UNDP-GEF Midterm Review - Achieving Low Carbon Growth in Cities through Sustainable Urban Systems Management in Thailand

UNDP PIM 4778 & GEF Project ID 5086

Final Report

19 April 2020

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PROJECT DATA

Project Title:	Achieving Low Carbon Growth in Cities through Sustainable Urban Systems Management in Thailand	
UNDP PIMS ID:	4778	
GEF ID:	5086	
Country:	Thailand	
Region:	Asia	
Focal Area:	Waste Management, Transport and Energy	
Outcome:	Outcome 1.1: Increased number of Thai cities that have formulated and implemented low carbon sustainable urban development plans Outcome 1.2: Increased number of Thai cities with energy efficient urban systems Outcome 2.1: Increased volume of investments in energy efficient urban systems by government and private sector	
Goal/Objective:	Goal: Reduction of future GHG emissions from cities in Thailand Objective: Promotion of sustainable urban systems management in Khon Kaen, Nakhon Ratchasima, Samui and Chiang Mai to achieve low carbon growth	
Implementing Partner:	UNDP Thailand Country Office	
National Partners:	Thailand Greenhouse Gas Management Organisation (TGO), Public Organisation, Ministry of Natural Resources and Environment Collaborating agencies: Municipality of Chiang Mai, Khon Kaen, Samui and Nakhon Ratchasima	
Financing:	At endorsement (USD)	*At mid-term (USD)*
GEF	3,150,000	2,881,857.00
TGO	400,000	300,000.00
UNDP	300,000	274,849.58
Local Governments	181,601,010	44,209,081.92
Total Project Cost:	185,451,010	47,683,438.92
Planned start date:	N/A	
Actual start date:	**26 April 2017**	
Planned end date:	26 April 2021	
Mid Term Evaluation date:	13 February 2020	
Final Evaluation date:	TBD	

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ACRONYMS

ARR	Annual Review Report
DIM	Direct Implementation Modality
CCF	City Carbon Footprint
CWG	City Working Group
GEF	The Global Environment Facility
GHG	Greenhouse Gas
GOT	Government of Thailand
LEDS	Low Emission Development Strategies
LF	Logical Framework
IP	Implementing Partner
NIM	National Implementation Modality
MONRE	Ministry of Natural Resources and Environment
MTR	Mid-Term Review
MOU	Memorandum Of Agreement
PB	Project Board
PIF	Project Identification Form
PIR	Project Implementation Report
PMU	Project Management Unit
PRF	Project Results Framework
PRR	Project Progress Report
PTR	Project Terminal Report
PD	Project Document
tCO2e	tons of carbon dioxide equivalent
TE	Terminal Evaluation
TGO	Thailand Greenhouse Gas Management Organization
The Project	Achieving Low Carbon Growth in Cities through Sustainable Urban Systems Management in Tha (the Project)
UNDP	United Nations Development Programme
UNDP CO	United Nations Development Programme, Country Office

EXECUTIVE SUMMARY

Introduction

The "Achieving Low Carbon Growth in Cities through Sustainable Urban Systems Management in Thailand (PIM 4778)" project is a project implemented by Thailand Greenhouse Gas Management Organisation (TGO), Ministry of Natural Resources and Environment (MONRE) – Government of Thailand, and supported by UNDP with a 4-year lifespan.

The Project started in 26 April 2017 with donor funding of US$3,150,000 from GEF, $300,000 from UNDP, $400,000 from TGO, and 182,001,010 from local Government of Thailand. The Project Document was signed on 26 April 2017 and the project has a planned end date on April 2021.

As outlined in the UNDP/GEF project monitoring and evaluation (M&E) policies and procedures, all GEF-financed full-sized projects are required to undergo a Mid-term Review (MTR) at the mid of project implementation, which constitutes an important part of the GEF projects' monitoring and evaluation plan. MTR is primarily a monitoring tool to identify challenges and take corrective measures to ensure that a project is on track to achieve expected results at the end of the project.

The overall objective of this MTR was to assess the progress towards the achievement of the project objectives and outcomes, and assess early signs of project success or failure with the goal of identifying the necessary changes to be made in order to set the project on-track to achieve its intended results. The MTR also reviewed the project's strategy, implementation and adaptive management and risks to sustainability.

The scope of the MTR covered the following four categories of project progress:
- Project Strategy;
- Progress Towards Results;
- Project Implementation and Adaptive Management; and
- Sustainability.

The MTR employed a mixed approach of methodologies, which included desk review, semi-structured interviews with a variety of stakeholders, country visits, debriefing, and meta-analysis of existing evaluations.

Project Descriptions and Background Context

Although Thailand has enjoyed steady economic and population growth and urbanization in recent years, GHG emissions have increased for last decades and are expected to rise in the future. In response to the challenges and in support of 12th National Economic and Social Development Plan, under joint financial resources from the GEF, UNDP and Government, the "Achieving Low Carbon Growth in Cities through Sustainable Urban Systems Management in Thailand Project" (the Project) was developed and approved by the GEF in 2017.

The goal of the Project is reduction of future GHG emissions from cities in Thailand. The objective of the Project is to support sustainable urban systems management in pilot municipalities to realize low carbon growth.

The Project has 3 components:
Component 1.1: Low carbon sustainable urban development planning in selected cities
Component 1.2: Low carbon investment in selected cities
Component 2.1: Financial incentives and institutional arrangement in support of low carbon Initiatives

The Project has 3 respective outcomes:
Outcome 1.1: Increased number of Thai cities that have formulated and implemented low carbon sustainable urban development plans
Outcome 1.2: Increased number of Thai cities with energy efficient urban systems
Outcome 2.1: Increased volume of investments in energy efficient urban systems by government and private sector

Findings

Project Strategy

The Project was relevant, appropriate and strategic to national goals. It provided the government with additional resources to promote sustainable urban systems management in selected cities to achieve low carbon growth. The Project was aligned with one of the pillars in the 12th National Economic and Social Development Plan (2017-2021). The Project was highly relevant to the GEF' objective, the UNDP's objectives and UNDAF for Thailand.

The Project Logical Framework (LF) provided a good logical chain for Component/Outcome 1.1 and 1.2, but not for Component/Outcome 2.1.

The indicator for goal, cumulative direct GHG emission reductions resulting from the technical assistance and investments by end-of-project (tCO2 eq.) was a good indicator. However, in practice, (i) some components might not generate cumulative direct GHG emission reductions resulting from the technical assistance and investments during the project period. (ii) Cumulative direct GHG emission reductions might have already been achieved without the technical assistance and investments of the Project.

Further, 177,708 (182,000 updated) tCO2 eq. was considered as an unrealistic target for goal as the amount of realized cumulative direct GHG emission reductions resulting from the technical assistance and investments was significantly lower than this figure up to the end of 2019 and even by the end of the Project. First of all, 177,708 tCO2 eq was overestimated as it did not take into account the project life. Second, the original target during project design was estimated with a traditional approach that relied mainly on assumptions rather scientific methodology while the actual amount of GHG emission reductions was estimated with the ERM approach that was part of the Project.

For Project objective, there were three targets. The first two indicators and targets were not appropriate for the Project objective. The targets for the first two indicators could not be used to measure and monitor the performance as the activities (subprojects) in 4 municipalities have been updated since the project design and even since the inception phase.

Similar to goal and objective above, some indicators and targets were not appropriate for the outcomes. For Output 1.2.1 through 1.2.4, most activities have been substituted or updated. The indicators and targets have been outdated and could not be used any more.

Although the updated targets for four municipalities were consistent with the target of total Project goal, they were not consistent with the original targets of Project output/outcomes.

Last but not least, the baseline values almost did not exist in the LF. The deficient baseline information led to overestimated and thus unrealistic target values of the goal/objective and outcome indicators related to GHG emission reduction to be addressed by the project

Progress Towards Results

As the only indicator for goal during the implementation was timely available, the progress toward goal was evaluated based on actual GHG emission reduction against the target reduction established in the original Project Document and updated in the Inception Report. The review of project achievements revealed that the implementation was not as successful as expected and did not meet the target planned at the outset of the Project. The total actual GHG emission reduction was estimated at 33,195.72 tCO2eq. as of December 2019; accounting for 18.24% of the updated target of 182,000 tCO2 eq.

The actual GHG emission reductions for each municipality and the Project were below the targets. By the end of project period in April 2021, it is expected that the amount of emission reduction will be 51,868.58* tCO2eq based on the current activities (subprojects), which is still far below the original and updated targets. Based on the above, the progress towards results of the project goal/objective is rated Moderately Unsatisfactory (MU).

There are three indicators with targets under Outcome 1.1. For the first indicator, 4 cities have approved and adopted low carbon development plans by 2017. For the second indicator, 100% of participating cities where evidence-based low carbon planning has been integrated with normal urban development planning processes. For the third indicator, 4 cities have completed carbon footprints in selected sectors and have institutionalized the process by 2018; completed by 100%.

Under Outcome 1.2, there are two indicators. For the first indicator, 18 demonstration projects were implemented as a result of technical and investment assistance in participating cities; completed by 85%. For the second indicator, 5 out of 8 low carbon projects (or 63%) were completed.

Under Outcome 2.1, there are two indicators. For the first indicator, total amount of new investment leveraged through local plans of participating cities for low carbon projects was $105.32 (completed by 658%), of which, $75.1million of incremental investment was approved by the local plan and $30.22 million of investment was in the waste-to-energy (WTE) projects. The second indicator and target had not been updated although some activities were updated. The activities have not been implemented (0%) and will depend on Output 2.1.2 which will be implemented in the next phase.

When comparing key results with the goal, the Project certainly contributed to Achieving Low Carbon Growth in Cities through Sustainable Urban Systems Management in Thailand. However, there are remaining barriers: Project timing and resistance to changes.

Project Implementation and Adaptive Management

Assessment of Project Implementation and Adaptive Management include assessment of the seven components: management arrangements, work planning, finance and co-finance, project-level monitoring and evaluation, management of risks, stakeholder engagement, as well as reporting and communications.

The overall rating for the project implementation and adaptive management is based on weighted average of the above ratings for seven individual components. Therefore, the overall Project Implementation and Adaptive Management is rated Satisfactory (S).

Sustainability

The project is generally sustainable from the financial, socio-economic, institutional and environmental points of view. However, the Project faces certain financial risk to sustainability as some subprojects have difficulty in securing financial resources. The Project also faces certain environmental risk to sustainability because of second GHG emission caused by west to energy projects. The overall sustainability of the Project is rated "Moderately Likely (ML)".

The evaluation results against criteria with justifications are summarized below.

MTR Ratings & Achievement Summary

Measure	MTR Rating	Achievement Description
Project Strategy	N/A	The Project goal and objective were assessed to be not well conceived and designed. The design of the LF generally, but not specifically responded to the barriers. The LF provided a good logical chain for components 1 and 1.2 (2), but not for component 2.1 (3). There were not second level activities particularly for component 1.2 in the LF, which might create a series of problems for implementation and M&E. Some indicators and targets were not appropriate for the outputs and outcomes.
Progress Towards Results	Objective Achievement Rating: Moderately Unsatisfactory (MU)	33,195.72 as of 2019 vs targets: 177,708/182,000 (update) tCO2eq; completed by 18.24%, far below the target KK: 23,923.37 vs target: 100,500; completed by 23.80% NR: 7,705.47 vs target: 10,000; completed by 77.06% CM: 946.47 vs target: 70,000; completed by 1.35% SM: 620.41 vs target: 1,500; completed by 41.36% Cumulative direct GHG emission reductions is a good indicator. In practice, (i) some components might not generate cumulative direct GHG emission reductions. (ii) Other components might have already achieved cumulative direct GHG emission reductions without the Project. 177,708 tCO2 eq. was considered as an unrealistic target for goal as the realized cumulative direct GHG emission reductions resulting from the technical assistance and investments up to the end of 2019 and by the end-of-project were significantly lower than this figure. The actual amount of fuel saving was not available and Annual amount of waste gainfully used was 244,043.36 tonnes as of Dec 2019; completed by 63%.
	Outcome 1.1 Achievement Rating: Highly Satisfactory (HS)	No. of cities that have approved and adopted low carbon development plans by 2017: 4 cities; completed by 100% Percentage of participating cities where evidence-based low carbon planning is integrated with normal urban development planning processes by EOP: completed by100%

		No. of cities which have completed carbon footprints in selected sectors and have institutionalized the process by 2018: 4 cities; completed by100% No. of cities where carbon footprint has been prepared for selected sectors: 4 cities; completed by100% No. of city officials trained on the carbon footprint process and organized into carbon footprint working groups: 115 city officials, completed by 575% No. of integrated low carbon urban development and action plans prepared: 4 cities; completed by 100% No. of individual sector specific plans prepared (e.g., waste management plans, sustainable transport plans) with inter-linkages with all other relevant sectors taken into account: 20 individual sector specific plans prepared; completed by 250% No. of monitoring plans for waste management facilities developed and implemented: 4 cities; completed by 100%.
	Outcome 1.2 Achievement Rating: Satisfactory (S)	GHG emission reductions completion: KK: 23,923.37 vs target: 100,500; completed by 23.80% NR: 7,705.47 vs target: 10,000; completed by 77.06% CM: 946.47 vs target: 70,000; completed by 1.35% SM: 620.41 vs target: 1,500; completed by 41.36% Indicators: No. of low carbon demonstration projects implemented as a result of technical and investment assistance in participating cities by EOP: 18 projects; completed by 95% No. of low carbon projects designed based on or influenced by the results of the demonstration projects and the low carbon city plans by EOP: 5 projects; 63% Activities: Nakhon Ratchasima, completed by 85% 1. Energy saving for the household sector; completed by 100% 2. Energy efficiency in the city waterworks system; completed by 70% 3. Low emissions building for the department stores and malls; completed by 90% 4. Damage cost study from traffic congestion in the municipality area; completed by 100% Khon Kaen, completed by 85% 1. Light Rail Transit (LRT); completed by 100% 2. Waste management; completed by 70% 3. Waste-to-Energy; completed by 100% 4. Solar roof top; completed by 100% Chiang Mai, completed 70% 1. Develop an integrated connection points between different bus routes; completed by 100% 2. Electronic common ticket for all urban transit in Chiang Mai City; completed by 40% 3. Real time tracking system via on-line application; completed by 100% 4. CCTV surveillance system; completed by 30%

		Samui, completed by 70% 1. Wastewater treatment plant installation; completed by 50% 2. Composting of organic waste in households; completed by 100% 3. Organic waste management improvement for Samui Organics Recycling Bophut Station; completed by 100% 4. Organic waste management improvement for Baan Ya Suan Pu Station; completed by 100% 5. Capacity buildings for food waste management in hotels; completed by 60% 6. Capacity buildings for internal waste management for Bangkok Airways Co., Ltd. (Samui International Airport); completed by 30%
	Outcome 2.1 Achievement Rating: Moderately Satisfactory (MS)	Total amount of new investment leveraged through local plans of participating cities for low carbon projects: USD105.32; completed by 658% No. of new policies facilitating low carbon investments in cities endorsed and approved by line agencies: no progress; completed by 0% No of guidelines on international and national sources of climate finance in Thai prepared and published: the indicator and target had not been updated although the activities were updated; completed by 100% for activities. The output was not on target to be achieved. No. of low carbon urban development projects that are financially assisted by government supported, or government-endorsed private sector, financing schemes in the 4 cities: no progress; completed by 0% No. of policy recommendations facilitating low carbon investments in cities prepared, submitted and endorsed/approved by line agencies and reported to NCCC: no progress; completed by 0% T-VER scheme fully operational: The indicator "T-VER scheme fully operational is not appropriate for Output 2.1.2, but for Output 2.1.3 No. of projects from the participating cities under the t-VER scheme: no progress; completed by 0% No. of cities which have provided inputs to the preparation of national NAMAs: no progress; completed by 0% No. of MRV frameworks for specific sectors in the 4 cities developed and institutionalized: 4 cities; completed by 100% No. of trained officers who are actively involved in low carbon planning/decision making/approving/project implementation: more than 40 officers; completed by 100% No. of trained private sector investors/practitioners actively involved in designing, financing and implementation of low carbon projects in cities: more than 115 officers and private sector investors; completed by 100% No. of cities that are officially members of the LCC Network; around 20; completed by 80% No. of national and international events in which the results of the project and experiences of cities on low carbon

		investments have been shared: more than 2 per year; completed by 100% No. of communication products on successful low carbon investments and activities in cities disseminated: no progress; completed by 100% No. of lessons learned reports/best practice examples published: no progress; completed by 100% No. of infographics/video/audio clips prepared, produced and disseminated for modern (social) media and community radio: no progress; completed by 100% No. of audience reached with awareness campaigns in cities: no progress; completed by 100%
Project Implementation & Adaptive Management	Satisfactory (S)	PB was an effective organization of the management arrangements for the Project in general and the PMU was an effective unit to undertake the daily activities of the Project. UNDP CO supported the project implementation with its own resources and expertise. The Annual Work Plans (AWPs) for the years 2017-2019 were found realistic with sufficiently detailed narrative description of planned interventions and contained information on financial inputs earmarked for each of the planned activities. However, the delay in approval caused unsatisfactory procurement and disbursement, thus delaying the timely delivery of project outputs in some cases. The existing financial controls for disbursement of the GEF and UNDP funds were sufficient and the project finance has been managed well by the implementing partner. However, the Project faced challenges related to the gap between amount of co-financing committed, actual contributions, and delay in co-finance. The Project performance monitoring and evaluation was conducted at three levels in line with the UNDP Programme and Operations Policies and Procedures (POPP) and the UNDP Evaluation Policy during the project period. The stakeholder consultations took place during the formulation and implementation stages of the Project funded by GEF although stakeholder engagement normally involved in long term process of discussions and consultations. The reporting of the project followed the monitoring and evaluations plans in the project document and the progress tracker, annual reports, PB reports were all being completed at the appropriate stages. Communication among the core stakeholder groups was extensive, particularly in the first year of the implementation.
Sustainability	Moderately Likely (ML)	The project is generally sustainable from the financial, socio-economic, institutional and environmental points of view. However, the Project faces certain financial risk to sustainability as some subprojects have difficulty in securing financial resources. The Project also faces certain

		environmental risk to sustainability because of second GHG emission caused by west to energy projects.

Conclusions

The analysis of the findings resulted in the following core conclusions:

Conclusion 1: The project goal was well designed and fully aligned with the GEF priority focus, UNPAF for Thailand and the national policies and priorities in the areas of low carbon and climate resilient society, while also addressing some of the critical barriers related to low carbon development in cities that were initially identified for Thailand. The Project has been able to provide assistance to TGO and Municipalities by addressing the most urgent needs of the capacities and processes of a local level bottom-up integrated low carbon development planning, implementation and sustainable management of low carbon development projects.

Conclusion 2: The Project LF did not provide a good tool for M&E and implementation. The LF was not well equipped with clearly logical chains from activities to outputs, to outcomes and to objective/goal particularly for Component 1.2 (Outcome 1.2). Some indicators in the Project LF were not sufficient or adequate in many cases to measure the progress or verify the achievements for some outcomes. Other indicators in the Project LF were not even appropriate for monitoring the goal/objective in practice.

Conclusion 3: The Project has made contributions to achieving low carbon growth in cities through sustainable urban systems management in Thailand. Nevertheless, many of the most important outputs/outcomes that have been achieved by the Project need to be finalized and fully implemented by TGO and municipalities and additional resources need to be provided for the Project during next phase of the Project period.

Conclusion 4: A 4-year project timeframe might be too short (4-year duration for municipal urban development plan). It does not provide enough time contingency for risks related to changing environmental, political and economic conditions, and does not provide enough time to realize the project achievements of outcomes before the Project is completed.

Conclusion 5: The Project has successfully implemented a number of activities leading to achievement of targets for many outputs/outcomes. These achievements also contributed to sustainable urban systems management changes beyond planned benefits (e.g. solar roof plus LED replacement, separation of solid waste and others).

Conclusion 6: The Project Board and Project Management Unit were well-functioning to serve as an executive and implementing body respectively during the project implementation. The Project Board provided a strategic direction and management guidance for the project while PMU managed daily activities implementation. UNDP, GEF and TGO are found to be adaptive and responsive partners. UNDP long-term presence and partnership with MONRE and other ministries, technical capacities of the staff and strong accountability for results were recognized as the crucial elements for successful implementation of the Project.

Conclusion 7: The Annual Work Plans (AWPs) during the implementation were considered realistic with sufficiently detailed narrative descriptions of planned activities. They also contained information on financial inputs earmarked for each of the planned activities. However, the Project has not been as efficient as expected as delay in approval by municipalities and UNDP led to unsatisfactory procurement and disbursement, thus delaying the timely delivery of project outputs in most cases. In spite of this, the Project can be completed on schedule due to catch up in the later stage of the project life span.

Conclusion 8: The existing financial controls for disbursement of the GEF and UNDP funds were sufficient, and the project finance is managed well by the implementing partner. However, the Project faced challenges related to realized co-financing contributions against the sizable commitment and delay in co-financing.

Conclusion 9: Although the Project established a well M&E system, particularly Performance Management Plan 2017-2021 in addition to LF, quarterly progress report, and PIR, the Project activities and results were some time difficult to be monitored and evaluated probably due to poor logical chain from activities, to outputs, outcomes, and to objective/goal, unique indicator (GHG emission reduction) and unrealistic targets for subprojects for the municipalities and the overall Project.

Conclusion 10: Although the Project stakeholders were identified and consulted during the design phase, responsiveness and alignment with the development demand and priorities of national partner is among the most important factors that have contributed to the results achieved. However, stakeholder engagement normally involved in long term process of discussion and consultations as different stakeholders have different objectives and priorities, which caused further delay in project implementation.

Conclusion 11: Despite that local municipalities have made sizeable co-financing commitments to the Project and a large portion of the commitments has not been realized at the MTR stage, this will definitely result in a financial risk to Project sustainability. In the same time, second GHG emission because of the project might create environmental risk to the Project sustainability due to unintended CO_2 emission caused by plastic content in the waste-to-energy facilities.

Recommendations

The recommendations based on the findings are given below:

Recommendation 1: A good PLF design always results in a good implementation, which in turn results in good project outcomes. The Project should update the LF by taking into account the chain between activities, outputs and outcome and also the chain between the results, targets and indicators as these two logical chains provide a powerful instrument for managing and monitoring the project implementation. More importantly, any updates on outcomes, outputs and activities should take into account the indicators and targets at the same time, vice versa.

Recommendation 2: The Project should use the consistent methodology to estimate the GHG emission reduction for both target and performance evaluation purposes. The Project should use the traditional approach based on some assumptions to verify and estimate the actual GHG emission reduction for GEF. In the same time, the Project should also utilize ERM service to re-estimate the goal of GHG emission reduction and distribute total amount of emission reduction among subprojects in four municipalities based on the activities undertaken and the total target.

Recommendation 3: The Project should update the first two indicators and targets of the objective. The Project can delete the existing first two indicators and targets as the two indicators do not provide consistent measurement. Alternatively, the Project can re-design the indicators of the objective by three sector: waste management, transport and energy. In addition, the targets of objective by sector should be consistent with the target of goal.

