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# **United Nations Development Programme**

**Government of Sri Lanka**

## **Mid-Term Review of UNDP/GEF Project: Appropriate Mitigation Actions in Energy Generation and End-Use Sectors (NAMA Project)**

**(GEF Project ID: 5586; UNDP PIMS ID: 5232)**

### **Final Report**

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**November 2017**

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## SYNOPSIS

**Title of UNDP supported GEF financed project:** Appropriate Mitigation Actions in the Energy Generation and End-Use Sectors in Sri Lanka (NAMA Project)

**UNDP Project ID:** PIMS 5232

**GEF Project ID:** 5586

**Evaluation time frame:** July 2015 to July 2017

**CEO endorsement date:** January 27, 2015

**Project implementation start date:** July 4, 2015

**Project end date:** July 4, 2019

**Date of evaluation report:** August 18, 2017

**Region and Countries included in the project:** Sri Lanka

**GEF Focal Area Objective:** Climate Change Mitigation Focal Area Strategic Objective CCM-2 (for GEF-5): “Promote market transformation for energy efficiency in industry and the building sector”

**Implementing partner and other strategic partners:**

Implementing partner: Sri Lanka Sustainable Energy Authority (SLSEA) under the Ministry of Power and Energy (MoPE)

Strategic partner: Climate Change Secretariat (CCS) under the Ministry of Mahaweli Development and Environment (MoMDE)

**Mid-Term Review team members:** Mr. Roland Wong, International Consultant  
Dr. Sarath Samaraweera, National Consultant

**Acknowledgements:**

The Evaluators wish to acknowledge with gratitude the time and effort expended by all project participants and stakeholders during the course of the NAMA Project Mid-Term Review. In particular, we wish to thank the UNDP Sri Lanka, the Sri Lanka Sustainable Energy Authority, the Climate Change Secretariat, the Tea Research Institute, the North Central Provincial Council, the Southern Provincial Council, the Ceylon Electricity Board as well as other Project personnel for making the efforts to recall details of their time during the Project. In particular, we wish to thank all the persons met during our missions to Colombo, Talawakelle, Kurunegala and Galle for their time to provide their opinions on the impact of this Project, and for your hospitality and insights. We sincerely hope that this report contributes to an accelerated transition of Sri Lanka towards a greener energy mix and economy.

## EXECUTIVE SUMMARY

This report summarizes the findings of the Midterm Review Mission conducted during the July 24 - August 2, 2017 period for the UNDP-GEF Project entitled: “*Appropriate Mitigation Actions in the Energy Generation and End-Use Sectors in Sri Lanka*” (hereby referred to as the NAMA Project or the Project), that received a US\$ 1,790,411 grant from the Global Environmental Facility (GEF) in January 2015.

### Project Information Table

Project Title:	<i>Appropriate Mitigation Actions in the Energy Generation and End-Use Sectors in Sri Lanka (NAMA Project)</i>			
GEF Project ID:	5586		<u>at endorsement</u> (Million US\$)	<u>at completion</u> (Million US\$)
UNDP Project ID:	5232	GEF financing:	1.790	0.00
Country:	Sri Lanka	IA/EA own:	0.250	0.0
Region:	Asia and the Pacific	Government:	3.630	0.0
Focal Area:	Climate Change	Other:	22.000	0.0
FA Objectives, (OP/SP):	CCM2 for GEF 5: Promote market transformation for energy efficiency in industry and the building sector	Total co-financing:	25.880	0.00
Executing Agency:	Sri Lanka Sustainable Energy Agency (SLSEA)	Total Project Cost:	27.670	0.00
Other Partners involved:		ProDoc Signature (date project began):		July 4, 2015
		(Operational) Closing Date:	Proposed: July 4, 2019	Actual: July 4, 2019

### Project Description

Sri Lanka is highly dependent on imported oil to meet its energy needs with 49% of the primary energy supply coming from imported fuel, while 12% of the total government budget is used for electricity generation alone. This heavy reliance on imported fossil fuels also leads to increased GHG emissions. The National Energy Policy of Sri Lanka seeks to diversify the supply mix with renewable energy resources whilst seeking to reduce energy demand through demand side management. The Renewable Energy Resources Development Plan (RERDP) aims to achieve 20% from renewable energy resources by 2020 and 30% by 2030 as part of the national strategy to reduce GHG emissions through appropriate mitigation actions (NAMA). The Energy Management Plan (EnMAP) seeks to achieve energy savings from the promotion of energy efficiency (EE) measures. Often the GHG savings and the cost-benefits of these low carbon interventions are not systematically quantified and their benefits remain obscure as they are implemented on an ad-hoc basis. Sub-national entities experience difficulties assessing the impact of NAMA interventions at sectoral and sub-sectoral levels.

To fill these gaps, the development of a robust, transparent and functional NAMA framework is needed complete with a clear inventory and monitoring, reporting and verification (MRV) system with supporting governance and oversight (NAMA Secretariat, NAMA Coordinating Entity, NAMA Implementing Entity, MRV Committee, and NAMA Registry). Such a framework is intended to systematically quantify GHG

savings and benefits of the mitigation interventions using a bottom up approach to aggregate data and information from the provincial and sub-sectoral levels to national and sectoral levels. Furthermore, such a transparent framework will open up opportunity to access regional and international climate funding. To achieve this, the NAMA Project was designed to support appropriate climate change mitigation actions in the energy generation and end-use sectors to assist the efforts of the Government of Sri Lanka to achieve its voluntary GHG mitigation targets.

The goal of the NAMA Project is the *“reduction of GHG emissions from the energy generation and end user sectors in Sri Lanka by developing a NAMA framework”*. The objective of the NAMA Project is to *“support appropriate climate change mitigation actions in the energy generation and end-use sectors as part of the initiatives to achieve the voluntary GHG mitigation targets of Sri Lanka”*. To achieve this goal and objective, the Project was to focus on achieving 4 outcomes:

- Outcome 1: Established and regular update of renewable energy utilization baseline and energy intensity reference baselines for the energy generation and end-use sectors. This was to be done through developing a robust provincial inventory system that could be updated periodically and aggregated at the national level using web-based EnerGIS database management system;
- Outcome 2: Prioritized Nationally Appropriate Mitigation Actions (NAMAs) in the energy generation and end-use sectors are identified and designed. This was to be achieved through developing a “marginal abatement cost curve” (MACC) that could be used as a decision making tool for analyzing and prioritizing a pipeline of bankable NAMAs for implementation;
- Outcome 3: Prioritized appropriate mitigation actions have been implemented through identified private and public sector entities for the achievement of Sri Lanka voluntary mitigation target. This was to be achieved through leveraging public, private and CSO resources through a NAMA Implementing Entity for implementation of bankable RE and EE NAMAs;
- Outcome 4: Accurate measurement and accounting of actual GHG emission reduction. This was to be achieved through development of a robust and transparent MRV system and national registry that is accurate, reliable, and credible and avoids double accounting.

## Project Progress Summary

Overall progress of the NAMA Project has been satisfactory considering the challenges the Project has faced in its efforts to meet fairly ambitious targets that were set in the ProDoc. The Project has been on target to deliver a number of intended outputs including the engagement of 4 provinces to participate in the collection of GHG emission data, establishing GHG emission inventories, setting up of web-based GHG inventory systems, and training their staff on NAMAs supported by the Project. The Project has also delivered on the provision of MACCs to determine cost effective low carbon technologies to deploy, and the design of 3 NAMA projects (biogas systems, variable frequency drives or VFDs for tea factories, and solar PV systems). In addition, the Project has assisted in the design of the institutional setup for the NAMA registry, which was recently approved in July 2017 cabinet.

A key issue with regards to Project progress is the pace of deployment of NAMA technologies, which needs to be accelerated if the Project is to meet its GHG emission reduction targets of 16,126 tonnes CO<sub>2eq</sub> by the EOP. Another key issue is the pace of baseline GHG emission data from provinces though this should improve with the availability of mobile apps for field officers to collect data from field installations.

## MTR Ratings and Achievement Summary

**Table A: MTR Ratings & Achievement Summary Table for NAMA Project in Sri Lanka**

Measure	MTR Rating <sup>1</sup>	Achievement Description
<b>Project Strategy</b>	N/A	Project strategy is sound although a bit ambitious with respect to GHG emission reductions which were to be generated during Year 1 of the Project, a scenario that likely was not possible given the government capacity constraints to implement NAMAs.
<b>Progress Towards Results</b>	Goal Achievement Rating: 4	GHG ERs from NAMAs is lagging behind schedule that will require significant deployment of technologies during the last 2 years to meet the 16,126 tCO <sub>2eq</sub> cumulative EOP target. A plan is in place for this accelerated deployment of NAMA technologies.
	Objective Achievement Rating: 5	Despite the need to change some of the NAMA designs, there has been strong support to meet the targets of 3 NAMAs in energy generation and end-use sectors in an effort to achieve voluntary GHG targets of the Sri Lankan government
	Outcome 1 Achievement Rating: 4	Progress is being made on the collection of baseline information in its entry into a web-based GHG inventory system. The pace of baseline data collection, however, is not to an extent of realizing significant GHG emission reductions required to meet targets set by the Government of Sri Lanka
	Outcome 2 Achievement Rating: 5	MACC analysis has been carried out for the 3 NAMA pilot technologies, and for 17 other technologies that has been used by SLSEA to identify prioritized technologies for future NAMAs
	Outcome 3 Achievement Rating: 5	Targets for identification of 2 entities (private and public sector) interested in funding NAMA projects has been met. In addition, 3 pilot NAMAs are currently being implemented although progress on technology deployment is slow (see Table 1)
	Outcome 4 Achievement Rating: 5	An MRV system is being developed to verify and report GHG emissions from the 3 pilot NAMAs including collection of primary energy and GHG data into the EnerGIS data management system. Institutional setup for NAMA registry has been approved by Cabinet in July 2017.
<b>Project Implementation &amp; Adaptive Management</b>	Achievement rating: 5	Project is being adaptively managed and implemented in a manner that is cost-effective. In addition, the PMU has effectively engaged central and provincial government stakeholders on NAMA activities.
<b>Sustainability</b>	Sustainability rating: 2	The “moderately unlikely” risk is related to the financial risks (lack of diverse sources of NAMA funding) and governance risks (lack of critical mass of qualified officers to manage NAMA projects)

<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.

## Conclusions

The NAMA Project has progressed well in the areas of identification of priority low carbon technologies (through MACCC analysis), setting up MRV protocols, data management systems and MRV institutional frameworks required. The Project, however, is lagging behind in the collection of baseline data for energy generation and end-use sector energy consumption at the provincial level. This barrier is related to the lower capacities of personnel at the field level which will require sustained support and training.

The NAMA Project is also currently at a stage where pilot NAMAs are being developed for the purposes of demonstrating the mechanism and protocols required for entry into the national NAMA registry. The Project has made substantial progress into detailed design of the NAMAs, engagement of key stakeholders in the field to coordinate and execute NAMA technology installations, and development of close working relationships with field and extension officers and Provincial Councils to work within an MRV framework and collect field data from various NAMA installations.

While a number of these pilot NAMA projects have provided substantial social benefits, the generation of direct GHG emission reduction benefits is lagging behind the targets set in the NAMA Project goal of 16,126 tonnes CO<sub>2eq</sub> by the EOP. GHG ERs at the mid-point of the NAMA Project are now in the order of 2,036 tonnes CO<sub>2eq</sub> (these are GHG ERs at the EOP with current deployment of NAMA pilot technologies). As such, meeting the 16,126 tonnes CO<sub>2eq</sub> target will now require a substantial rate of deployment of the pilot NAMA technologies during the remaining 2 years of the NAMA Project. This will most certainly be a significant challenge for the NAMA Project.

Adding to this challenge is the need to tweak the designs of all of the NAMA technologies for the purposes of generating higher volumes of GHG ERs, and demonstrate a viable process for registering NAMAs and attracting climate finance:

- The NAMA for solar PV with battery storage should be reviewed for its viability for small households, large public buildings (hospitals and schools) and for commercial entities;
- In addition to small households where small biogas units are installed, the biogas NAMA should include commercial and industrial entities, where efforts to measure GHG ER benefits would be more robust and have more certainty;
- The NAMA for tea processing factories should shift towards Variable Frequency Drive (VFD) technology to demonstrate substantial energy savings and financial viability of the NAMA.

Most importantly, the NAMA Project needs to demonstrate NAMA processes for the design, implementation, MRV and registry of projects into the national NAMA registry. Without such a process to demonstrate the benefits of the NAMA process, the NAMA Project as well as CCS will experience difficulties in facilitating buy-in from all stakeholders (including line ministries and low carbon investors).

## Recommendations

To improve implementation (and meet GHG emission reduction targets), the Project as a 1<sup>st</sup> priority should use its remaining resources to focus on accelerating the deployment of NAMA technologies to the targets set by the PMU including:

- For the pilot biogas NAMA, focus on the installation of 180, 300 and 200 biogas units during 2017, 2018 and 2019 respectively in 3 provinces (Central, Southern and North-western). This would result



in a cumulative ER of 8,617 tCO<sub>2e</sub> by the EOP. To mitigate any challenges to this new target, the Project should consider pursuing larger scale biogas installations (15 m<sup>3</sup> and above) that would be located at commercial entities and even industrial SMEs (particularly agro-processing industries with livestock). (see Paras 75 and 78);

- For the pilot solar PV NAMA, focus on the installation of 81 and 150 solar PV systems with battery storage to be installed by the end of 2017 and 2018 respectively. This would result in a cumulative ER of 941 tCO<sub>2e</sub> by the EOP for this NAMA. This NAMA, however, should shift its focus of solar PV installations (with battery storage) from small households to public buildings (such as hospitals and schools) and commercial entities who not only consume more electricity and pay higher bills to CEB, but who would stand to gain commercially from reduced operational costs by generating renewable solar electricity for its own use and possibly net metered to the national grid, thereby making their commercial establishment more competitive in the long term. This would benefit the Ceylon Electricity Board (CEB) in peak load reduction. For schools, solar PV investments would not require battery storage systems and would offset use of grid electricity during the day, and would make an attractive public investment considering the payback periods (see Para 78);
- For the pilot VFD NAMA in tea processing factories, focus on the installation of 100, 500 and 400 VFDs to be installed during 2017, 2018 and 2019 respectively. This would result in a cumulative ER of 3,116 tCO<sub>2e</sub> by the EOP. To mitigate the challenge of meeting this target, the Project will need to conduct a workshop (according to availability of budget) to disseminate the energy savings results from the pilot VFD installations and emphasize the need after installation of VFDs for close monitoring of energy savings coupled with training of the operators to ensure fan motor loads are reduced at appropriate times during the tea withering process. Energy savings and GHG emission reduction results over a period of one month should be collated and presented in a workshop targeting tea processing factories for their information and subsequent decisions for scaled-up VFD investments (see Para 39 and 78);

To improve implementation (and strengthen the functionality of NAMA processes), the Project as a 1<sup>st</sup> priority should work closely with the Climate Change Secretariat (CCS) to assist and facilitate data collection and authentication of baseline and pilot NAMA energy consumption into EnerGIS. Such assistance will contribute significantly to the capacity building of CCS in its management of the NAMA registry.

To improve Project implementation and management (for more efficient and timely delivery of outputs to meeting the Project outcome), the Project as a 1<sup>st</sup> priority conduct detailed discussions with SLSEA and CCS counterparts (at the Director level) that will result in more involvement of SLSEA and CCS staff in the implementation of planned activities.

To correct Project design, a number of suggestions are being recommended to adjust NAMA Project targets including:

- Clarify Outcome 1 indicator and target of 4 provinces that “regularly conduct sub-sectoral GHG emission inventories for a limited number of feasible technologies”;
- Change Outcome 2 indicator for “No. of provinces that established MACC curves established to identify technologies for energy sector by year 2” to “No of national MACC curves to be established by Year 2”;
- Adjust Outcome 3 target of “1,000 biogas systems” to an equivalency target of “8,000 m<sup>3</sup> of biogas systems” or another target that would significantly contribute towards meeting the Project target of 16,126 tonnes CO<sub>2eq</sub> cumulative by the EOP;

- Adjust Outcome 3 target of “205 solar PV systems” with a new target that can be expressed in kW of solar PV systems installed;
- Set a reasonable Outcome 3 target (based on remaining budget) for VFDs installed by EOP from “1,300 HEMs” to “1,024 VFDs”, subject to pilot tests of VFDs and dissemination of information on energy saving benefits of VFDs to be completed prior to the end of 2017.

To improve the monitoring and evaluation of the Project, Project staff should closely monitor tracking of energy consumption and GHG emission reductions of pilot NAMA projects, and facilitate improved pace of data collection and authentication to enhance output of an “operational and established MRV system”, and provide this data in PIRs under the section entitled “Development Progress” and reporting on progress towards the “Project Goal”.

Recommendations and proposals for future directions underlining main objectives are provided here as lower priority, and should be implemented according to available Project time and resources:

- Follow up and assist Provincial Councils in the scoping of future NAMA projects for entry into the NAMA registry;
- Strengthen work collaboration with the sister UNDP-GEF project “Sustainable Biomass Energy Project” on the preparation of a NAMA for biomass power generation for captive use in agro-industries;
- Expand the network of climate funds, both domestic and foreign who would be interested in funding projects in the NAMA registry set up by the Project. This should be done with the dissemination of NAMA awareness raising materials (and linked to ongoing but successful NAMA Project implementation) as soon as possible targeting domestic corporations, international climate funds, and bilateral agencies;
- Strengthen linkages between NAMAs and NDCs. NAMAs should be promoted as a delivery mechanism and an implementing tool to achieve Sri Lanka’s NDCs;
- Continue follow-up on the combined NAMA for biogas-solar PV for medium-sized agricultural operations with the Trilateral South-South Cooperation with China’s Ministry of Finance and Commerce and MoPE.

## ABBREVIATIONS

Acronym	Meaning
APR-PIR	Annual Project Report - Project Implementation Review
AWP	Annual Work Plan
CAGR	Compound annual growth rate
CCM	Climate change mitigation
CCS	Climate Change Secretariat
CDM	Clean Development Mechanism
CDR	Combined Delivery Report
CEB	Ceylon Electricity Board
CO	UNDP Country Office
CO <sub>2</sub>	Carbon Dioxide
CP	Country Programme
CPAP	Country Programme Action Plan
CSO	Civil service organization
DMS	Data Management System
DSM	Demand Side Management
EC	Energy Conservation
EE	Energy Efficiency
EECP	Energy Efficiency and Conservation Programme
EMS	Energy Management System
EnMAP	Energy Management Plan
EOP	End of project
ER	Emission reduction
ESCO	Energy Service Company
EU	European Union
FY	Fiscal Year
GDP	Gross Domestic Product
GEF	Global Environment Facility
GHG	Green House gas
GIS	Geographic Information System
GoSL	Government of Sri Lanka
HEM	High efficiency motors
INDC	Intended Nationally Determined Contributions
kWh	kilowatt hour
LPG	Liquid petroleum gas
MACC	Marginal abatement cost curve
MCA	Multi-Criteria Assessment
MDG	Millennium Development Goals
MJ	Megajoules
MoMDE	Ministry of Mahaweli Development and Environment
MoPE	Ministry of Power and Energy
MRV	Monitoring, reporting and verification
MTR	Mid Term Review
M&E	Monitoring and Evaluation
NAMA	Nationally Appropriate Mitigation Actions
NDC	Nationally Determined Contributions
NGO	Non-governmental organization
NIM	National implementation modality

Acronym	Meaning
NPC	National Project Coordinator
NPD	National Project Director
PAC	Planter’s Association of Ceylon
PB	Project Board
PC	Provincial Council
PIMS	UNDP/GEF Project Information Management System
PIN	People In Need
PMC	Project Management Committee
PMU	Project Management Unit
PPG	Project Preparatory Grant (GEF)
PRF	Project Results Framework
PV	Photovoltaic
RE	Renewable energy
RERDP	Renewable Energy Resources Development Plan
SLCF	Sri Lanka Climate Fund
SLSEA	Sri Lanka Sustainable Energy Authority
SMART	Specific, Measurable, Attainable, Relevant, Time-bound
tCO <sub>2</sub>	Tonne of Carbon Dioxide
TE	Terminal Evaluation
TOR	Terms of Reference
TRI	Tea Research Institute
UN	United Nations
UNDAF	UN Development Assistance Framework
UNFCCC	UN Framework Convention on Climate Change
UNDP	UN Development Programme
VFD	Variable Frequency Drive
WDI	World Development Indicators

# 1. INTRODUCTION

1. This report summarizes the findings of the Midterm Review (MTR) Mission conducted during the July 24-August 2, 2017 period for the UNDP-supported GEF-financed Project entitled: **“Appropriate Mitigation Actions in the Energy Generation and End-Use Sectors in Sri Lanka”** (hereby referred to as the NAMA Project or the Project), that received a US\$ 1,790,411 grant from the Global Environmental Facility (GEF). The Project goal is to “reduce GHG emissions from the energy generation and end-use sectors in Sri Lanka”. The Project objective is to “support appropriate climate change mitigation actions in the energy generation and end-use sectors as part of the initiatives to achieve the voluntary GHG mitigation targets of Sri Lanka”.

