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Government of Sri Lanka

**Terminal Evaluation 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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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 November 2019

CEO endorsement date: January 27, 2015

Project implementation start date: July 4, 2015

Project end date: July 4, 2019

Date of evaluation report: December 19, 2019

Region and Countries included in the project: Sri Lanka

GEF Focal Area Objective: ClimateChange 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 Renewable Energy (MoPRE)

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

Terminal Evaluation team members: Mr. Roland Wong, International Consultant
Mr. Swetha Perera, 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 Terminal Evaluation. In particular, we wish to thank the UNDP Sri Lanka, the Ministry of Power and Renewable Energy, the Sri Lanka Sustainable Energy Authority, the Climate Change Secretariat, the Uva Provincial Council, Aitken Spence Plantations and Elpitiya Plantations to recall details of their time during the Project. In particular, we wish to thank all the persons met during our missions to Colombo, Kurunegala, Pussellawa, Udawalawa and Badulla 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 Terminal Evaluation Mission conducted during the 20-29 November 2019 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 Summary 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		<i>at endorsement (Million US\$)</i>	<i>at completion (Million US\$)</i>
UNDP Project ID:	5232	GEF financing:	1.790	1.790
Country:	Sri Lanka	IA/EA own:	0.250	0.000
Region:	Asia and the Pacific	Government:	3.630	1.882
Focal Area:	Climate Change	Other:	22.000	19.325
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	21.207
Executing Agency:	Sri Lanka Sustainable Energy Agency (SLSEA)	Total Project Cost:	27.670	22.997
Other Partners involved:	ProDoc Signature (date project began):		4 July 2015	
	(Operational) Closing Date:	Proposed:	Actual:	
		Date:	4 July 2019	31 December 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. In 2011, the energy sector was the largest emitter in Sri Lanka accounting for 40% of all 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) sought to achieve 20% from renewable energy resources by 2020 as part of the national strategy to reduce GHG emissions through appropriate mitigation actions (NAMA). The Energy Management Plan (EnMAP) also sought 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 were not systematically quantified and their benefits remaining 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 was 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. The 2015 Paris Agreement amplified the importance of NAMAs by defining a link between national strategies (in this case RERDP and EnMAP) and NAMAs through “nationally determined contributions” (NDCs) on which NAMAs (consisting of policies and actions that measure and quantify emission reduction impacts) can guide and contribute to the development of NDCs. The existence of a transparent NAMA framework will open up opportunity to access regional and international climate funding for NDCs. 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 GHG mitigation targets.

Project Results

Actual outcomes of the NAMA Project are summarized on Table A in comparison with intended outcomes.

Table A: Comparison of Intended Project Outcomes from the Inception Report to Actual Outcomes

Intended Goal, Objectives and Outcomes in revised Project Planning Matrix of October 2015	Actual achievements towards intended goal, objective and outcomes as of December 2019
Goal: <i>Reduction of GHG emissions from the energy generation and end user sectors in Sri Lanka by developing a NAMA framework</i>	Actual achievement toward objective: 80% of the target GHG emission reductions from this Project were achieved, with 96% of target energy savings achieved. See Paras 64-67 for further details.
Objective: <i>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.</i>	Actual achievement toward objective: The target of 3 NAMA projects (for rooftop solar PV, biogas and variable frequency drives for motors) was successfully achieved. See Paras 64-67 for further details.
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.	Actual Outcome 1: Established and regular updating of baselines for renewable energy utilization and end-use energy consumption by Provincial personnel and private sector entities through a user-friendly web-based app (managed by SLSEA), EnerGIS that uses adopted MRV systems developed by the Project and is linked to national and provincial energy and GHG emission baseline inventories. (See Paras 70-73, 98).
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.	Actual Outcome 2: Prioritized Nationally Appropriate Mitigation Actions (NAMAs) in the energy generation and end-use sectors are identified and designed for energy-sector stakeholders including SLSEA and CCS, using combined results from MACC analysis and Multi-Criteria Analysis. (see Paras 76-81)
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.	Actual Outcome 3: Private and public sector entities including several tea plantation companies, biogas installers, solar PV installers and provincial-level officers and personnel with NAMA oversight, have implemented NAMAs that contribute to Sri Lanka’s voluntary mitigation targets and provides these entities with the necessary experience and confidence to implement NAMAs in the renewable energy and end use energy sectors (see Paras 84-94).

Intended Goal, Objectives and Outcomes in revised Project Planning Matrix of October 2015	Actual achievements towards intended goal, objective and outcomes as of December 2019
<p>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.</p>	<p>Actual Outcome 4: Tools and expertise are available in Sri Lanka for accurate measurement and accounting of actual GHG emission reduction resulting from an institutional framework for NAMA project processing procedure, an established NAMA registry and accounting of actual GHG emission reduction through an MRV framework. Expertise is available through provincial-level personnel and field officers, solar PV installers and biogas experts as well as CCS personnel (see Paras 97-103).</p>

Summary of Conclusions, Recommendations and Lessons

The NAMA Project has provided the GoSL with a number of tools and knowledge products and the experiences of pilot implementation of low carbon projects. This has strengthened national capacity to implement NAMA actions that credibly quantify GHG emission reductions and contribute to NDCs. This is also strongly aligned with Sri Lanka’s ambition to reduce its carbon footprint through implementing its National Energy Policy as a means to minimize the country’s dependence on imported fossil fuels for the energy generation and electricity (Para 117). The Project also informs the Government of i) the opportunities to expand the solar PV NAMA with battery storage as a means of peak demand management, attenuating distribution loss reduction, and as a solution for overvoltage and reverse power at selected points; ii) the required pace of implementation to meet the intended targets of the NEP through the REDP and Operation DSM; and iii) the need for continued promotion and assistance in the planning and design of NAMAs (Para 118).

The Project has also spawned a number of forward-looking actions by various levels of government on further development of low carbon programmes in Sri Lanka including:

- provincial-level mitigation plans which will require more detail if they are to be supported by foreign investors and owners;
- SLSEA are undertaking efforts to establish working committees on MRV and improving energy policy decision making tools using the outputs from the NAMA Project. Despite interest amongst the private sector and provincial level stakeholders in NAMA projects, continued technical assistance and awareness raising by SLSEA and CCS is still required for development of NAMAs that contribute to NDCs; and
- the establishment of the NAMA institutional structure and an ongoing legal review of the cabinet paper for a “Climate Change Act”. Notwithstanding, there is still no institutional mechanism and legal framework for reporting and transferring GHG emission data from the provinces, private sector and other entities to CCS (Para 119).

Corrective actions for the design, implementation, monitoring and evaluation of the project:

Action 1 (to UNDP and GEF): Strengthen the preparation of a Project Results Framework (PRF) utilizing a Theory of Change (ToC) analysis to increase the likelihood that project outcomes will result in the desired long term higher level changes for any project design (and in this case, the design of mitigation actions for the renewable energy and end use sectors of Sri Lanka. See Para 120 for details.

Actions to follow up or reinforce initial benefits from the project:

Action 2 (to MoPRE, SLSEA): To increase and sustain the growth of household solar PV systems with battery storage, change current regulations to allow households to use their solar PV systems during power failures and load shedding events. See Para 121 for further details.

Action 3 (to UNDP, CCS, SLSEA and provincial governments): Undertake ongoing management of a number of NAMA planning, design and implementation issues to sustain growth of NDC options and supporting NAMAs. See Para 122.

Proposals for future directions underlining main objectives of the NAMA project:

Action 4 (to CCS and SLSEA): CCS and SLSEA should work closely with suppliers to encourage a supplier-driven business model to promote and scale-up GHG emission abatement technologies, especially for biogas installers. This will require Government support for training programs (for example, with a biogas association) with the intent of increasing pool of provincial level biogas expertise in Sri Lanka, and to provide them the necessary support to give them a higher probability of success in the start-up of the biogas business. See Para 124.

Action 5 (to CCS and SLSEA): Engage the private sector for MRV of GHG emission reductions by biogas systems. This would include the replication of private entities who have financed in biogas units for tea plantation households as a CSR initiative. See Para 125.

Action 6 (to CCS): Mainstream GHG emission reporting by incorporating the estimation and monitoring of GHG emissions into the government project approval process. This would include GHG emission reporting in all the GoSL’s planning documents. See Para 126.

Action 7 (to CCS and SLSEA): CCS and SLSEA should encourage utilities (such as the Ceylon Electricity Board) to consider and implement schemes (through the NAMA registry) to equip solar PV for households with battery storage. See Para 127.

Action 8 (to SLSEA): Encourage sectoral leaders to lobby CCS for joint development of MRV protocols for technologies as prioritized by the Presidential Task Force on Energy DSM. See Para 128.

Action 9 (to CCS and SLSEA): CCS should routinely call for NAMA proposals to support NDC development (after completion of MRV protocol) from the private sector. See Para 129.

Best and worst practices in addressing issues relating to relevance, performance and success:

Best practice 1: Preparation of NAMAs for developing NDCs requires a fair amount of rigor and technical knowledge from trained personnel with experience in designing and implementing NAMAs. Future NAMA exercises without sufficient resources for rigorous development will prove to be higher risk. See Para 130.

Best practice 2: Successful projects not only have competent PMUs, but also dedicated counterpart officers and subordinates who would develop corporate memories of the project. See Para 131.

Practice that needs more improvement: More efforts are required to prepare GEF project designs, especially care with GHG emission reduction estimates. See Para 132.

Evaluation Ratings¹

1. Monitoring and Evaluation	Rating	2. IA & EA Execution	Rating
M&E design at entry	5	Quality of Implementation Agency - UNDP	5
M&E Plan Implementation	5	Quality of Execution - Executing Entity (SLSEA/CCS)	5
Overall quality of M&E	5	Overall quality of Implementation / Execution	5
3. Assessment of Outcomes	Rating	4. Sustainability²	Rating
Relevance ³	2	Financial resources	2
Effectiveness	5	Socio-political	3
Efficiency	5	Institutional framework and governance	2
Overall Project Outcome Rating	5	Environmental	3
		Overall likelihood of sustainability	2

¹ 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.

² Sustainability Dimension Indices: 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. *Overall rating is equivalent to the lowest sustainability ranking score of the 4 dimensions.*

³ Relevance is evaluated as follows: 2 = Relevant (R); 1 = Not relevant (NR)

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 ₂	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
MoPRE	Ministry of Power and Renewable Energy
MRV	Monitoring, reporting and verification
MTR	Mid Term Review
M&E	Monitoring and Evaluation
NAMA	Nationally Appropriate Mitigation Actions
NDC	Nationally Determined Contributions
NEP	National Energy Policy
NGO	Non-governmental organization

Acronym	Meaning
NIM	National implementation modality
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
tCO2	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, analyses and recommendations of the Terminal Evaluation Mission conducted during the 20-29 November 2019 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 Evaluation

2. This Terminal Evaluation (TE) for the NAMA Project is to evaluate the progress towards the attainment of global environmental objectives, project objectives and outcomes, capture lessons learned and suggest recommendations on major improvements. The TE is to serve as an agent of change and play a critical role in supporting accountability. As such, the TE will serve to:
 - promote accountability and transparency, and to assess and disclose levels of project accomplishments;
 - synthesize lessons that may help improve the selection, design and implementation of future GEF activities on climate change mitigation;
 - provide feedback on issues that are recurrent across the portfolio and need attention, and on improvements regarding previously identified issues; and
 - contribute to the GEF Evaluation Office databases for aggregation, analysis and reporting on effectiveness of GEF operations in achieving global environmental benefits and on the quality of monitoring and evaluation across the GEF system.
3. Outputs from this TE will provide an outlook and guidance in charting future directions on sustaining current efforts by UNDP, the Government of Sri Lanka, their donor partners, and the private sector, to sustain the capacities of relevant Sri Lankan government institutions to promote and regulate NAMA projects in Sri Lanka with the goal of reducing GHG emissions.

1.2 Scope and Methodology

4. The scope of the TE for the NAMA Project was to include all activities funded by GEF and activities from parallel co-financing. The Terms of Reference (ToRs) for the TE are contained in Appendix A. Key issues addressed on this TE include:
 - The extent to which the Project used its remaining resources (as of November 2017) to focus on accelerating the deployment of NAMA technologies to meet GHG emission reduction targets and improve implementation;
 - The quality of estimation and computation of GHG emission reductions and energy saved for the NAMAs by SLSEA and CCS;
 - The effectiveness of Project efforts with CCS to assist and facilitate data collection and authentication of baseline and pilot NAMA energy consumption into the DMS, and to build their capacity to manage a NAMA registry;

- The extent of increased SLSEA and CCS involvement with NAMA implementation of planned activities;
 - The effectiveness of follow up assistance to Provincial Councils for the purposes of scoping of future NAMA projects for entry into the NAMA registry.
5. Outputs from this TE will provide an outlook and guidance in charting future directions on sustaining current efforts by UNDP and the Government of Sri Lanka on strengthening the legal and regulatory framework for NAMA initiatives and investments in Sri Lanka, improving the knowledge base of NAMA opportunities amongst public, private and academia stakeholders involved with energy efficiency, renewable energy and other low carbon investments, and on implementing demonstration projects and mechanisms for information dissemination.
6. The methodology adopted for this evaluation includes:
- Review of project documentation (i.e. APR/PIRs, meeting minutes of Project Board or multipartite meetings, MTR) and pertinent background information;
 - Interviews with key project personnel including the current Project Managers, technical advisors, and Project developers;
 - Interviews with relevant stakeholders including participating government agencies, engineering professionals and academic institutions; 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 Evaluation Mission for the UNDP-GEF project was comprised of one lead international expert and one national expert.
7. The Project was evaluated for overall results in the context of:
- *Relevance* - the extent to which the outcome is suited to local and national development priorities and organizational policies, including changes over time;
 - *Effectiveness* - the extent to which an objective was achieved or how likely it is to be achieved;
 - *Efficiency* - extent to which results were delivered with the least costly resources possible; and
 - *Sustainability* - The likely ability of an intervention to continue to deliver benefits for an extended period after completion.
8. All possible efforts have been made to minimize the limitations of this independent evaluation. During the 10 days spent in Colombo, Kurunegala, Pussellawa, Udawalawa and Badulla by the evaluation team, meetings were setup to collect and triangulate as much information as possible, and visits were made to biogas, solar PV and energy efficient motors (using variable frequency drives). Notwithstanding, follow-up interviews, Skype conversations and e-mails were utilized by the evaluation team after the terminal evaluation mission to fill in information gaps.

1.3 Structure of the Evaluation

9. This evaluation 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 results based on Project objectives and outcomes through relevance, effectiveness and efficiency criteria;
- Assessment of sustainability of Project outcomes;
- Assessment of monitoring and evaluation systems;
- Assessment of progress that affected Project outcomes and sustainability; and
- Conclusions, recommendations and best and worst practices.

10. This evaluation report is designed to meet GEF’s “Guidelines for GEF Agencies in Conducting Terminal Evaluations, Evaluation Document No. 3” of 2008:

<http://www.thegef.org/gef/sites/thegef.org/files/documents/Policies-TEguidelines7-31.pdf>

11. The Evaluation also meets conditions set by:

- the UNDP Document of 2012 entitled “UNDP GEF – Terminal Evaluation Guideline”: <http://web.undp.org/evaluation/documents/guidance/GEF/UNDP-GEF-TE-Guide.pdf>;
- the UNDP Document entitled “Handbook on Planning, Monitoring and Evaluating for Development Results”, 2009: <http://www.undp.org/evaluation/handbook/documents/english/pme-handbook.pdf>; and
- the “Addendum June 2011 Evaluation”: <http://www.undp.org/evaluation/documents/HandBook/addendum/Evaluation-Addendum-June-2011.pdf>

2. PROJECT DESCRIPTION AND DEVELOPMENT CONTEXT

2.1 Project Start and Duration

12. The “Appropriate Mitigation Actions in the Energy Generation and End-Use Sectors in Sri Lanka” or NAMA Project officially commenced implementation on 4 July 2015, the date when the Sri Lankan government signature for the Project document (ProDoc) was obtained. The Project duration originally was planned for 4 years ending in 4 July 2019. However, the Project was extended to complete implementation of pilot programmes, capacity building of all stakeholders participating in climate change mitigation actions on the use of data management activities and MRV actions, and the smooth transition of the NAMA project activities to SLESEA at the EOP; in Q1 of 2019, a request for a no-cost extension of the Project to 31 December 2019 was approved.

2.2 Problems that NAMA Project Sought to Address

13. With a GDP per capita of US\$ 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%.
14. 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. In 2011, the energy sector was the largest emitter accounting for 40% of all emissions⁴. At the commencement of the NAMA Project, efforts to deploy low carbon measures and technologies were implemented on an ad-hoc basis, GHG savings and the cost-benefits from renewable energy and energy efficiency interventions were not systematically quantified, and efforts promote their economic and environmental benefits were obscured. Moreover, capacities of the local experts implementing low carbon projects were experiencing these difficulties and not able to properly assess the impact of their NAMA interventions.
15. With Sri Lanka as a signatory to the United Nations Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol), the GoSL established the Climate Change Secretariat (CCS) under its purview within the Ministry of Environment (which is now the the Ministry of Mahaweli Development and Environment or MMDE) to address climate change challenges through a comprehensive national approach. The MoPRE also established the Sri Lanka Carbon Fund (SLCF) to actively participate in the carbon trading business and to facilitate Clean Development Mechanism (CDM) project development within the country. The slow growth of the carbon trading business was mainly due to the market crash of carbon prices around 2012. More recently, the Government of Sri Lanka (GoSL) introduced policies and programmes by provide more incentives to the country’s drive towards a low carbon future:
 - the National Energy Policy (NEP) of Sri Lanka from 2008 has been updated in the August 2019 to provide a thrust on diversifying the supply mix with renewable energy resources whilst seeking to reduce energy demand through demand side management;

⁴ <https://www.climatelinks.org/resources/greenhouse-gas-emissions-factsheet-sri-lanka>

- the Renewable Energy Development Plan (REDP 2019-2025) as further detailed on Para 111;
 - a National Energy Management Plan (EnMAP) developed by SLSEA for Sri Lanka covering a period of 5 years from 2012 to 2016 as a guide for SLSEA to embark on an integrated and cohesive program of work with a long-term perspective to realize better energy efficiency in all energy consuming sectors of Sri Lanka;
 - EnMAP was succeeded by the “Presidential Task Force on Energy Demand Side Management”, otherwise known as *Operation DSM*, commenced implementation in August 2017, to accelerate the energy demand side activities through energy efficiency as a means to curb the addition of 500 MW power plants to the national grid in 5 years⁵; and
 - a Climate Change Act has been drafted the purposes of regulating and minimizing the emission of greenhouse gases. The Act is currently undergoing a legal review, the final stages of before promulgation.
16. To meet renewable energy, energy reduction and GHG emission reduction targets of these policies and programmes, the GoSL has sought assistance to develop a robust, transparent and functional NAMA framework, complete with monitoring, reporting and verification (MRV) systems with supporting governance and oversight through a NAMA Secretariat, NAMA Coordinating Entity, NAMA Implementing Entity, MRV Committee, and NAMA Registry. While the GoSL has setup the entities for such a framework, the NAMA Project sought to address the lack of capacities of a wide range of personnel that are required to assist the GoSL in meeting the targets of its NEP, REDP and Operation DSM through a NAMA framework. The 2015 Paris Agreement amplified the importance of NAMAs by defining a link between national strategies (in this case REDP and EnMAP) and NAMAs through “nationally determined contributions” (NDCs) on which NAMAs (consisting of policies and actions that measure and quantify emission reduction impacts) can guide and contribute to the development of NDCs. The existence of a transparent NAMA framework will open up opportunity to access regional and international climate funding for NDCs. 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 GHG mitigation targets.

2.3 Goal and Objective of NAMA Project

17. 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”. The project results framework (PRF) for the NAMA Project was amended in December 2017 to provide revised targets for the NAMA Project (but leaving the targets of the NAMA Project goal and objective intact) and is contained in Appendix F.

