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## **United Nations Development Programme**

**Government of Timor-Leste**

### **[Informal] Mid-Term Review of UNDP/GEF Project: Promoting Sustainable Bio-energy Production from Biomass (SBEPB) in Timor-Leste**

(GEF Project ID: 4344; UNDP PIMS ID: 4250)

**August 2019**

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## SYNOPSIS

**Title of UNDP supported GEF financed project:** Promoting Sustainable Bio-energy Production from Biomass

**UNDP Project ID:** PIMS 4250

**GEF Project ID:** 4344

**Evaluation time frame:** October 2014 to August 2019

**CEO endorsement date:** June 10, 2014

**Project implementation start date:** October 10, 2014

**Project end date:** March 26, 2020

**Date of evaluation report:** February, 2020

**Region and Countries included in the project:** Timor-Leste

**GEF Focal Area Objective:** Climate Change Mitigation Focal Area Strategic Program 1 CC-SP1: “Promoting Energy Efficiency in residential and commercial buildings”

**Implementing partner and other strategic partners:**

Implementing partner: UNDP Timor Leste

Strategic partner: Government of Timor-Leste, Electricidade de Timor Leste

**Mid-Term Review team members:** Milou Beerepoot, UNDP Regional Technical Specialist

**Acknowledgements:** This report is based on a one week mission to Dili, Timor Leste from 5 to 9 August 2019. During this week, the CO and the project team facilitated several interviews with all relevant stakeholders involved. This report could not have been developed without the great support from Alamgir Hossain (CTA UNDP), Ilidio Ximenes (project team) and Ermelinda Amaral (project team). The report also benefitted from discussions with Felisberta Moniz da silva (UNDP CO). More in general, the report benefitted from the time dedicated by all the persons that provided their opinions on the impact of this project during the one week mission in Timor Leste.

## EXECUTIVE SUMMARY

This report summarizes the findings of the [Informal] Midterm Review Mission conducted during the 5 to 9 August 2019 period for the UNDP-GEF Project entitled: “Promoting Sustainable Bio-energy Production from Biomass” (hereby referred to as the SBEPB Project or the Project), that received a US\$ 1,743,000 grant from the Global Environmental Facility (GEF) in October 2014.

## Project Information Table

Project Title:	Promoting Sustainable Bio-energy Production from Biomass			
GEF Project ID:	4344		<i>at endorsement</i> <i>(Million US\$)</i>	<i>at completion</i> <i>(Million US\$)</i>
UNDP Project ID:	4250	GEF financing:	1,743,000	0.00
Country:	Timor-Leste	IA/EA own:	770,000	0.0
Region:	Asia and the Pacific	Government:	4,200,000	0.0
Focal Area:	Climate Change	Other:	1,680,000	0.0
FA Objectives, (OP/SP):	Climate Change Mitigation Focal Area Strategic Program 1 CC-SP1: “Promoting Energy Efficiency in residential and commercial buildings”	Total co-financing:	6,650,000	0.00
Executing Agency:	United Nations Development Programme	Total Project Cost:	8,393,000	0.00
Other Partners involved:	Government of Timor-Leste, Electricidade de Timor Leste	ProDoc Signature (date project began):		October 10, 2014
		(Operational) Closing Date:	Proposed: Mar 26, 2020 (Extension request approved)	Actual: Mar 26, 2020

## Project Description

The goal of the Project is the reduction of GHG emissions through sustainable production and utilization of biomass energy in the country, and the promotion of innovative low-carbon biomass energy technologies.

Based on the above strategic considerations, the Project focuses on three major components as follows:

- **Component 1:** Policy and Institutional Support for Deployment and Commercialization of Advanced Bio-energy Technologies.
- **Component 2:** Bio-energy Investments Promotion - Sustainable Bio-energy Technology Demonstration & Market Development
- **Component 3:** Capacity Development and Market Transformation

Each of the above components will have specific activities that are designed to produce outputs leading to the following outcomes, respectively:

- **Outcome 1:** Implementation of strengthened enabling policies, legal and institutional framework for deployment of biomass energy technologies as well as the growth of biomass energy businesses in Timor-Leste.
- **Outcome 2:** Increased investments in bio-energy, development of a local supply chain and market for BETs, GHG emissions avoided from technology applications and investments.
- **Outcome 3:** Enhanced capacities of policy makers, financial institutions, entrepreneurs, project developers, communities and end-users on the development of the local BET market

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## Project Progress Summary

Overall progress of the SBEPB Project has been Moderately Satisfactory, also considering the challenges created by an instable political environment resulting in a temporarily non-functional government with e.g. a 1-year caretaker government at the time when elections could not be followed up with the creation of a coalition government. In addition, the project was designed at very high ambition levels, based on expected support from other UNDP projects. However, as the implementation date of the project was severely delayed, the related UNDP projects had already finished or finished in the first year of project implementation, resulting in the high ambitions (based on collaboration with other UNDP projects) not being feasible to materialize.

Indicators under Outcome 1 are particularly challenged by the complicated engagement with the GoTL where a renewable energy law was heavily supported by the project in organizing consultations throughout the country but approval of the decree law by the Council of Ministries is still pending after several year of discussions. Under Outcome 2, challenges in realizing indicators have particularly been faced with regard to the high ambitions in setting up financial instruments. The distribution of clean cookstoves under Outcome 2 is showing good achievements although subsidy levels are still as high as 80% which creates concerns for sustainability of the results of the project. In Outcome 3, satisfactory results are achieved in training entrepreneurs and technicians.

## MTR Ratings and Achievement Summary

**Table A: MTR Ratings & Achievement Summary Table for SBEPB Project in Timor Leste**

Measure	MTR Rating <sup>1</sup>	Achievement Description
<b>Project Strategy</b>	N/A	The Project Strategy has demonstrated to contain certain flaws as the project was designed at very high ambition levels, based on support from other UNDP projects. However, as the implementation date of the project was severely delayed, the related UNDP projects already finished or finished in the first year of project implementation, resulting in the high ambitions (based on collaboration with other UNDP projects) not being feasible to materialize. Also, the project LogFrame contains a very high number of indicators (28) while several indicators are overlapping.
<b>Progress Towards Results</b>	Goal Achievement Rating:	The goal achievement was not rated in the absence of GHG emission reduction data available.
	Objective Achievement Rating: 4	The objective achievement is rated as Moderately Satisfactory since the results in distribution of clean cookstoves and related reduction of non-sustainable fuel wood consumption has recently showing good rates of progress with the project being on track to achieve the end of project targets.
	Outcome 1 Achievement Rating: 3	The Outcome 1 achievement is rated as Moderately Unsatisfactory since a few crucial efforts under this Outcome have not yet delivered results. The development of the RE law was supported by the project but approval is still pending, although this may to a large extent correlate with by the political instability in the country. The setting up of a Biomass Energy Resource Information System (BERIS) was only about to start at the time of this review with only some 6 months of project implementation time remaining. This means that it is not clear if the BERIS will be finalised on time.
	Outcome 2 Achievement Rating: 4	The Outcome 2 achievement is rated as Moderately Satisfactory on the basis of the removal of Outcome 2.1. Distribution of clean cookstoves is on track to meet end of project targets but subsidy levels have not yet been reduced, against the project intention.
	Outcome 3 Achievement Rating: 5	The Outcome 3 achievement is rated as Satisfactory as the project at the time of review had achieved the end of project targets in number of trained people and enterprises.
<b>Project Implementation &amp; Adaptive Management</b>	Achievement rating: U/A	The project seems to be adaptively managed and implemented in a manner that is cost-effective. In the limited scope of this MTR mission, it was not possible to come to a complete evaluation on this aspect.
<b>Sustainability</b>	Sustainability rating: U/A	In the limited scope of this MTR mission, it was not possible to come to a complete evaluation and therefore the sustainability rating was limited to a qualitative analysis, see section 3.4.

## Conclusions

1. The project has picked up speed in implementation over the latest year of project implementation even though the project had a difficult start (with a 2-year delay between ProDoc signature and start of implementation) and was faced with a challenging political situation over the period 2017/2018. In particular the implementation of improved cookstoves

<sup>1</sup> Evaluation rating indices (except sustainability – see Footnote 2, and relevance – see Footnote 3): 6=*Highly Satisfactory (HS)*: The project has no shortcomings in the achievement of its objectives; 5=*Satisfactory (S)*: The project has minor shortcomings in the achievement of its objectives; 4=*Moderately Satisfactory (MS)*: The project has moderate shortcomings in the achievement of its objectives; 3=*Moderately Unsatisfactory (MU)*: The project has significant shortcomings in the achievement of its objectives; 2=*Unsatisfactory (U)* The project has major shortcomings in the achievement of its objectives; 1=*Highly Unsatisfactory (HU)*: The project has severe shortcomings in the achievement of its objectives.

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has substantially progressed, especially enhanced by the choice for an alternative distribution model where the NGO “middleman” was taken out and cookstove businesses themselves became responsible for their sales. This increased the sales of cookstoves and increased the confidence of stove manufacturers in enhancing their business profiles.

2. Other important achievements are the realization of local development plans in 10 Suco’s that include plans on biomass and clean cook stoves. One Suco managed to transform to 100% clean cook stoves and became a Model Suco for clean cook stove implementation. The project also introduced a model biogas plant that was very successful, and which created interest from the government to follow up with a biogas plant support program. Promotion campaigns on clean cook stoves concentrated on Community Radio channels, which have a very high penetration rate in rural areas (more than tv).
3. Specific challenges in the project progress relate to the pending approval of the RE decree law, which was strongly supported by the project, but which is still waiting for approval by the Council of Ministers. Even though there is a coalition government since elections in May 2018, the newly formed government is not very stable and very dependent on coalition partners approval.
4. Also, the BERIS (Biomass Energy Resource Information System) is still only starting to be developed and faced considerable delay in its commissioning of consultants to support this effort. Since the project is nearing its final phase of implementation, it is questionable if the BERIS system will be finalized on time while it is unlikely that it will be possible to monitor user satisfaction of the BERIS system in such short remaining time.
5. Another challenge is the sustainability of the results of the project since subsidy levels for clean cook stoves are still high at 80% of full cost price, whereas the project intention was to gradually reduce subsidy levels. As there is currently no indication of other sources being able to continue these subsidy levels, this raises concern for sustainability of project results after the project ends.
6. In terms of Monitoring and Reporting, the project has consistently completed the Project Implementation Review (PIR) for the years 2017 and 2018. There is room for improvement in reporting the GHG emission reduction though, as it is not clear how GHG emission reductions are being tracked.