## 1.1 Purpose of the Mid-Term Review

2. In accordance with UNDP and GEF M&E policies and procedures, all full and medium-sized UNDP-supported GEF-financed projects are required to undergo a 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. As such, the MTR for this Project serves to:
  - assess early signs of project success or failure with the goal of identifying the necessary changes to be made to set the Project on-track to achieve its intended results;
  - 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 MTR was prepared to:
  - be undertaken independent of Project management to ensure independent quality assurance;
  - apply UNDP-GEF norms and standards for midterm reviews;
  - assess achievements of outputs and outcomes, likelihood of the sustainability of outcomes, and if the Project met the minimum M&E requirements;
  - provide recommendations to increase the likelihood of the Project delivering all of its intended outputs and achieving intended outcomes.

## 1.2 Scope and Methodology

4. The scope of the MTR covers the entire UNDP-supported, GEF-financed, SLSEA-executed NAMA Project and its components as well as the co-financed components of the Project. This MTR assesses 25 months of Project progress, achievements and implementation taking into account the status of Project activities, outputs and the resource disbursements made up to July 31, 2017. 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 on Appendix F as to how these outcomes and outputs will be achieved within the Project duration (up to July 4, 2019) or with a Project extension. 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, meeting minutes of Project Steering Committee) and pertinent background information;
- Interviews with key Project personnel including the current Project Manager, Project Coordinator, technical advisors, and Project developers;
- Interviews with relevant stakeholders including other government agencies and institutes and private sector entities; and
- Field visits to selected Project sites and interviews with beneficiaries.

A detailed itinerary of the Mission is shown in Appendix B. A full list of people interviewed and documents reviewed are given in Appendix C and Appendix D respectively. The MTR Team for the NAMA Project was comprised of one international expert and one national expert.

6. The Project was reviewed in the context of:

- *Project strategy*: This includes an analysis of the NAMA 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 Implementing Partner of the Project, the Sri Lanka Sustainable Energy Authority (SLSEA). Assessment parameters would include management arrangements, work planning, finance and co-finance, Project level monitoring and evaluation systems, stakeholder engagement, reporting and communications; and
- *Sustainability*: The likely ability of an intervention to continue to deliver benefits for an extended period of time after the end-of-Project (EOP). The MTR sustainability assessment essentially sets the stage for the Terminal Evaluation during which sustainability will be rated under the four GEF categories of sustainability, namely financial, socioeconomic, institutional framework and governance, and environmental.

7. All possible efforts have been made to minimize the limitations of this independent MTR. The limitations of this MTR comprise of not being able to visit the numerous field installations by the Project within the 8 days spent by the MTR team in Colombo, Talawakelle, Kurunegala and Galle. Many of these installations are difficult to access. Project personnel were tasked with planning field visits to sites representative of the quality of implementation. At the request of the MTR team,

Project personnel were requested to include field visits to successful as well as less successful installations, the proportion of which was to be decided by the Project. On this basis, the MTR team would be able to assess progress as well as implementation issues. To minimize limitations of the MTR process, the MTR team is obligated to collect and triangulate as much information as possible with follow-up interviews and Skype conversations with other key stakeholders to be made after the July-August mission.

### 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 July 2015 to the present activities of the NAMA 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
- Conclusions and recommendations.

9. This MTR report has been structured to meet UNDP-GEF’s “Project-level Monitoring: Guidelines for Conducting Midterm Reviews of UNDP-Supported, GEF-Financed Projects” of 2014:

[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)

## 2. PROJECT DESCRIPTION AND DEVELOPMENT CONTEXT

### 2.1 Development Context

10. With a GDP per capita of USD 3,194 (2013), Sri Lanka became a lower middle-income country in 2010. Sri Lanka has well progressed towards meeting the Millennium Development Goals (MDG) by achieving 15 of the 22 MDG indicators (WDI 2013). His Excellency the President of Sri Lanka has vowed to achieve all 17 Sustainable Development Goals (SDG) by 2030. Sri Lanka's population as of 2013 was 20,483,000 with an average literacy rate of 96%.
11. Sri Lanka is also highly dependent on imported oil to meet its energy needs with 49% of the primary energy supply coming from imported fuel, and where 12% of the total government budget is used for electricity generation alone. This has led to a heavy reliance on imported fossil fuels and increased GHG emissions. The National Energy Policy of Sri Lanka aims to diversify supply mix with renewable energy resources whilst seeking to reduce energy demand through demand side management. The Renewable Energy Resources Development Plan (RERDP) also aims to achieve 20% from renewable energy resources by 2020 and 30% by 2030 as part of the national strategy to reduce GHG emissions through nationally appropriate mitigation actions (NAMA). The Energy Management Plan (EnMAP) seeks to achieve energy savings through the promotion of EE measures. Often, GHG savings and the cost-benefits of these low carbon interventions are not systematically quantified and their benefits remain obscure as they are implemented on an ad-hoc basis. Sub-national entities experience difficulties assessing the impact of NAMA interventions at sectoral and sub-sectoral levels.
12. To fill these gaps, the development of a robust, transparent and functional NAMA framework was identified as a requirement for a monitoring, reporting and verification (MRV) system with supporting governance and oversight (NAMA Secretariat, NAMA Coordinating Entity, NAMA Implementing Entity, MRV Committee, and NAMA Registry). Such a framework will facilitate systematic quantification of GHG savings and benefits of the mitigation interventions using a bottom up approach to aggregate data and information from the provincial and sub-sectoral levels to national and sectoral inventory levels. Furthermore, such a transparent framework will open up opportunities to access regional and international climate funding. To achieve this, the NAMA Project was designed to support appropriate climate change mitigation actions in the energy generation and end-use sectors to assist the efforts of the Government of Sri Lanka to achieve its voluntary GHG mitigation targets.

### 2.2 Problems that NAMA Project Seeks to Address

13. To test and verify the framework, the NAMA Project has been seeking to overcome the regulatory, institutional, technical, financial and social barriers for the scaling up of RE and EE NAMAs through demonstrating the actions through the deployment of 1,000 bio-digesters, 1,300 high efficiency motors in tea factories, and 205 solar PV net metering systems with battery storage. Through these deployment programmes, the NAMA Project was to:
  - develop a robust provincial inventory system that could be updated periodically and aggregated at the national level using web-based EnerGIS database management system;
  - develop a marginal abatement cost curve (MACC) that could be used as a decision making tool for analyzing and prioritizing a pipeline of bankable NAMAs for implementation;



- leverage public, private and CSO resources through a NAMA Implementing Entity for implementation of bankable RE and EE NAMAs that have been analyzed as viable cost effective business models that are supported by strong supply chains; and
- develop a robust and transparent MRV system that is accurate, reliable, credible and avoids double accounting.

## 2.3 NAMA Project Description and Strategy

14. The goal of the NAMA Project is the *“reduction of GHG emissions from the energy generation and end user sectors in Sri Lanka by developing a NAMA framework”*. The objective of the NAMA Project is to *“support appropriate climate change mitigation actions in the energy generation and end-use sectors as part of the initiatives to achieve the voluntary GHG mitigation targets of Sri Lanka”*.
15. Achievement of this goal and objective will require the Project to focus on 4 major components that are designed to produce outputs that will contribute to the realization of the following outcomes:
  - Outcome 1: Established and regular update of renewable energy utilization baseline and energy intensity reference baselines for the energy generation and end-use sectors;
  - Outcome 2: Prioritized Nationally Appropriate Mitigation Actions (NAMAs) in the energy generation and end-use sectors are identified and designed;
  - Outcome 3: Prioritized appropriate mitigation actions have been implemented through identified private and public sector entities for the achievement of Sri Lanka voluntary mitigation target;
  - Outcome 4: Accurate measurement and accounting of actual GHG emission reduction (through an MRV system and national registry) from mitigation actions in the energy generation and end-use sectors.

## 2.4 NAMA Project Implementation Arrangements

16. The NAMA Project was designed to provide the Government of Sri Lanka with a unique opportunity to strengthen the institutional, technical, and financial and organization capabilities of its agencies to develop and implement a robust and transparent GHG inventory, NAMAs and MRV systems for meeting national GHG targets. Given the focus on energy consumption and generation, the Project’s key Implementing Partner is the Sri Lanka Sustainable Energy Authority (SLSEA) under the Ministry of Power and Energy (MoPE). Another key and strategic Implementing Partner is the Climate Change Secretariat (CCS) under the Ministry of Mahaweli Development and Environment (MoMDE) who are to provide the oversight for developing and managing the NAMA programme for Sri Lanka. Provincial Councils are also key partners in managing NAMAs at the field level and the collection of energy data from the field. Day-to-day activities of the NAMA Project were to be managed by the Project Management Unit (PMU) to be housed within the premises of SLSEA. Implementation arrangements of the NAMA Project are elaborated in Section 3.3.1.

## 2.5 NAMA Project Timing and Milestones

17. The NAMA Project commenced on July 4, 2015 and was designed as a 4-year project, terminating on July 4, 2019. Milestones to be achieved during the first 25 months of the Project include:

- Delivery of a finalized provincial level inventory tool for energy generation and end-use sectors (Output 1.1) for completion by late 2016;
- Delivery of identified and analyzed priority appropriate mitigation actions in the energy generation and end-use sectors in Sri Lanka (Output 2.3) for completion by 3Q of 2016;
- Identification of fully capable and qualified private and public sector entities that are established to implement climate change mitigation programs and sourcing of funds (Output 3.1) for delivery by 1Q of 2017;
- The establishment of an operational national registry mechanism for mitigation actions in the energy generation and end-use sectors (Output 4.1) for completion by 1Q of 2016.

Other outputs of the NAMA Project were to be delivered in the 2<sup>nd</sup> half of the project.

## 2.6 Main Stakeholders

18. To achieve the specific NAMA Project objective “to support appropriate climate change mitigation actions in the energy generation and end-use sectors as part of the initiatives to achieve the voluntary GHG mitigation targets of Sri Lanka”, the NAMA Project has required the engagement of a diverse range of stakeholders. Key stakeholders on the NAMA Project comprises:

- The Ministry of Power and Energy (MoPE) responsible for implementing the Government’s policies and regulations related to the energy sector including both renewable and non-renewable sources of energy. MoPE also has the mandate to formulate policies, programmes and projects within the energy sector;
- The Sri Lanka Sustainable Energy Authority (SLSEA) under MoPE who serve as the Implementing Partner of the NAMA Project with a mandate to provide national guidance to develop indigenous energy resources and conserve energy resources by embracing best sustainability practices;
- The Ministry of Mahaweli Development and Environment (MoMDE) with the mandate for the formulation of policies and promotion of sustainable management of the environment and natural resources of Sri Lanka. MoMDE is also the National Focal point for UNFCCC, and the operational focal point for GEF in Sri Lanka;
- The Climate Change Secretariat (CCS) under MoMDE with oversight on the adoption of a comprehensive national approach to addressing climate change challenges of Sri Lanka;
- The Ministry of Provincial Councils and Local Government (MPCLG) who have the responsibility for policy and legislation and oversight of Provincial Councils and Provincial Ministry of Energy. The NAMA Project was to work with 4 Provincial Councils in developing the NAMA framework with user friendly and transparent inventories, MACCs and MRV systems for quantifying GHG savings and other co-benefits of a low carbon development trajectory;
- The Ceylon Electricity Board (CEB) that has a mandate for generating, transmitting and distributing electrical energy to all categories of consumers in Sri Lanka;
- The Tea Research Institute (TRI) with a mandate to facilitate research into all matters pertaining to tea and enriching the industry through a professional approach to commercial tea cultivation and processing.

Stakeholders engagement is further discussed in Section 3.3.5.

## 3. FINDINGS

### 3.1 Project Strategy

19. Design of the NAMA Project was intended to remove barriers to development of a NAMA framework to enable Sri Lanka to confidently monitor and report its GHG emission reductions from low carbon investments. The design incorporates a holistic approach building off existing baseline initiatives, incorporating international experiences and best practices in the development of a NAMA framework, and providing guidance to Government on best available technologies and measures to maximize GHG emission reductions. In addition, the Project was to provide activities to implement pilot NAMA activities that would contribute to the building of local capacities of the public and private sectors on designing and implementing a NAMA programme. Most importantly, the Project was to include the setup of a functional system for credible quantification of GHG emission reductions through an MRV system.

#### 3.1.1 Project Design

20. The strategy of the NAMA Project seeks to implement the aforementioned strategy by augmenting ongoing baseline activities. This includes a number of ongoing plans, initiatives and projects that are under implementation to meet the energy targets that were set through the various established relevant plans, policies and programs, notably:
- EnMAP with a target of achieving energy savings that are equivalent to 20% of the total 2010 energy consumption, by 2020 through promoting energy efficiency and energy conservation measures in the end-use sector. EnMAP is now being implemented as the country's Demand Side Management (DSM) Plan; and
  - The Renewable Energy Resources Development Plan (RERDP) of 2012 with a target of renewable energy share in the grid electricity generation mix of 20% by 2020.
21. Underlying assumptions to the success of achieving the overall Project results is covered in the PRF including assumptions on continued support from the central government (notably SLSEA), provincial ministries, financial institutions for the planned actions, and agreements and mechanisms in place to monitor and access data on energy savings and GHG emission reductions. Another important assumption was the strong support from Provincial Councils and Provincial energy ministries throughout the Project. The MTR team notes that baseline activities incorporated into the Project strategy were developed in close consultation with the implementing partner, SLSEA, CCS as well as Provincial Councils and Authorities. As such, the information collected from SLSEA and CCS as well as selected Provincial councils appears to be an appropriate representation of baseline initiatives worthy of NAMA Project support.
22. While senior personnel within the MoPE and MoMDE and the Provincial Councils have demonstrated strong ownership of the activities of the NAMA Project, the MTR team observes that the *capacities of lower-level government personnel* appears to be a primary barrier to the objectives of the NAMA Project. This is noteworthy since the NAMA Project will be challenged within its 4-year period to implement a quick start-up of a number of NAMA Project activities including the accelerated deployment of pilot NAMA technologies with this capacity deficit of lower level government personnel.

23. In reviewing the cumulative GHG emission goal of 16,126 tonnes CO<sub>2eq</sub> by the EOP, the MTR team notes that the deployment of pilot NAMA technologies was to commence in Year 1 of the Project with continuous deployment until Year 4 and the EOP of the Project. In consideration of the aforementioned *barriers related to the capacities of lower-level government personnel*, this target appears overly ambitious<sup>2</sup>, leaving the Project with a high risk of not achieving its GHG emission reduction target. There is also a design issue related to the development of MACC curves and their use in selecting pilot NAMA technologies. Given that pilot NAMA technologies were to be deployed in Year 1, MACC curves would not have been available to justify pilot technology selections.
24. A review of the NAMA ProDoc reveals that gender has been addressed in several areas including the policies of the GoSL, and in the activities of the Project, notably Output 4.4 related to the “review and document lessons learned for the development of gender sensitive knowledge products (CD, DVD, training manuals) and gender sensitive training program for all NAMA staff in operation and management of the Inventory, MRV system and implementation of the NAMAs”.

### 3.1.2 Analysis of Project Results Framework

25. The quality of the Project Results Framework (PRF) of the NAMA Project is **highly satisfactory**. The NAMA PRF meets “SMART” criteria<sup>3</sup> and best practices for preparing project PRFs. The NAMA Project Inception Report of October 2015 provides documentation of a few changes made to the NAMA Project PRF, mainly clarifications in the description of the indicators and revision of some targets based on new field information. The PRF from this Inception Report has been used as the basis for progress monitoring in the Project’s project implementation reports (PIRs):
- All indicators provide a clear description of the intended target complete with timelines with an economy of words. The simplicity of the indicators provide clarity to the PMU in terms of the activities to be monitored and targets to be reached;
  - Achievement of the targets are linked to critical activities and delivery of outputs (that are contained within the “sources of verification”) within each component that would lead to the intended outcome of that component;
  - Proper language has been used to describe the outcomes, Project objective and Project goal. None of the described outcomes, objective or goal of the Project can be confused with an output;
  - The column on “critical assumptions” appears reasonably complete. Moreover, these assumptions serve as a good basis for identification of Project risks for entry into the Project risk log. Many of the critical assumptions pertain to sustained support from relevant government agencies (both central and provincial governments) during Project implementation and competent capacity within these government agencies of implementing and managing various NAMA activities (an issue mentioned in Para 23).

<sup>2</sup> As detailed in the ProDoc on pgs 86, 102, and 111, Year 1 was scheduled to have completed the installation of 64 biogas systems, 100 solar PV systems, and 88 high efficiency motors as a part of the deployment plan to achieve.

<sup>3</sup> Specific, Measurable, Attainable, Relevant, Time-bound

## 3.2 Progress towards Results

### 3.2.1 Progress towards Outcome Analysis

26. Progress towards results is provided on Table 1 against the EOP targets in the NAMA 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:*

27. To meet the Project objectives, three NAMA technologies were commenced in 2016, the progress of which can be summarized as follows:
- 13 solar PV installations with battery storage were installed under the first phase (trial phase) in 2017 where performance monitoring is ongoing to track savings of electricity generated from fossil fuels and associated GHG emission reductions;
  - 24 high efficiency motors (HEMs) and 5 Variable Frequency Drivers (VFDs) were installed in 5 tea factories in 2016. Monitoring and analysis for electricity savings and associated GHG emission reductions have revealed less than anticipated energy savings from these HEM installations in selected tea processing steps, but higher energy savings potential for VFD installations;
  - 79 biogas digesters (varying in sizes from 8 to 15 m<sup>3</sup>) have been constructed with another 47 units currently under construction. These units are also being monitored for the production of biogas, and associated GHG emission reductions generated from the offsetting of LPG usage. For some of the households with biogas installations, however, the baseline consists of the use of home-garden derived biomass which would result in less and even insignificant GHG emission reductions for these units.
28. Moreover, the Project has not deployed pilot NAMA technologies at the pace envisaged by the ProDoc (as further elaborated in Para 23). This pace of pilot NAMA technology deployment places more challenges on the NAMA Project to meet the Project goal of 16,126 tonnes CO<sub>2eq</sub> by the EOP:
- Only 13 solar PV installations are in place totalling 21.5 kW (this is equivalent to 31 – 0.68 kW solar PV systems). The Project will be challenged to achieve its target of 205 systems and 443 tCO<sub>2eq</sub> by EOP. For solar PV, GHG ER for a 0.68 kW solar PV system installed is 0.62 tCO<sub>2eq</sub>/yr or 0.91 tCO<sub>2eq</sub>/yr per 1 kW;
  - Only an equivalent of 79 biogas units installations are in place totalling (with the average size of unit in the order of 11 m<sup>3</sup>). The Project will be challenged to achieve its target of 1,000 systems and 11,317 tCO<sub>2eq</sub> by EOP. For biogas units, the GHG ER is 5.82 tCO<sub>2eq</sub>/plant/yr (assuming 10-20 m<sup>3</sup> biogas units). This does account for leakage of direct methane emissions from waste in the absence of the Project’s biogas units;

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

Project Strategy	Indicator	Baseline Level	Level in 2016 PIR	Mid-Term target	End-of-Project Target	Midterm Level and Assessment	Achievement Rating	Justification for Rating
<b>Goal:</b> Reduction of GHG emissions from the energy generation and end user sectors in Sri Lanka	Cumulative GHG emissions by end of project (EOP), tCO <sub>2</sub> e	0	0	None	16,126	2,036 tCO <sub>2</sub> eq expected by EOP at current rate of deployment. Meeting EOP target will require some adjustments and aggressive deployment of pilot NAMAs to generate more GHG reductions to make up for the shortfall in Years 1 and 2.		See Para 28
	Cumulative energy savings achieved by end of project (EOP), MJ	0	0	None	74,866,639	19,554,000 MJ expected by EOP at current rate of deployment. Meeting EOP target will more aggressive deployment of pilot NAMAs to generate more energy savings.		See Para 28 and Tables 2, 3 and 4
<b>Objective:</b> Support appropriate climate change mitigation actions in the energy generation and end-use sectors as part of the initiatives to achieve the voluntary GHG mitigation targets of Sri Lanka	No. of implemented NAMAs in the energy generation and end use sectors by EOP	0	0	None	3	3 NAMAs being implemented. The viability of these NAMAs, however, is being questioned in the context of higher generation of GHG emission reductions		See Para 27
<b>Outcome 1:</b> Established and regular update of renewable energy utilization baseline & energy intensity reference baselines for the energy generation and end-use sectors	No. of provinces that regularly conduct sub-sectoral GHG emission inventories of their energy generation and end-use sectors by Year 4	0	0	None	4	4 provinces are now engaged in testing structures for energy and GHG emission data collection from technologies from selected NAMAs. This structure will then be applied to other NAMA applications for various sub-sectors		See Para 29
	No. of provinces that have established an operational sub-sectoral GHG	0	0	None	4	4 provinces are establishing their GHG emission inventories through the training of field level officers at the provincial level coupled with energy managers at SLSEA and CEB		See Para 30

