.

Data from the testing of the local LED products in Component 2 indicates output indicators are partially achieved and expected to be fully achieved by the end of 2022.

Indicator 1.2: Cumulative number of lighting manufacturers who received technical assistance to upgrade production facilities. Baseline 0: EoP target: 6.

Achieved: 10.

Manufacturers that received technical assistance participated in upgrading their production facilities through a series of Focus Group Discussions (FDGs) focused on business transformation, as well as 1:1 specific support by recruited consultants to guide them through the business transformation including linkages with local banks for funding to be able to meet the requirements of the MEPS. Further, the manufacturers have been provided with technical training on developing and submitting proposals for the local banks.

This effort encompassed both the local LED lamps industry.

The 10 assisted LED manufacturers are:

1. PT. Honoris Industry

2. CV. Sentosa Electric
3. PT. Kingled Indonesia
4. PT. Sinar Angkasa Rungkut
5. PT. Cipta Sinergi Asia
6. PT. Jaya Eco Energi
7. PT. Kreasi Mustika
8. PT. Makarim Berjaya
9. PT. Santini Energilestari Indonesia
10. PT. Solarens Ledindo

Indicator 1.3: Investment grade proposal for business transformation plans: (disaggregated by 'submitted by manufacturers and approved by banks). Baseline: Submitted by manufacturers 0, Approved by banks 0, EoP target: Submitted by manufacturers 6 and approved by banks 6.

Achieved: 0 finally approved out of the 7 supported.

The project recruited consultants to assist the targeted manufacturers with a one-on-one approach to expedite the business proposal development. In total 7 proposals have been drafted and submitted to banks and so far, none have been approved for funding, and yet proposals are still going through the process for meeting the audit requirement by the banks. Based on the feedback, banks have demonstrated limited appetite to engage in EE projects due to the fact these are relatively new projects for them and they are still in process of assessing the associated risks. This indicates the need to work more closely with local banks to ensure their support and to demonstrate the cost effectiveness of EE light projects.

Indicator 1.4: Ratio of women and men who believe they have the capacity to submit (local manufacturers) & approve (banks) investment grade proposal for business transformation plans, Baseline: 0. EoP target: 30/70.

Achieved: No data available on women and men reporting capacity to submit proposals, but the ADLIGHT project delivered a training on proposal writing and banks appraisal process. A total of 89 ppl trained, of which 31 women.

Outcome 2: Improved conditions for fair market competition of EE lighting products informed by robust policy and institutional framework.

Indicator 2.1: No. of policy documents at the national level, including Standard Minimum Quality and MEPS on LED and other relevant guidelines developed and approved. Baseline: 0. EoP target: 3.

Achieved: 7.

There are 7 Ministerial Decrees that have already been issued, consisting of one Ministerial Decree on MEPS and labelling for LED lamps and 6 other related rules derived from product certification bodies and testing laboratories as follows:

Table 8: list of all decrees developed by the ADLIGHT project and endorsed by Government.

Decree	Scope
1. Ministerial Decree of MEMR No. 135.K/EK.07/DJE/2022 about MEPS and labelling LED lamps,	1) Minimum Energy Performance Standards (MEPS) and energy saving labelling for light-emitting diode (LED) Swabalast, LED Tube Sabalast, and LED Luminer 2) MEPS and labelling include: LED types, label specifications according to energy saving levels, scheme requirements for MEPS, LED testing requirements, certification policy exceptions, tolerance for discrepancies in LED pick test results 3) Obligation to implement MEPS for domestic producers and importers through the inclusion of the MEPS mark or label. 4) Obligation to report the implementation of MEPS and energy saving labels every three months to the Director General of New Energy, Renewables and Energy Conservation (Ditjen EBTKE) 5) LEDs that have been produced and are in circulation are not required to comply with MEPS regulations. 6) MEPS implementation takes effect 12 months after the ministerial decree is made
2. Ministerial Decree of MEMR about LSPro No: 4.K/EK.07/DJE/2023,	1) Appoint the unaccredited Product Certification Body (LSPro) from the Accreditation Committee in the context of implementing minimum energy performance standards and labeling energy-saving signs for energy-using equipment LED Luminer 2) LSPro is tasked with issuing Energy Saving Certificates for LED Luminaire Energy Saving Appliances submitted by domestic manufacturers or importers. 3) LSPro is valid for a period of 2 years. 4) LSPro shall update the performance accreditation and be accredited for LED Luminaire Energy Saving Equipment by the National Accreditation Committee within a maximum period of 2 years from the issuance of the Ministerial Decree. 5) LSPro must report the results of updating performance accreditation in the form of an accreditation certificate in accordance with SNI IEC/PAS 62717: 2015 LED for public lighting - performance requirements or amendments and CIE S 025/E: 2015 Test methods for LED lamps, LED Luminaires, and LED Modules or amendments to subsequently be appointed as an accredited LSPro by the National Accreditation Committee. 6) Supervision by the Directorate General of New, Renewable Energy and Energy Conservation periodically or at any time related to the implementation of testing according to MEPS and Inclusion of Energy Saving Label for LED to LSPro 7) LSPro shall submit the issued energy saving certificate to the Minister of Energy and Mineral Resources c.q. Director General of New Renewable Energy and Energy Conservation c.q. Director of Energy Conservation by 5 working days since it is issued.
3. Ministerial Decree of MEMR about LSPro No: 9.K/EK.07/ DJE/2023,	1) Appoint the accredited and unaccredited Product Certification Body (LSPro) from the Accreditation Committee in the context of implementing minimum energy performance standards and labelling energy-saving signs for energy-using equipment LED Swaballast 2) LSPro is tasked with issuing Energy Saving Certificates for LED Swaballast Energy Saving Appliances submitted by domestic manufacturers or importers. 3) Appointed accredited LSPro is valid for 4 years and can be extended. 4) Appointed unaccredited LSPro is valid for 2 years. 5) LSPro shall update the performance accreditation and be accredited for LED Swaballast Energy Saving Equipment by the National Accreditation Committee within a maximum period of 2 years from the issuance of the Ministerial Decree. 6) LSPro must report the results of updating performance accreditation in the form of an accreditation certificate in accordance with SNI IEC 62612:2016 LED Swaballast for public lighting

	with >50V supply - performance requirements or amendments to subsequently be appointed as an accredited LSPro by the National Accreditation Committee. 7) Supervision by the Directorate General of New, Renewable Energy and Energy Conservation periodically or at any time related to the implementation of testing according to MEPS and Inclusion of Energy Saving Label for LED to LSPro 8) LSPro shall submit the issued energy saving certificate to the Minister of Energy and Mineral Resources c.q. Director General of New Renewable Energy and Energy Conservation c.q. Director of Energy Conservation by 5 working days since it is issued.
4. Ministerial Decree of MEMR about LSPro No: 10.K/EK.07/DJE/2023	1) Appoint the accredited and unaccredited Product Certification Body (LSPro) from the Accreditation Committee in the context of implementing minimum energy performance standards and labeling energy-saving signs for energy-using equipment LED Tube Swaballast 2) LSPro is tasked with issuing Energy Saving Certificates for LED Tube Swaballast Energy Saving Appliances submitted by domestic manufacturers or importers. 3) Appointed accredited LSPro is valid for 4 years and can be extended. 4) Appointed unaccredited LSPro is valid for 2 years. 5) LSPro shall update the performance accreditation and be accredited for LED Tube Swaballast Energy Saving Equipment by the National Accreditation Committee within a maximum period of 2 years from the issuance of the Ministerial Decree. 6) LSPro must report the results of updating performance accreditation in the form of an accreditation certificate in accordance with SNI IEC 62612:2016 LED Swaballast for public lighting with >50V supply - performance requirements or amendments to subsequently be appointed as an accredited LSPro by the National Accreditation Committee. 7) Supervision by the Directorate General of New, Renewable Energy and Energy Conservation periodically or at any time related to the implementation of testing according to MEPS and Inclusion of Energy Saving Label for LED Tube Swaballast to LSPro 8) LSPro shall submit the issued energy saving certificate to the Minister of Energy and Mineral Resources c.q. Director General of New Renewable Energy and Energy Conservation c.q. Director of Energy Conservation by 5 working days since it is issued.
5. Ministerial Decree of MEMR about Testing Laboratory No: 5.K/EK.07/DJE/2023,	1) Appoint the accredited and unaccredited Testing Lab from the Accreditation Committee in the context of implementing minimum energy performance standards and labeling energy-saving signs for energy-using equipment LED Swaballast 2) Testing Lab is tasked with conducting performance testing of LED Swaballast Lamps based on SNI IEC 62612:2016 LED Swaballast Lamps for public lighting services with supply voltage >50 V - Performance requirements or their amendments, which are submitted by LSPro in the context of MEPS implementation. 3) Appointed accredited Testing Lab is valid for 4 years and can be extended. 4) Appointed unaccredited Testing Lab is valid for 2 years. 5) Testing Lab shall update the performance accreditation and be accredited for LED Swaballast Energy Saving Equipment by the National Accreditation Committee within a maximum period of 2 years from the issuance of the Ministerial Decree. 6) Testing Lab must report the results of updating performance accreditation in the form of an accreditation certificate in accordance with SNI IEC 62612:2016 LED Swaballast Lamps for public lighting services with supply voltage >50 V - Performance requirements or their amendments to subsequently be appointed as an accredited Testing Lab by the National Accreditation Committee. 7) Supervision by the Directorate General of New, Renewable Energy and Energy Conservation periodically or at any time related to the implementation of testing according to MEPS and Inclusion of Energy Saving Label for LED Swaballast to Testing Lab

	8) Testing Lab shall submit the issued performance test report to the Minister of Energy and Mineral Resources c.q. Director General of New Renewable Energy and Energy Conservation c.q. Director of Energy Conservation by 5 working days since it is issued.
6. Ministerial Decree of MEMR about Testing Laboratory No: 6.K/EK.07/ DJE/2023,	1) Appoint the accredited and unaccredited Testing Lab from the Accreditation Committee in the context of implementing minimum energy performance standards and labeling energy-saving signs for energy-using equipment LED Tube Swaballast 2) Testing Lab is tasked with conducting performance testing of LED Tube Swaballast Lamps based on SNI IEC 62612:2016 LED Swaballast Lamps for public lighting services with supply voltage >50 V - Performance requirements or their amendments, which are submitted by LSPro in the context of MEPS implementation. 3) Appointed accredited Testing Lab is valid for 4 years and can be extended. 4) Appointed unaccredited Testing Lab is valid for 2 years. 5) Testing Lab shall update the performance accreditation and be accredited for LED Tube Swaballast Energy Saving Equipment by the National Accreditation Committee within a maximum period of 2 years from the issuance of the Ministerial Decree. 6) Testing Lab must report the results of updating performance accreditation in the form of an accreditation certificate in accordance with SNI IEC 62612:2016 LED Swaballast Lamps for public lighting services with supply voltage >50 V - Performance requirements or their amendments to subsequently be appointed as an accredited Testing Lab by the National Accreditation Committee. 7) Supervision by the Directorate General of New, Renewable Energy and Energy Conservation periodically or at any time related to the implementation of testing according to MEPS and Inclusion of Energy Saving Label for LED Tube Swaballast to Testing Lab 8) Testing Lab shall submit the issued performance test report to the Minister of Energy and Mineral Resources c.q. Director General of New Renewable Energy and Energy Conservation c.q. Director of Energy Conservation by 5 working days since it is issued.
7. Ministerial Decree of MEMR about Testing Laboratory No: 7.K/EK.07/DJE/2023.	1) Appoint the unaccredited Testing Lab from the Accreditation Committee in the context of implementing minimum energy performance standards and labeling energy-saving signs for energy-using equipment LED Luminer 2) Testing Lab is tasked with conducting performance testing of LED Luminer Lamps based on SNI IEC/PAS 62717: 2015 LED for public lighting - performance requirements or amendments and CIE S 025/E: 2015 Test methods for LED lamps, LED Luminaires, and LED Modules or amendments, which are submitted by LSPro in the context of MEPS implementation. 3) Appointed Testing Lab is valid for 2 years. 4) Testing Lab shall update the performance accreditation and be accredited for LED Luminer Energy Saving Equipment by the National Accreditation Committee within a maximum period of 2 years from the issuance of the Ministerial Decree. 5) Testing Lab must report the results of updating performance accreditation in the form of an accreditation certificate in accordance with SNI IEC/PAS 62717: 2015 LED for public lighting - performance requirements or amendments and CIE S 025/E: 2015 Test methods for LED lamps, LED Luminaires, and LED Modules or amendments to subsequently be appointed as an accredited Testing Lab by the National Accreditation Committee. 6) Supervision by the Directorate General of New, Renewable Energy and Energy Conservation periodically or at any time related to the implementation of testing according to MEPS and Inclusion of Energy Saving Label for LED Luminer to Testing Lab

	7) Testing Lab shall submit the issued performance test report to the Minister of Energy and Mineral Resources c.q. Director General of New Renewable Energy and Energy Conservation c.q. Director of Energy Conservation by 5 working days since it is issued.

Indicator 2.2: No. of policy and guideline on LED procurement developed and implemented in E-catalogue and regular public procurement system. Baseline: 0. EoP target: 2.

Achieved: 2.

1. Decree of the Deputy of Strategy and Policy Development of LKPP Number 1 of 2023
2. Procurement Showcase through the MEMR Sectoral E-catalogue for energy-efficient products (on-going)

Table 9: Key policy on LED procurement

Decree	Scope
1. Decree of the Deputy of Strategy and Policy Development of LKPP Number 1 of 2023	Model selection document for sustainable public procurement of Light-Emitting Diode (LED) lamps that apply MEPS and Energy Saving Label
2. Procurement Showcase through the MEMR Sectoral E-catalogue for energy-efficient products (on-going	MoU with MEMR and head of LKPP to integrate the EE equipment including lighting into the e-catalogue. Address policy follow-up through MEPS/Label with: 1) Developing the MEMR sectoral e-catalogue system for energy-efficient product showcases. 2) Prepare product showcases needed to create a market for accessible products especially for government institutions that use the APBN/D budget. 3) Setting up an integrated system to assist goods providers and product users.