## Recommendations

To improve project implementation and project sustainability, the following recommendations result from this MTR exercise:

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- Based on successful results after the project decided to discontinue collaboration with Mercy Corps, it would be even better if the project can continue this success and at the same time introduce signals that the market will change after the project ends.
  - It would be good if the project could stretch its implementation time and introduce one more round of subsidy to producers, this time at e.g. 50% level (instead of 80%). This way, producers can see the response from their customers on higher price levels (as they currently don't know what the market is willing to pay for stoves) and they can see a clear signal that things will change (as they now seem to count on continued high subsidies from whatever source). For this, it would be needed to continue the project implementation up to end of March 2020.
  - Another suggestion to enhance chances for sustainable results of the project would be if the project could support setting up an ICS producer industry association, e.g. suggesting structure (e.g. elected or rotating chair of the association) and set-up and initiating inauguration of the association. This may also be combined with a training for producers on alternative and/or innovative cook stove models (as brought up by one producer) to inspire and prepare for a changing future.
  - Discussions with the government, especially in the next board meeting, should focus on the approval of the RE law (and its relation to success rate of the project) and possibility to free up government budget (from the RE/biogas/solar programme?) for continuation of the ICS subsidy in one way or another (at lower levels, e.g. 50% for some time more and then further reduced). Perhaps the government could also be convinced to continue with the ICS Suco and introduce some kind of certification for such achievement. Please also note that the board meeting should approve the revised LogFrame.
  - With regard to the institutional cookstoves, it would be good if sustainability of the program could be discussed with the Ministry of Education and see if and how they could integrate clean cookstoves in their school feeding program.

To correct project design, a number of suggestions are being recommended to adjust the Project Results Framework target formulation as follows:

- In Component 1, leave out the indicator referring to PURE/SURE (this reference has never been explained in the ProDoc but probably refers to previous UNDP projects). Also revise policy referring to BET only towards broader RE policy.
- In Component 2, Remove the sub-outcome 2.1 in order to reduce number of indicators and to adjust against overstretched ambition without commitment of FIs at the project development stage and reduced UNDP TRAC resources dedicated to the project. Also, based on recommendation during Inception Phase, number of cookstoves deployed can be combined in one indicator (to reduce the number of indicators) and indicators under Outcome 2.3 that are duplications from indicators in other parts of the Logframe can be deleted.
- In Component 3, remove duplicating indicators in order to reduce the number of indicators.



To improve monitoring and evaluation of the project, the following is recommended:

- Come to a clear understanding of the GHG emission reduction targets as expected in the Project Goal as well as in the Tracking Tool and calculate savings both for End of Project targets (Project Goal) as well as for the Tracking Tool.

## ABBREVIATIONS

Acronym	Meaning
APR-PIR	Annual Project Report - Project Implementation Review
AWP	Annual Work Plan
CCM	Climate change mitigation
CO	UNDP Country Office
CO <sub>2</sub>	Carbon Dioxide
CP	Country Programme
CPAP	Country Programme Action Plan
CSO	Civil service organization
CTDC	Cook stove Testing and Development Centre
DIT	Dili Institute of Technology
EDTL	Electricidade de Timor-Leste
EOP	End of project
ER	Emission reduction
ESCO	Energy Service Company
GDP	Gross Domestic Product
GEF	Global Environment Facility
GHG	Green House Gas
GIS	Geographic Information System
GoTL	Government of Timor Leste
ICS	Improved Cookstove
kWh	kilowatt hour
LPG	Liquid petroleum gas
MCIE	Ministry of Commerce, Industry and Environment (former MED)
MAF	Ministry of Agriculture and Fisheries
MED	Ministry of Economy and Development (now MCIE)
MoF	Ministry of Finance
Mol	Ministry of Infrastructure (now MPW)
MPW	Ministry of Public Works (former Mol)
MJ	Megajoules
MoE	Ministry of Energy
MRV	Monitoring, reporting and verification
MTR	Mid Term Review
M&E	Monitoring and Evaluation
NDC	Nationally Determined Contributions
NGO	Non-governmental organization
NIM	National implementation modality
NPC	National Project Coordinator
NPD	National Project Director
PB	Project Board
PIMS	UNDP/GEF Project Information Management System
PMC	Project Management Committee
PMU	Project Management Unit
PPG	Project Preparatory Grant (GEF)
PRF	Project Results Framework
RE	Renewable energy
SMART	Specific, Measurable, Attainable, Relevant, Time-bound
SDG	Sustainable Development Goals

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<b>Acronym</b>	<b>Meaning</b>
tCO <sub>2</sub>	Tonne of Carbon Dioxide
TE	Terminal Evaluation
TOR	Terms of Reference
UN	United Nations
UNFCCC	UN Framework Convention on Climate Change
UNDP	UN Development Programme

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## 1. INTRODUCTION

1. This report summarizes the findings of the informal Midterm Review (MTR) Mission conducted in August 2019 for the UNDP-supported GEF-financed Project titled: “**Promoting Sustainable Bio-energy Production from Biomass” Project (SBEPB)**” (hereby referred to as the Biomass Project), that received a US\$ 1,743,000 grant from the Global Environmental Facility (GEF). The Project goal is to “to contribute to the reduction of greenhouse emissions through removal of barriers to sustainable production and utilization of biomass resources in Timor-Leste and application of biomass energy technologies to support local economic, environmental and social development”.

### 1.1 Purpose of the Mid-Term Review

2. In accordance with UNDP and GEF M&E policies and procedures, all full-sized UNDP-supported GEF-financed projects are required to undergo an MTR at the mid-point of implementation of a project to *provide a comprehensive and systematic account of the performance of an ongoing project by reviewing its design, process of implementation and achievements vis-à-vis GEF project objectives and any agreed changes during project implementation.* The Timor Leste Biomass project is a Medium Sized Project (MSP) and therefore does not have a mandatory requirement for an MTR. However, it was still considered very relevant to evaluate the results at mid-point of implementation. As such, the MTR for this Project serves to:

- assess signs of project success or failure with the goal of identifying the necessary changes to be made to set the Project on-track to achieve its intended results;
- strengthen the adaptive management and monitoring functions of the Project;
- enhance the likelihood of achievement of Project and GEF objectives through analyzing Project strengths and weaknesses and suggesting measures for improvement;
- enable informed decision-making;
- create the basis for replication of successful Project outcomes achieved to date;
- identify and validate proposed changes to the ProDoc to ensure achievement of all Project objectives; and
- assess whether it is possible to achieve the objectives in the given timeframe, taking into consideration the pace at which the Project is proceeding.

3. This informal MTR may not fulfill all requirements of UNDP-GEF for conducting an independent project review but still tried to follow as much of the UNDP-GEF guidance as possible.

### 1.2 Scope and Methodology

4. The scope of the MTR covers the entire GEF-financed, UNDP-executed Biomass Project and its components as well as the co-financed components of the Project. This MTR assesses 48 months of Project progress (first 18 months were needed to set up the project management unit so effectively 30 months of Project progress), achievements and implementation taking into account the status of Project activities, outputs up to August 9, 2019. The MTR also reports on the progress against objective, outcome, output, activity (including sub-activities) and impact indicators listed in the latest Project Results Framework (PRF) as provided in Appendix D as to how these outcomes and outputs

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will be achieved within the Project duration (up to March 22, 2020). The MTR report concludes with recommendations, as appropriate, for the key stakeholders of the Project. The MTR will be approached through the criteria of *relevance*, *effectiveness*, *efficiency*, *sustainability*, and *impact*, as defined and explained in the UNDP “Guidance for Conducting Midterm Reviews of UNDP-supported, GEF-financed Projects”, and the GEF M&E policy.

5. The methodology adopted for this MTR includes:

- Review of Project documentation (e.g. APR/PIRs, project output reports) and background information;
- Interviews with key stakeholders involved in the project.
- Field visits to selected Project sites.

A detailed itinerary of the Mission is shown in Appendix A. An overview of interview results is given in Appendix B.

6. The Project was reviewed in the context of:

- *Project strategy*: This includes an analysis of the Biomass Project design (and Project Results Framework or PRF) as outlined in the ProDoc to identify if the strategy is effective in achieving the desired outcomes;
- *Progress towards results*: This is to include information provided from, amongst others, Project work plans, Project implementation reports (PIRs), relevant Project reports and information provided from various Project stakeholders;
- *Project implementation and adaptive management*: This would be an assessment of the quality of support to the Project from UNDP as well as the main Implementing Partner of the Project, the Electricidade de Timor Leste (EDTL). Assessment parameters would include management arrangements, work planning, finance and co-finance, Project level monitoring and evaluation systems, stakeholder engagement, reporting and communications.
- *Sustainability*: The likely ability of an intervention to continue to deliver benefits for an extended period of time after the end-of-Project (EOP).

7. The limitations of this MTR comprise of not being able to conduct a full-fledged MTR as it was decided not to have a full scale consultancy team to do an MTR but instead to conduct an “internal MTR” with the Regional Technical Advisor (RTA) involved.