Project Strategy	Indicator	Baseline Level	Level in 2016 PIR	Mid-Term target	End-of-Project Target	Midterm Level and Assessment	Achievement Rating	Justification for Rating
	emission inventory system by Year 4					on collection of data for entry onto a web-based Data Management System.		
	No. of provinces that utilize the functioning web-based EnerGIS GHG inventory system by EOP	0	0	None	4	1 province. The North Western Province is now piloting a functioning web-based EnergyGIS inventory system with the entry of pilot NAMAs for biogas and solar PV units as a part of the inventory. Once functioning, capacity building activities will be provided in Q3 of 2017.		See Para 31
<b>Outcome 2:</b> Prioritized Nationally Appropriate Mitigation Actions (NAMAs) in the energy generation and end-use sectors are identified and designed	No. of provinces that established MACC curves established to identify technologies for energy sector by year 2	0	0	1	1	National MACC curves to be established in Q3 of 2017. Indicator should be changed to reflect that no provincial MACC curves will be developed.		See Para 32
	No. of NAMA EE/RE projects that are prioritized and designed by EOP	0	0	None	3	3 NAMA projects have been prioritized and designed. However, given the initial implementation results, tweaking of these designs will be required.		See Paras 33 and 34
<b>Outcome 3:</b> Identified private and public sector entities implemented prioritized appropriate mitigation actions for the achievement of Sri Lanka voluntary mitigation target	No. of identified fully capable and qualified private and public sector entities that are interested in funding prioritized NAMA projects by Year 2	0	0	2	2	Both SLSEA and the Planter's Association of Ceylon were identified as public and private entities respectively capable of funding prioritized NAMA projects by Year 1.		See Para 35
	No. of individual projects that constitute the	0	0	None	1,000 biogas systems 1,300 tea factories 205 solar systems	Progress to date consists of: -79 biogas systems -24 HEMs (including 5 VFDs)		See Paras 36-39

Project Strategy	Indicator	Baseline Level	Level in 2016 PIR	Mid-Term target	End-of-Project Target	Midterm Level and Assessment	Achievement Rating	Justification for Rating
	country's NAMAs by Year 4					<p>-13 solar PV systems with battery storage.</p> <p>Progress is lagging for various reasons that will necessitate changes to the NAMA designs and technologies.</p> <p>Indicators for biogas and solar PV installations should be changed to measure actual installed capacity instead of number of installations. See Para 76 for specific recommendation.</p>		
	No. of operational Private-funded NAMA projects by EOP	0	0	None	1 (high efficient motors in tea factories)	Planter's Association of Ceylon (PAC) is likely to fund a NAMA to reduce electricity consumption from motors in tea processing. However, VFDs will need to be piloted by the Project over the next year		See Para 40
<b>Outcome 4:</b> Accurate measurement and accounting of actual GHG emission reduction from mitigation actions in the energy generation and end-use sectors	No. of NAMA projects with GHG ERs correctly verified by the established and operational MRV systems for mitigation actions by Year 4	0	0	None	3	3 pilot NAMA projects are having MRV systems being developed that includes the collection of primary energy and GHG data into the Data Management System (DMS).		See Para 41
	No. of projects in the energy generation and end use sectors that are registered in the National NAMA registry by EOP.	0	0	None	3	0 projects registered. However, the institutional setup for the NAMA registry has been approved by Cabinet. This is excellent progress towards officially establishing the National NAMA registry and the registration of 3 NAMA projects.		See Paras 42-43



- For HEMs, only 24 HEMs along with 5 VFDs have been installed to date with a target of 1,300 HEMs or VFDs by EOP. HEM installations, however, did not generate the expected energy savings that would have been financially viable for tea factories. This will challenge the Project to achieve its target of 1,300 HEMs or VFDs and 4,365 tCO<sub>2eq</sub> by EOP. GHG ERs were estimated to be 1.74 tCO<sub>2eq</sub>/yr per motor (with a 5 kW motor size). The PMU is currently switching the technology to VFDs to provide equivalent energy savings based on a 10-hr average operation of 5 kW motor (on the withering process) at 80% loading for 300 days of operation/year. With 20% overall energy saving per withering cycle, the annual GHG savings from one VFD will be 1.72 tCO<sub>2eq</sub>/yr. Despite these promising GHG reductions, the Project will need to aggressively deploy VFDs to reach the GHG target for this pilot NAMA of 4,365 tCO<sub>2eq</sub> by EOP.

The MTR rating of progress towards the Project goal of energy savings and GHG emission reductions from the 3 NAMAs being implemented is **moderately satisfactory** in view of the ongoing efforts to implement these pilot NAMAs and address technical shortcomings (see Paras 36-39 under Outcome 3 for further details), and MTR team comments made in Para 23 regarding overly ambitious GHG emission reduction targets by the EOP.

#### Outcome 1 targets:

29. To date, the Project has been active in assisting with the development of a system for building a provincial GHG emission inventory system subdivided into economic sub-sectors for aggregation at the national level. This includes:
  - The upgrading of SLSEA’s existing EnerGIS Data Management System (DMS) with ArcGIS 10.5 as a fully functional energy DMS to include the GHG emission inventory. This is being accomplished through the testing of a web-based application tool to facilitate energy and GHG data collection from field activities of the NAMAs to be fed into the EnerGIS DMS. A local Information and Communication Technologies (ICT) service provider is executing this work that will include Quality Assurance (QA) and strengthening reporting functions of the DMS;
  - Data flow structures for energy and GHG emissions were identified for the selected technologies of the pilot NAMAs to include field data collection from the factory or site of installation, data quality control at provincial and sectorial levels, data collation with quality assurance to standards set by SLSEA, and annual reporting to the CCS. The functionality of the structure will be tested for the selected technologies of the pilot NAMA, and applied to other NAMA technology applications in the energy sector;
  - A provincial level stakeholder consultation was conducted in North-Western Provincial Council to solicit provincial-level suggestions for development of the inventory system with the aforementioned tools. This was in addition to the consultation of the two key stakeholders of the project: SLSEA and CCS;
  - Available data from pilot NAMAs are currently being fed into this DMS at SLSEA for testing and verification prior to the system being introduced at the provincial level. Once deployed at the provincial level in late 2017, the Project will facilitate further system improvements to be undertaken based on provincial and sectoral feedback.
30. The Project has made progress on establishing sub-sectorial GHG emission inventories in North Western and Southern Provinces (not much activity was observed in Uva and Central Provinces). The development of the web-based DMS as described in Para 29 will be used to make GHG Emission Reductions (ERs) inventories. The same system will also be used for the MRVing of these ERs further

described under the progress of Component 4. The PMU identified potential personnel who could be utilized for data collection, verifying and reporting process at provincial and sub-sectoral level (for these selected three NAMAs in particular) who are listed below:

- Provincial level: Livestock development inspectors, economic development officers, and agricultural inspectors of respective provinces. The Project provided a one-day capacity development workshop on the subject for a total of 125 officers involved with the biogas programme;
  - Sub-sectoral level: Energy managers (trained on energy efficiency and energy management in industrial sector by SLSEA), and meter readers of the electricity utility (Ceylon Electricity Board and the Lanka Electricity Company) covering the power generation sector. The Project has planned for workshops to deliver necessary training and capacity building requirements on energy and emission data management and MRVing of ERs for these personnel.
31. The web-based EnerGIS inventory system being developed will be first introduced to the North Western Province (NWP). Data of installed biogas and solar PV units in NWP has already been recorded and will be fed to this inventory system. The GHG inventory together with the renewable energy utilization baseline and energy intensity reference baselines will be made available later in 2017 to the provinces with available data from the pilot NAMA technologies. The required capacity building activities on normal operation, and optimal use of the web-based system for use as planning and decision tools have been scheduled for Q3 of 2017. This system will also be introduced to the other provinces as well as will be expanded to capture other technologies.

Outcome 2 targets:

32. Marginal Abatement Cost Curve (MACC) analysis was initially conducted for 17 pre-selected mitigation options in the energy generation and end user sectors and was substantially completed in late 2016 (as shown on Figure 1). The MACC analysis was delivered in a workshop with expert guidance from a team consisting of an international consulting firm with local consultants to key Project including SLSEA, CCS and the Project team. The list of 17 technologies was developed on the basis of national importance and larger abatement potential at national level, leading to the establishment of a national MACC Curve. While there was discussion of undertaking MACC analysis at the provincial level, the Project determined that provincial MACCs would have less impact in consideration that decisions on energy sector projects are made at the national level. Ongoing MACC analysis is to be completed in August 2017 with results to be shared with key decision and policy makers as well as the national expert committee on Climate Change Mitigation (CCM), who have oversight on energy sector CCM targets set under Nationally Determined Contributions (NDCs).
33. Three pilot NAMA projects under energy efficiency and renewable energy were identified through stakeholder consultations during project preparation phase. During the early stages of the Project, however, selected pilot NAMA technologies needed to be preselected for approval by GEF and UNDP prior to the availability of the MACC analysis. The pilot NAMA technologies could have benefited from the MACC analysis based on the following preliminary findings that were known as early as early 2017:
- Solar PV with battery for a small household is a costly GHG abatement option in consideration that their electricity consumption is not high. The converse is true for larger households;

- Efficient motors replacing an existing motor can be viewed as an operational “cost” as opposed to an efficient motor as a new purchase which can be an operational “benefit”;
- Measurement of biogas GHG emission reduction benefits can be difficult for smaller applications given that the baseline of biogas installations is not very clear and at times, not available<sup>4</sup>.

Given these preliminary findings, the existing design documents and implementation plans for these pilot NAMA technologies will need some adjustments to demonstrate a viable NAMA (more details provided in Paras 36-39). These documents will then be converted into NAMA design documents using the NAMA template proposed by the UNFCCC<sup>5</sup>.

34. To improve the utility of MACCs, the Project has been developing selection criteria for prioritizing NAMA in the energy sector. This prioritization process is incorporating a Multi-Criteria Assessment (MCA) methodology with the findings of MACC analysis and barrier analysis for RE/EE technologies of the sector, which was disseminated during two MACC workshops in 2016. This process would also include considerations of the technologies on sustainable development goals, and socio-economic aspects.

Outcome 3 targets:

35. The two capable and qualified private and public sector entities that have been identified by the project for funding prioritized NAMA’s are the SLSEA as a public sector entity (and also the Project implementing partner) and private tea processing companies who are members of the Planter’s Association of Ceylon (PAC) as the private entities representing a corporate-level tea producers:
  - The Sustainable Energy Authority (SLSEA) has ongoing support and funding for RE & EE programmes in Sri Lanka. Their support includes programs for establishment of energy baselines (e.g. hotels, hospitals and government institutes in 2016/2017), concessional financing for establishing and disseminating RE technologies including biogas and solar PV (the latter of which is associated with “Sooryabala Sangramaya”), and the ambitious action plan to install 1 million domestic-scale solar PV units by 2025. SLSEA is also leading efforts to implement a Demand Side Management (DSM) plan by accelerating implementation of energy efficiency measures to achieve 1,895 GWh savings by 2020;
  - Member companies of PAC have energy efficiency initiatives to reduce tea factory electricity consumption and improve productivity and competitiveness. In particular, tea industry companies have had an interest in investing in High Efficient Motors (HEMs) which led to initial commitments of US\$ 4 million from member companies of the PAC as Project co-financing to demonstrate the benefits of installing HEMs in tea factories. Initial Project assistance to these tea factories to invest in HEMs was in the form of a matching rebate scheme (which was 40% gradually reducing to 20% by EOP). After completion of pilot trials of HEMs with the Project, these companies will have more confidence into investments of energy efficiency applications including HEMs and VFDs.

<sup>4</sup> There are uncertainties in smaller households or commercial entities on how to quantify their baseline fuel consumption, either from fossil fuels (LPG or kerosene) or forest biomass.

<sup>5</sup> NAMAs from this Project would most likely be registered as “NAMAs seeking support” as opposed to “NAMAs for recognition”. The Project will need to clarify the conditions for these registration categorizations.

36. Three RE and EE NAMAs (domestic solar PV with battery storage, biogas as solution for waste management and high efficiency motors) were initially preselected after stakeholder consultations, and are now used to test and verify the proposed NAMA framework. These 3 NAMA technologies were assessed prior to available MACC analysis, using lessons learned from initial implementation and trials of these NAMAs. Their progress can be summarized as follows:

- Biogas installations. Progress on the provincial biogas programmes has been somewhat hampered by technical issues and other limitations of the technology, the need to improve the quality of workmanship of local biogas builders, and initial delays in the start-up of the provincial biogas programmes. In consideration of the target of 1,000 digesters with only 79 biogas digesters currently installed and two years remaining on the Project, meeting the target of 1,000 biogas digesters will be a challenge. To date, the programmes in the 4 Provinces have only been targeting biogas digesters for smaller households, all of whom need project financial support, and all of whom generate smaller quantities of direct GHG emission reductions to the Project. During the remaining 2 years of the Project (as mentioned in the Project’s Biogas report<sup>6</sup>), biogas units to be installed will need to be medium to larger-scale scale biogas applications to maximize generation of GHG emission reductions of this NAMA. Para 37 further discusses this NAMA;
- Domestic Solar PV with battery storage. Similar to the biogas NAMA, progress of solar PV installations is 13 PV systems installed against a target of 205 systems by EOP. Again, the Project will be challenged to meet this target given the pace of solar PV systems installed. In addition, the cost of battery storage technology is high which does not make this NAMA in its current form financially viable or economical for smaller households that consume lower quantities of electricity but may be viable from a national perspective (considering this investment maybe less than the total electricity subsidies to these smaller households). Domestic solar PV without battery is a possible alternative for promotion and demonstration by the Project. Para 38 further discusses this solar PV NAMA;
- High Efficiency Motors (HEMs) in the tea sector. Progress of this NAMA was hampered somewhat by the departure of a Project Coordinator in early 2016 and the Sector Specialist in mid-2016, and difficulties in finding a replacement. To date, 24 HEMs and 5 VFDs installed in 5 tea factories in 2016 revealed that energy savings from the replacement of existing motors with HEMs did not lead to substantial or financially viable energy savings in the withering process<sup>7</sup>. Moreover, HEMs procured only were able to operate at one speed when in fact, the withering process for tea leaves requires less speed as the tea leaves become drier and lighter later into the process. The demonstration of 5 VFDs provided evidence that VFDs would result in more significant energy savings than HEMs alone. As such, the Project will require a change in the technology for this NAMA to VFDs. Para 39 provides additional details on the viability of a VFD/HEM NAMA for the tea sector.

37. With regards to the actual viability of a biogas NAMA, the MTR team provides the following observations and comments:

- The 79 smaller biogas units installed to date do not generate considerable GHG emission reductions considering their sizes are mostly between 8 and 15 m<sup>3</sup> (an average of 11 m<sup>3</sup> that

<sup>6</sup> Pg 30 of the NAMA Project report, “Rapid Assessment of Current Biogas Programs in North Western and Southern Provinces” by Mr. Namiz Musafer, National Consultant Biogas Technology for UNDP Sri Lanka, July 2016.

<sup>7</sup> HEMs had a 1.5-2% higher speed and consequently a 4.6-6.1% higher power consumption reducing measurable energy savings.

generate only 4.6 tCO<sub>2eq</sub>/year) with the targeted sizes being in the order of 10 to 20 m<sup>3</sup> (that would generate more than 5.82 tCO<sub>2eq</sub>/year);

- Biogas generation efficiencies are highly dependent on the water content of the feedstock. For 2 biogas installations observed during the MTR mission which used food waste from restaurants, biogas from these sources was not easily ignited, likely due to either too much water content in the gas or insufficient time for the feedstock to generate higher pressures of biogas for cooking;
- Most biogas installations were equipped with makeshift venting outlets in the event of releasing biogas pressure in case biogas is not being used on a particular day. While it is likely that venting frequently occurs with the biogas units observed, the MTR team notes that 10% leakage is mentioned in the MRV protocol for biogas NAMAs prepared by the Project (instead of observed leakages which would be obviously difficult to monitor)<sup>8</sup>;
- There have been reports of some households being unable to purchase biogas cookers due to lack of availability. The lack of availability is also linked to low demand due to few biogas installations, and the consequent high price of biogas cookers;
- Slow pace of implementing this NAMA can be attributed to the remote locations of the biogas units, and low awareness of biogas units resulting in low demand for biogas as an alternative and renewable energy for cooking and heating purposes, and as a means of waste management. Future management of the biogas programs needs to include stronger promotion of biogas units with these benefits. This may improve demand;
- In summary, this NAMA can be improved for the remainder of the Project by promoting the benefits of biogas installations to create higher demand, and targeting larger biogas installations that would have the impact of increasing the generation of GHG ERs and interest amongst NAMA investors. However, due to the complexity of the biogas project baselines<sup>9</sup>, the use of different feedstocks<sup>10</sup>, the unquantified emission from accidental or necessary venting of biogas, and the unavailability of biogas cookers, the quality of ERs from this NAMA would not be as strong as ERs from solar PV or other NAMAs where the measurement of baseline and project interventions are more certain.

Table 2 provides a schedule of the number of biogas units to be installed for the remainder of the Project. Para 76 also recommends that the indicator for this NAMA should be installed capacity of biogas units which will provide a better indicator when installing larger biogas units.

38. With regards to the actual viability of a solar PV NAMA, the MTR team provides the following observations and comments:
  - To date, the Project has installed only 13 small solar PV installations with battery storage in small households (equivalent to 31 - 0.68 kW solar PV systems). While these households consume very small quantities of electricity, it is doubtful if this NAMA that only covers small households could be sustained with the consumers driving this process. This is due to the fact that the payback period for the small households would be well beyond 15 to 20 years given that their electricity rate is heavily subsidized by the government (Rs 3 per kWh rate versus the government cost of Rs 17 per kWh);
  - The addition of battery storage to a solar PV systems is costly and likely to remain costly due to the strong likelihood that duties on solar batteries will never be waived. As such, and in the

<sup>8</sup> NAMA Project report on “Monitoring, Reporting and Verification Protocol for Biogas Projects 8 to 20 m<sup>3</sup> for Sri Lanka NAMAs”

<sup>9</sup> Varying baselines may include use of LPG, the use of fuel wood, and the possibility of avoidance of methane formation (depending on how waste feedstock is disposed).

<sup>10</sup> Can include different feedstocks such as pig and cow manure, and waste food products.

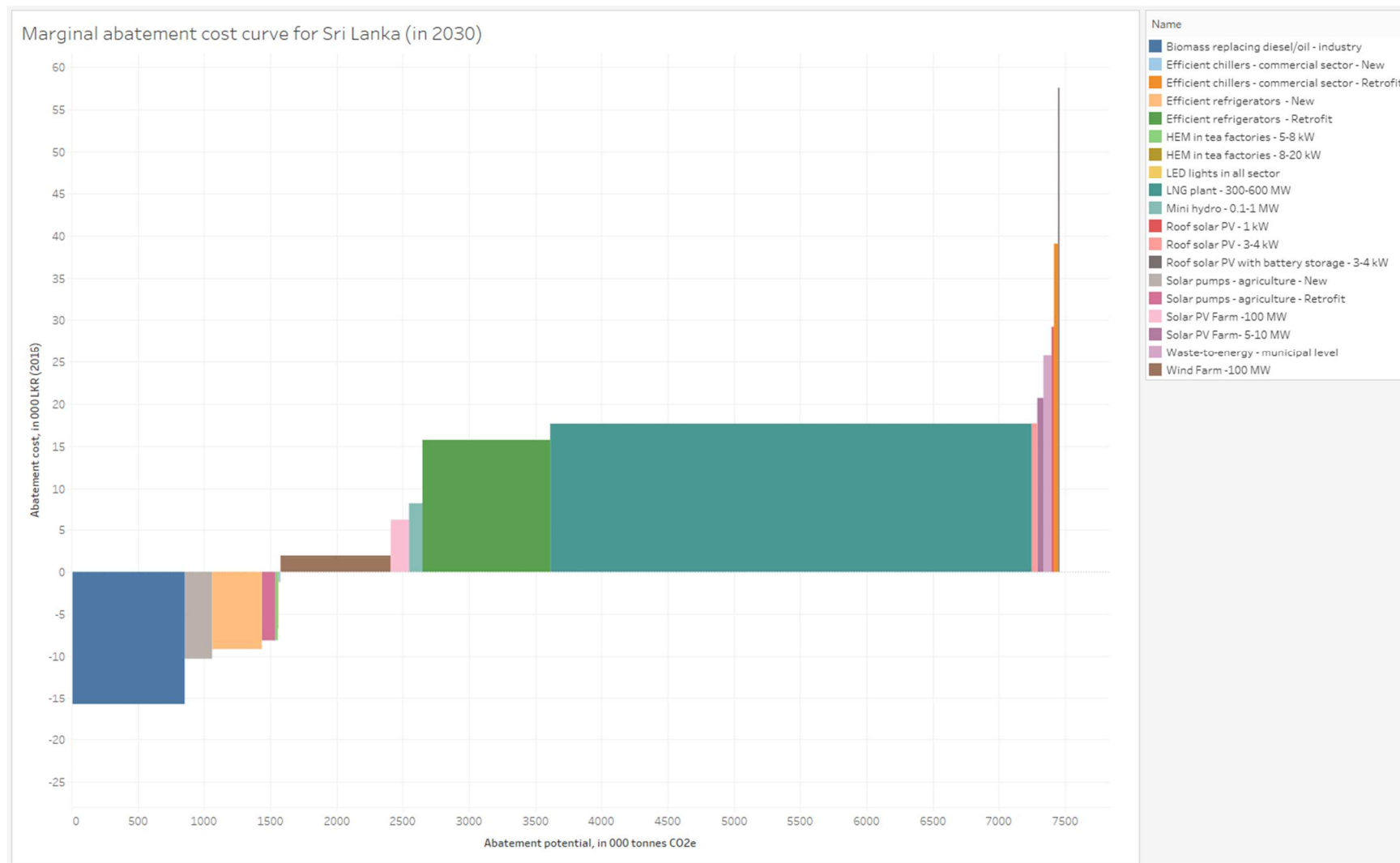
context of seeking the means to maximize GHG emission reductions from this NAMA during the Project, solar PV systems for a number of scenarios should be reviewed:

- For small households, benefits of battery storage to a solar PV system will be marginal. While peak demand from solar PV systems with battery storage from this small household is reduced, the amounts reduced are small in comparison to the cost the battery storage. Notwithstanding, the Government (through SLSEA) may still want to consider providing financial support for solar PV systems to these small households. The cost of a solar PV system (over a 20-year period) may generate sufficient electricity to these households that would partially offset the subsidies provided by the Government to these households during the service life of the solar PV system;
- For hospitals, the benefits of adding battery storage to a solar PV system could be substantial as hospitals consume much more energy, with battery storage contributing to the reduction of peak loads from the hospital;
- Schools should be considered under this NAMA since schools will require little to no electricity during peak demand periods in the evening. As such, no battery storage system would be required. The payback period for the systems would likely be attractive to some public establishments and also have positive spin-off impacts related to education of renewables to school children in Sri Lanka;
- Commercial buildings (such as supermarkets or smaller retail stores) could benefit from a solar PV system with battery storage. Retail stores consume higher quantities of electricity during peak periods in the evening, which could be offset by a solar PV system with battery storage. A challenge in this scenario would be finding commercial establishments that are located on buildings that are owned by the establishment;

Table 3 provides a schedule of the number of solar PV systems to be installed for the remainder of the Project. Para 76 also recommends that the indicator for this NAMA should be installed capacity of solar PV systems which will provide a better indicator for the PMU when installing larger solar PV systems.