Recommendation 4: The Project should work on the gap after the end of MTR so as to enhance

the effectiveness of the Project. In particular, the Project should give high priority to the key outputs that have been delivered but have not yet been implemented in order to enhance the impact of the subprojects, particularly

- Electronic Common Ticket for all urban transit, Chiang Mai;
- Real time tracking system via on-line application, Chiang Mai;
- Organic Waste Management Improvement for Samui Organics Recycling Bophut Station, Samui;
- Organic Waste Management Improvement for Baan Ya Suan Pu Station, Samui;
- Energy saving for the household sector, Nakhon Ratchasima;
- Low emissions building for the department stores and malls, Nakhon Ratchasima;
- Damage cost study from traffic congestion in the municipality area, Nakhon Ratchasima; and
- Light Rail Transit (LRT), Khon Kean.

Recommendation 5: The Project should move the first general indicator and target of Outcome 2.1 to Outcome 1.2 as total amount of new investment leveraged through local plans of participating cities for low carbon projects by EOP is closely associated with the investment in the subprojects in 4 municipalities under Outcome 1.2. Further, the Project should re-design the indicators and target for Output 1.2 2 through Output 1.2.5 (subprojects in 4 municipalities) as the related activities have been updated.

Recommendation 6: The Project should update output 2.1.1 and associated indicator and target as the activity has been updated. As the first general indicator and target has been moved to Outcome 1.2, the remaining activities under Outcome 2.1 can be re-grouped into a component called “Capacity Building”. In addition, the Project should update the name of Outcome 2.1 and related indicators and target.

Recommendation 7: The implementation of the Project after the MTR should take into account the AWP so as to ensure that the level of resourcing and implementation timeframe are better aligned with the objectives and scope of the Project. Also, the Project should install a Project Management System by incorporating project accounting, procurement, asset management, and grant disbursement. The system should be connected to local municipality and UNDP to avoid delay in reconciliation and approval.

Recommendation 8: The Project should change the methodology for co-financing from an official co-financing letters provided to PMU to an innovative leveraged investment approach, where the actually realized co-financing contributions against the sizable commitment should be provided before the actual disbursement of GEF funds.

Recommendation 9: In addition to the target of GHG emission reduction for the Project and the subprojects in 4 municipalities, the Project should design a set of indicator and target for 6 activities in Samui, and 4 activities in Chang Mai, Khon Kaen Nakhon Ratchasima respectively. For 4 activities in Chiang Mai as an example, no. of passengers in the public (integrated) transport system might be a good indicator to avoid small incremental low carbon benefits during the project life. Other indicators can be designed for the Light Rail Transit (LRT) in Khon Kaen to avoid no benefits from emission reduction before the end of the Project.

1 INTRODUCTION

1.1 Purpose of MTR and Objectives

1. "Achieving Low Carbon Growth in Cities through Sustainable Urban Systems Management in Thailand (PIM 4778)" is a project implemented by Thailand Greenhouse Gas Management Organisation (TGO), Ministry of Natural Resources and Environment (MONRE) – Government of Thailand and supported by UNDP with 4-year lifespan.

2. The Project started in 26 April 2017 with donor funding of US$3,150,000 from GEF, $300,000 from UNDP, $400,000 from TGO, and 182,001,010 from local Government of Thailand. The Project Document (PD) was signed on 26 April 2017 and the project has a planned end date on April 2021.

3. As outlined in the UNDP/GEF project monitoring and evaluation (M&E) policies and procedures, all GEF-financed full-sized projects are required to undergo a Mid-term Review (MTR) at the mid of project implementation, which constitutes an important part of the GEF projects' monitoring and evaluation plan. MTR is primarily a monitoring tool to identify challenges and take corrective measures to ensure that a project is on track to achieve expected results at the end of the project.

4. The MTR was undertaken in line with Guidance for Conducting Midterm Review of UNDP-Supported, GEF-Financed Projects. The MTR was also conducted by following the United Nations Evaluation Group (UNEG) Ethical Guidelines for Evaluators in 2008 and the United Nations Universal Declaration of Human Rights, in particular being sensitive to and addressing issues of discrimination and gender equality. This MTR reports the key findings, conclusions and recommendations.

5. The overall objective of this MTR was to assess the progress towards the achievement of the project objectives and outcomes, and assess early signs of project success or failure with the goal of identifying the necessary changes to be made in order to set the project on-track to achieve its intended results. The MTR also reviewed the project's strategy, implementation and adaptive management, and risks to sustainability.[1]

1.2 Scope and Methodology

6. The scope of the MTR covered the following four categories of project progress as indicated in the Terms of Reference in Annex 1:

- Project strategy, including project design and results framework/log frame (LF);
- Progress towards results, including progress towards outcomes analysis and remaining barriers to achieving the project objectives. progress towards outcomes analysis; particularly the following:

[1] During the MTR mission, the COVID-19 outbreak started to affect social and economic activities in some countries. When the MTR report was about to be submitted, the outbreak has become a global pandemic which virtually halted the implementation of all activities in the four cities in Thailand as local authorities have focused mainly on the COVID response. This might have an impact on the timely delivery of the project's final results.

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

- Project implementation and adaptive management, including management arrangements, work planning, finance and co-finance, project-level monitoring and evaluation systems, stakeholder engagement, reporting, and communications.
- Sustainability, including financial risks to sustainability, socio-economic risks to sustainability, institutional framework and governance risks to sustainability, and environmental risks to sustainability.

7. The MTR employed a mixed approach of methodologies, which included desk review, semi-structured interviews with a variety of stakeholders, country visits, debriefing, and meta-analysis of existing evaluations. The consultants (i.e., MTR Team) assessed the Project against the criteria of project strategy, progress towards results, project implementation and adaptive management, and sustainability. The consultants conducted the evaluation based on the evidence-based information that was credible, reliable and useful. The consultants adopted a participatory and consultative approach ensuring close involvement with the project team, UNDP country officers, other major stakeholders, such as Thailand Greenhouse Gas Management Organisation (TGO), Ministry of Natural Resources and Environment (MONRE) and other line agencies of government in Thailand, and 4 municipalities as presented in Annex 4. The consultants reviewed all relevant documents (Annex 5), such as quarterly reports, annual project reports (PIR), project budget and actual financial data, project files, technical reports, national strategic and legal documents, and any other materials that the consultants considered useful to an evidence-based assessment.

8. As shown in Annex 6, the consultants travelled to Bangkok, and 4 municipalities in Thailand from 27 January to 7 February 2020, during which the interviews were conducted with the stakeholders as listed in Annex 4. The first meeting on arrival was with the project team who had been working on the Project since the beginning of the Project in April 2017. During the meeting, the project team briefed consultants the following issues:

- Project design and implementation;
- Project components/outcome and outputs;
- Project activities and achievements;
- Performance indicators and targets;
- Adaptation to changes;
- Finance and Co-finance; and
- Risks to sustainability.

9. A list of evaluation questions was designed by following Annex 2 in the Terms of Reference and delivered to some stakeholders in advance of interviews through email to allow them to prepare if they wished. All responses were treated with strict confidentiality. This list of the evaluation questions was used as a general guide and the actual interviews were semi-structured and flexible depending on their positions and role in the Project. Only parts of the questions were asked for each interview. The follow-up questions might be asked depending how the questions

were answered.

10. The meta-analysis was utilized to broaden the information available from various sources and to crosscheck for similarities and differences in approaches. The meta-analysis included a review of project/program evaluations conducted by the Evaluation Office of UNDP between 2015 and 2019.

11. The consultants assessed the project results based on the parameters in the Project Logical Framework (LF), including Project objectives, indicators and targets. The consultants used a rating system with the rating scales in Annex 3.

1.3 Structure of MTR Report

12. This MTR report is organized as follows. Part 1 provides an overview of the evaluation objectives, scopes and methodology. Part 2 provides a description of the country and the project context. Part 3 presents the main findings which consist of project strategy; progress toward results, project Implementation and adaptive management, and sustainability. Part 4 summarizes the major conclusions. Part 5 provides a set of recommendations for the consideration of project stakeholders.

2 PROJECT DESCRIPTIONS AND BACKGROUD CONTEXT

2.1 Development Context

13. Thailand is a newly industrialized country located in Southeast Asia with a population of 68 million in 2018, among which more than one third live in cities with 1.8% urbanization rate per year. In 2018, Thailand had a GDP of 16.316 trillion baht (US$504.9 billion), the 8th largest economy in Asia based on the World Bank. Thailand has achieved a steady GDP growth since 2014: 3.4%, 4%, 4.1% and 2.6% respectively for 2016 through 2019. Currently, Thailand's economic fundamentals are sound, with low inflation, low unemployment, and reasonable public and external debt levels.

14. Although Thailand has enjoyed steady economic growth, population increase, and urbanization in recent years, GHG emissions have increased for last decades and are expected to rise in the future. Based on the World Resource Institute (2016), Thailand emitted 375.70 MtCO2e/yr in 2012, accounting for 0.8% of the global greenhouse gas emission. Among the total emission, energy, waste and transport were considered as the three out of 5 major sectors in Thailand between 1990 and 2010.

15. To address the challenges of the increasing GHG emissions as a result of economic growth, population increase, and urbanisation, the Royal Government of Thailand (RTG) has established the institutional capacities and strategic plans to support the move towards a low carbon and climate resilient society. In particular, RTG set up the National Climate Change Committee (NCCC) in 2006 and Thailand Greenhouse Gas Management Organization (Public Organization, TGO) in 2007. It also integrated Low Carbon Developments and Green Growth in Thailand into the 11th National Development Plan (2012-2016) and the Thailand Climate Change Master Plan

(2012-2050). At COP2016, RTG established a GHG emission reduction target: "Thailand will, on a voluntary basis, reduce its GHG emissions in the range of 7%-20% below the business as usual (BAU) in 2020.

16. Although RTG has taken important measures to facilitate this move, it found it difficult to realize GHG emission targets without involvement of municipalities as a large share of the population lives in cities currently and in the future. The amount of carbon emission reduction contributed by cities is huge since there are 2,283 cities/municipalities in the county. Further, the effectiveness of urban systems management within their geographic constituencies, cities/municipalities in reducing GHG emissions will be enhanced by integrating low carbon and sustainability into the urban development planning.

17. Established in 1990, Global Environment Fund (GEF) is a private equity fund to support high-growth clean energy, energy and resource efficiency, environmental, and sustainable natural resource management industries across the world. It provides financial resource for innovative businesses that deploy proven technologies, products and services that incrementally make the world economy run with less energy, utilize fewer raw materials, promote improved environmental quality and more efficient use of natural resources.

18. In response to these challenges and in support of 12th National Economic and Social Development Plan, under joint financial resources from the GEF, UNDP and Government, Achieving Low Carbon Growth in Cities through Sustainable Urban Systems Management in Thailand (the Project) was developed and approved by UNDP in 2017.

2.2 Project Descriptions

2.2.1 Problems Addressed by the Project

19. In 2016, Thailand faced the following problems and barrier related to slow carbon development in cities as shown in the Project Document (PD):

- Lack of awareness on climate change and benefits of low carbon sustainable systems by citizens and government officials at the local level.
- Lack of capacity to plan, design, implement and manage sustainable development solutions.
- Limited sharing of lessons learned in low carbon development between the cities and with other countries.
- Limited bottom up and inclusive development planning and involvement of stakeholders during planning as well as implementation of low carbon urban UNDP Environmental Finance Services systems.
- Lack of implementation after preparation of a plan.
- Lack of cooperation across sectors &jurisdiction.
- Lack of data in cities which can support planning, policy making and monitoring of progress.
- Local politics in implementation of local policies and investment decisions.
- Difficulties accessing financial support; and
- social resistance to local waste management projects.

20. The Project aims to strengthen the capacities and processes at local level for bottom-up integrated low carbon development planning and the implementation and sustainable management of low carbon development projects by addressing the barrier above. In particular, the Project concentrates on these three low carbon urban systems, i.e. waste management, energy efficiency and sustainable transport, in 4 pilot municipalities/cities.

2.2.2 Project Goal/Objective, Outcomes, and Outputs

21. The goal of the Project is reduction of future GHG emissions from cities in Thailand. The objective of the Project is promotion of sustainable urban systems management in Chiang Mai, Khon Kaen, Nakorn Ratchasima, and Samui to achieve low carbon growth. The Project has the following 3 components:

Component 1.1: Low carbon sustainable urban development planning in selected cities
Component 1.2: Low carbon investment in selected cities
Component 2.1: Financial incentives and institutional arrangement in support of low carbon Initiatives

22. The Project has the following respective outcomes and outputs:

Outcome 1.1: Increased number of Thai cities that have formulated and implemented low carbon sustainable urban development plans
- Output 1.1.1: GHG inventory for each of the project cities
- Output 1.1.2: Formulated integrated low carbon urban development and action plan in each of the project cities
- Output 1.1.3: Formulated and implemented monitoring frameworks for waste management activities in cities

Outcome 1.2: Increased number of Thai cities with energy efficient urban systems
- Output 1.2.1: Operational low carbon urban waste management and sustainable transport systems in Khon Kaen
- Output 1.2.2: Operational low carbon urban waste management and sustainable transport systems in Nakhon Ratchasima
- Output 1.2.3: Operation low carbon urban waste management and sustainable transport system in Chiang Mai1
- Output 1.2.4: Operation low carbon urban waste management and sustainable transport system in Samui

Outcome 2.1: Increased volume of investments in energy efficient urban systems by government and private sector
- Output 2.1.1: Completed analysis on existing and forthcoming options on financial incentive schemes, both domestic and international including carbon offset initiatives
- Output 2.1.2: Financial incentives and institutional arrangement to replicate low-carbon urban development
- Output 2.1.3: A cadre of qualified technical specialists in the local governments of Thai cities capable of working with market mechanisms for mitigation efforts and accessing funds

for climate change mitigation.

Output 2.1.4: Developed and operational monitoring, reporting and verification system for public offset

Output 2.1.5: Designed, developed and conducted training course on low carbon cities

Output 2.1.6: Expanded and improved low carbon cities network

Output 2.1.7 Designed, developed and implemented awareness campaign on climate change and low carbon developments

23. The activities and associated outputs related to each component/outcome of the Project were originally summarized in PD and updated in Table 1-5 in Performance Management Plan.

2.2.3 Project Plementation Arrangements

24. An overview of the Project management arrangement is illustrated in Figure 1.

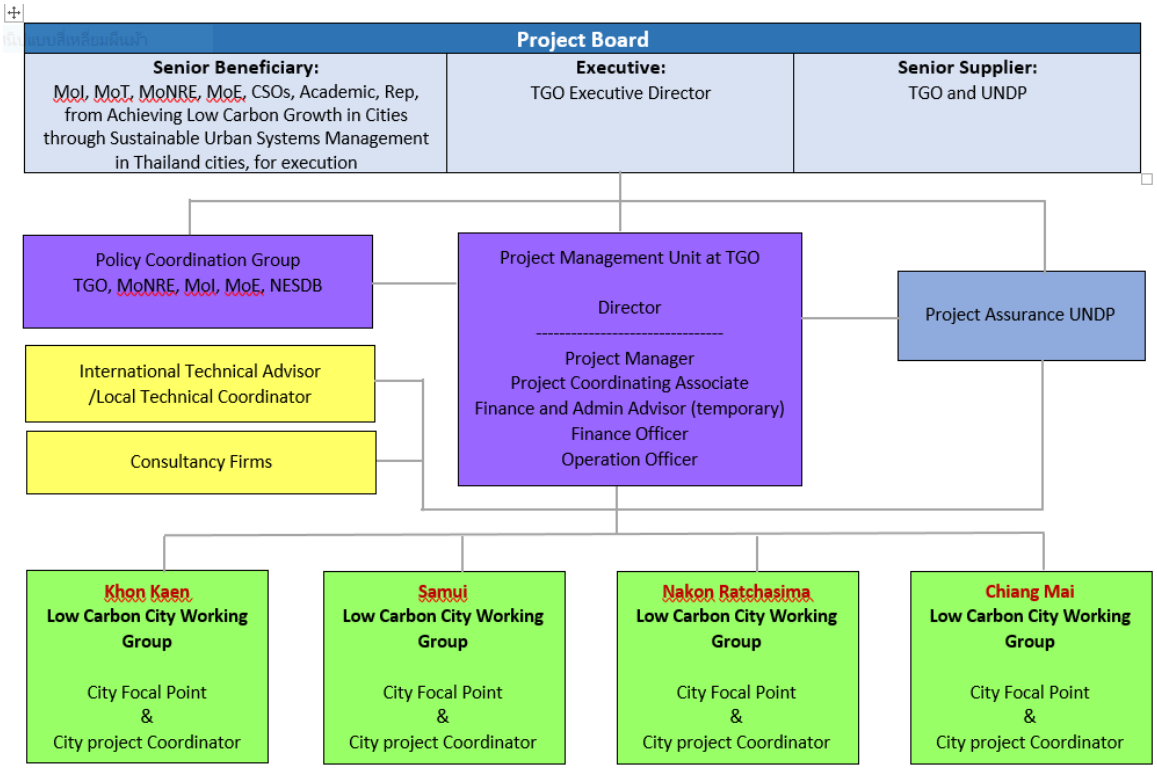


Figure 1 Project management structure

25. The Project is fully implemented by Thailand Greenhouse Gas Management Organisation (TGO), under the Ministry of Natural Resources and Environment. The implementation was collaborated with 4 municipalities/cities: Chiang Mai, Khon Kaen, Nakhon Ratchasima and Samui. The implementation was undertaken through the National Implementation Modality (NIM).

26. The technical oversight support for the Project is provided by the United Nations Development Programme Thailand Country Office (UNDP CO) based in Bangkok. The UNDP CO team works closely with TGO to oversee the project implementation. Support provided included project oversight, policy advice, technical support, administrative support and quality control.

27. The project team consists of a full-time Project Manager, a Project Coordinator and an Administrative Assistant. The project manager reported directly to Project Board (PB)/TGO and UNDP.

3 FINDINGS

28. The major findings from the MTR of the Project are presented below.

3.1 Project Strategy

3.1.1 Project Design

29. The consultants assessed whether the project strategy was proving to be effective in reaching the desired results though project design and LF. The consultants conducted an assessment of the project design as outlined in the Project Document. In doing so, the consultants judged the extent to which the project addressed country priorities and was country driven. Furthermore, the consultants assessed the extent to which the project objectives were consistent with the priorities and objectives of the GEF.

30. The Project was relevant, appropriate and strategic to national goals. It provided the government with additional resources to promote sustainable urban systems management in selected cities to achieve low carbon growth. The Project was aligned with one of the pillars in the 12th National Economic and Social Development Plan (2017-2021), which called for moving Thailand towards a low carbon and climate resilient society that is environmentally friendly.

31. The project was also linked with the officially announced GHG emission reduction targets of Thailand. The project concept derived from national priorities to strengthen these areas. The Project was formulated based on a detailed review of barriers, issues, emission reduction gaps and priorities. The outputs produced by the Project, such as reduction of GHG emission, etc., met the targets of Thailand.

32. The Project was highly relevant to the GEF' objectives, which was to support high-growth clean energy, energy and resource efficiency, environmental, and sustainable natural resource management industries across the world. The Project was part of a set of supporting areas funded by the GEF under the strategic approach to investing for development.

33. The Project supports the low carbon development that aimed at contributing to sustainable development and climate & disaster resilience, which were in line with the UNDP's objectives and UNDAF for Thailand. As part of its country projects, UNDP supports Government of Thailand to meet its obligations for low carbon urban plan formulation by providing technical support and capital assistance.

3.1.2 Result Framework/Project Logframe

34. The Project Results Framework (RF)/Log Frame (LF) during the design phase, as originally presented in PD, provided a detailed set of goal/objective, outcomes, outputs, but not

activities; and a detailed set of indicators and targets (but not at output level). The goal/objective, outcomes, outputs, and activities; and indicators and targets in the LF were updated in 1.4 in Performance Management Plan. The LF was a useful tool to support the successful management, monitoring and reporting of project implementation.

35. In principle, the LF provides a logical chain, i.e. from activities to outputs, to outcomes and to objectives/goals. The LF is used to implement the planned activities so as to achieve a set of expected outputs, which contribute to achieving a set of expected outcomes, which in turn contribute to realizing the overall objective of the Project. The design of the LF generally but not specifically responded to these barriers that were initially identified as discussed in Section 2.2.1.

36. The PLF provided a good logical chain for Component/Outcome 1.1 and 1.2, but not for Component/Outcome 2.1. As shown in Table 1, most activities were not directly connected to the respective outputs. In addition, most of original 7 outputs did not directly contribute to Outcome 2.1. In contrast, only first two outputs were associated with Component 2.1 (rather Outcome 2.1).

37. Further, although Activity 2.1.1 was updated, Output 2.1.1 has not been updated under outcome 2.1. In the same time, the indicator and target under output 2.1.1 has not been updated.

Table 1: Component/Outcome 2.1

Outcome 2.1	Outputs	Updated Outputs	Activities
Outcome 2.1: Increased volume of investments in energy efficient urban systems by government and			
	Output 2.1.1: Completed analysis on existing and forthcoming options on financial incentive schemes, both domestic and international including carbon offset initiatives	**A study on private sector involvement in low carbon city initiative**	**Activity 2.1.1 A study on decoding a new city development innovative to support low carbon city initiative** - Preparation of an analysis of national and international sources of financial and technological support for low carbon developments in cities in Thailand - Preparation of guidance for financing options
	Output 2.1.2: Financial incentives and institutional arrangement to replicate low-carbon urban development		**Activity 2.1.2 Recommend policy facilitating low carbon investments in cities** - Design of financing scheme(s), institutional setting and implementation mechanisms for low carbon initiatives in cities - Analysis of the institutional/legal arrangements at city levelto identifywhether they contain barriers and/or provide sufficient incentives forlocal officials to take low carbon actions
	Output 2.1.3: A cadre of qualified technical specialists in the local governments of Thai cities capable of working with market mechanisms for mitigation efforts and accessing funds for climate change mitigation		**Activity 2.1.3 Support the selected 4 projects to participate in T-VER or LESS and training** '- Conduct of capacity assessment - Conduct of capacity development training courses - Conduct on-the-job technical advisory services (coaching) to city staff - Preparation of documents for accessing the Environmental Fund, T-VER and other mechanisms - Development of sectoral NAMAs - Cities will provide inputs to the NAMA process in Thailand via TGO and relevant line ministries to ONEP. - Impact assessment of capacity development interventions
	Output 2.1.4: Developed and operational monitoring, reporting and verification system for public offset		**Activity 2.1.4 Third party assurance on project results (compare against the results framework)** '- Capacity building on urban waste management - Establishment of a working group on MRV in each city - Establishment of an MRV framework for the waste management sector - Development of a guidance note on MRV at the local level - Formulation of MRV protocols for eachwaste management demo project - Impact assessment of capacity development interventions
	Output 2.1.5: Designed, developed and conducted training course on Low Carbon Cities		**Activity 2.1.5 Develop LCC planning curriculum and provide trainings on low carbon cities for 4 cities** - Conduct of training needs assessments - Preparation of a "Low Carbon Cities" training course and development of a curriculum for the course - Conduct of trail runs for "low Carbon Cities" training course - Conduct of "Low Carbon Cities" training program - Identification of good practice examples internationally and nationally
	Output 2.1.6: Expanded and improved Low Carbon Cities Network		**Activity 2.1.6 (A) Develop te LCC network strengthening strategy and execute the proposed activities** **Activity 2.1.6 (B) Organize national and international events in collaboration with CITC** - Design and conduct of the Low Carbon Cities Network (LCCN) outreach program - Organization and conduct of LCCN meetings for cities to share experiences on low carbon activities - Design and implementation of information sharing scheme - Development of a LCCN sustainable follow-up program
	Output 2.1.7:Designed, developed and implemented awareness campaign on climate change and low carbon developments		**Activity 2.1.7 Awarness raising on low carbon city Promote replication of low carbon cities in other cities** - Preparation of a Communication Strategy and Action Plan - Preparation and dissemination of knowledge products for practitioners and decision-makers in cities - Dissemination of lessons-learned and documentation of best practices (national and international)

38. The LF also included a set of indicators with baseline and target values to be achieved by the end of the Project for each component/outcome. These indicators and targets were used to monitor the performance of the Project. In general, the indicators and targets in the LF were not well designed.