### 1.3 Structure of the MTR Report

8. This MTR report is presented as follows:

- An overview of Project activities from commencement of operations in early 2016 (officially October 2014) to the present activities of the Biomass Project;
- An assessment of Project strategy;
- An assessment of Project progress towards results;
- An assessment of Project implementation and adaptive management;
- Assessment of sustainability of Project outcomes; and

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- Conclusions and recommendations.
9. Although this MTR was restricted to an “internal MTR” by the Regional Technical Advisor only, it has been tried to structure this MTR report to meet UNDP-GEF’s “Project-level Monitoring: Guidelines for Conducting Midterm Reviews of UNDP-Supported, GEF-Financed Projects” of 2014 as much as possible:

[http://web.undp.org/evaluation/documents/guidance/GEF/midterm/Guidance\\_Midterm%20Review%20 EN 2014.pdf](http://web.undp.org/evaluation/documents/guidance/GEF/midterm/Guidance_Midterm%20Review%20EN_2014.pdf)

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## 2. PROJECT DESCRIPTION AND DEVELOPMENT CONTEXT

### 2.1 Development Context

10. With a growing population that remains largely dependent upon subsistence agriculture, the challenge for Timor-Leste is to pursue economic development without creating additional burdens on natural resources thereby preserving ecosystems that are critical to maintaining the quality of life and providing environmental services to society. Internal migration to urban areas (specifically the capital Dili), poor enforcement of legislation and widespread poverty are some of the main contributing factors to fuel poverty and degraded natural resources. These trends are rapidly heading towards a state where over-extraction and insufficient re-planting of trees is threatening both people’s ability to afford fuel wood for cooking and their ability to easily attain it in other ways.
11. Although forests were in relative good condition during the Portugese time and during Indonesia occupation forestry programs existed, after independence, deforestation in Timor Leste became worse. Pressure on forests became more acute as firewood collection intensified due to high kerosene prices and lack of alternative fuel for cooking. Firewood collections become a source of livelihood for many poor families who cannot find meaningful alternative work.
12. Energy demand in Timor-Leste was growing by about 11% each year in 2010, with total consumption in the country at 392,466 TOE. According to a 2010 Census, 90% of people use inefficient, open, wood-fuelled fires for cooking and heat. The main source of primary energy consumed in Timor-Leste is fuel wood. The country consumed around 724 thousand tons (or 232 kTOE) of fuel wood, which accounted for 59.1% of the total energy consumption (Table 2). Fuel wood is mainly used in the residential sector for cooking and to some degree, in cottage industry such as bakeries, salt and tofu/tempe making. At the household level, energy is provided primarily from non-renewable energy sources. Firewood is the primary energy source for cooking. According to Mercy Corps’s study in 2011<sup>2</sup> on average, households use 9.3 kg of firewood per day. Multiplying this number with the number of households that report they use firewood for cooking (165,423 households), it can be estimated that as much as 561,528 tons of firewood is being consumed for household cooking in 2010. This amount is roughly equal to 179,792 tons of oil equivalent (TOE).
13. In this context, the Government of Timor Leste recognizes that action is needed to address growing unsustainable use of biomass, also in light of its Nationally Determined Contributions (NDC) towards achieving the objective of the Paris Agreement of the UN Framework Convention on Climate Change and the government’s overall plan to scale up alternative clean bioenergy and reduce reliance on unsustainable firewood by promoting bioenergy standards and best practices..

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<sup>2</sup>Mercy Corp, 2010s Baseline household energy survey – EU’s E4A,

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## 2.2 Problems that the Biomass Project Seeks to Address

14. To reduce Timor-Leste’s energy and biomass-related CO<sub>2</sub> emissions the Biomass project intends to enable the mitigation of the demand for non-renewable firewood and the access to cleaner alternative energy and renewable biomass in the country’s residential, institutional and industrial sectors in the rural and peri-urban areas through the introduction of a certification and testing scheme for new equipment and appliances. The Biomass Project has been seeking to integrate a top-down approach of providing support through policy measures and demand side management, and bottom-up approach of promoting market mechanisms to create demand for energy efficient stoves.
15. Through these activities, the Biomass Project was to address the following barriers:
  - the barriers to access to affordable alternative energy by introducing the necessary legal, institutional and regulatory frameworks for scaling up of bioenergy solutions.
  - the technical barriers by providing the Government agencies, manufacturers and importers with technical assistance and a certified independent testing facility to measure the energy consumption of end-use appliances.
  - the informational barriers by carrying out outreach programs designed to sensitize the Timor-Leste population on bioenergy concept and its potential for socio-economic development.

## 2.3 Biomass Project Description and Strategy

16. The goal of the Biomass Project is *“the reduction of GHG emissions through sustainable production and utilization of biomass energy in the country, and the promotion of innovative low-carbon biomass energy technologies”*. The Project objective is to *“Removal of barriers to sustainable utilization of biomass resources in Timor-Leste and application of biomass energy technologies to support local economic, environmental and social development that leads to GHG mitigation”*.
17. Achievement of this goal and objective will require the Project to focus on 3 major components that are designed to produce outputs that will contribute to the realization of the following outcomes:
  - Outcome 1: Implementation of strengthened enabling policies, legal and institutional framework for deployment of biomass energy technologies as well as the growth of biomass energy businesses in Timor-Leste
  - Outcome 2: Increased investments in bioenergy, leading to the development of a local supply chain and market for BETs that will contribute to GHG emissions avoided from technology applications and investments
  - Outcome 3: Enhanced capacities of policy makers, financial institutions, entrepreneurs, project developers, communities and end-users on the development of the local BET market



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## 2.4 Biomass Project Implementation Arrangements

18. The Biomass Project was designed to provide the Government of Timor Leste with the opportunity to strengthen the institutional, technical, and financial and organization capabilities of its agencies in the area of sustainable biomass supply and demand for clean bioenergy, especially at it applies to the residential and institutional sector. Originally, the SSE was intended to act as a lead partner from the Government of Timor-Leste but after dismantling of the SEE, it was deemed more appropriate to work with the EDTL under the Ministry of Power as it is the best entity for driving this project forward and for establishing a technical competency center in the area of energy efficiency in appliances. Other prime beneficiaries were expected to be the Forestry, Livestock and Environment departments and CTDC at DIT, under the Ministry of Public Works and Ministry of Commerce, Industry and Environment.

## 2.5 Biomass Project Timing and Milestones

19. The Biomass Project officially commenced on October 10, 2014 but only started implementation effectively at the establishment of the project management unit early 2016. The project was designed as a 4-year project, terminating on September 26, 2018 but successfully requested an 18 month project extension, thereby extending the project closure to March 26 2020. The project document does not contain Mid Term targets.

## 2.6 Main Stakeholders

20. To achieve the specific Biomass Project objective “*Removal of barriers to sustainable utilization of biomass resources in Timor-Leste and application of biomass energy technologies to support local economic, environmental and social development that leads to GHG mitigation*”, the Biomass Project has required the engagement of a diverse range of stakeholders. Main stakeholders in the Biomass Project comprise of:
- The Ministry of Power, Electricidade Du Timor Lest (EDTL) is the vertically integrated monopoly generator and distributor of electric power in Timor Leste. The Renewable Energy and Alternative Energy unit addresses the issues of renewable energy and energy efficiency. The unit is charged with the responsibility of organizing and conducting research and development in renewable energy and energy efficiency and conservation.
  - Cook stove Testing and Development Centre (CTDC) at Dili Institute of Technology (DIT): The Centre has recently been set up by Mercy Corps to train local expertise to develop standard for cook stove through testing and certification program with support from Aprovecho.
  - Mercy Corps: is an international, non-governmental humanitarian relief and development agency with headquarters in the UK and the USA. Mercy Corps has been operating in Timor-Leste since 2005, and in this time it has implemented programs with funding from USAID, the EU, DFID, OFDA and the UN. Since 2011 the organization has been implementing an EU financed alternative energy program E4A with a focus on clean cook stove and solar technologies. The E4A Baseline Assessment was completed in 2011 which consisted of a comprehensive analysis

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of current energy practices and attitudes in the three target districts. In addition, Mercy Corps is the coordinating agency for the Timor-Leste National Cookstove Working Group, and also co-hosted the first Alternative Energy Stakeholders Meeting.

- University of Timor-Leste, Universidade Nacional Timor Lorosa (UNTL): is the major institution of higher education in the country. The Department of Community Development leads local researchers and supervises the data collection and analysis on community development in the country

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## 3. FINDINGS

### 3.1 Project Strategy

21. The design of the Biomass Project was intended to remove barriers to the development of a clean cookstove market and sustainable biomass production and consumption in Timor Leste. The Project was designed to integrate a top-down approach of providing support through policy measures and demand side management, and bottom-up approach of promoting market mechanisms to create demand for energy efficient stoves. To enhance the effectiveness of these approaches and to create an enabling environment among the stakeholders and participants in the Project, capacity building and training activities would be conducted among the different levels of participants and in the different stages of the project execution.
22. The relevance of the project strategy was confirmed by key stakeholders. The National Director for Renewable Energy in EDTL still considered biomass energy and clean cooking to be a key priority for realising multiple development goals among which GHG emission reduction in Timor Leste and commended several achievements in the project, e.g. related to biomass and the 100% ICS model village. The EDTL mentioned that the Biomass project is seen as providing the basis for further exploration of renewable energy development in Timor Leste.

#### 3.1.1 Project Design

23. From the discussions with the project team, complemented with studies that the project already conducted previously, discussions with the stakeholders and the UNDP Country Director, a number of specific challenges in the project design were identified related to
  - a) The Project Document which has inconsistencies and an elaborate list of ambitious deliverables while the size of the project is Medium Size (1,743,000 \$ GEF funds)
  - b) Change in the market situation of biomass use, especially resulting in a transformation in the use of industrial biomass stoves
  - c) Reduced financial resources in the project as a result of financial constraints in the UNDP Country Office which resulted in reduced allocation of TRAC funds to the project (216,00\$ so far with unclear perspective of receiving additional TRAC funds whereas 620,000\$ was suggested in the Project Document).
24. With regard to the Project Design, the original Project Document is showing a number of unclaritys that lead to confusion about the project’s focus. E.g. the Project Document title “Promoting Sustainable Biomass Production from Biomass in Timor Leste” suggests that the project is looking into sustainable biomass production but the project components and project activities mainly discuss bio-energy technologies (Comp 1: Policies for bio-energy Technologies, Comp 2: Demonstration of bio-energy technologies, Comp 3: Capacity Development related to bio-energy technologies). Also, there seem to be certain discrepancies between project activities and project targets. Examples are a LogFrame indicator that refers to “PURE/SURE projects” whereas this is nowhere explained in the ProDoc.
25. Another challenge from the Project Document arises from the ambition to get substantial financial instruments delivered with the project while there seem to have been no consultation with the

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financial institutions targeted for these financial instruments; no letters of interest were submitted with the Project Document and discussions with Financial Institutions only started at implementation of the project. Also the size of the financial instruments, e.g. 3 m\$ for a guarantee scheme for BET technologies, doesn't seem to be in line with the scale of the Timor Leste economy, e.g. comparing a guarantee facility that was initiated by the government for all TL private sector operations having a size of 4 m\$.