39. With regards to the actual viability of a HEM/VFD NAMA, the MTR team provides the following observations and comments:
- VFDs need to be required equipment additions to all fan motors applied to the withering process. With a number of trials already completed to quantify energy savings of VFDs, the Project needs to disseminate these results in a wider forum targeting stakeholders in the tea industry including key stakeholders such as the Tea Research Institutes, corporate sector tea factories, VFD suppliers, SLSEA, and other industry experts. A workshop should be conducted to share the information on energy savings from VFDs from detailed monitoring programs and formally proposed as the technology alternative to HEMs. The current requirement for this NAMA would be to seek potential suppliers of VFDs, conduct a demonstration, and conduct an awareness campaign targeting all factories of private tea plantations of the value of VFDs in tea plantation operations;
  - A key issue in realization of VFD energy savings is the operation of the motor and the timing of its turndown using the VFD during the withering process (as the leaves become drier and lighter). As such, the energy savings from VFDs can only be estimated, but can be measured based on the actions of the tea plantation operators. The PMU estimates that energy savings of more than 20% can be achieved;

Table 4 provides a schedule of the number of VFDs to be installed for the remainder of the Project.

**Figure 1: MACCC for Sri Lanka in 2030**

**Table 2: Summary of Energy Savings and GHG Reductions from Biogas NAMA**

	Actual	Cumulative Unit	End of year Annual ERs (tCO <sub>2</sub> eq/y)	Cumulative ER(tCO <sub>2</sub> e)	Planned Biogas systems after 2016	Cumulative Biogas systems installed	End of year Annual ERs (tCO <sub>2</sub> eq/y)	Cumulative ER(tCO <sub>2</sub> e)	Annual energy saved (GJ)	Cumulative energy saved (GJ)
2015	0	0	0	0	0		0	0	0	0
2016	35	35	203.77	204	0		42	42	47	47
2017	55	90	523.98	728	180	215	1,252	1,456	286	333
2018	0	90	523.98	1252	300	515	2,998	4,454	685	1,017
2019	0	90	523.98	1776	200	715	4,163	8,617	951	1,968

**Table 3: Summary of Energy Savings and GHG Reductions from Solar PV NAMA**

	Actual	Cumulative Unit	End of year Annual ERs (tCO <sub>2</sub> eq/y)	Cumulative ER(tCO <sub>2</sub> e)	Planned Solar PV systems after 2016	Cumulative Solar PV systems installed	End of year Annual ERs (tCO <sub>2</sub> eq/y)	Cumulative ER(tCO <sub>2</sub> e)	Annual Elect saved (MWh)	Cumulative Elect saved (MWh)
2015	0	0	0	0	0		0	0	0	0
2016	0	0	0	0	0		42	42	0	0
2017	31	31	19	19	81	81	51	51	195	195
2018	0	31	19	39	150	231	144	195	362	557
2019	0	31	54	93	0	231	401	596	0	557

**Table 4: Summary of Energy Savings and GHG Reductions from VFD/HEM NAMA**

	Actual	Cumulative Unit	End of year Annual ERs (tCO <sub>2</sub> eq/y)	Cumulative ER(tCO <sub>2</sub> e)	Planned VFDs to be installed after 2016	Cumulative VFDs installed	End of year Annual ERs (tCO <sub>2</sub> eq/y)	Cumulative ER(tCO <sub>2</sub> e)	Annual Elect saved (MWh)	Cumulative Elect saved (MWh)
2015	0	0	0	0	0		0	0	0	0
2016	24	24	42	42	0		42	42	58	58
2017	0	24	42	83	100	124	215	257	299	357
2018	0	24	42	125	500	624	1,083	1,339	1,504	1,861
2019	0	24	42	167	400	1,024	1,777	3,116	2,468	4,328



40. A privately funded NAMA project on HEMs in the tea industry commenced implementation with pilot HEM trials in late 2016-early 2017. This was to ensure that no technical risks would be incurred with the application of HEMs and that HEMs would be a viable technology for promotion and up-scaling under the Project. This pilot trial included installation of 24 HEMs and 5 VFDs in five tea factories covering all tea growing areas. The installation of these HEMs and VFDs was completed by 6 different suppliers during the 4<sup>th</sup> quarter of 2016 with operational trials taking place during the first quarter of 2017. As mentioned in Para 39, this privately NAMA will likely shift technology from HEMs to VFDs.

Outcome 4 targets:

41. CCS experienced difficulties during early 2016 to fully support the implementation of activities of this component mainly due to the lack of qualified personnel to be assigned to this component. This was rectified in 2017 with the recruitment of a full-time officer to assist CCS in implementing the activities of the Project. This resulted in an MRV system framework for verification of GHG emissions from pilot NAMAs being developed:
- A generalized MRV framework has been identified for energy sector technologies;
  - This framework was used to identify and design specific MRV systems for the 3 pilot NAMAs including “MRVing” parameters of these technologies, and defined field data gathering mechanisms;
  - With assistance of international consultants, the Project has prepared monitoring procedures and protocols, and logbook templates for data collection for technologies of the 3 NAMAs;
  - The Project is implementing these proposed MRV systems for the pilot technologies based on the primary data collected through the energy/GHG inventory DMS. Based on these data, GHG Emission Reductions (ERs) can be verified and reported. Based on the results of this exercise, improvements will be made to the proposed MRV systems and procedures;
  - Integration of these proposed MRVing systems to existing institutional setups is now being discussed;
  - A training workshop on MRVing was been delivered to national stakeholders with an additional workshop planned for September 2017 with pilot MRV demonstrations. Provincial level MRV training programs are also being planned targeting field and extension officers engaged as sectorial and provincial focal persons for data collection and actual monitoring of NAMAs.
42. In addition, the Project managed to assist CCS in implementing the proposed NAMA Institutional set-up to facilitate development of future NAMAs in Sri Lanka. A proposed NAMA registry will be a part of this set-up under which these pilot NAMAs will be registered. Based on recommendations from international consultants and using existing institutional arrangements, a governing structure for the approval and implementation of NAMAs (called the NAMA Institutional Framework) was defined after extensive consultations with the first steering committee on NDCs and Climate Change Mitigation committees. This structure includes roles and responsibilities defined for a NAMA Coordinating Entity, Designated NAMA Entity, NAMA Secretariat and Approver, and NAMA Expert Committee as well as for relevant “Designated NAMA Entities” from different key sectors, namely energy, transport, waste, industry, agriculture and forests.
43. A Cabinet Paper on this governing structure has been prepared, submitted and approved by Cabinet in July 2017. Awareness material on NAMA, draft project proposal templates and NAMA project

appraisal formats are now available and will be finalized after consultation of the NAMA Expert Committee. A web portal has been suggested for this NAMA proposal submission, approval process, and linkage with the NAMA registry. The Project is now assisting CCS in calling for applications from individuals interested in joining a NAMA expert group.

### 3.2.2 Remaining Barriers to Achieving Project Goal and Objective

44. In tracking the NAMA Project’s progress towards its goal of “GHG emissions from the energy generation and end user sectors in Sri Lanka” and objective of “supporting appropriate climate change mitigation actions in the energy generation and end-use sectors as part of the initiatives to achieve the voluntary GHG mitigation targets of Sri Lanka”, there is a high risk that the GHG emission reductions of 16,126 tonnes of CO<sub>2eq</sub> cannot be achieved by July 4, 2019, the EOP date. The Project, however, is progressing in its objective of supporting implementation of 3 NAMAs.
45. Barriers that are currently obstructing the Project from meeting its goal and fully achieving its objective include:
  - Limitations of current government capacity to efficiently process NAMA applications and manage registry. Despite the best efforts of the Project and lead management of both SLSEA and CCS to process and manage NAMA projects, these institutions still do not have the capacity and critical mass of personnel to manage the desired size of the NAMA program to generate and achieve the targeted levels of energy savings and GHG emission reductions. This also applies to the capacities of provincial level governments who do not have sufficient staff to process applications for pilot NAMA technologies<sup>11</sup> and to collect baseline information and information from pilot NAMAs at a pace required to meet the Project’s target GHG emission reductions of 16,126 tonnes CO<sub>2eq</sub><sup>12</sup>;
  - Low level of awareness and a lack of comprehensive understanding of the NAMA process with line ministries. CCS has experienced difficulties conveying NAMA concepts with line ministries with regards to implementation and participation in the NAMA process. Despite the NAMA institutional structure having received full Cabinet approval in July 2017, a number of the line ministries involved with the NAMA institutional structure are still experiencing difficulties in the comprehension and rationale for NAMA as well as all the UNFCCC nomenclature associated with NAMAs as well as INDCs. A primary reason for these difficulties lies with the lack of a fully functioning NAMA which can serve as a demonstration and enhance the understanding of all participating line ministries and provincial governments involved with NAMAs. In addition, the demonstration of a functioning NAMA will also enhance dialogue between CCS and the line ministries towards productive outcomes of a fully functional NAMA structure;
  - Capacities and knowledge of owners of pilot NAMA technologies are insufficient to optimize energy savings and maximize GHG ERs. This generally applies to biogas and VFD/HEM NAMAs. For biogas NAMAs, owners of biogas units need to manage their units with regards to the timing of feedstock inputs into the biogas unit as well as minimization of excess biogas preventing (see

<sup>11</sup> For example, the capacity of the Southern Province for processing biogas applications are 2 persons. For them to process 200 applications over the next 2 years represents a challenge. This also applies to applications for the solar PV NAMA.

<sup>12</sup> Collection of baseline information provincial levels has only recently commenced. While it is important to establish the processes and protocols for collecting this information for strengthening the NAMA framework, the baseline information collected during this Project may have a limited use as there are still outstanding issues regarding the quality of data collected. To ensure quality of data, a data verification process is proposed; however, completeness can be an issue as the project cannot cover the scattered data from all technology applications of the energy sector.

Para 37). For tea factory operators, efforts will be required to train more operators on the timing for reducing motor loads as required during the tea withering process (see Para 39);

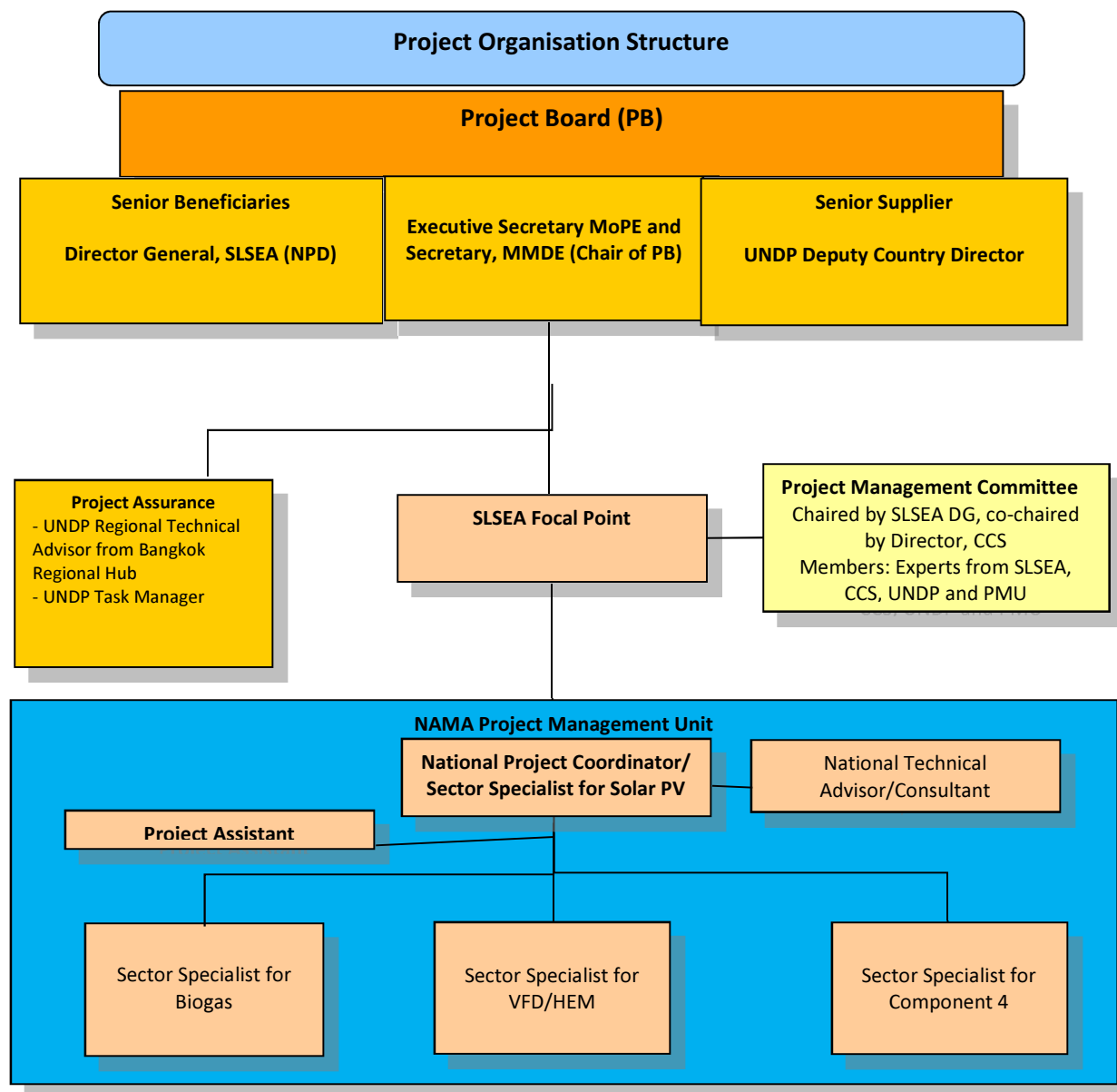
- Current NAMAs in their current form of implementation are not financially attractive or sustainable. Details of these financial and sustainability issues are provided on Para 37 (for biogas NAMA), Para 38 (for solar PV NAMA), and Para 39 (for VFD/HEM NAMA). Efforts should be made for the remainder of the Project to improve the financial attractiveness and sustainability aspects of these NAMAs;
- Weak linkages to a diversity of climate finance options for funding NAMA projects in registry. While the ProDoc has mentioned the private Sri Lanka Carbon Fund (SLCF) and SLSEA as sources of carbon financing, these entities currently have limitations in their ability to finance low carbon projects under the NAMA framework. There is a need to build a network of climate financing entities in addition to SLCF and SLSEA to enhance the likelihood of financing of future low carbon projects in Sri Lanka. As first steps, the enhancement of awareness raising information (using the demonstration of a functioning NAMA) on Sri Lanka’s efforts to develop a robust NAMA framework is required targeting corporate entities in Sri Lanka (who would be interested in lowering their carbon footprint) and international journals and media and international climate funds, some of who are based in the EU and Japan.

### 3.3 Project Implementation and Adaptive Management

#### 3.3.1 Management Arrangements

46. This Project is being implemented under a national implementation modality (NIM) by MoPE. The NAMA Project is managed by a PMU that is led by a Project Coordinator who reports to a NAMA Project Focal Point within SLSEA (at the level of Deputy Director General). The Project Coordinator also manages a team of 4 consultants (of which only the biogas consultant is part-time) who support efforts within SLSEA to develop and implement pilot NAMAs and systems for data collection from the field (Components 1 to 3) and efforts within CCS to develop a functional MRV system and a NAMA registry (Component 4). The Project Board (PB) mandate is to provide overall guidance for the NAMA 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 PB includes representatives from MoPE, MoMDE, SLSEA (whose representative is the National Project Director or NPD), and UNDP. The PB is chaired by the Executive Secretary of MoPE.
47. The NAMA Project Focal Point is also supported by a Project Management Committee (PMC) to assist in the making of key management, functional and operational decisions that can be executed by PMU personnel. These management arrangements comply with UNDP standards to ensure optimal performance of the Project. The NAMA Project organization structure is provided in Figure 1.

**Figure 1: Current Management Arrangements for the UNDP-GEF Project Appropriate Mitigation Actions in the Energy Generation and End-Use Sectors in Sri Lanka (NAMA Project)**



48. To date, the NAMA Project has held 5 PB meetings (1 in 2015, 3 in 2016 and 1 in 2017) since the Project Inception workshop in September 2015 (PMU staff were appointed in October 2015). The last PB meeting was held in April 2017. The PB meeting minutes indicate detailed and sincere discussions on all aspects of NAMA Project activities, resulting in proposed actions to support NAMA implementation and support. In general, the PB meetings appear to be effective in the context of making key Project decisions, notably the adaptive management of the NAMA Project.

### 3.3.2 Work Planning

49. NAMA work plans were prepared for 2016 and 2017. The 2016 work plan was reflected in the Inception Report of October 2015. The 2017 work plan was also prepared using information provided in the December 2016 PB meeting minutes. The MTR team also notes the contribution of the 2016 PB meeting minutes to the preparation of annual work plans (AWPs) for the NAMA Project, leading to results-based action plans. The PB meeting minutes from December 2016 demonstrate adaptive management being undertaken by the PB under the strong leadership of the Chair of the PB.

### 3.3.3 Finance and Co-Finance

50. Disbursement of the NAMA Project’s GEF resources are provided in Table 5. After 24 months of Project disbursements, US\$ 706,725 or 40% of the NAMA grant of US\$1,790,411 has been expended. Towards the end 2017, an estimated US\$ 1.27 million or 71% of the NAMA grant will be expended, mainly on Project support for the 3 pilot NAMAs. The expenditure of the NAMA Project’s GEF budget up to 2017 can be characterized as follows:
- Considering the Project is scheduled to end on June 30, 2019, there is only US\$ 518,607 of uncommitted funds from the NAMA Project for activities in 2018 and 2019;
  - Outcome expenditures and Project management expenditures do not appear to be out of line from the projections made in the ProDoc.
51. The Project has also demonstrated that appropriate financial controls are in place, notably through:
- Combined Delivery Reports (CDRs) and Project Budget Balance Report which shows the expenditure and commitments in the current year up to date (both as generated by Atlas);
  - manual monitoring of Project expenditures against budget lines to attain an in-depth understanding of the financial progress and the pending commitments;
  - the involvement of the Bangkok Regional Hub to whom detailed information is provided if there are any deviations before releasing the ASL (authorized spending limit) for that particular year;
  - government audits carried out by the Office of the Internal Branch of the Sri Lanka Sustainable Energy Authority as part of the audit on Foreign Funded Projects implemented under SLSEA;
  - UNDP carrying out a financial spot checks on the transactions carried out by SLSEA procurement and finance departments under the Project. Spot checks are done by an independent consultant from KPMG.