2.4 Baseline Indicators Established

18. Baseline indicators for the amended 2017 PRF for NAMA can be found on Appendix F, with the design of the NAMA Project and its PRF indicators further discussed in Section 3.1.1. The main goal and objective baseline indicators of the PRF of NAMA includes:

⁵<http://www.energy.gov.lk/ODSM/About-Us.html>

- Cumulative GHG emissions by end of project (EOP), tCO_{2e};
- Cumulative energy savings achieved by EOP, MJ;
- No. of implemented NAMAs in the energy generation and end use sectors by EOP.

The baseline value for all these indicators of the NAMA Project can be found in the December 2017 PRF in Appendix F.

2.5 Main Stakeholders

19. Main stakeholders that are of interest to the Evaluation includes:

- The Ministry of Power and Renewable Energy (MoPRE) responsible for implementing the Government’s policies and regulations related to the energy sector including both renewable and non-renewable sources of energy. MoPRE also has the mandate to formulate policies, programmes and projects within the energy sector;
- The Sri Lanka Sustainable Energy Authority (SLSEA) under MoPRE 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.

20. Stakeholder partnerships on the NAMA Project are further discussed in Section 3.2.2 (Paras 43-46).

2.6 Expected Results

21. To achieve the specific NAMA 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”, the NAMA Project was designed with the following expected **Project outcomes** (from the 2017 amended PRF):

- 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 a Sri Lankan 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.

3. FINDINGS

3.1 Project Design and Formulation

22. Design of the NAMA Project was intended to develop a NAMA framework to enable Sri Lanka to confidently monitor and report its GHG emission reductions from low carbon investments, and effectively implement low carbon programme activities towards its national targets for greenhouse gas emission reductions and energy savings. The design provides technical assistance and capacity building that covers the full cycle of implementing greenhouse gas reduction activities, primarily with the energy sector through augmenting existing initiatives. This would include augmenting ongoing activities such as collecting baseline information, incorporating international experiences and best practices to develop a NAMA framework, and providing tools for Government on optimizing their approaches to maximize GHG emission reductions through the identification of best available technologies and measures. The technical assistance being provided by the Project is strengthened through activities that pilot the development and implementation of NAMA activities. This would include pilot programmes to increase the use of biogas, solar PV and high efficiency motors that would generate energy savings for end users and GHG emission reductions. Moreover, these activities contribute to the building of local capacities of the beneficiaries, both public and private sectors, to design and implement a NAMA programme that credibly quantifies GHG emission reductions through an MRV system.
23. The NAMA Project was intended to build off ongoing baseline activities. The National Energy Policy of 2019 mentioned in Para 15, is an updated version of the 2008 NEP. Programmes were formulated from the NEP to meet the energy targets, notably:
 - EnMAP with a target of achieving 20% energy savings (against 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 Operation DSM mentioned in Para 15; 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, which has been updated to an RERDP for 2019-25, also mentioned in Para 15.
24. The success in achieving the targets and intended outcomes of the NAMA Project is based on a number of assumptions covered in the PRF including:
 - continued support from the central government (notably SLSEA and CCS), 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;
 - strong support from Provincial Councils and Provincial energy ministries throughout the Project;
 - selected project proponents get required access to loans through bank and continued favourable business environment;
 - GoSL maintains its policy of achieving its voluntary emission reduction targets through the systematic implementation of NAMAs in the energy sector; and
 - competent staff operate, maintain, and upgrade the MRV system on regular basis.
25. The NAMA Project strategy to augment the baseline activities mentioned in Para 23 was informed by close consultations with the implementing partners, SLSEA, CCS as well as Provincial Councils

and Authorities during the PPG phase. However, the design duration of the NAMA Project of 48 months was shorter than most other GEF projects, subjecting the Project to higher risks of not achieving key targets such as cumulative GHG emission reductions and energy savings (objective-level) as well as identifying “fully capable and qualified private and public sector entities that are interested in funding prioritized NAMA projects”.

26. To achieve the targeted cumulative GHG emission goal of 16,126 tonnes CO_{2eq} by the EOP, the evaluation 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. This assumes NAMA activities could be quickly started up including an accelerated deployment of pilot NAMA technologies (biogas, solar PV and high efficiency motors) in partnership with stakeholders whose capacities were being strengthened with NAMA Project resources. The NAMA Project was to strengthen the capacities of all stakeholders concurrently with deployment of pilot NAMA technologies, a challenge considering the wide range of stakeholders from lower-level government personnel and local energy experts to national government agency personnel under SLSEA and MoMDE. The considerable effort and time to build capacity would have increased the risk of not achieving its GHG emission reduction target within the 48-month period of the NAMA Project.
27. Moreover, the Project was seeking to pilot NAMA activities 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 as a means to overcome the regulatory, institutional, technical, financial and social barriers for the scaling up of RE and EE NAMAs. Through these pilot activities, the NAMA Project was intending 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 and supported by strong supply chains; and
 - develop a robust and transparent MRV system that is accurate, reliable, credible and avoids double accounting.
28. The NAMA Project design also addresses gender issues 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”.

3.1.1 Analysis of Project Planning Matrix

29. The quality of the Project Results Framework (PRF) of the NAMA Project is **satisfactory**. The NAMA PRF meets “SMART” criteria⁶ and best practices for preparing project PRFs. The NAMA PRF used for this Evaluation was from the Project Inception Report of October 2015 (in Appendix E) that documents a few changes made to the NAMA Project PRF, mainly clarifications in the description of

⁶Specific, Measurable, Attainable, Relevant, Time-bound

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 24);
- Though not required for GEF-5 projects, the NAMA ProDoc did not have a theory of change (ToC) to specify how the NAMA Project will contribute to higher level change (such as meeting the targets of the NEP), and to justify that the NAMA Project strategy was the best approach. Despite the NAMA design appearing as a logical and rational approach to reducing national GHG emissions from the renewable energy and end-use sectors, a ToC may have improved the NAMA Project’s vision on longer-term outlooks, especially towards meeting targets of the NEP.

3.1.2 Risks and Assumptions

30. Project risks and assumptions are covered in Annex A of the ProDoc. Four risks were identified⁷ that were within, to a certain extent, under control of NAMA activities. More importantly, the assumptions in the PRF are linked to the risks identified in Annex A of the ProDoc. The ProDoc clearly states that the assumptions in the PRF are conditions critical to the success of the Project design, which if worded negatively, would constitute a project implementation risk. The risks in Table A-1 of the ProDoc are internal risks identified that are within the control of the Project. In summary, risks and assumptions identified in the ProDoc are reasonably laid out in a useful manner for Project implementers.

3.1.3 Lessons from Other Relevant Projects Incorporated into NAMA Project Design

31. The ProDoc of the NAMA Project does list the following relevant projects into its design including:
- two previous CDM Programme of Activities (PoAs) developed by the SL Carbon Fund for developing a functional NAMA framework. Lessons learned from this initiative potentially relates to the NAMA concept and hence, provided a starting point for conceptualizing a NAMA;

⁷Table A-1, pg. 73 of the ProDoc

- the Renewable Energy for Rural Economic Development (RERED) Project in Sri Lanka (Source: WB 2014 Loan assessment report)⁸. Lessons for incorporating into the NAMA Project included i) local participation and involvement, suitably incentivized, is crucial to promoting distributed power generation activities; ii) Involving the private sector effectively in a decentralized developmental effort requires flexibility in implementation arrangements and space for adapting to market conditions; iii) An appropriate feed-in-tariffs policy and its consistent and transparent application are crucial to spur growth of small scale and non-conventional renewable energy generation; iv) Investments in off-grid electrification could be underutilized or even abandoned in the event of a faster than expected arrival of the electricity grid. These lessons could be incorporated into the design of the pilot NAMAs proposed for this Project.

3.1.4 Planned Stakeholder Participation

32. One of the primary purposes of NAMA Project was to increase the knowledge and build the capacity of a wide range of stakeholders, both public and private sector stakeholders as well as CSOs and academia to plan, design, and implement programmes for reducing energy consumption and GHG emissions. The ProDoc outlines these stakeholders in Section 1.6 as well as their roles on the Project. This list includes:

- Line ministries and their policymaking agencies. These include the:
 - Ministry of Power and Renewable Energy (MoPRE), responsible for implementing the government of Sri Lanka's policies and regulations related to the energy sector, which encompasses renewable and non-renewable conventional sources of energy;
 - Ministry of Mahaweli Development and Environment (MoMDE) and formerly the Ministry of Environment and Renewable Energy, responsible for the policymaking and promotion regarding management of the environment and natural resources of the country. This includes the Ministry serving as the focal point for UNFCCC and having oversight of supporting NAMA entities and institutions;
 - Ministry of Finance and Planning who are responsible for formulation of national economic and financial policies and strategies for Sri Lanka that includes the coordination of public and private sector activities and facilitating private sector for economic development;
- The Climate Change Secretariat (CCS) that was established by MoMDE with the responsibility of undertaking a comprehensive national approach to address climate change challenges to Sri Lanka;
- The Sri Lanka Sustainable Energy Authority (SLSEA) that established in 2007 under the old Ministry of Environment and Renewable Energy but now under the oversight of MoPRE. SLSEA is positioned to regulate and facilitate development of sustainable indigenous sources of energy;
- Ministry of Provincial Councils and Local Government (MoPCLG) where partnering was to be done with the Provincial Councils and the Provincial Ministry of Energy to undertake the development of a NAMA framework that includes the collection of field data, compilation and management of energy and GHG emission inventories as well as the development of reporting protocols to SLSEA and CCS;

8

http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2014/06/30/000442464_20140630134905/Rendered/PDF/885470PPAR0P070C0disclosed060260140.pdf

- Sri Lanka Carbon Fund, a public private partnership established in 2007 for the purposes of providing and facilitating technical assistance to CDM project developers. Their corporate profile is highly relevant to NAMA development;
- Financial institutions to facilitate investments in NAMA low carbon technologies and measures promoted by the Project;
- Academic institutions who were to be invited to participate on the Project to provide technological expert opinion in the design of NAMAs and establishment of MRV systems;
- The Ceylon Electricity Board (CEB) that has the responsibility for generating, transmitting and distributing electrical energy to all categories of consumers. In addition, they serve an important role in collecting revenues for these services based on government approved tariffs for electricity;
- The Tea Research Institute (TRI) that was to be involved with the promotion of opportunities for tea companies to invest in high efficiency motors used in the industry;
- Trade associations that are key stakeholders to instil confidence to private sector investment into various technologies. This would include associations such as the one of solar suppliers and installers, the Lanka Biogas Association, and the Tea Plantation Association; and
- Private sector entities, primarily the tea industry, but also private homeowners as well as small businesses who may consider investments in solar PV and biogas technologies as well as VFDs if they serve as investments that improve their businesses or generate household energy savings.

In summary, the planned level of stakeholder involvement is satisfactory in consideration of wide range of stakeholders required for successful deployment NAMA technologies and measures. While reaching out to this number of stakeholders is ambitious, the involvement of all these listed stakeholders seems well justified.

3.1.5 Replication Approach

33. A prominent feature of the NAMA Project design was the pilot NAMA implementation involving the establishment of GHG emission inventories related to baseline energy and the deployment of bio-digesters, solar PV net metering with battery storage and high efficiency motors. With Project activities supporting the building of technical capacities of end users and provincial regulators for the collection, energy savings and GHG emission reductions for these 3 technologies would be generated and credibly quantified into a NAMA framework.
34. The replication approach of the NAMA Project was to support other NAMAs proposed by various stakeholders, mainly in the energy sector, through technical assistance from national and international personnel as deemed appropriate. The establishment of MRV mechanisms could be replicated to other energy sector technologies and measures. Another replication approach was to support a NAMA planning framework to include other NAMA activities. This was likely intended to facilitate development of NAMAs in other sectors including industry and transport where the aforementioned MRV mechanisms could be replicated.

3.1.6 UNDP Comparative Advantage

35. UNDP has a comparative advantage to other donor agencies for the NAMA Project due to its strong local presence in Sri Lanka and focus on policy-based and cross-sectoral approaches. This positions UNDP to more effectively build local capacities through collaboration over a wide range of local stakeholders ranging from the public and private sectors to technical experts, civil society and

grassroots level organizations as listed in Para 32. Given UNDP’s long track record on a wide variety of projects within the energy sector, UNDP was suited as an implementing agency for this Project.

3.1.7 Linkages between NAMA Project and Other Interventions within the Sector

36. The other interventions within the energy sector primarily includes national programmes as previously mentioned in Para 15 including:

- the Renewable Energy Resources Development Plan (RERDP 2019-2025) aims to achieve 20% from renewable energy resources by 2020 and 30% by 2030;
- the National Energy Management Plan (EnMAP from 2012 to 2016) aimed at guiding SLSEA towards improving energy efficiency in all energy consuming sectors of Sri Lanka. EnMAP has been succeeded by the “Presidential Task Force on Energy Demand Side Management”, otherwise known as Operation DSM, that commenced implementation in August 2017.

No other interventions including donor projects were identified in the NAMA ProDoc.

3.1.8 Management Arrangements

37. The original management arrangements for the NAMA Project was articulated in Section 6 of the NAMA ProDoc. The Project was to be implemented under a national implementation modality (NIM) under the former Ministry of Environment and Renewable Energy (MERE) which had the responsibility of facilitating the development low carbon power generating sources for Sri Lanka and environmental policies. The Project Manager was to be from SLSEA (at the level of Deputy Director General), and head of the NAMA Project Management Unit (PMU) that was to be staffed with a National Technical Advisor, other external experts, and Assistant Project Managers for each of the 4 NAM Project components. The PMU would report to a Project Board (PB) whose mandate was 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 was to include representatives from MoPRE, SLSEA (whose representative is the National Project Director or NPD), CCS and UNDP. The PB was to be chaired by the Executive Secretary of MERE.

3.2 Project Implementation

38. The following is a compilation of critical path events and issues of NAMA Project implementation in chronological order:

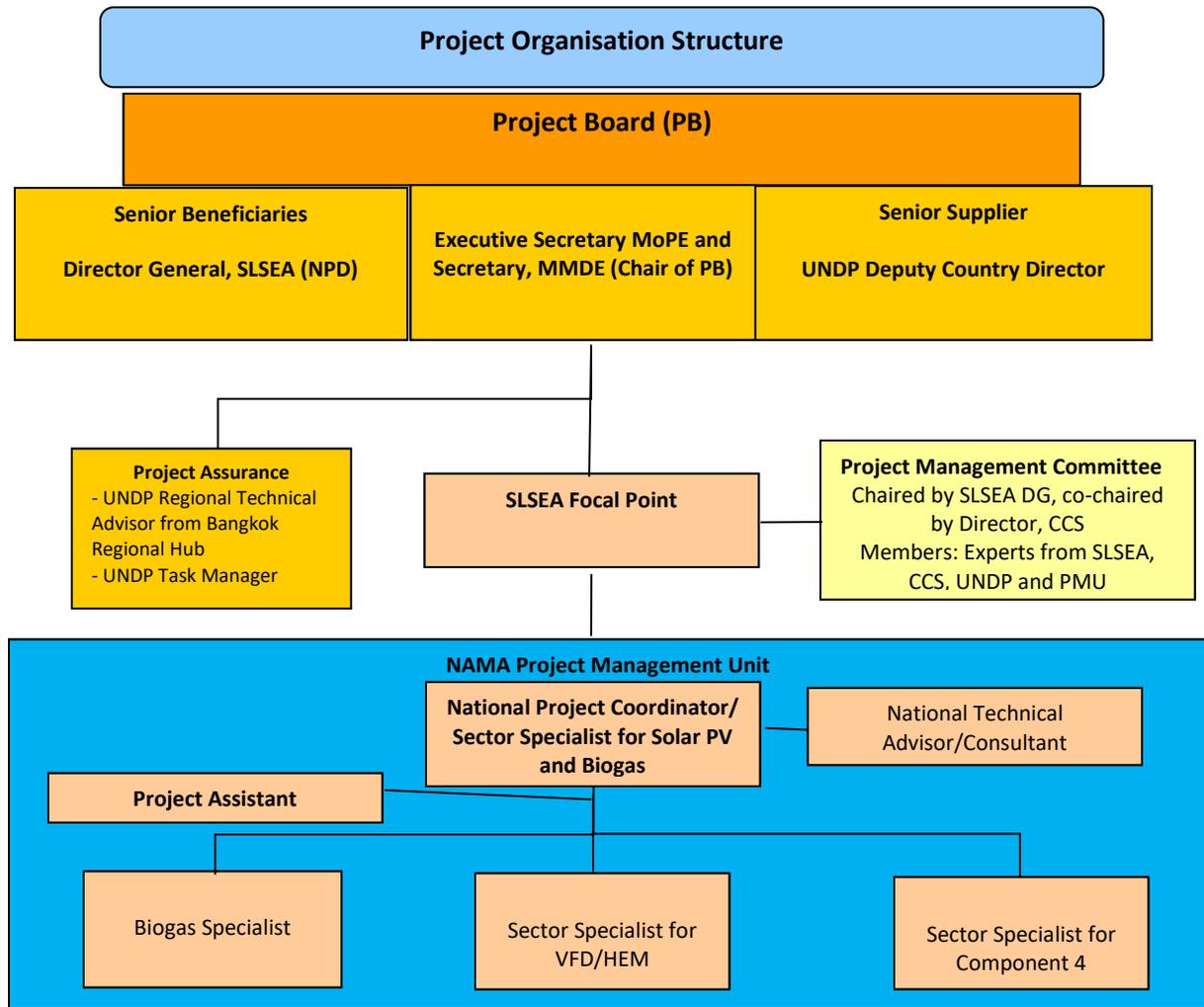
- The ProDoc was signed on 4 July 2015 by the Government of Sri Lanka marking the official start of the Project;
- The NAMA Project Inception Workshop was held on for September 2015 with the Nama Inception Report issued in October 2015;
- By early 2017, 4 provinces were engaged in testing structures for energy and GHG emission data collection from solar PV, biogas and high efficiency motor installations;
- By mid-2017, 79 biogas systems, 13 solar PV systems with battery storage and 24 high efficiency motors have been installed;

- NAMA MTR was conducted between August and November 2017. The MTR conclusions included the slow pace of deployment of NAMA low carbon technology and measures, and made recommendations to increase the pace of deployment as a measure to meet the NAMA project’s GHG emission reduction targets of 16,126 tons CO₂ by the EOP;
- NAMA Project extension requested in early 2019 for 6 months from the original EOP date of 30 June 2019 to 31 December 2019.