26. The LogFrame of the project has a very elaborate list of indicators whereas several may seem to be repetitive or overlapping. E.g. under Outcome 2.2 it is asking for 20,000 stoves to be produced as one indicator and 20,000 stoves to be bought and utilized as another indicator and at the same time it also asks for 20,000 stoves under the Project Objective and the LogFrame also asks for GHG emission reductions and fuel wood savings both under the Project Goal/Objective as under Outcome 2.3.
27. The project document is expressing an ambition of realizing 400 industrial stoves installed and operational by EOP. As mentioned in the Inception Report, “catering companies” were expected to be a target group for industrial stoves. The project therefore conducted a survey among restaurants to identify the use of fuelwood and potential for improved stoves. The survey resulted in the conclusion that in urban areas, there is little use of fuelwood in industrial applications since fuelwood in urban areas is costly and alternative fuels such as LPG but also (subsidized) electricity is readily available. Out of 169 restaurants and bakeries surveyed, only 3% was using fuel wood only, while 18% was using open fires on the side for certain specific dishes that required a “smoky” taste. The project may therefore need to reconsider the target of 400 industrial stoves installed and operational by EOP.
28. The relatively volatile political situation in TL has led to changing institutional conditions, e.g. whereas the Project Document was developed with the State Secretary of Electricity (SEE) as the Implementing Partner, this changed into the Electricidade de Timor Leste (EDTL), the monopolist utility in TL under the Ministry of Public Works, Transport & Communication. Also, the activities of the project with the EDTL resulted in the government partners to be more and more interested in looking at renewable energy holistically instead of in biomass cookstoves only. Whereas the project aimed for developing a policy on Biomass Energy Technologies, the government expanded this initiative to developing a Renewable Energy Policy targeting a 50% share of RE (for power or total final energy?) by 2030. The government partner has therefore requested the project to discuss renewable energy in general and broaden the focus of policy development for just biomass towards policy development for renewable energy in general.
29. The project was originally designed as having funds managed by UNDP up to an amount of 2,513,000\$, comprising of 1,7430,000\$ and 150,000\$ UNDP Social Business funds and 620,000\$ UNDP TRAC funds. Whereas the GEF funds are below 2 m\$, making it a Medium Sized project, the additional UNDP funds add up to a project > 2 m\$ and thus a Full-Sized project. However, the UNDP funds have so far only added up to 216,833\$ as a result of reduced TRAC funding being available. Prospects for future UNDP funding through TRAC funds are uncertain.

### **3.1.2 Analysis of Project Results Framework**

30. In reviewing the Project Results Framework, discussions concentrated on removing overlap and duplication among indicators as some indicators are mentioned twice and some indicators suggest more or less similar content. Since the original LogFrame consists of 28 indicators, removing overlap and duplication is much needed in order to come to a manageable amount of indicators to monitor. The fact that the project has 5 outcomes (3 sub-outcomes listed under outcome 2) also suggest that the project design is not in line with the project being a Medium Sized Project.
31. A part of discussions on the LogFrame concentrated on the indicators under Outcome 2.1 This outcome is based on the idea that there would be other UNDP projects under implementation at the same time as the SBEPB project (e.g. the Social Business project) and thereby create synergy whereby the SBEPB project could lean on Social Business project initiatives. However, due to delayed implementation timeline of the SBEPB project, the Social Business project was no longer under implementation during SBEPB implementation and the activities under outcome 2.1 did not work out as stand-alone activities. Given the fact that the intended 600 k\$ grant co-financing from UNDP TRAC resources did not materialize, it is deemed justified that the project lowers its ambition level and leaves out the indicators mentioned under Outcome 2.1.
32. Due to reasons of reduced budget availability and reduced relevance of industrial wood stoves, it was discussed to concentrate on non-industrial stoves (household and institutional stoves). As a result of the Inception Phase, the indicator under Outcome 2.2 was already simplified into “20,000 stoves being used by households, institutions and industries installed and operational” in order to come to more flexibility. Thus the focus on household and institutional stoves does not result in different indicators.
33. In order to acknowledge the interest of the GoTL in expanding efforts to RE in general instead of a narrow focus on biomass only, the indicators referring to “BET policy development” and “BET investment” could be broadened to “RE policy development” and “RE investment”.

## 3.2 Progress towards Results

### 3.2.1 Progress towards Outcome Analysis

34. Progress towards results is provided in Table 1 against the EOP targets in the Biomass PRF. Comments on some of the ratings are provided in the following paragraphs. For Table 1, the “achievement rating” is color-coded according to the following scheme:

Green: Completed, indicator shows successful achievements	Yellow: Indicator shows expected completion by the EOP	Red: Indicator shows poor achievement – unlikely to be completed by project closure
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#### Project goal and objective level targets:

35. To meet the Project Goal, the progress can be summarized as follows:

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- 14,035 clean cookstoves have been able to replace open fire cooking, thereby contributing to 47,145 fuel wood savings per year and thus annual CO2 emission reduction of 50,563 tonnes per year.
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36. In tracking the Biomass Project’s progress towards its goal of “Reduction of GHG emissions through sustainable production and utilization of biomass energy in the country, and the promotion of innovative low-carbon biomass energy technologies”, there is a need to streamline GHG emission reduction calculation as calculated thus far by the project (in terms of direct savings by EOP) towards the GHG emission reduction targets as reported in the GEF Tracking Tool.
37. The MTR rating of progress towards the Project goal of GHG emission reductions from the Biomass project is **moderately satisfactory** in view of the ongoing efforts to distribute clean cookstoves and develop enabling conditions for continuous clean cookstove market development.

**Table 1: Progress Towards Results Matrix (Achievement of outcomes against End-of-project Targets)**

Strategy	Objectively Verifiable Indicators			Midterm level and assessment	Achievement Rating
	Indicators	Baseline	Targets		
<b>Project Goal:</b> Reduction of GHG emissions through sustainable production and utilization of biomass energy in the country, and the promotion of innovative low-carbon biomass energy technologies.	1. Quantity of GHG emissions mitigated annually by End of Project (EOP), tCO <sub>2</sub> e.  2. Total cumulative quantity of GHG emissions mitigated by EOP, tCO <sub>2</sub> e.	• 0  • 0	• Up to 117,145  • Up to 206,633	<ul style="list-style-type: none"> <li>• 14,035 by August 2019 clean cookstoves contributing to 50,563 tonnes CO<sub>2</sub> emission reduction per year</li> <li>• On the basis of 14,035 clean cookstoves by August 2019, EOP cumulative GHG emission reduction will be 108,673 tonnes CO<sub>2</sub> emission reduction</li> </ul>	
<b>Project Objective:</b> Removal of barriers to sustainable production and utilization of biomass resources in Timor-Leste and application of biomass energy technologies to support local economic, environmental and social development that leads to GHG mitigation.	3. Reduction of non-sustainable fuel wood consumption for energy use in households and industries by EOP, tons.  4. No. of households and industries that adopted, and are benefiting from, the energy-efficient furnaces/stoves & other BET applications by EOP.	• 0  • 0	• Up to 192,665  • Up to 20,000	<ul style="list-style-type: none"> <li>• 123,785</li> <li>• 13,628</li> </ul>	
<b>Component 1: Policy and Institutional Support for Deployment and Commercialization of Advanced Bio-energy Technologies.</b>					
<b>Outcome 1:</b> <i>Implementation of strengthened enabling policies, legal and institutional framework for deployment of biomass</i>	5. No. of sustainable biomass energy production and clean cook stoves businesses that were proposed and developed as influenced by the strengthened policy and institutional frameworks for the deployment of BETs and biomass	• 0	• 25	25	

<b>energy technologies as well as the growth of biomass energy businesses in Timor-Leste.</b>	energy businesses by Year 2				
	6. <del>No. of biomass energy utilization projects that are planned and developed for PURE/SURE purposes by EOP<sup>3</sup></del>	•	•		
	7. No. of policies and legal frameworks that is supportive of RE <sup>4</sup> applications and biomass energy business development approved and enforced by Year 3	• 0	• 1	1 (drafting of RE law was supported by project but approval is still pending)	
	8. Volume of funding made available for RE <sup>5</sup> application projects by EOP, US\$ million/year	0	1	-	
9. No. of relevant GOT agencies and institutions involved in biomass energy production and use of BETs and are linked with each other via a working mechanism for coordination by EOP.	0	5	5 ( Ministry of Public Works, Ministry of Agriculture and Fisheries, CNEFP, Secretary of State of Environment, and Ministry of Commerce, Industry and Environment)		
10. No. of satisfied users of the Biomass Energy Resource Information System (BERIS) each year starting Year 2	• 0	• 200	-		
<b>Component 2: Bio-energy Investments Promotion - Sustainable Bio-energy Technology Demonstration &amp; Market Development</b>					
<b>Outcome 2.1: Availability of financial support for rural bio-energy production and associated low-carbon technology</b>	11. No. of operational financial support schemes (e.g., loan products) for scaling up and replicating successfully implemented BET projects (e.g., ICS) by Year 2, including the LRGS.	• 0	• 2		

<sup>3</sup> The MTR suggests to delete this indicator as there is no reference to PURE/SURE in the Project Document

<sup>4</sup> The MTR suggests to expand this from BET to RE to acknowledge GoTL interest in expanding efforts to RE.