39. For goal as an example, cumulative direct GHG emission reductions resulting from the technical assistance and investments by end-of-project (tCO2 eq.) was a good indicator. However, in practice, (i) some components might not generate cumulative direct GHG emission reductions resulting from the technical assistance and investments during the project period. For LTR in Khon Kaen as an example, the subproject might not be completed by the end of the Project due to lack of sources of funds. (ii) Cumulative direct GHG emission reductions might have already been achieved without the technical assistance and investments of the Project. For 4 subprojects in Chiang Mai as an example, most GHG emission reductions had already been achieved even before the Project started as the technical assistance and investments only contributed to marginal GHG emission reductions.

40. Further, 177,708 (182,000 updated) tCO2 eq. was considered as an unrealistic target for goal as the amount of realized cumulative direct GHG emission reductions resulting from the technical assistance and investments was significantly lower than this figure up to the end of 2019 and even by the end of the Project. First of all, 177,708 tCO2 eq was overestimated as it did not take into account the project life (from 27 April 2017 to 27 April 2021). Second, original target during project design was estimated with a traditional approach that relied mainly on assumptions rather scientific methodology while the actual amount of GHG emission reductions was estimated with ERM approach that was part of the Project.[2]

41. For Project objective, there were three targets: (i) cumulative direct fuel savings resulting from the technical assistance and investments in the transport sector in the 4 participating cities by EOP (GJ): 788,093; (ii) annual amount of waste gainfully used (recycled, composted, anaerobically digested or for waste to- energy) in the 4 participating cities by EOP (tonnes/year): 389,352; and (iii) total number of new green jobs created in the waste management sector and sustainable transport sector in the cities by EOP: 40. The first two indicators and targets were not appropriate for the Project objective. First, similar to goal, whether the first two targets were achieved depend on the timing (project period) and the methodologies used during the design and implementation phases. Second, the first two indicators were a duplication of the indicator of Project goal as fuel savings and annual amount of waste gainfully used were also used to estimate the GHG emission reduction. If the methodologies used to convert fuel savings and amount of waste gainfully used to GHG were different, the two set of targets (tCO2 eq and GJ) might complicate the performance evaluation.

42. Further, the cumulative direct fuel savings and amount of waste gainfully used resulting from the technical assistance and investments were originally designed for transport sector and waste management sectors respectively. As indicated in the Inception Report, the Project activities

[2] The methodology and parameters rely on both national and international standards (i.e. City Carbon Footprint (CCF) used by TGO and 2006 IPCC Guideline for National Greenhouse Gas Inventories).

have been updated or replaced. The indicators of the Project objectives should cover three sectors: energy sector in addition to transport and waste management sectors.

43. Finally, the targets for the first two indicators could not be used to measure and monitor the performance as the activities (subprojects) in 4 municipalities have been updated since the project design and even since the inception phase.

44. For the third indicator and target, the proposed indicator is suitable for the Project. However, total number of new green jobs created should not be limited to the waste management and transport sectors. As the Project activities have been updated, the indicator and target should cover all sectors in the Project.

45. Similar to goal and objective above, some indicators and targets were not appropriate for the outcomes. For example, for the first indicator and target under Output 1.1.1, although the target was appropriate, the indicator lacked energy sector. The indicator and target under Output 1.1.2 duplicated with the fist general indicator and target under Outcome 1. The indicator and target under 1.1.3 were appropriate, the indicator lack the monitoring plans for transport and energy sector/facilities.

46. For Output 1.2.1 through 1.2.4 in Table 2, as most activities have been substituted or updated, the indicators and targets have been out-of-dated and could not be used any more.

47. The indicators and targets for Outcome 2.1 were not the good parameters for measurement and monitoring in practice. The first indicator and target under Outcome 2.1 (Total amount of new investment leveraged through local plans of participating cities for low carbon projects by EOP, $16 million) were not well designed since they were not directly related to the activities. In other word, most activities under Outcome 2.1 were studies (not projects), which would not produce quantified output and amount of new investment directly.

Table 2: Component/Outcome 1.2

Outcome 1.2	Outputs	Updated Outputs	Activities	Indicators1	Baseline	Targets1
Outcome 1.2: Increased number of Thai cities with energy efficient urban systems				**No. of low carbon demonstration projects implemented as a result of technical and investment assistance in participating cities by EOP**	**0**	**19**
	Output 1.2.1: Operational low carbon urban waste management and sustainable transport systems in KhonKaen		**Activity 1.2.1: Low carbon demonstration projects in Khon Kaen** - Review of feasibility analysis and establishment of baseline and performance targets of each of the 6 demonstrations - Evaluation of logistical, safety, administrative, and legal requirements for the sustainable urban projects - Facilitation of the successful implementation of the urban waste management and sustainable transport demonstrations - Conduct of stakeholder consultations with all stakeholders involved, including government agencies at city-level and regional level, private sector, civil society, academic institutions and communities - Development of the engineering design and implementation plan (including financial plan) of the demonstrations - GEF supported technical assistance - Implementation of the urban systems demonstrations - Operation and performance evaluation of each urban system demonstrations - Demonstration results presentation and follow-up planning	Average daily quantity of organic waste composted in the central composting plant, tonnes	2	20
				No. of operating decentralized composting units (5 plants of 1 tonne per day)	0	5
				Average monthly quantity of waste recycled, tonnes	1900	2200
				Daily no. of cyclists utilizing the 4.8 km bikeway	0	200
				Average speed of vehicles in the roads where the traffic	15	17
				Annual amount of electricity produced by WTE plant (MWh/year)	0	21000
				Daily number of passengers using the shuttle bus system (in preparation of BRT)	0	8000
	Output 1.2.2: Operational low carbon urban waste management and sustainable transport systems in Nakorn Ratchasima		**Activity 1.2.2: Low carbon demonstration projects in Nakhon Ratchasima** - Review of feasibility analysis and establishment of baseline and performancetargets of eachof the 5 demonstrations - Evaluation of logistical, safety, administrative, and legal requirements for the 5 sustainable urban projects - Facilitation of the successful implementation of the 5 urban waste management and sustainable transport demonstrations - Conduct of stakeholder consultations with all stakeholders involved, including government agencies at city-level and regional level, private sector, civil society, academic institutions and communities - Development of the engineering design and implementation plan (including financial plan) of the demonstrations - Additionally, GEF funding will be used to provide technical assistance in (a) the evaluation and determination of best-available-technologies (BAT) for the WTE; Technical assistance in the design, engineering, implementation and (financial) planning of the other demonstration projects will be consideredif needed. - Implementation of the 5 urban systems demonstrations - Operation and performance evaluation of each urban system demonstration - Demonstration results presentation and follow-up planning	Average daily quantity of organic waste digested by the AD plant,	10	80
				Average monthly quantity of waste recycled, tonnes	750	1,150
				Annual amount of electricity produced by WTE plant (MWh/year)	0	21,000
				No. of existing bus routes changed as part of the bus rerouting	0	13
				Average traffic speed in the area where traffic area management pilot will be implemented, kph	15	18
	Output 1.2.3: Operational low carbon urban (waste management and sustainable transport)systems in Klaeng	**Operation low carbon urban waste management and sustainable transport system in Chiang Mai**	**Activity 1.2.3: Low carbon demonstration projects in Chiang Mai** - Review of feasibility analysis and establishment of baseline and performancetargets of eachof the 4 demonstrations - Facilitation of the successful implementation of the 4 urban system demonstrations - Conduct of stakeholder consultations with all stakeholders involved, including government agencies at city-level and regional level, private sector, civil society, academic institutions and communities - Development of the engineering design and implementation plan (including financial plan) of the demonstrations - Implementation of the 4 urban systems demonstrations - Operation and performance evaluation of each of the 4 urban system demonstrations - Demonstration results presentation and follow-up planning	Average monthly quantity of waste recycled, tonnes	11	31
				Total daily number of passengers using the shuttle bus system	400	1,500
				Annual volume of water distributed (m3)	288,000	576,000
				Daily average volume of organic waste composted by community based composting facilities, tonnes	4	10
	Output 1.2.4: Operational low carbon urban waste management and sustainable transport systems in Samui		**Activity 1.2.4: Low carbon demonstration projects in Samui** - Review of feasibility analysis and establishment of baseline and performancetargets of eachof the 4 demonstrations - Evaluation of logistical, safety, administrative, and legal requirements for the sustainable urban projects - Facilitation of the successful implementation of the 4 urban system demonstrations - Conduct of stakeholder consultations with all stakeholders involved, including government agencies at city-level and regional level, private sector, civil society, academic institutions and communities - Development of the engineering design and implementation plan (including financial plan) of the demonstrations - Implementation of the 4 urban systems demonstrations - Operation and performance evaluation of each of the 4 urban system demonstrations - Demonstration results presentation and follow-up planning	Monthly quantity of waste recycled, tonnes	715	1,315
				Daily no. of cyclists utilizing the bikeway	0	200
				Average traffic speed in areas where the traffic area management pilot (zoning for heavy trucks) will be implemented, kph	30	36

48. As shown in Table 3 from the Inception Report, the Project updated its targets and activities for Outcome 1.2 (4 municipalities). Although the updated targets for four municipalities were consistent with the target of total Project goal, they were not consistent with the original targets of Project output/outcomes (see last column in Table 2). Further, although the targets and activities for 4 municipalities were updated in Outcome 1.2, the 3-4 indicators under Outcome 1.2 in Table 2 were not updated. Therefore, the indicators and targets under Outcome 1.2 could not be used any more.

Table 3: Original and Updated Project Component/Activities and Targets for 4 Municipalities

City	List of Projects in the Project Doc	Original GHG Re (tCO2e)	List of Projects Identified Duri the Inception Phase	Updated GHG R (tCO2e)
	1. Waste Composting		1. Light Rail Transit (LRT)	
	2. Promotion of 3Rs		2. Waste Management	
	3. Waste-to-Energy		3. Waste-to-Energy	
	4. City shuttle bus		4. Solar Roof Top	
	5. Bikeway			
Khon Kaen	6. Traffic data management	76,696		100,500
	1. Promotion of 3Rs		1. Energy saving for the housel	
	2. Waste to Energy facility		2. Energy efficiency in the city	
	3. Bus re-routes		3. Low emissions building for t	
	4. Traffic data management		4. Damage cost study from tra	
Nakhon Ratchas	5. Pilot project	83,432		10,000
	1. Promotion of decentralized waste mar			
	2. Integrated waste management facility			
Koh Samui	3. Traffic zoning	16,642	1. Community waste managem	1,500
	4. Bikeway		2. Pilot community wastewater treatment plant	
	1. Waste management			
	2. City shuttle bus service			
	3. Pedestrian area			
Kleang	4. Energy efficiency	938	N/A	N/A
			1. Develop an integrated conn	
			2. Electronic Common Ticket fo	
			3. Real time tracking system vi	
Chiang Mai	N/A	N/A	4. CCTV Surveillance System	70,000
Total	**19 projects**	**177,708**	**14 projects**	**182,000**

Source: Inception Report, April 2018.

49. Although the targets and activities were updated, the three targets of the Project objectives were not updated and were not distributed among 4 municipalities.

50. Although the proposed (updated) set of targets for 4 municipalities were measurable and easy to be monitored, it created some problems during the implementation. First of all, as mentioned above some activities might not achieve the target when the subprojects end. In contrast, other activities have already achieved their targets without the subprojects implementation. Second, amount of CO2 reduction is not a good indicator to measure the performance for all outputs under three outcomes particularly Outcome 1.1 and 2.1. Even for Outcome 1.2, amount of CO2 reduction is not appropriate to measure some activities for Samui, Chiang Mai, Khon Kaen and Nakhon Ratchasima. For example, it was not appropriate to use this indicator to measure real time tracking system in Chiang Mai. Obviously, different outputs/activities also need different set of indicators in addition to CO2 reduction.

51. Although the list of subprojects/activities and targets under Outcome 1.2 in the LF were updated as shown in Table 3, the outputs (1.2.3 and 1.2.4) and targets under Outcomes (1.2) were not updated. This resulted in confusion in the expected outputs and outcomes that would be achieved. In addition, Samui had only 2 activities up to inception phase, and updated its activities only after inception phase.

52. Last but not least, the baseline values almost did not exist in the LF. The deficient baseline information led to overestimated and thus unrealistic target values of the goal/objective and

outcome indicators related to GHG emission reduction to be addressed by the project.

53. A review of the Project indicators and the proposed amendments are summarized in Table 4

Table 4: Review of Project Indicators

Goal	Indicators1	Baseline	Targets1	Issues/Proposed Amendment
Reduction of future GHG emissions from cities in Thailand	**Cumulative direct GHG emission reductions resulting from the technical assistance and investments by end-of-project (tCO2 eq.)**	**0**	**177,708 / 182,000 (update) KK: 100,500 NR: 10,000 CM: 70,000 SM: 1,500**	Issues: (i) Cumulative direct GHG emission reductions was a good indicator. However, in practice, 1) some components might not generate emission reductions during the project period. 2) Cumulative direct GHG emission reductions might have already been achieved without the technical assistance and investments of the Project. (ii) 177,708 (182,000 updated) tCO2 eq. was considered as an unrealistic target for goal as the amount of realized reductions was far below this figure up to MTR and the end of the Project. First of all, 177,708 tCO2 eq was overestimated as it did not take into account the project life. Second, the original target during project design was estimated with the traditional approach based on lots of assumptions while the actual amount of reduction was estimated with the ERM approach. Proposed amendments: (i) use both traditional approach and ERM approach to estimate the target and actual performances by taking into account the project life; (ii) adjust the target of total emission based on (i), and distribute the target among 4 municipalities; (iii) use the adjusted figure as a new target supplemented by other set of indicators for each output/outcome.

Objective	Indicators1		Targets1	
Promotion of sustainable urban systems management in Khon Kaen, Nakhon Ratchasima, Samui and Chiang Mai to achieve low carbon growth	**Cumulative direct fuel savings resulting from the technical assistance and investments in the transport sector in the 4 participating cities by EOP (GJ)**	**0**	**788,093**	Issues: The indicator and target were not appropriate for the objective. (i) Whether the target was achieved depend on the timing (project period) and the methodologies used during the design and implementation phases. (ii) The indicator was a duplication of the indicator of Project goal as fuel savings were also used to estimate the GHG emission reduction. If the methodologies used to convert fuel savings to GHG were different, the two targets (tCO2 eq and GJ) might complicate the performance evaluation. (iii) The target was originally designed for transport sector. However, the activities in 4 municipalities have been updated and replaced. Therefore, this indicator and target could not be used any more. Amendments: (i) replace the fuel saving with the GHG mission reduction as the indicator and establish the target by tCO2 eq and by sector (any sectors related to fuel saving rather than just transport sector) based on re-estimation of Project goal above; or (ii) keep the existing indicator and set up a new target by (GJ) by sector (any sectors related to fuel saving, rather than just transport sector).
	Annual amount of waste gainfully used (recycled, composted, anaerobically digested or for waste-to-energy) in the 4 participating cities by EOP (tonnes/year)	**46,272**	**389,352**	Issues: The indicator and target were not appropriate for the objective. (i) Whether the target was achieved depend on the timing (project period) and the methodologies used during the design and implementation phases. (ii) The indicator was a duplication of the indicator of Project goal as annual amount of waste gainfully used were also used to estimate the GHG emission reduction. If the methodologies used to convert amount of waste gainfully used to GHG were different, the two targets (tCO2 eq and GJ) might complicate the performance evaluation. (iii) The target is originally designed for waste management sector. However, the activities in 4 municipalities have been updated and replaced. Therefore, this indicator and target could not be used any more. Amendments: (i) replace the amount of waste gainfully used with the GHG mission reduction as the indicator and establish the target by tCO2 eq and by sector (any sectors related to amount of waste gainfully used rather than just waste sector) based on re-estimation of Project goal above; or (ii) keep the existing indicator and set up a new

				target by (GJ) by sector (any sectors related to waste, rather than recycled, composted, anaerobically digested or for waste to- energy sector).
	Total number of new green jobs created in the waste management sector and sustainable transport sector in the cities by EOP	**0**	**40**	Issues: The indicator is suitable for the Project. However, total number of new green jobs created should not limited to the waste sector and transport sector in the cities. Also, the target of 40 is lower than expected. Amendments: (i) the indicator should be changed to total number of new green jobs created with the Project by the end of the Project period. (ii) The target should be greater than 40.
Outcome 1.1	**Indicators1**		**Targets1**	
Outcome 1.1: Increased number of Thai cities that have formulated and implemented low carbon sustainable urban development plans	**No. of cities that have approved and adopted low carbon development plans by 2017**	**0**	**4**	Issues: No major issue for the indicator and target Amendments: No
	Percentage of participating cities where evidence-based low carbon planning is integrated with normal urban development planning processes by EOP	**0%**	**100%**	I Issues: No major issue for the indicator and target Amendments: No
	No. of cities which have completed carbon footprints in selected sectors and have institutionalized the process by 2018	**0**	**4**	Issues: No major issue for the indicator and target Amendments: No
	No. of cities where carbon footprint has been prepared for selected sectors: - Waste management: KK, NR, S and KI - Sustainable transport: KK & NR	0	4	Issues: No major issue for target, but indicator lacks energy sector. Amendments: Add energy sector to the indicator and update the three sectors by municipalities.
	No. of city officials trained on the carbon footprint process and organized into carbon footprint working groups	0	20	Issues: No major issue for the indicator and target Amendments: No

	No. of integrated low carbon urban development and action plans prepared	0	4	Issues: Duplicate with the indicator and target under in Outcome 1.1. Amendments: Delete the indicator and target.
	No. of individual sector specific plans prepared (e.g., waste management plans, sustainable transport plans) with inter-linkages with all other relevant sectors taken into account	0	8	issues: No major issue for the indicator and target Amendments: No
	No. of monitoring plans for waste management facilities developed and implemented	0	3	Issues: No major issue for target, but lack of monitoring plans for transport and energy sector/facilities developed and implemented. Amendments: Add monitoring plans for transport and energy sector/facilities developed and implemented.
Outcome 1.2	**Indicators1**		**Targets1**	
	Average daily quantity of organic waste composted in the central composting plant, tonnes	2	20	Issues: Both indicators and targets have been out of dated and could not be used as most activities have been updated. Amendments: establish a set of indicators and target for each output based on the updated activities.
	No. of operating decentralized composting units (5 plants of 1 tonne per day)	0	5	
	Average monthly quantity of waste recycled, tonnes	1900	2200	
	Daily no. of cyclists utilizing the 4.8 km bikeway	0	200	
	Average speed of vehicles in the roads where the traffic area management pilot is implemented, kph	15	17	
	Annual amount of electricity produced by WTE plant (MWh/year)	0	21000	
	Daily number of passengers using the shuttle bus system (in preparation of BRT)	0	8000	
	Average daily quantity of organic waste digested by the AD plant, tonnes	10	80	Issues: Both indicators and targets have been out of dated and could not be used as most activities have been updated. Amendments: establish a set of indicators and target for each output based on the updated activities.
	Average monthly quantity of waste recycled, tonnes	750	1,150	

	Annual amount of electricity produced by WTE plant (MWh/year)	0	21,000	
	No. of existing bus routes changed as part of the bus rerouting project, in support of the BRT system	0	13	
	Average traffic speed in the area where traffic area management pilot will be implemented, kph	15	18	
	Average monthly quantity of waste recycled, tonnes	11	31	Issues: Both indicators and targets have been out of dated and could not be used as most activities have been updated. Amendments: establish a set of indicators and target for each output based on the updated activities.
	Total daily number of passengers using the shuttle bus system	400	1,500	
	Annual volume of water distributed (m3)	288,000	576,000	
	Daily average volume of organic waste composted by community based composting facilities, tonnes	4	10	
	Monthly quantity of waste recycled, tonnes	715	1,315	Issues: Both indicators and targets have been out of dated and could not be used as most activities have been updated. Amendments: establish a set of indicators and target for each output based on the updated activities.
	Daily no. of cyclists utilizing the bikeway	0	200	
	Average traffic speed in areas where the traffic area management pilot (zoning for heavy trucks) will be implemented, kph	30	36	
Outcome 2.1	**Indicators1**		**Targets1**	
Outcome 2.1: Increased volume of investments in energy efficient urban systems by government and private sector	**Total amount of new investment leveraged through local plans of participating cities for low carbon projects by EOP**	**0**	**USD 16 million**	Issues: The indicator and target were not well designed since they were not related to activities. In other word, most activities under Outcome 2.1 were studies (not projects), which would not produce quantified output and amount of new investment directly. Amendments: (i) change the indicator and target from "Total amount of new investment leveraged through local plans of participating cities for low carbon projects by EOP, $16 million" to qualitative indicator and target; (ii) update the indicator and target based on the updated activities.

	No. of new policies facilitating low carbon investments in cities endorsed and approved by line agencies by EOP	**0**	**2**	Issues: No major issue for the indicator and target Amendments: No
	No of guidelines on international and national sources of climate finance in Thai prepared and published.	0	1	Issues: Both indicators and targets have been out of dated and could not be used as the activity has been updated. Amendments: establish a new indicator and a new target based on the updated activity although the activity has been completed.
	No. of low carbon urban development projects that are financially assisted by government supported, or government-endorsed private sector, financing schemes in the 4 cities	0	8	Issues: No major issue for the first two indicators and targets Amendments: No Issues: The third indicator "T-VER scheme fully operational is not appropriate for Output 2.1.2, but appropriate for Output 2.1.3 Amendments: Indicator: T-VER scheme fully operational should be moved to Output 2.1.3 as an independent indicator or integrate into the indicators under Output 2.1.3.
	No. of policy recommendations facilitating low carbon investments in cities prepared, submitted and endorsed/approved by line agencies and reported to NCCC	0	2	
	T-VER scheme fully operational	0	1	
	No. of projects from the participating cities under the t-VER scheme	0	4	Issues: No major issue for the indicator and target Amendments: No
	No. of cities which have provided inputs to the preparation of national NAMAs	0	4	
	No. of MRV frameworks for specific sectors in the 4 cities developed and institutionalized	0	4	Issues: No major issue for the indicator and target Amendments: No
	No. of trained officers who are actively involved in low carbon planning/decision making/approving/project implementation	0	40	Issues: No major issue for the indicator and target Amendments: No
	No. of trained private sector investors/practitioners actively involved in designing, financing and implementation of low carbon projects in cities	0	40	Issues: No major issue for the indicator and target Amendments: No
	No. of cities that are officially members of the LCC Network	16	32	Issues: No major issue for the indicator and target Amendments: No
	No. of national and international events in which the results of the project and experiences of cities on low carbon investments have been shared	0	at least 2 per year	Issues: No major issue for the indicator and target Amendments: No

	No. of communication products on successful low carbon investments and activities in cities disseminated	0	at least 2 per year	Issues: No major issue for the indicator and target Amendments: No
	No. of lessons learned reports/best practice examples published	0	6	Issues: No major issue for the indicator and target Amendments: No
	No. of infographics/video/audio clips prepared, produced and disseminated for modern (social) media and community radio	0	6	Issues: No major issue for the indicator and target Amendments: No "
	No. of audience reached with awareness campaigns in cities	0	40,000	Issues: No major issue for the indicator and target Amendments: No

54. The overall strategy of the Project is rated Moderately Unsatisfactory (MU) although the rating is not required in the terms of reference.