The Guidelines for Application Integration (PIA) document was created with the following objectives:

- To facilitate each party related to the system to do integration.
- As a guideline for sending transaction data in real-time
- Reducing the potential for human-error due to manual data entry or double data entry
- Faster, more precise and accurate data presentation

Indicator 2.3: No. of comprehensive MVE Guideline and required implementing rules and regulations for including resolving custom dispute and legality of products developed and implemented. Baseline: 0. EoP target:1.

Achieved:0

The annexes of the developed MEPS include bases information about the MVE but there is no specific guidelines that have been developed to articulate the roles and responsibilities among stakeholders. The guidelines are particularly needed in case of Indonesia for ensuring that energy savings and efficiency improvements are

accurately assessed, reported, and verified. The MVE Guidelines provide a framework to ensure that the MEPS standards are not just recommendations but are actively followed and enforced. MVE Guidelines help push the market towards more energy-efficient products by gradually raising the bar for what constitutes minimum energy performance.

The ADLIGHT project developed a registration system allow the manufacturers to register their EE products, this will help to manufacturer to define the efficiency standards of their products, which will then be verified by the concerned authorities by lab testing which will facilitate the enforcement of MEPS in case of non-compliance is detected. However, reliance on a registration system alone is insufficient for a comprehensive and effective approach to MVE of EE products.

Indicator 2.4: Ratio of women and men employees in relevant government institutions who believe they have the capacity to monitor verify and enforce high quality efficiency lighting systems. Baseline: 0. EoP target: 30/70.

No quantitative data available to report on the ratio, however, the ADLIGHT project considers the FGD as a mean for capacity building and engagement, through the FGD, the ADLIGHT PMU believes that the MVE capacities have improved but cannot be quantified in response to this indicator. Nonetheless, it is evident through the TE engagement process that MVE capacity is a residual barrier that has not been adequately addressed by the ADLIGHT project – as explained above.

The PMU also noted that a Gender training has been conducted to the Ministry of Energy and Mineral Resources.

Outcome 3: Component/ Outcome 3: Increased market penetration of high quality and efficient lighting

Indicator 3.1: Cumulative no. of innovative financial support schemes developed to accelerate penetration of EE lighting systems. Baseline: 0. EoP target: 4.

Achieved: 4.

Four (4) schemes have been identified and implemented in the selected pilot demonstrations.

- A multi-year'' budgeting scheme
- Central government loan, and
- Public Private Partnership (PPP)
- ESCO financing model.

The level of adoption by local governments of these models remains primitive despite some promising individual cases where these models have been applied. Despite the huge potential for these models, the adoption of these models faces several challenges mainly the reluctance of the government organizations to engage in untested models with hesitation to take risks. On the other hand, financial institutions have demonstrated limited interest in EE lighting projects in Indonesia mainly due to the fact that these projects are new, untested and skepticism on the scale of financial risks that these projects may involve.

Indicator 3.2: Cumulative no. of pilot demonstrations completed and replication plans developed and approved for implementation. Baseline: 0. EoP target: 5.

Achieved: 22 demonstrations of which 19 have either completed or initiated their replication projects.

15 out of the 22 pilots are completed and 7 are underway at the time of writing the evaluation report.

The project target has been exceeded in terms of the number of demonstrations. There has been a total of 22 demonstration pilots of which 19 have either completed or initiated their replication projects. See table 8 below.

The pilot demonstrations involved granting unit bulbs and street lighting units for different site, technical assistance for replications through the developed financial models and capacity building through training of staff on energy efficiency and regular engagement through the pilot demonstration process.

Importantly, the pilots have been demonstrated to other districts through the platforms specialized for local government engagements managed by the central government. This is expected to generate more momentum towards the broader adoption of EE lights across the board in Indonesia.

Table 10: list of pilot demonstrations implemented by the ADLIGHT project.

Pilot	Scope	Status
1. Regency of West Lombok	- Pilot Demonstration of 12,915-unit streetlighting - Streetlighting Grant of 552 unit - Technical Assistance for PPP Scheme of 12,915-unit streetlighting - Capacity Building for Training & Certification 5 staffs - Pilot Demonstration of 14 Desa Wisata - Grant of 3,500-unit bulb	Completed
2. City of Palu	- Pilot Demonstration of 12,468-unit streetlighting - Technical Assistance for Multi Years Contract scheme - Baseline measurement assistance - Capacity Building for Training & Certification 2 staffs	Completed
3. City of Banjarmasin,	- Pilot Demonstration of 33,631-unit streetlighting - Streetlighting Grant of 316 unit - Technical Assistance for Baseline measurement assistance of 33,631-unit streetlighting - Capacity Building for Training & Certification 1 staffs	Completed
4. The regency of Wonosobo	- Pilot Demonstration of 2,736-unit streetlighting - Streetlighting Grant of 283 unit - Technical Assistance for Baseline measurement assistance of 2,736-unit streetlighting - Capacity Building for Training & Certification 6 staffs	Completed
5. The regency of Banyuwangi	- Pilot Demonstration of 8,027-unit streetlighting - Hibah Smart System 100 unit - Capacity Building for Training & Certification 2 staffs	Completed
6. The Regency of Donggala	- Pilot Demonstration of 891-unit streetlighting - Streetlighting Grant of 160 unit - Capacity Building for Training & Certification 1 staffs	Completed

7. Regency of Blitar	- Pilot Demonstration of 5,140-unit streetlighting - Streetlighting Grant of 140 unit - Capacity Building for Training & Certification 1 staffs	Completed
8. Regency of Dharmasraya	- Demonstration of 4,500-unit streetlighting - Technical Assistance for PPP Scheme of 4,500-unit streetlighting	Completed
9. City of Bandung	- Pilot Demonstration of streetlighting - Streetlighting Grant of 100 unit - Capacity Building for Training & Certification 3 staffs	Underway
10. Regency of Klaten	- Pilot Demonstration of streetlighting - Streetlighting Grant of 140 unit - Capacity Building for Training & Certification 1 staffs	Completed
11. Regency of Sigi	- Pilot Demonstration of 4,815-unit streetlighting - Streetlighting Grant of 140 unit - Capacity Building for Training & Certification 1 staffs	Completed
12. City of Sungai Penuh	- Pilot Demonstration streetlighting - Streetlighting Grant of 100 unit - Capacity Building for Training & Certification 1 staffs	Completed
13. City of Jambi	- Pilot Demonstration streetlighting - Streetlighting Grant of 126 unit - Capacity Building for Training & Certification 1 staffs	Completed
14. Regency of Sumedang	- Pilot Demonstration streetlighting - Streetlighting Grant of 100 unit	Completed
15. Regency of Garut	- Pilot Demonstration streetlighting - Streetlighting Grant of 125 unit - Capacity Building for Training & Certification 1 staffs	Underway
16. Regency of Sumba Barat Daya	- Pilot Demonstration 132 streetlighting - Streetlighting Grant of 132 unit - Capacity Building for Training & Certification 1 staffs	Underway
17. Regency of Lombok Tengah	- Pilot Demonstration streetlighting collaborate with Kemenkomarves - Streetlighting Grant of 100 unit	Underway
18. Regency of Toba	- Pilot Demonstration streetlighting collaborate with Kemenkomarves - Streetlighting Grant of 100 unit	Underway
19. Regency of Karo	- Pilot Demonstration streetlighting collaborate with Kemenkomarves - Streetlighting Grant of 100 unit	Underway
20. Cepu	Grant of 60 Unit streetlighting	Completed
21. Government Building of Municipal Secretary in Central Java Province	Grant of 1,829 Unit streetlighting Capacity Building for Training & Certification of Energy Auditors 10 staffs	Completed
22. Hospital of dr. Soeradji Tirtonegoro Klaten	Grant of 546 Unit streetlighting Capacity Building for Training & Certification of Energy Manager 2 staffs	Completed

Indicator 3.3: Number of stakeholders engaged: municipalities, clients (project developers/ building owners), technology providers, financial institutions. Baseline: 0. EoP target: municipalities 4. clients (project developers/ building owners) 6. Technology providers 5, and financial institutions 2.

Achieved: 40, 7, 17 and 4 respectively.

ADLIGHT is a multi-stakeholders project that has been engaging with large number of national and local governments as well private sector including local banks and manufacturers. The ADLIGHT project has consistently utilized Focus Group Discussions (FGDs) as a key platform for consultation and collaboration. These discussions serve as a vital forum for stakeholders to engage in detailed dialogues about the technical facets of the project. Through these FGDs, participants from various backgrounds and expertise come together to exchange ideas, provide insights, and deliberate on the technical challenges and solutions associated with the project's implementation.

Table 11: ADLIGHT engagement mapping

Category	Engaged stakeholders	Engagement method	Engagement outcomes
Cities/Regencies	40 (Madiun, Banda Aceh, Solo, Sijunjung, Bogor, Bangka Tengah, Banjarmasin, Wonosobo, Pekalongan, Bontang, Blitar, Klaten, Dharmasraya, Banyuwangi, Bandung, Surabaya, Mojokerto, BPTD 11, Pangkajene, Pangkep, Madiun, Mataram, Gianyar, Denpasar, Klungkung, Badung, Bangli, Buleleng, Jemberana, Karang Asem, Tabanan, Lombok Barat, Musi Rawas, Palu, Donggala, Lubuklinggau, Sleman, Medan, Lombok Tengah, and Lombok Utara).	1. Direct engagement, regular calls and meetings, coordination to select Streetlighting Pilot Projects candidates. 2. Assessment of project feasibility based on potential and data responsiveness 3. Determining the location of the pilot project that will collaborate is processed with an MoU document and Cooperation Application Letter and other accompanying documents	1. Availability of pilot project location feasibility data 2. Connections are established, and information is obtained 3. Implementation of Financing Schemes Activity and Pilot Project Demonstration

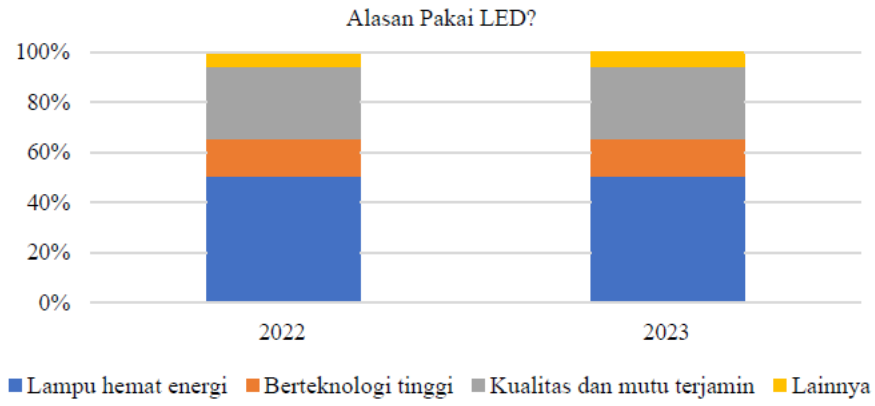
Building Clients	7 (BRI, BCA, Danamon, MEMR units, Ministry of Finance units, Ministry of Industry, Setda Jateng, RSUP Klaten)	1. 1. Direct engagement, regular calls and meetings, coordination to select Commercial & Government Building Pilot Projects candidates. 2. Assessment of project feasibility based on potential and data responsiveness 3. Determining the location of the pilot project that will collaborate is processed with an MoU document and Cooperation Application Letter and other accompanying documents	1. Availability of pilot project location feasibility data 2. Connections are established, and information is obtained 3. Implementation of Financing Schemes and Pilot Project Demonstration
Technology providers	17 of local providers under 2 associations (ALINDO and APERLINDO) and small medium enterprise have been selected for the streetlighting pilot demonstrations in West Lombok Regency.	Regular call & Procurement	Procurement from technology providers
Financial institutions	4 (Bank BRI, BSI, BJB, UOB).	Regular call, cooperation & involvement both in pilot project and exhibition event	involvement in Multiyear Contract (Palu - BRI), ESCO Plan (Bidakara - UOB), PPP (Dharmasraya - Nagari)

Indicator 3.4: Women's and men's level of satisfaction with EEL systems provided (reliability, affordability, convenience, efficiency). Baseline: NA. EoP target: At least 70 % of women and men beneficiaries are highly satisfied with the EEL systems provided (minimum score 7/10).

No quantitative data available can be reported. However, the data collected by the market survey of high efficiency lighting in Indonesia in 2022 and 2023[15] present insights on the level of uptake of EE lights by households.

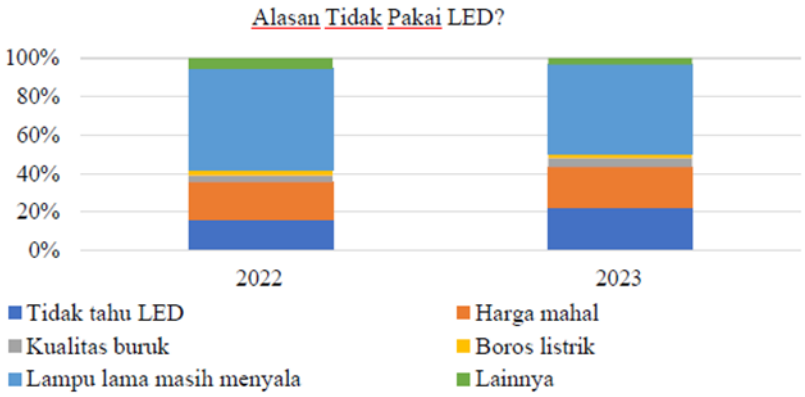
According to the survey results, in response to a question about the reasons for using LED, the main reason for using LED lights because of the awareness of LED lamps is energy-saving lamps (49% of the total respondents in both years 2022 and 2023). Followed by reasons related to quality being guaranteed.