3.2.1 Adaptive Management

39. Adaptive management is discussed in GEF terminal evaluations to gauge Project performance in its ability to adapt to changing regulatory and environmental conditions, common occurrences that afflict many GEF projects. Without adaptive management, GEF investments would not be effective in achieving their intended outcomes, outputs and targets. Several examples are available of adaptive management on the NAMA Project to adapt to the numerous changing circumstances to ensure effective implementation of the Project during its 4.5-year duration. To comply with UNDP standards to ensure optimal implementation of the Project, the first and key adaptive management action undertaken was changing the management arrangements and Project organization structure as illustrated in Figure 1.
40. The changes in management arrangements were made in late 2015 in response to the creation of new ministries within GoSL including MERE changing to the Ministry of Mahaweli Development and Environment (MMDE) where SLSEA, a key Project beneficiary, had been shifted to the Ministry of Power and Renewable Energy (MoPRE). The CCS, the other key Project beneficiary, would remain under the new MMDE. This resulted in some changes to the management arrangements of the NAMA Project including:
- The NAMA Project being implemented within the premises of SLSEA under MoPRE with the SLSEA Focal Point (the NAMA National Project Director) reporting to MoPRE;
 - The addition of a Project Management Committee (PMC) to assist the SLSEA Focal Point in the making of key management, functional and operational decisions that can be executed by PMU personnel;
 - Instead of assistant Project Managers for each of the 4 NAMA Project Components, sector specialists were employed for each of the 3 NAMA technologies being piloted including 3 sector specialists (for biogas, VFDs and solar PV) with support from a Chief Technical Advisor, a National Technical Consultant. The solar PV specialist also serves as the National Project Coordinator.
41. The MTR for the NAMA Project was conducted in August 2017 that was an opportunity for further adaptive management changes. NAMA management responses to MTR recommendations included the following:
- For the recommendation of “focusing remaining resources on accelerating the deployment of NAMA technologies that increase the generation of GHG emissions as a means to meet Project GHG emission reduction targets as a first priority of the Project”, the Project expects to address this challenge by:

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)



- facilitating medium-to-large scale biogas installations by facilitating partnerships and actions with other government, non-government institutes and commercial and industrial SMEs (such as hoteliers associations and milk producer groups) as a response to the MTR recommending pursuit of larger scale biogas installations (15 m³ and above). Further details of the results of this response is provided in Para 65;
- undertaking a techno-economic assessment of domestic solar PV with battery storages, and implementing a new solar PV pilot initiative, both in response to the MTR recommendation of focusing on the installation of 81 and 150 solar PV systems (or total equivalent capacity of 140kW) by the end of 2017 and 2018 respectively). Further details of the results of this response is provided in Para 66;
- refocusing the HEM programme to deploy VFDs through a pilot programme in the tea sector as a response to the MTR recommendation to focus on the installation of 100, 500 and 400 VFDs to be installed during 2017, 2018 and 2019 respectively). Further details of the results of this response is provided in Para 67;

- For the recommendation of “the Project working more closely with CCS to assist and facilitate data collection and authentication of baseline and pilot NAMA energy consumption into EnerGIS”, Project management has responded by working more closely with CCS engaging them through additional training in the GHG inventory and energy sector baseline establishment process so that the CCS team is also familiar with the overall process. Further details of this response are provided in Para 98;
 - For the recommendation of “conducting 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”, Project management responded by recommending the establishment of a proposed PMU cadre and appointing SLSEA & CCS staff on part-time basis for the project;
 - For the recommendation of “Follow up and assist Provincial Councils and the scoping of future NAMA projects for entry into the NAMA registry”, the response was to provide direction to Provincial Councils on potential NAMA Project developments. To date, however, there have been no new NAMAs proposed;
 - For the recommendation of “commissioning 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”, Project management agreed to implement this under Activity 1.2.3 but did not complete this due to lack of time on the NAMA Project. A recommendation has been made in Para 127 on how this issue may be addressed.
42. In conclusion, the efforts of the NAMA Project for adaptive management were sincere and **satisfactory** in consideration of NAMA generally meeting its targets and achieving successful outcomes.

3.2.2 Partnership Arrangements

43. The Project has successfully facilitated partnership arrangements with a wide range of stakeholders, all relevant to effective development of NAMA projects in Sri Lanka. Most importantly, this includes the engagement of SLSEA and CCS as strategic implementing partners whose institutions will remain to continue the work of NAMAs after the conclusion of the NAMA Project.
44. The Project has also engaged with other public sector entities including:
- The 5 Provincial Councils (PCs), namely Northwestern, Southern, Central, Uva and Eastern Provinces who are participants to pilot NAMA management activities that promote and disseminate the use of biogas technologies. The engagement of these PCs has been extended to include work with their relevant departments and entities under various 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 for outreach to rural households who would be willing end-users of biogas technologies;
 - The Ceylon Electricity Board and the Lanka Electric Company who serve as partners to implement the NAMA pilot for solar PV with battery storage. Their support is crucial in promoting and implementing NAMA activities for the installation of solar PV with net metering and battery storage, technologies that have not been widely tried in Sri Lanka;

- The Tea Research Institute (TRI) of Sri Lanka, a semi-governmental institute for promoting and disseminating new technologies related to tea cultivation and processing. The Project has developed a close research collaboration with TRI on trial phases of HEMs and VFDs that has generated energy efficiency benefits for Sri Lanka’s tea industry.
45. The Project has successfully engaged partnerships with private sector stakeholders and CSOs, to facilitate buy-in and investments to NAMA technologies including:
- private sector tea companies and factories where, more recently, the NAMA Project has been working closely to switch NAMA measures from the installation of HEMs to VFDs to improve the tea withering process;
 - qualified solar PV installers with good access to quality battery storage systems. Though these installers were required to pre-qualify for NAMA solar PV tenders, these installers emerged as good partners in promoting their low carbon technology;
 - Sri Lankan CSOs and local experts involved with the promotion and installation of biogas technology 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 Initiative⁹;
 - More recently, the UNDP-GEF “Promoting Sustainable Biomass Energy Production and Modern Bio-Energy Technologies” (GEF Project ID 4096) executed by SLSEA received approval for a Phase II project (using GoSL funds), justified on the NAMA Project’s finding on biomass use in industry boilers as a very attractive mitigation activity through with MACC analysis.
46. The NAMA Project has also gained successful linkages 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 and implementation of an initiative for “Trilateral South-South Cooperation - Transitioning to Sustainable Energy Uses in the Agro-Industry, Sri Lanka”. This initiative is in the process of adding NAMA projects to the energy NAMA framework involving agro-industry with solar PV irrigation, and scaled-up biogas technology applications. Initial project size is an estimated US\$ 2 million that includes US\$ 1 million co-finance from GoSL;
 - The World Bank assisted “Partnership for Market Readiness (PMR)” project where the PMR in partnership with the CCS are linking many of the outputs of the NAMA Project as a means of scaling-up NAMA actions using technologies prioritized in MACC analyses and MRV protocols from the Project applied to their NAMA projects to attract international investors to finance activities for carbon offsets that work towards Sri Lanka’s NDC goals.
47. 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.

⁹www.switch-asia.eu/policy-support-components/psc-sri-lanka/

3.2.3 Feedback from M&E Activities Used for Adaptive Management

48. Feedback from M&E activities was provided primarily from PIRs (2016, 2017, 2018 and 2019) that provides appropriate levels of detail on development progress made on each of 4 intended NAMA outcomes (against the PRF indicators and targets), implementation progress, risk management, comments on delays in key project milestones, ratings and overall assessments from key UNDP personnel to the country’s OFP, gender analyses, communication impacts, and partnerships. Quality of the PIRs is undertaken by the UNDP CO (through the Energy and Environment Cluster Leader, a Programme Quality and Design Analyst and an M&E advisor) and the Bangkok Regional Hub (through an RTA) undertake thorough reviews of PIRs from the NAMA Project as well as other projects in Sri Lanka that are under the oversight of the CO.
49. Information in the PIRs was also supplemented by field reports and BTORs (from sector specialists particularly after the 2017 MTR) which provide details of visit to various NAMA project sites for monitoring progress, identifying key issues requiring action, and action plans to address issues. Some of these reports also contain cross-cutting issues related to gender, sustainability and strengthening partnerships. These reports contain a sufficient level of detail that contribute to information that can be used in making adaptive management decisions.
50. As a result of the quality of the PIRs and BTORs, feedback from M&E activities of the Project can be assessed as **satisfactory**.

3.2.4 Project Finance

51. The NAMA Project had a GEF budget of US\$ 1,790,411 that was disbursed over a 4.5-year duration, managed by the PMU under the direction of a Project Board headed by an Executive Secretary from MoPRE and a Secretary from MMDE. Table 2 depicts disbursement levels up to 30 November 2019, 1 month prior to the terminal date of the NAMA Project of 31 March 2019, revealing the following:
 - There were no major deviations of actual expenditures from the ProDoc budget. The largest budgeted component was Component 3 on support for implementing pilot NAMAs for US\$ 1.214 million where 93% of this budget was expended;
 - The savings from Component 3 were spread out amongst the other components (mainly Component 4 for additional capacity building activities) and Project Management;
 - Disbursement rates were not as evenly distributed as envisaged by the ProDoc. This is reflected in much lower disbursement rates in the 18 months of the Project (2015 and 2016) followed by much higher disbursements during the latter years (notably 2019). This reflects the NAMA Project efforts to respond to the MTR recommendations to increase the rate of GHG emission reductions to meet EOP targets.
52. 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;

Table 2: GEF Project Budget and Expenditures for Sri Lanka NAMA Project (in USD as of 31 December 2019)

NAMA Outcomes	Budget (from Inception Report)	2015 ²²	2016	2017	2018	2019 ²³	Total Disbursed	Total to be expended in December 2019	Total remaining	Commitments (in Dec 2019 for exiting contracts)
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	49,677	51,088	37,965	181,065	-	(11,065)	8,758
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	92,770	32,062	29,587	184,675	7,450	3,375	16,942
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	390,810	201,067	233,044	1,019,031	9,718	185,250	97,382
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	54,516	48,019	34,268	146,421	30,392	(33,986)	975
Project Management	66,685	2,212	6,374	58,574	19,945	(903)	86,202	-	(19,517)	-
Total (Actual)	1,790,411	30,736	255,168	646,348	352,181	333,961	1,618,394	47,960	124,507	124,507
Total (Cumulative Actual)		30,736	285,905	932,253	1,284,434	1,618,394				
Annual Planned Disbursement (from ProDoc) ²⁴		139,438	491,049	551,723	372,573	235,628				
% Expended of Planned Disbursement			52%	117%	95%	142%				

²²Commencing September 2015 - the Project Document signed by the Government of Sri Lanka on June 20, 2015

²³Up to 30 November 2019

²⁴ Year 1 in ProDoc was prorated to the September-December 2015 when the Project was being implemented

- 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. This includes the GoSL’s comprehensive financial audit for 2017 by the Auditor General’s Office of Sri Lanka;
- UNDP carrying out a financial spot checks by an independent consultant from KPMG on the transactions carried out by SLSEA procurement and finance departments under the Project.

53. Project co-financing in the ProDoc was estimated to be US\$ 25.88 million. Actual co-financing realized from the NAMA Project was US\$21.206 million or 82% of the target. This level of co-financing on the NAMA Project is reflective of the investments leveraged by the Project through NAMA activities in Outcome 3. The target may have been achieved if the deployment of the NAMA technologies had achieved the expected GHG emission reductions at the time of the MTR in late 2017. Regardless, this is a satisfactory outcome. Table 3 provides details of NAMA Project co-financing.

Table 3: Summary of Co-Financing for Sri Lanka NAMA Project (as of 30 November 2019)

Sources of Co-financing	Name of Co-financier	Type of Co-financing	Investment Mobilized	Amount (\$)
Beneficiaries	Multiple(Provincial small scale biogas programme)	Equity Investment	Investment mobilized	143,716
Civil Society Organization	Berendina Development Services	Equity Investment	Investment mobilized	5,799
Beneficiaries	Biogas Beneficiaries	Equity Investment	Investment mobilized	5,799
Private Sector	Tea Sector VFD programme - Tea factories	Equity Investment	Investment mobilized	493,616
Beneficiaries	Solar PV beneficiaries	Equity Investment	Investment mobilized	40,490
Other	Public/Private/Individuals invested in medium-large biogas programme	Equity Investment	Investment mobilized	634,685
Recipient Country Government	Sri Lanka Sustainable Energy Authority	In-kind	Investment mobilized	56,086
Recipient Country Government	Sri Lanka Sustainable Energy Authority	Public Investment	Investment mobilized	1,826,349
Private Sector	Industrial Solutions Lanka (Pvt) Ltd	Other	Investment mobilized	18,000,000
Total Co-Financing:				21,206,540

54. In conclusion, the cost effectiveness of the NAMA Project has been **satisfactory** in consideration of the Project meeting most of its intended targets, and providing the GoSL with the necessary tools, knowledge products and NAMA implementation experience to move forward with an expanded NAMA programme. With an estimated 54,937 tons of lifetime CO₂ emissions directly reduced by the NAMA Project (see Appendix E for details), the unit cost of GHG emission reductions by GEF funds was US\$32.59 per ton CO₂ reduced. While the NAMA Project has been cost-effectiveness on the provision of tools, knowledge products and NAMA implementation experience, the NAMA Project has only addressed less than 1% of all opportunities for reducing carbon footprints in the energy sector throughout Sri Lanka. However, the MACC analysis from Outcome 2 provides guidance for SLSEA and CCS after the EOP on possible pathways for scaling-up of NAMA activities for NDCs that are supported by the GoSL.

3.2.5 M&E Design at Entry and Implementation

55. The M&E design as covered in Section 6.1 in the NAMA Project ProDoc. The design which appears as fairly standard for all UNDP-GEF projects, covers all M&E activities including:

- the Project inception phase;
- monitoring reporting requirements including annual Project reviews and Project implementation reports (APRs/PIRs);
- periodic monitoring through site visits;
- independent evaluations that includes the Midterm Evaluation as well as the Final Evaluation;
- communication and visibility requirements; and
- dissemination of Project results to encourage learning and knowledge sharing.

The M&E design, however, was from a boilerplate template that did not include M&E of the pilot NAMA projects. *M&E design is rated as **satisfactory**.*

56. Monitoring and evaluation activities were implemented by the PMU on a frequent basis (roughly in 2-4-week intervals for each NAMA pilot). The UNDP M&E Advisor regularly met the PMU on a quarterly basis to discuss the progress and implementation issues, and to focus the reporting on the indicators in the PRF. In addition, there were periodic visits and regular phone communication with demonstration project proponents. With regular project monitoring meetings being conducted, there was quality feedback and systematic documentation of NAMA Project results with additional assistance to PMU to sustain a satisfactory quality of reporting of monitoring results throughout the duration of the NAMA Project.

57. Implementation of the M&E plan was *rated as **satisfactory***. Ratings according to the GEF Monitoring and Evaluation system²⁵ are as follows:

- *M&E design at entry - 5;*
- *M&E plan implementation - 5;*
- *Overall quality of M&E - 5.*

3.2.6 Performance of Implementing and Executing Entities

58. The performance of the implementing partners, the Sri Lanka Sustainable Energy Authority (SLSEA) and the Climate Change Secretariat (CCS) can be characterized as follows:

- SLSEA has had a close working relationship with the PMU to ensure Project works complemented and improved the routine work performed by SLSEA. This would have included the Project’s work on GHG inventories and its integration with the EnerGIS system in SLSEA;

²⁵ 6 = HS or Highly Satisfactory: There were no shortcomings;

5 = S or Satisfactory: There were minor shortcomings,

4 = MS or Moderately Satisfactory: There were moderate shortcomings;

3 = MU or Moderately Unsatisfactory: There were significant shortcomings;

2 = U or Unsatisfactory: There were major shortcomings;

1 = HU or Highly Unsatisfactory

U/A = Unable to assess

N/A = Not applicable.

- CCS also worked closely with the Project to setup NAMA institutional arrangements and the NAMA registry;
- In summary, there has been a high degree of cooperation between the PMU and both implementing partners. As such, the overall performance of both SLSEA and CCS is rated as **satisfactory**.

59. The performance of UNDP (the Implementing Agency) can be characterized as follows:

- UNDP has adeptly implemented this project by recruiting well-qualified individuals to coordinate and manage Project activities;
- it has allowed the PMU the latitude to recruit sector specialists and senior technical advisors who along with the NSC help steer the project towards the delivery of web-based MRV tools and knowledge products and NAMA implementation experience that has been very useful to the GoSL;
- it has provided robust monitoring and evaluation support to ensure the avoidance of unnecessary delays, greatly contributing to 4.5-year implementation period of the Project, with only a 6-month extension over the design period of 48 months;
- with no significant implementation issues of the NAMA Project, the overall performance of UNDP on the NAMA Project is rated as **satisfactory**.

60. A summary of ratings of the implementing and executing entities of the NAMA Project are as follows:

- *Implementing Partners (SLSEA/CCS)* – 5;
- *Implementing Entity (UNDP)* – 5;
- *Overall quality of implementation/execution (UNDP/SLSEA/CCS)* – 5.

3.3 Project Results

61. This section provides an overview of the overall results of the NAMA Project and assessment of the relevance, effectiveness and efficiency, country ownership, mainstreaming, sustainability, and impact of the NAMA Project. In addition, evaluation ratings for overall results, effectiveness, efficiency and sustainability are also provided against the revised December 2017PRF (as provided in Appendix F)²⁶. For Tables 4, and 10 to 13, the “status of target achieved” is color-coded as per the following colour coding 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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3.3.1 Overall Results

62. A summary of the achievements of NAMA Project at the Project Goal and Objective level with evaluation ratings are provided on Table 4.

²⁶Evaluation ratings are on a scale of 1 to 6 as defined in Footnote 25.

Table 4: Project-level achievements against NAMA Project targets

Project Strategy	Performance Indicator	Baseline	Target	Status of Target Achieved	Evaluation Comments	Rating ²⁷
Project goal: <i>Reduction of GHG emissions from the energy generation and end user sectors in Sri Lanka.</i>	Cumulative GHG emission reductions by end of project (EOP), tCO ₂ e	0	16,126	12,766	See Paras 64-67	5
	Cumulative energy savings achieved by end of project (EOP), MJ	0	74,866,639	69,982,762	See Paras 64-67	5
Project objective: <i>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</i>	No. of implemented NAMAs in the energy generation and end use sectors by EOP	0	3	3	See Paras 64-67	5
Overall Rating – Project-Level Targets						5

²⁷Ibid 25

63. Prior to the commencement of NAMA in 2015, Sri Lanka did not have a NAMA framework that was able to transparently capture and quantify the cost and benefits of efforts to voluntarily reduce greenhouse gas emissions. This included the absence of any systematic approach for: (1) collecting GHG emissions information into an inventory at a sub-national level; (2) establishing and updating baseline energy consumption data that includes sectoral and sub-sectoral energy consumption data; and (3) measuring, reporting and verifying the impacts and contribution of individual appropriate mitigation actions in the energy generation and end-use sectors towards meeting voluntary emission reduction targets of the country. The NAMA Project was designed to address these issues by designing a NAMA framework and piloting the framework with 3 technologies:
- solar PV installations with battery storage which would generate emission reductions by reducing electricity generation using fossil fuel;
 - high efficiency motors (HEMs) and variable frequency drivers (VFDs) in tea factories which would generate emission reductions through electricity savings; and
 - biogas digesters (varying in sizes from 8 to 15 m³) to produce biogas, and offset LPG usage for emission reductions.
64. The NAMA Project has achieved 79% (12,766 tCO_{2eq}) and 93% (69,983 GJ) of its objective-level GHG emission reduction and energy saving targets. Achievement of these targets is illustrated on Table 5 with Table 6 providing factors assumed in the calculations for GHG emission reductions. While this is not 100% of the target, this Evaluation considers this to be a successful outcome in consideration of the path towards the achievement of these targets:
- At the mid-point of the NAMA Project (mid-2017), only 8% of the EOP GHG emission reductions had been achieved;
 - The MTR made recommendations to increase the generation of GHG emission reductions and energy savings and increase the likelihood of the Project meeting its objective-level targets;
 - The PMU adopted these recommendations commencing in early 2018;
 - GHG emission reductions accrued by the Project during 2018 and 2019 increased by factors of 2.6 and 6.4 respectively from 2017, allowing the Project to achieve a substantial percentage of its targets while providing the GoSL and key private sector stakeholders with the necessary experience in managing and implementing NAMAs.
65. Up to 2017, the Project focus for biogas installations were single family households, generating a low quantity of GHG emission reductions. The MTR had identified that a continuation on these households to the EOP would result in a shortage of GHG emission reductions from this NAMA. In addition, these were low profile installations which were difficult to publicize to popularize these installations. The Project responded to the MTR recommendation of pursuing opportunities with commercial and industrial SMEs (such as hoteliers associations and milk producer groups) who had larger scale biogas units of greater than 15 m³ installed. This has provided substantial increases in GHG emission reductions totaling 8,309 tCO_{2eq} (73% of the target for this technology) by the EOP. Details are provided in Table 7.
66. The contribution of GHG emission reductions from the NAMA of solar PV systems with battery storage was expected to be small. Similarly, the MTR recommended that larger solar PV installations should be pursued to increase the GHG emission reductions from this technology. While the Project

did make efforts in this regard to the commercial and industrial sector, only 101 tCO_{2eq} was achieved by the EOP through reduction in grid emissions through the generation of a cumulative 140 MWh of electricity (23% of the target envisaged for this technology). Details of the GHG emission reduction generation for solar PV is provided on Table 8.