<sup>5</sup> The MTR suggests to acknowledge GoTL interest in expanding efforts to RE



<p><b>applications</b></p>	<p>No. of local financial institutions that apply the new financial support schemes to support BET projects by Year 4<sup>6</sup></p> <p>12. Volume of funds earmarked by participating FIs for financing BET projects by EOP, US\$ million/year</p>		<ul style="list-style-type: none"> <li>•</li> </ul>		
<p><b>Outcome 2.2: Increased investments in Bio-energy</b></p>	<p>10. No. of stoves being used by households, institutions and industries installed and operational by End of Project (EOP).<sup>7</sup></p> <p>Production of improved cook stoves (ICS) by Year 4, units</p> <p>No. of ICS bought and utilized by consumers annually starting Year 4</p> <p>No. of furnaces/stoves installed &amp; being used on a daily basis by households in targeted areas by EOP</p> <p>No. of industrial institutional stoves installed and are operational by EOP.</p> <p>11. Total volume of investments on biomass energy technology applications by EOP, US\$ million/year<sup>8</sup></p> <p>12.</p>	<ul style="list-style-type: none"> <li>• 0</li> <li>• 0</li> <li>•</li> </ul>	<ul style="list-style-type: none"> <li>• 20,000</li> <li>• 600</li> <li>•</li> </ul>	<ul style="list-style-type: none"> <li>• 13,628</li> <li>• 266</li> </ul>	

<sup>6</sup> The MTR suggests to remove these in order to simplify and to adjust against overstretched ambition without commitment of FIs at the project development stage

<sup>7</sup> This suggestion was already done at the Inception Phase and reflects the need for flexibility, e.g. with regards to change in use of industrial biomass stoves

<sup>8</sup> The MTR suggests to remove because of duplication of previous indicator

<p><b>Outcome 2.3: GHG emissions avoided from technology applications and investments</b></p>	<p>Annual quantities of sustainable fuel wood produced, starting Year 4, tons.</p> <p>Annual fuel wood savings from the cost-effective and efficient use of biomass energy in rural communities starting Year 4, tons<sup>9</sup></p> <p>13. Annual GHG emission reduction from the cost effective and efficient use of biomass energy in rural communities starting Year 4, tons</p>	<ul style="list-style-type: none"> <li>• 0</li> <li>•</li> </ul>	<ul style="list-style-type: none"> <li>• 117,145</li> </ul>	<ul style="list-style-type: none"> <li>• 14,035 by August 2019 clean cookstoves contributing to 50,563 tonnes CO2 emission reduction per year</li> </ul>	
<p><b>Component 3: Capacity Development and Market Transformation</b></p>					
<p><b>Outcome 3: Enhanced capacities of policy makers, financial institutions, entrepreneurs, project developers, communities and end-users on the development of the local BET market</b></p>	<p>14. No. of local manufacturing firms that can fabricate and install equipment/components used in BET systems by Year 4</p> <p>15. No. of trained and qualified men and women technicians working on and qualified to repair and maintain BET application projects by EOP</p> <p>No. of trained men and women technicians who are qualified to repair and maintain BET equipment and installations by EOP</p>	<ul style="list-style-type: none"> <li>• 1</li> <li>• 0</li> <li>• 0</li> </ul>	<ul style="list-style-type: none"> <li>• 25</li> <li>• 25</li> <li>• 25</li> </ul>	<p>7: Black Smith, Nazareth Foundation, Naroman Ba Futuru, Centru Sover, Ermera Gleno, Mesak Training Centre, and Startec</p> <p>95 Mercy Corps trained 64 ICS producers in 2018, from Biomass Project we trained 7 technicians about Biogas and Biomass training 24 in CNEFP</p> <p>13 in 2017 (training with Jeju – Timor Leste Friendship Forest about eco-tourism and</p>	

<sup>9</sup> Duplication with indicators under Project Goal/Objective

	<p>16. No. of trained and qualified men and women in rural communities gainfully engaged in community forestry and woodlot operations by EOP.</p> <p>17. No. of local development plans that integrate biomass energy use, BET applications, and biomass industry development prepared by local government men and women planners by EOP</p> <p><del>No. of local men and women financial officers that are capable of evaluating biomass energy and other RE project proposals by EOP</del></p> <p>18. No. of local entrepreneurs and SMEs that are gainfully involved in businesses that make up the value chain of the BET application industry by EOP</p>	<ul style="list-style-type: none"> <li>• 0</li> <li>• 0</li> <li>• 0</li> </ul>	<ul style="list-style-type: none"> <li>• 10</li> <li>• 15</li> <li>• 25</li> </ul>	<p>two of them went to Korea next year for training about forestry)</p> <p>24 in 2018, the project was held biomass Capacity Building Training in CNEFP for government officials, DIT, and CNEFP trainees</p> <p>7 Local ICS producers</p>	
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### 3.2.2 Remaining Barriers to Achieving Project Goal and Objective

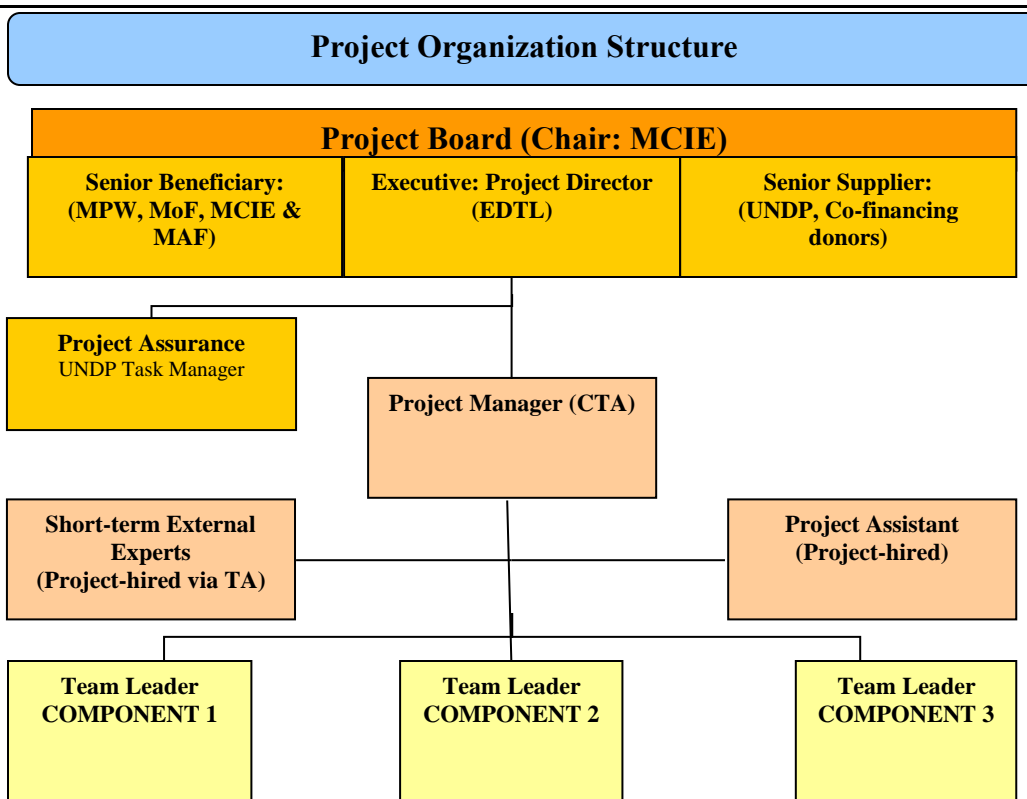
38. In realising the objective of the biomass project, it is important for the project to also address the following challenges:
39. A specific challenge in the project progress relates to the pending approval of the RE decree law, which was strongly supported by the project, but which is still waiting for approval by the Council of Ministers. Even though there is a coalition government since elections in May 2018, the newly formed government is not very stable and very dependent on coalition partners approval.
40. The BERIS (Biomass Energy Resource Information System) is still only starting to be developed and faced considerable delay in its commissioning of consultants to support this effort. Since the project is nearing its final phase of implementation, it is questionable if the BERIS system will be finalized on time while it is unlikely that it will be possible to monitor user satisfaction of the BERIS system in such short remaining time.
41. Another challenge is the sustainability of the results of the project since subsidy levels for clean cook stoves are still high at 80% of full cost price, whereas the project intention was to gradually reduce subsidy levels. As there is currently no indication of other sources being able to continue these subsidy levels, this raises concern for sustainability of project results after the project ends.

## 3.3 Project Implementation and Adaptive Management

### 3.3.1 Management Arrangements

42. This Project is being implemented under a direct implementation modality (DIM) by UNDP. The Biomass Project is managed by a PMU that is led by a Project Manager (CTA) who manages a team of consultants. The Project Steering Committee (PSC) mandate is to provide overall guidance for the Biomass Project throughout its implementation, and be responsible for, amongst other responsibilities, coordination amongst various government agencies, overseeing work carried out by different agencies, monitoring progress and approving plans and reports, and providing oversight to financial management and production of financial reports. The PSC includes representatives from Ministry of Public Works (MPW), Ministry of Finance (MoF), Ministry of Commerce, Industry and Environment (MCIE), Ministry of Agriculture and Fisheries (MAF) and UNDP. The PB is chaired by the EDTL National Director for Renewable Energy. The Biomass Project organization structure is provided in Figure 1.

**Figure 1: Current Management Arrangements for the UNDP-GEF Project Promoting Sustainable Bio-energy Production from Biomass” Project (SBEPB)**



43. To date, the Biomass Project has held 6 PSC meetings (16<sup>th</sup> and 22<sup>nd</sup> October in 2016, 30<sup>th</sup> January in 2017, 7<sup>th</sup> March in 2018 and 28<sup>th</sup> January and 24<sup>th</sup> September in 2019) since the Project Inception workshop in 17<sup>th</sup> March 2015. The PCS meetings entailed detailed discussions on aspects of the Biomass Project activities, including the proposed actions to support sustainable biomass and clean cookstoves implementation. In general, the PSC meetings appeared to be effective in the context of making key project decisions.