Figure 3: Reasons for using LED.



On the other side, figure 4 shows the reasons households don't use LED lights. Common reasons for still using non-LED lamps are that old lights are still on 52% (2022) and 47% (2023), the price of LED lamps is more expensive 20% (2022) and 21% (2023), and the reasons for not using LEDs due to not knowing is 16% (2022) and 23% (2023).

Figure 4: Reasons Not to Use LEDs



[15] Market survey of high efficiency lighting in Indonesia, 2022 & 2023.

3.3.2 Relevance (*)

Assessment element	Rating
Relevance	Satisfactory (S)

Relevance is the extent to which a project's objectives are consistent with beneficiaries' requirements, country needs, global priorities and partners' and donors' policies.

The ADLIGHT project is in line with the Indonesia's NDC submitted to UNFCCC in November 2016 and the enhanced NDC submitted to the UNFCCC Secretariat by 23 September 2022 with increased emission reduction target from 29% in First NDC to 31.89% unconditionally, and from 41% in the Updated NDC to 43.20% conditionally. The Enhanced NDC is the transition towards Indonesia's Second NDC which will be aligned with the Long-Term Low Carbon and Climate Resilience Strategy (LTS-LCCR) 2050 with a vision to achieve net-zero emission by 2060 or sooner. The enhanced NDC recognises the 'street lighting with efficient lamp' as a key mitigation measure for Indonesia, to which the ADLIGHT contributes directly.

Also, the ADLIGHT project is aligned with national priorities as defined by the Indonesian National Energy Plan which aims to increase renewable energy share in the primary energy mix in 2025 to 23% and save 17% of the total primary energy through energy efficiency in industries, buildings and households by 2025. Efficient lighting plays a key role in meeting these targets.

The project is aligned with the UNDP Indonesia Country Programme Document (CPD 2021-2025)[16], the CPD includes direct activities aiming at improving access to clean energy for local development and communities, and adoption of sustainable technologies in Indonesia. UNDP also assists in the identification of bankable energy projects and their de-risking under the Sustainable Development Goals Indonesia.

The ADLIGHT project is also aligned with UNEP strategic plan that aims at supporting countries and stakeholders in achieving rapid, just and comprehensive decarbonization in line with their climate commitments and aspirations and help countries to demonstrate opportunities to deploy timely renewable energy and energy efficiency solutions.

The ADLIGHT project is also directly relevant to SDG 7 "Ensure access to affordable, reliable, sustainable and modern energy for all', more specifically to SDG 7.3 target that calls for global progress on energy efficiency by doubling the rate of improvement in energy efficiency globally by 2030. The ADLIGHT project contributes directly to reduce energy intensity by reducing the amount of energy used to for lighting to produce a given output or service.

The ADLIGHT project is directly aligned to two objectives of the GEF 7 Climate Change Focal Area Strategy, Objectives #1 (Promote innovation and technology transfer for sustainable energy breakthroughs) and #2 (Demonstrate mitigation options with systemic impacts).

Therefore, relevance is assessed on a six-point scale as **Satisfactory (S).**

[16] UNDP Indonesia Country Programme Document (CPD 2021-2025). Available here.

3.3.3 Effectiveness (*)

Assessment element	Rating
Effectiveness	Satisfactory (S)

The effectiveness of a project is defined as the degree to which the development intervention's objectives were achieved or are expected to be achieved. The valorization of effectiveness is used as an aggregate for judgment of the merit or worth of an activity, (i.e., the extent to which an intervention has attained, or is expected to attain, its major relevant objectives proficiently in a sustainable fashion and with a positive institutional development impact).

The effectiveness of this ADLIGHT project can be rated as S (Satisfactory) since it met expectations as to the degree of the outcomes are achieved. Objective level targets are largely met, but finance mechanisms are instrumental sustainability elements in advancing the EE lighting in the future.

The project faced a number of very forceful challenges that, although taken care of adaptively to the degree possible, in some ways required resources (mainly time) to adapt and these externalities had had an impact on the project implementation as well as on the results. The main hindering issues are:

- **Electricity subsidies** in Indonesia have a complex impact on energy efficiency investment. Subsidies can lower the cost of electricity for consumers, reducing the immediate incentive for households and businesses to invest in energy-efficient technologies or practices, as the financial savings from using less energy are diminished. However, the government has been restructuring these subsidies to encourage more efficient energy use and to support renewable energy sources. The effectiveness of these measures in promoting energy efficiency investments depends on the balance between making energy affordable and creating incentives for energy-saving investments.
- **Flat rate tariff by PLN:** Municipalities are often not willing or able to implement LED retrofits due to lacking benefit from the energy savings in economic terms. This is because, in general, PLN does not bill the municipalities for street lighting based on actual electricity consumption but on a flat fee (lump sum) basis which is not related to actual electricity consumed, even where PLN meters are installed. This is a limiting factor for encouraging local authorities to engage in EE lights deals.
- **The financing models introduced** by the ADLIGHT project in Indonesia are in the early stages of development and have not yet been fully tested or largely adopted. These models, meant to support the transition to energy-efficient lighting, face skepticism from regional and local authorities, indicating a limited current interest in adopting new financial strategies for energy efficiency investments. This situation suggests challenges in gaining traction for innovative financing solutions that are crucial for scaling up energy-efficient lighting projects within the country.
- **Limited commitment from financial institutions to support lighting projects**: In addition to the consumer skepticism, the financial institutions on the other hand have demonstrated limited interest in EE lighting projects in Indonesia mainly due to the fact that it is new, untested and skepticism on the scale of financial risks that these projects may involve.
- **Consumer limited awareness about (EE) lighting**. Although the projects have significantly raised awareness among those involved in the pilot demonstration projects, this increased understanding has largely not extended beyond the host organizations. Outside of these specific circles, knowledge about the benefits and effectiveness of EE lighting is still not widespread. This indicates a need for broader educational and outreach efforts to ensure that the advantages of energy-efficient lighting are understood and embraced by a wider segment of organizations, thereby maximizing the environmental and economic benefits of such technologies.

- **Limited confidence in the local products**: While achieving energy efficiency outcomes has been the key focus of the ADLIGHT project, it was important to maintain the competitiveness of the local manufacturers in the market. This was challenged with level of confidence in the local market by consumers despite the fact that results of lab testing in many cases demonstrated better quality of local products than those imported. This required the project to invest resources in promoting local products.
- **Understanding and application of lamp hazardous waste**. It is evident that old lamps practices have not been incorporated widely into the demonstration projects and replications, this poses environmental and health risks with a case of no compliance with the Indonesian policies and legislation pertaining to the hazardous waste management.
- **Lengthy procurement and recruitment process** have caused delays in delivering some of the project activities, particularly in setting up the PMU team. These processes are critical components of project planning and execution, ensuring that the right resources, both human and material, are available to meet the project's objectives. However, when these processes are protracted, they can adversely affect the project's timeline and efficiency.
- **COVID-19**: The pandemic has had multiple impacts on the ADLIGHT project, 1) the pandemic came at a time when filed activities and direct engagement with the local authorities were due particularly for pilot demonstration activities, and as these were not possible and online engagements were done instead, 2) COVID created an uncertain environment for engaging in major investment by local authorities and manufacturers and 3) the Gov priorities have been re-focused on dealing with COVID impacts.

The factors that have aided or supported effective achievement of goals have been identified as follows:

- **The strong consultative process followed in delivery project outcomes**: The ADLIGHT project has consistently utilized Focus Group Discussions (FGDs) as a key platform for consultation and collaboration. These discussions serve as a vital forum for stakeholders to engage in detailed dialogues about the technical facets of the project. Through these FGDs, participants from various backgrounds and expertise come together to exchange ideas, provide insights, and deliberate on the technical challenges and solutions associated with the project's implementation. This collaborative approach ensured that a wide range of perspectives and technical knowledge are considered, contributing to a more comprehensive and informed decision-making process. The emphasis on maintaining these discussions underscores the project's commitment to transparency, stakeholder engagement, and leveraging collective expertise to achieve its objectives.
- **Enhanced NDC** provided high political umbrella and drove the acceptance of government and counterparts to the new MEPS and other project outcomes. Luckily, the ADLIGHT project came at time when Indonesia has been going through enhancing its NDC and strengthening its commitments to Paris Agreement, this meant that the project benefited from the push to implement impactful climate change mitigation actions including EE lights and street lighting in particular.
- **Effective collaboration with Private Sector**: The ADLIGHT project demonstrated good example of effective engagement with the private sector, particularly when it comes with local manufacturers, as well as partnerships with private entities for infrastructure development and financing, using models such as public-private partnerships (PPPs).

3.3.4 Efficiency (*)

Assessment element	Rating
Efficiency	Moderately Unsatisfactory (MU)

Efficiency is defined as the extent to which results have been delivered with the least costly resources possible. Efficiency is a measure of how economically resources/inputs (funds, expertise, time, etc.) are converted into results.

The Project has been efficient to certain extent in achieving outputs/products and in achieving some of the outcomes, it has provided value-for-money since it achieved the results within budgets, agreed disbursement, etc., while leveraging investments and in-kind support from sources external to the project per se (co-funding) particularly from financing to directly fund EE lighting programs.

The cost-effectiveness of the ADLIGHT stems from its foundation on the barrier removal approach, which is inherently cost-effective, as reasonably argued in the project document. By addressing all these barriers in the ADLIGHT Project design through demonstrating a viable financial support mechanism, an increase is expected in the implementation of EE lighting investments. The project leverages limited inputs of GEF funding to stimulate much greater investments by other parties, namely the government and the private sector. The project has been able to generate private sector investments (approx. $16 million) within the project timeline and additional resources as the pilot demonstrations are replicated in the country.

Also, the partnership approach with national and local authorities (including standardisation, laboratories, etc), manufacturers and financing agencies established cost sharing environment in implementing the project activities, for instance, the contributions into the establishment/upgrade of the testing labs and strengthening the capacities and replication projects.

On project timeframe, the project has been going through a considerable delay considerable delay between the PIF approval (June 2016) to Project Document Signature May 2020 (UNDP) Jan 2021 (UNEP), this is almost 4 years which affected the feasibility of the PIF content. Another delay was caused by the late establishment of the PMU until 1 August 2020 due to delayed recruitment process of the PMU team organized by the Executing Agency. In addition, the Coordinator for Component 1 started her assignment on 1 September 2021. Also, COVID-19 which has had the impact of reducing in-person contacts between ADLIGHT, MEMR and stakeholders.

Based on all of these delays, the MTR recommended a project extension for 12 months at no cost which was later approved by the project board and UNDP/GEF and UNEP. The extension request seemed reasonable for the TE team and helped in progressing towards the project targets. For UNEP's component, it was agreed to be extended beyond the closure of the UNDP project until October 2024 to enable time for implementing additional activities.

As of December 2023, the project reports that 68 percent delivery, leaving quite substantial amount of funding for 2024 of $1.2 million, nearly half of which for component 2 where UNEP has longer timeframe for delivery until October 2024. There will be a risk that there is a high possibility that a large amount of the GEF funding remains unspent by the end of the project for UNDP component, the exact amount to be the returned to the GEF depends on the expenditures in 2024.

Table 12: ADLIGHT project financial delivery

Outcome	Budget	Expenditures by year				Total Disbursed	Total remaining	Financial Delivery %
		2020	2021	2022	2023			
Outcome 1: Improved quality, energy efficient and affordable locally produced EE Lighting (EEL) products and systems	1,055,355	40,216	250,916	257.288,11	297,113	845,533	209,822	80%
Outcome 2: Improved conditions for fair market competition of EE lighting products informed by robust policy and institutional framework.	1,262,500	0	155,777	139,685	395,461[17]	690,923	571,577	55%
Outcome 3: Increased penetration of high quality and efficient lighting	1,392,500	54,683	170,835	426,162	356,860	1,008,540	383,960	72%
Project Management	185,517	7,672	37,087	38,872	34,977	118,608	66,909	64%
Total (Actual)	3,895,872	102,571	614,615	604,719	1,084,411	2,663,604	1,232,268	68%

Given the above, the efficiency of implementation faced number of shortcomings. Therefore, the overall ranking of efficiency is Moderately Unsatisfactory (MU).

3.3.5 Overall Outcome (*)

Given the objective-level and outcome-level targets are mostly met, the overall project outcome is ranked as Satisfactory (S).

3.3.6 Sustainability: financial (*), socio-political (*), institutional framework and governance (*), environmental (*), and overall likelihood (*)

Assessment element	Rating
Financial	Moderately Unlikely (MU)
Institutional Framework and governance	Moderately Likely (ML)
Socio-political	Likely (L)
Environmental	Moderately Unlikely (MU)
Overall Likelihood of Sustainability	Moderately Unlikely (MU)

[17] Including amount of 202,478.22 spent by UNEP's U4E unit.

Sustainability of the project is judged by the commitment of the project benefits to continue and replicate beyond the project completion date. The evaluation identifies key risks to sustainability and explains how these risks may affect continuation of the project benefits after the project closes. The assessment covers institutional/governance risks, financial, socio-political, and environmental risks.

Conceptually, the sustainability of the ADLIGHT project is grounded on the barrier removal approach, covering policy and planning, commercial and technical viability, financing, and information and awareness, is designed to stimulate ongoing replication of the project demos and, thus, scale-up of project results.

Financial sustainability

The financial risks to sustainability relate to the likelihood of continuation of the funding offer for street lighting and public building to invest in EE lighting.