In conclusion, the cost effectiveness of the use of the NAMA Project budget to date has been **satisfactory**, with the primary issue being the slow progress made thus far on the pilot NAMAs.

52. Co-financing commitments for the NAMA Project are roughly US\$18.455 million, comprising around 71% of the co-financing commitments in the ProDoc of US\$ 25.88 million. A large proportion of this co-financing (US\$18.0 million) comes from a privately funded 10 MW solar PV facility that is currently in operation. The remainder of the co-financing comes from private investments and loans made for the deployment of the 3 pilot NAMA technologies, all of which are progressing slowly. Co-financing details to date are summarized on Table 6. In conclusion, co-financing of the NAMA project to date has been **moderately satisfactory**.

**Table 5: GEF Project Budget and Expenditures for Sri Lanka NAMA Project (in USD as of June 30, 2017)**

NAMA Project Outcomes	Budget (from Inception Report)	2015 <sup>25</sup>	2016	2017 <sup>26</sup>	Total Disbursed	Total to be expended from July-December 2017	Total Remaining
OUTCOME 1: Established and regular update of renewable energy utilization baseline & energy intensity reference baselines for the energy generation and end-use sectors	171,000	9,726	33,610	20,505	63,841	38,124	69,035
OUTCOME 2: Prioritized Nationally Appropriate Mitigation Actions (NAMAs) in the energy generation and end-use sectors are identified and designed	195,500	1,939	28,317	15,838	46,094	16,421	132,985
OUTCOME 3: Identified private and public sector entities implemented prioritized appropriate mitigation actions for the achievement of Sri Lanka voluntary mitigation target	1,213,999	10,308	183,801	113,248	307,357	339,580	567,062
OUTCOME 4: Accurate measurement and accounting of actual GHG emission reduction from mitigation actions in the energy generation and end-use sectors	143,227	6,552	3,066	23,297	32,915	37,847	72,465
Project Management	66,685	2,212	6,374	26,250	34,836	8,513	23,336
Exchange loss				674	674	-	(674)
<b>Total (Actual)</b>	<b>1,790,411</b>	<b>30,736</b>	<b>255,168</b>	<b>199,812</b>	<b>485,717</b>	<b>440,485</b>	<b>864,209</b>
Total (Cumulative Actual)		30,736	285,905	485,717			
Annual Planned Disbursement (from ProDoc) <sup>27</sup>		54,233	358,472	684,303			
% Expended of Planned Disbursement			71%				

<sup>25</sup> Although the Project Document was signed by the Government of Sri Lanka on June 20, 2015, 2015 expenditures are only September-December 2015

<sup>26</sup> Up to June 30, 2017

<sup>27</sup> Year 1 is only September-December 2015 when the Project was being implemented

**Table 6: Actual Co-Financing for Sri Lanka NAMA Project (as of May 31, 2017)**

Co-financing (type/source)	UNDP own financing (million USD)		Government (million USD)		Partner Agency (million USD)		Private Sector (million USD)		Total (million USD)	
	Planned	Actual	Planned	Actual	Planned	Actual	Planned	Actual	Planned	Actual
Grants <sup>28</sup>	0.250	0.000			1.240 <sup>29</sup>		22.000 <sup>30</sup>	18.000 <sup>31</sup>	23.490	18.000
Loans/Concessions									0.000	0.000
• In-kind support			0.230 <sup>32</sup>	0.017	2.160 <sup>33</sup>	0.036		0.003 <sup>34</sup>	2.390	0.056
• Other						0.339 <sup>35</sup>		0.049 <sup>36</sup>		0.388
<b>Totals</b>	0.250	0.000	0.230	0.017	3.400	0.375	22.000	18.052	25.880	18.445

<sup>28</sup> Includes all cash contributions<sup>29</sup> From SLSEA for biodigesters<sup>30</sup> Planter's Association US\$4.0 million for HEM motors, Industrial Solution Lanka US\$18.0 million for Solar PV<sup>31</sup> Actual expenditure of Industrial Solution Lanka for a 10 MW Solar PV plant<sup>32</sup> MoPE contribution<sup>33</sup> SLSEA in-kind contribution<sup>34</sup> Tea Research Institute<sup>35</sup> Contributions from foreign-aid related domestic funds, related SLSEA programmes for biogas and RE/EE activities, and GIS software suppliers<sup>36</sup> Owners of biogas and solar PV units

### 3.3.4 Project Level Monitoring and Evaluation Systems

53. The MTR team has had access to the 2016 PIR as well as a draft 2017 PIR, which provide sufficient details of the progress of the NAMA Project for the purposes of monitoring and evaluation of all Project outcomes and indicators. These reports provide information from the 5 members of the NAMA PMU, and on progress from the various Project components. The PIRs also provide “critical risk management” details identify 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. Though the Project had provided good reports on GHG emission reduction progress as requested by the MTR team, this information should be provided in the PIRs under “Development Progress” with a heading of Project Goal. In conclusion, however, the M&E systems of the NAMA Project are **satisfactory**, and if continued in a similar manner with the aforementioned recommendation, will adequately serve the purpose of addressing and managing critical risks for the remainder of the NAMA Project to 2019.

### 3.3.5 Stakeholder Engagement

54. The Project has successfully facilitated partnerships with relevant stakeholders, all related to the efficient implementation of NAMA projects in Sri Lanka. Along with the engagement of SLSEA and CCS as strategic implementing partners, public sector stakeholders include:
- The four Provincial Councils (PCs), namely Northwestern, Southern, Central and Uva to promote and disseminate the NAMA for the use of the biogas technology. The engagement of these PCs has been extended to include work with various departments and entities under these Provincial Councils that oversee various agricultural and natural resource sectors including as fisheries, energy and power, agriculture, animal production and livestock development. Extension officers related to agriculture or livestock development are key partners in this category of stakeholders;
  - The Ceylon Electricity Board and the Lanka Electric Company serve as partners on the solar PV pilot NAMA, and are supportive of net metering with battery storage as an innovative aspect to the NAMA. Pilot activities for the NAMA have been implemented in their green energy zones;
  - The Tea Research Institute (TRI) of Sri Lanka, a semi-governmental institute for generating and disseminating new technologies related to tea cultivation and processing. The project has a close research collaboration with TRI on trial phases of HEMs and VFDs and increase energy efficiency within the tea industry.
55. Project has also engaged partnerships with private sector stakeholders and CSOs, namely:
- three private sector tea companies/factories where detail experiments and analysis on HEMs in the tea withering process were conducted amidst some day-to-day process/production disturbance;
  - CSOs involved with the scale-up of biogas technology in Sri Lanka that includes access to their training expertise on training masons for biogas installations and registering them as qualified personnel for biogas installations. Some of the CSOs include People in Need (PIN), Cz and Janathakshan (GTE) Limited, which had been working on the EU SWITCH-Asia Initiative<sup>37</sup>.

<sup>37</sup> [www.switch-asia.eu/policy-support-components/psc-sri-lanka/](http://www.switch-asia.eu/policy-support-components/psc-sri-lanka/)



56. Finally, the Project has successfully linked with other donor-supported projects including:
- The Chinese Government’s “Belt & Road” initiative (through the Ministry of Science and Technology Administrative Centre for China’s Agenda 21) with the concept development for “Trilateral South-South Cooperation - Transitioning to Sustainable Energy Uses in the Agro-Industry, Sri Lanka”. This initiative will add NAMA projects to the energy NAMA framework involving agro-industry with solar PV irrigation, and scaled-up biogas technology applications. Initial project size is US\$ 2 million that includes US\$ 1 million co-finance from Government of Sri Lanka;
  - CCS development of the World Bank assisted “Partnership for Market Readiness (PMR)” project where the PMR will scale-up efforts for technology prioritization, MRVing process and applications, to attract other stakeholders in climate financing, carbon offsets that work towards Sri Lanka’s NDC goals.
57. In summary, the NAMA Project have made **satisfactory** efforts to reach out to a wide range of stakeholders that only increases the likelihood of the sustainability of the NAMA Project’s goal and objective.

### 3.3.6 Reporting

58. NAMA progress reporting has been **satisfactory**. This is based on an assessment of the quality of PIRs from 2016 and 2017. These PIRs provide sufficient descriptions of issues identified for adaptive management under sections entitled “Critical risk management” and “Ratings and overall assessment”. Furthermore, there is evidence from the 5 Project Board presentations and meeting minutes that these issues are discussed for approval by the Project Board for adaptive management. However, as mentioned in Para 53, improvements to progress reporting can be made on achievements in GHG emission reductions.

### 3.3.7 Communications

59. Communications between Project personnel and the various stakeholders of the NAMA Project appear **satisfactory**. With the NAMA Project office being located within the premises of SLSEA, there are frequent communications with the Project’s Implementing Partner. In addition, communications between CCS and Project personnel have recently improved with the appointment of a full time NAMA Project Sector Specialist working at CCS offices to assist in the implementation of Component 4.
60. Communications with external stakeholders are mainly channeled through the various Sector Specialists employed on the Project. The MTR team has observed during the field visits to 2 provinces that communication relationships between NAMA Project personnel and provincial level counterparts are healthy:
- For biogas NAMAs, focal points in the provinces are designated by Provincial Councils to manage applications for biogas installations, conduct consultations with household representatives with the Sector Specialist providing oversight whenever requested by the Provincial Councils. Extension officers assigned to biogas programmes are key persons involved in the communication aspects of the NAMA Project to participating households;

- For the solar PV NAMAs, there are Ceylon Electricity Board representatives in each province with similar responsibilities for monitoring solar PV installations;
  - A Sector Specialist oversees the VFD/HEM NAMA through the contacts at TRI to identify tea processing factories where pilot NAMA activities can be conducted. The Project also relies on TRI to provide hosts for demonstrations and provide assistance for dissemination activities including workshops to share results on pilot installations of HEMs and VFDs.
61. The NAMA Project also has strong communication lines through NAMA Project personnel and the Country Office with other donor projects within the sustainable development arena in Sri Lanka including those projects listed in Para 56.

### 3.4 Sustainability

62. In assessing sustainability of the NAMA Project at its mid-point, the evaluators asked “how likely will the Project outcomes be sustained beyond Project termination?” Sustainability of these objectives was 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*.

Overall rating is equivalent to the lowest sustainability ranking score of the 4 dimensions.

63. Financial risks to sustainability: Current financial risks to the sustainability of the NAMA Project are related to the lack of an extensive network of financing sources for NAMA projects. Current sources include the Sri Lanka Carbon Fund (SLCF), and the Green Climate Fund (GCF). The financial viability of the SLCF is currently in question with an immediate need to capitalize the fund. Accessing funds from the GCF are effort-intensive and competitive, not necessarily leading to any assurances of financing for future NAMAs. The purposes of financing these NAMAs is to provide financing for preparations of NAMA projects, and to provide subsidies or concessional loans to end-users who otherwise cannot afford such investments. Furthermore, subsidy funds from the Sri Lankan government are becoming scarcer. For the remaining period of the NAMA Project, the Project team will need to focus identification of a network of financing sources for future NAMA projects. In addition, setup of the NAMA registry and the subsequent registration of NAMA projects will enhance the profile of NAMA projects requiring financing. Thus, the rating for the financial risks to sustainability is moderately unlikely (MU).
64. Socioeconomic risks to sustainability: Most NAMA projects in the energy generation and end-use sectors mainly consist of households and entities who are not able to afford such investments. While the NAMA Project continues its engagement with a wide range of stakeholders including end-users, equipment suppliers and installation technicians, the Project needs to find NAMAs with stakeholders who would benefit from a socioeconomic standpoint on NAMA technologies. For example, the current solar PV NAMA design with small households is not sustainable since these households pay a subsidized rate of electricity and have no incentive to purchase such a system. Similarly, the focus

of the biogas NAMA is on small households, many of which cannot afford a biogas installation and require technical support to ensure their feedstock generates biogas; in the end, the biogas NAMA in its current design only generates small volumes of GHG ERs.

65. Opportunities for larger GHG ERs generally lie with commercial and industrial entities throughout Sri Lanka. However, there is generally a low level of awareness amongst these entities of the benefits of low carbon investments. If the NAMA framework is to serve as a vehicle towards achievement substantial GHG emission reductions, higher levels of awareness within commercial and industrial end-use sectors is required. Despite the enthusiasm of Provincial Councils in implementing these NAMAs and the interest of some private commercial and industrial entities in low carbon investments, the socioeconomic risks to sustainability is rated as moderately likely (ML).
66. Institutional framework and governance risks: On July 17, 2017, the Government of Sri Lanka received Cabinet approval for the NAMA institutional framework to be managed under the CCS. In addition, CCS have also prepared MRV framework designs and protocols specifically tailored for the 3 NAMA pilot projects being undertaken. However, higher risk of the Project from a governance perspective is the lack of capacity and skills within both CCS, SLSEA and the Provincial Councils that would provide substantial GHG emission reductions. This lack of capacity would also apply to the implementation of the 3 NAMA technologies where an acceleration of technology deployment will be required during the remaining 2 years of the NAMA Project. While Provincial Councils met during the MTR mission had numerous ideas for NAMA projects, screening of these ideas is required by NAMA specialists from SLSEA or CCS along with encouragement and assistance to prepare NAMA documentation. Unless there is a substantial spike in recruitment in these respective government agencies, institutional framework and governance risks to sustainability is rated as moderately unlikely (MU).
67. Environmental risks to sustainability: The Project has identified NAMAs are geared towards reducing GHG emissions with collateral benefits in improving local air quality and living conditions. There is, however, an unresolved issue regarding the disposal of batteries (after their service life of 7 to 10 years) used within households with solar PV. This issue will need to be resolved by SLSEA in collaboration with the MoMDE. As such, environmental risks to sustainability of this Project are viewed to be largely insignificant with the exception of an absence of a disposal plan for solar PV batteries, and resulting in a rating of environmental risks to sustainability as moderately likely (ML).

## 4. CONCLUSIONS AND RECOMMENDATIONS

### 4.1 Conclusions

68. The NAMA Project has progressed well in the areas of identification of priority low carbon technologies (through MACC analysis), setting up MRV protocols, data management systems and MRV institutional frameworks required. The Project, however, is lagging behind in the collection of baseline data for energy generation and end-use sector energy consumption at the provincial level. This barrier is related to the lower capacities of personnel at the field level which will require sustained support and training.
69. The NAMA Project is also currently at a stage where pilot NAMAs are being developed for the purposes of demonstrating the mechanism and protocols required for entry into the national NAMA registry. The Project has made substantial progress into detailed design of the NAMAs, engagement of key stakeholders in the field to coordinate and execute NAMA technology installations, and development of close working relationships with field and extension officers and Provincial Councils to work within an MRV framework and collect field data from various NAMA installations.
70. While a number of these pilot NAMA projects have provided substantial social benefits, the generation of direct GHG emission reduction benefits is lagging behind the targets set in the NAMA Project goal of 16,126 tonnes CO<sub>2eq</sub> by the EOP. GHG ERs at the mid-point of the NAMA Project are now in the order of 2,036 tonnes CO<sub>2eq</sub> (these are GHG ERs at the EOP with current deployment of NAMA pilot technologies). As such, meeting the 16,126 tonnes CO<sub>2eq</sub> target will now require a substantial rate of deployment of the pilot NAMA technologies during the remaining 2 years of the NAMA Project. This will certainly be a significant challenge for the NAMA Project.
71. Adding to this challenge is the need to tweak the designs of all of the NAMA technologies for the purposes of generating higher volumes of GHG ERs, and demonstrate a viable process for registering NAMAs and attracting climate finance:
- The NAMA for solar PV with battery storage should be reviewed for its viability for small households, large public buildings (hospitals and schools) and for commercial entities. Given that there are no incentives for small households to purchase such a solar PV system in light of the fact that their electricity is heavily subsidized, this NAMA may still have value to the Government and CEB in that a solar PV system may offset these subsidies to a value greater than the cost of installing the solar PV system (with or without the battery storage system). For public buildings such as hospitals and schools, their electricity consumption is higher and would make an attractive public investment considering the payback periods. Commercial entities should also be involved with this NAMA since they would be interested in solar PV with battery storage systems which would benefit CEB in peak load reduction;
  - The current design for the biogas NAMA includes small households where small biogas units are installed with mixed results on the generation of biogas and small generation of GHG ERs. If the biogas NAMA included commercial and industrial entities, efforts to measure GHG ER benefits would be more robust and have more certainty;
  - The NAMA for tea processing factories included less encouraging test results for energy savings from the installation of HEMs in the tea withering process. A shift towards technologies such as VFDs is required to demonstrate substantial energy savings and financial viability of the NAMA.

72. Most importantly, for the purposes of the NAMA Project, is the need to demonstrate NAMA processes for the design, implementation, MRV and registry of projects into the national NAMA registry. Without such a process to demonstrate the benefits of the NAMA process, the NAMA Project as well as CCS will experience difficulties in facilitating buy-in from all stakeholders (including line ministries and low carbon investors).

**Table 7: MTR Ratings & Achievement Summary Table for “NAMA Project” in Sri Lanka**

Measure	MTR Rating <sup>38</sup>	Achievement Description
<b>Project Strategy</b>	N/A	Project strategy is sound although a bit ambitious with respect to GHG emission reductions which were to be generated during Year 1 of the Project, a scenario that likely was not possible given the government capacity constraints to implement NAMAs.
<b>Progress Towards Results</b>	Goal Achievement Rating: 4	GHG ERs from NAMAs is lagging behind schedule that will require significant deployment of technologies during the last 2 years to meet the 16,126 tCO <sub>2eq</sub> cumulative EOP target. A plan is in place for this accelerated deployment of NAMA technologies.
	Objective Achievement Rating: 5	Despite the need to change some of the NAMA designs, there has been strong support for the target of 3 NAMAs in energy generation and end-use sectors in an effort to achieve the voluntary GHG targets
	Outcome 1 Achievement Rating: 4	Progress is being made on the collection of baseline information in its entry into a web-based GHG inventory system. The pace of baseline data collection, however, is not to an extent of realizing significant GHG emission reductions required to meet targets set by the Government of Sri Lanka
	Outcome 2 Achievement Rating: 5	MACCC analysis has been carried out for the 3 NAMA pilot technologies, and for 17 other technologies that has been used by SLSEA to identify prioritized technologies for future NAMAs
	Outcome 3 Achievement Rating: 5	Targets for identification of 2 entities (private and public sector) interested in funding NAMA projects has been met. In addition, 3 pilot NAMAs are currently being implemented although progress on technology deployment is slow (see “Goal Achievement” above in this table)
	Outcome 4 Achievement Rating: 5	An MRV system is being developed to verify and report GHG emissions from the 3 pilot NAMAs including collection of primary energy and GHG data into the EnerGIS data management system. Institutional setup for NAMA registry has been approved by Cabinet in July 2017.
<b>Project Implementation &amp; Adaptive Management</b>	Achievement rating: 5	Project is being adaptively managed and implemented in a manner that is cost-effective. In addition, the PMU has effectively engaged central and provincial government stakeholders on NAMA activities.
<b>Sustainability</b>	Sustainability rating: 2	The “moderately unlikely” risk is related to the financial risks (lack of diverse sources of NAMA funding) and governance risks (lack of critical mass of qualified officers to manage NAMA projects)

<sup>38</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

## 4.2 Recommendations

73. To improve implementation (and meet GHG emission reduction targets), the Project as a 1<sup>st</sup> priority should use its remaining resources to focus on accelerating the deployment of NAMA technologies to the targets set by the PMU as provided in Tables 2, 3 and 4. This would include:

- For the pilot biogas NAMA, focus on the installation of 180, 300 and 200 biogas units during 2017, 2018 and 2019 respectively. Since biogas units are being proactively installed in 3 provinces (Central, Southern and North-western), these numbers of biogas units to be installed as per Table 2 is feasible but challenging, considering the locations of the small households targeted by the Provincial biogas programmes. This would result in a cumulative ER of 8,617 tCO<sub>2e</sub> by the EOP<sup>39</sup>. To mitigate this challenge, the Project should consider pursuing larger scale biogas installations (15 m<sup>3</sup> and above) that would be located at commercial entities and even industrial SMEs (particularly agro-processing industries with livestock). Para 75 provides a recommendation to change the biogas NAMA indicator from the number of units to m<sup>3</sup> of biogas units installed;
- For the pilot solar PV NAMA, focus on the installation of 81 and 150 solar PV systems (or total equivalent capacity of 140kW) to be installed by the end of 2017 and 2018 respectively. The installation of this number of solar PV systems as per Table 3 will also be challenging, but could result in a cumulative ER of 596 tCO<sub>2e</sub> by the EOP for this NAMA<sup>40</sup>. Mitigation of this GHG challenge could be accomplished by shifting the focus of solar PV installations (with battery storage) from small households to public buildings (such as hospitals and schools) and commercial entities who not only consume more electricity and pay higher bills to CEB, but who would stand to gain commercially from reduced operational costs by generating renewable solar electricity for its own use and possibly net metered to the national grid, thereby making their commercial establishment more competitive in the long term. This would also contribute towards CEB’s goal of reducing peak loads. Challenges of this approach would include finding commercial entities who operate on their own property, instead of leased or rented properties. For schools, solar PV investments would not require battery storage systems and would offset use of grid electricity during the day, and would make an attractive public investment considering the payback periods;
- For the pilot VFD NAMA in tea processing factories, focus on the installation of 100, 500 and 400 VFDs to be installed during 2017, 2018 and 2019 respectively as provided on Table 4. This would result in a cumulative ER of 3,116 tCO<sub>2e</sub> by the EOP. While this also appears to be a challenge, the Project will need to conduct a workshop (according to availability of budget) to disseminate the energy savings results from the pilot VFD installations and emphasize the need after installation of VFDs for close monitoring of energy savings coupled with training of the operators to ensure fan motor loads are reduced at appropriate times during the tea withering process (as explained in Para 39)<sup>41</sup>. Energy savings and GHG emission reduction results over a period of one

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.