### 3.3.2 Work Planning

44. Biomass project work plans were prepared for 2016, 2017, 2018 and 2019. The 2016 work plan was reflected in the Inception Report of March 2015. The MTR team also notes the adjustment of the AWP's following the delay in project start and due to restructuring of the government and institutional arrangements after the parliamentary election demonstrating adaptive management.

### 3.3.3 Finance and Co-Finance

45. Disbursement of the Biomass Project's GEF resources are provided in Table 5. The expenditure of the Biomass Project's GEF budget up to 2019 can be characterized as follows:

- Considering the Project is scheduled to end in March 2020, there is US\$ 88,352.00 of uncommitted funds from the Biomass Project for activities in 2019 and 2020;
- Outcome expenditures and Project management expenditures do appear to be mostly in line with the projections made in the ProDoc.

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In conclusion, the cost effectiveness of the use of the Biomass Project budget to date has been **moderately satisfactory**, with the primary issue being the slow progress at the start of project implementation.

**Table 5: GEF Project Budget and Expenditures for Timor Leste Biomass Project (in USD as of September 20, 2019)**

Biomass Project Outcomes	Budget (from Inception workshop)	2015 Disbursement	2016 Disbursement	2017 Disbursement	2018 Disbursement	2019 Disbursement (as of 20 Sep)	Total Disbursed (as of 30 Sep '19)	Total to be expended from Oct '19- March 2020	Total Remaining
Outcome 1:	\$125,000.00	\$3,665.91	\$212,816.60	\$147,334.26	\$46,302.02	\$60,539.64	\$ 470,658.43	xx	\$ (345,658.43)
Outcome 2:	\$1,197,000.00	\$ 13,970.91	\$136,516.00	\$75,308.87	\$330,174.44	\$254,578.14	\$ 810,548.36	xx	\$ 386,451.64
Outcome 3:	\$ 303,000.00	\$635.20	\$ 2,364.00	\$97,182.65	\$25,072.21	\$69,267.28	\$194,521.34	xx	\$ 108,478.66
Project Management Unit	\$ 118,000.00	\$ 7,609.53	\$(47,583.02)	\$37,440.55	\$47,145.13	\$ 30,682.33	75,294.52	-	\$ 42,705.48
Exchange gain/loss	-			-		-	-	-	-
<b>Total (Actual)</b>	<b>\$ 1,743,000.00</b>	<b>\$ 25,881.55</b>	<b>\$ 304,113.58</b>	<b>\$ 357,266.33</b>	<b>\$ 448,693.80</b>	<b>\$ 415,067.39</b>	<b>\$ 1,551,022.65</b>	<b>xx</b>	<b>\$191,977.35</b>
Total (Cumulative Actual)				xx		x			
Annual Planned Disbursement				xx		xx			

(from ProDoc)							
% Expended of Planned Disbursement				xx		xx	



### 3.3.4 Project Level Monitoring and Evaluation Systems

46. The 2016 to 2019 PIRs provide sufficient details of the progress of the Biomass Project for the purposes of monitoring and evaluation of all Project outcomes and indicators. These reports provide information from project manager, CO and implementing partner on progress in the various Project components. The PIRs also provide “critical risk management” details identifying key issues impeding progress or achievement of goals and objectives of the Project. One area of monitoring that can be improved within the PIRs is the tracking of GHG emission reductions, an important metric in measuring the success of GEF CCM projects. This information should be provided in the PIRs under “Development Progress” but may have been left out due to an absent heading of Project Goal. This should be corrected in follow up reporting and will be particularly relevant for the upcoming Terminal Evaluation. Moreover, the Tracking Tool is also guiding the project in expected GHG emission reduction targets. The Tracking Tool will also have to be updated as part of the Mid-Term review process. In conclusion, therefore, the M&E systems of the Biomass Project are **moderately satisfactory**.

### 3.3.5 Stakeholder Engagement

47. The Project has successfully facilitated partnerships with relevant stakeholders, related to the efficient implementation of the Biomass project in Timor Leste. The National Project Director is committed to the project, although the Ministry of Public Works (governing the EDTL) is only involved at a distance. The PMU may want to emphasize the importance of the work in the project for the MoPW in order to get them more involved in project consultations. The project engaged with several clean cookstove producers that are all involved in the project with regard to clean cookstove distribution. The project has also established ties with several NGOs, including a prominent role for Mercy Corps, in the implementation of the project. However, the project did not manage to get the financial sector interested in the project, although this may also related to unrealistic expectations in the Project Document.
48. In summary, the Biomass Project has made **moderately satisfactory** efforts to reach out to a range of stakeholders that are intended to increases the likelihood of the sustainability of the Biomass Project’s goal and objective.

### 3.3.6 Reporting

49. Biomass progress reporting has been **moderately satisfactory**. This is based on an assessment of the quality of PIRs from 2016 to 2019. These PIRs provide sufficient descriptions of issues identified for adaptive management. However, improvements to progress reporting can be made on reporting of progress from the perspective of the CO and achievements in GHG emission reductions.

### 3.3.7 Communications

50. Communications between Project personnel and the various stakeholders of the Biomass Project appear **moderately satisfactory**. There are frequent communications between the PMU and the

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Project’s Implementing Partner, however there may have been room for improved communication between the project and the cookstove private sector partners in the developments of the voucher system over the year 2019.

51. The MTR team has observed during the field visit of the biogas pilot project and in meetings with relevant stakeholders that communication relationships between the Biomass Project personnel and demonstration project level counterparts are healthy.

### 3.4 Sustainability

52. In assessing sustainability of the Biomass Project at its mid-point, the question should be asked “how likely will the Project outcomes be sustained beyond Project termination?” Sustainability is usually evaluated in the dimensions of financial resources, socio-political risks, institutional framework and governance, and environmental factors, using a simple ranking scheme:
- 4 = *Likely (L)*: negligible risks to sustainability;
  - 3 = *Moderately Likely (ML)*: moderate risks to sustainability;
  - 2 = *Moderately Unlikely (MU)*: significant risks to sustainability; and
  - 1 = *Unlikely (U)*: severe risks to sustainability; and
  - U/A = *unable to assess*.

However, in the limited scope of this MTR mission, it was not possible to come to a complete evaluation and therefore was limited to a qualitative analysis.

53. Current risks to the sustainability of the Biomass Project are mainly related to the high level of subsidies for clean cookstoves and absent guarantee for continued funding for the subsidies. Also, important project outputs such as the RE law is still pending approval and the Biomass Energy Resource Information System is still about to be developed.
54. With regard to the subsidy levels for clean cookstoves, these are still high at 80% of full cost price, whereas the project intention was to gradually reduce subsidy levels. This is partially a result from resistance from the NGO that the project was partnering with until recently. However, the project should try to still reduce the subsidy level in the remaining months of project operation.
55. In the coming months, the project will conduct surveys among customers of clean cook stoves in order to gather evidence of user satisfaction levels and experience of customers with using clean cook stoves. The results of the survey will be used to discuss follow up by the government on the project results and continuation of activities.
56. With regard to the sustainable operation of the projects outputs, e.g. the BERIS system, it will be crucial to identify the right owner for this project output, including a convincing reason and means for the owner to continue managing and operating the BERIS system.

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## 4. CONCLUSIONS AND RECOMMENDATIONS

### 4.1 Conclusions

57. Overall progress of the SBEPB Project has been Moderately Satisfactory, also considering the challenges created by an instable political environment resulting in a temporarily non-functional government with e.g. a 1 year caretaker government at the time when elections could not be followed up with the creation of a coalition government. In addition, the project was designed at very high ambition levels, based on expected support from other UNDP projects. However, as the implementation date of the project was severely delayed, the related UNDP projects had already finished or finished in the first year of project implementation, resulting in the high ambitions (based on collaboration with other UNDP projects) not being feasible to materialize.
58. Indicators under Outcome 1 are particularly challenged by the complicated engagement with the GoTL where a renewable energy law was heavily supported by the project in organizing consultations throughout the country but approval of the decree law by the Council of Ministries is still pending after several year of discussions. Under Outcome 2, challenges in realizing indicators have particularly been faced with regard to the high ambitions in setting up financial instruments. The distribution of clean cookstoves under Outcome 2 is showing good achievements although subsidy levels are still as high as 80% which creates concerns for sustainability of the results of the project. In Outcome 3, satisfactory results are achieved in training entrepreneurs and technicians.
59. The project has picked up speed in implementation over the latest year of project implementation even though the project had a difficult start (with a 2-year delay between ProDoc signature and start of implementation) and was faced with a challenging political situation over the period 2017/2018. In particular the implementation of improved cookstoves has substantially progressed, especially enhanced by the choice for an alternative distribution model where the NGO “middleman” was taken out and cookstove businesses themselves became responsible for their sales. This increased the sales of cookstoves and increased the confidence of stove manufacturers in enhancing their business profiles.
60. Other important achievements are the realization of local development plans in 10 Suco’s that include plans on biomass and clean cook stoves. One Suco managed to transform to 100% clean cook stoves and became a Model Suco for clean cook stove implementation. The project also introduced a model biogas plant that was very successful, and which created interest from the government to follow up with a biogas plant support program. Promotion campaigns on clean cook stoves concentrated on Community Radio channels, which have a very high penetration rate in rural areas (more than tv).
61. Specific challenges in the project progress relate to the pending approval of the RE decree law, which was strongly supported by the project, but which is still waiting for approval by the Council of Ministers. Even though there is a coalition government since elections in May 2018, the newly formed government is not very stable and very dependent on coalition partners approval.
62. Also, the BERIS (Biomass Energy Resource Information System) is still only starting to be developed

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and faced considerable delay in its commissioning of consultants to support this effort. Since the project is nearing its final phase of implementation, it is questionable if the BERIS system will be finalized on time while it is unlikely that it will be possible to monitor user satisfaction of the BERIS system in such short remaining time.