The project developed business and financing models to implement large scale EEL production upgrade project, aiming to make EE lighting investment as a feasible investment, replication will be easier to conduct. The ADLIGHT project developed 4 models for financing. 1) Multi-year budget scheme (self-funding across multiple years), 2) Central Government Loan (still under development), 3) Public Private Partnership (PPP) and 4) ESCO model. The level of adoption by local governments of these models remains primitive despite some promising individual cases where these models have been applied. Despite the huge potential for these models, the adoption of these models faces several challenges mainly the reluctance of the government organizations to engage in untested models with hesitation to take risks. On the other hand, financial institutions have demonstrated limited interest in EE lighting projects in Indonesia mainly due to the fact that these projects are new, untested and scepticism on the scale of financial risks that these projects may involve.

Nonetheless, in Indonesia, the presence of subsidized and affordable electricity rates is hindering the widespread adoption of LEDs and other energy-saving devices. The lack of immediate financial incentive means that commercial, industrial, and residential users feel little pressure to transition to LEDs or similar energy-efficient technologies. While mandatory MEPS could facilitate the market entry of LEDs, it may not fully address the broader issue of market adoption quickly enough.

Additionally, the approach used to determine the expenses associated with street lighting, which employs a uniform pricing strategy for its electricity usage, presents significant financial challenges. This method, by not differentiating between varying levels of consumption, disregards the potential for cost savings through more efficient use or the adoption of energy-saving technologies such as LED lighting. The flat rate system fails to incentivize reductions in energy consumption or reward efforts to install more efficient lighting solutions. Consequently, this can lead to higher operational costs for local entities, as the economic model does not encourage or reward energy efficiency improvements. This lack of financial incentives to adopt more efficient technologies or practices makes it difficult to justify the upfront investment required for transitioning to more sustainable street lighting systems, thereby impeding efforts towards achieving energy efficiency and sustainability goals in public lighting infrastructures.

Therefore, due to this combination of factors, the general likelihood ranking of the financial sustainability is Moderately Unlikely (MU).

Institutional framework and governance risks to sustainability

The ADLIGHT project sustainability is well-founded within Indonesia's long drawn policies and program on energy efficiency and conservation as committed by the enhanced NDCs, mandated in the country's Government Regulation of the Republic of Indonesia No. 70/2009 on Energy Conservation, and commitment to regional agreements such as in the ASEAN.

The project supported the Government of Indonesia in harmonization of its policies and legislative framework, particularly Minimum Energy Performance Standards (MEPS) for LED lighting products with international conventions and ASEAN standards. The Government has formally endorsed the MEPS and been committed to exercise pressure on both the industry and the public to adhere to these new mandates, and thus the application of MEPS in Indonesia will be a strong element of the ADLIGHT project sustainability.

Also, the engagement of the local EEL manufacturing industry as the key stakeholder in this market transformation strategy helps to ensure their buy-in in demonstrating the benefits of quality production and creating conditions for them to benefit from sustainable application of EELs.

In terms of capacity, the ADLIGHT project provided energy audit trainings to the beneficiaries to enable convenient understanding of the LED efficiencies but also build the capacities for maintaining EE lighting units. The installed capacities will be important sustainability element for the pilot demonstration projects.

The ADLIGHT project, focusing on enhancing sustainability and energy efficiency, offered comprehensive energy audit training to participants. This initiative aimed to equip beneficiaries with the knowledge and skills necessary to understand the benefits and functionalities of LED lighting technologies. By doing so, it not only facilitated a deeper comprehension of LED efficiency but also empowered participants with the expertise required for the upkeep of energy-efficient (EE) lighting systems. The training was designed to be accessible and informative, ensuring that all participants could fully grasp the concepts and apply them effectively.

Furthermore, the capacity-building aspect of the ADLIGHT project plays a pivotal role in ensuring the long-term success and sustainability of the pilot demonstration projects. By installing robust capacities in energy management and maintenance, the project lays a solid foundation for these initiatives to sustain. These capabilities are anticipated to be a key sustainability component, enabling the projects to operate efficiently, and reduce energy consumption. However, there is no clear plan to continue some of the ADLIGHT project activities particularly the market survey which is significantly important to understand the dynamics of the market in the future.

On the other side, the expertise and resources available to market surveillance teams in Indonesia might fall short of what's necessary to ensure the consistent quality and reliability of energy-efficient equipment in the marketplace. This discrepancy raises concerns about the ability of these teams to effectively monitor, enforce,

and verify compliance with established standards for energy efficiency. Without rigorous oversight, there's a risk that substandard products could enter the market, potentially undermining consumer confidence in energy-efficient technologies.

Therefore, due to this combination of factors, the general **likelihood of institutional/governance sustainability is ranked Moderately Likely (ML).**

Socio-political risks to sustainability

When analysing socio economic risks to sustainability, an examination is made of the potential social or political risks that may jeopardize sustainability of project outcomes.

The ADLIGHT contributed to increase level of awareness of the public as well as local authorities effectively. The 2023 market survey shows better trends in awareness and adoptions of the EE lights, however, there is more needs to be done to influence behavioural changes associated with the replacement of the lights with new energy efficiency lamps. Also, the ADLIGHT Project appears to have effective relationships with all stakeholders that are mapped in the project document, and these relationships are expected to pursue beyond the project completion date.

Therefore, the ranking for **socio – political sustainability is Likely (L).**

Environmental risks to sustainability

While LEDs significantly contribute to reducing energy consumption and greenhouse gas (GHG) emissions as a positive environmental outcome, however, the environmental management of end-of-life CFLs (Compact Fluorescent Lamps) and LEDs presents a challenge that must be tackled safely. Safe disposal practices for these lighting technologies, along with recycling measures, require urgent attention. This is because both CFLs and LEDs contain materials that, if not properly handled, could be harmful to the environment. For instance, CFLs contain a small amount of mercury, a toxic substance, while LEDs are composed of various electronic components and metals that could pose disposal challenges.

The project document acknowledges that effective waste management and recycling protocols are essential to mitigate the potential environmental impacts associated with the disposal of these lighting technologies. However, throughout the pilot phase, pre-existing lighting units were either repurposed in alternative locations or stored in a repository close to the facility. Currently, there are no concrete strategies for the environmentally safe disposal of these old lamps. This oversight poses a risk of exposing both humans and the environment to hazardous substances contained within the lighting units. Without a dedicated plan for their responsible disposal, these materials could potentially lead to health hazards and environmental contamination, emphasizing the need for immediate attention to sustainable waste management practices.

The key requirements for dealing with lamp waste in Indonesia focus on the comprehensive management of hazardous and toxic waste (B3 waste), including mercury-containing lamps. The regulations encompass various stages such as storage, packaging, collection, transportation, treatment, and disposal, with specific guidelines to

ensure environmental safety and compliance with legal standards. There's a significant emphasis on preventing mercury contamination, with detailed procedures for handling, recycling, or disposing of lamp waste to minimize environmental impact and protect public health. The ADLIGHT pilots have not been assessed if they comply with the B3 waste requirements as outlined in the relevant national policies and regulations. The project input to this matter was limited to two training sessions and supporting 1 pilot (in central Java) to safely dispose old lamps by contracting a specialized waste company.

Therefore, the ranking for environmental sustainability is Moderately Unlikely (MU).

Taking a composite view of the rankings for financial, socio – political, institutional as well as environmental sustainability probabilities, the overall likelihood of sustainability is ranked as Moderately Unlikely (MU).

3.3.7 Country ownership

National governmental institutions in Indonesia have shown a commendable level of country ownership. The adoption and endorsement of policies, regulations, and decrees, including Minimum Energy Performance Standards (MEPS), have been a critical aspect of the ADLIGHT project's ownership. This demonstrates a significant commitment from national partners, who have not only fully embraced the project but also played a leading role in its development in collaboration with the UNDP. Subsequently, these partners have been deeply involved in the execution of the project, indicating a strong and proactive stance in driving the project's objectives and ensuring its success, for example the local authorities have shown complete ownership of the pilot demonstration projects, this was also evident in the replication work taking place. This is also true in case of local manufacturers who are now adopting and owning the new MEPS and started the production in compliance with the new standards.

The strong collaborative spirit in the form of information sharing, research, and demonstration, etc. prevailed among stakeholders from all sectors. While a number of local entities participating in the project have also committed to continuing efforts for the deployment of EE light investments, and a number of plans have already been formulated towards this end.

3.3.8 Gender equality and women empowerment

The ADLIGHT ProDoc indicates that gender considerations were integrated into the project wherever feasible. This integration included ensuring gender equality in the creation of capacity-building opportunities, as well as gathering gender-disaggregated data within the LED industry. Such detailed data collection enables the formulation of policies and strategies that are inclusive and cater to the needs of the entire population, rather than focusing on a single gender. To specifically address and incorporate gender issues throughout the project's implementation, a Gender Mainstreaming consultant was engaged in the design phase of the ADLIGHT Project. This approach underlines the project's commitment to promoting gender equity and ensuring that its benefits are accessible to all individuals, regardless of gender.

Data collection for 'people-count' related indicators has been designed and implemented in a gender disaggregated approach where possible.

In 2022, a gender analysis conducted by a consultant found that the ADLIGHT project successfully incorporates a gender perspective throughout all project phases, including planning, execution, monitoring, evaluation, and reporting. This approach ensures equitable access and benefits for both women and men to all resources provided by the project, such as LED lighting solutions. From the outset, ADLIGHT has prioritized gender strategies and analysis to identify and address gender-related issues, disparities, and dynamics within the project's scope. This foundational work enables the development of gender-sensitive plans and activities.

Specifically, for the first component, ADLIGHT emphasizes the equitable involvement of both genders in market surveys by utilizing gender-sensitive survey instruments. This effort has achieved a balanced gender ratio of 50:50 among survey respondents, ensuring all questions are designed to be gender aware.

In the second component, ADLIGHT supports the formulation of gender-sensitive policies tailored to meet the diverse needs of community members. It underlines the importance of incorporating the perspectives, interests, and ambitions of both men and women in policy development. Furthermore, it ensures that information is accessible to all community segments, encouraging active participation in the policy-making process.

For the third component, ADLIGHT is committed to raising awareness and promoting programs that highlight the advantages of advanced energy-saving lighting technologies, with a special focus on gender-specific considerations. The project regards households, particularly those led by women, as critical units for evaluating energy equity and usage, as well as understanding family dynamics and decision-making processes in household activities. This comprehensive approach aims to ensure that energy solutions are accessible and beneficial to all, reflecting the nuanced needs of diverse households.

The representation of women within the project management and teams seems to be appropriate, women are actively participating in events, and efforts are being made to maintain gender balance. Gender equality has been promoted across project activities and platforms such as technical meetings and workshops, monitoring and reporting; and forums in which energy efficient related issues are discussed and in which potential solutions are proposed tend to have an inadvertent male bias.

3.3.9 Cross-cutting Issues

The ADLIGHT project was crafted and executed with a strong emphasis on human rights principles, incorporating the ideals of equality in both the distribution of knowledge and the sharing of its benefits. By focusing on energy efficiency initiatives within sectors of high energy consumption, such as public buildings, the project aimed to conserve significant amounts of energy. This saved energy could then be redistributed to additional households and industries, amplifying the project's impact leading to enhanced access to affordable and effective energy resources.

Throughout the selection and execution of energy efficiency pilot projects, a participatory approach was employed. This approach involved engaging stakeholders directly impacted by the projects such as the local manufacturers, ensuring their voices and concerns were heard and addressed. Such engagement was carried out with a keen awareness of international human rights laws and standards. By doing so, the ADLIGHT project not only aimed to achieve its environmental objectives but also to uphold and respect the human rights of all

stakeholders involved, demonstrating a comprehensive commitment to both environmental sustainability and social equity.

The principle of Leave no one behind (LNOB) has been implicit in the ADLIGHT project design and delivery by implementing inclusive targeting approach during the pilot projects by ensuring reasonable geographical distribution of benefits across the country.

Cross-cutting issues such as poverty alleviation, disaster prevention and recovery and human rights have been integrated into UNDP Social and Environmental and Social Screening (SESP) as relevant.

3.3.10 GEF Additionality

GEF additionality, defined as the additional outcome (both environmental and otherwise) that can be directly associated with the GEF-supported project. In December 2018, the GEF Council approved 'An Evaluative Approach to Assessing GEF's Additionality'. GEF IEO classifies additionality into six factors: Specific Environmental Additionality; Legal/Regulatory Additionality; Institutional Additionality/Governance additionality; Financial Additionality; Socio-Economic Additionality; and Innovation Additionality[18].

The GEF additionality in the ADLIGHT project involves overcoming the key barrier to the wider adoption of EE lights in Indonesia that would have not been achieved without the GEF funding, the ADLIGHT project contributes 4 main types of additionalities, these include:

Additionality	ADLIGHT project contribution
Legal/Regulatory Additionality	Overcoming the regulatory barriers by introducing the MEPS and other decrees and guidelines for public procurement.
Institutional Additionality/Governance additionality	Overcoming the limited capacity barrier building the individual and institutional capacities for testing EE lights and for measurement and verification of energy efficiency.
Financial Additionality	Overcoming the financial barrier by introducing financial mechanism to fund the EE light investments through different financing scheme, these models, despite limited level of maturity at this point, remain important element in overcoming the financial barriers.
Specific Environmental Additionality	Co2 reduction and overcoming the awareness barrier by increasing, to a certain extent, the capacities and awareness on the importance of energy efficiency and its benefits, and the opportunities to achieve energy and non-energy benefits from energy efficiency.

[18] GEF -IEO, An Evaluative Approach to Assessing GEF's Additionality, 2018.

3.3.11 Catalytic Role / Replication Effect

Replication lies at the heart of the ADLIGHT project strategy and design, conceptually the project is meant to remove barriers and enable the environment for large scale adoption of EE lights in Indonesia and develop sustainable financing models that continue to attract attentions of authorities in charge of the public streetlighting and public buildings to invest in EE lights. The established regulatory framework along with capacity building are instrumental elements for replication.