3.2 Progress towards Results

3.2.1 Progress towards Outcomes Analysis

55. The implementation progress towards results was assessed though a set of indicators and targets to be achieved by the Project based on information provided in the various progress reports, the findings of the MTR mission, and interviews with the Project stakeholders. Table 6 through 9 present a summary of the progress towards the end-of-project targets for the Project goal/objective and each outcome. Further, a rating system was utilized to show the extent of progress achieved by goal/objective and outcome/output.

Progress towards goal/objective

56. Table 6 presents the progress of the Project toward the goal/objective against its performance indicator/target. As the only indicator for goal during the implementation was timely available, the progress toward goal was evaluated based on actual GHG emission reduction against the target reduction established in the original Project Document and updated in the Inception Report. The review of project achievements presented in Table 6 revealed that the implementation was not as successful as expected and did not meet the target planned at the outset of the Project. Thailand is now better off with its achievement in Low Carbon Growth in the cities because of the Project, but not as better as expected.

57. In spite of this, the Project produced three outcomes, particularly outcome 1.2 with 4 outputs, which clearly suggested the reduction of greenhouse gas emissions through implementation. As a consequence, the Project contributed to sustainable development goal 13: take urgent action to combat climate change and its impacts.

58. The original target as indicated in the Project Document suggested that the cumulative direct GHG emission reductions resulting from the technical assistance and investments by end-of-project was 177,708 tCO2 eq. The target was updated to 182,000 tCO2 eq. during the inception phase. The Project also updated the partner cities by substituting the city of Klang for Chiang Mai.

In addition, more activities (subprojects) such as LRT in Khon Kaen were identified during the inception phase.

59. The total actual GHG emission reduction was estimated at 33,195.72 tCO2eq. as of December 2019; accounting for 18.24% of the updated target of 182,000 tCO2 eq. Table 5 presents the comparison between the actual emission reductions and the targets for 4 municipalities and the Project.

Table 5: Comparison between Actual Performances and Target (tCO2 eq.)

	Actual Emission Reduction	Target Emission Reduction
Chiang Mai	946.47	70,000
Khon Kaen	23,923.37	100,500
Nakhon Ratchasima	7,705.47	10,000
Samui	620.41	1,500
Total	33,195.72	182,000 (upd)/177,708 (orig)

Source: ERM

60. Table 5 clearly indicated that the actual GHG emission reductions for each municipality and the Project were below the targets. By the end of project period in April 2021, it is expected that the amount of emission reduction will be 51,868.58* tCO2eq based on the current activities (subprojects), which is still far below the original and updated targets.

61. For the first indicator of the objective: cumulative direct fuel savings resulting from the technical assistance and investments in the transport sector in the 4 participating cities by EOP (GJ), it was originally designed for transport sector and the actual amount of fuel savings was not available during the MTR. Currently, there are two on-going transport subprojects in Khon Kaen and Chiang Mai. It was extremely difficult to realize the target during the project period as it took time to achieve the intended results of these two transport projects. In addition, as mentioned in Table 4, the estimate of amount of carbon emission reduction also derived from the fuel savings. There might be double accounting for the same goal with different methodologies. Finally, as the activities at municipalities have been updated, this target might not appropriate for the Project objective. As consequence, the indicator and target need to be revisited.

62. For the second indicator of the Objective (annual amount of waste gainfully used (recycled, composted, anaerobically digested or for waste-to-energy) in the 4 participating cities by EOP (tones/year), the actual amount of waste gainfully used in the 4 cities was 244,043.36 tonnes as of Dec 2019, representing 63% of the original target, or 389,352 tonnes. Despite the actual annual amount of waste gainfully was estimated during MTR, similar to the first indicator, this indicator was originally designed for waste management sector, as the activities at municipalities have been updated, this target might not be appropriate for the Project objective. Therefore, the indicator and target also need to be revisited.

63. For the third indicator of the Objective: total number of new green jobs created in the waste management sector and sustainable transport sector in the cities by EOP, 20 new green jobs were created up to the MTR, accounting for 50% of the target. The actual number of green jobs could be much greater than 20 as this figure only included the green jobs for the waste management

sector and sustainable transport sector.

64. Based on the above, the progress towards results of the project goal/objective is rated Moderately Unsatisfactory (MU).

Table 6: Progress towards Goal/Objective

Goal	Indicators1	Targets1	Rating	MT Level & Assessment	Justification for Rating
Reduction of future GHG emissions from cities in Thailand	Cumulative direct GHG emission reductions resulting from the technical assistance and investments by end-of-project (tCO2 eq.)	**177,708 (original)** **182,000 (update in inception phase by city: KK: 100,500 NR: 10,000 CM: 70,000 SM: 1,500)**	**Moderately Unsatisfactory (MU)**		33,195.72 tCO2eq of actual reduction as of Dec 2019; or 18.24% against the updated target of 182,000 tCO2 eq. (original target of 177,708 tCO2 eq.). In particular, KK: 23,923.37 (mainly from WTE 22,679.83); NR: 7,705.47 (mainly from VSD cold water pump 4,033); CM: 946.47; SM: 620.41 By the end of project period in April 2021, the estimated amount of emission reduction will be 51,868.58* tCO2eq, which is still far below the original target. 1. The Target was updated during the inception phase: The original target as indicated in the Project Document was 177,708 and was updated in the inception phase to 182,000 by replacing the city of Klang by CM. More projects were identified during the inception phase e.g. LRT in KK. 2. higher original target number and lower actual achievement number by EOP As of Dec 2019 the CO2 reduction total number achieved = 33,195.72* tCO2eq Source: ERM report (Jan 2020)
Objective	**Indicators1**	**Targets**			
Promotion of sustainable urban systems management in Khon Kaen, Nakhon Ratchasima, Samui and Chiang Mai to achieve low carbon growth	Cumulative direct fuel savings resulting from the technical assistance and investments in the transport sector in the 4 participating cities by EOP (GJ)	**788,093**			Not available. As this indicator was originally designed for transport sector, the actual amount of fuel savings was not available during the MTR. Currently, there are two on-going transport projects in KK & CM. It was extremely difficult to realize this target during the project period as it took time to achieve the intended results of these two transport projects. In addition, the amount of carbon emission reduction will also be derived from the fuel savings. Finally, as the activities at municipalities have been updated, this indicator and target might not be appropriate for the Project. As consequence, the indicator and target need to be revisited.

	Annual amount of waste gainfully used (recycled, composted, anaerobically digested or for waste-to-energy) in the 4 participating cities by EOP (tones/year)	**389,352**			244,043.36 tonnes as of Dec 2019; completed by 63% Source: ERM report (Jan 2020)
	Total number of new green jobs created in the waste management sector and sustainable transport sector in the cities by EOP	**40**			20 new green jobs created in KK; completed by 50% No green job created in other cities was reported Source: PIR & KK report

Progress toward Outcomes

65. The Project has been implemented through 3 outcomes. Table 7 presents a list of key results achieved by the Project against each expected outcome, using the corresponding targets to measure the progress made.

Outcome 1.1: **Increased number of Thai cities that have formulated and implemented low carbon sustainable urban development plans**

66. The assessment of progress towards Outcome 1 is summarized in Table 7. Column Indicators and Targets were from logical framework. Column MT Level & Assessment is verification based on the assessment of Justification for Rating. Column Rating is a comprehensive assessment of % of completion for all outputs under Outcome 1.1.

67. There are three indicators with targets under Outcome 1.1. For the first indicator, 4 cities have approved and adopted low carbon development plans; completed by 100% by 2017. For the second indicator, 100% of participating cities where evidence-based low carbon planning have been integrated with normal urban development planning processes. In particular,

- Chiang Mai and Khon Kaen established the Smart City Plans, where the low carbon city is included.
- Chiang Mai integrated the city bus project into its municipality plan and allocated budget for development of the low carbon municipality plan.
- Khon Kaen used the results from carbon city footprint as a tool for low carbon planning and was selected as a KPI city.
- Samui established Lovely Green Island, which included low carbon city activities.
- Nakhon Ratchasima integrated the Project components into the city development plan (2018-2022).

68. For the third indicator, 4 cities have completed carbon footprints in selected sectors and have institutionalized the process by 2018; completed by 100%. In particular,

- The City Carbon Footprint (CCF) Reports and manual were completed for the 4 partner cities.
- Training on low carbon city planning and climate change adaption curriculum was conducted in 4 cities.
- The CCF Manual was completed and would be delivered to the cities.
- The Low Emission Development Strategies (LEDS) for four partner cities were developed and the draft reports were submitted.

- The Service Providers organized the meeting with City Working Groups in November 2019 to integrate low carbon measures into future city development plan.

69. There are three outputs under Outcome 1.1.

Output 1.1.1: GHG inventory for each of project city, including manual development and trainings

70. For Output 1.1.1, there are two indicators. For the first indication, 4 cities have prepared carbon footprint for selected sectors with 100% completion. Particularly, 4 cities estimated the City Carbon Footprint (CCF) for 2013-2017 and forecasted the CCF for 2018-2030, which was used to develop a "Smart Growth" scenario and a Low Emission Development Strategies (LEDS) that aimed to integrate sustainable urban management into development policy.

71. For the second indicator, 115 city officials were trained on low carbon city planning and the climate change adaption curriculum was developed in 4 cities; completed by 575%. Among the total, 27 city officials were from Khon Kaen; 25 from Chiang Mai; 36 from Samui; and 27 from Nakhon Ratchasima.

Output 1.1.2: Formulated integrated low carbon urban development and action plan in each of the project cities

72. For Output 1.1.2, there are two indicators. For the first indicator, 4 cities have integrated low carbon into urban development and action plans; reached by 100%. The CCF Manual was completed and LEDS for 4 partner cities were developed. The meetings with City Working Group were also organized.

73. For the second indicator, 20 individual sector specific plans were prepared (e.g., waste management plans, sustainable transport plans) with inter-linkages with all other relevant sectors being taken into account. The target was reached by 250%. Especially, each city prepared the strategies for all 5 sectors:

Khon Kaen: 2 strategies; 5 sectors (with 23 sub-sectors on EE-7 ss, AE-3, WM-5, TM-6, FOR/AGR-2)

Nakhon Ratchasima: 1 strategy; 5 sectors (with 25 sub-sectors on EE-7 ss, AE-4, WM-6, TM-6, FOR/AGR-2)

Chiang Mai: 2 strategies; 5 sectors (with 26 sub-sectors on EE-7 ss, AE-4, WM-5, TM-7, FOR/AGR-3)

Samui: 1 strategy; 5 sectors (with 16 sub-sectors on EE-4 ss, AE-4, WM-3, TM-2, FOR/AGR-3)

Output 1.1.3: Formulated and implemented monitoring frameworks for waste management activities in the cities

74. For Output 1.1.3, there is only one indicator. Monitoring plans for waste management facilities were developed and implemented in 4 cities with 100% completion.

75. Monitoring, Reporting and Verification (MRV) Framework was developed by ERM for

Khon Kaen, Nakhon Ratchasima and Chiang Mai and by Bright Management for Samui. For Samui, CCF methodology was developed and data was collected. The city carbon footprint report and manual were prepared.

76. The progress towards results of the end-of-project targets under Outcome 1 is rated Highly Satisfactory (HS).

Table 7: Progress towards Outcome 1.1

Outcome 1.1	Indicators1	Targets	Rating	MT Level & Assessment	Results
Outcome 1.1: Increased number of Thai cities that have formulated and implemented low carbon sustainable urban development plans	No. of cities that have approved and adopted low carbon development plans by 2017	**4**	**Satisfactory (S)**		4 cities have approved and adopted low carbon development plans by 2017; completed by 100% Source: MOM
	Percentage of participating cities where evidence-based low carbon planning is integrated with normal urban development planning processes by EOP	**100%**			100% of participating cities where evidence-based low carbon planning have been integrated with normal urban development planning processes. • Chiang Mai and Khon Kaen established the Smart City plans, where the low carbon city was included. • Chiang Mai also integrated the city bus project into its municipality plan and allocated budget for development of the low carbon municipality plan. • Khon Kaen used the results from carbon city footprint as a tool for low carbon planning and was selected as a KPI city. • Samui established Lovely Green Island, which included Low Carbon City activities. • Nakhon Ratchasima integrated the Project components into the city development plan (2018-2022). Sources: consultations and project reports and documents
	No. of cities which have completed carbon footprints in selected sectors and have institutionalized the process by 2018	**4**			4 cities have completed carbon footprints in selected sectors and have institutionalized the process by 2018; completed by 100%. In particular, The City Carbon Footprint Reports and manual were completed for the 4 partner cities. Training on low carbon city planning and climate change adaption curriculum was conducted in 4 cities. The CCF Manual was completed and would be delivered to cities. The Low Emission Development Strategies (LEDS) for four partner cities were developed. The draft reports were submitted. The service providers organized the meeting with City Working Groups in November 2019 to integrate low carbon measures into future city development plan. Sources: MOM and other documents

	No. of cities where carbon footprint has been prepared for selected sectors: - Waste management: KK, NR, S and Kl - Sustainable transport: KK & NR	4			4 cities have prepared carbon footprint for selected sectors; completed by 100%. 4 cities estimated the CCF for 2013-2017 and forecasted the CCF for 2018-2030, which was used to develop a "Smart Growth" scenario and a LEDS that aimed to integrate sustainable urban management into development policy. Sources: consultations and project reports and documents
	No. of city officials trained on the carbon footprint process and organized into carbon footprint working groups	20			115 city officials were trained on low carbon city planning and climate change adaption curriculum was conducted in 4 cities; completed by 575%. Among the total, 27 from Khon Kaen; 25 from Chiang Mai; 36 from Samui; and 27 from Nakhon Ratchasima. Sources: consultations and project reports and documents
	No. of integrated low carbon urban development and action plans prepared	4			4 cities have integrated low carbon into urban development and action plans; completed by 100%. The CCF Manual was completed and Low Emission Development Strategies (LEDS) for four partner cities were developed. The meetings with City Working Group were also organized. Working group: KK (22); NR (18); CM (12); SM (16) Sources: consultations and project reports and documents
	No. of individual sector specific plans prepared (e.g., waste management plans, sustainable transport plans) with inter-linkages with all other relevant sectors taken into account	8			20 individual sector specific plans were prepared (e.g., waste management plans, sustainable transport plans) with inter-linkages with all other relevant sectors being taken into account; completed by 250% Each city prepared all 5 sectors: KK: 2 strategies; 5 sectors (with 23 sub-sectors on EE-7 ss, AE-3, WM-5, TM-6, FOR/AGR-2) NR: 1 strategy; 5 sectors (with 25 sub-sectors on EE-7 ss, AE-4, WM-6, TM-6, FOR/AGR-2) CM: 2 strategies; 5 sectors (with 26 sub-sectors on EE-7 ss, AE-4, WM-5, TM-7, FOR/AGR-3) SM: 1 strategy; 5 sectors (with 16 sub-sectors on EE-4 ss, AE-4, WM-3, TM-2, FOR/AGR-3)" Source: MOM and Integration Strategy Report - Nov 2019 Source: Consultations, and Project Document and reports

	No. of monitoring plans for waste management facilities developed and implemented	3			Monitoring plans for waste management facilities were developed and implemented in 4 cities; completed by 100%. Monitoring, Reporting and Verification (MRV) Framework was developed by ERM for KK, NR and CM and by Bright Management for Samui. SM: CCF methodology developed and data collected. The city carbon footprint report and manual were prepared. Source: Consultations, and Project Document and reports

Component (Outcome) 1.2: Increased number of Thai cities with energy efficient urban systems

77. The assessment of progress towards Outcome 1.2 is summarized in Table 8. Under Outcome 1.2, there are two indicators. For the first indicator, 18 demonstration projects were implemented as a result of technical and investment assistance in participating cities; completed by 95%.

Khon Kaen has 5 on-going projects:

- The management and extermination of waste by using waste-to-energy technologies;
- Solar rooftop installation at Bung Tung Srang WWTP pumping station;
- Solar rooftop installation at Municipal Fresh Market 1;
- Inorganic waste recycling through 3Rs; and
- LTR.

Nakhon Ratchasima has 8 on-going projects, 4 pending projects, and 1 WTE study conducted:

- Solar rooftop project (Central Plaza);
- VSD cold water pump installation for cold flow rate reduction (Terminal 21);
- The LED flood light replacement 18 watts for fluorescent 42 watts project (The Mall);
- The LED replacement in Maharaj Hospital;
- Energy efficiency improvement by replacing old lighting system with LED;
- Upgrading of water pipeline for water loss (Water Supply Bureau);
- Upgrading of pumping system for energy efficiency improvement (Water Supply Bureau);
- Solar rooftop project (Nakhon Ratchasima Technical College);
- The compact-fluorescent bulbs replacement 18 watts for flood light 35 watts project (Klang Plaza Jomsurang);
- The LED replacement project for Klang Plaza Jomsurang;
- The LED replacement project for Klang Plaza Assadang;
- Solar rooftop project for Maharaj Hospital (study); and
- Waste to energy.

Chiang Mai has 1 Urban Waste Improvement Project with 4 sub-components:

- Chiang Mai transit application;
- Installation of electronic common ticket system;
- Installation of CCTV on the buses; and
- Installation of Geographical Positioning System (GPS) on the buses.

Samui has 4 on-going and 2 pending projects:

- Composting of organic waste in households and schools;
- Organic waste management at Samui Organics Recycling Bophut Station;
- Coconut waste management (transform into soil amendment substance);
- Coconut waste management (transform into charcoal);

2 additional projects this year:

- Capacity buildings for food waste management in hotels; and
- Capacity buildings for internal waste management for Bangkok Airways Co., Ltd. (Samui International Airport).

78. For the second indicator, 5 out of 8 low carbon projects (or 63%) were completed. Three low carbon projects were identified:

- Waste management in the hotel sector in Samui;
- Plastic waste reduction in the 7-Eleven stores in four LCC partner cities and Phuket (new city); and
- EE in CP-All's distribution centers in the partner cities plus Phuket (CP-All is the parent company of 7-Eleven).

Two low carbon projects were under design phase and would be implemented soon:

- Organic waste management in restaurants and schools in Samui and replication to a nearby island, Pha-Ngan; and
- A new WTE with capacity of 400 tons of waste per day in Nakhon Ratchasima. Both projects have completed their designs and the feasibility studies, will be open for tendering in 2020.

79. As original design, there were four outputs and there were 4-7 indicators for each output under Outcome 1.2. As the indicators and targets for 4 outputs were not updated, Outcome 1.2 was only evaluated based on the activities (subprojects) undertaken.

Output 1.2.1: Operational low carbon urban waste management and sustainable transport systems in Khon Kaen

80. Total amount of emission reduction was 33,344 tCO2e by the end of the Project; and 23,923 tCO2e by 2019 against the target of 100,500 tCO2e in the Inception Report. The municipality has the plan to implement the projects for sustainable urban development.

81. By the end of 2019, 5 projects were implemented; completed by 85% in terms of activities:

1) Light Rail Transit (LRT); completed by 100%. The data collection for the study of Feeder to LRT was completed by 100%. The data is currently being analyzed with computer model. The preliminary results of GHG reduction from the feeder system was estimated at approximately 10,000 tCO2eq per year and projected to increase every year with more people using LRT.

2) Waste Management; completed by 70%. There are two components: (1) inorganic waste system: for recycling through 3Rs, 64 out of 95 total participating communities were completed with total waste collection of 34.8 ton/month. The purchase of sign to promote the recycle center was completed. (2) Organic Waste Management System: as part of the effort to reduce the waste, Khon Kaen municipality team provided a training programme to one community by focusing on how to reduce waste at the household level.

3) Waste-to-Energy; completed by 100%. The data collection and study were completed, and

the monitoring was implemented. The waste with 264 ton/day from Khon Kaen municipality and surrounding municipalities were generated and delivered to the plant. The preliminary data for GHG reduction at Waste to Energy Power Plant has been collected. Using the calculation template provided by MRV consultants, the preliminary carbon emission for a baseline from the previous 5 years has been calculated and will be verified by MRV consultants.

4) Solar rooftop installation at Municipal Fresh Market; completed by 100%. The power generated from the solar panel will be collected and used to calculate the GHG reduction according to MRV methodology. The training on monitoring the electrical generation was conducted.

5) Solar roof top installation at Bung Tung Srang WWTP pumping station; completed by 100%. The power generated from the solar panel will be for wastewater treatment plant (This project is a demonstration subproject, and is not included in the Project).

Output 1.2.2: Operational low carbon urban waste management and sustainable transport systems in Nakorn Ratchasima

82. Total amount of emission reduction was 13,804.79 tCO2e by the end of the Project; and 7,705.47 tCO2e by 2019 against the target of 10,000 tCO2e in the Inception Report.

83. By the end of 2019, 5 projects were implemented; completed by 85% in terms of activities:

1) Energy saving for household sector; completed by 100%. “Low Carbon Home” Guidebook (for New House Construction) was completed and published in Thailand. 1,000 copies were distributed to households and vocational college students.

2) Energy efficiency in the city water supply system; completed by 70%. The study and data collection were completed. In addition, 2 pumps will be installed, and training on the water supply model will be conducted for the staffs from local Water Supply Bureau.

3) Low emissions building for the department stores and shopping malls; completed by 90%. The study and MRV have been completed. Further, 10 other buildings (including schools and hospitals) were involved in the activities.

4) Damage cost study from traffic congestion in the municipality area; completed by 100%. Phrase I study for the operation system and cost study were completed.

5) Waste to energy project. This project was originally not incorporated in the project.

Output 1.2.3: Operational low carbon urban waste management and sustainable transport systems in Chang Mai

84. Total amount of emission reduction was 1,667.59 tCO2e by the end of the Project; and 946.47 tCO2e by 2019 against the target of 70,000 tCO2e in the Inception Report.

85. By the end of 2019, 4 activities related to transport sector were implemented; completed by 70% in terms of activities:

1) Develop an integrated connection points between different bus routes; completed by100%.

2) Electronic common ticket for all urban transit in Chiang Mai City; completed by 40%. The procurement of electronic ticket was delayed due to the time require to resolve some legal issues for installation of electronic ticket system on Chiang Mai city buses.

3) Real time tracking system via on-line application; completed by 100%. The CM Transit Application (version 1.0) was Launched and used by the general public.

4) CCTV Surveillance System; completed by 30%. The procurement of Geographical Positioning System (GPS) was delayed and was on track.

Output 1.2.4: Operational low carbon urban waste management and sustainable transport systems in Samui

86. Total amount of emission reduction was 2,605.70 tCO2e by the end of the Project; and 620.414 tCO2e by 2019 against the target of 1,500 tCO2e in the Inception Report.