67. For HEMs, a similar situation ensued at the time of the MTR in mid-2017. With the MTR recommendation of shifting towards the use of VFDs, the Project recruited a sector specialist to prepare a report on energy savings of VFDs used in the tea industry. With pilot tests of VFDs used in the withering process revealing substantial energy savings, a large number of tea factories made investments during 2018 to have VFDs installed for this purpose. Additional VFDs were also installed in these factories to regulate fan speeds involved with the combustion of biomass fuels (thereby reducing the amount that wood being used) as well as other industrial factories such as chemical and cement factories where regulation of fan speeds resulted in significant energy savings and was highly beneficial to their processes. The installation of VFDs in 2018 and 2019 has resulted in cumulative GHG emission reductions of 4,355 tons of CO₂ equivalent (100% of the target envisaged for HEMs/VFDs). Details of the GHG emission reduction generation for VFDs is provided on Table 9.
68. For the aforementioned reasons, the evaluation has determined that the overall rating for goal and objective level targets is **satisfactory**. The Project has met its energy and GHG emission reduction targets with 3 targeted NAMAs in energy generation and end use sectors, providing the required experience and knowledge products for future developments of other NAMA projects. GHG emission reductions and energy savings estimates from the NAMA Project are also summarized on the GEF Tracking Tool as provided in Appendix F.

3.3.2 Component 1: Business-as-usual energy generation and end-use sector baselines at national and sub-national level

69. To achieve Outcome 1 (established and regular update of renewable energy utilization baseline & energy intensity reference baselines for the energy generation and end-use sectors), Project resources were to be used to:
- finalize provincial level inventory tools for energy generation and end-use sectors (Output 1.1);
 - define and establish sectoral and sub-sectoral reference baseline specific energy consumptions for the energy generation and end-use sector and sub-sectors (Output 1.2);
 - establish, operationalize and update national and provincial GHG emission inventory system for energy generation and end-use sectors (Output 1.3).

The Project achievements in delivering this outcome are summarized on Table 10.

70. Prior to the commencement of Component 1, no sub-national (or provincial) level GHG emissions inventories existed to provide useful data to establish sectoral and sub-sectoral reference baselines for the energy generation and end-use sectors. Although efforts existed at the national level towards creating a GHG emissions inventory management system to improve national communications to the UNFCCC, initiatives toward establishment of such system for energy generation and end-use sectors and sub-sectors simply did not exist. Understanding of the importance and purpose of such a system by government was never realized. Given the pro-activeness activeness of three provinces,

Table 5: Total Energy Saving and Emission Reduction

Year	Cumulative Energy Saving (GJ)	Target Energy Saving (GJ)	Achievement at Year End	Cumulative Emission Reduction (tCO _{2e})	Target Emission Reduction (tCO ₂)	Achievement at Year End
2015	-	605	0%	-	131	0%
2016	683	6,025	11%	245	1,181	21%
2017	1,838	20,893	9%	1,267	4,263	30%
2018	24,100	46,633	52%	4,613	9,941	46%
2019	69,983	74,541	94%	12,766	16,127	79%

Table 6: Parameters Used in GHG Emission Reduction Calculation

Parameter	HEM/VFD	Solar PV with battery	Biogas digesters
Electricity saving per unit/system per year (MWh)	2.41	0.869	n/a
Power plant efficiency	32.7%		n/a
Input energy saved per unit/system per year (GJ)	26.53	9.56	1.33
Grid emission factor (tCO _{2e} /MWh)	0.72		n/a
Emission reduction per unit/system per year (tCO _{2e})	1.735	0.625	5.822

Table 7: Pilot Project on Biogas Digesters

Year	No. of Systems ²⁸	Cumulative Systems	Energy Saving of the Year (GJ)	Cumulative Energy Saving (GJ)	Target Energy Saving (GJ)	Achievement at Year End	Emission Reduction of the Year (tCO ₂ e)	Cumulative Emission Reduction (tCO ₂ e)	Target Emission Reduction (tCO ₂)	Achievement at Year End
2015	0	0	-	-	21.28	0%	-	-	93	0%
2016	35	35	46.55	46.55	160.93	29%	204	204	798	26%
2017	130	165	219.45	266.00	486.78	55%	961	1,164	2,928	40%
2018	164	329	438.01	704.01	919.03	77%	1,917	3,082	6,951	44%
2019	569	898	1,194.34	1,898.35	997.50	190%	5,228	8,310	11,318	73%

Table 8: Pilot Project on Solar PV Systems with Battery

Year	No. of Systems ²⁹	Cumulative Systems	Electricity Saving of the Year (MWh)	Cumulative Electricity Saving (MWh)	Cumulative Energy Saving (GJ)	Target Energy Saving (GJ)	Achievement at Year End	Emission Reduction of the Year (tCO ₂ e)	Cumulative Emission Reduction (tCO ₂ e)	Target Emission Reduction (tCO ₂)	Achievement at Year End
2015	0	0	-	-	-	-	0%	-	-	-	0%
2016	0	0	-	-	-	956	0%	-	-	63	0%
2017	31	31	27.3	27.3	300	2,867	10%	20	20	187	10%
2018	0	31	27.3	54.6	600	4,827	12%	19	39	316	12%
2019	67	99	85.9	140.5	1,545	6,786	23%	61	101	444	23%

²⁸ Based on an equivalence of volume of 14.8 m³

²⁹ Based on an average installed value of 2.0 kW

Table 9: Pilot Project of HEM/VSD

Year	No. of Systems ³⁰	Cumulative Systems	Electricity Saving of the Year (MWh)	Cumulative Electricity Saving (MWh)	Cumulative Energy Saving (GJ)	Target Energy Saving (GJ)	Achievement at Year End	Emission Reduction of the Year (tCO ₂ e)	Cumulative Emission Reduction (tCO ₂ e)	Target Emission Reduction (tCO ₂)	Achievement at Year End
2015	-	-	-	-	-	584	0%	-	-	38	0%
2016	24	24	57.8	57.8	636	4,909	13%	42	42	321	13%
2017	-	24	57.8	115.7	1,272	17,539	7%	42	84	1147	7%
2018	788	812	1,956.8	2,072.5	22,796	40,888	56%	1,409	1,493	2674	56%
2019	838	1,650	3,977.1	6,049.6	66,540	66,757	100%	2,862	4,355	4365	100%

³⁰ Based on an average motor capacity of 6.56 kW

Table 10: Component 1 achievements against targets

Project Strategy	Performance Indicator	Baseline	Target	Status of Target Achieved	Evaluation Comments	Rating ³¹
Outcome 1: 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	4	See Para 71	5
	No. of provinces that have established an operational sub-sectoral GHG emission inventory system by Year 4	0	4	4	See Para 72	5
	No. of provinces that utilize the functioning web-based EnerGIS GHG inventory system by EOP	0	4	5	See Para 73	5
Overall Rating – Component 1						5

³¹Ibid 25

Uva, Central and Southern in delivering climate mitigation activities, the NAMA Project was to support Provincial Councils to develop and improve their inventory system in partnership with SLSEA.

71. The setup of data collection of energy baselines for the 3 NAMA projects was one of the initial achievements of the NAMA Project. This included:
- Identification of data flow structures for energy and GHG emissions for the selected technologies of the pilot NAMAs. This included field data collection from a tea factory or site of installation (a household or commercial establishment), data quality control at provincial and sectorial levels, data collation using SLSEA quality assurance standards, and annual reporting to the CCS;
 - Testing the functionality of the aforementioned structure for the pilot NAMAs using upgraded an upgraded version of SLSEA’s existing EnerGIS Data Management System (DMS) with ArcGIS 10.5 to include a GHG emission inventory. This involved the development and use of a web-based application tool, sufficiently user-friendly for the entry of energy and GHG data collection from field activities of the NAMAs into the EnerGIS DMS³². The Project recruited a local Information and Communication Technologies (ICT) service provider who developed this app with strengthened DMS reporting functions and various levels of permission for its users at the field level for data entry, provincial level for data collation, and finally at the national level for SLSEA and CCS for national reporting functions;
 - Upon initial completion of the app, consultations were held with:
 - CCS to align with their requirements for National Communications emission reporting;
 - SLSEA on data for the assessment of energy balance and energy sector baselines; and
 - Provincial Councils on the design of the inventory system and its use for provincial activity reporting and monitoring;
 - Available data from pilot NAMAs was fed into the upgraded DMS for testing and verification prior to the system being introduced at the provincial level.
72. There are currently 4 provinces and the tea industry who are keeping inventories of energy and GHG emissions data that fed from the point of generation or end-user levels and checked for quality assurance at sub-national and sub-sectoral levels. The PMU consulted CCS and their National Communications team and SLSEA’s Energy Manager Programme in the design of a general GHG emission related data collection template. The design taken to CCS and SLEA included the inputs of a NAMA Project international consultant who improved the system to be consistent with international protocols and standards. The app under which energy and GHG emission data inventories are kept can also generate reports for any user, a sample screenshot of which is provided in Figure 1 illustrating the level of detail developed by the app. To date, 4 provinces have received training on the use of this app which they mainly use for biogas installations that are aligned with provincial biogas programmes³³. The app was also first introduced in 2017 to solar PV service providers registered under SLSEA and tea companies participating in the HEM/VFD NAMA for the purposes of reporting their installations on voluntary basis.

³² Accessible on <https://clean.energy.gov.lk/index.php>

³³ Training to introduce the web-based DSM was extended to 180 field officers and executive level officers of these provinces. More detailed training was provided to 60 field officers in these four provinces on the use of the Energy DMS for pilot NAMA-related GHG emission reduction data collection. The Project supported these training sessions that included a portable tablet for field data collection.

Figure 1: Screenshot of biogas installations and their baseline energy usage

Bio - Biogas / Bio - Biogas

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	Serial Number	Owner	District	Volume of Bio Digester(m ³)	Implementation Completed Date	LPG Usage(kg/month)	Kerosene Usage(l/month)	Mixed/Other Des
<input type="checkbox"/>	Bio - Biogas Readings	T.H.K. Udayananda	Hambantota	10.00	10/10/2018	6.00	0.00	
<input type="checkbox"/>	Bio - Biogas Readings	S.T.S ARIYASINHA	Kurunegala	15.00	11/05/2018	24.00	0.00	
<input type="checkbox"/>	Bio - Biogas Readings	P.D.RAJARATHNAYAKA	Kurunegala	10.00	09/22/2010	0.00	0.00	
<input type="checkbox"/>	Bio - Biogas Readings	M g m shanthi kumari	Matara	8.00	10/03/2018	0.00	0.00	
<input type="checkbox"/>	Bio - Biogas Readings	Toy Maker Pvt LTD	Puttalam	15.00	02/23/2019	130.00	0.00	
<input type="checkbox"/>	Bio - Biogas Readings	W.M. Sudarma Kumari Wasala	Kurunegala	10.00	06/19/2017	4.00	5.00	
<input type="checkbox"/>	Bio - Biogas Readings	E.M.Sarah Kumara Ekansayake	Kurunegala	12.00	09/12/2016	0.00	5.00	
<input type="checkbox"/>	Bio - Biogas Readings	S.M.A. Herath Banda	Kurunegala	12.00	11/12/2019	0.00	7.00	
<input type="checkbox"/>	Bio - Biogas Readings	K .L .A. Pradeep Kumarasena	Kurunegala	12.00	07/16/2017	0.00	80.00	

73. To date, 4 provinces, Uva, Central, Southern and Northwestern have established an operational sub-sectoral GHG emission inventory system that uses the app for accessing the web-based EnerGIS GHG inventory system³⁴. The application is now being used at the provincial level and by a wider range of stakeholders:

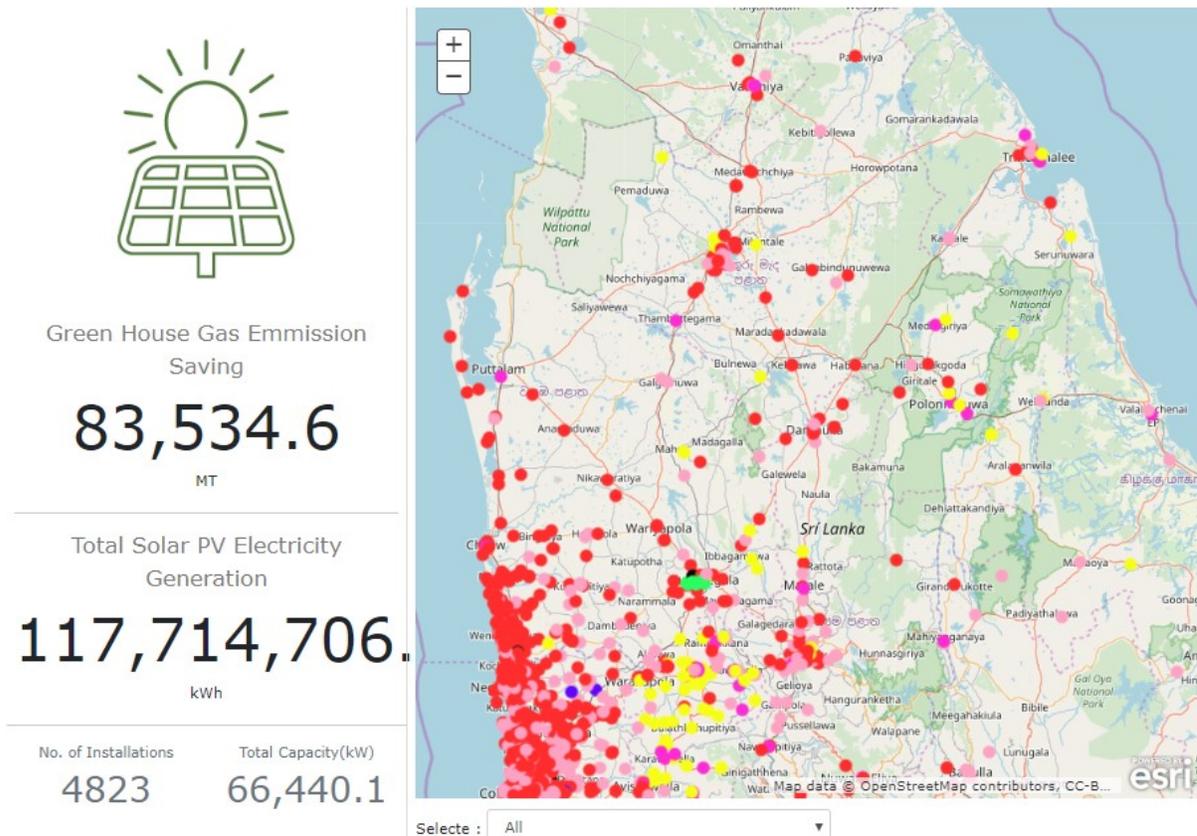
- The same solar PV service providers who were registered under SLSEA now needed to report their solar PV installations was made mandatory in early 2019. To date, solar PV installers have reported more than 4,800 solar PV installations with more than 65 MWp capacities on the app;
- Tea factory owners have been reporting VFD installations in several tea factories, and compiling reports on a voluntary basis to SLSEA. Their access to the EnerGIS app has allowed their personnel to be trained for relevant reporting and verification functions, and enables them to measure energy intensity of each tea factory, and compare it to baselines at the national, provincial and sectoral levels.
- They have favorable opinions of the app as it easily allows them to monitor the energy savings of each VFD installation;
- In parallel, a web portal has been developed within SLSEA’s EnerGIS system to monitor the progress of other renewable energy installations. This facilitates both the project developers and SLSEA to monitor the progress online from the submission of new project proposal/applications to SLSEA;
- Collected data from this website can now be requested and displayed for national, provincial and sectoral levels. Figure 2 provides an example of this reporting function that includes a spatial display of the locations of solar PV installations as reported by solar PV installers;
- The app has generated considerable interest amongst provincial authorities on the budgetary provisions for expanding provincial data collection activities. Recent discussions have taken place to expand data collection for energy consumption for agricultural irrigation (NWP, SP, UP),

³⁴Ibid 29.

fisheries (SP), dedicated coconut and solar water pumping (NWP), and off-grid solar (UP, CP) to be included into a modified energy DMS.

74. In conclusion, the results of Outcome 1 can be rated as **satisfactory** in consideration that all targets have been met with a high degree of satisfaction amongst the beneficiaries of usefulness of the app, and large number of users who view the app as essential in assessing other EE and RE NAMA investments at the provincial levels.

Figure 2: Screenshot of EnerGIS output for solar PV installations



3.3.3 Component 2: Mitigation options for the energy generation and end-use sectors

75. To achieve Outcome 2 (Prioritized NAMAs in the energy generation and end-use sectors are identified and designed), Project resources were to be utilized to:

- develop and published detailed marginal GHG abatement cost curves (MACCs) for the energy generation and the end-use sectors (Output 2.1);
- complete a comprehensive barrier analysis for mitigation options in the energy generation and end-use sector (Output 2.2);
- identify and analyze priority appropriate mitigation actions in the energy generation and end use sector in Sri Lanka (Output 2.3); and

- categorize identified mitigation actions as supported and voluntary (Output 2.4).

A summary of the actual achievements of Outcome 2 with evaluation ratings is provided on Table 11.

76. Prior to the commencement of Component 2, the purpose of MACC curves was never recognized apart from unavailability of the data. Moreover, there is no existing analysis of MACCs for CCM technologies and measures for energy generation and end-use sectors. Only the Second National Communications from Sri Lanka provides some detail of some of the potential mitigation options.
77. For the number of provinces that established MACCs for energy-sector stakeholders, only one MACC was established covering energy sector technology options at the national level. MACC analysis was initially conducted for 17 pre-selected mitigation options, based on national priorities, in the energy generation and end-user sectors, and now covers 40+ mitigation options. This analysis was also used for building the capacity of key stakeholders, namely SLSEA, CCS and the PMU. The required expert guidance was provided by an International Consultancy firm with the assistance of local consultants who identified the importance of MACC analysis in deciding on the energy sector’s Nationally Determined Contributions (NDCs).
78. The guidance was translated into a comprehensive analysis of energy sector mitigation options at a national level with MACC analysis. To offset the weakness of the MACC analysis that is primarily the consideration of the potential barriers for implementing these technologies, a Multi-Criteria Analysis (MCA) for technology-application screening process was adopted in March 2019. The MCA considered barrier and risk parameters with different weighting as identified through consultations with key stakeholders including government officials and private sector experts³⁵. By identifying mitigation options through the MCA in parallel with the MACC, a more accurate determination of appropriate mitigation options would result (as illustrated in Figure 3). This was introduced to a national expert committee on Climate Change Mitigation (CCM) as a systematic tool for policy makers in the MoPRE, notably for refining energy sector’s NDC targets.
79. The results of the comprehensive MACC analysis can be accessed on-line³⁶. A report was prepared in December 2018 linking these MACC analysis findings and the country’s NDC targets³⁷. The benefit of these studies is the replicability of the same procedure for other energy-consuming sectors such as industry or transport.
80. On the number of NAMA EE/RE projects that are designed based on the prioritized NAMA projects for the energy generation and end-use sector, the Project used the MCA/MACC analysis to select 3 or more appropriate actions for design as an activity under the Component 4 of this Project. Full NAMA design documents were to be prepared for these selected NAMAs, using the NAMA template proposed by the UNFCCC. Key results indicated that LED lights replacing CFL lights and incandescent lighting, efficient chiller in commercial applications, wind and solar power plants (farms), domestic solar rooftop applications were “high priority” mitigation options.

³⁵ These parameters may include national priorities and policies, co-benefits (socio-economic) and difficulty of implementation.