<sup>39</sup> The actual target of 11,317 tonnes CO<sub>2eq</sub> for biogas units cannot be met since the PMU is of the opinion that the above rate of deployment of biogas units is not feasible, and that it would be feasible for 180, 300 and 200 biogas units to be installed during 2017, 2018 and 2019 respectively under a conservative approach to reach a target of 8,617 tonnes CO<sub>2eq</sub> (see Table 2).

<sup>40</sup> A target of 443 tonnes CO<sub>2eq</sub> for solar PV systems can be exceeded met with the installation of 81 and 150 solar PV during 2017 and 2018 respectively, generating 596 tonnes CO<sub>2eq</sub> (see Table 3).

<sup>41</sup> The actual target of 4,365 tonnes CO<sub>2eq</sub> for VFDs/HEMs cannot be met since the PMU is of the opinion that the above rate of deployment of VFDs is not feasible, and that it would be feasible for 100, 500 and 400 VFDs to be installed during 2017, 2018 and 2019 respectively under a conservative approach to reach a target of 3,116 tonnes CO<sub>2eq</sub> (see Table 4).

month should be collated and presented in a workshop targeting tea processing factories for their information and subsequent decisions for scaled-up VFD investments. If the Project is able to complete the demonstrative part of the VFD investment before the end of 2017, the installation of more than 1,000 VFDs before the EOP should be possible.

By accelerating deployment of NAMA technologies, the NAMA process would be demonstrated and contribute to the removal of one of the remaining barriers of this Project, the low level of awareness and a lack of comprehensive understanding of the NAMA process with line ministries (as mentioned in Para 45).

74. To improve implementation (and strengthen the functionality of NAMA processes), the Project as a 1<sup>st</sup> priority should work closely with CCS to assist and facilitate data collection and authentication of baseline and pilot NAMA energy consumption into EnerGIS. Such assistance will contribute significantly to the capacity building of CCS in its management of the NAMA registry.
75. To improve Project implementation and management (for more efficient and timely delivery of outputs to meeting the Project outcome), the Project as a 1<sup>st</sup> priority conduct detailed discussions with SLSEA and CCS counterparts (at the Director level) that will result in more involvement of SLSEA and CCS staff in the implementation of planned activities. Current Project activities require substantial PMU time and resources. At present, there are only a few SLSEA and CCS staff available to assist with Project activities; more counterpart staff participating on Project activities would build the required capacity participation and allow SLSEA and CCS to manage the NAMA programme after the EOP.
76. To correct Project design, a number of suggestions are being recommended to adjust NAMA Project targets including:
  - Clarify Outcome 1 indicator and target of 4 provinces that “regularly conduct sub-sectoral GHG emission inventories for a limited number of feasible technologies”;
  - Change Outcome 2 indicator for “No. of provinces that established MACC curves established to identify technologies for energy sector by year 2” to “No of national MACC curves to be established by Year 2”;
  - Adjust Outcome 3 target of “1,000 biogas systems” to an equivalency target of “8,000 m<sup>3</sup> of biogas systems” or another target that would significantly contribute towards meeting the Project target of 16,126 tonnes CO<sub>2eq</sub> cumulative by the EOP. The PMU should review this target as soon as possible;
  - Adjust Outcome 3 target of “205 solar PV systems” with a new target of that can be expressed in kW of solar PV systems installed. The levels of installed capacity could be to a level equivalent to the current target of “231 solar PV systems” (for example, a target of 231 kW installed if each system is 1 kW installed capacity). This would allow the PMU to get credit for larger solar PV installations at public schools or other large households;
  - Set a reasonable Outcome 3 target (based on remaining budget) for VFDs installed by EOP from “1,300 HEMs” to “1,024 VFDs”, subject to pilot tests of VFDs and dissemination of information on energy saving benefits of VFDs to be completed prior to the end of 2017.
77. To improve the monitoring and evaluation of the Project, Project staff should closely monitor tracking of energy consumption and GHG emission reductions of pilot NAMA projects, and facilitate

improved pace of data collection and authentication to enhance output of an “operational and established MRV system”, and provide this data in PIRs under the section entitled “Development Progress” and reporting on progress towards the “Project Goal” (see Para 53).

78. Recommendations and proposals for future directions underlining main objectives are provided here as lower priority, and should be implemented according to available Project time and resources:

- Follow up and assist Provincial Councils and the scoping of future NAMA projects for entry into the NAMA registry;
- Commission a study with the approval of SLSEA to study the cost of a solar PV system (over a 20-year period with and without battery storage), its generation of electricity to households where electricity prices are subsidized, and the benefit to the Government of partially offsetting these subsidies during the service life of the solar PV system (as suggested in Para 38);
- Strengthen work collaboration with the sister UNDP-GEF project “Sustainable Biomass Energy Project” on the preparation of a NAMA for biomass power generation for captive use in agro-industries. Since this is one of the best NAMA projects on the MACC curves, interest is expected to be high for this NAMA;
- Commission a study to provide a strategic plan for the disposal of batteries used for battery storage in solar PV systems that were supported by the Project. Such a study need to identify regulations to be adopted, estimating and scoping necessary investments, and providing next steps that will require close collaboration between SLSEA and MoMDE;
- Expand the network of climate funds, both domestic and foreign who would be interested in funding projects in the NAMA registry set up by the Project. This should be done with the dissemination of NAMA awareness raising materials (and linked to ongoing but successful NAMA Project implementation) as soon as possible targeting domestic corporations, international climate funds, and bilateral agencies;
- Strengthen linkages between NAMAs and NDCs. NAMAs should be promoted as a delivery mechanism and an implementing tool<sup>42</sup> to achieve Sri Lanka’s NDCs;
- Continue follow-up on the combined NAMA for biogas-solar PV for medium-sized agricultural operations with the Trilateral South-South Cooperation with China’s Ministry of Finance and Commerce and MoPE.

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<sup>42</sup> Implementing tool was first mentioned during the First Steering Committee on NDCs



## **APPENDIX A – MISSION TERMS OF REFERENCE FOR TCNT PROJECT MTR**

Job Title:	International Consultant – Mid Term Review of Appropriate Mitigation Actions in the Energy Generation and End-user Sectors in Sri Lanka
Reports to:	Assistant Country Director / ESDR
Duty Station:	Homebased with one mission travel to Sri Lanka
Type of Contract:	Individual Consultant (International)
Language required:	English
Duration of Assignment:	27 <sup>th</sup> June – 11 <sup>th</sup> September 2017 (24 working days from June to September 2017 including 8 days in Sri Lanka without travel time)
Contract Start Date:	27 <sup>th</sup> June 2017
Application Deadline:	31 <sup>st</sup> May 2017

### **A. BACKGROUND**

These are the Terms of Reference for the UNDP-GEF Midterm Review (MTR) of the medium-sized project titled Appropriate Mitigations Actions in the Energy Generation and End-User Sectors in Sri Lanka (PIMS#5232) implemented through the Ministry of Power and Renewable Energy, which is to be undertaken in mid-2017. The project started on the 10<sup>th</sup> June 2015 and is in its second year of implementation. In line with the UNDP-GEF Guidance on MTRs, this MTR process was initiated before the submission of the second Project Implementation Report (PIR). The MTR process must follow the guidance outlined in the document Guidance For Conducting Midterm Reviews of UNDP-Supported, GEF-Financed Projects.

The project has been designed to support appropriate climate change mitigation actions in the energy generation and end-use sectors as part of the initiatives to achieve the voluntary GHG mitigation targets of Sri Lanka. This will be achieved by:

- Develop a robust provincial inventory system that could be updated periodically and aggregated at the national level using web-based EnerGIS database management system
- Develop a decision making tools such as MACCC tools for analyzing and prioritizing a pipeline of bankable NAMAs that could be implemented
- Leverage public, private and CSOs resources through the NAMA Implementing Entity for the implementation of bankable RE and EE NAMAs based on viable and cost effective business models to incentivize value chain actors to reduce supply risks and create demand and
- Develop a robust and transparent MRV system that are accurate, reliable and credible and avoid double accounting.

The project is funded by the Global Environmental Facility (GEF) and operational from 2015 June to 2019 June. The project is being implemented by the Sri Lanka Sustainable Energy Authority (SLSEA) under the purview of the Ministry of Power & Renewable Energy (MoPRE) of Sri Lanka.

### **B. SCOPE AND OBJECTIVES**

The MTR will assess progress towards the achievement of the project objectives and outcomes as specified in the Project Document, and assess early signs of project success or failure with the goal of

identifying the necessary changes to be made in order to set the project on-track to achieve its intended results. The MTR will also review the project’s strategy, its risks to sustainability.

The MTR team will consist of two independent consultants that will conduct the MTR - one team leader (with experience and exposure to projects and evaluations in other regions globally) and one team expert, usually from Sri Lanka.

The MTR must provide evidence based information that is credible, reliable and useful. The MTR team will review all relevant sources of information including documents prepared during the preparation phase (i.e. PIF, UNDP Initiation Plan, UNDP Environmental & Social Safeguard Policy, the Project Document, project reports including Annual Project Review/PIRs, project budget revisions, lesson learned reports, national strategic and legal documents, and any other materials that the team considers useful for this evidence-based review). The MTR team will review the baseline GEF focal area Tracking Tool submitted to the GEF at CEO endorsement, and the midterm GEF focal area Tracking Tool that will be completed before the MTR field mission begins.

The MTR team is expected to follow a collaborative and participatory approach ensuring close engagement with the Project Team, government counterparts (implementing entity), the UNDP Country Office, UNDP Regional Technical Advisers, and other key stakeholders.

Engagement of stakeholders is vital to a successful MTR. Stakeholder involvement should include interviews with stakeholders who have project responsibilities, including but not limited to; executing agencies, senior officials and task team/ component leaders, key experts and consultants in the subject area, Project Board, project stakeholders, academia, local government and CSOs, etc. Additionally, the MTR team is expected to conduct field missions within Sri Lanka. These field missions shall include North-western, Central, Southern and Uva provinces, to the project sites, as needed.

The MTR team will assess the following four categories of project progress and produce a draft and final MTR report. See the [Guidance For Conducting Midterm Reviews of UNDP-Supported, GEF-Financed Projects](#) for details. The final MTR report should describe the full MTR approach taken and the rationale for the approach making explicit the underlying assumptions, challenges, strengths and weaknesses about the methods and approach of the review.

## **1. Project Strategy**

### *Project Design:*

- Review the problem addressed by the project and the underlying assumptions. Review the effect of any incorrect assumptions or changes to the context to achieving the project results as outlined in the Project Document.
- Review the relevance of the project strategy and assess whether it provides the most effective route towards expected/intended results.
- Review how the project addresses country priorities
- Review decision-making processes

### *Results Framework/Logframe:*

- Undertake a critical analysis of the project’s logframe indicators and targets, assess how “SMART” the midterm and end-of-project targets are (Specific, Measurable, Attainable, Relevant, Time-bound), and suggest specific amendments/revisions to the targets and indicators as necessary.

- Examine if the project’s objectives and outcomes or components clear, practical, and feasible within its time frame?
- Examine if progress so far has led to, or could in the future catalyse beneficial development effects (i.e. income generation, gender equality and women’s empowerment, improved governance etc...) that should be included in the project results framework and monitored on an annual basis.

## **2. Progress Towards Results**

Please refer to the detailed TOR attached.

In addition to the progress towards outcomes analysis:

- Compare and analyse the GEF Tracking Tool at the Baseline with the one completed right before the Midterm Review.
- Identify remaining barriers to achieving the project objective.
- By reviewing the aspects of the project that have already been successful, identify ways in which the project can further expand these benefits.

## **3. Project Implementation and Adaptive Management**

Using the *Guidance For Conducting Midterm Reviews of UNDP-Supported, GEF-Financed Projects*; assess the following categories of project progress:

- Management Arrangements
- Work Planning
- Finance and co-finance
- Project-level monitoring and evaluation systems
- Stakeholder Engagement
- Reporting
- Communications

## **4. Sustainability**

Assess overall risks to sustainability factors of the project in terms of the following four categories:

- Financial risks to sustainability
- Socio-economic risks to sustainability
- Institutional framework and governance risks to sustainability
- Environmental risks to sustainability

The MTR consultant/team will include a section in the MTR report setting out the MTR’s evidence-based conclusions, in light of the findings.

Additionally, the MTR consultant/team is expected to make recommendations to the Project Team. Recommendations should be succinct suggestions for critical intervention that are specific, measurable, achievable, and relevant. A recommendation table should be put in the report’s executive summary. The MTR consultant/team should make no more than 15 recommendations total.

## **C. RESPONSIBILITIES**

### Expected Output/Deliverables

The MTR consultant/team shall prepare and submit:

- MTR Inception Report: MTR team clarifies objectives and methods of the Midterm Review no later than 2 weeks before the MTR mission. To be sent to the Commissioning Unit and project management. Approximate due date: 7<sup>th</sup> July 2017
- Presentation: Initial Findings presented to project management and the Commissioning Unit at the end of the MTR mission. Approximate due date: 28<sup>th</sup> July 2017
- Draft Final Report: Full report with annexes within 3 weeks of the MTR mission. Approximate due date: 18<sup>th</sup> August 2017
- Final Report\*: Revised report with annexed audit trail detailing how all received comments have (and have not) been addressed in the final MTR report. To be sent to the Commissioning Unit within 1 week of receiving UNDP comments on draft. Approximate due date: 11<sup>th</sup> September 2017

\*The final MTR report must be in English. If applicable, the Commissioning Unit may choose to arrange for a translation of the report into a language more widely shared by national stakeholders.

### **Institutional Arrangement:**

The principal responsibility for managing this MTR resides with the Commissioning Unit. The Commissioning Unit for this project’s MTR UNDP Country Office in Sri Lanka. The Commissioning Unit will contract the consultants and ensure the timely provision of field travel arrangements within the country for the MTR team. The Project Team will be responsible for liaising with the MTR team to provide all relevant documents, set up stakeholder interviews, and arrange field visits.

### **D. TIMEFRAME**

The total duration of the MTR will be approximately *24 working days (over 12 weeks)* starting *27<sup>th</sup> June 2017* and shall not exceed five months from when the consultant(s) are hired. The tentative MTR timeframe is as follows:

- *31<sup>st</sup> May 2017*: Application closes
- *14<sup>th</sup> June 2017*: Selection of MTR Team
- *27<sup>th</sup> June 2017*: Prepare the MTR Team (handover of project documents)
- *28<sup>th</sup> – 3<sup>rd</sup> July 2017, 4 days*: Document review and preparing MTR Inception Report
- *4<sup>th</sup> – 7<sup>th</sup> July 2017, 4 days*: Finalization and Validation of MTR Inception Report
- *19<sup>th</sup> – 28<sup>th</sup> July 2017, 8 days*: MTR mission: stakeholder meetings, interviews, field visits (excluding travel time to/from Sri Lanka)
- *28<sup>th</sup> July 2017*: Mission wrap-up meeting & presentation of initial findings
- *By 18<sup>th</sup> August 2017, 5 days*: Submission of draft report
- *19<sup>th</sup> – 26<sup>th</sup> August 2017*: No working days for consultants. Review of draft report by CO
- *28<sup>th</sup> – 29<sup>th</sup> August 2017, 2 days*: Incorporating audit trail on draft report/Finalization of MTR report
- *4<sup>th</sup> – 8<sup>th</sup> September 2017*: No working days for consultants. Preparation & Issue of Management Response
- *11<sup>th</sup> September 2017, 1 day*: Finalization of Report. Expected date of full MTR completion

The date start of contract is 27<sup>th</sup> June 2017.

**Work Planning:**

- Review any delays in project start-up and implementation, identify the causes and examine if they have been resolved.
- Are work-planning processes results-based? If not, suggest ways to re-orientate work planning to focus on results?
- Examine the use of the project’s results framework/ logframe as a management tool and review any changes made to it since project start.

**Finance and co-finance:**

- Consider the financial management of the project, with specific reference to the cost-effectiveness of interventions.
- Review the changes to fund allocations as a result of budget revisions and assess the appropriateness and relevance of such revisions.
- Does the project have the appropriate financial controls, including reporting and planning, that allow management to make informed decisions regarding the budget and allow for timely flow of funds?
- Informed by the co-financing monitoring table to be filled out, provide commentary on co-financing: is co-financing being used strategically to help the objectives of the project? Is the Project Team meeting with all co-financing partners regularly in order to align financing priorities and annual work plans?

**Project-level Monitoring and Evaluation Systems:**

- Review the monitoring tools currently being used: Do they provide the necessary information? Do they involve key partners? Are they aligned or mainstreamed with national systems? Do they use existing information? Are they efficient? Are they cost-effective? Are additional tools required? How could they be made more participatory and inclusive?
- Examine the financial management of the project monitoring and evaluation budget. Are sufficient resources being allocated to monitoring and evaluation? Are these resources being allocated effectively?

**Stakeholder Engagement:**

- Project management: Has the project developed and leveraged the necessary and appropriate partnerships with direct and tangential stakeholders?
- Participation and country-driven processes: Do local and national government stakeholders support the objectives of the project? Do they continue to have an active role in project decision-making that supports efficient and effective project implementation?
- Participation and public awareness: To what extent has stakeholder involvement and public awareness contributed to the progress towards achievement of project objectives?

**Reporting:**

- Assess how adaptive management changes have been reported by the project management and shared with the Project Board.
- Assess how well the Project Team and partners undertake and fulfil GEF reporting requirements (i.e. how have they addressed poorly-rated PIRs, if applicable?)
- Assess how lessons derived from the adaptive management process have been documented, shared with key partners and internalized by partners.

**Communications:**

- Review internal project communication with stakeholders: Is communication regular and effective? Are there key stakeholders left out of communication? Are there feedback mechanisms when communication is received? Does this communication with stakeholders contribute to their awareness of project outcomes and activities and investment in the sustainability of project results?
- Review external project communication: Are proper means of communication established or being established to express the project progress and intended impact to the public (is there a web presence, for example? Or did the project implement appropriate outreach and public awareness campaigns?)
- For reporting purposes, write one half-page paragraph that summarizes the project’s progress towards results in terms of contribution to sustainable development benefits, as well as global environmental benefits.

**Sustainability:**

- Validate whether the risks identified in the Project Document, Annual Project Review/PIRs and the ATLAS Risk Management Module are the most important and whether the risk ratings applied are appropriate and up to date. If not, explain why.
- In addition, assess the following risks to sustainability:

**Financial risks to sustainability:**

- What is the likelihood of financial and economic resources not being available once the GEF assistance ends (consider potential resources can be from multiple sources, such as the public and private sectors, income generating activities, and other funding that will be adequate financial resources for sustaining project’s outcomes)?

**Socio-economic risks to sustainability:**

- Are there any social or political risks that may jeopardize sustainability of project outcomes? What is the risk that the level of stakeholder ownership (including ownership by governments and other key stakeholders) will be insufficient to allow for the project outcomes/benefits to be sustained? Do the various key stakeholders see that it is in their interest that the project benefits continue to flow? Is there sufficient public / stakeholder awareness in support of the long term objectives of the project? Are lessons learned being documented by the Project Team on a continual basis and shared/ transferred to appropriate parties who could learn from the project and potentially replicate and/or scale it in the future?

**Institutional Framework and Governance risks to sustainability:**

- Do the legal frameworks, policies, governance structures and processes pose risks that may jeopardize sustenance of project benefits? While assessing this parameter, also consider if the required systems/ mechanisms for accountability, transparency, and technical knowledge transfer are in place.

**Environmental risks to sustainability:**

- Are there any environmental risks that may jeopardize sustenance of project outcomes?

### **Conclusions & Recommendations:**

The MTR team will include a section of the report setting out the MTR’s evidence-based conclusions, in light of the findings<sup>43</sup>.

Recommendations should be succinct suggestions for critical intervention that are specific, measurable, achievable, and relevant. A recommendation table should be put in the report’s executive summary. See the *Guidance For Conducting Midterm Reviews of UNDP-Supported, GEF-Financed Projects* for guidance on a recommendation table.

The MTR team should make no more than 15 recommendations total.