87. By the end of 2019, 6 projects were implemented; completed by 70% in terms of activities:

1) Wastewater treatment plant installation; completed by 50%. The design of a WWTP with capacity of 15m3/day was being finalized.

2) composting of organic waste in households; completed by 100%. 100% Households received the first bins (2,500 bins).

3) Organic waste management improvement for Samui Organics Recycling Bophut Station; completed by 100%. The crushing machine, milling machine, mixing machine and pellet making machine were procured and installed.

4) Organic waste management improvement for Baan Ya Suan Pu Station; completed by 100%. The crushing machine with electricity motor, crushing machine with diesel; engine and blade sharpening machine were procured and installed.

5) Capacity buildings for food waste management in hotels; completed by 60%. 17 out of 24 participated hotels started the activities.

6) Capacity buildings for internal waste management for Bangkok Airways Co., Ltd. (Samui International Airport); completed by 30%. MOU between Samui Municipality and Bangkok Airways Public Co., Ltd. (Samui International Airport) was signed.

88. Based on the above findings, the progress towards results of the end-of-project targets under Outcome 1.2 is rated Satisfactory (S).

Table 8: Progress towards Outcome 1.2

Outcome 1.2	Indicators1	Targets	Rating	Rating	Justification for Rating
Outcome 1.2: Increased number of Thai cities with energy efficient urban systems	No. of low carbon demonstration projects implemented as a result of technical and investment assistance in participating cities by EOP	**19**	**Satisfactory (S)**		18 demonstration projects were implemented as a result of technical and investment assistance in participating cities; completed by 95%. KK: 5 on-going projects: 1) The management and extermination of waste by using waste-to-energy technologies; 2) Solar rooftop installation at Bung Tung Srang WWTP pumping station; 3) Solar rooftop installation at Municipal Fresh Market 1; 4) Inorganic waste recycling through 3Rs; and 5) LTR NR: 8 on-going projects, 4 pending projects, and 1 WTE study conducted 1) Solar rooftop project (Central Plaza Nakhon Ratchasima); 2) VSD cold water pump installation for cold flow rate reduction (Terminal 21); 3) The LED flood light replacement 18 watts for fluorescent 42 watts project (The Mall Nakhon Ratchasima); 4) The LED replacement in Maharaj Hospital; 5) Energy efficiency improvement by replace old lighting system by LED; 6) Upgrading of water pipeline for water loss (Water Supply Bureau); 7) Upgrading of pumping system for energy efficiency improvement (Water Supply Bureau); 8) Solar rooftop project (Nakhon Ratchasima Technical College) (pending); 9) The compact-fluorescent bulbs replacement 18 watts for flood light 35 watts project (Klang Plaza Jomsurang); 10) The LED replacement project for Klang Plaza Jomsurang; 11) The LED replacement project for Klang Plaza Assadang; 12) Solar Rooftop Project for Maharaj Hospital (study); and 13) Waste to energy. CM: 1 Chiang Mai urban waste improvement project with 4 sub-components 1) Chiang Mai transit application; 2) Installation of electronic common ticket system; 3) Installation of CCTV on the buses; and 4) Installation of Geographical Positioning System (GPS) on the buses. SM: 4 on-going and 2 pending projects 1) Composting of organic waste in households and schools; 2) Organic waste management at Samui Organics Recycling Bophut Station; 3) Coconut waste management (transform into soil amendment substance); 4) Coconut waste management (transform into charcoal); 2 additional projects this year:

					5) Capacity buildings for food waste management in hotels; and 6) Capacity buildings for internal waste management for Bangkok Airways Co., Ltd. (Samui International Airport).
	No. of low carbon projects designed based on or influenced by the results of the demonstration projects and the low carbon city plans by EOP	**8**			5 out of 8 projects (or 63%) were completed. 3 low carbon projects were identified: 1) waste management in the hotel sector in Samui; 2) plastic waste reduction in the 7-Eleven stores in four LCC partner cities and Phuket (new city); and 3) EE in CP-All's distribution centers in the partner cities plus Phuket (CP-All is the parent company of 7-Eleven). 2 low carbon projects were under design phase and would be implemented soon: 1) organic waste management in restaurants and schools in Samui and replication to a nearby island, Pha-Ngan; and 2) a new WTE with capacity of 400 tons of waste per day in Nakhon Ratchasima. The design and the feasibility study were completed. The project would be open for tendering in 2019-2020.

Khon Kaen	Average daily quantity of organic waste composted in the central composting plant, tones	20			The indicators had not been updated although the activities were updated. The progress towards results for Output 1.2.1 was based on the updated activities in the inception report and other reports. Total amount of emission reduction was 33,344 tCO2e by the end of the Project; 23,923 tCO2e by 2019 against the target of 100,500 tCO2e in the Inception Report. The municipality has the plan to implement the projects for sustainable urban development. 5 projects were implemented; completed by 85% for activities: 1) Light Rail Transit (LRT); completed by 100%. The data collection for the study of Feeder to LRT was completed by 100%. The data is currently being analyzed with computer model. The preliminary results of GHG reduction from the feeder system was estimated at approximately 10,000 tCO2eq per year and projected to increase every year with more people using LRT. 2) Waste Management; completed by 70%. There are two components: (1) inorganic waste system: for recycling through 3Rs, 64 out of 95 total participating communities were completed with total waste collection of 34.8 ton/month. The purchase of sign to promote the recycle center was completed. (2) Organic Waste Management System: as part of the effort to reduce the waste, Khon Kaen municipality team provided a training programme to one community by focusing on how to reduce waste at the household level. 3) Waste-to-Energy; completed by 100%. The data collection and study were completed, and the monitoring was implemented. The waste with 264 ton/day from Khon Kaen municipality and surrounding municipalities were generated and delivered to the plant. The preliminary data for GHG reduction at Waste to Energy Power Plant has been
	No. of operating decentralized composting units (5 plants of 1 tonne per day)	5			
	Average monthly quantity of waste recycled, tones	2,200			
	Daily no. of cyclists utilizing the 4.8 km bikeway	200			
	Average speed of vehicles in the roads where the traffic area management pilot is implemented, kph	17			
	Annual amount of electricity produced by WTE plant (MWh/year)	21,000			

	Daily number of passengers using the shuttle bus system (in preparation of BRT)	8,000			collected. Using the calculation template provided by MRV consultants, the preliminary carbon emission for a baseline from the previous 5 years has been calculated and will be verified by MRV consultants. 4) Solar rooftop installation at Municipal Fresh Market; completed by 100%. The power generated from the solar panel will be collected and used to calculate the GHG reduction according to MRV methodology. The training on monitoring the electrical generation was conducted. 5) Solar roof top installation at Bung Tung Srang WWTP pumping station; completed by 100%. The power generated from the solar panel will be for wastewater treatment plant (This project is a demonstration subproject, and is not included in the Project). Sources: consultation and Project reports
Nakorn Ratchasima	Average daily quantity of organic waste digested by the AD plant, tones	80			The indicators had not been updated although the activities were updated. The progress towards results for Output 1.2.2 was based on the updated activities in the inception report and other reports. Total amount of emission reduction was 13,804.79 tCO2e by the end of the Project; 7,705.47 tCO2e by 2019 against the target of 10,000 in the Inception Report. 5 projects were implemented for the Project; completed by 85% for activities: 1) Energy saving for household sector;
	Average monthly quantity of waste recycled, tones	1,150			
	Annual amount of electricity produced by WTE plant (MWh/year)	21,000			
	No. of existing bus routes changed as part of the bus rerouting project, in support of the BRT system	13			

	Average traffic speed in the area where traffic area management pilot will be implemented, kph	18			completed by 100%. “Low Carbon Home” Guidebook (for New House Construction) was completed and published in Thailand. 1,000 copies were distributed to households and vocational college students. 2) Energy efficiency in the city water supply system; completed by 70%. The study and data collection were completed. In addition, 2 pumps will be installed, and training on the water supply model will be conducted for the staffs from local Water Supply Bureau. 3) Low emissions building for the department stores and shopping malls; completed by 90%. The study and MRV have been completed. Further, 10 other buildings (including schools and hospitals) were involved in the activities. 4) Damage cost study from traffic congestion in the municipality area; completed by 100%. Phase I study for the operation system and cost study were completed. 5) Waste to energy project. (This project was originally not incorporated in the project.) Sources: consultations and Project reports
Chang Mai	Average monthly quantity of waste recycled, tones	31			The indicators had not been updated although the activities were updated. The progress towards results for Output 1.2.3 was based on the updated activities in the inception report and other reports. Total amount of emission reduction was 1,667.59 tCO2e by the end of the Project; 946.47 tCO2e by 2019 against the target of 70,000 in the Inception Report. 4 activities related to transport sector were implemented; completed by 70% for activities: 1) Develop an integrated connection points between different bus routes; completed by100%. 2) Electronic common ticket for all urban transit in Chiang Mai City; completed by 40%. The procurement of electronic ticket was delayed due to the time require to resolve some legal issues for installation of electronic ticket system on Chiang Mai city buses. 3) Real time tracking system via on-line application; completed by 100%. The CM Transit Application (version 1.0) was Launched and used by the general public. 4) CCTV Surveillance System; completed by 30%. The procurement of Geographical Positioning System (GPS) was delayed and was on track. Sources: consultation and Project reports
	Total daily number of passengers using the shuttle bus system	1,500			
	Annual volume of water distributed (m3)	576,000			
	Daily average volume of organic waste composted by community based composting facilities, tones	10			
Samui	Monthly quantity of waste recycled, tones	1,315			The indicators had not been updated although the activities were updated. The progress towards results for Output 1.2.4 was based on the updated activities in the
	Daily no. of cyclists utilizing the bikeway	200			

	Average traffic speed in areas where the traffic area management pilot (zoning for heavy trucks) will be implemented, kph	36			inception report and other reports. Total amount of emission reduction was 2,605.70 tCO2e by the end of the Project; 620.414 tCO2e by 2019 against the target of 1,500 in the Inception Report. 6 projects were implemented for the Project; completed by 70% for activities: 1) Wastewater treatment plant installation; completed by 50%. The design of a WWTP with capacity of 15m3/day was being finalized. 2) Composting of organic waste in households; completed by 100%. 100% Households received the first bins (2,500 bins). 3) Organic waste management improvement for Samui Organics Recycling Bophut Station; completed by 100%. The crushing machine, milling machine, mixing machine and pellet making machine were procured and installed. 4) Organic waste management improvement for Baan Ya Suan Pu Station; completed by 100%. The crushing machine with electricity motor, crushing machine with diesel; engine and blade sharpening machine were procured and installed. 5) Capacity buildings for food waste management in hotels; completed by 60%. 17 out of 24 participated hotels started the activities. 6) Capacity buildings for internal waste management for Bangkok Airways Co., Ltd. (Samui International Airport); completed by 30%. MOU between Samui Municipality and Bangkok Airways Public Co., Ltd. (Samui International Airport) was signed. Sources: consultations and Project reports

Outcome 2.1: **Increased volume of investments in energy efficient urban systems by government and private sector**

89. The assessment of progress towards Outcome 2.1 is summarized in Table 9. Under Outcome 2.1, there are two indicators. For the first indicator, total amount of new investment leveraged through local plans of participating cities for low carbon projects was $105.32 (completed by 658%), of which, $75.1million of incremental investment was approved by the local plan and $30.22 millions of investment was in the WTE projects as detailed below:

- $30 million in a new WTE plant with a capacity of 600 tons per day in Khon Kaen; and
- $215,384 in the efficiency improvement in an existing WTE plant by focusing on waste segregation and impeller efficiency in the biogas plant in Nakhon Ratchasima.

90. The second indicator and target had not been updated although some activities were updated. The activities have not been implemented (0%) and will depend on Output 2.1.2 which will be implemented in the next phase.

Output 2.1.1: Completed analysis on existing and forthcoming options on financial incentive schemes, both domestic and international including carbon offset initiatives

91. The indicator and target had not been updated although the activities were updated and

completed by 100%. The output was not on target to be achieved.

92. The Project hired a Stakeholder Engagement Consultant (IC), Mr. Pasnakorn Maikate to conduct a study on decoding a new city development innovative to support low carbon city initiative. The consultant has completed the review of private sector engagement in Khon Kaen and Chiang Mai. The report was already to be submitted to UNDP."

Output 2.1.2: Financial incentives and institutional arrangement to replicate low-carbon urban development

93. There are two indicators and targets under this output. No progress has been made for this output (or completed by 0%). The activities will be implemented in the next phase.

94. The indicator "T-VER scheme fully operational" is not appropriate for Output 2.1.2, but appropriate for Output 2.1.3.

Output 2.1.3: A cadre of qualified technical specialists in the local governments of Thai cities capable of working with market mechanisms for mitigation efforts and accessing funds for climate change mitigation

95. There are two indicators and targets under this output. No progress has been made for this output (or completed by 0%). The activities will be implemented in the next phase. 3 projects will be implemented with T-VER.

Output 2.1.4: Developed and operational monitoring, reporting and verification system for public offset

96. The MRV frameworks for specific sectors in 4 cities have been developed and institutionalized; completed by 100%. ERM-Siam Co Ltd (ERM) was awarded the contract for Monitoring, Reporting and Verification (MRV) Services. ERM reviewed and provided comments and feedback to the project implementers in order to further update the on-site validation. The on-site validation was conducted for all projects in Samui Municipality during May 2019. For the remaining municipalities, the schedule was the 3rd and 4th week of November in 2019. The validation reports for all projects were completed by the end of 2019. In particular, 13 demo projects out of 23 projects were validated. Further, the stakeholders' capacity building had been strengthened in understanding the MRV process, document templates and methodologies. Finally, Project Baseline Report for Assurance was completed for all Low Carbon Demonstration Projects.

Output 2.1.5: Designed, developed and conducted training course on Low Carbon Cities

97. There are two indicators and targets. For the first indicator, more than 40 officers and 115 people in total including officers and private sector were trained and were actively involved in low carbon planning/decision making/approving/project implementation); completed by 100%.

98. For the second indicator, the Low Carbon City Planning and Climate Change Adaption Curriculum were developed and trainings were conducted for all 4 partner cities. Particularly

- The training for Nakhon Ratchasima Municipality was conducted during 6-8 August 2019

at Leosor Hotel with 27 staffs from municipality and related organizations.

- The training for Khon Kaen Municipality was conducted during 19-20 August 2019 at Nadee 10 Hotel with 27 staffs from municipality and related organizations.
- The training for Chiang Mai Municipality was conducted during 22-23 August 2019 at Chiang Mai Grandview Hotel with 25 staffs from municipality and related organizations.
- The training for Koh Samui Municipality was conducted during 27-28 August 2019 at Mana Thai Hotel with 36 staffs from municipality and related organizations."

Output 2.1.6: Expanded and improved Low Carbon Cities Network

99. There are two indicators and targets. For the first indicator, number of cities network was around 20; completed by 80%.

100. For the second indicator, the results of this output are shown below:

1) Network through MOU:

- MOU signed with CP ALL to join the Low Carbon City Project in 5 Cities: Khon Kaen, Chiang Mai, Nakhon Ratchasima, Samui and Phuket;
- MOU signed with ten buildings in Nakhon Ratchasima to join the Low Carbon Building Project;
- MOU signed with partners for Low Carbon Project Implementation in Samui;
- MOU signed with Chiang Mai Smart Mobility Alliance Network; and
- MOU signed with 7-Eleven to join the Low Carbon City initiative.

2) Network through projects:

After a kick-off meeting in January, CP ALL, TGO and UNDP had discussed the scope and work plan of the Project based on three activities; plastic reduction, energy efficiency and awareness raising campaign and project communication. The MOU for this collaboration was prepared.

3) Network through events:

In 2019, the Project participated/co-organized the following events:

- National dialogue on GEF7, Bangkok; and
- COP24 in Katowice, Poland - KK shared in the COP.

In 2018, the Project participated/co-organized the following events:

- The 4th CITC Regional Conference 2018 “Accelerating the Paris Agreement Implementation through Climate Finance, Technology and Capacity Building” with the Climate Change International Technical and training Centre (CITC);
- The ‘Outstanding Women Leaders for Green Growth Awards Ceremony’ with the Federation of Business and Professional Women’s Association of Thailand;
- Khon Kaen Smart City Project Model for Sustainable Low Carbon Cities with TGO; and
- The seminar on “Integration of Industrial and Urban Cooperation in Greenhouse Gas Management to Support the Thailand’s Nationally Determined Contribution” with Global Green Growth Institute (GGGI).

Output 2.1.7: Designed, developed and implemented awareness campaign on climate change and low carbon developments

101. Although there are 4 indicators, no progress has been made or completed (by 0%). The activities will be implemented in the next phase.

102. Based on the above findings, the progress towards results of the end-of-project targets for Outcome 2.1 is rated Moderately Satisfactory (MS).

Table 9: Progress towards Outcome 2.1

Outcome 2.1	Indicators1	Targets1	Rating	Rating	Justification for Rating
Outcome 2.1: Increased volume of investments in energy efficient urban systems by government and private sector	Total amount of new investment leveraged through local plans of participating cities for low carbon projects by EOP	**USD 16 million**	Moderately Satisfactory (MS)		Total amount of new investment leveraged through local plans of participating cities for low carbon projects was $105.32 (completed by 658%), of which, $75.1million of incremental investment was approved by the local plan and $30.22 millions of investment was in the WTE projects as detailed below: $30 million in a new WTE plant with a capacity of 600 tons per day in Khon Kaen; and $215,384 in the efficiency improvement in an existing WTE plant by focusing on waste segregation and impeller efficiency in the biogas plant in Nakhon Ratchasima.
	No. of new policies facilitating low carbon investments in cities endorsed and approved by line agencies by EOP	**2**			No progress; completed by 0%. The activities depend on Output 2.1.2 and will be implemented in the next phase.
	No of guidelines on international and national sources of climate finance in Thai prepared and published.	1			The indicator and target had not been updated although the activities were updated; completed by 100% for activities. The output was not on target to be achieved. The Project hired a Stakeholder Engagement Consultant (IC), Mr. Pasnakorn Maikate to conduct a study on decoding a new city development innovative to support low carbon city initiative. The consultant has completed the review of private sector engagement in Khon Kaen and Chiang Mai. The report was already to be submitted to UNDP.
	No. of low carbon urban development projects that are financially assisted by government supported, or government-endorsed private sector, financing schemes in the 4 cities	8			No progress (completed by 0%). The activities will be implemented in the next phase. The indicator "T-VER scheme fully operational is not appropriate for Output 2.1.2, but appropriate for Output 2.1.3
	No. of policy recommendations facilitating low carbon investments in cities prepared, submitted and endorsed/approved by line agencies and reported to NCCC	2			
	T-VER scheme fully operational	1			
	No. of projects from the participating cities under the t-VER scheme	4			No progress (completed by 0%). The activities will be implemented in the next phase.

	No. of cities which have provided inputs to the preparation of national NAMAs	4			3 projects will be implemented with T-VER. (Source: Q report)
	No. of MRV frameworks for specific sectors in the 4 cities developed and institutionalized	4			MRV frameworks for specific sectors in 4 cities were developed and institutionalized; completed by 100% ERM-Siam Co Ltd (ERM) was awarded the contract for Monitoring, Reporting and Verification (MRV) Services. ERM reviewed and provided comments and feedback to the project implementers in order to further update the on-site validation. The on-site validation was conducted for all projects in Koh Samui Municipality during May 2019. For the remaining municipalities, the schedule was the 3rd and 4th week of November in 2019. The validation reports for all projects were completed by the end of 2019. In particular, 13 demo projects out of 23 projects were validated. The stakeholders' capacity building had been strengthened in understanding the MRV process, document templates and methodologies. Project Baseline Report for Assurance was completed for all Low Carbon Demonstration Projects.
	No. of trained officers who are actively involved in low carbon planning/decision making/approving/project implementation	40			More than 40 trained officers and 115 officers and private sector were trained and were actively involved in low carbon planning/decision making/approving/project implementation); completed by 100%
	No. of trained private sector investors/practitioners actively involved in designing, financing and implementation of low carbon projects in cities	40			The Low Carbon City Planning and Climate Change Adaption Curriculum were developed and the trainings were conducted for all 4 partner cities. Particularly • The training for Nakhon Ratchasima Municipality was conducted on 6-8 August 2019 at Leosor Hotel with 27 staffs from municipality and related organizations. • The training for Khon Kaen Municipality was conducted on 19-20 August 2019 at Nadee 10 Hotel with 27 staffs from municipality and related organizations. • The training for Chiang Mai Municipality was conducted on 22-23 August 2019 at Chiang Mai Grandview Hotel with 25 staffs from municipality and related organizations. • The training for Koh Samui Municipality was conducted on 27-28 August 2019 at Mana Thai Hotel with 36 staff from municipality and related organizations.
	No. of cities that are officially members of the LCC Network	32			No. of cities network – around 20; completed by 80% and No. of events: more than 2 per year; completed by 100%

	No. of national and international events in which the results of the project and experiences of cities on low carbon investments have been shared	at least 2 per year			Network through MOU: MOU signed with CP ALL to join the Low Carbon City Project in 5 Cities: Khon Kaen, Chiang Mai, Nakhon Ratchasima, Samui and Phuket; MOU signed with ten buildings in Nakhon Ratchasima to join the Low Carbon Building Project; MOU signed with partners for Low Carbon Project Implementation in Samui; MOU signed with Chiang Mai Smart Mobility Alliance Network; MOU signed with 7-Eleven to join the Low Carbon City initiative. Network through projects: After a kick-off meeting in January, CP ALL, TGO and UNDP had discussed the scope and work plan of the Project based on three activities; plastic reduction, energy efficiency and awareness raising campaign and project communication. The MOU for this collaboration was prepared. Network through events: In 2019, the Project participated/co-organized the following events: -National dialogue on GEF7, Bangkok; and -COP24 in Katowice, Poland - KK shared in the COP. In 2018, the Project participated/co-organized the following events: -The 4th CITC Regional Conference 2018 "Accelerating the Paris Agreement Implementation through Climate Finance, Technology and Capacity Building" with the Climate Change International Technical and training Centre (CITC); -The 'Outstanding Women Leaders for Green Growth Awards Ceremony' with the Federation of Business and Professional Women's Association of Thailand; -Khon Kaen Smart City Project Model for Sustainable Low Carbon Cities with TGO; and -The seminar on "Integration of Industrial and Urban Cooperation in Greenhouse Gas Management to Support the Thailand's Nationally Determined Contribution" with Global Green Growth Institute (GGGI). Sources: Project documents and reports
	No. of communication products on successful low carbon investments and activities in cities disseminated	at least 2 per year			No progress; completed by 0%. The activities will be implemented in the next phase.
	No. of lessons learned reports/best practice examples published	6			
	No. of infographics/video/audio clips prepared, produced and disseminated for modern (social) media and community radio	6			

	No. of audience reached with awareness campaigns in cities	40,000			

103. The review of progress toward results above suggested that the Project was able to achieve what it was intended to achieve, and thus was generally on track to deliver its expected results by April of 2021.