The scalability of the ADLIGHT project is envisaged to take place at three levels:

- Scaling up

The implementation of new MEPS and regulatory changes by the ADLIGHT project marks a significant shift towards EE lighting, encouraging market adaptation to these norms. As supply standards evolve, demand for EE lighting is expected to naturally increase. Nonetheless, the scalability of these efforts faces barriers including due to underdeveloped financing models and the persistent subsidy on electricity in Indonesia, which diminishes the economic incentive for private sector EE investments and may limit governmental organisations' enthusiasm for further replication. In addition, the model for street lighting pricing and costing involves applying flat rate on street lighting electricity consumption, and this makes the economic feasibility even more challenging.

- Scaling out

For ADLIGHT project, scaling out involves promoting EE lights across regional and local authorities. The project has implemented a few demonstration activities through the local government platforms that are coordinating by the central government, however, it is hard to assume the buy in based on a presentation in a meeting especially for those regions who have not been engaged in the pilot stage, but rather it needs more targeted demonstration activities to showcase the benefits and share lessons learned has led to concerns about the project's ability to motivate replication by other institutions, such as regional authorities and hospitals. Without these practical examples, the potential for broader adoption and scaling out of EE lighting solutions across the board remain challenging.

- Scaling deep:

The potential for scaling deep varies from one host to another. With some planning long-term replacements of inefficient lighting with LED technology as part of their regular maintenance and budgeting processes. However, short-term consideration of financing options to accelerate the switch to EE lighting and realize cost savings through securing capital funding (PPP, central loan, or ESCO models) appears to be limited with only one case in Dharmasraya where PPP contract is quite advanced. This suggests that while there is recognition of the benefits of EE lighting, immediate financial strategies through securing capital upfront are still challenging.

In brief, the ADLIGHT project's introduction of new MEPS and regulatory changes signifies a pivotal move towards EE lighting, with expectations for market demand to grow as standards evolve. However, challenges such as immature financing models and electricity subsidies in Indonesia limit both private and public sector investment enthusiasm and make the replication efforts move at slower pace than anticipated. Efforts to promote EE lighting

across regions need to be strengthened for broader adoption. Moreover, while some institutions plan long-term shifts to LED lighting, immediate financing strategies for quick transitions and cost savings are not prioritized, indicating a recognition of EE lighting benefits without substantial financial commitment for swift implementation.

3.3.12 Progress to impacts

Long-term impacts (of different sorts) can be expected from the ADLIGHT project on the short term and long-term. The project achievements on regulatory framework, capacity building, testing capacities, finance mechanism and awareness will result in number of impacts including more reduction of CO2 emission, electricity savings, cost savings and non-energy benefits (for example increased productivity/quality or reduced maintenance costs).

Most prominently, the project contributed to increasing the market share of qualified EE light products, a technology with the least adverse environmental impacts among artificial illumination solutions.

Further, the project triggered thinking of EE measures in the organisations who hosted the pilots beyond only lighting. Some of the stakeholders engaged in this TE expressed willingness to observe further EE measures after seeing the impact on the EE lights, particularly on cost savings.

4. Conclusions, Recommendations & Lessons

4.1 Main Findings & conclusions

1. **Project achievement and market transformation**: The ADLIGHT project has successfully met its core objectives, significantly contributing to energy savings and GHG emissions reduction in Indonesia. It has played a crucial role in transforming the national market by increasing the penetration of high-quality energy-efficient lighting technologies and introducing critical MEPS and regulatory changes. These efforts mark a significant step forward in Indonesia's transition to energy-efficient lighting, setting a foundation for future market demand growth as standards continue to evolve.
2. **Challenges and areas for improvement**: Despite these achievements, the project faced notable challenges, particularly regarding financing models and electricity subsidies, which have slowed down replication efforts and dampened investment enthusiasm. Additionally, the limited impact on behavioural shifts towards energy efficiency underscores the need for stronger initiatives to promote the adoption and proper use of energy-efficient lights.
3. **Technical assistance and capacity building**: Through the market surveys and technical assistance to local LED manufacturers, the ADLIGHT project has laid an adequate groundwork for promoting energy-efficient lighting in Indonesia. However, the pending approval of business transformation proposals from financial institutions highlights the necessity for more streamlined processes and improved collaboration between project beneficiaries and financial stakeholders.
4. **Regulatory advances and challenges**: The development of decrees for MEPS and labelling represents a milestone in regulatory progress, yet the project's efforts in market surveillance and product registration underline ongoing challenges in implementing a comprehensive and effective approach for MVE of energy-efficient products.
5. **Environmental considerations and waste management**: The project has made advances in lamp waste management by engaging in training and pilot activities for safe disposal practices. However, the absence of concrete strategies for the environmentally safe disposal of old lamps across all sites presents a significant oversight, posing risks to both human health and the environment.
6. **Pilot demonstrations and financial models**: The implementation of pilot demonstrations has showcased the potential benefits of energy-efficient lighting, leading to replication efforts. Yet, the cautious adoption of financing schemes by local governments and limited interest from financial institutions in energy-efficient lighting projects indicate a need for more robust models and incentives to support such initiatives.
7. **Alignment with national and global goals**: The ADLIGHT project stands as a pivotal initiative in supporting Indonesia's commitment to climate change mitigation and energy efficiency, aligning closely with the country's NDCs and the broader goal of achieving net-zero emissions by 2060. Its focus on efficient street

lighting not only contributes to Indonesia's National Energy Plan but also resonates with global efforts to enhance energy efficiency, supporting Sustainable Development Goal 7.

8. **Comprehensive design and strategic approach**: The project design is comprehensive, which provides a clear roadmap for transforming the energy-efficient lighting industry in Indonesia. By addressing the entire LED lighting value chain and focusing on sustainable environmental improvements, ADLIGHT's strategy effectively tackles identified barriers, from policy and regulatory gaps to the need for greater manufacturer capacity and more robust mechanisms for monitoring, verification, and enforcement. Through a design process, ADLIGHT has successfully identified the primary obstacles hindering the widespread adoption of energy-efficient lighting in Indonesia. ADLIGHT's approach of piloting, testing, learning, and then upscaling exemplifies a dynamic and adaptive model for project implementation.

9. **Challenges*:*** The ADLIGHT project encountered several challenges that affected its progress. Electricity subsidies and a flat rate tariff policy reduced the economic incentive for energy efficiency investments. Financing models for the project were new and met with skepticism, while financial institutions showed limited interest due to perceived risks. Lengthy procurement processes and limited consumer awareness further hindered progress. Despite the superior quality of local products, consumer confidence remained low, necessitating additional promotional efforts. These obstacles highlighted the need for adaptive strategies, broader engagement, and innovative solutions to advance energy efficiency initiatives.

10. **Success factor**: The effectiveness of the ADLIGHT project was significantly supported by a strong consultative process and the favorable political climate stemming from Indonesia's enhanced NDCs. The project utilized Focus Group Discussions (FGDs) as a crucial platform for stakeholder consultation and collaboration, bringing together participants with diverse backgrounds and expertise. The effectiveness of this ADLIGHT project can be rated as S (Satisfactory) since it met expectations as to the degree of the outcomes are achieved. Objective level targets are largely met, but finance mechanisms are instrumental sustainability elements in advancing the EE lighting in the future.

11. **Efficiency*:*** The ADLIGHT project has demonstrated efficiency in achieving its outcomes, offering value for money by delivering results within budget and agreed disbursements. It has effectively leveraged investments and in-kind support from external sources, including significant co-funding for EE lighting programs of $16 million in private sector investments.

12. **Delays:** The project faced considerable delays, from the PIF approval in June 2016 to the Project Document Signature in May 2020 (UNDP) and Jan 2021 (UNEP), and further delays in establishing the Project Management Unit (PMU) and starting key assignments, compounded by the impact of COVID-19 on in-person engagements. In response to these delays, a 12-month extension at no cost was recommended and approved, allowing for continued progress towards project targets. UNEP's component of the project is set to extend beyond the UNDP project closure until October 2024, to accommodate additional activities.

13. **Financial delivery:** As of December 2023, the project reported 68 % financial delivery, with a significant portion of the budget, around $1.2 million, allocated for 2024, particularly for activities under UNEP's extended timeline. Co-financing target has been outperformed. Co-financing has largely come from MEMR contributions through parallel programs and investments in the laboratory settings, and the second largest contribution comes from the private sector, particularly investment by local manufacturers made in meeting the new MEPS. There's a risk that a considerable portion of the GEF funding for the UNDP component may remain unspent by the project's end, with the exact amount to be returned to the GEF depending on 2024 expenditures. Therefore, the overall ranking of efficiency is Moderately Unsatisfactory (MU).
14. **Utilisation of unspent resources:** The project applied adaptive measures in relation to the project extension and budget reallocations to support pilot demonstrations, this decision was approved by the project board, however, the decision to allocate budget savings under component 2 to support the development of MEPS for products outside the original scope of EE lighting raised questions about staying within the project's primary focus.
15. **M&E design:** The design of the ADLIGHT project's M&E framework is adjudged to be comprehensive and robust, aligning well with the standards expected for projects of its scale and complexity. With sufficient resources allocated ($205,000 in total) and clear delineation of roles and responsibilities, the M&E design effectively supports the project's needs for monitoring results and tracking progress towards its objectives, earning it a satisfactory rating.
16. **M&E implementation**: The implementation phase revealed critical areas for improvement, particularly the insufficient monitoring of key indicators and environmental risks. This gap in effective implementation, highlighted by the lack of data for three specified indicators in the PRF and limited tracking of environmental impacts, highlights the need for more rigorous and comprehensive monitoring practices. Consequently, the implementation aspect of M&E is rated as moderately unsatisfactory, leading to an overall M&E quality rating of moderately satisfactory.
17. **Effective support and oversight by UNDP and UNEP**: The ADLIGHT project benefited significantly from the vigilant support and oversight of UNDP and UNEP, with UNDP monitoring financial transactions to ensure efficiency and accountability, conducting audits, and facilitating essential project reviews and meetings to track progress and resolve issues. Similarly, UNEP's active involvement, including through engaging U4E team, in providing technical support and capacity-building initiatives, such as training sessions on testing methods and the development of standards, contributed to the project's ability to meet its objectives. This comprehensive support framework resulted in a satisfactory rating for the quality of UNDP/UNEP implementation and oversight.
18. **Effective project ownership and execution by MEMR**: The implementation of the NIM modality by MEMR ensured that the ADLIGHT project was deeply integrated within the national administrative and operational frameworks, fostering a strong sense of ownership and commitment to the project's success.

Despite challenges such as delays in recruitment and procurement processes, the effective integration of the PMU within MEMR and the active engagement with the project's goals and processes underscore the effectiveness of MEMR's execution of its responsibilities. This level of integration and commitment has led to a satisfactory rating for the quality of implementing partner execution, contributing to a satisfactory overall rating for project implementation and execution.

19. **Social and Environmental Safeguards**: The ADLIGHT project took important steps to address environmental risks associated with the disposal of mercury-containing lamps, integrating UNDP's Social and Environmental Standards (SES) and conducting targeted training on waste management and recycling. However, there has been limited monitoring of environmental risks among the pilot projects, which highlights a crucial area for enhancement. Ensuring rigorous and systematic compliance checks is essential for preventing the reuse or inadequate storage of hazardous materials, thereby safeguarding environmental sustainability and health in the transition to energy-efficient lighting solutions.
20. **Stakeholder engagement**: A crucial component of the ADLIGHT project has been its ongoing engagement with stakeholders through Focus Group Discussions (FGDs), which have facilitated deep technical discussions and collaborative problem-solving among participants from diverse backgrounds. Despite the project's inclusive approach, engagement with the Ministry of the Environment and Forestry (MoEF) was noted as limited, especially concerning hazardous waste management.
21. **Gender mainstreaming**: The ADLIGHT project presented a good commitment to gender equality by integrating gender considerations throughout its lifecycle, from design to implementation. Through targeted strategies like equal capacity-building opportunities, gender-disaggregated data collection, and the promotion of gender-balanced participation, the project successfully fosters an inclusive environment that addresses gender-specific needs and challenges. This approach ensures equitable access to resources and opportunities in the energy-efficient lighting sector, marking a significant step forward in promoting gender equality within the context of sustainable development initiatives.
22. **Financial sustainability**: The ADLIGHT project's efforts to promote energy-efficient lighting in Indonesia face significant challenges in financial model adoption and market penetration due to governmental reluctance towards unproven models, limited financial institution interest, and existing electricity pricing strategies. The subsidized and flat-rate electricity tariffs diminish the motivation for adopting LED and energy-saving technologies, impacting the financial sustainability and widespread adoption of such initiatives. Consequently, the project's potential for achieving long-term financial sustainability and incentivizing energy efficiency on a broader scale is assessed as Moderately Unlikely (MU), highlighting the need for innovative approaches to overcome these barriers.
23. **Institutional/governance sustainability**: The sustainability of the ADLIGHT project is anchored in Indonesia's robust energy efficiency and conservation policies, benefiting from governmental support and the endorsement of MEPS. This backing, alongside active engagement with the local energy-efficient lighting manufacturing industry, fosters a conducive environment for sustainable market transformation.

The project's focus on capacity building further strengthens the potential for long-term success and sustainability of energy-efficient initiatives. However, challenges in market surveillance and the enforcement of standards present potential risks to maintaining the consistency and reliability of energy-efficient products. These issues could affect consumer confidence and the overall market acceptance of such technologies. Given these dynamics, the project's institutional and governance sustainability is considered moderately likely, reflecting a balanced outlook that recognizes both its solid foundation and the areas requiring further attention.

24. **Socio – political sustainability**: The ADLIGHT contributed to increase level of awareness of the public as well as local authorities effectively. Also, the ADLIGHT Project appears to have effective relationships with all stakeholders that are mapped in the project document, and these relationships are expected to pursue beyond the project completion date. Therefore, the ranking for socio – political sustainability is Likely (L).