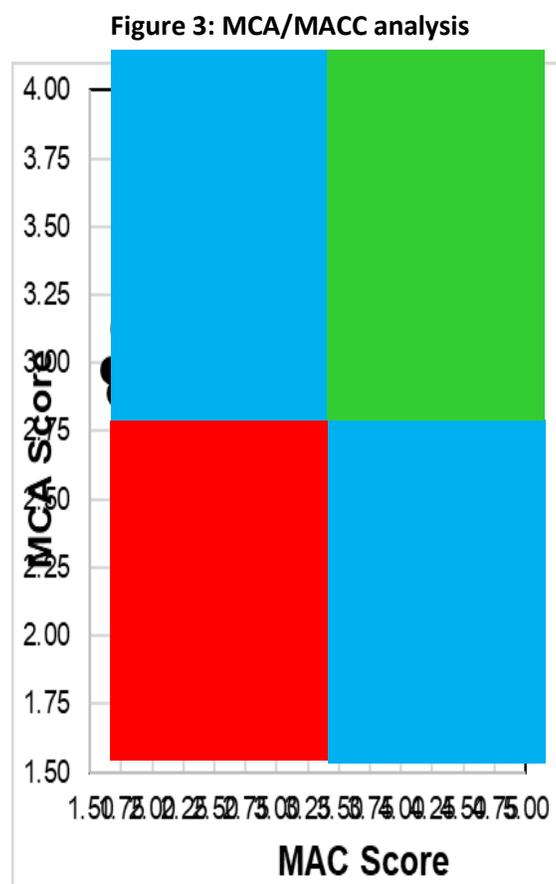
³⁶<https://public.tableau.com/profile/rma3719#!/vizhome/MCAFinal-PPT/Names?publish=yes>

³⁷ Accessible on : <https://drive.google.com/open?id=1N0RVru7v52nhh4cg9Y9Vcx6Qftbk4niS>

Table 11: Component 2 achievements against targets

Project Strategy	Performance Indicator	Baseline	Target	Status of Target Achieved	Evaluation Comments	Rating ³⁸
Outcome 2: 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	1	1	See Para 77	5
	No. of NAMA EE/RE projects that are prioritized and designed by EOP	0	3	3	See Paras 78-81	5
Overall Rating – Component 2						5

³⁸ Ibid 25



81. The 3 NAMA projects under Component 3 were tested, verified and demonstrated under the overall NAMA framework. Validation of the 3 selected technologies was confirmed in early 2019 using the MACC analysis with the following preliminary findings:

- Domestic solar PV with battery storage is the highest costly GHG abatement option amongst those NAMA technologies selected for piloting on this Project;
- Efficient motors replacing an existing motor will be a “cost” to the beneficiary in comparison to an efficient motor as a new purchase that will be a “benefit”. Conversely, VFD applications are identified as a “benefit”;
- Biogas remains as a grey area due to the fact that baseline data of the technology are not clear and not always available;
- Possibility of developing full NAMA proposals for pre-selected technologies based on lessons learned during implementation need to be considered with VFD installations appearing as most promising option.

82. In conclusion, the results of Outcome 2 can be rated **satisfactory** in consideration that NAMAs or NDCs in the energy generation and end-use sectors were identified and designed.

3.3.4 Component 3: Implementation of appropriate mitigation actions in the energy generation and end-use sectors

83. Component 3 was setup to implement prioritized appropriate mitigation actions through identified private and public sector entities towards the achievement of voluntary mitigation targets for Sri Lanka. NAMA Project resources would be utilized to:

- identify and establish fully capable and qualified private and public sector entities in the implementation of climate change mitigation programs and sourcing of funds (Output 3.1);
- update financial tools that support the implementation of the mitigation actions program in the energy generation and end-use sectors, including sustainable energy guarantee fund, fiscal incentives, feed in tariffs and other options available in Sri Lanka (Output 3.2); and
- implement NAMA projects (Output 3.3).

A summary of the achievements of Component 3 with evaluation ratings is provided on Table 12.

84. Prior to the commencement of Component 3, there were no assessments of previously implemented climate change mitigation programs in generating voluntary emission reduction. As such, the value of a well-managed NAMA framework in monitoring a CCM project had not yet been demonstrated in Sri Lanka. The absence of a robust MRV system likely led to a low level of confidence in the previous CCM actions and lost opportunities to leverage regional and international climate funding. This was identified as a major barrier for the effective implementation of the EnMAP.

85. With regards to the target of 2 identified fully capable and qualified private and public sector entities interested in funding prioritized NAMA projects, the SLSEA was the public sector entity identified (and also the project implementing partner) and the Planters’ Association of Ceylon (PAC) identified as private sector entity that is an industrial collaboration between amongst tea producers investing in NAMA activities throughout the project implementation period.

86. In addition to serving as the implementing partner of the NAMA Project, SLSEA played key roles in resource identification and development for RE and EE projects, implementation and facilitation of RE project development with grant assistance, implementation of EE programmes, policy and regulatory support for RE and EE, and knowledge management. SLSEA are heavily invested in NAMAs including:

- The “Sooryabala Sangramaya” programme that aims for 1000 MW solar PV capacity additions by 2025 for public buildings including solar PV for religious places at government cost (under the sub-programme of “Rivi Aruna”, and a US\$ 2.0 million programme for solar PV for government hospitals and schools;
- Support for the development of other grid connected RE power plants such as small hydro, wind, ground mounted utility-scale solar, and biomass;
- Serving as the lead agency for the Operation DSM (see Para 15) where in addition to implementing EE activities, SLSEA is involved in many policy and regulatory decision making processes, capacity development and promotional activities which facilitate RE/EE mitigation actions (that includes SLSEA leading the Project’s biogas pilot programme with the involvement of 5 Provincial Councils;

Table 12: Component 3 achievements against targets

Intended Outcome	Performance Indicator	Baseline	Target	Status of Target Achieved	Evaluation Comments	Rating ³⁹
Outcome 3: 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	2	2	See Paras 85-87	5
	No. of individual projects that constitute the country’s NAMAs by Year 4	0	1,000 biogas systems 1,300 tea factories 205 solar systems	3 NAMA projects consisting of: <ul style="list-style-type: none"> • 402 biogas units⁴⁰ • 70+ tea factories with 609 VFDs installed • 34 solar systems 	See Paras 88-93	5
	No. of operational Private-funded NAMA projects by EOP	0	1 (high efficient motors in tea factories)	1	See Para 94	5
Overall Rating – Component 3						5

³⁹ Ibid 25⁴⁰ Includes 365 small scale biogas units and 37 medium-large scale biogas units.

- Tea industry companies including those under PAC who have been interested in energy efficiency improvements, mainly for cost reduction by energy (electricity) saving which also improves overall productivity and competitiveness. This further leads to emission reduction and a perception of that their products and processes are green boosting the industry’s marketing image.
87. For the HEM NAMA, PAC has served as the entity that represents private tea industry companies who made a commitment to cost share, and demonstrate the benefits of the HEMs. Several member companies of PAC had indicated their interest in 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\$ 4.0 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). However, the completion of pilot trials of HEMs with the Project in 2016 did not provide attractive returns on energy savings.
88. With the MTR recommendation to pilot variable frequency drives (VFDs) for the tea industry in place of HEMs, the PMU along with the support of PAC undertook several pilot trials of VFDs for tea factories in the withering process in early 2018. These pilot operations of VFDs revealed significant energy savings from operators being able to turn down withering fans to lesser loads. A positive outcome coming from the VFD conversions was the improvement of the quality of tea leaves. This has led to tea factories seeking other opportunities to use VFDs which has included fans used to blow heat from burned wood to various processes within the tea factory. By using VFDs in this application, tea factory operators claim a 25% reduction in the amount of fire wood consumed in this process. The involvement of tea factories under PAC has resulted in the installation of more than 600 VFDs leveraging co-financing of more than US\$ 450,000.
89. VFDs have also been installed in other factories by the Project that manufacture materials to make ceramics and wire cables. Users in those factories also claim significant benefits from improved quality of products to energy savings. This has catalyzed their interest in VFDs which are being actively installed on other fans and other equipment. In general, messaging coming from the VFD NAMA has been very positive.
90. The biogas pilot NAMA was successfully implemented. There were early challenges in 2016 in implementing this program due to the scattered locations of the installations, building the capacity of provincial extension officers to collect baseline and post-installation energy data, and setting up streamlined data collection within the provinces. With the 2017 MTR recommending the pursuit of larger sized biogas units at commercial establishments in an effort to meet the targets for GHG emission reductions, the installed capacities of biogas units after the MTR had significantly increased, resulting in the achievement of the targeted emission reductions for this NAMA. The biogas NAMA programme at the EOP had proven to be popular with small-scale households as well as commercial establishments for the following reasons:
- Biogas serves as a solution for eliminating bio-waste from livestock or leftover food;
 - Savings for commercial establishments from paying waste or discharge permit;
 - Offsets household need for purchasing LPG for cooking fuel or heating;

- Reduces the need to collect firewood as fuel for small-scale households. As women are the primary collectors of firewood and users of the stoves, there is a significant gender benefit that is 2-fold benefit: they eliminate or significantly reduce the need to collect firewood, and the emissions from cooking gas is an improvement from wood smoke in a household;
- Readily available gas that can be used for cooking or other applications such as heating for drying purposes;
- Possibility of the sale of excess gas to neighbours or other commercial establishments;
- The use of bio residuals for fertilizer and small family agricultural plots; and
- Reasonable payback periods for the investment that ranges from 2 to 3 years depending on the circumstances.

91. Main constraints for more rapid growth of biogas units throughout Sri Lanka includes:

- the scattered locations of households that would benefit from our gas unit installations. Unfortunately, these are not in cities where each household likely does not have sufficient waste to generate biogas;
- the uniqueness of each biogas insulation to a particular household or commercial establishment. This requires a fair amount of investigation and rigour in determining the optimal biogas solution for a particular site;
- the shortage of biogas experts in Sri Lanka. In a visit to Uva Province, they had noted that they were less than 2 biogas experts for the entire province.

92. The NAMA for solar PV with battery storage has only resulted in 99 solar PV systems (equivalent system capacity) being installed since 2017. Households that have installed these systems have eliminated their monthly electricity costs, and are able to sell any excess electricity through net metering back to the grid. However, one of the drawbacks of this NAMA and the primary reason for the low level of uptake of solar PV with batteries is cost of the system where the payback period exceeds 10 years (likely eliminating any possibilities of commercial financing).

93. Notwithstanding, the 2 electrical utilities in Sri Lanka have taken considerable interest in the pilot solar PV installations due to the renewed August 2019 National Energy Policy that stipulates the promotion of "energy storage solutions for affirming intermittent renewable sources, voltage and frequency regulation, local grids support, peak shaving and proved resilience" (Clause 3.7.7). With battery storage installed on 34 solar PV installations by the Project, utilities are interested in the behaviour of the battery storage and its impact on peak demand management, attenuating distribution loss reduction, its impact on making up for differences in voltage corrections (especially in remote locations), and its impact as a solution for overvoltage and reverse power at selected points. Moreover, the pilots for solar PV with batteries does raise some interesting possibilities with regards to these installations on low income households which receive subsidized electricity from the grid. The replacement of the subsidies with the investment of solar PV into these low income households would serve as a win-win situation for the consumer (the low income households), the utility (who would have increased their generation capacities especially for peak load management) and the nation (which can eliminate these cross subsidies to low income households).

94. For the number of operational private-funded NAMA projects, the application of VFDs in the tea industry has resulted in significant energy savings catalysing interest in other applications within the tea industry. The high level of interest due to significant energy savings is making the decision to

invest in VFDs much easier for tea plantation managers. As such, the growth and saturation of the tea plantation market for VFDs will be self-financed by the industry. The likelihood of VFD installations for other industries (such as the ceramics and cable manufacturing industries supporting pilot VFD installations) will likely be self-financed if there is financial viability from substantial energy savings and improved product quality.

95. In conclusion, the results of Outcome 3 can be rated **satisfactory** with the Project achieving most of its intended targets and providing good experiences in NAMA implementation.

3.3.5 Component 4: MRV system and national registry for mitigation actions in the energy generation and end-use sectors

96. Component 4 was setup to build capacity for accurate measurement and accounting of actual GHG emission reduction from mitigation actions in the energy generation and end-use sectors. NAMA Project resources would be utilized to:

- establish operational NAMA supporting entities and mechanism for mitigation actions in the energy generation and end-use sectors (Output 4.1);
- define key parameters (quantitative/qualitative) to be monitored for the selected appropriate mitigation actions (Output 4.2);
- design and implement MRV systems for the selected appropriate mitigation actions (Output 4.3); and
- complete a capacity development program for strengthening all public, private (value chains actors) and CSO stakeholders involved in the operation and management of the NAMA program (Output 4.4).

A summary of the achievements of Component 4 with evaluation ratings is provided on Table 13.

97. Prior to the commencement of Component 4, the policy design and planning processes of the GoSL do not consider the importance and advantages of Measurement, Reportable and Verifiable (MRV) methodologies for ongoing projects and programs. In the context of NAMA implementation, MRV would be essential or meeting national voluntary GHG emission reduction targets. While MRV methodologies exist under CDM, a new MRV system for Sri Lanka would need to include metrics that can be measured or quantified for sustainable development benefits of the actions, such as poverty reduction of local communities, improved health conditions, and higher social inclusion.
98. For the 3 NAMA projects, GHG emission reductions have been monitored and verified by the established and operational MRV systems for mitigation actions for solar PV net-metering with battery storage, biogas and variable frequency drives. The Project supported:
- the preparation of monitoring procedures, protocols, templates for data collection, reporting and verification at different levels of the data flow structure that were developed in line with the EnerGIS DSM (as detailed in Para 71) complete with provisions for expanding the energy DSM for future climate mitigation interventions in the energy sector;
 - MRV of GHG ERs for the 3 pilot NAMAs using the energy DSM;

Table 13: Component 4 achievements against targets

Intended Outcome	Performance Indicator	Baseline	Target	Status of Target Achieved	Evaluation Comments	Rating ⁴¹
Outcome 4: 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	3	3	See Paras 98-99	5
	No. of projects in the energy generation and end use sectors that are registered in the National NAMA registry by EOP.	0	3	2	See Paras 100-102	5
Overall Rating – Component 4						5

⁴¹ Ibid 25

- integration of MRV system for biogas systems into the administrative structure of the 4 Provincial Councils and the MRV of the VSD intervention in the tea sector with the existing structure of each tea plantation company;
- ongoing strengthening of the GHG ER MRV for the 3 NAMAs including shoring up deficiencies of data, lower priority given to MRV by lower level personnel implementing pilot NAMAs;
- training and capacity building activities for SLSEA and CCS staff that included:
 - two national level training programs conducted by international experts on MRV of GHG mitigation projects;
 - four provincial level training programs conducted in North-western, Southern, Uva and Central provinces on MRV targeting field officers and executives engaged in monitoring and verification;
 - additional trainings for provincial level officials and personnel in the tea industry on development of MRV framework for other NAMAs involving GHG mitigation and MRV of biogas programme;
- setup of a website³⁰ to provide ERs of project pilots and NAMA Project awareness materials that included printed material on NAMA institutional framework, project proposal procedure, posters, MRV guidelines and other booklets.

99. In collaboration with the Climate Change Secretariat (CCS), the Project helped to establish the proposed NAMA under an institutional framework set-up as illustrated on the NAMA Sri Lanka website³¹. This NAMA institutional set-up was developed to facilitate future NAMAs of the country, of which the NAMA registry is an integral part of this set-up designed to accelerate NAMA developments. This institutional structure includes entities identified as NAMA Coordinating Entity, Designated NAMA Entity, NAMA Secretariat and Approver, and NAMA Expert Committee. The roles and responsibilities of these entities were identified along with the relevant Designated NAMA Entities from different sectors, namely the Energy, Transport, Waste, Industry, Agriculture and Forestry sector. The Cabinet of Ministers approved this institutional framework on 17 September 2017.

100. For the number of projects in the energy generation and end use sectors that are registered in the National NAMA registry, only 2 NAMAs are listed³². A web-based application portal has been developed to facilitate NAMA proposal submission and approval process. This portal facilitates the tracking of the approval process for mitigation proposals until it is published on the national NAMA registry.

101. Institutionalization of this structure had started with several Project-supported sector-wise capacity building workshops in 2016. The Project assisted the nominated officials of the designated NAMA entities by developing NAMA proposals which they prioritized. This exercise was assisted by an international expert on NAMA project/programme proposal development. As a result of this work, three NAMAs were identified for the registry, namely “mangrove re-forestry in degraded mangrove lands”, “biogas as a mitigation action against municipal solid waste management issue”, and “inland water transport”. Another proposal on “energy efficient chillers” is currently being discussed as a potential NAMA.

³⁰http://www.climatechange.lk/nama/?page_id=459

³¹http://www.climatechange.lk/nama/?page_id=228

³²http://www.climatechange.lk/nama/?page_id=404

102. With CCS being an implementing partner of the World Bank-supported “Partnership for Market Readiness” (PMR)³³, it has made efforts to link projects in the NAMA registry with the PMR registry where emission reductions can be presented to international markets. CCS reports that as of November 2019, there are 5 NAMA projects that will be placed into the PMR registry. PMR are also helping CCS focus on 5 sectoral areas for mitigation projects including industry, transport, waste management, and energy, including assistance on MEPS for processes in the industrial sector. This opens opportunities for CCS and SLSEA to pursue other avenues of climate change mitigation actions. While having the NAMA institutional structure in place, CCS are experiencing challenges to fill in these positions with qualified personnel due to internal recruitment rules of the GoSL (see Action 8, Para 128).
103. With the assistance of the Project to setup a NAMA institutional structure (as mentioned in Para 99), CCS had commenced the drafting of a cabinet paper for a “Climate Change Act” that includes the formation of a “Climate Change Commission”, an upgraded version of the CCS under MMDE that could serve as a body with legal powers to regulate greenhouse gas emissions. The Act would provide the Commission with higher technical capacities to undertake these regulatory roles, and with responsibilities to strategically coordinate with other economic sectors on their efforts to meet their GHG emission obligations under the Act³⁴. The Act is now under final legal review before its approval in Parliament.
104. In conclusion, the results of Outcome 4 can be rated **satisfactory** with the Project achieving most of its intended targets.

3.3.6 Relevance

105. The NAMA Project is **relevant** to NDC implementation in Sri Lanka, namely through:

- “Mahinda Chintana – Vision for the Future”, Sri Lanka's Socio-Economic Development Strategy for 2011-2020, was the national strategy which incorporated an environmental dimension into the economic development process to ensure the long-term sustainability of human development, and includes meeting the challenges of climate change as a focal area of action. Subsequent governments after 2015 in their policy statements and development plans (such as Sri Lanka Next – Blue Green Era) have recognised the importance of Mahinda Chintana. While Sri Lanka is not a major emitter, it is highly vulnerable to the impacts of climate change to which the NAMA Project provides technical assistance for national actions to mitigate climate change³⁵;
- Its January 2019 “Sustainable Sri Lanka Vision 2030 Strategic Path” that seeks to achieve the vision for sustainable development by amongst other actions, “replace fossil-fuel based power generation for national grid by using modern renewable energy and promote application of renewable energy in industrial and commercial applications, to “research and implement ideas about de-growth, bio-economy and circular economy, in all resource consuming enterprises to eliminate waste and encourage recovery of resources”, and to undertake “prudent

³³<https://www.thepmr.org/country/sri-lanka>

³⁴The Climate Change Commission would be a semi-autonomous body that is able to recruit experts for their various sub-committees at market rates.

³⁵https://ec.europa.eu/europeaid/sites/devco/files/mip-20142020-programming-sri-lanka-20140812_en.pdf on pg 4

development of indigenous renewable energy sources such as wind, solar and biomass can significantly improve the security of supply, while reducing carbon emissions”³⁶; and

- its National Energy Policy (NEP) of 2009 that was recently updated in August 2019 along with its RERDP and Operation DSM programmes described in Para 15.