3.2.2 Remaining Barriers to Achieving the Project Objectives

104. When comparing key results with the goal, the Project certainly contributed to Achieving Low Carbon Growth in Cities through Sustainable Urban Systems Management in Thailand. However, there are remaining barriers to achieving the Project objective/goal, which include: (i) Project timing. The Project has produced its intended outcomes as discussed in section 3.2.1. However, the Project duration (only 4 years) was too short to measure any lasting changes in low carbon development. By the end of project life, the Project achievement particularly the GHG reduction might not be realized and estimated as some subprojects are long term projects. (2) Resistance to changes. Low carbon development is a systematic process. It might be easy to conduct physical interventions in waste management, transport and energy sector. But it might not be easy for the public to change their customs, behavior and culture. To realize the planned results, the municipalities need to manage the resistance to changes with the Project.

3.3 Project Implementation and Adaptive Management

105. This section presents assessment of the seven components of the project implementation and adaptive management: management arrangements, work planning, finance and co-finance, project-level monitoring and evaluation, management of risks, stakeholder engagement, as well as reporting and communications.

3.3.1 Management Arrangements

106. Two types of implementation modalities are normally employed by UNDP for national-level development projects: Direct Implementation Modality (DIM) and National Implementation Modality (NIM). DIM is referred as UNDP direct involvement in project implementation, including PMU establishment, procurement, disbursements and M&E. NIM is referred as UNDP agreement with a relevant national government agency who assumes project implementation, including PMU establishment, procurement, disbursements and M&E.

107. The Project was implemented under NIM with the TGO as the local government agency based on the project design documents. UNDP Thailand Office (CO) provided support services upon request from the implementing partner for activities within the Project Document or/and annual work plan such as procurement and disbursements.

108. Through documents review and consultation with stakeholders, it appeared that the NIM with UNDP assistance in procurement and disbursements worked well.

109. As originally designed, a Project Board consisting of senior officers from UNDP,

Ministry of Interior, Ministry of Energy, Ministry of Transport, Ministry of Natural Resources and Environment, and pilot municipalities/cities: Chiang Mai, Khon Kaen, Nakorn Ratchasima, and Samui was established to guarantee the successful implementation of the Project. The PB was chaired by TGO, a key government agency in charge of planning and setting targets for greenhouse gas emission reductions in Thailand. The PB also included the representatives from universities and CSOs. The PB sometime invited other participants to attend the PB meetings. The PB met regularly to oversee the project implementation, provide overall strategic policy and management direction, and play a critical role in reviewing the project progress, make recommendations and approve annual project work and budget.

110. The consultants considered that the established managerial arrangements and frequency of PB meetings are adequate for the size and level of complexity of the project. Through the detailed review of meeting minutes and other documents, and consultations with the stakeholders, it appeared that the PB was an effective organization in the management arrangements for the Project in general. In particular, it

- enabled a high level of influence by Government of Thailand during the project implementation;
- ensured close communication between all stakeholders at a senior level;
- ensured the ownership; and
- steered the Project in response to changing circumstances, needs and priorities.

111. A PMU staffed with a director, a manager, a coordinator and an administrative and finance accountant was established within TGO office to manage the daily operation of the Project. The Project Manager reported directly to Project Director.

112. To facilitate the coordination and implementation of the Project activities at local level, the local government in consultation with TGO in each municipality appointed a high-level city focal point, who was in charge of cooperation among the different departments in the city. In addition, the local government also appointed a city project coordinator to support the implementation of the project activities in each city.

113. Through the detailed review of meeting minutes, other documents, and consultations with the stakeholders, it appeared that the PMU was an effective unit to undertake the daily activities of the Project. One issue with the PMU was its small size relative to the strategic and complex nature of the Project. Further, there was not even a case of turnover of PMU staffs during the project implementation. All staffs in the PMU team have been working in the office since the start of the Project. This has ensured the continuity and consistency in Project activity implementation.

114. A Project Working Group at national level was established and updated. The group consisted of 11 members. The Executive Director and Deputy Executive Director served as the Project Advisor. The Project Director served as the Chairman of the Working Group. The members comprised all TGO's Directors and the Project Manager.

115. A city working group was established and updated. The city group consisted of representatives from the municipality and related governmental agencies, local university and private sector. The city working group played an advisory role during the project implementation, particularly on the development of city carbon footprint, low carbon city plan and demonstration

projects as well as liaison and monitoring the achievement against the plan.

116. UNDP CO supported the project implementation with its own resources and expertise. UNDP CO assisted the PMU in the project implementation procedures such as procurement/disbursement, recruiting and contracting as well reporting. UNDP CO also provided the required quality assurance over the implementation of the Project, particularly ensuring the required quality of the project outputs.

117. The UNDP CO helped develop capacity building by adopting the demand-driven approaches and needs assessment strategy which ensured that the activities undertaken contributed to the desired outcomes. For instance, the training conducted for composting of organic waste in households was developed by the demand from local municipalities rather than enforced by the development stakeholders.

118. The Project implemented through UNDP benefitted from UNDP's comparative advantage, which is based on extended country presence in the Thailand and decentralized structure. This comparative advantage is also represented by its long history and extensive experience of support on a wide range of development issues, particularly the country's environmental issue in the region. UNDP is trusted in the country as a development enabler with neutrality and absence of political bias, combined with its ability to identify funding sources, consultants and cost-effective technical inputs.

119. The Project was implemented by following the activities as defined in the LF. In particular, each activity was undertaken based on the well-defined terms of reference. The project also used adaptive management to provide a good flexibility in in allocating project resources and implementing activities to be able to respond to stakeholders needs and changing conditions. The examples included:

- The project had a rapid response to an identified need for updating the targets of GHG emission reduction in 4 municipalities during the inception phase.
- The Project had a rapid response to an identified need for updating subprojects' activities:
  (1) Replace Klaeng with Chiang Mai under Outcome 1.2.
  (2) Update the activities in Samui, Khon Kean, and Nakhon Ratchasima
- The PB had a prompt response to an updated board membership during the inception phase (TGO's order number 3/2561 dated 25 January 2018).

120. It is worth noting here that, despite changing conditions, the Project was still able to deliver most of its expected results on time and on budget. Therefore, the management arrangement is rated Highly Satisfactory (HS).

3.3.2 Work Planning

121. In consultation with the relevant stakeholders, Project Document and Performance Management Plan 2017-2021, the PMU prepared the results-based Annual Work Plans (AWPs) with the planned activities and related indicative timeframe under each Project output for the coming year. AWPs were presented to PB meetings for discussion and approval.

122. The consultants reviewed the Annual Work Plans (AWPs) for Year 2017, 2018 and 2019

and found them realistic with sufficiently detailed narrative description of planned interventions for each of the planned activities. In addition, the utilisation of the resources was generally guided by the approved Annual Work Plan in line with desired project outputs and outcomes. This practice appeared to be consistent with the standard UNDP AWP template.

123. However, the delay in approval of municipalities and reviews of submitted FACE forms by UNDP caused unsatisfactory procurement and disbursement, thus delaying the timely delivery of project outputs in some cases as reported in the Project reports and consultations.

124. Given that a high rate of the expected outputs has been achieved as planned in the Project reports relative to staff, time and budget constraints, the consultants rate the project work planning Moderately Satisfactory (MS).

3.3.3 Finance and Cofinance

125. An overall assessment of the financial performances of the Project is required based on the UNDP/GEF evaluation guidelines. Table 10 presents the Project's planned and actual allocations of GEF funds from 2017 to 2019. Table 10 revealed that the Project had smaller amount of allocation in 2017 and 2018 and greater amount of allocation in 2019, suggesting that the activities were conducted mainly in the latter stage of the project period.

Table 10: Budget and Actual Allocation of GEF Funds (as of 31 December 2019)

Results	2017 (USD)			2018 (USD)			2019 (USD)			Total (USD)		
	Budget	Actual expense	as %	Budget	Actual expense	as %	Budget	Estimated expense	as %	Budget	Expense	as %
Outcome 1.1	213,939	25,603	12.0%	239,373	77,918	32.6%	40,000	323,824	809.6%	493,312.00	427,344	86.6%
Outcome 1.2	331,776	26,670	8.0%	880,543	179,478	20.4%	532,144	753,031	141.5%	1,744,463.00	959,178	55.0%
Outcome 2	111,400	3,030	2.7%	225,230	18,075	8.0%	205,452	82,601	40.2%	542,082.00	103,707	19.1%
Outcome 3	37,300	42,634	114.3%	49,700	15,066	30.3%	15,000	5,541	36.9%	102,000.00	63,241	62.0%
Others												
Total	**694,415**	**97,937**	**14.1%**	**1,394,846**	**290,537**	**20.8%**	**792,596**	**1,164,997**	**147.0%**	**2,881,857.00**	**1,553,470**	**53.91%**

126. The co-financing commitment that Government of Thailand and municipalities made at the beginning of the project implementation through official co-financing letters provided to PMU was considered an important indicator to assess the country's ownership of the project.

127. Table 11 presents the actually realized co-financing contributions from all stakeholders including the national counterparts. The realized co-financing by year showed that the initial high level of commitment and Project ownership by the municipality has not been maintained throughout the project life up to date.

Table 11: Allocation of resources for the project by funding source (in US$)

Source	At Inception	2017	2018	2019	Total MTR	%
GEF	3,150,000.00	694,415	1,394,846	792,596	2,881,857	91%
UNDP	300,000.00	179,761	32,649	62,439	274,850	92%
TGO	400,000.00	100,000	100,000	100,000	300,000	75%
Local Governments	852,312,282.68	34,368,096	5,487,583	4,353,403	44,209,082	5%
Total Cofinancing	853,012,282.68	34,647,857	5,620,232	4,515,842	44,783,932	5%
Total Project	856,162,282.68	35,342,272	7,015,078	5,308,438	47,665,789	6%

128. Based on the consultations at the local level, there was a significant delay of co-finance for some subprojects in the municipalities.

129. Except for the above challenges related to small amount of contributions by municipalities and delay in co-finance, the consultants did not detect any serious problems related to the financial management of the project and considered the existing system for financial controls for disbursement of the GEF and UNDP funds was in place and that the project finance has been managed well by the implementing partner.

130. The rating for finance and co-finance component is Moderately Unsatisfactory (MU).

3.3.4 Project Level Monitoring & Evaluation Systems

131. The Project performance monitoring and evaluation was conducted at several levels in line with the UNDP Programme and Operations Policies and Procedures (POPP) and the UNDP Evaluation Policy during the project period. The monitoring was undertaken at first level by PMU and at the second level by the PB.

132. At third level, the Project Manager and the UNDP-GEF Technical Advisor prepared on annual basis the GEF Project Implementation Reports (PIRs) that covered the reporting period from July (previous year) to June (current year) for each year of project implementation. Two PIRs have been submitted so far, covering the periods 18 July 2017 – 30 June 2018 and 30 June 2018 - 1 July 2019 respectively.

133. A review of quarterly reports, PB minutes and PIRs suggested that the monitoring at the first, second and third levels worked well. More importantly, the Project developed a Performance Management Plan 2017-2021, which clearly presented the monitoring and evaluation Framework, tool, managing for results, PMP, data quality, data analysis, and budget for program management.

134. The consultants found that both PIRs were prepared based on the standard GEF PIR format and contained adequate level of details in narrative descriptions of achievements during the two reporting periods as well as adequate ratings of progress towards the outcomes and of overall progress towards the project goal/objective in project implementation.

135. Although the mid-term evaluation was required after the second PIR was submitted to the GEF, the MTR was initiated few months earlier with the intention to complete the MTR report well in advance of the required submission of 3rd PIR to GEF. The Terms of Reference, the MTR process and the required outline of the MTR report were in line with the standard templates and guidance for GEF-financed projects available on the UNDP Evaluation Resource Centre (ERC).

136. Based on the above, the monitoring and evaluation of the project is rated Highly Satisfactory (HS).

3.3.5 Stakeholder Engagement

137. As shown in Table 1.4 in the original Project Document, the Project stakeholders were

identified and consulted during the design phase. The main target stakeholders included the government ministries and their subsidiary agencies and departments responsible for low carbon development as well as the institutions responsible for waste management, transport and energy. These stakeholders were involved in design of Project within the country's sustainable development framework. They were also involved in discussing recommendations for developing capacities of state and local stakeholders to more effectively manage the low carbon issues.

138. The following agency and ministries were identified as major stakeholders:

- TGO: TGO was identified as the key national executing agency to play the key coordination role in the implementation of the Project.
- MONRE: This ministry was identified as the key national agency to integrate the low carbon policy into municipal plan. This ministry would also be involved in the monitoring the progress of the Project.
- Local municipalities: Those municipalities were also identified as major participants to the project activities and included Chiang Mai, Khon Kaen, Nakhon Ratchasima and Samui.
- Other Ministries: The roles and responsibilities of these ministries, including Ministry of Transport, Ministry of Energy, Ministry of Interior, and other ministries, were also clearly defined in the Project Document.

139. As shown in Table 1.4 in the original Project Document, a stakeholder analysis was conducted through a table indicating the names of stakeholders and their respective roles. However, this list was too general to distinguish the key and other stakeholders.

140. MONRE and Ministry of Transport, which were identified as the primary (core) stakeholders, had been involved in the design of the Project through baseline studies and consultation workshops/meetings. The extensive core stakeholder engagement has been continued during the project implementation up to date, mainly throughout the PB meetings. The initial purpose to involve more stakeholders through their membership proved to be hindering the effectiveness of PB functionality. Therefore, during the inception phase, based on TGO order number 3/2561 dated 25 January 2018, the PB membership was updated to include only the representatives of the core stakeholders:

- Advisors: Gen Thoranit Rojanasuwan
- Chairman: TGO's Executive Director
- Vice Chairman: TGO's Deputy Executive Director
- Members: 11 Representatives from 10 organizations, including Khon Kaen, Nakorn Ratchasima, Chiang Mai and Samui municipalities, Pollution Control Department, Office of Natural Resources and Environmental Policy and Planning (ONEP), Department of Local Administration, Transport and Traffic Policy Plan Office, Office of the Permanent Secretary- Ministry of Natural Resources and Environment, Department of Environmental Quality Promotion, Department of Alternative Energy Department and Efficiency and UNDP
- Member and Secretary: TGO's Director of Strategic Division
- Member and Secretary Support: Project Manager

141. The decision to reduce the PB membership suggested that the project had fewer associations with the noncore stakeholders (such as other ministries and governmental agencies).

142. However, based on the interviews in the municipalities, stakeholder engagement normally involved in long term process of discussion and consultation as different stakeholders have different objectives and priorities, which further caused delay in project implementation.

143. Based on the above, the consultants rate the stakeholder engagement in the project formulation and implementation as Satisfactory (S).

3.3.6 Reporting

144. During the project implementation, reporting is required to identify the potential problems that may have negative impacts on the project implementation so as to achieve its intended objectives. Reporting also helps make informed decisions, provide valuable information for project evaluation, and present lessons to be learnt for future projects.

145. The reporting for the project has been followed as laid out in the both the Monitoring and Evaluations plans in the Project Document. Discussions with implementing agency offices and the working groups in the municipalities indicated there was no concern regarding reporting from the Project.

146. The Progress Tracker, PIRs, PB reports were all being completed at the appropriate stages during the Project implementation. Any changes to the work plan, contracting of staff, budget variation, etc. were easily identified through reporting.

147. Therefore, the rating for the reporting component is Satisfactory (S).

3.3.7 Communication

148. Through the consultations with various stakeholders, the level of communication between the local municipalities, consultants, and national level institutions with the PMU was well carried out. Most stakeholders had very positive comments regarding information flow, access to materials, preparation for meetings, reviewing products, and undertaking contracts during the Project implementation.

149. Communication between the TGO, GEF and the UNDP were also found to be efficient and effective. Those who were interviewed indicated that there were frequent calls and emails between the TGO, UNDP and GEF regarding financial and execution activities, and issues are addressed timely and professionally.

150. The rating for the communication component is Satisfactory (S).

151. The overall rating for the project implementation and adaptive management is based on weighted average of the above ratings for 7 individual components. Two out of the 7 components received the rating of Highly Satisfactory (HS), three out of the 7 components are rated Satisfactory (S), one component is rated Moderately Unsatisfactory (MU) and one Moderately Satisfactory (MS). Therefore, the overall Project Implementation and Adaptive Management is rated Satisfactory (S).

3.4 Sustainability

152. Sustainability is referred to continuation of benefits from an intervention after the Project is completed. The important aspect here is the sustainability of results, rather than the sustainability of the activities that have produced the results.

153. Overall, the Project made important contribution to the sustainable urban systems management in Thailand. As indicated in the annual/quarterly progress reports, the Project produced a wide range of high-quality outputs across all three outcomes. These outputs, particularly the operational urban waste management produced by the Project will guide the new national projects to facilitate low carbon investments development beyond the Project period.

154. In general, the activities undertaken with the project have the potential to ensure long-term sustainability but with challenges described below.

3.4.1 Financial Risks to Sustainability

155. The local municipalities have not contributed sizeable amount of co-financing to the project and a certain portion of the commitments has not been realized up to the MTR. Whether the continued commitment of financial resources depend on the ownership of the local governments/state-owned firms and the profitability of the subprojects. For Capacity Buildings for Internal Waste Management for Bangkok Airways Co., Ltd. (Samui International Airport) in Samui, 4 subprojects in Chiang Mai and LRT and Waste Management in Khon Kaen (Category 1), the continued commitment appeared to be secured. However, the subprojects such as Composting of Organic Waste in households (Category 2) in Samui might face financial risk to sustainability. The situation could be different for Light Rail Transit (LRT) and Waste-to-Energy in Khon Kaen, and Wastewater Treatment Plant Installation, Organic Waste Management Improvement for Samui Organics Recycling Bophut Station, Organic Waste Management Improvement for Baan Ya Suan Pu Station, and Capacity Buildings for Food Waste Management in Hotels in Samui, the financial risks to sustainability depend on the subproject's profitability.

156. The Project also assisted in mobilizing additional resource beyond the project period. For Khon Kaen as an example, one potential source will be from ADB as MOU was signed in March 2019. Other potential sources will come from some foundations in Singapore and other APEC countries as Khon Kaen has been selected as a model of low carbon city.

157. Financial sustainability of the project is rated Moderately Unlikely (MU).

3.4.2 Socio-economic Risks to Sustainability

158. Commitment to environmentally sound management of urban waste and prevention of environmental pollution and adverse health impacts are the main issues for socio-economic sustainability. Insufficient communication with the wider circle of stakeholders and lack of understanding of environmental and health effects caused by urban waste on the public at large can cause challenges for acceptance and operation of a sustainable urban management system in Chiang

Mai, Khon Kaen, Nakorn Ratchasima, and Samui.

159. Socio-economic sustainability of the project is rated Moderately Likely (ML).

3.4.3 Institutional Framework and Governance Risks to Sustainability

160. The project is aligned with the key mandate of governmental agencies such as MONRE, Ministry of Transport, Ministry of Energy, and local governments in Thailand. The trainings provided to a number of inspectors and operators from the leading national institutions and the private sector have strengthened the already existing institutional capacities in Thailand. These together with the Project interventions constitutes a base for good institution and governance of the urban systems management in medium and long term.

161. However, the actual institutional sustainability will depend on the nature of the subprojects. For the subprojects in Category 1 and 3, this will be achieved through establishment of an innovative public-private partnership for the management of the subprojects. This is expected to put in place various financial mechanisms to ensure continuous operation of the urban systems in line with the obligations of low carbon growth. For the subprojects in category 2, there will be Institutional Framework and Governance Risks to the actual sustainability as the project was implemented through households supported by the community.

162. Institutional and governance sustainability of the project is rated Moderately Likely (ML).

3.4.4 Environmental Risks to Sustainability

163. It is critical for environmental sustainability that in the remaining and after the period of implementation the project makes a concentrated effort on disposal and separation of as much as possible of existing urban waste. Further, the project should also avoid second GHG emission because of the project. For example, although the total GHG reduction was achieved from the WTE plant in Khon Kaen during 2017-2018, the Project "received negative GHG reduction from the WTE plant in Nakhon Ratchasima. This is because the ratio of total carbon in the MSW and ratio of fossil carbon, in comparison to total carbon in MSW values of plastic/foam is very high as compared to other type of municipality waste (PIR)". The WTE in service could have negative environmental effects in case of leakages and/or more severe accidents related to operation and maintenance of electrical equipment.

164. Environmental sustainability of the project is rated Moderately Likely (ML). The overall sustainability of the Project is rated "Moderately Likely (ML)".