63. Another challenge is the sustainability of the results of the project since subsidy levels for clean cook stoves are still high at 80% of full cost price, whereas the project intention was to gradually reduce subsidy levels. As there is currently no indication of other sources being able to continue these subsidy levels, this raises concern for sustainability of project results after the project ends.
64. In terms of Monitoring and Reporting, the project has consistently completed the Project Implementation Review (PIR) for the years 2017 and 2018. There is room for improvement in reporting the GHG emission reduction though, as it is not clear how GHG emission reductions are being tracked.
65. With regard to the sustainability of the Biomass Project, there is a need to demonstrate that clean cookstoves can be distributed with lower subsidy levels and that the BERIS system will be operated and maintained in an organization that will be fully committed to operation the system.

**Table 7: MTR Ratings & Achievement Summary Table for “Biomass Project” in Timor Leste**

Measure	MTR Rating <sup>22</sup>	Achievement Description
<b>Project Strategy</b>	N/A	The Project Strategy has demonstrated to contain certain flaws as the project was designed at very high ambition levels, based on support from other UNDP projects. However, as the implementation date of the project was severely delayed, the related UNDP projects already finished or finished in the first year of project implementation, resulting in the high ambitions (based on collaboration with other UNDP projects) not being feasible to materialize. Also, the project LogFrame contains a very high number of indicators (28) while several indicators are overlapping.
<b>Progress Towards Results</b>	Goal Achievement Rating:	The goal achievement was not rated in the absence of GHG emission reduction data available.
	Objective Achievement Rating: 4	The objective achievement is rated as Moderately Satisfactory since the results in distribution of clean cookstoves and related reduction of non-sustainable fuel wood consumption has recently showing good rates of progress with the project being on track to achieve the end of project targets.
	Outcome 1 Achievement Rating: 3	The Outcome 1 achievement is rated as Moderately Unsatisfactory since a few crucial efforts under this Outcome have not yet delivered results. The development of the RE law was supported by the project but approval is still pending, although this may to a large extent correlate with by the political instability in the country. The setting up of a Biomass Energy Resource Information System (BERIS) was only about to start at the time of this review with only some 6 months of project implementation time remaining. This means that it is not clear if the BERIS will be finalised on time.
	Outcome 2 Achievement Rating: 4	The Outcome 2 achievement is rated as Moderately Satisfactory on the basis of the removal of Outcome 2.1. Distribution of clean cookstoves is on track to meet end of project targets but subsidy levels have not yet been reduced, against the project intention.
	Outcome 3 Achievement Rating: 5	The Outcome 3 achievement is rated as Satisfactory as the project at the time of review had achieved the end of project targets in number of trained people and enterprises.
<b>Project Implementation &amp; Adaptive Management</b>	Achievement rating: U/A	The project seems to be adaptively managed and implemented in a manner that is cost-effective. In the limited scope of this MTR mission, it was not possible to come to a complete evaluation on this aspect.
<b>Sustainability</b>	Sustainability rating: U/A	In the limited scope of this MTR mission, it was not possible to come to a complete evaluation and therefore the sustainability rating was limited to a qualitative analysis, see section 3.4.

<sup>22</sup> Evaluation rating indices (except sustainability – see Footnote 2, and relevance – see Footnote 3): 6=*Highly Satisfactory (HS)*: The project has no shortcomings in the achievement of its objectives; 5=*Satisfactory (S)*: The project has minor shortcomings in the achievement of its objectives; 4=*Moderately Satisfactory (MS)*: The project has moderate shortcomings in the achievement of its objectives; 3=*Moderately Unsatisfactory (MU)*: The project has significant shortcomings in the achievement of its objectives; 2=*Unsatisfactory (U)* The project has major shortcomings in the achievement of its objectives; 1=*Highly Unsatisfactory (HU)*: The project has severe shortcomings in the achievement of its objectives.

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## 4.2 Recommendations

61. To improve project implementation and project sustainability, the following recommendations result from this MTR exercise:

- Based on successful results after the project decided to discontinue collaboration with Mercy Corps, the project should continue this success and at the same time introduce signals that the market will change after the project ends.
- The project should stretch its implementation time and introduce one more round of subsidy to producers, this time at e.g. 50% level (instead of 80%). This way, producers can see the response from their customers on higher price levels (as they currently don't know what the market is willing to pay for stoves) and they can see a clear signal that things will change (as they now seem to count on continued high subsidies from whatever source). For this, it would be needed to continue the project implementation up to end of March 2020.
- To enhance chances for sustainable results of the project the project could support setting up an ICS producer industry association, e.g. suggesting structure (e.g. elected or rotating chair of the association) and set-up and initiating inauguration of the association. This may also be combined with a training for producers on alternative and/or innovative cook stove models (as brought up by one producer) to inspire and prepare for a changing future.
- Discussions with the government, especially in the next board meeting, should focus on the approval of the RE law (and its relation to success rate of the project) and possibility to free up government budget (from the RE/biogas/solar programme?) for continuation of the ICS subsidy in one way or another (at lower levels, e.g. 50% for some time more and then further reduced). Perhaps the government could also be convinced to continue with the ICS Suco and introduce some kind of certification for such achievement. Please also note that the board meeting should approve the revised LogFrame.
- With regard to the institutional cookstoves, it would be good if sustainability of the program could be discussed with the Ministry of Education and see if and how they could integrate clean cookstoves in their school feeding program.

62. To correct project design, a number of suggestions are being recommended to adjust the Project Results Framework target formulation as follows:

- In Component 1, leave out the indicator referring to PURE/SURE (this reference has never been explained in the ProDoc but probably refers to previous UNDP projects). Also revise policy referring to BET only towards broader RE policy.
- In Component 2, Remove the sub-outcome 2.1 in order to reduce number of indicators and to adjust against overstretched ambition without commitment of FIs at the project development

stage and reduced UNDP TRAC resources dedicated to the project. Also, based on recommendation during Inception Phase, number of cookstoves deployed can be combined in one indicator (to reduce the number of indicators) and indicators under Outcome 2.3 that are duplications from indicators in other parts of the Logframe can be deleted.

- In Component 3, remove duplicating indicators in order to reduce the number of indicators.

63. To improve monitoring and evaluation of the project, the following is recommended:

- Come to a clear understanding of the GHG emission reduction targets as expected in the Project Goal as well as in the Tracking Tool and calculate savings both for End of Project targets (Project Goal) as well as for the Tracking Tool.

## APPENDIX A – MISSION ITINERARY

### Mission Plan for Milou Beerepoot, RTA, BRH 5 Aug 2019 Afternoon – 9 Aug 2019 Early Afternoon

Date	Description	Time	Partners or Agencies	Place or Venue
5/08/19	Briefing by SBEPB PMU on project progress, previous MTR mission, plan for “informal MTR mission”, overall project issues and challenges	14:00-17:00	Biomass Team	UNDP Building 12
6/08/19	- Meeting with other relevant partners for implementation of project (e.g. Mercy Corps)	09:30	Mercy Corps	Mercy corps office
	- Nazareth Foundation ICS producer	02:30-03:30	CPB producer	CPB Nazareth foundation
7/08/19	- Naroman ba futuro	09:15-10:00	Naroman office	Local producer
	- Centru Sover	10:15- 11:15	Palapasu office	Local producer
	- Internal PMU/UNDP CO workshop on MTR and PIR preparation (and possibly broader discussion on mitigation portfolio)	02:00-03:00	Alamgir with team	MoP/EDTL Government
	- MoP/EDTL	03:00-400	Luciano Room (Director)	
08/8/19	- Additional meetings or preparation of MTR report	09:00-12:00	Alamgir with team	Biomass office
	- Additional meetings or preparation of MTR report		UNDP CO	UNDP Building 12
09/08/19	- Meeting with SBEPB PMU to conclude on MTR and discuss way forward	09:00-10:30		
	- Debriefing with UNDP Country Director and Head of Sustainable Development Unit	10:30-11:15	Mana Berta	UNDP CO Building 10



## APPENDIX B – INTERVIEW RESULTS

- The mission started with discussions with the project manager on Monday 4 August on overall progress and challenges in the project. Particular highlights in achievements of the project relate to further professionalization of the cookstove market by means of removing an NGO middleman in the sector and introducing direct sales and distribution by stove manufacturers to clients or retailers. This increased the sales of cookstoves and increased the confidence of stove manufacturers in enhancing their business profiles. Other achievements are the realization of local development plans in 10 Suco’s that include plans on biomass and clean cook stoves. One Suco managed to transform to 100% clean cook stoves and became a Model Suco for clean cook stove implementation. Further promotion campaigns on clean cook stoves are concentrating on Community Radio channels, which have a very high penetration rate in rural areas (more than tv). The project introduced a model biogas plant that was very successful, and which created interest from the government to follow up with a biogas plant support program.

Specific challenges in the project progress relate to the pending approval of the RE decree law, which was strongly supported by the project but which is still waiting for approval by the Council of Ministers. Even though there is a coalition government since elections in May 2018, the newly formed government is not very stable and very dependent on coalition partners approval. Also, the BERIS (Biomass Energy Resource Information System) is still only starting to be developed. Subsidy levels for clean cook stoves are still high, 80% of full cost price, whereas the project intention was to gradually reduce subsidy levels. This is partially a result from resistance from the NGO that the project was partnering with until recently. In the coming months, the project will conduct surveys among customers of clean cook stoves in order to gather evidence of user satisfaction levels and experience of customers with using clean cook stoves. The results of the survey will be used to discuss follow up by the government on the project results and continuation of activities.
- In a meeting with Tate Munro, Mercy Corps, the role of Mercy Corps in the project and the overall ideas on the project implementation was discussed. Mercy Corps explained difficulties in fulfilling their tasks in the project as a result of different challenges, e.g. ICS test center staff who were not available due to studies abroad, free distribution of cook stoves by another NGO and the market still being dominated by micro-enterprises. MS also expected to be involved for a 2 year period which then ended up being a 1 year involvement. Positive signals in the cook stove market in TL are that there has been innovation in cook stove designs and local production of cook stove parts that were previously imported. Also new actors entered the cook stove market. Challenges are still access to capital, either formal or informal, and changing the government mind-set of providing direct help (e.g. by means of 100% free distribution of cookstoves and solar panels). Also diversification of products suitable for urban versus rural areas may be worthwhile in future.
- A meeting with cookstove producer Nazareth Foundation (NF) concentrated on their current cookstove business model and the changes after they became responsible for sales themselves (instead of via Mercy Corps). NF explained that they sold 3000 cook stoves since Feb this year whereas Mercy Corps sold only 300 of their stoves in the year before. NF therefore feels the current sales model works better and want to continue this way. They have people in Sucu’s that act as retailers for their stoves and they visit markets where they give demonstrations (some 5/6 times per year). A stove costs some 8/9\$ + 2\$ for the retailer. NF also produces larger institutional cook stoves for schools. This year, they sold some 207 institutional stoves to schools and some 10 larger stoves to restaurants. These stoves costs some 120\$.
- On Wednesday morning, the mission met with Naroman ba futuro, a small cookstove producer. They also experienced the new situation with direct sales to customers as an improvement from the previous situation with Mercy Corps as middle man. They had certain concerns about the situation after the project ends when there will be no more subsidies. They mentioned that they used to sell cook stoves for the full cost price but sales were rather low as only middle calls can afford the full cost prices. They used to give

credit to customers (re-payment in installments) but stopped doing that after it turned out to be difficult to get the installments back.