25. **Environmental sustainability**: During the pilot stage, pre-existing lighting units were either repurposed in alternative locations or stored in a repository close to the facility. Currently, there are no concrete strategies for the environmentally safe disposal of these old lamps. The ADLIGHT pilots have not been assessed if they comply with the B3 waste requirements as outlined in the relevant national policies and regulations. The project input to this matter was limited to two training sessions and supporting 1 pilot (in central Java) to safely dispose old lamps by contracting a specialized waste company. Therefore, the ranking for environmental sustainability is Moderately Unlikely (MU).

26. **Lessons learned**: The project's experiences emphasize the importance of establishing a robust policy-regulatory framework to guide the market transition towards energy-efficient technologies like LED lighting. Essential components of this framework include setting minimum energy performance standards and a comprehensive system for monitoring, verification, and enforcement to ensure compliance. The disposal and recycling of old lighting technologies, particularly those containing hazardous materials, highlight the need for careful waste management strategies to address environmental and health risks. Finally, the success of transitioning to energy-efficient lighting technologies relies heavily on effective stakeholder engagement and communication, ensuring that all parties involved are aligned in their goals and understand the benefits of such initiatives, thus mitigating resistance to change.

4.2 Recommendations and Lessons Learned

Below recommendations take into account the timeframe available to implement recommendation. In case of UNDP, the project is so close to be operationally closed at the time of drafting this TE evaluation report, while UNEP have longer time until October 2024 to operationally close the project. Accordingly, the following are a mix of recommendations for corrective actions in the remaining time and forward-looking recommendations/lesson learned focussed on future programming:

#	TE Recommendation	Entity Responsible	Timeframe
1	1. **Enhance the capacity of stakeholders in implementing market surveillance on EE lighting** to address the need for a structured and knowledgeable approach to ensuring that EE lighting products in the market meet established energy efficiency standards and regulations. This is particularly pertinent in Indonesia, where the growth of the EE lighting market presents both opportunities and challenges in terms of regulation and compliance. To do so, it is recommended that: ○ 1.1 Establishing a Market Surveillance Framework: This involves reviewing and finalising the draft Technical Guidelines on Supervision of MEPS and Energy Saving Labels for LED Lamps, creating a comprehensive structure that outlines the roles, responsibilities, and procedures for conducting market surveillance of EE lighting products. Key components of this framework would include Defining stakeholder roles and responsibilities, setting up surveillance procedures, establishing Reporting and Compliance Mechanisms, and consider integrating international standards and best practices into the national framework to ensure that the surveillance process is robust, transparent, and in line with global standards. ○ 1.2 Capacity Building through Training on Market Surveillance: this is critical to ensure that all stakeholders are equipped with the necessary knowledge and skills to effectively participate in the market surveillance process.	UNEP/PMU	April-Oct 24
2	2. **Promote successful EE lighting pilot projects results through broad targeted demonstration** is an important pre-condition for project sustainability and replication. This can be done by ○ 2.1 Implement targeted demonstration for local authorities at the local and provincial levels, by providing concrete evidence of the potential energy savings, cost reductions, and environmental impacts. Seeing the results can make the concept more tangible and compelling. ○ 2.2 Promoting financial models developed to finance EE lighting projects by showcasing financial models that have successfully funded pilot projects, stakeholders can see viable pathways for	PMU	April-Oct 24

	financing their initiatives. This might include models such as public-private partnerships, or ESCO financing model.		
3	3. **Strengthen the application of environmentally sound management** for the old lamps that are classified as waste particularly the ones contaminated with mercury. ○ 3.1 Undertake thorough assessment of how pilot and replication projects comply with Indonesian environmental legislation related to waste management and best practices. ○ 3.2 Develop concrete strategies for the environmentally safe disposal of these old lamps in all sites. Explore and incorporate technical solutions for the safe collection, transportation, and disposal of mercury-containing lamps. This might include specialized recycling technologies that safely extract mercury and other hazardous components. ○ 3.3 Facilitate engagement between the Ministry of Environment and Forestry and local authorities to ensure technical support, monitoring, evaluation and compliance. Also, promote partnerships between the government and private sector entities that specialize in hazardous waste management, leveraging their expertise and resources for more efficient and safe disposal solution.	UNEP/PMU	April-Oct 24

Lessons learned.

- **Establishing a robust policy-regulatory framework is crucial for transitioning the market towards more energy-efficient consumer technologies**, like LED lighting. Within this framework, setting minimum energy performance standards (MEPS) is intended to phase out outdated equipment from the market. To ensure compliance, such a mandatory framework must be supported by a comprehensive monitoring, verification, and enforcement system. This includes having proper testing facilities, conducting organized market inspections, and imposing penalties on violators.
- **LED Street lighting is increasingly cost-effective**, making it an affordable option with a rapid return on investment. The installation process is swift, and the benefits, including financial savings and reductions in greenhouse gas (GHG) emissions, are straightforward to quantify. Well-executed street lighting projects have become markers of modernity, showcasing enhanced quality and increased levels of illumination. Importantly, they also lead to significant reductions in energy use and GHG emissions, reflecting a move towards more sustainable urban environments.
- **Proper disposal and recycling of old lighting technologies are crucial**: Transitioning to energy-efficient lighting technologies such as LED lamps involves the disposal of old, less efficient lamps, which may contain hazardous materials (e.g., mercury in fluorescent lamps). The case of most of pilot projects highlights the importance of managing these lamps as hazardous waste and ensuring they are treated alongside medical waste to mitigate environmental and health risks. This approach emphasizes the need for robust waste management strategies that address the environmental impact of transitioning to newer technologies.
- **Effective engagement and communication with stakeholders are essential for success**: Projects that involve a transition to energy-efficient technologies, such as LEDs, necessitate the involvement and buy-in of various

stakeholders, including government entities, the private sector, local communities, and end-users. The TE findings underscore the importance of engaging these groups early and throughout the project lifecycle to ensure alignment of goals, understanding of benefits, and mitigation of resistance to change.

- **Integrating stakeholders' surveys into the monitoring system is crucial for tracking project indicators systematically**, particularly for projects where outcomes are gauged through surveys and stakeholder engagement, a structured approach to data collection and analysis is crucial. This requires using all opportunities of engaging with stakeholders to be ask survey questions and collect data regularly. Also, incorporating feedback mechanisms into the survey process allows stakeholders to provide insights beyond structured survey questions. This can uncover valuable qualitative data and insights that quantitative measures might miss.
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Annexes

Annex 1: TE ToR (excluding ToR annexes)

Annex 2: List of documents reviewed.

List of documents that have been reviewed includes, but not limited to:

1. Project Identification Form (PIF)
2. Final UNDP-GEF Project Document with all annexes
3. CEO Endorsement Request
4. UNDP Social and Environmental Screening Procedure (SESP) Form
5. Inception Workshop Report
6. Mid-Term Review report and management response to MTR recommendations
7. All Project Implementation Reports (PIRs)
8. Minutes of Project Board Meetings and of other meetings (i.e., Project Appraisal Committee meetings)
9. GEF Tracking Tools (from CEO Endorsement, midterm and terminal stages)
10. GEF/LDCF/SCCF Core Indicators (from PIF, CEO Endorsement, midterm and terminal stages); for GEF-6 and GEF-7 projects only
11. Financial data, including actual expenditures by project outcome, including management costs, and including documentation of any significant budget revisions.
12. Co-financing data with expected and actual contributions broken down by type of co-financing, source, and whether the contribution is considered as investment mobilized or recurring expenditures.
13. Audit reports.
14. Electronic copies of project outputs (booklets, manuals, technical reports, articles, etc.)
15. Sample of project communications materials
16. Summary list of formal meetings, workshops, etc. held, with date, location, topic, and number of participants.
17. Minutes of meetings and workshop reports covering key meetings by the project
18. Market survey reports
19. All decrees and regulations produced during the project implementation.
20. Tutorial videos on the performance test
21. Lamp waste management study report
22. MoUs signed by the project.

Annex 3: Evaluation Question Matrix

Evaluation matrix is important to identifying the key evaluation questions and how they will be answered through the selected methods. The evaluation matrix is a tool that evaluators create as a map and reference in planning and conducting an evaluation. It also serves as a useful tool for summarizing and visually presenting the evaluation design and methodology for discussions with stakeholders. It details evaluation questions that the evaluation will answer, data sources, data collection and analysis tools or methods appropriate for each data source, and the standard or measure by which each question will be evaluated.

Table 13: Evaluation Matrix

Evaluative Criteria Questions	Indicators/evidence	Sources	Methodology
Relevance: How does the project relate to the main objectives of the GEF Focal area, and to the environment and development priorities at the national level?			
- To what extent was the project in line with GEF focal area, UNDP CPD, UNSDCF, Indonesia's Nationally Determined Contribution (NDC)?	- Level of alignment of project's activities with relevant stakeholders' plans - Stakeholders' perceptions on the relevance of project's activities to their needs - Degree of involvement and inclusiveness of beneficiaries and stakeholders in project design and implementation	- project documentations. - national policies or strategies, project websites - Project stakeholders feedback	- Desk review. - Stakeholders' interviews
- To what extent was the theory of change applied in the project relevant to promoting investment in energy efficient lighting	- Degree of coherence of the project design in terms of theory of change, components, choice of partners, structure, delivery mechanism, scope, budget, use of resources, etc.	- project documentations. - Project stakeholders feedback	- Desk review. - Stakeholders' interviews
- Are the project objectives and outputs clear, practical and feasible within its frame? Do they clearly address target groups?	- Level of coherence between programme design and project implementation approach - Identification of the problem and its causes in the project being addressed?	- project documentations. - Project stakeholders feedback	- Desk review. - Stakeholders' interviews
- To what extent were lessons learned from other relevant projects considered in the design?	- Degree to which other projects are referenced in the project design with lessons identified and built upon	- project documentations. - Project stakeholders feedback	- Desk review. - Stakeholders' interviews

- To what extent does the Project create synergy/linkages with other projects and interventions in the country?	- Project's strategic partnerships and complementarities with other projects	- project documentations. - Project stakeholders feedback	- Desk review. - Stakeholders' interviews
- To what extent was this Project designed as rights based and gender sensitive?	- Degree to which the project design identifies and address gender and human rights issues. - Existence of gender actions plan	- project documentations. - Project stakeholders feedback	- Desk review. - Stakeholders' interviews
Effectiveness: To what extent have the expected outcomes and objectives of the project been achieved?			
- To what extent did the Project contribute to the attainment of the development of outputs and outcomes initially expected/stipulated in the Project Document's logical framework until the end of the project duration?	- Delivery on project targets defined in the PRF. - Stakeholder feedback on the delivery and most significant achievements	- project documentations (PIRs) - Progress reports - Project deliverables - Project stakeholders feedback	- Desk review. - Stakeholders' interviews
- To what extent has the UNDP partnership strategy been appropriate and effective?	- Partners feedback - Evidence on co-design and co-delivery of project activities	- project documentations (PIRs) - Progress reports - Project deliverables - Project stakeholders feedback	- Desk review. - Stakeholders' interviews
- In which areas does the project have the greatest achievements? Why and what have been the supporting factors? How can the project build on or expand these achievements?	- Evidence of success factors - Stakeholders feedback on the upscaling potential	- project documentations (PIRs) - Progress reports - Project deliverables - Project stakeholders feedback	- Desk review. - Stakeholders' interviews
- In which areas does the project have the fewest achievements?	- Stakeholders' perceptions on the constraints	- project documentations (PIRs) - Progress reports	- Desk review. - Stakeholders' interviews

What have been the constraining factors and why? How can or could they be overcome?		- Project deliverables - Project stakeholders feedback	
- To what extent are project management and implementation participatory, and is this participation of target groups/stakeholders contributing towards achievement of the project objectives?	- Stakeholders feedback on the effectiveness of their participation - Number, and type, of engagements with stakeholders. - Extent to which stakeholders are aware of the project and its activities	- project documentations (PIRs) - Progress reports - Project deliverables - Project stakeholders feedback	- Desk review. - Stakeholders' interviews
- To what extent has the project been appropriately responsive to the needs of the target groups and changing partner priorities?	- Stakeholders feedback on the extent to which their needs are addressed. - Documented adaptive management actions to accommodate the changing priorities.	- project documentations (PIRs) - Progress reports - Project deliverables - Project stakeholders feedback	- Desk review. - Stakeholders' interviews
- Did Covid-19 measures have a positive or negative effect on the achievement of Project results?	- Documented implications of the COVID 19 - Documented delays that are directly attributed to the COVID 19 - Changes to project results as a result of the COVID 19.	- project documentations (PIRs) - Progress reports - Project deliverables - Project stakeholders feedback	- Desk review. - Stakeholders' interviews
Efficiency: Was the project implemented efficiently, in line with international and national norms and standards?			
- How well did Project Management work for achievement of results?	- Extent to which project targets are met. - Stakeholders feedback on the effectiveness of the project management - Effectiveness of the M&E functions - Frequency and effectiveness of the board in decision making and strategic guidance	- project documentations (PIRs) - board MoM - Progress reports - Project deliverables - Project stakeholders feedback	- Desk review. - Stakeholders' interviews

- To what extent has there been an economical use of financial and human resources? Have resources (funds, staff, time, expertise, etc.) been allocated strategically and cost-effectively to achieve outcomes?	- Cost in view of results achieved compared to costs of similar projects from other organizations. - Project team feedback -	- project documentations (PIRs) - board MoM - Progress reports - Project deliverables - Project stakeholders feedback	- Desk review. - Stakeholders' interviews
- To what extent have project funds and activities been delivered in a timely manner?	- Level of discrepancy between planned and utilized financial expenditures. - Planned vs. actual funds leveraged. - Timeliness of activities delivery - Co-financing data and evidence - Level of cash and in-kind co-financing relative to expected level	- project documentations. - risk/issue register. - PIRs - Project stakeholders feedback	- Desk review. - Stakeholders' interviews
- To what extent do the M&E systems utilized by UNDP ensure effective and efficient project management?	- Existence, quality and use of M&E, feedback and dissemination mechanism to share findings, lessons learned and recommendation. - Quality of M&E at the design stage - Quality of M&E throughout the implementation - Adequacy of the M&E budget - Alignment of M&E to the GEF requirements - Response to the MTR findings	- project documentations (PIRs) - board MoM - Progress reports - Project deliverables - Project stakeholders feedback	- Desk review. - Stakeholders' interviews
- To what extent was there any identified synergy between UNDP initiatives/projects that contributed to reducing costs while supporting results?	- Linkages with the UNDP energy portfolio in the country - Documented cooperation and complementarities	- project documentations (PIRs) - board MoM - Progress reports - Project deliverables - Project stakeholders feedback	- Desk review. - Stakeholders' interviews
Sustainability: To what extent are there financial, institutional, socio-political, and/or environmental risks to sustaining long-term project results?			