### **Ratings:**

The MTR team will include its ratings of the project’s results and brief descriptions of the associated achievements in a *MTR Ratings & Achievement Summary Table* in the Executive Summary of the MTR report. See Annex E for ratings scales. No rating on Project Strategy and no overall project rating are required.

**Table. MTR Ratings & Achievement Summary Table for Towards Carbon Neutral Tourism in Montenegro**

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

## **E. TIMEFRAME**

The total duration of the MTR will be approximately 25 working days over a time period of 11 weeks starting (8h May), and shall not exceed five months from when the consultant(s) are hired. The tentative MTR timeframe is as follows:

<sup>43</sup> Alternatively, MTR conclusions may be integrated into the body of the report

TIMEFRAME	ACTIVITY
(28 April 2017)	Application closes / selection from UNDP Roster
(8th May 2017)	Select MTR Team
(8th May 2017)	Prepare the MTR Team (handover of Project Documents)
(8th May – 21st May 2017) 5 days	Document review and preparing MTR Inception Report
(26 May - 2 June 2017) 2 days	Finalization and Validation of MTR Inception Report- latest start of MTR mission
(12 - 16 June 2017) 6 days	MTR International Expert mission (accompanied with local expert): stakeholder meetings, interviews, field visits
(16 June)	Mission wrap-up meeting & presentation of initial findings- earliest end of MTR mission
(17-30 June 2017) 10 days	Preparing draft report
(10 – 17 July 2017) 2 days	Incorporating audit trail from feedback on draft report/Finalization of MTR report (note: accommodate time delay in dates for circulation and review of the draft report)
10 July 2017	Preparation & Issue of Management Response
n/a	(optional) Concluding Stakeholder Workshop (not mandatory for MTR team)
17 July 2017	Expected date of MTR completion

Options for site visits should be provided in the Inception Report.

## F. MIDTERM REVIEW DELIVERABLES

#	Deliverable	Description	Timing	Responsibilities
1	MTR Inception Report	MTR team clarifies objectives and methods of Midterm Review	No later than 2 weeks before the MTR mission: (2 June 2017)	MTR team submits to the Commissioning Unit and project management
2	Presentation	Initial Findings	End of MTR mission: (16 June 2017)	MTR Team presents to project management and the Commissioning Unit
3	Draft Final Report	Full report (using guidelines on content outlined in Annex B) with annexes	Within 3 weeks of the MTR mission: (30 June 2017)	Sent to the Commissioning Unit, reviewed by RTA, Project Coordinating Unit, GEF OFP
	Final Report <sup>44</sup>	Revised report with audit trail detailing how all received comments have (and have not) been addressed in the final MTR report	Within 1 week of receiving UNDP comments on draft: 17 July 2017	Sent to the Commissioning Unit

<sup>44</sup> The final MTR report must be in English. If applicable, the Commissioning Unit may choose to arrange for a translation of the report into a language more widely shared by national stakeholders.



## G. MTR ARRANGEMENTS

The principal responsibility for managing this MTR resides with the Commissioning Unit. The Commissioning Unit for this project’s MTR is UNDP Montenegro.

The commissioning unit will contract the consultants and ensure the timely provision of per diems and travel arrangements within the country for the MTR team. The Project Team will be responsible for liaising with the MTR team to provide all relevant documents, set up stakeholder interviews, and arrange field visits.

## H. TEAM COMPOSITION

A team of two independent consultants will conduct the MTR - one team leader / international expert (with experience and exposure to projects and evaluations in other regions globally) and one local expert familiar with local/national context. The consultants cannot have participated in the project preparation, formulation, and/or implementation (including the writing of the Project Document) and should not have a conflict of interest with project’s related activities.

Team leader will take the lead on drafting the MTR Inception, Draft and Final MTR Report, review all relevant sources of information, such as the project document, project reports – including Inception Report, PIR, project budget revisions, midterm review, progress reports, GEF focal area tracking tools, project files, national strategic and legal documents, and any other materials that the evaluator considers useful for this evidence-based assessment. The Team Leader will conduct interviews with selected key stakeholders during the field mission to Montenegro.

The selection criteria for the Team Leader are as follows:

- Recent experience with result-based management evaluation methodologies;
- Experience applying SMART indicators and reconstructing or validating baseline scenarios;
- Competence in adaptive management, as applied to climate change/environment / tourism;
- Experience working with the GEF or GEF-evaluations;
- Experience working in Montenegro, Western Balkans, CIS countries;
- Work experience in relevant technical areas for at least 7 years;
- Demonstrated understanding of issues related to gender and climate change/environment experience in gender sensitive evaluation and analysis.
- Excellent communication skills;
- Demonstrable analytical skills;
- Project evaluation/review experiences within United Nations system;

A University degree in technical sciences (civil engineering, mechanical engineering, technical engineering) and/or natural sciences (biology, environment, sustainable development...) or other closely related field. Master’s degree will be considered as an asset.

## APPENDIX B – MISSION ITINERARY (FOR JULY-AUGUST 2017)

#	Activity	Stakeholder involved	Place
<b>July 22, 2017 (Saturday)</b>			
	Arrival of Roland Wong in Colombo		
<b>July 23, 2017 (Sunday)</b>			
	Meeting between Mr. Wong and Dr. Samaraweera		Colombo
<b>July 24, 2017 (Monday)</b>			
1	Evaluation debriefing meeting with NAMA Project Team	UNDP and NAMA Project Team	Colombo
2	Meeting with Mr. Gayan Subasinghe on NAMA Project implementation	NAMA Project Team	Colombo
<b>July 25, 2017 (Tuesday)</b>			
3	Meeting with Mr. Gayan Subasinghe, on solar PV NAMA	NAMA Project Team	Colombo
4	Meeting with Mr. G.B. Wimalaratne, National Technical Consultant on technical issues of NAMA Project	NAMA Project Team	Colombo
5	Meeting with Mr. MMR Padmasiri, CTA	NAMA Project Team	Colombo
6	Meeting with Chamila Delpitiya on CCS and Component 4	NAMA Project Team	Colombo
7	Meeting with Lakmini Premarathne on NAMA Project administration	NAMA Project Team	Colombo
<b>July 26, 2017 (Wednesday)</b>			
8	Meeting with Mr. Gamini Senanayake, Independent consultant at CCS	NAMA Project Team	Colombo
9	Meeting with Dr. Sunimal Jayathunga, Director, Ms. Thamara Dulani, and Ms. Hasula Wickremasinghe of CCS	CCS under MMDE	Colombo
10	Meeting with Mr. Namiz Musufar on biogas	NAMA Project Team	Colombo
11	Meeting with Mr. Harsha Wickramasinghe, Deputy Director General, SLSEA	SLSEA	Colombo
<b>July 27, 2017 (Thursday)</b>			
	Travel to Talawakelle from Colombo		
12	Meeting with Dr. Saman Hettiarachchi, Additional Director and Mr Raveendran, Technologist at Tea Research Institute	Tea Research Institute	Talawakelle
	Tour of St. Coombs Tea Factory in Talawakelle	End-user beneficiary	Talawakelle

#	Activity	Stakeholder involved	Place
	Travel to Kandy		
<b>July 28, 2017 (Friday)</b>			
	Travel to Kurunegala		
13	Meeting with NAMA implementers at the North Western Provincial Council	North Western Provincial Council	Kurunegala
	Visit to solar PV plus battery installation at the house of Mr. Jinadasa Subasinghe	End-user beneficiary	Kurunegala
	Visits to biogas installations at Yapahuwa	End-user beneficiary	Yapahuwa
14	Meeting with Mr. Kapila, Regional Engineer at Kurunegala	Ceylon Electricity Board	Kurunegala
	Overnight at Kurunegala		
<b>July 29, 2017 (Saturday)</b>			
	Travel from Kurunegala to Colombo		
<b>July 30, 2017 (Sunday)</b>			
	Preparing report		
<b>July 31, 2017 (Monday)</b>			
	Travel to Galle from Colombo		
	Visit with Mr. Upul Karunanayake (state manager) at the Tea Factory on HEMs and VFDs	State manager of Divithura Tea Factory	North of Galle
15	Meeting with NAMA Implementers with South Provincial Council	South Provincial Council	Galle
	Visit to biogas installation at Hasara restaurant	End-user beneficiary	Galle
	Travel to Colombo from Galle		
<b>August 1, 2017 (Tuesday)</b>			
	Discussions with Project team on recommendations		
16	Skype call with Ms. Milou Beerepoot	UNDP	
<b>August 2, 2017 (Wednesday)</b>			
17	MTR mission de-briefing with UNDP, SLSEA and CCS	UNDP, SLSEA and CCS	SLSEA Conference Room, SLSEA
<b>August 3, 2017 (Thursday)</b>			
	Departure of Roland Wong from Colombo		

Total number of meetings conducted: 17

## APPENDIX C – LIST OF PERSONS INTERVIEWED


This is a listing of persons contacted in Colombo, Talawakelle, Kurunegala and Galle (unless otherwise noted) during the Mid-Term Review Period only. The Evaluation Team regrets any omissions to this list.

1. Ms. Lovita Ramguttee, Deputy Country Director, UNDP Sri Lanka;
2. Ms. Visaka Hidellage, Energy and Environment Cluster Leader, UNDP Sri Lanka;
3. Ms. Milou Beerepoot, Regional Technical Advisor, Bangkok RCC;
4. Mr. Gayan Subasinghe, NAMA Project Coordinator;
5. Mr. G.B. Wimalaratne, National Technical Consultant, NAMA Project;
6. Mr. Ranjith Padmasiri, Chief Technical Advisor, NAMA Project;
7. Mr. Sureka Perara, NAMA Technology Advisor, NAMA Project;
8. Ms. Chamila Delpitiya, CCS Project Advisor, NAMA Project;
9. Ms. Lakhmini Premarathne, Project Assistant, NAMA Project;
10. Mr. Namiz Musafar, Consultant Biogas Technology, NAMA Project;
11. Mr. Gamini Senanayake, UNDP Energy Consultant for NAMA Formulation;
12. Mr. Harsha Wickramasinghe, Deputy Director General, SLSEA;
13. Dr. Jayathunga, Director Climate Change Secretariat;
14. Ms. Thamara Dulani, Assistant Director, CCS;
15. Ms. Hasula Wickramasinghe, CCS;
16. Dr. Saman Hettiarachchi, Additional Director, Tea Research Institute, Talawakelle;
17. Mr. Raveendran, Technologist, Tea Research Institute, in Talawakelle;
18. Key solar and biogas teams representing the North Western Provincial Council in Kurunegala;
19. Mr. A.U.Welaratne, Secretary, Ministry of Fisheries & Electricity, South Province;
20. Mr. Chamila Jayasekara, Director (Strategy);
21. Ms. Dilki Palliyaguruge, M&E Analyst.

## APPENDIX D – LIST OF DOCUMENTS REVIEWED

1. NAMA Project Initiation Plan, March 2014;
2. Project Document for NAMA Project;
3. NAMA Project Inception Report, October 2015;
4. NAMA Project Implementation Reviews (PIRs) for 2014, 2015, 2016 and 2017;
5. NAMA Project Board minutes and presentations from November 2015, January 2016, July 2016, December 2016 and April 2017;
6. Project site visit reports;
7. NAMA Project MACC Tool from May 18, 2017;
8. Finalized GEF focal area Tracking Tools at CEO endorsement;
9. NAMA Project Report on “Implementation Mechanism for Nationally Appropriate Mitigation Actions (NAMAs) in Sri Lanka”;
10. NAMA Project report on “Rapid Assessment of Current Biogas Programs in North Western and Southern Provinces” by Mr. Namiz Musaffer, National Consultant Biogas Technology for UNDP Sri Lanka, July 2016;
11. NAMA Project report on “Monitoring, Reporting and Verification Protocol for Biogas Projects 8 to 20 m<sup>3</sup> for Sri Lanka NAMAs”;
12. NAMA Project Procedures for Data Monitoring, Data Handling and MRV Protocols for all NAMA Projects (biogas, solar PV and tea factory motors);
13. MoMDE Report on “Readiness Plan for Implementation of IMDCs (2017-2019), August 2016.

## APPENDIX E – COMPLETED TRACKING TOOL

 <b>Tracking Tool for Climate Change Mitigation Projects</b> <b>(For Mid-term Evaluation)</b>		
<b>Special Notes: reporting on lifetime emissions avoided</b>		
<p><b>Lifetime direct GHG emissions avoided:</b> Lifetime direct GHG emissions avoided are the emissions reductions attributable to the investments made until the mid-term evaluation, totaled over the respective lifetime of the investments.</p> <p>Please refer to the Manual for Calculating GHG Benefits of GEF Projects.</p> <p><a href="#">Manual for Energy Efficiency and Renewable Energy Projects</a></p> <p><a href="#">Manual for Transportation Projects</a></p> <p>For LULUCF projects, the definition of "lifetime direct" applies. Lifetime length is defined to be 20 years, unless a different number of years is deemed appropriate. For emission or removal factors (tonnes of CO<sub>2</sub>eq per hectare per year), use IPCC defaults or country specific factors.</p>		
General Data	Results at Mid-term Evaluation	Notes
<b>Project Title</b>	Appropriate Mitigation Actions in Energy Generation and End Use Sectors in Sri Lanka	
GEF ID	5586	
Agency Project ID	5232	
Country	Sri Lanka	
Region	SAR	
GEF Agency	UNDP	
Date of Council/CEO Approval	December 9, 2013	Month DD, YYYY (e.g., May 12, 2010)
GEF Grant (US\$)	1,790,411	
Date of submission of the tracking tool	November 15, 2017	Month DD, YYYY (e.g., May 12, 2010)
Is the project consistent with the priorities identified in National Communications, Technology Needs Assessment, or other Enabling Activities under the UNFCCC?	1	Yes = 1, No = 0
Is the project linked to carbon finance?	0	Yes = 1, No = 0
Cumulative cofinancing realized (US\$)	\$18,445,000	
Cumulative additional resources mobilized (US\$)	-	additional resources means beyond the cofinancing committed at CEO endorsement

Objective 2: Energy Efficiency		
Please specify if the project targets any of the following areas		
Lighting	0	Yes = 1, No = 0
Appliances (white goods)	0	Yes = 1, No = 0
Equipment	1	Yes = 1, No = 0
Cook stoves	1	Yes = 1, No = 0
Existing building	0	Yes = 1, No = 0
New building	0	Yes = 1, No = 0
Industrial processes	1	Yes = 1, No = 0
Synergy with phase-out of ozone depleting substances	0	Yes = 1, No = 0
Other (please specify)		
Policy and regulatory framework	2	0: not an objective/component 1: no policy/regulation/strategy in place 2: policy/regulation/strategy discussed and proposed 3: policy/regulation/strategy proposed but not adopted 4: policy/regulation/strategy adopted but not enforced 5: policy/regulation/strategy enforced
Establishment of financial facilities (e.g., credit lines, risk guarantees, revolving funds)	2	0: not an objective/component 1: no facility in place 2: facilities discussed and proposed 3: facilities proposed but not operationalized/funded 4: facilities operationalized/funded but have no demand 5: facilities operationalized/funded and have sufficient demand
Capacity building	3	0: not an objective/component 1: no capacity built 2: information disseminated/awareness raised 3: training delivered 4: institutional/human capacity strengthened 5: institutional/human capacity utilized and sustained
Lifetime energy saved	10,764,000	MJ (Million Joule, IEA unit converter: <a href="http://www.iea.org/stats/unit.asp">http://www.iea.org/stats/unit.asp</a> ) Fuel savings should be converted to energy savings by using the net calorific value of the specific fuel. End-use electricity savings should be converted to energy savings by using the conversion factor for the specific supply and distribution system. These energy savings are then totaled over the respective lifetime of the investments.
Lifetime direct GHG emissions avoided	2,150	tonnes CO <sub>2</sub> eq (see Special Notes above)

Objective 3: Renewable Energy		
Please specify if the project includes any of the following areas		
Heat/thermal energy production	1	Yes = 1, No = 0
On-grid electricity production	1	Yes = 1, No = 0
Off-grid electricity production	0	Yes = 1, No = 0
Policy and regulatory framework	2	0: not an objective/component 1: no policy/regulation/strategy in place 2: policy/regulation/strategy discussed and proposed 3: policy/regulation/strategy proposed but not adopted 4: policy/regulation/strategy adopted but not enforced 5: policy/regulation/strategy enforced
Establishment of financial facilities (e.g., credit lines, risk guarantees, revolving funds)	2	0: not an objective/component 1: no facility in place 2: facilities discussed and proposed 3: facilities proposed but not operationalized/funded 4: facilities operationalized/funded but have no demand 5: facilities operationalized/funded and have sufficient demand
Capacity building	3	0: not an objective/component 1: no capacity built 2: information disseminated/awareness raised 3: training delivered 4: institutional/human capacity strengthened 5: institutional/human capacity utilized and sustained
Installed capacity per technology directly resulting from the project		
Wind		MW
Biomass		MW el (for electricity production)
Biomass	0.01	MW th (for thermal energy production)
Geothermal		MW el (for electricity production)
Geothermal		MW th (for thermal energy production)
Hydro		MW
Photovoltaic (solar lighting included)	0.022	MW
Solar thermal heat (heating, water, cooling, process)		MW th (for thermal energy production, 1m² = 0.7kW)
Solar thermal power		MW el (for electricity production)
Marine power (wave, tidal, marine current, osmotic, ocean thermal)		MW
Lifetime energy production per technology directly resulting from the project (IEA unit converter: <a href="http://www.iea.org/stats/unit.asp">http://www.iea.org/stats/unit.asp</a> )		
Wind		MWh
Biomass		MWh el (for electricity production)
Biomass	79.40	MWh th (for thermal energy production)
Geothermal		MWh el (for electricity production)
Geothermal		MWh th (for thermal energy production)
Hydro		MWh
Photovoltaic (solar lighting included)	195.000	MWh
Solar thermal heat (heating, water, cooling, process)		MWh th (for thermal energy production)
Solar thermal power		MWh el (for electricity production)
Marine energy (wave, tidal, marine current, osmotic, ocean thermal)		MWh
Lifetime direct GHG emissions avoided	9,274	tonnes CO2eq (see Special Notes above)



## APPENDIX F – PROJECT RESULTS FRAMEWORK FOR NAMA PROJECT (FROM JUNE 2015)

Project Strategy	Indicator	Baseline	Target	Sources of Verification	Risks and Assumptions
<b>Goal:</b> Reduction of GHG emissions from the energy generation and end user sectors in Sri Lanka	Cumulative GHG emissions by end of project (EOP), tCO <sub>2e</sub>	0	16,126	AMA Project implementation reports;	Continued support and participation from co-financing institutions, MPE, SLSEA and other stakeholders
	Cumulative energy savings achieved by end of project (EOP), MJ	0	74,866,639	MRV Registry, Mid-tern and Terminal reports	
<b>Objective:</b> Support appropriate climate change mitigation actions in the energy generation and end-use sectors as part of the initiatives to achieve the voluntary GHG mitigation targets of Sri Lanka	No. of implemented NAMAs in the energy generation and end use sectors by EOP	0	3	AMA Project Documents; NAMA Project implementation and Mid-term evaluation and Terminal reports	Selected project proponents get required loan accessed through bank and continued favorable business environment
<b>Outcome 1:</b> Established and regular update of renewable energy utilization baseline & energy intensity reference baselines for the energy generation and end-use sectors	No. of provinces that regularly conduct sub- sectoral GHG emission inventories of their energy generation and end-use sectors by Year 4	0	4	Periodic sub-sectoral GHG emission inventory reports from provinces	Strong support and buy in from the provincial councils and provincial energy ministries throughout the project
	No. of provinces that have established and operational sub-sectoral GHG emission inventory system by Year 4	0	4	Mid-term report, Documentation on the established sub- sectoral GHG emission inventory system of each province	
<b>Outcome 2:</b> Prioritized Nationally Appropriate Mitigation Actions (NAMAs) in the energy generation and end-use sectors are identified and designed	No. of provinces that established MACC curves <b>established to identify technologies for energy sector by year 2</b>	0	1	Mid-term and Terminal report, Documentation on the established MACCC report of each province	Continued support and participation from co-financing institutions, MPE, SLSEA and other stakeholders  Availability of reliable and accurate baseline data
	No. of NAMA EE/RE projects that are <b>prioritized and designed by EOP</b>	0	3		
<b>Outcome 3:</b> Identified private and public sector entities implemented prioritized	No. of identified fully capable and qualified private and public sector entities that are interested in	0	2	MOU signed between project developers and SLSEA	Strong support and buy in from the private sector