106. The NAMA Project is also relevant to the United Nations Framework Convention on Climate Change (UNFCCC) which Sri Lanka ratified in November 1993 and acceded its Kyoto Protocol in September 2002. As a part of its UNFCCC obligations, Sri Lanka submitted its Second National Communication (SNC) Report to UNFCCC on 16th March 2012³⁷. The relevance of this report to the NAMA Project is its recognition that amongst other government efforts, emission reductions can be achieved through emphasizing energy efficiency of end-use sectors and a shift to renewable energy for energy generation.

107. With regards to donor programming and SDG targets and indicators, the NAMA Project has relevance to:

- GEF-5 climate change mitigation focal area strategic objective CCM-2 “promote market transformation for energy efficiency in industry and the building sector” (Outcome 2.2: Sustainable financing and delivery mechanisms established and operational); CCM-3 “promote investment in renewable energy technologies” (Outcome 3.2: Investment in renewable energy technologies increased); and CCM-6 “Support enabling activities and capacity building under the Convention”;
- GEF-6 Climate Change Mitigation Focal Area Strategic Framework, specifically “CC 1: Promote Innovation, Technology Transfer, and Supportive Policies and Strategies” (Program 1: Promote timely development, demonstration and financing of low carbon technologies and mitigation options, and Program 2: Develop and demonstrate innovative policy packages and market initiatives to foster new range of mitigation actions);
- SDGs including: 1 (No poverty), 2 (Zero hunger), 3 (Good health and well-being), 7 (Affordable and clean energy), 8 (Decent work and economic growth), 9 (Industry, innovation and infrastructure), 11 (Sustainable cities and communities), 12 (Responsible consumption and production), 13 (Climate action).

3.3.7 Effectiveness and Efficiency

108. The effectiveness of the NAMA Project has been **satisfactory** in consideration of:

- the positive opinions of the quality of technical assistance provided by the Project amongst national and provincial level government personnel. This would include their appreciation of the apps produced by the Project, notably the web-based Energy DMS application for inputting field energy data and managing energy and GHG emission inventories. This is evidenced by the high rate of usage amongst provincial government personnel and implementing partners of the Project, SLSEA and CCS;

³⁶ https://www.researchgate.net/publication/327221768_Sustainable_Sri_Lanka_2030_Vision_and_Strategic_Path, see pgs 6 and 12

³⁷ <http://unfccc.int/resource/docs/natc/lkanc2.pdf>

- the opinions of private sector entities (such as tea plantation personnel, commercial establishments, solar PV installers), many of whom expressed satisfaction on their attendance to NAMA Project seminars and workshops, the knowledge products provided to them for improving their comprehension of energy accounting, and the tools provided to them (web-based Energy DMS application) for reporting field level energy information from tea factories (for VFD installations and biogas units), commercial establishments (mainly for biogas units), and households (for both solar PV installations with batteries and biogas units);
- the high rate of utility of NAMA products and tools that compile energy information for energy and GHG inventories not only from all pilot NAMAs, but also energy information outside of these NAMAs. This would include all biogas installations within Provincial programmes, and solar PV installations that are outside of those supported by this Project; and
- the timely follow-up actions of CCS to Project-supported capacity building workshops and Project inputs into MRV methodologies, the NAMA institutional setup³⁸, and the setup of the NAMA Registry. This includes CCS’s actions to prepare 3 more MRV methodologies outside of the 3 NAMA pilots³⁹, establish the NAMA institutional framework which has been promulgated by the GoSL’s Ministers of the Cabinet in 2017, the drafting of a Climate Change Act (in 2017) which is currently undergoing a legal review, and the incorporation of NAMA knowledge products into the PMR Project.

109. The efficiency of the NAMA Project has been rated as **satisfactory** in consideration of:

- The 52% expenditure at the end of 2017, the midway point of the NAMA Project, with only a 10% achievement of the objective level targets for GHG emission reductions and energy savings;
- The impressive recovery efforts of the NAMA Project during 2018 and 2019 to reach 79% and 94% of their EOP targets for GHG emission reductions and energy savings respectively (see Table 5). These efforts included strong dedication by the NAMA PMU to undertake adaptive management actions to intensify NAMA activities on increasing energy savings and GHG emission reductions to meet the objective-level targets;
- The efficiencies demonstrated by the Project to deliver by Year 2 the web-based application for the Energy DSM, and the rapid uptake of the app by all public sector stakeholders (SLSEA, CCS and personnel from the 5 participating Provincial Councils) and the private sector (energy managers at tea factories, solar PV installers, commercial establishments participating in NAMAs and private households);
- The Project delivering all outputs and most of the intended outcomes within a 54-month period, 6 months longer than the NAMA Project design period of 48 months.

3.3.8 Country Ownership and Drivenness

110. Sri Lanka’s drivenness on the NAMA Project is demonstrated through its August 2019 revisions of its National Energy Policy (NEP) that contains targets and clauses encouraging and supporting the diversification of the energy supply mix with renewable energy resources whilst seeking to reduce energy demand through demand side management. This includes a low carbon future through energy efficiency measures and the

³⁸ This includes the setup of the NAMA Coordinating Entity, Designated NAMA Entity, NAMA Secretariat and Approver, and NAMA Expert Committee.

³⁹ This includes MRV methodologies for efficient refrigerators, LEDs and RE programmes.

development of indigenous renewable energy generation creating more energy independence for Sri Lanka on imported fossil fuels policies. The implementing partners, SLSEA and CCS, demonstrated ownership of the Project since the NAMA Project strongly complements the targets and intentions of a number of ongoing programmes designed to comply with the NEP including:

- the Renewable Energy Resources Development Plan of 2010 had aimed to achieve 20% from renewable energy resources by 2020 as part of the national strategy to reduce GHG emissions through renewable energy development activities. Updated renewable energy targets are now available in the Renewable Energy Development Plan (REDP 2019-2025)⁴⁰;
- the National Energy Management Plan (EnMAP) covering a period of 5 years from 2012 to 2016. It served as a guide for SLSEA to embark on an integrated and cohesive program of work with a long-term perspective to realize better energy efficiency in all energy consuming sectors of Sri Lanka;
- the successor to EnMAP known as the “Presidential Task Force on Energy Demand Side Management”, otherwise known as Operation DSM that commenced implementation in August 2017 to accelerate the energy demand side activities through energy efficiency as a means to curb the addition of 500 MW power plants to the national grid in 5 years⁴¹; and
- a Climate Change Act that has been recently drafted for the purposes of accelerating GHG emission reductions through mandatory legislation requiring credible quantification, and the formation of a Climate Change Commission. The Act is currently undergoing a legal review, the final stages before promulgation.

3.3.9 Mainstreaming

111. The intended objective and outcomes of the NAMA Project are strongly mainstreamed with the current United Nations Sustainable Development Framework 2018 – 2022 (UNSDf) that contributes to strategic priorities including:

- Driver 3: Human security and socio-economic resilience (related to work in partnership with the private sector, supporting SMEs, their production and trade, as part of the efforts to contribute to the country’s inclusive growth);
- Driver 4: Enhancing resilience to climate change and disasters and strengthening environmental management (related to climate change mitigation such as reduction of deforestation, forest degradation, and renewable energy).

112. While the NAMA Project design was focused around the need for improved MRV tools, gender analysis and action plan were not fully reflected in the design phase. However, pilot MRV tests revealed the need to commission a study on gender and social impact assessment in November 2019 that specifically focused on gender and social impacts of NAMA pilot technology interventions. This led to recommendations for future gender and social action plans for CCM projects in the energy sector. The report does link the Provincial biogas programmes as a primary entry point for more

⁴⁰<http://www.energy.gov.lk/images/news/renewable-energy-development-plan-eng.pdf>

⁴¹<http://www.energy.gov.lk/ODSM/About-Us.html>

gender analysis with more than 150 biogas units within households with dairy and farming activities. Women were the primary beneficiaries in these households as a result of biogas:

- directly addressing waste management issues (disposal of animal and agricultural waste);
- replacing LPG as a cooking fuel to reduce the household cost of cooking fuel;
- replacing fuelwood thus reducing the time spent by women to collect firewood;
- increasing the availability of household disposable incomes opening opportunities for women to access home-based income-generating activities that includes home-based food processing;
- enhancing the overall quality of life through its convenience, cleaner qualities, less air pollution and improved safety;
- contributing to the overall satisfaction and empowerment of women.

113. The report does conclude that there is additional scope for facilitating increased engagement and capacity development of women in the deployment of the clean energy technologies. The women who have experience in the use of these clean technologies or in the management of their deployment in the field should be developed and utilized as mentors to other households and families. Similarly, provincial-level female officials (especially in the management, administrative and technical levels in the provincial and district levels) and end-users in these provinces can lead in the influence of other provinces for greater uptake of NAMA-promoted options to increase the access and use of clean energy and achieve greater, gender balanced results.

3.3.10 Sustainability of Project Outcomes

114. In assessing sustainability of the NAMA Project, 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.

115. The overall NAMA Project sustainability rating is moderately unlikely (MU). This is primarily due to:

- the Provincial Councils still seeking financing to expand energy data collection at the Provincial levels with this financing likely being available at a later date considering the interest at the Provincial level in several NAMA activities;
- no firm sources of financing to undertake preparations and implement NAMA Projects such as small biogas units and solar PV investments where subsidies or concessional loans may still be required to catalyse investments. Notwithstanding, the electric utilities are interested in battery storage of solar PV systems supported by the Project as a means of peak load management;
- no commitments yet for staffing increases in CCS or SLSEA for an expected increase in NAMA development activity;
- Provincial Councils and the private sector (namely tea plantations) not yet initiating any new NAMA project concepts;
- only 2 registered NAMA projects in the registry though there is activity by CCS to prepare additional 3 MRV protocols which should serve as a catalyst for future NAMA investments.

Details of sustainability ratings for the NAMA Project are provided on Table 14. **Table 14: Assessment of Sustainability of Outcomes**

Actual Outcomes (as of December 2019)	Assessment of Sustainability	Dimensions of Sustainability
<p>Actual Outcome 1: Established and regular updating of baselines for renewable energy utilization and end-use energy consumption by Provincial personnel and private sector entities through a user-friendly web-based app, EnerGIS that is linked to national and provincial energy and GHG emission baseline inventories.</p>	<ul style="list-style-type: none"> • <i>Financial Resources:</i> Most of the 5 Provincial Councils who participated on the NAMA Project are currently seeking financial resources to expand the reach of energy and GHG data collection within their jurisdictions. While there are currently no confirmed sources of financing for this expanded scope of data collection, financing will likely be available at a later date considering the interest at the Provincial level in several NAMA activities; • <i>Socio-Political Risks:</i> Users of the EnerGIS app are likely to continue its use well after the EOP to continue growth of the energy and GHG emission inventories; • <i>Institutional Framework and Governance:</i> The policies of the Ministry of Power and Energy are encapsulated within their NEP which is driven by action plans within their RERDP and their Operation DSM; • <i>Environmental Factors:</i> There are no environmental risks from this outcome. <p style="text-align: right;">Overall Rating</p>	<p style="text-align: center;">2</p> <p style="text-align: center;">4</p> <p style="text-align: center;">4</p> <p style="text-align: center;">3</p> <p style="text-align: center;">2</p>
<p>Actual Outcome 2: Prioritized Nationally Appropriate Mitigation Actions (NAMAs) in the energy generation and end-use sectors are identified and designed using combined results from MACC analysis and Multi-Criteria Analysis (MCA).</p>	<ul style="list-style-type: none"> • <i>Financial Resources:</i> The continued use of MACC analysis and MCA for the energy sector as well as other economic sectors will depend on financial resources within a Government department or an external consultant to regularly update the MACCs and MCA. This may be required in 3 to 5 years for which resources have not yet been identified but is a recommendation from this Evaluation; • <i>Socio-Political Risks:</i> There is interest in other ministries and sectors in the expanded use of a combined analysis from MACCs and an MCA for the purposes of effective evaluation of prioritization of energy mitigation options as well as other economic sectors such as agriculture and transport; • <i>Institutional Framework and Governance:</i> The MoPRE has been reliant on MACC/MCA analysis to determine the optimal NDC actions to be prioritized; 	<p style="text-align: center;">3</p> <p style="text-align: center;">4</p> <p style="text-align: center;">4</p>

Details of sustainability ratings for the NAMA Project are provided on Table 14. **Table 14: Assessment of Sustainability of Outcomes**

Actual Outcomes (as of December 2019)	Assessment of Sustainability	Dimensions of Sustainability
	<ul style="list-style-type: none"> • <u>Environmental Factors</u>: No environmental risks from the use of MACC/MCA analysis. <p style="text-align: right;">Overall Rating</p>	<p style="text-align: center;">4</p> <p style="text-align: center;">3</p>
<p>Actual Outcome 3: Private and public sector entities have implemented NAMAs that contributes to Sri Lanka’s voluntary mitigation targets and provides these entities with the necessary experience and confidence to implement NAMAs in the renewable energy and end use energy sectors.</p>	<ul style="list-style-type: none"> • <u>Financial Resources</u>: Financing is available amongst tea factory owners as well as other industries where VFDs would provide energy efficiency benefits. However, no firm sources of financing are available after the EOP to undertake preparations and implement NAMA Projects such as small biogas units and solar PV investments where subsidies or concessional loans may still be a catalyst for investment. With subsidy funding from the Sri Lankan government being somewhat scarce, the NAMA framework and MRV protocols should improve the confidence of climate investors to financially support NAMA projects that require subsidies; • <u>Socio-Political Risks</u>: The number of experts available in Sri Lanka who can assist in turnkey biogas services is very low, constraining growth of this NAMA; • <u>Institutional Framework and Governance</u>: Mandatory standards are required to accelerate the increase in adoption of energy efficiency measures and renewable energy adoption. This appears to be the next iteration in the evolution of NAMAs in Sri Lanka as it seeks to align its actions with the NEP. There are currently no commitments for staffing increases in SLSEA for NAMA data collection, required when additional NAMAs are formulated. In addition, CEB are interested in sustaining growth of the household solar PV NAMA with battery storage. CEB are also aware of the need to remove the policy that prevents these households from using these systems during power failures and load shedding (as a means of protecting line repair crews from electrocution during blackouts); • <u>Environmental Factors</u>: Environmental impacts from some of these NAMAs may need to be addressed including disposal of batteries (after 7 or more years) from solar PV installations that were supported by the Project. <p style="text-align: right;">Overall Rating</p>	<p style="text-align: center;">3</p> <p style="text-align: center;">3</p> <p style="text-align: center;">2</p> <p style="text-align: center;">3</p> <p style="text-align: center;">2</p>
<p>Actual Outcome 4: Tools and some expertise is available in Sri Lanka for the accurate measurement and accounting of actual GHG emission reduction from mitigation actions in the energy generation and end-use sectors.</p>	<ul style="list-style-type: none"> • <u>Financial Resources</u>: With only 2 registered NAMA projects in the registry, there is currently no confirmed financing for expanding NAMA investments. This lack of confirmed funding may also be due to the lack of available time to prepare financing for a number of promising NAMAs; • <u>Socio-Political Risks</u>: There is plenty of interest in NAMAs within both public and private sectors, and thus the appearance of low socio-political risks. However, Provincial Councils and private stakeholders (namely tea plantation owners) are struggling to initiate other NAMA projects for development; 	<p style="text-align: center;">2</p> <p style="text-align: center;">3</p>

Details of sustainability ratings for the NAMA Project are provided on Table 14. **Table 14: Assessment of Sustainability of Outcomes**

Actual Outcomes (as of December 2019)	Assessment of Sustainability	Dimensions of Sustainability
	<ul style="list-style-type: none"> • <i>Institutional Framework and Governance:</i> NAMA institutional arrangements have been promulgated accompanied by an increase in the number of MRV methodologies. However, there are currently no commitments yet to increases in staffing in CCS for NAMA data collection, managing the NAMA registry and MRV oversight; • <i>Environmental Factors:</i> GHG accounting from some of the NAMAs, particularly the biogas NAMA, remains inexact. For example, leakage from biogas units still needs to be addressed in MRV protocols with the possibility that it is actually being addressed under the CCS’s partnership with the PMR project. 	<p style="text-align: center;">2</p> <p style="text-align: center;">3</p>
	<u>Overall Rating</u>	2
	<u>Overall Rating of Project Sustainability:</u>	2

3.3.11 Impacts

116. The impacts of the NAMA Project are related to the strengthened capacities for:

- Provincial Councils who managed the mobilization and management of field and local staff for the systematic data collection of energy data related to all NAMA activities;
- Private sector end users including the tea industry who were able to plan, design, procure and install VFDs to reduce tea plantation energy costs and to install biogas units to ease daily burdens of and increase access to clean fuels for tea plantation workers through the installation of biogas units;
- SLSEA who have been enabled to manage and oversee energy data collection, manage energy and GHG emission inventories, and prepare reports to other ministries including the MMDE (specifically CCS);
- CCS in their abilities to manage and provide oversight for the entire NAMA institutional arrangement and the process of registering and approval of NAMA proposals.

4. CONCLUSIONS, RECOMMENDATIONS AND LESSONS

117. The NAMA Project has provided the GoSL with a number of tools and knowledge products and the experiences of pilot implementation of low carbon projects. This has strengthened national capacity to implement NAMA actions that credibly quantify GHG emission reductions and contribute to NDCs. This is also strongly aligned with Sri Lanka’s ambition to reduce its carbon footprint through implementing its National Energy Policy as a means to minimize the country’s dependence on imported fossil fuels for the energy generation and electricity. The NAMA Project has:

- provided a framework and strong foundation for a streamlined NAMA that contributes to the NDC development process involving CCS, SLSEA, Provincial Councils, targeted industrial leaders, solar PV installers, biogas experts and electrical equipment suppliers and technicians through delivery of knowledge products, user-friendly software, training, institutional systems, and NAMA technology pilots. However, additional capacity building is required for a critical mass of stakeholders to be able to meet the targets of the NEP⁴², notably for biogas experts;
- instilled confidence to SLSEA and CCS in promoting NAMAs that contribute to NDCs to attract national and international investors in low carbon projects. This confidence is bolstered by:
 - the use of MACC analyses and multi-criteria analyses excellent resource tools for prioritizing mitigation options;
 - the use of mobile applications and a central database for the systematic collection and credible quantification of field energy information now in use by all participants in the 3 NAMA pilots;
 - valuable experience gained from implementing pilot NAMAs that assists the GoSL through SLSEA and CCS in the credible quantification of energy savings and GHG emission reductions;
- enabled a strengthened Climate Change Secretariat to link projects in the NAMA registry into a PMR registry where emission reductions can be presented to international markets. CCS reports that there are 5 NAMA projects in the PMR registry. PMR are also helping CCS focus on 5 sectoral areas for mitigation including industry, transport, waste management, and energy. This includes MEPS for processes for industrial sector. This opens opportunities for CCS and SLSEA to pursue other avenues of climate change mitigation actions.

118. The NAMA Project has also informed the Government of Sri Lanka of:

- the opportunities to expand the solar PV NAMA with battery storage as a means of peak demand management, attenuating distribution loss reduction, making up for differences in voltage corrections (especially in remote locations), and as a solution for overvoltage and reverse power at selected points. If this was implemented for low income households, GoSL can realize a win-win scenario where:
 - the low-income household receives a reliable electricity supply;
 - the 2 utilities in Sri Lanka would be able to decrease electricity demand during periods of peak load, reducing the demand for additional generation capacity; and

⁴² Primary NEP targets are to reduce the dependence of Sri Lanka on fossil fuels to below 50% of the primary energy supply, reduce the specific energy use across all end-uses by 20% of 2015 level by 2030, and to achieve carbon neutrality and complete transition of all the energy value chains by 2050 (from page 4 of the NEP from 9 August 2019).

- the nation can eliminate these cross subsidies to low income households and align its actions with the renewed August 2019 National Energy Policy, in particular Clause 3.7.7 (see Para 93);
- the required pace of implementation to meet the intended targets of the NEP through the REDP and Operation DSM. Implementation pace refers to ensuring the GoSL and Provincial Councils have estimates for the required level of human and fiscal resources to manage and implement these programs to NEP targets⁴³;
- the need for continued promotion and assistance in the planning and design of NAMAs. This would include increasing the staffing of SLSEA, CCS and provincial level personnel to consult with key stakeholders such as industrial associations and technology experts.