To what extent will target stakeholders benefit from the project interventions in the long-term?	Stakeholders feedback on the long-term benefits Level of ownership of the project benefits by the stakeholders Existence of financial and institutional settings to support long term benefits.	project documentations (PIRs) Risk log. Progress reports Project deliverables Project stakeholders feedback	Desk review. Stakeholders' interviews
Are there any political or financial risks that may jeopardize sustainability of project results?	Evidence of commitments from government or other stakeholder to financially support relevant sectors of activities after project end. Level of recurrent costs after completion of project and funding sources for those recurrent costs	project documentations (PIRs) Risk log. Progress reports Project deliverables Project stakeholders feedback	Desk review. Stakeholders' interviews
Are the legal frameworks, policies and governance structures and processes in place for sustaining Project benefits?	Efforts to support the development of relevant policies at the country level.	project documentations (PIRs) Risk log. Progress reports Project deliverables Project stakeholders feedback	Desk review. Stakeholders' interviews
To what extent have development partners committed to providing continuing support? What is the risk that the level of stakeholder ownership will be insufficient to allow for the Project outcomes/benefits to be sustained?	Level of project stakeholders' ownership Evidence of commitments from government or other stakeholder to financially support relevant sectors of activities after project end. Level of capacities at the country level to continue delivering on the project results.	project documentations (PIRs) Risk log. Progress reports Project deliverables Project stakeholders feedback	Desk review. Stakeholders' interviews
To what extent does this UNDP intervention have a well-designed and well-planned exit strategy?	Exit strategy in place and actively operationalisation	project documentations (PIRs) Risk log. Progress reports Project deliverables	Desk review. Stakeholders' interviews

		- Project stakeholders feedback	
Cross-cutting issues and gender equality and women's empowerment: How did the project contribute to gender equality and women's empowerment?			
- To what extent have gender equality and the empowerment of women been addressed in the design, implementation and monitoring of the project?	- Extent to which programme products are sensitive to gender. - Extent to which project data are sex-disaggregated. - Existence of logical linkages between gender results and project outcomes and impacts	- project documentations. - Project stakeholders feedback - List of project participants	- Desk review. - Stakeholders' interviews
- Is the gender marker assigned to this project representative of reality?	- Existence of gender marker	- project documentations.	- Desk review.
- **Impact: Are there indications that the project has contributed to, or enabled progress toward reduced environmental stress and/or improved ecological status?**			
- To what extent has the project provided an enabling environment and basis for deployment of energy efficient lights?	- Elements in place in those different management functions, at appropriate levels in terms of adequate structures, strategies, systems, skills, incentives and interrelationships with other key actors - Evidence/Quality of steps taken to create an enabling environment and sustainability. - Degree to which project activities and results have been taken over by local counterparts	- project documentations. - PIRs - Project stakeholders feedback	- Desk review. - Stakeholders' interviews
- To what extent has the project established a sustainable financing mechanism for energy efficient lighting?	- Effectiveness of the financing mechanism - Stakeholders feedback the financing mechanism. - Evidence on new financing mechanisms	- project documentations. - PIRs - Project stakeholders feedback	- Desk review. - Stakeholders' interviews

Annex 4: Interview questions

It should be noted that below interview questions have been used as a guide in the interviews, however, each individual interview is unique, and questions have been tailored to the interviewees' roles and perspectives. In addition, follow up questions have been asked based on the responses to obtain a full story from each response.

Introductory question

Could you please introduce yourself and explain your involvement and the role of your organization/agency in the ADLIGHT project?

Effectiveness

1) In your opinion, what has been the greatest achievement in the ADLIGHT project to date? And why?
2) What were the challenges in delivering the ADLIGHT project? How could we overcome these challenges?
3) What factors have contributed to achieving intended ADLIGHT outputs and outcomes?
4) What worked so well and what didn't work so well? And why?

Impacts

5) What sort of impacts did the ADLIGHT project have to its stakeholders?
6) What trends do you foresee in the implementing EE measures in lighting in Indonesia?

Relevance

7) In your opinion, to what degree the ADLIGHT project activities are aligned to the needs of the participating stakeholders?
8) In your opinion, to what degree the ADLIGHT project activities are aligned with the strategic plans and strategies of the participating stakeholders?

Efficiency

9) In your opinion, has the ADLIGHT project been delivered on time and on budget? Has there been anything underachieved or overachieved within the agreed framework of the ADLIGHT project, and what are the reasons/explanation for it?
10) In what ways has the ADLIGHT project been adaptive to emerging issues and opportunities? Examples?

Sustainability

11) Do you foresee any social, financial or political risks that may jeopardize sustainability of the ADLIGHT project outputs and outcomes?
12) What would happen to the ADLIGHT project output and benefits when the GEF funding finishes?
13) Going forward, how do you see the capacity of participating stakeholders to pursue delivering ADLIGHT related outcomes?
14) What lessons have been learnt for the ADLIGHT project in achieving outcomes?

Closing

- In what ways gender has been mainstreamed in the project? Do you have any gender-related concerns?
- Anything else you would like to add that we haven't covered?

Thank you for your kind participation!

Annex 5 TE Mission itinerary and agenda

Day/date	Location
Friday 1 March	Arrival to Indonesia
Saturday 2nd March – Morning	Depart to Jogja
Saturday 2nd March – Afternoon	Visit RSUP: Soeradji Tirtonegoro, Wonosobo
Saturday 2nd March – evening	Visit APJ om Wonosobo District
Sunday 3rd March – Morning	Wonosobo filed visit
Sunday 3rd March – Evening	Meeting with local government, Wonosobo Depart to Semarang
Monday 4th March – Morning	Meeting with local government, Central Java
Monday 4th March – Afternoon	Travel to Jakarta
Tuesday 5th March	Meetings with stakeholders in Jakarta
Wednesday 6th March	
Thursday 7th March	
Friday 8th March – morning	Visit factory, Bogor. Field visit - Moradon
Friday 8th March – evening @ 7.00 pm	Departure

Annex 6: TE Rating scales

Evaluation criteria and ratings: The standard evaluation criteria according to UNDP/GEF evaluation policy are Relevance, Impact, Effectiveness, Efficiency and Sustainability. The different scales for rating various criteria are shown in the tables below.

Table 14: TE Rating Scales & Evaluation Ratings Table

TE Rating Scales	
Ratings for Outcomes, Effectiveness, Efficiency, M&E, Implementation/Oversight, Execution, Relevance	**Sustainability ratings:**
6 = Highly Satisfactory (HS): exceeds expectations and/or no shortcomings 5 = Satisfactory (S): meets expectations and/or no or minor shortcomings 4 = Moderately Satisfactory (MS): more or less meets expectations and/or some shortcomings 3 = Moderately Unsatisfactory (MU): somewhat below expectations and/or significant shortcomings 2 = Unsatisfactory (U): substantially below expectations and/or major shortcomings 1 = Highly Unsatisfactory (HU): severe shortcomings Unable to Assess (U/A): available information does not allow an assessment.	4 = Likely (L): negligible risks to sustainability 3 = Moderately Likely (ML): moderate risks to sustainability 2 = Moderately Unlikely (MU): significant risks to sustainability 1 = Unlikely (U): severe risks to sustainability Unable to Assess (U/A): Unable to assess the expected incidence and magnitude of risks to sustainability.

Annex 7: list of persons consulted

Stakeholders and beneficiaries engaged:

1. Mr Kemaludin SKM, MPH, Head of Organization and General Division, RSUP Soeradji Tirtonegoro, Klaten District
2. Mr Agus Susanto, S.H., M.M, Head of Settlements and Transportation Agency, Wonosobo District
3. Mrs Rini Kaswigatini, SE, Administration Assistance of Provincial Secretary, Central Java Province
4. Mr Revantino, Department of Materials Technology Material (Balai Besar Bahan dan Barang Teknik), Ministry of Industry
5. Mr. Nasrulah Salim, Mr Dion, Mr Edi Sartono, Mrs. Amanda, Mr Ari Prasutiyawan, Mrs. Zahra, PMU ADLIGHT
6. Mr. Hendro, Ministry of Transportation
7. Mrs. Dwi Rahayu Eka Setyowati, Mrs. Hajeng Hayu Wandira, National Procurement Agency

8. Mr. Gigih Udi Atmo, S.T., M.EPM., PH.D, Director of Energy Conservation, MOEM
9. Mr. Febriantino Nugroho, National Standardization Agency
10. Mr. Sudhir Sarma, GEF Task Manager Asia Pacific and OIC GCF Portfolio Manager GEF Climate Change Mitigation Unit Climate Change Division, UNEP
11. Mrs. Verania Andria, Mrs. Budi Ayu, UNDP
12. Mr. Yefrinaldi M.M, Head of Settlements and Transportation Agency, Dharmasraya District
13. Mr. Endah Martiningrum, S.E, A.k, Mrs. Siti Rahmawati, Mr. Zahron, Ministry of Finance
14. Mr. Heru Riando, Marketing Manager PT Honoris Industry, Bogor District
15. Mr. Andrew Trisno, Marketing Manager PT MORADON, Tangerang

Annex 8: Signed UNEG Code of Conduct form

Independence entails the ability to evaluate without undue influence or pressure by any party (including the hiring unit) and providing evaluators with free access to information on the evaluation subject. Independence provides legitimacy to and ensures an objective perspective on evaluations. An independent evaluation reduces the potential for conflicts of interest which might arise with self-reported ratings by those involved in the management of the project being evaluated. Independence is one of ten general principles for evaluations (together with internationally agreed principles, goals, and targets: utility, credibility, impartiality, ethics, transparency, human rights and gender equality, national evaluation capacities, and professionalism).

Evaluators/Consultants:

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 imitations, 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 and did not carry out the project's Mid-Term Review.

Evaluation Consultant Agreement Form

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

Name of Evaluator: Mohammad Alatoom

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 (Place) on 29 March 2024

Signature: DocuSigned by: Mohammad Alatoom D947CE9700A4427...

Name of Evaluator: Chitra Retna Septyandrica

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 (Place) on 29 March 2024

Signature: DocuSigned by: 0116E114C3E64D3...

Annex 9: Signed TE Report Clearance form

Terminal Evaluation Report for Terminal Evaluation of UNDP/GEF 'Advancing Indonesia's Lighting Market to High-Efficient Technologies' (ADLIGHT Project). Reviewed and Cleared By:

Commissioning Unit (M&E Focal Point) – Management Performance Oversight Unit

Name: Ari Pratama

Signature: DocuSigned by: A9E92855636D444... Date: 29-Apr-2024

Regional Technical Advisor (Nature, Climate and Energy)

Name: Bahtiyar Kurt

Signature: DocuSigned by: 8CD90396275549F... Date: 29-Apr-2024

Officer-in-Charge, UNDP

Name: Sujala Pant

Signature: DocuSigned by: Sujala Pant 04186D9E3AB9435... Date: 29-Apr-2024

ANNEX 10: CONFIRMED SOURCES OF CO-FINANCING FOR THE PROJECT BY NAME AND BY TYPE

PLEASE COMPLETE FOR ALL PROJECTS AT MTR AND TE STAGES

Please include evidence for co-financing for the project with this form (please add rows as necessary)

Sources of Co-financing	Name of Co-financier	Type of Co-financing	Investment Mobilized	Amount ($)
Government	MEMR	In-kind	Recurrent expenditures	155,605
Government	MEMR	Cash	Recurrent expenditures	55,172,413
Government	MEMR (P3TEK, R & D Dept)	In-kind and Cash (for lab)	Recurrent expenditures	4,167,300
Private Sector	Indonesian Lighting Manufactures Association - GAMATRINDO	Cash	Investment mobilized	2,800,000
Private Sector	Indonesian Lighting Manufactures Association - APERLINDO	Equity	Investment mobilized	1,892,857
Private Sector	Solarens (local LED manufacture)	Equity	Investment mobilized	3,565,857
Private Sector	Solarens (local LED manufacture)	Cash	Investment mobilized	7,809,879
Implementing Agency	UNDP	In-kind		84,193
Total Co-financing				75,647,354*

*the total co-finance target has been exceeded. The project reported a total of USD 75,648,104 of secured co-finance by the TE stage, this brings the total project cost to USD $79,648,104 (assuming full consumption of GEF resources). Co-financing has largely come from MEMR contributions through parallel programs and investments in the laboratory settings, and the second largest contribution comes from the private sector, particularly investment by local manufacturers made in meeting the new MEPS. Co-financing has generally been well-documented through official letters from the co-financing agencies.

ANNEX 11 Core Indicators

GEF-8 Results Measurement Framework Worksheet

Please complete relevant indicators and provide justifications in the textbox at the bottom.