Project Strategy	Indicator	Baseline	Target	Sources of Verification	Risks and Assumptions
appropriate mitigation actions for the achievement of Sri Lanka voluntary mitigation target	<p>funding prioritized NAMA projects by Year 2</p> <p>No. of individual projects that constitute the country's NAMAs by Year 4</p> <p>No. of operational Private- funded NAMA projects by EOP</p>	<p>0</p> <p>0</p>	<p>1,000 biogas systems 1,300 tea factories 205 solar systems</p> <p>1 (high efficient motors in tea factories)</p>		<p>Capable public department/ministry agencies serve as National Implementing Entity (NIE) for selected NAMAs</p>
<b>Outcome 4:</b> Accurate measurement and accounting of actual GHG emission reduction from mitigation actions in the energy generation and end-use sectors	<p>No. of NAMA projects with GHG ERs correctly verified by the established and operational MRV systems for mitigation actions by Year 4</p> <p>No. of projects in the energy generation and end use sectors that are registered in the National NAMA registry by EOP</p>	<p>0</p> <p>0</p>	<p>3</p> <p>3</p>	Mid-term and Terminal report, Documentation on MRV system	<p>The Government of Sri Lanka maintains its policy of achieving its voluntary emission reduction targets through the systematic implementation of NAMAs in the energy sector</p> <p>Competent staff operate, maintain, and upgrade the MRV system on regular basis</p>

## APPENDIX G - EVALUATION CRITERIA QUESTIONS

Evaluative questions	Indicators	Sources	Methodology
<b>Project Strategy: To what extent is the project strategy relevant to country priorities, country ownership, and the best route towards expected results?</b>			
Is NAMA sufficiently comprehensive to drive towards GHG emissions reduction targets of the GoSL?	GHG emission reduction targets of legislation	Translations of legislation into English	Document review
Has the legislation catalyzed interest in NAMA low carbon investment targets of the project?	Number of NAMA low carbon investments with involvement on the project	Low carbon investors PIRs Project documents on low carbon investments	Stakeholder interviews Document reviews
Does the Project provide adequate support in strengthening and scaling up Sri Lanka's NAMA program?	Number of trained governments officers and low carbon professionals	PIRs Training materials Awareness raising products Trained government officers and low carbon professionals	Document reviews Web page reviews Stakeholder interviews
Has the project provided any products that would improve the credibility of NAMA low carbon investments and initiatives?	Validated GHG accounting protocol	GHG validation reports	Document review Stakeholder interviews
Does the project provide technical assistance and resources for sustaining financing to replicate pilot low carbon projects?	Estimate of finance required for various low carbon projects  Number of financial institutions and large investors interested in low carbon investments	Outputs relevant to baselines (from outcome one) and MACCCs analyses with cost estimates  Financial institutions, donors and private investors	Document review Stakeholder interviews
<b>Progress Towards Results: To what extent have the expected outcomes and objectives of Project been achieved thus far?</b>			
What a state of readiness of the EnerGIS database management system to receive and process energy and GHG inventories?	Number of outstanding issues remaining towards full functionality of the database management system	Project reports  Personnel responsible for the development of database management system	Document review Stakeholder interviews
Will the targets for establishment of operational subsectoral GHG emissions inventories be achieved by EOP?	% of targeted subsectoral GHG emission inventories at provincial levels where activities on data collection have commenced	Energy and GHG emission inventories at provincial levels  Provincial personnel involved in energy and GHG inventories	Document review Stakeholder interviews

Evaluative questions	Indicators	Sources	Methodology
<b>Project Implementation and Adaptive Management: Has the project been implemented efficiently, cost-effectively, and able to adapt to any changing conditions thus far? To what extent are project-level monitoring and evaluation systems, reporting, and project communications supporting the project's implementation?</b>			
To what extent has the project made satisfactory achievements in delivering project outputs vis-à-vis the targets and related delivery of inputs and activities?	All targets and indicators in PRF	PIRs and other progress reports	Document review Stakeholder interviews
Does the project have a risk log to adequately identify risks that would obstruct achievement of intended outcomes and outputs, and has the project identified adaptive management measures to mitigate these risks?	Number of risks listed in the risk log  Management responses to risks	PIRs and risk log	Document review Stakeholder interviews
Are adaptive management changes reported regularly?	Number of management responses to risks	PIRs	Document review Stakeholder interviews
<b>Sustainability: To what extent are there financial, institutional, socio-economic, and/or environmental risks to sustaining long-term project results?</b>			
Do low carbon projects in the NAMA framework have payback periods to attract further investments in other NAMA opportunities?	Payback period for low carbon investments or various NAMA opportunities	Investment reports  Personnel involved with all NAMA low carbon investments (both public and private)	Document review Stakeholder interviews
Have the financial barriers to NAMA low carbon investments in both public and private sectors been sufficiently identified? If so, have adequate mechanisms been identified to catalyze more investment in NAMA opportunities?	Costs of NAMA low carbon investments and payback periods  Available funds for supporting NAMA low carbon investment programs	Investment reports  Personnel involved with all NAMA low carbon investments (both public and private)	Document review Stakeholder interviews
Is GHG emission reduction accounting sufficiently robust to improve the credibility of GHG reductions resulting from NAMA low carbon investments?	GHG emission reductions from NAMA low carbon investments	GHG verification reports from third-party sources  Personnel from third-party verification entities	Document review Stakeholder interviews

## APPENDIX H - RESPONSES TO COMMENTS RECEIVED ON DRAFT MTR REPORT

To the comments received on August 31, 2017 from the Mid-Term Review of Sri Lanka’s “NAMA Project” (UNDP PIMS 5232), responses are provided in the following table by institution (“Author” column) and track change comment number (“#” column):

Author	#	Para #/ Comment location	Comment/Feedback on draft TE report	TE response and actions taken
PMU	1	Executive Summary	Complete the sections on Project Description, Project Progress Summary and MTR Ratings and Achievements including Table A, Conclusions and Recommendations	This will not be completely filled in until the Final Report.
PMU	2	Para 17	Addition/correction: The Project’s inception was held in Sept 2015 and actual implementation works started with the appointment of PMU staffs in Oct, 2015	This correction actually belongs in Para 48.
PMU	3	Para 20, 1 <sup>st</sup> bullet	This EnMAP is now being implemented as Demand Side Management (DSM) Plan	Correction made.
PMU	4	Para 21,	Also with close consultations of Provincial Councils and Authorities	Correction made
PMU	5	Para 27, 3 <sup>rd</sup> bullet	Not forest biomass This is home garden-derived biomass	Correction made
PMU	6	Para 28, 1 <sup>st</sup> bullet	Total installed capacity of these 13 units (31 equivalent) are 21.5 kW	Correction made as 13 units with installed capacity of 21.5 kW
PMU	7	Para 28, 2 <sup>nd</sup> bullet	“average volume in the order of 8m <sup>3</sup> ” Many of biogas installations’ volume are between 8-15m <sup>3</sup> , and the average size is 11m <sup>3</sup> (average of 51 units)	Correction to 11 m <sup>3</sup> made
PMU	8	Para 28, page 13	PMU wish if MTR team can reconsider this Moderately Unsatisfactory goal level rating which is mainly based on saved GHG/Energy savings of 3 NAMAs to MTR level. This rating will hinder the project’s actual overall progress.	MTR team changed rating due MS based on reasoning in Para 28
PMU	9	Para 37, 1 <sup>st</sup> bullet	Sizes are mostly between 8 -15m <sup>3</sup> , and average of 11m <sup>3</sup>	Correction made
PMU	10	Para 36, 3 <sup>rd</sup> bullet	“Progress of this NAMA was hampered somewhat by the departure of the sector specialist in early 2016, and difficulties in finding a replacement”. We shall leave this sentence or shall be corrected as a general note; Actually this was Project Coordinator who left in early 2016 and HEM sector specialist left the project in mid-2016 and both these led to certain delays in project implementations.	Correction made according to information provided

<b>Author</b>	<b>#</b>	<b>Para #/ Comment location</b>	<b>Comment/Feedback on draft TE report</b>	<b>TE response and actions taken</b>
PMU	11	Para 37, 4 <sup>th</sup> Bullet	Biogas cookers ,non availability is the main issue, not the high cost	Correction made
PMU	12	Para 37, 5 <sup>th</sup> Bullet	Non the unaffordability, but non availability of biogas appliances. The broader issue is the limited market opportunity for suppliers to cater for such limited requirements and/or resulting in high cost of appliance due to lower order quantities.	These facts are provided in the 4 <sup>th</sup> bullet.
PMU	13	Para 37	Reasons for slow dissemination of biogas units under the programme is not discussed in the report; More specifically technology issues, scale, no requirement of biogas as a means of energy/alternative energy, but as a solution for waste management.	Discussion provided in 5 <sup>th</sup> and 6 <sup>th</sup> bullets in Para 37
	14	Para 38	Need to discuss why project has designed SPV with batteries, cost and benefits. Does the user get any additional benefits for the high price pay for batteries? Reasons for non-sustainability and need of change of with batteries to without batteries having the same or higher ER. Batteries one the most expensive method of energy storage address the issue of night peak shaving (I hope not within the scope of NAMA project). This is not workable without a tariff change	Para 38 has been rewritten to include a number of solar PV installation scenarios that should be reviewed by the PMU. This review should be in the context of identifying options for solar PV installations that would maximize GHG emission reductions for the EOP.
	15	Para 38, 3 <sup>rd</sup> bullet	“and commercial buildings (such as supermarkets)” We shall leave out commercial building/establishments as they are not subsidised, and for them this (solar PVs) is affordable	The MTR team prefers to leave the option of working with commercial buildings for solar PV installations with battery storage. Their inclusion within a NAMA does not necessarily mean their installation will be subsidized. This arrangement should be worked out between the commercial establishment and the PMU.
PMU	16	Para 44	EOP date should be 4 <sup>th</sup> July 2019 (not 1 <sup>st</sup> Sept, 2019) Also not just “supporting implementation of 3 NAMAs” but overall NAMA Framework as well	Correction made.
PMU	17	Footnote 10	“For them to process 400 applications over the next 2 years” The project is actually working in 5 provinces thus number of units per province would be approximately 200 units	Correction made.
PMU	18	Footnote 11	“quality of data” There will be a process to ensure the quality of data as there will be a data verification process (middle level step). However,	Correction added

<b>Author</b>	<b>#</b>	<b>Para #/ Comment location</b>	<b>Comment/Feedback on draft TE report</b>	<b>TE response and actions taken</b>
			<b>completeness</b> can be an issues as the project cannot cover the scattered data of all technology-applications of energy sector	
PMU	19	Para 34, Outcome 2 targets	Capacity building of stakeholders on prioritization process is a key aspects, and we have conducted 2 capacity building activities/workshops on MACCC in this regards. Can be indicated here as a bullet point	Corrections added to Para 34
PMU	20	Table 3	31 is the equivalent number Year 2018 & 2019 – Annual Elect saved (MWh) Zero should be corrected as 557, 557 (not 362, 0) and cumulative numbers 752 and 1309 respectively for 2018 and 2019	Correction made.
PMU	21	Para 46	“and co-chaired by the Secretary of MMDE” This is incorreced and the Secretary of MMDE has not been involved from the beginning	Correction made.
PMU	22	Para 51	Information requested, provided separately and adjust the paragraph accordingly	Adjustments made.
PMU	23	Para 52	Information requested, provided separately and adjust the paragraph accordingly	Adjustments made.
PMU	24	Para 71, 1 <sup>st</sup> bullet	“commercial entities” Should be corrected as government entities (like hospitals and schools	The MTR team has added hospitals and schools but has also retained commercial entities that should be part of the solar PV NAMA with battery storage
PMU	25	Table 2, Goal Achievement Rating	MTR Rating is 3 PMU suggests that the Project should have a Rating of 4 based on the overall progress of the project rather than rating at 3 considering progress against GHG saving target only. Also achievement description section can be used to justify and provide details in supporting this rating	Upgraded to 4. See Comment 8.
PMU	26	Para 73, Recommendations 1 <sup>st</sup> bullet	Since biogas units are being installed in 2 provinces, Actually biogas units are being installed in five provinces, but more proactively this task is taken up by these two provinces (southern and north-western). We have also noticed that Central province has also taken up this work seriously in the very recent. Also other two provinces (Uva, and Eastern) are not	Adjustments made in Para 73 as per information provided.
PMU	27	Para 73, Recommendations	Remove Commercial entities and correct this as government entities	The MTR team left commercial entities in the recommendations. See Comment 24 for reasons.

Author	#	Para #/ Comment location	Comment/Feedback on draft TE report	TE response and actions taken
		2 <sup>nd</sup> bullet		
PMU	28	Footnote 37, 38 and 39	Indicated target for biogas, solar PV and VFDs are of Scenario 2 (aggressive approach) and should this be corrected to Scenario 1 (conservative approach)?	Corrections made.
PMU	29	Para 77, 4 <sup>th</sup> bullet point	As an <b>implementing tool</b> (insert the reference; first steering committee on NDCs) and we can also phrased as <b>NAMAs should be promoted as a delivery mechanism and an implementing tool to achieve Sri Lanka’s NDCs...</b>	Corrections made but need date of NDC SC meeting
PMU	30	Para 46	4 consultants Actually this is 3 full time consultants (biogas consultant is part-time/need basis)	Correction made.
PMU	31	Para 47, Organogram	Actual NAMA Project Management Unit is different of what is indicated in IR. PMU does not have a dedicated person for Solar PV, and this work is handled by Project Coordinator with the assistance of National Technical Advisor (see attached org.chart).	Corrections made.
PMU	32	4.2 Recommendation	<b>Project Implementation and Management:</b> for more efficient delivery and meeting the project outcome in time PMU wishes to have more involvement from SLSEA and CCS staff in activity level implementations (At present apart from project management activities, substantial time of PMU has to spend on project activities with very limited staff available. We feel this hinders the progress of the project to some extend)  A few members of SLSEA closely working with the project shall ensure the smooth functioning of the NAMA framework after completion of the project ensuring the sustainability	The MTR team agrees with this additional recommendation which is provided in Para 75.
PMU	33	Para 29, 1 <sup>st</sup> bullet	Word ‘SLSEA’ is repeating	Correction made.
PMU	34	Para 30, 2 <sup>nd</sup> bullet, last line	Lanka Electricity Company. Not “electrify”	Correction made.
PMU	35	Para 37, 3rd Bullet	10% leakage has considered in MRV protocol and emission calculation formulas, and this should be corrected	Correction made.
PMU	36	Para 39, 1st Bullet	Project has already done several trials to estimate/ measure savings potential from VFD application.	Para 39 has been corrected as well as the 3 <sup>rd</sup> bullet of Para 73.



<b>Author</b>	<b>#</b>	<b>Para #/ Comment location</b>	<b>Comment/Feedback on draft TE report</b>	<b>TE response and actions taken</b>
RTA	37	Para 33	I found in the UNFCCC registry that the current NAMA project is registered in the UNFCCC NAMA registry as a “NAMA seeking support”. When the 3 pilot NAMAs are converted into NAMA design documents, there may need to be some more discussion on how these NAMAs should best be filed in the UNFCCC NAMA Registry: would they be “NAMAs seeking support” (which means Sri Lanka is looking for funds in order to be able to implement the NAMAs) or would they be “NAMAs for recognition” (which means they have been implemented already)? (I am also not sure whether the current GEF project should be registered in the UNFCCC registry as a “NAMA seeking support”).	The MTR team has added Footnote 5 on Page 15 as a directive to the PMU to consider these registration categorizations.
RTA	38	Para 38, 1 <sup>st</sup> bullet (1 <sup>st</sup> sub-bullet)	Could it be of interest if the project commissions a small assignment to calculate to what extent the battery will offset the electricity subsidies, in order to use that as evidence towards the Government/SLSEA for granting subsidies for this system?	An additional recommendation has been added to Para 78 to commission such an assignment. The PMU can then decide if it does commission such an assignment pending the availability of funds and approvals from SLSEA
RTA	39	Table 5, Pg 26	I’m somewhat surprised to see that the expected expenses in the period July-Dec ‘17 are almost similar to the expenses over Sep ‘15 to June ‘17. Are the July-Dec ‘17 expectations realistic?	The MTR team noted that expenses required during the July to December 2017 period would be high due to the expected high demand for VFD by members of the Planters Association of Ceylon, and the assistance by the Project to procure more than 500 VFDs to be installed during 2018 as well as the latter half of 2017. In addition, procurement assistance for more than 80 solar PV systems would be required for the latter half of 2017 as well as early 2018. Tables 3 and 4 provides a timeline for the deployment of equipment for the solar PV and VFD NAMAs respectively.
RTA	40	Para 67	In fact, environmental risk may come from the disposal of the batteries used with the household PV systems (with battery lifetime of 7 to 10 years). But perhaps the project has addressed this?	The MTR team acknowledges the risk identified by the RTA and has added this to Para 67 and downgraded the sustainability rating (since the Project has not addressed this issue). A recommendation has also been added to Para 78 for the Project to address this issue pending availability of Project funds.

<b>Author</b>	<b>#</b>	<b>Para #/ Comment location</b>	<b>Comment/Feedback on draft TE report</b>	<b>TE response and actions taken</b>
RTA	41	Para 71, 1 <sup>st</sup> bullet	See earlier comment, perhaps it could be worthwhile for the project to assign a small study to calculate this effect (perhaps also in view of financing future NAMA development)	See response to Comment 38.
UNDP, M&E team of CO	42	Para 6, last Bullet (sustainability)	If we focus/assess processes of reject interventions in order to assess the sustainability of intervention, mentioning it would be much more appropriate here.	The sustainability of interventions is reviewed at an outcome or component level, within which there are several “sub- interventions” which may or may not be rejected through the adaptive management of the project. While the MTR team appreciates this comment, mentioning any rejected interventions at this juncture of the report would be difficult, and likely not appropriate.
UNDP, M&E team of CO	43	Para 7	Limitation and challenges of the MTR need to be spelled out. Those limitation will be useful at CO level to learn from evaluations	An expanded description of the limitations and challenges of the MTR has been provided in Para 7.
UNDP, M&E team of CO	44	Para 57	Under the 2 point of barriers, its understand the low level of awareness, if the communication is at satisfactory, how far we have addressed the challenge of low awareness. For us these two statements are bit contradictory	The MTR team is not clear on this comment given the lack of reference in Para 57 to awareness issues on the project. However, we believe this comment is referring to strong communications mentioned in Section 3.3.7 as contradictory to the mention of a low level of awareness on a number of issues throughout the Project (see Paras 37, 45, 65 and 73). The MTR team believes that the Project has communicated very well within its own team and its implementing partners to implement this project. This communication strength, however, is not linked to low awareness nor is this a contradictory finding. The challenges of low awareness on the Project are more related to the difficulties in raising awareness of remote project activities, and interministerial communications. Efforts to improve this level of awareness by the Project and its implementing partners is mentioned in several paragraphs in the report including Paras 39, 43, 45, 65, 73, and 78.

<b>Author</b>	<b>#</b>	<b>Para #/ Comment location</b>	<b>Comment/Feedback on draft TE report</b>	<b>TE response and actions taken</b>
PMU	45	Para 73, 2 <sup>nd</sup> bullet	The recommendations in Section 4.2, the Solar PV CO2 ER number should be corrected to 596 from 941. In addition, the statement “For the pilot solar PV NAMA, focus on the installation of 81 and 150 solar PV systems with battery storage to be installed by the end of 2017 and 2018 respectively” should be rephrased as “For the pilot solar PV NAMA, focus on the installation of 81 and 150 solar PV systems (or total equivalent capacity of 140kW) to be installed by the end of 2017 and 2018 respectively”.	The corrections have been made in the report as suggested by the PMU.

## APPENDIX I - EVALUATION CONSULTANT AGREEMENT FORM

### Evaluator 1:

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

### Evaluation Consultant Agreement Form<sup>45</sup>

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

Name of Consultant: Roland Wong

Name of Consultancy Organization (where relevant): \_\_\_\_\_

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

Signed at Surrey, BC, Canada on November 6, 2017



<sup>45</sup> [www.unevaluation.org/unegcodeofconduct](http://www.unevaluation.org/unegcodeofconduct)

**Evaluator 2:**

1. Must present information that is complete and fair in its assessment of strengths and weaknesses so that decisions or actions taken are well founded.
2. Must disclose the full set of evaluation findings along with information on their limitations and have this accessible to all affected by the evaluation with expressed legal rights to receive results.
3. Should protect the anonymity and confidentiality of individual informants. They should provide maximum notice, minimize demands on time, and respect people’s right not to engage. Evaluators must respect people’s right to provide information in confidence, and must ensure that sensitive information cannot be traced to its source. Evaluators are not expected to evaluate individuals, and must balance an evaluation of management functions with this general principle.
4. Sometimes uncover evidence of wrongdoing while conducting evaluations. Such cases must be reported discreetly to the appropriate investigative body. Evaluators should consult with other relevant oversight entities when there is any doubt about if and how issues should be reported.
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6. Are responsible for their performance and their product(s). They are responsible for the clear, accurate and fair written and/or oral presentation of study imitations, findings and recommendations.
7. Should reflect sound accounting procedures and be prudent in using the resources of the evaluation.

**Evaluation Consultant Agreement Form<sup>46</sup>****Agreement to abide by the Code of Conduct for Evaluation in the UN System**

**Name of Consultant:** Dr. Sarath Samaraweera

**Name of Consultancy Organization (where relevant):** \_\_\_\_\_

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

Signed at Colombo, Sri Lanka on November 6, 2017



<sup>46</sup> [www.unevaluation.org/unegcodeofconduct](http://www.unevaluation.org/unegcodeofconduct)