119. The Project has also spawned a number of forward-looking actions by various levels of government on further development of low carbon programmes in Sri Lanka including:

- Provincial-level mitigation plans complete with provincial targets for Operation DSM and RERDPs as a part of an overall provincial development plan (for Uva Province, they received assistance for the preparation of these development plans from the UNDP Sri Lanka Governance Programme). While the evaluation team was unable to view these development plans in detail, there is a distinct possibility that the measures to meet these provincial targets will require more detail, especially if these plans are to be reviewed and supported by foreign investors and owners;
- SLSEA are undertaking efforts to establish working committees on MRV and improving energy policy decision making tools using the outputs from the NAMA Project such as the EnerGIS software. These committees will work with the strengthened capacity at SLSEA. Notwithstanding the interest amongst the private sector and provincial level stakeholders in NAMA projects, they are struggling to initiate new NAMA concepts (as mentioned in Table 14 under Outcome 4), leading to a conclusion that continued technical assistance and awareness raising of NAMAs by SLSEA and CCS is still required to sustain development of NAMAs that contribute to NDCs;
- The establishment of the NAMA institutional structure and the ongoing legal review of the cabinet paper for a “Climate Change Act” (as mentioned in Para 110). However, there is still no institutional mechanism and legal framework for reporting and transferring GHG emission data from the provinces, private sector and other entities to CCS.

4.1 Corrective actions for the design, implementation, monitoring and evaluation of the project

120. *Action 1 (to UNDP and GEF): Strengthen the preparation of a Project Results Framework (PRF) utilizing a Theory of Change (ToC) analysis to increase the likelihood that project outcomes will result in the desired long term higher level changes for any project design (and in this case, the design of mitigation actions for the renewable energy and end use sectors of Sri Lanka).* Notwithstanding that the NAMA Project was well executed and generally resulting in the desired outcomes, this recommendation is provided on the basis of comments on the lack of a ToC in preparing the NAMA PRF made in Para 29. For future designers of GEF projects, a well-prepared PRF is important to Project implementers and being able to identify and monitor pathways of development progress to a long-term common objective or goal. Future GEF project preparations need to ensure project activities

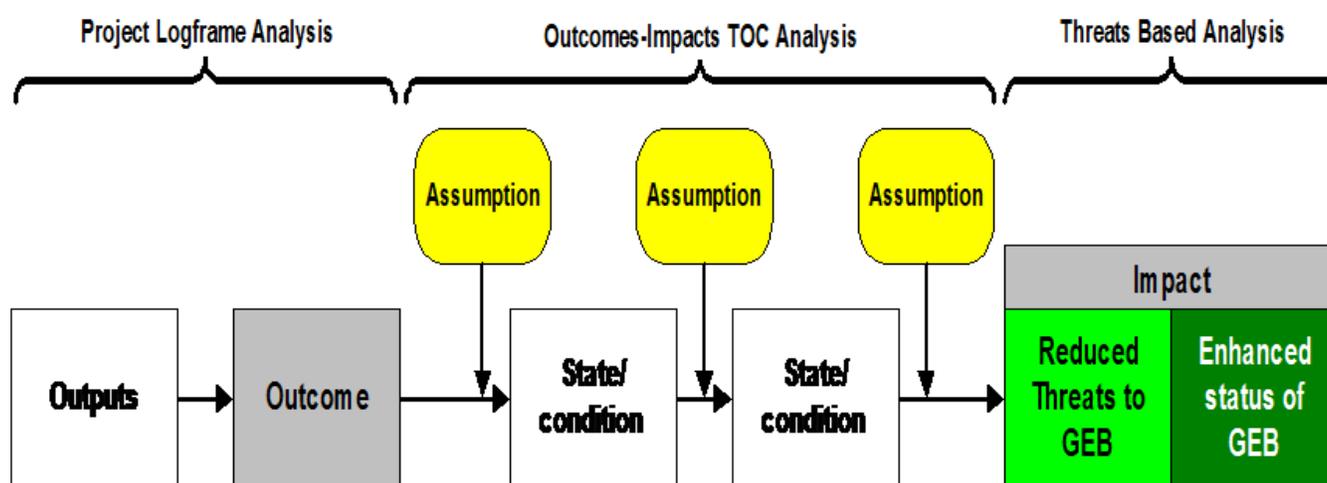
⁴³ Ibid 42

have clear linkages to global benefits (in the case of the NAMA Project, a linkage to sustained GHG emission reductions) through a ToC analysis. A draft PRF should be prepared and reviewed and reviewed through an iterative process “review of outcomes to impacts” or ROTI which forces the designer to review how the project will reach the desired impacts from the designed project outcomes. Project designers should review the pathways to achieve a desired impact from a baseline scenario to a desired impact with causal pathways consisting of project activities to outputs, outcomes, and intermediate states that lead to desired impacts, all to be done with inputs of project beneficiaries and other relevant stakeholders. A Theory of Change diagram should then be prepared illustrating the linkages or causal pathways leading from the baseline to outputs, outcomes intermediate state and the intended impacts. With an acceptable development (causal) pathway from outcomes to impacts, the designers should then review the PRF to ensure it reflects pathway to desired impacts. In the context of the NAMA Project, a ToC approach may strengthen or clarify:

- the baseline scenario and identification of barriers to mitigating GHG emissions from energy generation and end use sectors;
- drivers of change that includes government policies and programmes such as the NEP, REDP and Operation DSM, and stakeholder needs (increased knowledge and experience in implementing NAMA projects and a lack of user-friendly tools for collecting and managing data);
- assumptions for the design project intervention to succeed and for the project to achieve its long-term outcomes and sustainability (increased staffing levels in relevant government departments knowledgeable in NAMA projects to manage an expected increase in volume of these projects);
- project stakeholders and their linkages to relevant project activities and outputs; and
- examination of activities of each project component to achieve their intended outcomes.

Figure 4 provides a generic ToC flowchart.

Figure 4: Generic Theory of Change Diagram⁴⁴



⁴⁴Reproduced from April 2009 GEF Presentation by Todd and Risby, accessible on: https://www.google.ca/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&cad=rja&uact=8&ved=0ahUKEwiOz7Wfk-DYAhUF62MKHV6UCsQQFggNMAA&url=http%3A%2F%2Fwww.3ieimpact.org%2Fmedia%2Ffiler%2F2013%2F02%2F25%2F13_1_gef_eo_cairo_presentation_final.ppt&usq=AOvVaw3rP1GHRib0YW2cABRZ8D0g

4.2 Actions to follow up or reinforce initial benefits from the project

121. *Action 2 (to MoPRE, SLSEA): To increase and sustain the growth of household solar PV systems with battery storage, change current regulations to allow households to use their solar PV systems during power failures and load shedding events.* This action stems from Table 14 (Actual Outcome 3) where under institutional framework and governance risks, CEB are aware of the need to remove the policy that prevents these households from using these systems during power failures and load shedding. These regulations were in place as a means of protecting line repair crews from electrocution during power failure and load shedding events. New regulations to allow households the use of their solar PV systems during power failures should specify the installation of an “islanding switch” at the inverter to prevent electrical currents into the grid during these events to protect these crews from live wires. This will also inform MoPRE and SLSEA of the benefits of battery storage in managing peak loads (see Para 118 and Action 7 in Para 127).
122. *Action 3 (to UNDP, CCS, SLSEA and provincial governments): Undertake ongoing management of a number of NAMA planning, design and implementation issues to sustain growth of NDCs and supporting NAMAs.* This will require the involvement of key stakeholders, CCS, SLSEA and provincial governments, to:
- invest in NAMA promotional efforts to encourage and facilitate development of other NAMA concepts that contribute to NDCs. This would need to be done with additional staff, conducting meetings with stakeholders with the capacity or access to key NAMA actors (such as various associations such as the biogas association or industrial associations);
 - provide regular updates of MACCs with latest costs and multi-criteria assessments which may change over time and be worthy of re-evaluation by SLSEA and other policymakers;
 - continually recruit technical experts and utilize offers for donor technical assistance to plan and design new MRV protocols employing best international practices;
 - continue training of personnel for managing and undertaking MRV actions for NAMAs that contribute to NDCs.

4.3 Proposals for future directions underlining main objectives

123. In proposing future directions of the Project, the following recommendations are suggestions taken from various stakeholders on intensifying efforts to accelerate climate mitigation in Sri Lanka with energy generation, end use sectors and 5 other sectoral areas for further development under PMR (see Para 102). The Evaluation Team understands that some of these recommendations may already be implemented by CCS and SLSEA. The Evaluation Team also understands that the future course of actions by CCS and SLSEA to promote NAMAs for NDCs in the energy sector and other sectors will be strategic in the context of GoSL determination of the most effective courses of action to undertake.
124. *Action 4 (to SLSEA): SLSEA should work closely with suppliers to encourage a supplier-driven business model to promote and scale-up GHG emission abatement technologies, especially for biogas installers.* To a large extent, this has been occurring for solar PV installers and suppliers as well as suppliers for motor equipment and VFDs, especially in consideration of the number of solar PV installations and the efficiency of VFD installations supported by the Project for tea factories and other factories. Their knowledge of their products and familiarity with government and international standards of their equipment helps end-users in making decisions on investing in low carbon technologies and measures (in addition to the fact some solar PV installers are feeding information

into the Energy GIS database). The expansion of the biogas installations supported by the Project, however, could have been larger if there were more biogas experts in Sri Lanka (as mentioned in Para 117). Currently, the biogas market is served by biogas experts who provide turnkey solutions for biogas installations⁴⁵. For the government to support a supplier driven business model for biogas installers, it will need to support training programs (in association with a biogas association) with the intent of increasing pool of provincial level biogas expertise in Sri Lanka, and to provide them the necessary support⁴⁶ to give them a higher probability of success in the start-up of the biogas business.

125. Action 5 (to CCS and SLSEA): Engage the private sector for MRV of GHG emission reductions by biogas systems. Further to Action 3 (Para 131) in promoting the formulation of new NAMA concepts for NDCs, CCS and SLSEA could focus their NAMA promotional engagement efforts on the private sector to encourage them to prepare NAMAs for biogas systems in partnership with provincial biogas programs. The actions of Elpitiya Plantations and Berendina (who are have financed in biogas units for tea plantation households as a CSR initiative and as a measure to strengthen employee loyalty) could be replicated.
126. Action 6 (to CCS): Mainstream GHG emission reporting by incorporating the estimation and monitoring of GHG emissions into the government project approval process. In response to the conclusion that there are no clear plans to sustain the interest of other stakeholders to develop other NAMAs (Para 128), the CCS can accelerate the mainstreaming of GHG emission reporting by working with the Planning Ministry to ensure the inclusion of GHG emission reporting in all the GoSL’s planning documents. These documents could include baseline GHG emissions of a development project, estimates of GHG emission reductions of this development project, and monitoring plans during implementation for energy consumption and GHG emissions as well as implementing MRV obligations.
127. Action 7 (to MoPRE and SLSEA): MoPRE and SLSEA should encourage utilities (such as the Ceylon Electricity Board) to consider and implement schemes (through the NAMA registry) to equip solar PV for households with battery storage. Further to Para 118 on the opportunities to expand the solar PV NAMA (as mentioned in Table 14), there is currently an allocation for 200 MW of installed capacity for household solar PV systems. These allocations are likely to be rapidly taken up by households who could afford such systems without subsidies (i.e. the wealthy). As such, there is virtually no chance that low income households eligible for social electricity tariffs will have access to these solar PV allocations with net metering. The government should also explore and evaluate the provision of subsidies for these households eligible for social electricity tariffs against an investment of that household into a solar PV system with batteries. Such investments by the government may in the long run provide more national benefits in the form of subsidy removal of these social tariffs and improved management of peak loads using remote storage systems in the national grid. If the Government sponsored such a programme, additional benefits could be realized through the procurement of large quantities of batteries that would reduce the cost of battery storage for these installations. Possible issues to be resolved with this scheme may be battery disposal methods and costs, and a possible lack of tenure over the lands where the solar PV systems would be installed (though some believe this to be a very minor issue).

⁴⁵Services would entail an initial site visit to determine client requirements for biogas based on available supplies of biowaste, design and costing of a biogas system, and constructing biogas units in partnership with local construction companies.

⁴⁶Support would include assistance for preparing business plans, execution of contracts, and planning for routine maintenance and repair of poorly constructed biogas units.

128. *Action 8 (to SLSEA): Encourage sectoral leaders to lobby CCS for joint development of MRV protocols for technologies as prioritized by the Presidential Task Force on Energy DSM.* With regards to the challenges for the CCS to fill in positions with qualified personnel to advance 5 sectoral areas for mitigation projects (Para 102), SLSEA should suggest to CCS on more unique arrangements to engage sectoral energy experts to CCS in the form of secondments of industry experts who work for industrial entities or as individual consultants. They could serve as in-house expertise to CCS to provide experience and technical knowledge of specific energy sectors for MRV developments on as-needed basis for NDC mitigation options. This modality of engagement may serve as an easier recruitment alternative to normal government recruitment procedures. The suggestion of having SLSEA spearhead this action is due to their extensive network of industrial experts in Sri Lanka.
129. *Action 9 (to CCS and SLSEA): CCS should routinely call for NAMA proposals to support NDC development (after completion of MRV protocol) from the private sector.* As a follow-up to Action 9 and to address the moderately unsustainable assessment of the NAMA Project as mentioned in Para 123, CCS should make regular calls for NAMA proposals (to support NDCs) from private companies. SLSEA can facilitate this process for CCS by working closely with CCS to identify priority areas and best prospects for NAMAs that support NDC development, especially through the use of the MACC analyses and MCA, and contacts with the existing industrial and private sector network of SLSEA.

4.4 Best and worst practices in addressing issues relating to relevance, performance and success

130. *Best practice 1: The preparation of NAMAs for developing NDCs requires a fair amount of rigour and technical knowledge from trained personnel with experience in designing and implementing NAMAs. Future NAMA exercises without sufficient resources for rigorous development will prove to be a higher risk.* This was notably demonstrated with the biogas NAMA and the NAMA for the tea industry which revealed more energy savings by reducing motor loads instead of the outright replacement of the motor. During NAMA implementation, highly qualified NAMA sectoral specialists were able to efficiently analyse and adaptively manage these NAMAs to ensure optimal benefits to the end users. This required time to comprehend the issues on these NAMAs including reasons why there was a low level of GHG emission reductions and to resolve the issue to the satisfaction of the investor and end user. For the biogas NAMA, there was an avoidance of a “cookie cutter approach” where the biogas expert was required to assess the end user situation that included a determination of waste volumes and availability followed by a biogas unit design that was appropriate for a particular end user. This required a certain amount of rigour to the biogas expert’s approach to the installation.
131. *Best practice 2: Successful projects not only have competent PMUs, but also dedicated counterpart officers and subordinates who would develop corporate memories of the project.* The NAMA Project has been fortunate to have had no changes in PMU personnel during its 4.5-year implementation period. The NAMA Project PMU has only employed one Project Manager (who also served as the sector specialists for solar PV), one sector specialist for high efficiency motors and VFDs, one specialist for biogas, a national technical consultant (Mr. G.B. Wimalaratne) and a Chief Technical Advisor (Mr. Ranjith Padmasiri) who had formerly served as the Director General of SLSEA and who fully understood the modalities of working with government agencies. With government counterpart staff, the NAMA Project had the same NPDs from the SLSEA and CCS through the 4.5-year implementation period. By not having to recruit new personnel or replace an NPD midway through the NAMA Project, the Project benefited from no delays during implementation, and was able to

continuously compile corporate and information related to energy generation and the end use sectors, useful for adaptive management of a project.

132. *Practice that needs more improvement: More efforts are required to prepare GEF project designs, especially care with GHG emission reduction estimates.* The estimates for the deployment of the NAMA technologies and measures needed a fair amount of revision during implementation. This included an overestimate of energy savings from high energy efficient motor replacements, and a high number of households where small biogas units and solar PV installations to be implemented. For motor replacements in the tea industry, a more in-depth analysis of the use of these motors and fans would have revealed higher benefits of VFDs instead of motor replacements. For the households where small biogas units and solar PV with batteries were to be installed, the rated deployment would have been constrained by the remote locations of most of these installations. While this evaluation is not placing blame on the project designers, the evaluation team is certain that the project preparation team did not have sufficient time to prepare a proper analysis of the 3 pilot NAMAs. This evaluation recommends that PPG teams improve their preparations on greenhouse gas estimates for GEF projects.

APPENDIX A – MISSION TERMS OF REFERENCE FOR NAMA PROJECT TERMINAL EVALUATION

Job Title:	International Consultant- GEF Terminal Evaluation
Reports to:	Policy and Design Specialist, UNDP Sri Lanka
Duty Station:	Home based, with one mission to Sri Lanka for 9 days (in-country)
Type of Contract:	Individual Contract (International)
Language required:	English
Duration of Assignment:	25 days full time within the period of 07 th October 2019 – 30 th November 2019
Contract Start Date:	07 th October 2019
Application Deadline:	13 th August 2019

A. BACKGROUND

The United Nations Development Programme (UNDP), Sri Lanka is assisting the Sri Lanka Sustainable Energy Authority (SLSEA) under the Ministry of Power Energy and Business Development in the implementation of the Project “Appropriate Mitigations Actions in the Energy Generation and End-User Sectors in Sri Lanka (PIMS#5232)”. The UNDP is also acting as an implementing agency of the Global Environment Facility (GEF), and this is a 4 year project started in June 2015. In accordance with UNDP and GEF M&E policies and procedures, all full and medium-sized UNDP support GEF financed projects are required to undergo a terminal evaluation upon completion of implementation. These terms of reference (TOR) sets out the expectations for a Terminal Evaluation (TE) of this Project which is to be completed in the last quarter of 2019.

This 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 MACC 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 June 2015 June to December 2019. The project is being implemented by the Sri Lanka Sustainable Energy Authority (SLSEA) under the purview of the Ministry of Power Energy & Business Development of Sri Lanka and Sri Lanka Climate Change Secretariat under the Ministry of Mahaweli Development & Environment.

B. SCOPE AND OBJECTIVES

This Terminal Evaluation will be conducted according to the guidance, rules and procedures established by UNDP and GEF as reflected in the UNDP Evaluation Guidance for GEF Financed Projects.

The objectives of the evaluation are to assess the achievement of project results, and to draw lessons that can both improve the sustainability of benefits from this project, and aid in the overall enhancement of UNDP programming.

This TE will be conducted by a team of two independent consultants - one team leader (international consultant with experience and exposure to projects and evaluations as specified in Section E of this TOR) and one local consultant. The local consultant will assist the international consultant with the assigned responsibilities as detailed in Section C below.

C. RESPONSIBILITIES

The evaluator is expected to frame the evaluation effort using the criteria of **relevance, effectiveness, efficiency, sustainability, and impact**, as defined and explained in the UNDP Guidance for Conducting Terminal Evaluations of UNDP-supported, GEF-financed Projects.

The evaluation must provide evidence-based information that is credible, reliable and useful. The evaluator is expected to follow a participatory and consultative approach ensuring close engagement with government counterparts, in particular the GEF operational focal point, UNDP Country Office, project team, UNDP GEF Technical Adviser based in the region and key stakeholders.

For more details on the responsibilities and the project sites in which the field mission is expected to be conducted, please refer the below link;

<https://drive.google.com/open?id=1eO2LomL7Avzryu-TsAmLDeIfNuuJjZ>

Expected Output/Deliverables

The Evaluation will assess the key financial aspects of the project, including the extent of co-financing planned and realized. Project cost and funding data will be required, including annual expenditures. Variances between planned and actual expenditures will need to be assessed and explained. Results from recent financial audits, as available, should be taken into consideration. The evaluator(s) will receive assistance from the Country Office (CO) and Project Team to obtain financial data which will be included in the terminal evaluation report.