GEF ID:	9493
Agency ID:	5721
Reported by:	ADLIGHT PMU
Date:	March 2024

Table of Contents

CONSERVING & SUSTAINABLY USING BIODIVERSITY

Core Indicator 1 — **Terrestrial protected areas created or under improved management**

	TOTAL HECTARES (1.1 + 1.2)			
	Expected		Achieved	
	PIF Stage	Endorsement	MTR	TE
	-	-	-	-

Indicator 1.1 — **Terrestrial protected areas newly created**

Name of Protected Area	WDPA ID	IUCN Category *(please select from the dropdown list)*	Expected *(hectares)*		Achieved *(hectares)*	
			PIF Stage	Endorsement	MTR	TE
		<pls select>				
		<pls select>				
		<pls select>				
		Sum >>>	-	-	-	-

Indicator 1.2 — **Terrestrial protected areas under improved management effectiveness**

Name of Protected Area	WDPA ID	IUCN Category *(please select from the dropdown list)*	Hectares				METT Score			
			Baseline		Achieved		Baseline		Achieved	
			PIF Stage	Endorsement	MTR	TE	PIF Stage	Endorsement	MTR	TE
		<pls select>								
		<pls select>								
		<pls select>								
		Sum >>>	-	-	-	-	-	-	-	-

Core Indicator 2 — **Marine protected areas created or under improved management**

	Total Hectares (2.1 + 2.2)			
	Expected		Achieved	
	PIF Stage	Endorsement	MTR	TE
	-	-	-	-

Indicator 2.1 — **Marine protected areas newly created**

Name of Protected Area	WDPA ID	IUCN Category *(please select from the dropdown list)*	Expected *(hectares)*		Achieved *(hectares)*	
			PIF Stage	Endorsement	MTR	TE
		<pls select>				
		<pls select>				
		<pls select>				
		Sum >>>	-	-	-	-

Indicator 2.2 — **Marine protected areas under improved management effectiveness**

Name of Protected Area	WDPA ID	IUCN Category *(please select from the dropdown list)*	Hectares				METT Score			
			Baseline		Achieved		Baseline		Achieved	
			PIF Stage	Endorsement	MTR	TE	PIF Stage	Endorsement	MTR	TE
		<pls select>								
		<pls select>								
		<pls select>								
		Sum >>>	-	-	-	-	-	-	-	-

Core Indicator 4 — **Area of landscapes under improved practices**

Note: The sub-indicator 'Area of landscapes under sustainable land management in production systems' is available under the group of indicators titled 'Sustainably managing and restoring land'

	TOTAL HECTARES (4.1 + 4.2 + 4.3 + 4.4)			
	Expected		Achieved	
	PIF Stage	Endorsement	MTR	TE
	-	-	-	-

Indicator 4.1 — **Area of landscapes under improved management to benefit biodiversity**

	Expected *(hectares)*		Achieved *(hectares)*	
	PIF Stage	Endorsement	MTR	TE
Sum >>>	-	-	-	-

Indicator 4.2 — **Area of landscapes under third-party certification incorporating biodiversity considerations**

Third party certification(s):	Expected *(hectares)*		Achieved *(hectares)*	
	PIF Stage	Endorsement	MTR	TE
Sum >>>	-	-	-	-

Indicator 4.4 — **Area of High Conservation Value Forest (HCVF) or other forest loss avoided (please select the drop-down menu)**

Indicate the names and areas of forests targeted. A counterfactual is needed to estimate the loss avoided, such as against the baseline or to the "business as usual" scenario. In the case of HCVF, Agencies should justify how forests met one or more of the High Conservation Value criteria if the forest has yet to be recognized by the related network.	Expected *(hectares)*		Achieved *(hectares)*	
	PIF Stage	Endorsement	MTR	TE
<pls select>				
Sum >>>	-	-	-	-

Indicator 4.5 — **Terrestrial OECMs supported**

Name of OECM	WDPA ID	Expected *(hectares)*		Achieved *(hectares)*	
		PIF Stage	Endorsement	MTR	TE
	Sum >>>	-	-	-	-

Core Indicator 5 — **Area of marine habitat under improved practices to benefit biodiversity**

Indicator 5.1 — **Fisheries under third-party certification that incorporates biodiversity considerations**

Third party certification(s):	Expected *(number)*		Achieved *(number)*	
	PIF Stage	Endorsement	MTR	TE

Indicator 5.4 — **Marine OECMs supported**

Name of OECM	WDPA ID	Expected *(hectares)*		Achieved *(hectares)*	
		PIF Stage	Endorsement	MTR	TE
	Sum >>>	-	-	-	-

SUSTAINABLY MANAGING AND RESTORING LAND

Core Indicator 3 — **Area of land and ecosystems under restoration**

	TOTAL HECTARES (3.1 + 3.2 + 3.3 + 3.4)			
	Expected		Achieved	
	PIF Stage	Endorsement	MTR	TE
	-	-	-	-

Indicator 3.1 — **Area of degraded agricultural lands under restoration (choose from drop-down menu)**

	Expected *(hectares)*		Achieved *(hectares)*	
	PIF Stage	Endorsement	MTR	TE
<pls select>				
<pls select>				
Sum >>>	-	-	-	-

Indicator 3.2 — **Area of forest and forest land under restoration**

	Expected *(hectares)*		Achieved *(hectares)*	
	PIF Stage	Endorsement	MTR	TE
Sum >>>	-	-	-	-

Indicator 3.3	Area of natural grass and woodlands under restoration (choose from drop-down menu)				
		Expected (hectares)		Achieved (hectares)	
		PIF Stage	Endorsement	MTR	TE
	<pls select>				
	<pls select>				
	Sum >>>	-	-	-	-

Indicator 3.4	Area of wetlands (including estuaries and mangroves) under restoration				
		Expected (hectares)		Achieved (hectares)	
		PIF Stage	Endorsement	MTR	TE
	Sum >>>	-	-	-	-

Indicator 4.3	Area of landscapes under sustainable land management in production systems				
		Expected (hectares)		Achieved (hectares)	
		PIF Stage	Endorsement	MTR	TE
	Sum >>>	-	-	-	-

REDUCING GHG EMISSIONS

Core Indicator 6	Greenhouse gas emission mitigated				
		Expected metric tons of CO2e (6.1 + 6.2)			
		PIF Stage	Endorsement	MTR	TE
	6.1 Greenhouse gas emission mitigated (direct+indirect) (6.1+6.2)	1,646,309.00	1,646,309.00	**0.00**	19,216,196.47
	6.1 Greenhouse gas emission mitigated in the AFOLU sector (direct+indirect) (6.5+6.6)	0.00	0.00	0.00	0.00
	6.2 Greenhouse gas emission mitigated outside AFOLU sector (direct+indirect) (6.7+6.8)	1,646,309.00	1,646,309.00	0.00	19,216,196.47

Indicator 6.5	Carbon sequestered or emissions avoided in the sector of Agriculture, Forestry, and Other Land Use (direct)					
	Anticipated start year of accounting		Expected (metric tons of CO2e)		Achieved (metric tons of CO2e)	
	Duration of accounting		PIF Stage	Endorsement	MTR	TE
			N/A			

Indicator 6.6	Carbon sequestered or emissions avoided in the sector of Agriculture, Forestry, and Other Land Use (indirect)					
	Anticipated start year of accounting		Expected (metric tons of CO2e)		Achieved (metric tons of CO2e)	
	Duration of accounting		PIF Stage	Endorsement	MTR	TE

Indicator 6.7	Emissions avoided outside AFOLU sector (direct)					
	Anticipated start year of accounting	2023	Expected (metric tons of CO2e)		Achieved (metric tons of CO2e)	
	Duration of accounting		PIF Stage	Endorsement	MTR	TE
			N/A	548,776.00	0.00	693,810.00

Indicator 6.8	Emissions avoided outside AFOLU sector (indirect)					
	Anticipated start year of accounting	2023	Expected (metric tons of CO2e)		Achieved (metric tons of CO2e)	
	Duration of accounting		PIF Stage	Endorsement	MTR	TE
				1,097,533.00	0.00	18,522,386.47

Indicator 6.3	Energy saved (in megajoule)				
		Expected (megajoule)		Achieved (megajoule)	
		PIF Stage	Endorsement	MTR	TE
	Cumulative electricity savings by EOP	N/A	278,820,000.00	0.00	267,588,000.0

Indicator 6.4	Increase in installed renewable energy capacity per technology *(in MW)*				
	Technology	Expected (Capacity - MW)		Achieved (Capacity - MW)	
	(please select from the dropdown list)	PIF Stage	Endorsement	MTR	TE
	Biomass,geothermal, ocean, small hydro, solar photovoltaic, solar thermal, wind power, and storage	N/A			
	<pls select>				

Indicator 6.8 Indirect CO2 has been calculated based on actual sales data from producers, this represents replacement of LED that happens in market (effect of customer's behaviour changes) associated with the number of sales.

STRENGTHENING TRANSBOUNDARY WATER MANAGEMENT

Core Indicator 7	Shared water ecosystems under new or improved cooperative management				
		Number			
		PIF Stage	Endorsement	MTR	TE

Indicator 7.1	Level of Transboundary Diagnostic Analysis and Strategic Action Program (TDA/SAP) formulation and implementation				
		Rating (Scale 1-4)			
		PIF Stage	Endorsement	MTR	TE
		<pls select>	*<pls select>*	*<pls select>*	*<pls select>*
		<pls select>	*<pls select>*	*<pls select>*	*<pls select>*

Indicator 7.2	Level of Regional Legal Agreements and Regional Management Institutions to support its implementation				
		Rating (Scale 1-4)			
		PIF Stage	Endorsement	MTR	TE
		<pls select>	*<pls select>*	*<pls select>*	*<pls select>*
		<pls select>	*<pls select>*	*<pls select>*	*<pls select>*

Indicator 7.3	Level of National/Local reforms and active participation of Inter-Ministerial Committees				
		Rating (Scale 1-4)			
		PIF Stage	Endorsement	MTR	TE
		<pls select>	*<pls select>*	*<pls select>*	*<pls select>*
		<pls select>	*<pls select>*	*<pls select>*	*<pls select>*

Indicator 7.4	Level of engagement in IW: LEARN through participation and delivery of key products				
		Rating (Scale 1-4)			
		PIF Stage	Endorsement	MTR	TE
		<pls select>	*<pls select>*	*<pls select>*	*<pls select>*
		<pls select>	*<pls select>*	*<pls select>*	*<pls select>*

Core Indicator 8	Globally over-exploited marine fisheries moved to more sustainable levels				
Fishery Details: Include here the name of the fishery targeted, the source for the estimate of tonnage, and the initial justification for considering the fishery to be overexploited.		Metric Tons			
		PIF Stage	Endorsement	MTR	TE

Indicator 5.2	Large marine ecosystems with reduced pollution and hypoxia				
Indicate here the names of the LMEs, as well as the type and extent (qualitative or quantitative) of pollution reduction achieved through policy and infrastructure investments to address point and non-point sources.		Expected		Achieved	
		PIF Stage	Endorsement	MTR	TE

REDUCING CHEMICALS AND WASTE

Core Indicator 9	Chemicals of global concern and their waste reduced				
		Metric Tons (9.1 + 9.2 + 9.3+9.7)			
		Expected (metric tons)		Achieved (metric tons)	
		PIF Stage	Endorsement	MTR	TE
		-	-	-	-

Indicator 9.1	Persistent Organic Pollutants (POPs) removed or disposed (POPs type) *(in metric tons)*				
POPs Type to choose from:		Expected (metric tons)		Achieved (metric tons)	
		PIF Stage	Endorsement	MTR	TE
<pls select>					
<pls select>					
<pls select>					
	Sum >>>	-	-	-	-

Indicator 9.2	Quantity of mercury reduced				
		Expected (metric tons)		Achieved (metric tons)	
		PIF Stage	Endorsement	MTR	TE

Indicator 9.3	Hydrochlorofluorocarbons reduced/phased out				
Provide information by HCFC, such as HCFC22, HCFC-141b, HCFC-142b, HCFC-123, HCFC-124, HCFC-225ca and 225cb, and HCFC-21.		Expected		Achieved	
		PIF Stage	Endorsement	MTR	TE

Indicator 9.4	Countries with legislation and policy implemented to control chemicals and waste	
		Number of Countries

		Expected		Achieved	
		PIF Stage	Endorsement	MTR	TE
Indicator 9.5	**Low-chemical/non-chemical systems implemented particularly in food production, manufacturing and cities**				
	Technology used to be listed here:	Expected *(number)*		Achieved *(number)*	
		PIF Stage	Endorsement	MTR	TE
Indicator 9.6	**POPs/Mercury containing materials and products directly avoided (in metric tons)**				
		Expected *(metric tons)*		Achieved *(metric tons)*	
		PIF Stage	Endorsement	MTR	TE
Indicator 9.7	**Highly Hazardous Pesticides eliminated**				
		Expected *(metric tons)*		Achieved *(metric tons)*	
		PIF Stage	Endorsement	MTR	TE
Indicator 9.8	**Avoided residual plastic waste**				
		Expected *(metric tons)*		Achieved *(metric tons)*	
		PIF Stage	Endorsement	MTR	TE
Core Indicator 10	**Persistent organic pollutants to air reduced**				
		Expected *(grams of toxic equivalent)*		Achieved (grams of toxic equivalent)	
		PIF Stage	Endorsement	MTR	TE
Indicator 10.1	**Countries with legislation and policy implemented to control emissions of POPs to air**				
		Number of Countries			
		Expected		Achieved	
		PIF Stage	Endorsement	MTR	TE
Indicator 10.2	**Emission control technologies/practices implemented**				
		Number			
		Expected		Achieved	
		PIF Stage	Endorsement	MTR	TE

CROSS-CUTTING STRATEGIC AREAS						
Core Indicator 11	**People benefiting from GEF-financed investments**					
			Number			
			Expected		Achieved	
			PIF Stage	Endorsement	MTR	TE
		Female	N/A	60.00	829.00	4,232.00
		Male		140.00	1,775.00	2,245.00
		Total	**#VALUE!**	**200.00**	**2,604.00**	**6,477.00**

COMMENTS (explain the methodological approach and underlying logic to justify target levels for Core and Sub-Indicators):
<type here>