165. The evaluation results against criteria with justifications are summarized in Table 10.

Table 12: MTR Ratings & Achievement Summary

Measure	MTR Rating	Achievement Description

Project Strategy	N/A	The Project goal and objective were assessed to be not well conceived and designed. The design of the LF generally, but not specifically responded to the barriers. The LF provided a good logical chain for components 1 and 1.2 (2), but not for component 2.1 (3). There were not second level activities particularly for component 1.2 in the LF, which might create a series of problems for implementation and M&E. Some indicators and targets were not appropriate for the outputs and outcomes.
Progress Towards Results	Objective Achievement Rating: Moderately Unsatisfactory (MU)	33,195.72 as of 2019 vs targets: 177,708/182,000 (update) tCO2eq; completed by 18.24%, far below the target KK: 23,923.37 vs target: 100,500; completed by 23.80% NR: 7,705.47 vs target: 10,000; completed by 77.06% CM: 946.47 vs target: 70,000; completed by 1.35% SM: 620.41 vs target: 1,500; completed by 41.36% Cumulative direct GHG emission reductions is a good indicator. In practice, (i) some components might not generate cumulative direct GHG emission reductions. (ii) Other components might have already achieved cumulative direct GHG emission reductions without the Project. 177,708 tCO2 eq. was considered as an unrealistic target for goal as the realized cumulative direct GHG emission reductions resulting from the technical assistance and investments up to the end of 2019 and by the end-of-project were significantly lower than this figure. The actual amount of fuel saving was not available and Annual amount of waste gainfully used was 244,043.36 tonnes as of Dec 2019; completed by 63%.
	Outcome 1.1 Achievement Rating: Highly Satisfactory (HS)	No. of cities that have approved and adopted low carbon development plans by 2017: 4 cities; completed by 100% Percentage of participating cities where evidence-based low carbon planning is integrated with normal urban development planning processes by EOP: completed by100% No. of cities which have completed carbon footprints in selected sectors and have institutionalized the process by 2018: 4 cities; completed by100% No. of cities where carbon footprint has been prepared for selected sectors: 4 cities; completed by100% No. of city officials trained on the carbon footprint process and organized into carbon footprint working groups: 115 city officials, completed by 575% No. of integrated low carbon urban development and action plans prepared: 4 cities; completed by 100% No. of individual sector specific plans prepared (e.g., waste management plans, sustainable transport plans) with inter-linkages with all other relevant sectors taken into account: 20 individual sector specific plans prepared; completed by 250% No. of monitoring plans for waste management facilities developed and implemented: 4 cities; completed by 100%.
	Outcome 1.2 Achievement	GHG emission reductions completion: KK: 23,923.37 vs target: 100,500; completed by 23.80%

	Rating: Satisfactory (S)	NR: 7,705.47 vs target: 10,000; completed by 77.06% CM: 946.47 vs target: 70,000; completed by 1.35% SM: 620.41 vs target: 1,500; completed by 41.36% Indicators: No. of low carbon demonstration projects implemented as a result of technical and investment assistance in participating cities by EOP: 18 projects; completed by 95% No. of low carbon projects designed based on or influenced by the results of the demonstration projects and the low carbon city plans by EOP: 5 projects; 63% Activities: Nakhon Ratchasima, completed by 85% 1. Energy saving for the household sector; completed by 100% 2. Energy efficiency in the city waterworks system; completed by 70% 3. Low emissions building for the department stores and malls; completed by 90% 4. Damage cost study from traffic congestion in the municipality area; completed by 100% Khon Kaen, completed by 85% 1. Light Rail Transit (LRT); completed by 100% 2. Waste management; completed by 70% 3. Waste-to-Energy; completed by 100% 4. Solar roof top; completed by 100% Chiang Mai, completed 70% 1. Develop an integrated connection points between different bus routes; completed by 100% 2. Electronic common ticket for all urban transit in Chiang Mai City; completed by 40% 3. Real time tracking system via on-line application; completed by 100% 4. CCTV surveillance system; completed by 30% Samui, completed by 70% 1. Wastewater treatment plant installation; completed by 50% 2. Composting of organic waste in households; completed by 100% 3. Organic waste management improvement for Samui Organics Recycling Bophut Station; completed by 100% 4. Organic waste management improvement for Baan Ya Suan Pu Station; completed by 100% 5. Capacity buildings for food waste management in hotels; completed by 60% 6. Capacity buildings for internal waste management for Bangkok Airways Co., Ltd. (Samui International Airport); completed by 30%
	Outcome 2.1 Achievement Rating: Moderately Satisfactory (MS)	Total amount of new investment leveraged through local plans of participating cities for low carbon projects: USD105.32; completed by 658%

		No. of new policies facilitating low carbon investments in cities endorsed and approved by line agencies: no progress; completed by 0% No of guidelines on international and national sources of climate finance in Thai prepared and published: the indicator and target had not been updated although the activities were updated; completed by 100% for activities. The output was not on target to be achieved. No. of low carbon urban development projects that are financially assisted by government supported, or government-endorsed private sector, financing schemes in the 4 cities: no progress; completed by 0% No. of policy recommendations facilitating low carbon investments in cities prepared, submitted and endorsed/approved by line agencies and reported to NCCC: no progress; completed by 0% T-VER scheme fully operational: The indicator "T-VER scheme fully operational is not appropriate for Output 2.1.2, but for Output 2.1.3 No. of projects from the participating cities under the t-VER scheme: no progress; completed by 0% No. of cities which have provided inputs to the preparation of national NAMAs: no progress; completed by 0% No. of MRV frameworks for specific sectors in the 4 cities developed and institutionalized: 4 cities; completed by 100% No. of trained officers who are actively involved in low carbon planning/decision making/approving/project implementation: more than 40 officers; completed by 100% No. of trained private sector investors/practitioners actively involved in designing, financing and implementation of low carbon projects in cities: more than 115 officers and private sector investors; completed by 100% No. of cities that are officially members of the LCC Network; around 20; completed by 80% No. of national and international events in which the results of the project and experiences of cities on low carbon investments have been shared: more than 2 per year; completed by 100% No. of communication products on successful low carbon investments and activities in cities disseminated: no progress; completed by 100% No. of lessons learned reports/best practice examples published: no progress; completed by 100% No. of infographics/video/audio clips prepared, produced and disseminated for modern (social) media and community radio: no progress; completed by 100% No. of audience reached with awareness campaigns in cities: no progress; completed by 100%

Project Implementation & Adaptive Management	Satisfactory (S)	PB was an effective organization of the management arrangements for the Project in general and the PMU was an effective unit to undertake the daily activities of the Project. UNDP CO supported the project implementation with its own resources and expertise. The Annual Work Plans (AWPs) for the years 2017-2019 were found realistic with sufficiently detailed narrative description of planned interventions and contained information on financial inputs earmarked for each of the planned activities. However, the delay in approval caused unsatisfactory procurement and disbursement, thus delaying the timely delivery of project outputs in some cases. The existing financial controls for disbursement of the GEF and UNDP funds were sufficient and the project finance has been managed well by the implementing partner. However, the Project faced challenges related to the gap between amount of co-financing committed, actual contributions, and delay in co-finance. The Project performance monitoring and evaluation was conducted at three levels in line with the UNDP Programme and Operations Policies and Procedures (POPP) and the UNDP Evaluation Policy during the project period. The stakeholder consultations took place during the formulation and implementation stages of the Project funded by GEF although stakeholder engagement normally involved in long term process of discussions and consultations. The reporting of the project followed the monitoring and evaluations plans in the project document and the progress tracker, annual reports, PB reports were all being completed at the appropriate stages. Communication among the core stakeholder groups was extensive, particularly in the first year of the implementation.
Sustainability	Moderately Likely (ML)	The project is generally sustainable from the financial, socio-economic, institutional and environmental points of view. However, the Project faces certain financial risk to sustainability as some subprojects have difficulty in securing financial resources. The Project also faces certain environmental risk to sustainability because of second GHG emission caused by west to energy projects.

4 CONCLUSIONS

166. The analysis of the findings resulted in the following core conclusions:

Conclusion 1: The project goal was well designed and fully aligned with the GEF priority focus, UNPAF for Thailand and the national policies and priorities in the areas of low carbon and climate resilient society, while also addressing some of the critical barriers related to low carbon development in cities that were initially identified for Thailand. The Project has been able to provide assistance to TGO and Municipalities by addressing the most urgent needs of the capacities and processes of a local level bottom-up integrated low carbon development planning, implementation and sustainable management of low carbon development projects.

Conclusion 2: The Project LF did not provide a good tool for M&E and implementation. The LF was not well equipped with clearly logical chains from activities to outputs, to outcomes and to objective/goal particularly for Component 1.2 (Outcome 1.2). Some indicators in the Project LF were not sufficient or adequate in many cases to measure the progress or verify the achievements for some outcomes. Other indicators in the Project LF were not even appropriate for monitoring the goal/objective in practice.

Conclusion 3: The Project has made contributions to achieving low carbon growth in cities through sustainable urban systems management in Thailand. Nevertheless, many of the most important outputs/outcomes that have been achieved by the Project need to be finalized and fully implemented by TGO and municipalities and additional resources need to be provided for the Project during next phase of the Project period.

Conclusion 4: A 4-year project timeframe might be too short (4-year duration for municipal urban development plan). It does not provide enough time contingency for risks related to changing environmental, political and economic conditions, and does not provide enough time to realize the project achievements of outcomes before the Project is completed.

Conclusion 5: The Project has successfully implemented a number of activities leading to achievement of targets for many outputs/outcomes. These achievements also contributed to sustainable urban systems management changes beyond planned benefits (e.g. solar roof plus LED replacement, separation of solid waste and others).

Conclusion 6: The Project Board and Project Management Unit were well-functioning to serve as an executive and implementing body respectively during the project implementation. The Project Board provided a strategic direction and management guidance for the project while PMU managed daily activities implementation. UNDP, GEF and TGO are found to be adaptive and responsive partners. UNDP long-term presence and partnership with MONRE and other ministries, technical capacities of the staff and strong accountability for results were recognized as the crucial elements for successful implementation of the Project.

Conclusion 7: The Annual Work Plans (AWPs) during the implementation were considered realistic with sufficiently detailed narrative descriptions of planned activities. They also contained information on financial inputs earmarked for each of the planned activities. However, the Project has not been as efficient as expected as delay in approval by municipalities and UNDP led to unsatisfactory procurement and disbursement, thus delaying the timely delivery of project outputs in most cases. In spite of this, the Project can be completed on schedule due to catch up in the later stage of the project life span.

Conclusion 8: The existing financial controls for disbursement of the GEF and UNDP funds were sufficient, and the project finance is managed well by the implementing partner. However,

the Project faced challenges related to realized co-financing contributions against the sizable commitment and delay in co-financing.

Conclusion 9: Although the Project established a well M&E system, particularly Performance Management Plan 2017-2021 in addition to LF, quarterly progress report, and PIR, the Project activities and results were some time difficult to be monitored and evaluated probably due to poor logical chain from activities, to outputs, outcomes, and to objective/goal, unique indicator (GHG emission reduction) and unrealistic targets for subprojects for the municipalities and the overall Project.

Conclusion 10: Although the Project stakeholders were identified and consulted during the design phase, responsiveness and alignment with the development demand and priorities of national partner is among the most important factors that have contributed to the results achieved. However, stakeholder engagement normally involved in long term process of discussion and consultations as different stakeholders have different objectives and priorities, which caused further delay in project implementation.

Conclusion 11: Despite that local municipalities have made sizeable co-financing commitments to the Project and a large portion of the commitments has not been realized at the MTR stage, this will definitely result in a financial risk to Project sustainability. In the same time, second GHG emission because of the project might create environmental risk to the Project sustainability due to unintended CO_2 emission caused by plastic content in the waste-to-energy facilities.

5 RECOMMENDATIONS

167. The recommendations based on the findings are given below:

Recommendation 1: A good PLF design always results in a good implementation, which in turn results in good project outcomes. The Project should update the LF by taking into account the chain between activities, outputs and outcome and also the chain between the results, targets and indicators as these two logical chains provide a powerful instrument for managing and monitoring the project implementation. More importantly, any updates on outcomes, outputs and activities should take into account the indicators and targets at the same time, vice versa.

Recommendation 2: The Project should use the consistent methodology to estimate the GHG emission reduction for both target and performance evaluation purposes. The Project should use the traditional approach based on some assumptions to verify and estimate the actual GHG emission reduction for GEF. In the same time, the Project should also utilize ERM service to re-estimate the goal of GHG emission reduction and distribute total amount of emission reduction among subprojects in four municipalities based on the activities undertaken and the total target.

Recommendation 3: The Project should update the first two indicators and targets of the objective. The Project can delete the existing first two indicators and targets as the two indicators do not provide consistent measurement. Alternatively, the Project can re-design the indicators of the objective by three sector: waste management, transport and energy. In addition, the targets of objective by sector should be consistent with the target of goal.

Recommendation 4: The Project should work on the gap after the end of MTR so as to enhance the effectiveness of the Project. In particular, the Project should give high priority to the key outputs that have been delivered but have not yet been implemented in order to enhance the

impact of the subprojects, particularly

- Electronic Common Ticket for all urban transit, Chiang Mai;
- Real time tracking system via on-line application, Chiang Mai;
- Organic Waste Management Improvement for Samui Organics Recycling Bophut Station, Samui;
- Organic Waste Management Improvement for Baan Ya Suan Pu Station, Samui;
- Energy saving for the household sector, Nakhon Ratchasima;
- Low emissions building for the department stores and malls, Nakhon Ratchasima;
- Damage cost study from traffic congestion in the municipality area, Nakhon Ratchasima; and
- Light Rail Transit (LRT), Khon Kean.

Recommendation 5: The Project should move the first general indicator and target of Outcome 2.1 to Outcome 1.2 as total amount of new investment leveraged through local plans of participating cities for low carbon projects by EOP is closely associated with the investment in the subprojects in 4 municipalities under Outcome 1.2. Further, the Project should re-design the indicators and target for Output 1.2 2 through Output 1.2.5 (subprojects in 4 municipalities) as the related activities have been updated.

Recommendation 6: The Project should update output 2.1.1 and associated indicator and target as the activity has been updated. As the first general indicator and target has been moved to Outcome 1.2, the remaining activities under Outcome 2.1 can be re-grouped into a component called "Capacity Building". In addition, the Project should update the name of Outcome 2.1 and related indicators and target.

Recommendation 7: The implementation of the Project after the MTR should take into account the AWP so as to ensure that the level of resourcing and implementation timeframe are better aligned with the objectives and scope of the Project. Also, the Project should install a Project Management System by incorporating project accounting, procurement, asset management, and grant disbursement. The system should be connected to local municipality and UNDP to avoid delay in reconciliation and approval.

Recommendation 8: The Project should change the methodology for co-financing from an official co-financing letters provided to PMU to an innovative leveraged investment approach, where the actually realized co-financing contributions against the sizable commitment should be provided before the actual disbursement of GEF funds.

Recommendation 9: In addition to the target of GHG emission reduction for the Project and the subprojects in 4 municipalities, the Project should design a set of indicator and target for 6 activities in Samui, and 4 activities in Chang Mai, Khon Kaen Nakhon Ratchasima respectively. For 4 activities in Chiang Mai as an example, no. of passengers in the public (integrated) transport system might be a good indicator to avoid small incremental low carbon benefits during the project life. Other indicators can be designed for the Light Rail Transit (LRT) in Khon Kaen to avoid no benefits from emission reduction before the end of the Project.

Annex 1: MTR TOR

1. INTRODUCTION

This is the Terms of Reference (ToR) for the UNDP-GEF Midterm Review (MTR) of the *full*-sized project titled *Achieving Low Carbon Growth in Cities through Sustainable Urban Systems Management in Thailand (PIM 4778)*, implemented by the *United Nations Development Programme*. The project was started on *26 April 2017* and is in its *third* year of implementation. In line with the UNDP-GEF Guidance on MTRs, this MTR process was initiated before the submission of the second Project Implementation Report (PIR). This ToR sets out the expectations for this MTR. The MTR process must follow the guidance outlined in the document *Guidance For Conducting Midterm Reviews of UNDP-Supported, GEF-Financed Projects* (Guidance For Conducting Midterm Reviews of UNDP-Supported, GEF-Financed Projects).

2. PROJECT BACKGROUND INFORMATION

Thailand's 12th National Economic and Social Development Plan (2017-2021) sets a vision in moving Thailand towards a low carbon and climate resilient society and promotes sustainable economic and social growth that is environmentally friendly. Important steps have been taken to pave the way for low carbon and climate resilient society, but local authorities especially municipalities are faced with a range of challenges on low carbon urban development. Rapid economic development, urbanization and climate change pose a threat to the management of municipalities/cities in a sustainable way. In support of the Royal Thai Government and the local administration, UNDP Thailand designed a country-led intervention on strengthening the capacities and processes at local level for bottom-up integrated low carbon development planning and the sustainable management of low carbon development projects.

The Achieving Low Carbon Growth in Cities through sustainable Urban Systems Management in Thailand (LCC) Project aims to strengthen the capacities and processes at local level for bottom-up integrated low carbon development planning and the implementation and sustainable management of low carbon development projects. The 4-year project (2016-2220) focuses on low carbon urban systems, in particular waste management and sustainable transport, in 4 cities, while experiences will be shared with other cities to learn from.

The project objective is to "promote sustainable urban systems management in selected cities to achieve low carbon growth." The objective will be achieved by removing barriers to adoption of low carbon development in cities in Thailand through the following components:

a) Low carbon sustainable urban development planning in 4 cities, which will enable them to formulate and implement low carbon sustainable urban development plans
b) Low carbon investments in 4 cities leading to more energy efficient urban systems
c) Financial incentives and institutional arrangements to increase volume of investments in energy efficient urban systems by government and private sector

The project is financially supported by the Global Environment Facility (GEF), with the Thailand Greenhouse Gas Management Organization (TGO) Public Organization, as the Implementing Partner. The total GEF-supported funding is US$ 3,150,000.

3. OBJECTIVES OF THE MTR

The MTR will assess progress towards the achievement of the project objectives and outcomes as specified in the Project Document, and assess early signs of project success or failure with the goal of identifying the necessary changes to be made in order to set the project on-track to achieve its intended results. The MTR will also review the project's strategy, its risks to sustainability.

4. MTR APPROACH AND METHODOLOGY

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

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

Engagement of stakeholders is vital to a successful MTR. Stakeholder involvement should include interviews with stakeholders who have project responsibilities, including but not limited to (list); executing agencies, senior officials and task team/ component leaders, key experts and consultants in the subject area, Project Board, project stakeholders, academia, local government and CSOs, etc.

Engagement of stakeholders is vital to a successful MTR.[3] Stakeholder involvement should include interviews with stakeholders who have project responsibilities, including but not limited to executing agencies, senior officials and task team/ component leaders, key experts and consultants in the subject area, Project Board, project stakeholders, academia, local government and CSOs, etc. Additionally, the MTR team is expected to conduct field missions to **Bangkok, Koh Samui, Chiang Mai, Khon Kaen and Nakorn Ratchasima** and have consultations with the following on-site organizations.

1) Thailand Greenhouse Gas Management Organization (TGO) Public Organization
2) United Nations Development Programme Thailand
3) Koh Samui Municipality
4) Chiangmai Municipality
5) Bright Management Consulting
6) School of Public Policy, Chiang Mai University
7) Khon Kaen Municipality
8) College of Local Administration, Khon Kaen University
9) Nakorn Ratchasima Municipality
10) Chulalongkorn University

[3] For more stakeholder engagement in the M&E process, see the UNDP Handbook on Planning, Monitoring and Evaluating for Development Results, Chapter 3, pg. 93.

11) Other project consultants and local counterparts as appropriate

The final MTR report should describe the full MTR approach taken and the rationale for the approach making explicit the underlying assumptions, challenges, strengths and weaknesses about the methods and approach of the review.

5. DETAILED SCOPE OF THE MTR

The MTR team will assess the following four categories of project progress. See the *Guidance For Conducting Midterm Reviews of UNDP-Supported, GEF-Financed Projects* for extended descriptions.

i. Project Strategy

Project design:

- Review the problem addressed by the project and the underlying assumptions. Review the effect of any incorrect assumptions or changes to the context to achieving the project results as outlined in the Project Document.
- Review the relevance of the project strategy and assess whether it provides the most effective route towards expected/intended results. Were lessons from other relevant projects properly incorporated into the project design?
- Review how the project addresses country priorities. Review country ownership. Was the project concept in line with the national sector development priorities and plans of the country (or of participating countries in the case of multi-country projects)?
- Review decision-making processes: were perspectives of those who would be affected by project decisions, those who could affect the outcomes, and those who could contribute information or other resources to the process, taken into account during project design processes?
- Review the extent to which relevant gender issues were raised in the project design. See Annex 9 of Guidance For Conducting Midterm Reviews of UNDP-Supported, GEF-Financed Projects for further guidelines.
- If there are major areas of concern, recommend areas for improvement.

Results Framework/Logframe:

- Undertake a critical analysis of the project's logframe indicators and targets, assess how "SMART" the midterm and end-of-project targets are (Specific, Measurable, Attainable, Relevant, Time-bound), and suggest specific amendments/revisions to the targets and indicators as necessary.
- Are the project's objectives and outcomes or components clear, practical, and feasible within its time frame?
- Examine if progress so far has led to, or could in the future catalyse beneficial development effects (i.e. income generation, gender equality and women's empowerment, improved governance etc...) that should be included in the project results framework and monitored on an annual basis.
- Ensure broader development and gender aspects of the project are being monitored effectively. Develop and recommend SMART 'development' indicators, including sex-disaggregated indicators and indicators that capture development benefits.

ii. Progress Towards Results

Progress Towards Outcomes Analysis:

- Review the logframe indicators against progress made towards the end-of-project targets using the Progress Towards Results Matrix and following the *Guidance For Conducting Midterm Reviews of UNDP-Supported, GEF-Financed Projects*; colour code progress in a "traffic light system" based on the level of progress achieved; assign a rating on progress for each outcome; make recommendations from the areas marked as "Not on target to be achieved" (red).

Table. Progress Towards Results Matrix (Achievement of outcomes against End-of-project Targets)

Project Strategy	Indicator[4]	Baseline Level[5]	Level in 1st PIR (self-reported)	Midterm Target[6]	End-of-project Target	Midterm Level & Assessment[7]	Achievement Rating[8]	Justification for Rating
Objective:	Indicator (if applicable):							
Outcome 1:	Indicator 1:							
	Indicator 2:							
Outcome 2:	Indicator 3:							
	Indicator 4:							
	Etc.							
Etc.								

Indicator Assessment Key

Green= Achieved	Yellow= On target to be achieved	Red= Not on target to be achieved

In addition to the progress towards outcomes analysis:

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

iii. Project Implementation and Adaptive Management

Management Arrangements:

- Review overall effectiveness of project management as outlined in the Project Document. Have changes been made and are they effective? Are responsibilities and reporting lines clear? Is decision-making transparent and undertaken in a timely manner? Recommend areas for improvement.

[4] Populate with data from the Logframe and scorecards

[5] Populate with data from the Project Document

[6] If available

[7] Colour code this column only

[8] Use the 6 point Progress Towards Results Rating Scale: HS, S, MS, MU, U, HU

- Review the quality of execution of the Executing Agency/Implementing Partner(s) and recommend areas for improvement.
- Review the quality of support provided by the GEF Partner Agency (UNDP) and recommend areas for improvement.

Work Planning:

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

Finance and co-finance:

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

Project-level Monitoring and Evaluation Systems:

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

Stakeholder Engagement:

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

Reporting:

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

- Assess how lessons derived from the adaptive management process have been documented, shared with key partners and internalized by partners.

Communications:

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

iv. Sustainability

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

Financial risks to sustainability:

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

Socio-economic risks to sustainability:

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

Institutional Framework and Governance risks to sustainability:

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

Environmental risks to sustainability:

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

Conclusions & Recommendations

The MTR team will include a section of the report setting out the MTR's evidence-based conclusions, in light of the findings.[9]

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

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

Ratings

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

Table. MTR Ratings & Achievement Summary Table for (*Achieving Low Carbon Growth in Cities through Sustainable Urban Systems Management in Thailand (PIM 4778)*,)

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

[9] Alternatively, MTR conclusions may be integrated into the body of the report.

6. TIMEFRAME

The total duration of the MTR will be approximately 25 working days starting on/about 16 January 2020 until 31 March 2020.

Duty Station: Home-based with one mission from home to Bangkok and four domestic missions in Thailand to project sites, **Chiangmai, Samui, Khon Kaen and Nakorn Ratchasima** and series of meetings with project counterparts in Bangkok. The tentative TE timeframe is as follows:

TIMEFRAME	ACTIVITY
3-13 December 2019	Advertisement for consultants
13 December 2019	Application closed
16-31 December 2019	Select MTR Team
16 January 2020	Contract begins Preparation for the MTR Team (handover of Project Documents)
17-20 January 2020 (4 days)	Project Document Review Submit MTR Inception Report to UNDP for review
21 January 2020 (0 day)	Finalization of the MTR Inception Report and re-submit to UNDP.
26 January 2020	Arrival in Bangkok of International Evaluation Team Lead
27 January 2020-5 February 2020 (10 days)	Inception meeting at UNDP Country Office Meeting with TGO and team and other stakeholders in Bangkok. MTR mission: stakeholder meetings, interviews and field visits
6 February 2020 (1 day)	Mission wrap-up meeting & presentation of initial findings- earliest end of MTR mission
8-12 February 2020 (5 days)	Preparing draft report and draft MTR report submission
13 February 2020 (0 day for consultant)	Circulation of draft report with draft management response template for comments and completion
1-14 March 2020 (5 days)	Incorporating audit trail from feedback on draft report/Finalization of MTR report
15 March 2020	Submission MTR final report
30 March 2020	Expected date of full MTR completion

7. MTR DELIVERABLES

#	Deliverable	Description	Timing	Responsibilities
1	**MTR Inception Report**	MTR team clarifies objectives and methods of Midterm Review	21 January 2020	MTR team submits to the Commissioning Unit and project management
2	**Presentation**	Initial Findings	5 February 2020	MTR Team presents to project management and the Commissioning Unit
3	**Draft Final MTR Report**	Full report (using guidelines on content	13 February 2020	Sent to the Commissioning Unit,

		outlined in Annex B) with annexes		reviewed by RTA, Project Coordinating Unit, GEF OFP
4	**Final MTR Report***	Revised report with audit trail detailing how all received comments have (and have not) been addressed in the final MTR report	15 March 2020	Sent to the Commissioning Unit

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

8. MTR ARRANGEMENTS

The principal responsibility for managing this MTR resides with the Commissioning Unit (UNDP Thailand Country Office). The Commissioning Unit for this project's MTR is UNDP Thailand Country Office.