The principal responsibility for managing this evaluation resides with the UNDP CO in Sri Lanka. Integrated Knowledge Management Team of the UNDP CO will contract the evaluator and ensure the timely provision of per diems and travel arrangements within the country for the evaluation team. The Project Team will be responsible for liaising with the Evaluators team to set up stakeholder interviews, arrange field visits, coordinate with the Government etc.

The evaluation team is expected to deliver the following:

- **Inception Report-** provide clarifications on timing and method. Report need to be submitted

to UNDP CO by 15th October 2019.

- **Presentation on initial findings** to project management, UNDP CO by 15th November 2019
- **Draft Final Report**- Full report (per annexed template) with annexes submitted to CO, reviewed by RTA, PCU, GEF OFPs by 20th November 2019.
- **Final Report** (When submitting the final evaluation report, the evaluator is required also to provide an 'audit trail', detailing how all received comments have (and have not) been addressed in the final evaluation report. The final report need to be submitted to CO for uploading to UNDP ERC by 06th December 2019.

D. TIMEFRAME

The envisaged time frame of the consultancy is 25 working days (fulltime) from 10th October 2019 to 06th December 2019 according to the following plan:

- **Preparation:** 4 days, completion date: 15th October 2019
- **Evaluation Mission**- 9 days, completion date: 15th November 2019
- **Draft Evaluation Report**- 8 days, completion date: 29th November 2019
- **Final Report**- 4 days, completion date: 06th December 2019

E. CONSULTANT PROFILE

The prospective consultant should have the following competencies and qualifications;

1. COMPETENCIES

a. Technical competencies

- The consultant shall have an understanding about climate change mitigation, renewable energy and energy efficiency, adaptive management, as applied to Climate Change Mitigation. Experience in Energy, Energy Technology and /or Environmental Engineering will be an added advantage.
- The consultants shall have prior experience in evaluating similar projects. Experience with GEF financed projects is an advantage.
- The evaluators selected should not have participated in the project preparation and/or implementation and should not have conflict of interest with project related activities.

b. Partnerships

- The consultant must be able to Builds strong relationships with clients, focuses on impact and result for the client and responds positively to feedback.
- The evaluation team will be composed of one international and one national evaluator. Both national and international evaluators should work in conjunction and have regular coordination during the whole evaluation process
- Proven ability to work in a complex environment with different national and international experts/consultants.
- Strong interpersonal skills and ability to work with people from different backgrounds to deliver quality products within a short timeframe

c. Results

- The consultant shall have Experience with result-based management evaluation methodologies and Experience applying SMART targets and reconstructing or validating baseline scenarios
- Knowledge of UNDP and GEF
- Be flexible and responsive to changes and demands;

2. QUALIFICATIONS

- A Master’s degree in Energy/Energy Technology/Environmental Engineering, or other closely related field (10%)
- Experience with result-based management evaluation methodologies for at least 10 years (15%);
- Experience applying SMART targets and reconstructing or validating baseline scenarios (10%);
- Competence in adaptive management, as applied to Climate Change Mitigation (15%);
- Experience working with the GEF or GEF-evaluations (15%);
- Experience working in Sri Lanka (5%);
- Work experience in relevant technical areas for at least 10 years (15%);
- Demonstrated understanding of issues related to gender and Climate Change Mitigation; experience in gender sensitive evaluation and analysis (5%);
- Excellent communication skills (5%);
- Demonstrable analytical skills (5%);
- Project evaluation/review experiences within United Nations system will be considered an asset

Language requirements:

- Fluency in English.

F. HOW TO APPLY

To apply please access UNDP Jobs site <http://jobs.undp.org>.

Recommended Presentation of Offer;

- Completed **Letter of Confirmation of Interest and Availability** using the [template](#) provided by UNDP;
- **Personal CV or a [P11 Personal History form](#)**, indicating all past experience from similar projects, as well as the contact details (email and telephone number) of the candidate and at least three (3) professional references;
- **Brief description of approach to work/technical proposal** of why the individual considers him/herself as the most suitable for the assignment, and a proposed methodology on how they will approach and complete the assignment; (max 1 page)
- Applicants should duly fill the financial proposal and send as a separate email to consultants.lk@undp.org and The Position/Title - Financial Proposal should be entered as the Subject Line. Incomplete applications will be excluded from further consideration.

G. FINANCIAL PROPOSAL

Financial Proposal that indicates the all-inclusive fixed total contract price, supported by a breakdown of costs, as per [template](#) provided (based on the number of working days mentioned in Section D of this ToR). If an applicant is employed by an organization/company/institution, and he/she expects his/her employer to charge a management fee in the process of releasing him/her to UNDP under Reimbursable Loan Agreement (RLA), the applicant must indicate at this point, and ensure that all such costs are duly incorporated in the financial proposal submitted to UNDP. **See Letter of Confirmation of Interest template for financial proposal template.**

Note:

Payments will be based on invoices on achievement of agreed milestones i.e. upon delivery of the services specified in the TOR and certification of acceptance by the UNDP. The applicant must factor in all possible costs in his/her **“All Inclusive Lump Sum Fee/Daily Fee”** financial proposal including his/her consultancy and professional fee, honorarium, communication cost such as telephone/internet usage, printing cost, return travel from home to office including air fares, ad-hoc costs, stationery costs, and any other foreseeable costs in this exercise. No costs other than what has been indicated in the financial proposal will be paid or reimbursed to the consultant. The UNDP will only pay for any unplanned travel outside of this TOR and Duty Station on actual basis and on submission of original bills/invoices and on prior agreement with UNDP officials. Daily per diems and costs for accommodation/meals/incidental expenses for such travel shall not exceed established local UNDP DSA rates.

For an Individual Contractor who is of 65 years of age or older, and on an assignment requiring travel, be it for arriving at the duty station or as an integral duty required under the TOR, a full medical examination and statement of fitness to work must be provided. Such medical examination costs must be factored in to the financial proposal above. Medical examination is not a requirement for individuals on RLA contracts.

H. PAYMENT FOR SERVICES

Payments will be based on milestones certified by the Project Management Unit.

Payment Milestones will be as follows:

- 20% upon submission of the terminal evaluation inception report
- 40% following submission and approval of the 1st draft terminal evaluation report
- 40% following submission and approval (UNDP-CO and UNDP RTA) of the final terminal evaluation report

Note:

- Please group all your documents into one (1) single PDF document as the system only allows uploading maximum one document. This should not include your financial proposal.
- Qualified women and members of minorities are encouraged to apply.
- Incomplete applications will not be considered. Please make sure you have provided all requested materials.

Incomplete applications will be excluded from further consideration.

APPENDIX B – MISSION ITINERARY (FOR NOVEMBER 2019)

#	Activity	Stakeholder involved	Place
19 November 2019 (Tuesday)			
	Arrival of Roland Wong in Colombo		
20 November (Wednesday)			
1	Briefing meeting with NAMA PMU and UNDP Sri Lanka	UNDP Sri Lanka	Colombo
2	Meeting with Secretary, MoPRE	MoPRE	Colombo
21 November 2019 (Thursday)			
3	Meeting with NPD and Deputy Director, SLSEA	SLSEA	Colombo
4	Meeting with Berendina NGO on biogas programme	Berendina NGO	Colombo
5	Meeting with Ceylon Electricity Board	Ceylon Electricity Board	Colombo
22 November 2019 (Friday)			
6	Meeting with Climate Change Secretariat	CCS	Colombo
7	Meeting with Director General for SLSEA	SLSEA	Colombo
8	Meeting with Elpitiya Plantations on VFDs and biogas installations	Elpitiya	Colombo
9	Meeting with National biogas expert	Biogas sectoral expert	Colombo
23 November 2019 (Saturday)			
	Travel to Kurunegala		
5	Field visits in and around Kurunegala to solar PV installations with battery storage and biogas installations	NAMA beneficiaries	Kurunegala
	Overnight in Kandy		
24 November 2019 (Sunday)			
	Working on evaluation report		Kandy
25 November 2019 (Monday)			
8	Travel to New Peacock and Nayap Tea Plantations to view VFD and biogas installations	NAMA beneficiaries	Pussellawa
	Overnight in Hali Ela		
26 November 2019 (Tuesday)			
9	Meeting with Badulla Provincial Secretary and Provincial Biogas Team	Provincial Councils	Badullah

#	Activity	Stakeholder involved	Place
	Travel to Udawalawa		
11	Field visit to the Grand Udawalawa Resort using biogas for laundry driers	NAMA beneficiaries	Udawalawa
12	Field visit to porcelain materials factory that has installed VFDs	NAMA beneficiaries	Kosgama Industrial Park
	Travel to Colombo		
27 November 2019 (Thursday)			
12	Meeting with UNDP Sri Lanka	UNDP Sri Lanka	Colombo
13	Meeting with M&E Coordinator	UNDP Sri Lanka	Colombo
14	Meeting with Sector Specialist on EnerGIS demo	UNDP Sri Lanka	Colombo
28 November 2019 (Friday)			
15	De-briefing presentation for NAMA Project		Colombo
	Departure of Roland Wong from Colombo		

Total number of meetings conducted: 15

APPENDIX C – LIST OF PERSONS INTERVIEWED

This Draft is a listing of persons contacted in Sri Lanka (unless otherwise noted) during the Terminal Evaluation Period only. The Evaluator regrets any omissions to this list.

1. Ms. Usha Rao, UNDP Regional Technical Advisor for CCM, Bangkok Regional Hub;
2. Ms. Faiza Effendi, Deputy Country Director, UNDP Sri Lanka;
3. Ms. Tharuka Dissanaiké, Energy and Environment Cluster Leader, UNDP Sri Lanka;
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. Ms. Sureka Perera, NAMA Technology Advisor, NAMA Project;
8. Mr. Chamila Delpitiya, Motors Sector Specialist, NAMA Project;
9. Mr. Dasitha Premarathne, Project Assistant, NAMA Project;
10. Mr. Roshan Raja, M&E Coordinator, UNDP Sri Lanka;
11. Ms. Tashya de Silva, M&E Officer, UNDP Sri Lanka;
12. Dr. Suren Batagoda, Secretary, MoPE, Colombo;
13. Dr. Asanka Rodrigo, Director-General, SLSEA;
14. Mr. Harsha Wickramasinghe, National Project Director/Deputy Director General, SLSEA;
15. Mr. K.G. Chamila Jayasekera, Director (Strategy), SLSEA;
16. Dr. H. Wijekoon, Chief Engineer, Ceylon Electricity Board, Colombo;
17. Dr. Sunimal Jayathunga, Director, CCS;
18. Ms. Kumudini Vidyalankara, Assistant Director, CCS;
19. Ms. Hasula Wickramasinghe, Programme Assistant, CCS;
20. Ms. Chamika Iddagoda, Programme Assistant, Planning Department, Ministry of Environment;
21. Mrs. G.A.M.S.P. Abanwala, Secretary, Ministry of Education, Power & Energy, Uva Provincial Council;

22. Mr. H.M.S.T. Sampath, Assistant Director-Planning;
23. Mr. Chaminda T. M. L. Dissanayake, Livestock Development Instructor, Dept. of Animal Production and Health, Uva Provincial Council;
24. Mr. Kaushal Mathavan, Deputy General Manager, Aitken Spence Plantations, Pussellawa;
25. Mr. Priyantha Dissanayake, General Manager - Engineering & Projects at Aitken Spence Plantations, Colombo;
26. Mr. Jagath Godakanda, Chairman, Berendina, Colombo;
27. Mr. Kasun Dissanayake, Environmental Coordinator of biogas beneficiaries, Berendina, Colombo;
28. Mr. Rajesh Ramasamy, Manager - Enterprise Development Services, Berendina, Colombo;
29. Mr. Athula Jayamanna, CEO of Eco Engineers & Co., Biogas Expert and Supplier;
30. Mr. Bandara Wickramasinghe, proprietor, Isuri Bio Construction, Biogas Service Provider.

APPENDIX D – LIST OF DOCUMENTS REVIEWED

1. NAMA Project Inception Plan, March 2014;
2. Project Document for NAMA Project;
3. NAMA Project Inception Report, October 2015;
4. NAMA Project Implementation Reviews (PIRs) for 2016, 2017, 2018 and 2019;
5. NAMA Project Board minutes and presentations from November 2015, January 2016, July 2016, December 2016 and April 2017;
6. Project BTORs;
7. NAMA Project MACC Tool from May 18, 2017;
8. NAMA Project Report on “Implementation Mechanism for Nationally Appropriate Mitigation Actions (NAMAs) in Sri Lanka”;
9. NAMA Project report on “Rapid Assessment of Current Biogas Programs in North Western and Southern Provinces” by Mr. Namiz Musafar, National Consultant Biogas Technology for UNDP Sri Lanka, July 2016;
10. NAMA Project report on “Monitoring, Reporting and Verification Protocol for Biogas Projects 8 to 20 m³ for Sri Lanka NAMAs”;
11. NAMA Project Procedures for Data Monitoring, Data Handling and MRV Protocols for all NAMA Projects (biogas, solar PV and tea factory motors);
12. MoMDE Report on “Readiness Plan for Implementation of IMDCs (2017-2019), August 2016;
13. Gender and Social Impact Assessment, NAMA in the Energy Generation and End-User Sectors in Sri Lanka, “Key Findings and Recommendations for Future Interventions”, November 2019;
14. United Nations Sustainable Development Framework 2018 – 2022 Sri Lanka;
15. Sri Lanka’s Middle Path to Sustainable Development through “Mahinda Chintana - Vision for the Future”, Country Report of Sri Lanka, United Nations Conference on Sustainable Development/(Rio +20), 20-22 June 2012, Rio de Janeiro, Brazil;
16. “Barrier Analysis and MCA of GHG Mitigation Options, by Thusitha Sugathapala, for UNDP Sri Lanka, March 2019;
17. “Link between Sri Lanka’s Energy Sector NAMA and NDC: Marginal Abatement Cost Curve Analysis of the Energy Sector in Sri Lanka” by Carbon Limits SA for UNDP Sri Lanka and SLSEA, October 2019.

APPENDIX E – COMPLETED TRACKING TOOL

Figure E-1: Screenshot of Page 1 of NAMA Project Tracking Tool

 Tracking Tool for Climate Change Mitigation Projects (For Terminal Evaluation)		
Special Notes: reporting on lifetime emissions avoided		
<p>Lifetime direct GHG emissions avoided: Lifetime direct GHG emissions avoided are the emissions reductions attributable to the investments made during the project's supervised implementation period, totaled over the respective lifetime of the investments.</p> <p>Lifetime direct post-project emissions avoided: Lifetime direct post-project emissions avoided are the emissions reductions attributable to the investments made outside the project's supervised implementation period, but supported by financial facilities put in place by the GEF project, totaled over the respective lifetime of the investments. These financial facilities will still be operational after the project ends, such as partial credit guarantee facilities, risk mitigation facilities, or revolving funds.</p> <p>Lifetime indirect GHG emissions avoided (top-down and bottom-up): indirect emissions reductions are those attributable to the long-term outcomes of the GEF activities that remove barriers, such as capacity building, innovation, catalytic action for replication.</p> <p>Please refer to the Manual for Calculating GHG Benefits of GEF Projects.</p> <p>Manual for Energy Efficiency and Renewable Energy Projects Manual for Transportation Projects</p> <p>For LULUCF projects, the definitions of "lifetime direct and indirect" apply. Lifetime length is defined to be 20 years, unless a different number of years is deemed appropriate. For emission or removal factors (tonnes of CO2eq per hectare per year), use IPCC defaults or country specific factors.</p>		
General Data	Results at Terminal Evaluation	Notes
Project Title	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	9-Dec-13	Month DD, YYYY (e.g., May 12, 2010)
GEF Grant (US\$)	1,790,411	
Date of submission of the tracking tool	16-Dec-19	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\$)	21,206,540	
Cumulative additional resources mobilized (US\$)	-	additional resources means beyond the cofinancing committed at CEO endorsement

Figure E-2: Screenshot of EE Page of NAMA Project Tracking Tool

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	4	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)	5	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	5	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	293,767,383	MJ (Million Joule, IEA unit converter: http://www.iea.org/stats/unit.asp) 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	19,228	tonnes CO2eq (see Special Notes above)
Lifetime direct post-project GHG emissions avoided	17,429	tonnes CO2eq (see Special Notes above)
Lifetime indirect GHG emissions avoided (bottom-up)	85,647	tonnes CO2eq (see Special Notes above)
Lifetime indirect GHG emissions avoided (top-down)	19,228	tonnes CO2eq (see Special Notes above)

Figure E-3: Screenshot of EE Page of NAMA Project Tracking Tool

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	5	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)	5	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	4	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		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)	10.067	MW
Solar thermal heat (heating, water, cooling, process)		MW th (for thermal energy production, 1m ² = 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: http://www.iea.org/stats/unit.asp)		
Wind		MWh
Biomass	218.40	MWh el (for electricity production)
Biomass		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)	1,720.6	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	35,709	tonnes CO ₂ eq (see Special Notes above)
Lifetime direct post-project GHG emissions avoided	189,269	tonnes CO ₂ eq (see Special Notes above)
Lifetime indirect GHG emissions avoided (bottom-up)	162,049	tonnes CO ₂ eq (see Special Notes above)
Lifetime indirect GHG emissions avoided (top-down)	36,025	tonnes CO ₂ eq (see Special Notes above)

Figure E-4: Screenshot of Enabling Activities Page of NAMA Project Tracking Tool

Objective 6: Enabling Activities		
Please specify the number of Enabling Activities for the project (for a multiple country project, please put the number of countries/assessments)		
National Communication		
Technology Needs Assessment		
Nationally Appropriate Mitigation Actions	3	
Other		
Does the project include Measurement, Reporting and Verification (MRV) activities?	1	Yes = 1, No = 0

APPENDIX F – REVISED PROJECT PLANNING MATRIX FOR NAMA PROJECT (OCTOBER 2015 NAMA INCEPTION WORKSHOP)

Project Strategy	Indicator	Baseline	Target	Sources of Verification	Risks and Assumptions
Goal: Reduction of GHG emissions from the energy generation and end user sectors in Sri Lanka	Cumulative GHG emissions by end of project (EOP), tCO _{2e}	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	
Objective: 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 favourable business environment
Outcome 1: 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 Year4	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 Year4	0	4	Mid-term report, Documentation on the established sub- sectoral GHG emission inventory system of each province	
Outcome 2: 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	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
	No. of NAMA EE/RE projects that are prioritized and designed by EOP	0	3		

Project Strategy	Indicator	Baseline	Target	Sources of Verification	Risks and Assumptions
					Availability of reliable and accurate baseline data
Outcome 3: 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 Year2	0	2	MOU signed between project developers and SLSEA	Strong support and buy in from the private sector Capable public department/ministry agencies serve as National Implementing Entity (NIE) for selected NAMAs
	No. of individual projects that constitute the country's NAMAs by Year4	0	1,000 biogas systems 1,300 tea factories 205 solar systems		
	No. of operational Private- funded NAMA projects by EOP	0	1 (high efficient motors in tea factories)		
Outcome 4: 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 Year4	0	3	Mid-term and Terminal report, Documentation on MRV system	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 Competent staff operate, maintain, and upgrade the MRV system on regular basis
	No. of projects in the energy generation and end use sectors that are registered in the National NAMA registry by EOP	0	3		

APPENDIX G—RESPONSES TO COMMENTS RECEIVED ON DRAFT TE REPORT

Provided as a separate file

APPENDIX H - EVALUATION CONSULTANT AGREEMENT FORM

Evaluators:

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 Form⁵⁹

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 16 February 2020



⁵⁹www.unevaluation.org/unegcodeofconduct

Evaluators:

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 Form⁶⁰**Agreement to abide by the Code of Conduct for Evaluation in the UN System**

Name of Consultant: Swetha Perera

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 16 February 2020



⁶⁰www.unevaluation.org/unegcodeofconduct