- On Wednesday morning the mission also met with Centru Sover, small cookstove producer and producer of some other products based on using waste materials. This producer is selling directly to customers by selling at markets as well as by door-to-door sales, the latter seems to work best. The stoves cost some 15 to 20\$ at full price but are now sold for some 5\$ on the basis of the project subsidy. They target to sell 2000 stoves this year but so far only sold 330 due to a cash flow problem because subsidies were not paid after March this year. Once they receive the subsidies, they expect to be able to sell the 2000 stoves still this year. Considerations of Centru Sover are to improve cookstove models, e.g. the metal lid on top of the stove is usually the first thing to break down. They are also interested in inspiration for more innovative cook stove products, it would be good if there could be training for producers on the developments in the cook stove market and how they could also step into such developments. Another suggestion is to set up a cookstove producer industry association that would encourage collaboration and discussions among cook stove producers.

- On Wednesday afternoon, the mission had a meeting with the Director of the National Directorate Renewable Energy (NDRE) under the EDTL (Electricidade de Timor Leste) under the Ministry of Public Works. The NDRE Director is also the head of the Project Board. The Director confirmed continued interest of the TL government in improved cookstoves and highlighted a specific interest in biogas and solar as well. In terms of the results of the project he specifically appreciated the biogas demonstration plant, which shows that there is good potential for biogas as long as the technical detailing of the project is done correctly (several biogas plants initiated by the TL government in the past failed over time). The TL government would now like to continue working on biogas plants and already identified potential locations for biogas installations. The Director also appreciated the 100% ICS Sucu, as a model Sucu that could be replicated throughout TL.

Part of the discussions focused on the approval of the RE decree law, which is considered an important impact indicator for the project as the project has supported consultation sessions throughout TL to discuss the RE decree law. The Director explained that the approval of the RE law was still pending and still had to be submitted to the Council of Ministers for their approval. The next board meeting of the project in September should be a good opportunity to further discuss the importance of the approval of the RE law and possible support that the project can give to speed up the process. The project board meeting can also be used to discuss the chances of sustainability of the project results and the role of the TL government to continue activities in encouraging clean cookstoves implementation.

- On Thursday, the PMU and RTA discussed the project LogFrame and possible adjustments to create a LogFrame that is in line with the available project resources as well as that is transparent and does not have overlapping indicators.

Revisions in the LogFrame mainly concentrated on removing overlap and duplication among indicators as some indicators are mentioned twice and some indicators suggest more or less similar content. Since the original LogFrame consists of 28 indicators, removing overlap and duplication is much needed in order to come to a manageable amount of indicators to monitor. The fact that the project has 5 outcomes (3 sub-outcomes listed under outcome 2) also suggest that the project design is not in line with the project being a Medium Sized Project.

A part of discussions on the LogFrame concentrated on the indicators under Outcome 2.1. This outcome is based on the idea that there would be other UNDP projects under implementation at the same time as the SBEPB project (e.g. the Social Business project) and thereby create synergy whereby the SBEPB project could lean on Social Business project initiatives. However, due to delayed implementation timeline of the SBEPB project, the Social Business project was no longer under implementation during SBEPB implementation and the activities under outcome 2.1 did not work out as stand-alone activities. Given the fact that the intended 600 k\$ grant co-financing from UNDP TRAC resources did not materialize, it is deemed justified that the project lowers its ambition level and leaves out the indicators mentioned under Outcome 2.1.

- On Friday morning, a discussion with the CO Environmental Focal Point concentrated on the findings of the mission and recommendations for the project. The possibility of developing a GCF SAP project idea was also briefly discussed.

## **APPENDIX C – COMPLETED TRACKING TOOL**

## APPENDIX D – MTR RECOMMENDATIONS- **REVISED** PROJECT RESULTS FRAMEWORK FOR BIOMASS PROJECT

Strategy	Objectively Verifiable Indicators			Midterm level and assessment	Achievement Rating
	Indicators	Baseline	Targets		
<b>Project Goal:</b> Reduction of GHG emissions through sustainable production and utilization of biomass energy in the country, and the promotion of innovative low-carbon biomass energy technologies.	1. Quantity of GHG emissions mitigated annually by End of Project (EOP), tCO2e.	• 0	• Up to 117,145		
	2. Total cumulative quantity of GHG emissions mitigated by EOP, tCO2e.	• 0	• Up to 206,633		
<b>Project Objective:</b> Removal of barriers to sustainable production and utilization of biomass resources in Timor-Leste and application of biomass energy technologies to support local economic, environmental and social development that leads to GHG mitigation.	3. Reduction of non-sustainable fuel wood consumption for energy use in households and industries by EOP, tons.	• 0	• Up to 192,665		
	4. No. of households and industries that adopted, and are benefiting from, the energy-efficient furnaces/stoves & other BET applications by EOP.	• 0	• Up to 20,000		
<b>Component 1: Policy and Institutional Support for Deployment and Commercialization of Advanced Bio-energy Technologies.</b>					
<b>Outcome 1:</b> <i>Implementation of strengthened enabling policies, legal and</i>	5. No. of sustainable biomass energy production and clean cook stoves businesses that were proposed and developed as influenced by the	• 0	• 25		

<p><b><i>institutional framework for deployment of biomass energy technologies as well as the growth of biomass energy businesses in Timor-Leste.</i></b></p>	<p>strengthened policy and institutional frameworks for the deployment of BETs and biomass energy businesses by Year 2</p> <p>6.No. of policies and legal frameworks that is supportive of RE applications and biomass energy business development approved and enforced by Year 3</p> <p>7.Volume of funding made available for RE application projects by EOP, US\$ million/year</p> <p>8.No. of relevant GOT agencies and institutions involved in biomass energy production and use of BETs and are linked with each other via a working mechanism for coordination by EOP.</p> <p>9.No. of satisfied users of the Biomass Energy Resource Information System (BERIS) each year starting Year 2</p>	<p>• 0</p> <p>• 0</p> <p>• 0</p> <p>• 0</p>	<p>• 1</p> <p>• 1 million</p> <p>• 5</p> <p>• 200</p>		
<p><b>Component 2: Bio-energy Investments Promotion - Sustainable Bio-energy Technology Demonstration &amp; Market Development</b></p>					
<p><b><i>Outcome 2.2: Increased investments in Bio-energy</i></b></p>	<p>19.No. of stoves being used by households, institutions and industries installed and operational by End of Project (EOP).</p> <p>20.Total volume of investments on RE technology applications by EOP, US\$ million/year</p>	<p>• 0</p> <p>• 0</p>	<p>• 20,000</p> <p>• 1</p>	<p>• Surveys; SPEPB project activity and M&amp;E reports</p> <p>• Survey of FIs; SPEPB project activity and M&amp;E reports</p>	
<p><b><i>Outcome 2.3: GHG emissions avoided from technology applications and investments</i></b></p>	<p>21. No. of local entrepreneurs and SMEs that are gainfully involved in businesses in supplying biomass fuel from waste products (e.g. bio-briquettes) by EOP</p> <p>22. Annual GHG emission reduction from the cost effective and</p>	<p>• 1</p> <p>• 0</p>	<p>• 5</p> <p>• 117,145</p>	<p>• Quantifications based on survey of local entrepreneurs</p> <p>• Quantifications based on annual surveys of biomass resources; SPEPB project activity and M&amp;E reports</p>	

	efficient use of biomass energy in rural communities starting Year 4, tons				
<b>Component 3: Capacity Development and Market Transformation</b>					
<b>Outcome 3: Enhanced capacities of policy makers, financial institutions, entrepreneurs, project developers, communities and end-users on the development of the local BET market</b>	23. No. of local manufacturing firms that can fabricate and install equipment/components used in BET systems by Year 4	• 1	• 25	<ul style="list-style-type: none"> <li>• Company profile of qualified local manufacturing firms fabricating and installing BET system equipment and components</li> <li>• Company profile of qualified local engineering firms working on BET application projects; job certifications of technical staff</li> <li>• Company profile of local firms working on sustainable forestry projects; job certifications of technical staff</li> <li>• Documentation on local development plans in selected towns</li> <li>• Survey of companies involved in the upstream and downstream activities in the BET application industry</li> </ul>	
	24. No. of trained and qualified men and women technicians working on and qualified to repair and maintain BET application projects by EOP	• 0	• 25		
	25. No. of trained and qualified men and women in rural communities gainfully engaged in community forestry and woodlot operations by EOP.	• 0	• 10		
	26. No. of local development plans that integrate biomass energy use, BET applications, and biomass industry development prepared by local government men and women planners by EOP	• 0	• 15		
	27. No. of local entrepreneurs and SMEs that are gainfully involved in businesses that make up the value chain of the BET application industry by EOP	• 0	• 25		