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

9. TEAM COMPOSITION

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

The selection of consultants will be aimed at maximizing the overall "team" qualities in the following areas:

A. INTERNATIONAL CONSULTANT

Profile

- At least Master's Degree in environment, engineering, technology, climate change, environmental science, economics, sustainable development or related fields.
- Minimum 8 years at the national or international level, related to environmental and/or energy planning, climate change, transport and waste management, low carbon development, and carbon footprint development.

- Minimum of 5 years of project evaluation and/or implementation experience in the result-based management framework, adaptive management and UNDP or GEF Monitoring and Evaluation Policy. Some experience working with GEF or GEF-evaluation is an advantage.
- Very good report writing and communication skills in English.
- Familiarity with the issues concerning the evaluated project in Thailand or in Asia Region is an advantage.
- Demonstrated understanding of issues related to gender, youth, and interlinkages with the Sustainable Development Goals.
- Good in data analytic and visualization techniques

Responsibilities

- Documentation review
- Leading the MTR Team in planning, conducting and reporting on the evaluation
- Deciding on division of labour within the Team and ensuring timeliness of reports
- Use of best practice evaluation methodologies in conducting the evaluation
- Leading the drafting and finalization of the Inception Report for the Mid-term Review
- Leading presentation of the draft evaluation findings and recommendations in-country
- Conducting the de-briefing for the UNDP Country Office in Thailand and Core Project Management Team
- Leading the drafting and finalization of the MTR Report

B. NATIONAL CONSULTANT

Profile

- At least a Master's degree in urban planning, environmental studies, social development, public policy, environmental studies, and/ or other related fields.
- Minimum of five (5) years of supporting project evaluation and/or implementation experience using the result-based management framework and adaptive management.
- 1 year experience Thailand national and local development policies, programs and projects related to low carbon development, energy, and climate change, and public administration process
- Some project management experience in urban management, urban climate resilience, energy, waste management, transport management, low carbon development will be an advantage.
- Proven evaluation skills, including conducting interviews, focus group discussions, desktop research, qualitative and quantitative analysis.
- Excellent command of English and Thai, both writing and speaking. Some knowledge of UNDP or GEF Monitoring and Evaluation Policy will be an advantage.

Responsibilities

- Documentation review and data gathering
- Contributing to the development of the review plan and methodology
- Conducting those elements of the evaluation as determined jointly with the international consultant and UNDP
- Contributing to the interviews, meetings during the onsite evaluation
- Contributing to presentation of the review findings and recommendations at the wrap-up meeting
- Contributing to the drafting and finalization of the review report

10. PAYMENT MODALITIES AND SPECIFICATIONS

Consultant must send a financial proposal based on Lump Sum Amount. The total amount quoted shall be all-inclusive and include all costs components required to perform the deliverables identified in the TOR, including professional fee, travel costs, living allowance (if any work is to be done outside the IC´s duty station) and any other applicable cost to be incurred by the IC in completing the assignment. The contract price will be fixed output-based price regardless of extension of the herein specified duration. Payments will be done upon completion of the deliverables/outputs and as per below percentages:

%	Milestone
10%	Following submission and approval of Inception Report
40%	Following submission and approval of the draft MTR report
50%	Following submission and approval (UNDP-CO and UNDP RTA) of the final MTR report

In general, UNDP shall not accept travel costs exceeding those of an economy class ticket. Should the IC wish to travel on a higher class he/she should do so using their own resources.
In the event of unforeseeable travel not anticipated in this TOR, payment of travel costs including tickets, lodging and terminal expenses should be agreed upon, between the respective business unit and the Individual Consultant, prior to travel and will be reimbursed. Travel costs shall be reimbursed at actual but not exceeding the quotation from UNDP approved travel agent. The provided living allowance will not be exceeding UNDP DSA rates. Repatriation travel cost from home to duty station in Bangkok and return shall not be covered by UNDP.

11. APPLICATION PROCESS

Criteria for Evaluation of Proposal: Only those applications which are responsive and compliant will be evaluated. Offers will be evaluated according to the Combined Scoring method – where the educational background and experience on similar assignments will be weighted at 70% and the price proposal will weigh as 30% of the total scoring. The applicant receiving the Highest Combined Score that has also accepted UNDP's General Terms and Conditions will be awarded the contract.
Only candidates obtaining a minimum of 70% of the total technical points would be considered for the Financial Evaluation. UNDP applies a fair and transparent selection process that will take into account the competencies/skills of the applicants as well as their financial proposals. Qualified women and members of social minorities are encouraged to apply.

Document to be included when Submitting the Proposals:
Interested individual consultants must submit the following document's information to demonstrate their qualifications; Please group them into one1) single PDF document as the application only allows to upload maximum on document:

a) Letter of Confirmation of Interest and Availability and Financial Proposal using the template provided by UNDP

b) CV indicating all past experiences from similar projects, as well as the contact details (email and telephone number) of the Candidate and at least three (3) professional references.

c) 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)

d) Financial Proposal that indicates the all-inclusive fixed total contract price and all other travel
related costs (such as flight ticket, per diem, etc.), supported by a breakdown of costs, as per template attached to the Letter of Confirmation of Interest template. 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.

Evaluation criteria:

Criteria	Weight	Max. Point
Technical	70%	700
Master's Degree in environment, engineering, technology, climate change, environmental science, economics, sustainable development or related fields	20%	200
Minimum of five (5) years of supporting project evaluation and/or implementation experience using the result-based management framework and adaptive management.	15%	150
1 year experience Thailand national and local development policies, programs and projects related to low carbon development, energy, and climate change, and public administration process	15%	150
Proven evaluation skills, including conducting interviews, focus group discussions, desktop research, qualitative and quantitative analysis	10%	100
Competency in Brief description of approach to work/technical proposal.	10%	100
Financial	30%	300

All application materials must be submitted to UNDP by 13 December 2019. Short-listed candidates may be contacted and the successful candidate will be notified.

Annex 2: MTR Evaluation Matrix

Evaluative Questions	Indicators	Sources	Methodology
Project Strategy: To what extent is the project strategy relevant to country priorities, country ownership, and the best route towards expected results?			
(include evaluative question(s))	(i.e. relationships established, level of coherence between project design and implementation approach, specific activities conducted, quality of risk mitigation strategies, etc.)	(i.e. project documents, national policies or strategies, websites, project staff, project partners, data collected throughout the MTR mission, etc.)	(i.e. document analysis, data analysis, interviews with project staff, interviews with stakeholders, etc.)
Progress Towards Results: To what extent have the expected outcomes and objectives of the project been achieved thus far?			
Project Implementation and Adaptive Management: Has the project been implemented efficiently, cost-effectively, and been able to adapt to any changing conditions thus far? To what extent are project-level monitoring and evaluation systems, reporting, and project communications supporting the project's implementation?			
Sustainability: To what extent are there financial, institutional, socio-economic, and/or environmental risks to sustaining long-term project results?			

Annex 3: Rating Scales

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

Ratings for Project Implementation & Adaptive Management: (one overall rating)		
6	Highly Satisfactory (HS)	Implementation of all seven components – management arrangements, work planning, finance and co-finance, project-level monitoring and evaluation systems, stakeholder engagement, reporting, and communications – is leading to efficient and effective project implementation and adaptive management. The project can be presented as "good practice".
5	Satisfactory (S)	Implementation of most of the seven components is leading to efficient and effective project implementation and adaptive management except for only few that are subject to remedial action.
4	Moderately Satisfactory (MS)	Implementation of some of the seven components is leading to efficient and effective project implementation and adaptive management, with some components requiring remedial action.
3	Moderately Unsatisfactory (MU)	Implementation of some of the seven components is not leading to efficient and effective project implementation and adaptive, with most components requiring remedial action.
2	Unsatisfactory (U)	Implementation of most of the seven components is not leading to efficient and effective project implementation and adaptive management.
1	Highly Unsatisfactory (HU)	Implementation of none of the seven components is leading to efficient and effective project implementation and adaptive management.

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

Annex 4: List of Persons Interviewed

Name	Position	Organization	Role in the Project	Email and Phone Number
Dr. Amornwan Resanond,	Project Manager	UNDP	Project Manager	Tel: 081 742 4447 Email: amornwan.resanond@undp.org
Ms. Kwanjai Satchatham	Project Coordinator	UNDP	Project Coordinator	0923515626 Kwanjai.satchatham@undp.org
Mr. Saengroj Srisawaskraisorn	Programme Specialist / Team Leader, IGSD Unit, RTA GEF	UNDP	Program team	+66 (0)2 304 9100 ext. 5446 saengroj.srisawaskraisorn@undp.org
Mr. Manuel Soriano	Advisor RTA GEF	UNDP	Program team	
Ms. Natsuda Suwatthanabunpot	UNDP Programme Associate	UNDP	Program team	+66 (0)89 893 4300 Natsuda.suwatthanabunpot@undp.org
Dr.Natarika Wayuparb Nitiphon	Deputy Executive Director	TGO	Implementing Agency	natarika@tgo.or.th 02-1419801
Mr. Pasnakorn Maikate	Individual Consultant		Consultant for 4 cities LCC Plan integration	0815548263, 021150726 ideadees@gmail.com
Dr. Chacharee Therapong	Principal Consultant	ERM-Siam	MRV Consultant	02 6795200 ext.175 Chacharee.therapong@erm.com
Mr. Supeerapat Kraidech	Consultant	ERM-Siam	MRV Consultant	02 6795200 ext.175 Supeerapat.kraidech@erm.com
Ms. Porntip Janphong	Deputy City Clerk	Koh Samui Municipality	Partner city	tipphy13@yahoo.co.th 098-8284179
Mr. Padungsak Unontakarn	RE & Sustainability Manager	Bright Management Consulting	Consultant for Low Carbon Projects Implementation in Samui	padungsaku@bright-ce.com 081-9967186
Mr. Trinnaphop Lertsinsathaporn, aka DJ Noo	The founder of Samui Golden Bin Group	Koh Samui	Demo Project implementers	
Dr. Aroon Meepien	The Owner of a station transform the organic waste into soil conditioner and animal food.	Koh Samui	Demo Project implementers	
Mr. Kanit Somwong (Phuyai Pu)	The founder of Baan Ya Suan Pu Learning Center	Koh Samui	Demo Project implementers	

Name	Position	Organization	Role in the Project	Email and Phone Number
Ms. Jim (Owner)	Lamai Wanta Beach Resort	Koh Samui	Demo Project implementers	Tourism Association of Koh Samui and Samui HR Club,
Mr. Trinnawat Suwanprik	Sanitation Expert	Chiang Mai Municipality	Partner city	trinnawat1@gmail.com 089-7999805
Dr. Ora-orn Poocharoen	Director School of Public Policy	Chiang Mai University	Consultant for Low Carbon Projects Implementation in Chiang Mai	087 717 3637 ora-orn.p@cmu.ac.th oraorn@gmail.com
Ms. Pongtip Tiengburanathum	Project Manager, School of Public Policy	Chiang Mai University	Local Technical Advisor	08 1300 9929 ppuvacharoen@gmail.com
Dr. Poon Thiengburanathum	Deputy Director of Area-based collaborative research unit	Thailand Research Fund - TRF	Partner city	0866541202, 022788233 orashun@gmail.com
Mr. Julanop Thongsopit	Deputy Mayor	Khon Kaen Municipality	Partner city	julanop@hotmail.com 081-6611771
Mr. Tassanai Prachubmorn	Director of Public Health and Environment Promotion Division	Khon Kaen Municipality	Mayor Khon Kaen	tassy_prach@yahoo.com 061-9524995
Dr. Pattanapong Toparkngam	College of Local Administration	Khon Kaen University	Partner city	0851685552 pattto@kku.ac.th
Mr. Netiwit Reungsukpipattana	Director of Sanitary Works Division	Nakhon Ratchasima Municipality	Partner city	netiwit11111@hotmail.com 081-8780022
Prof. Dr. Orathai Chavalparit	Professor and Project Leader, Faculty of Engineer	Chulalongkorn University	Consultant for Low Carbon Projects Implementation in Nakhon Ratchasima	orathai.c@chula.ac.th 081-5536884

Annex 5: List of Documents Reviewed

1. PIF
   - 88545_Signed PIP_Low carbon Growth in the city.pdf (PPG – Project Preparation Grant)
   - PIMS 4778 Signed DOA PPG THA PLECT
2. UNDP Initiation Plan
   - UNDP Initiation Plan (88545_Signed PIP_Low Carbon Growth in City)
3. UNDP Project Document
   - UNDP Project Document
   - PIMS4778 THA LCC Signed Pro Doc and LOA (Signature P2&P150X.pdf (Project Document)
4. UNDP Environmental and Social Screening results
5. Project Inception Report
   - Inception Report_LCC_Final.pdf
   - Annex E2.pdf (Outcome/Activity and Budget)
   - Annex E3 AWP.pdf (Revised Budget and work plan)
   - Annex E4 MWP.pdf (Project work plan)
6. All Project Implementation Reports (PIR's)
   - 2019 -GEF-PIR-PIMS4778-GEFID5086.pdf
   - Final 2018-GEF-PIR-PIMS4778-GEFID5086.pdf
7. Quarterly progress reports and work plans of the various implementation task teams
   - 2017 Q2_Progress Report.pdf
   - 2017 Q3_Progress Report.pdf
   - 2017 Q4_Progress Report.pdf
   - 2018 Q1_Progress Report.pdf
   - 2018 Q2_Progress Report.pdf
   - 2018 Q3_Progress Report.pdf
   - 2018 Q4_Progress Report.pdf
   - 2019 Q1_Progress Report.pdf
   - 2019 Q2_Progress Report.pdf
   - 2019 Q3_Progress Report.pdf
8. Audit reports
   - Micro Assessment Report.pdf
   - TGO Spot Check Report 2018.pdf
9. Finalized GEF focal area Tracking Tools at CEO endorsement and midterm (SFM/REDD-Plus, BD and CC Mitigation areas)
10. Oversight mission reports
    - Project Monitoring Report_LCC_20181123.pdf
    - Project Monitoring Report_LCC_Samui_20190521.pdf
11. All monitoring reports prepared by the project
12. Financial and Administration guidelines used by Project Team
13. Project operational guidelines, manuals and systems
    - LCC-GEF5 Performance Management Plan (rev3)_Final
14. UNDP country/countries programme document(s)
15. Minutes of the Project Board Meetings and other meetings (i.e. Project Appraisal Committee meetings)
    - รายงานการประชุมคณะกรรมการอำนวยการโครงการ 1-2561.pdf (2018)

- รายงานการประชุมคณะกรรมการอำนวยการโครงการ 1-2562.pdf (2019)
- Draft MOM LEDS Meeting_CM
- Draft MOM LEDS Meeting_KK
- Draft MOM LEDS Meeting_KK
- Draft MOM LEDS Meeting_SM

16. Project site location maps

The following documents will also be available:

17. Standard Operating Procedures (SOP)
18. UNDP Strategic Plan 2018-2021
19. UNDP Thailand CPD 2017-2021
20. Integration Strategy Report_PDF

Annex 6: MTR Mission Itinerary

Venue:

1) Bangkok, UNDP, TGO office
2) Samui
3) Chiang Mai
4) Khon Kean
5) Nakhon Ratchasima

Specific objectives:
1) 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.
2) To assess the extent to which the project is achieving impacts or progressing towards the achievement of impacts

No.	Date	Organization	Contact Person	Remarks
1	27 Jan 2020 9-12pm	UNDP project team	Amornwan Resanond, (Project Manager) Kwanjai Satchatham, (Project Coordinator) LCC Project, UNDP	UNDP, 3rd fl Yangze room, UN services building, Rajdamnern Nok Ave. Pranakorn Bangkok 10200
	27 Jan 2020 1-3 pm	UNDP Briefing with Programme team and RTA GEF	Saengroj Srisawaskraisorn Manuel Soriano, RTA GEF, UNDP	Contact person at UNDP Thailand, Natsuda 08-9893 4300
2	28 Jan 2020 9am-12am	ERM Stakeholder Engagement consultant + Pasnakorn	Mr. Pasnakorn Maikate – Individual consultant	Contact person for meeting at TGO office: Kwanjai - Tel: 0923515626 Kwanjai.satchatham@undp.org
	28 Jan 2020 2-4pm	Briefing with Thailand Greenhouse Gas Management Organisation - TGO	Dr. Natarika Wayuparb Nitiphon (Deputy Executive Director), TGO natarika@tgo.or.th 02-1419801	Implementing Agency TGO's office 120 Ratthaprasasanabhakti Building, 9th fl the Government Complex, Commemorating His Majesty, Chaeng Wattana Road Laksi, Bangkok 10210 Thailand. Tel: +66 (0) 2141 9790 Email : info@tgo.or.th
	28 Jan 2020	Bright Management Consulting	Contact person in Samui: Griddipong Tel: 0869100320 Email: griddipongb@bright-ce.com	Flight from Bangkok to Samui Late evening
3	29 Jan 2020 9.30-10.30am	Koh Samui Municipality	Ms. Porntip Janphong (Deputy City Clerk)	Partner city tipphy13@yahoo.co.th 098-8284179 Location: Lipa Noi 29/1 Moo.1 Tambon Angthong, Amper Koh Samui Suratthani 84140, Thailand

No.	Date	Organization	Contact Person	Remarks
				Phone: 077421421 E-mail: info@kohsamuicity.go.th
	29 Jan 2020 11am-12pm	Koh Samui	DJ Noo/ Phuyai Pu/ AJ Arun/ Lamai Wanta Beach resort hotel	Demo Project implementers
	29 Jan 2020		Mr. Padungsak Unontakarn, Bright Management Consulting padungsaku@bright-ce.com 081-9967186	Consultant for Low Carbon Projects Implementation in Samui
4	30 Jan 2020	School of Public Policy (SPP), Chiang Mai University	Contact person for Chiangmai Meeting: Pongtip Tel: 0813009929 Email: ppuvacharoen@gmail.com	Flight Samui to CM on morning (Bangkok Airways (PG241) 10:21-12:10am
	30 Jan 2020 13:30 - 16:30	Chiang Mai Municipality	Mr. Trinnawat Suwanprik (Sanitation Expert) Mayor Smart Mobility Alliance Network	trinnawat1@gmail.com 089-7999805 1 Wang Sing Kham Rd Mueang Chiang Mai Chiang Mai 50300 Thailand
5	31 Jan 2020	College of Local Administration (COLA), Khon Kaen University	Contact person for Khon Kaen meeting: Dr. Pattanapong Toparkngam Tel: 0851685552 Email: pattto@kku.ac.th	Flight Chiangmai -Khon Kaen, 6.00-7.00 am by Air Asia
	31 Jan 2020	Mayor Khon Kaen	Mr. Julanop Thongsopit (Deputy Mayor) julanop@hotmail.com 081-6611771 Mr. Tassanai Prachubmorn (Director of Public Health and Environment Promotion Division) tassy_prach@yahoo.com 061-9524995	Khon Kaen Municipality: 3/3 Pracha Samran Rd., Mueang Khon Kaen, Khon Kaen 40000
	31 Jan 2020	Waste Management – WTE Plant		
6	2 Feb 2020		Contact person for Nakorn Ratchasima meeting: Prof. Dr. Orathai Chavalparit orathai.c@chula.ac.th 081-5536884	Car to Nakhon Ratchasima (afternoon) Consultant for Low Carbon Projects Implementation in Nakhon Ratchasima

No.	Date	Organization	Contact Person	Remarks
7	3 Feb 2020 9.30 am	Nakhon Ratchasima Municipality	Mr. Netiwit Reungsukpipattana netiwit11111@hotmail.com 081-8780022	Partner city: Pho Klang Rd., Nai Muang, Muang, Nakhon Ratchasima, 30000
	3 Feb 2020 11am	Water Supply Bureau at Makhamtao Pumping station		
	3 Feb 2020 13.30	The Mall and Central Departments		Travel to BKK evening
8	4 Feb 2020	Prepare findings		
9	5 Feb 2020 2-4pm	Debriefing with UNDP office	Amornwan, Kwanjai, Saengroj, Natsuda, Renaud and Lovita	UNDP, 1st fl Mekong, UN Service Building Rajdamnern Nok Ave. Pranakorn Bangkok 10200 Contact; Natsuda 08-9893 4300
	7 Feb 2020			Depart Bangkok
10	11 or 12 Feb 2020	Skype debriefing with TGO team (date and time to be confirmed)	Dr. Natarika Wayuparb Nitiphon (Deputy Executive Director), TGO	Kwanjai will confirm the time and availability
	13 Feb 2020			Submit draft MTR
				Feedback MTR
	15 March 2020			Submit final report

Contact details:

1. MTR National consultant: Arada Yawilat; +66(0) 9 2629-5455, email: A'rada yawilat arada.a@gmail.com
2. MTR International consultant: Mr. Langnan Chen: email : lnchen lnchen@xmu.edu.cn
3. UNDP Programme Associate: Natsuda Suwatthanabunpot , +66 (0)89 893 4300, email: Natsuda.suwatthanabunpot@undp.org
4. TGO Meeting venue: Kwanjai Satchatham, Tel: +66 (0)9 23515626, Email: Kwanjai.satchatham@undp.org
5. Samui meeting: Mr. Griddipong, Tel: +66(0) 8 6910 0320 Email: griddipongb@bright-ce.com
6. Chiang Mai Meeting: Ms. Pongtip, Tel: +66 (0) 8 1300 9929, Email: ppuvacharoen@gmail.com
7. Khon Kaen Meeting: Dr. Pattanapong, Tel: +66 (0)8 5168 5552, Email: pattto@kku.ac.th
8. Nakorn Ratchakima: Dr. Orathai, Tel: +66 (0) 8 1553 6884, Email: orathai.c@chula.ac.th
9. Interpreter during field mission in 4 provinces: Mr.Chanuntorn Katasaenee Tel +66 08-1931-1834

Annex 7: Signed UNEG Code of Conduct Form

Evaluators/Consultants:

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

MTR Consultant Agreement Form

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

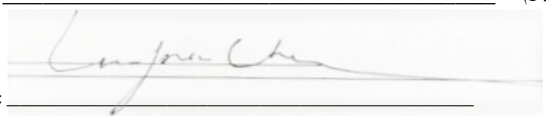
Name of Consultant: Langnan Chen

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 30 June 2020 *(Place)* on Xiamen, Fujian, China

(Date)

Signature: 

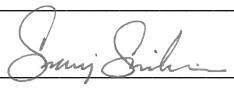
Annex 8: Signed MTR Final Report Clearance Form

(to be completed by the Commissioning Unit and UNDP-GEF RTA and included

Midterm Review Report Reviewed and Cleared By:

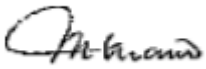
Commissioning Unit

Name: Saengroj Srisawaskraisorn

Signature:  Date: 12 March 2020

UNDP-GEF Regional Technical Advisor

Name: Manuel Soriano



Signature: _____ Date: 12 March 2020