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Mid-term Review

GREEN TECHNOLOGY APPLICATION FOR THE DEVELOPMENT OF LOW CARBON CITIES PROJECT (GTALCC)

(GEF Project ID: 5329 – UNDP PIMS ID 4283)

MALAYSIA
GEF-5; GEF Climate Change Mitigation; CC-4 (Promote energy efficient, low-carbon transport and urban systems)

Evaluation timeframe: April 2015 - present

Final version

July 2019

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Disclaimer

Please note that the analysis and recommendations of this report do not necessarily reflect the views of the United Nations Development Programme, its Executive Board or the United Nations Member States. This publication reflects the views of its authors.

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ABBREVIATIONS AND ACRONYMS

ADB	Asian Development Bank
APUDG	AJM Planning and Urban Design Group
AWP	Annual Work Plan
BOMS	BRT Operational Management System
PBT	Local Authorities *(Pihak Berkuasa Tempatan)*
BRT	bus rapid transit
CEO	Chief Executive Officer
CEO ER	CEO Endorsement Request
CETDEM	Centre for Environment, Technology and Development
CNG	compressed natural gas
CO	Country Office
CO_2	carbon dioxide
COMOS	Cohesive Mobility Solution
EA	GEF Executing Agency (UNDP Implementing Partner)
EE	energy efficiency
EMS	energy management system
EnMS	Energy Management Standard
EPC	energy performance contracting
EPU	Economic Planning Unit
EV	electric vehicle
GEF	Global Environment Facility
GHG	greenhouse gas
GMB	Gas Malaysia Berhad
GNG	Green Neighbourhood Guidelines
GTALCC	Green Technology Application for the Development of Low Carbon Cities Project
GTMP	Green Technology Master Plan
HTJ	Huang Tuah Jaya
HWCG	Healthy Walkable Cities Guidelines
IA	GEF Implementing Agency
IGEM	International Greentech and Eco Products Exhibition and Conference Malaysia
IRDA	Iskandar Regional Development Authority
LCCF	Low Carbon Cities Framework
LCS	low carbon society
LCUD	low-carbon urban development
KATS	Ministry of Water, Land and Natural Resources
KL	Kuala Lumpur
KPKT	Ministry of Housing and Local Government
$ktCO_2$	kilotons of CO_2
KeTTHA	Ministry of Energy, Green Technology and Water (MEGTW)
M&E	monitoring and evaluation
MEA	Ministry of Economic Affairs
MGBC	Malaysia Green Buildings Confederation
MHLG	Ministry of Housing and Local Government
MBIPV	Malaysia Building Integrated Photovoltaic Project
MESTECC	Ministry of Energy, Science, Technology, Environment & Climate Change
MIEEP	Malaysia Industrial Energy Efficiency Improvement Project
MIP	Malaysian Institute of Planners
MIPTC	MIP Training Centre
MGTC	Malaysian Green Technology Corporation (GreenTech)
MMS	BRT Mobility Management System
MP	Malaysian Plan
MRT	mass rapid transit

$MTCO_2$	millions of tons of CO_2
MUF	Malaysia Urban Forum
NEEAP	National Energy Efficiency Action Plan
NGTP	National Green Technology Policy
NLCCMP&PRM	National Low Carbon Cities Master Plan and Policy Road Map
NPCC	National Policy on Climate Change
NPM	National Project Manager
NPP	National Physical Plan
NREPAP	National Renewable Energy Policy and Action Plan
NSC	National Steering Committee
NUP	National Urbanization Plan
MB	City Council
MP	Municipal Council
MTR	Mid-Term Review
MW	megawatt (= 1 million Watt)
PHEV	plug-in hybrid electric vehicle
PIF	Project Identification Form
PIR	Project Implementation Review
PJ	Petaling Jaya
ST	Energy Commission
PMU	Project Management Unit
PPP	public-private partnership
PTC	Project Technical Committee
RE	renewable energy
SEDA	Sustainable Energy Development Authority Malaysia
SDOE	Sime Darby Offshore Engineering
TOD	transit-oriented development
ToR	Terms of Reference
PV	photovoltaic
RM	Malaysian Ringgit
tCO_2	ton of carbon dioxide
UNDP	United Nations Development Programme
UNIDO	United Nations Industrial Development Organisation
UPEN	State Economic Planning Unit
USD	United States dollar
UTM	University of Technology Malaysia

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EXECUTIVE SUMMARY

Project information table

Project Title:	**Green Technology Application for the Development of the Low Carbon Cities**			
GEF Project ID:	5329		*Committed at endorsement (USD Million)*	*Realized co-financing / spent GEF budget at midterm review (USD 10^6)*
UNDP Project ID:	4283	GEF financing:	4.355	1.68
Country:	Malaysia	IA/EA own:	0.3540	0.114
Region:	South-East Asia	Government:	55.258	40.707
Focal Area:	Climate Change	Others (private):	--	--
FA Objectives, (OP/SP):	Climate Change programme #4 to "Promote Energy Efficient, Low-Carbon Transport, and Urban Systems" (CC-4)	Total co-financing:	55.613	40.821
Executing Agency:	UNDP	Total Project Cost:		
Other Partners involved:	MESTECC, Ministry of Energy, Science, Technology, Environment & Climate Change (Implementing Partner) SEDA, Sustainable Energy Development Authority Malaysia (Lead Consultant)	GEF endorsement: April 2015		ProDoc Signature (date project began): June 2016
		(Operational) Closing Date:	Dec 2020	

Description of the Project

The project has been formulated by UNDP and MESTECC (Ministry of Energy, Science, Technology, Environment & Climate Change formerly known as KeTTHA (Ministry of Energy, Green Technology and Water), which are the Global Environment Facility (GEF) and local implementing agencies, respectively with SEDA (Sustainable Energy Development Agency) in the Lead Consultant role.

The **objective** of the project *is to facilitate the implementation of low carbon initiatives in at least five Malaysian cities and showcase a clear and integrated approach to low carbon development*, by means of addressing barriers and challenges to low carbon urban development (summarised in the previous Section 2.1).

The objective will be achieved by removing barriers to integrated low carbon urban planning and development through 3 components:

1. Policy support for the promotion of integrated low carbon urban development, which will enable cities to implement and adopt integrated low carbon urban development plans and programmes;
2. Awareness and institutional capacity development, which will expedite appraisal, approval and the implementation of strategic urban development, and ensure cities are aware of planning and implementing low carbon technology applications, and;
3. Low-carbon technology investments in cities, where there is an increase in investment in low carbon technologies with more low carbon projects implemented.

A summary of the project's outcomes and outputs is given in the table below.

Outcome	Outputs
Component1Component1 Policy support for the promotion of integrated LCUD GEF budget: USD 925,890	
Outcome 1.1 Major cities implemented and adopted integrated low carbon urban development plans and/or programmes	1.1.1 Approved city policies, legislation and regulations, and strengthened enforcement systems for integrated LCUD 1.1.2 Established GHG accounting framework and decision-making tools for national and sub-national levels 1.1.3 Completed and approved evidence-based low carbon development plans and investment programmes for cities and precincts
Component 2 Awareness and institutional capacity development GEF budget: USD 861,252	
Outcome 2.1 Expedient appraisal, approval, and implementation of strategic urban development plans/program and projects	2.1.1 Strengthened and operational coordination mechanisms for effective implementation of low carbon city policy
Outcome 2.2 Major cities are aware of, and are planning and implementing low carbon technology applications for integrated urban development	2.1.2 Complete training programs for policy decision-makers, local governments, green practitioners and financing institutions on strategic urban planning processes for low carbon and climate resilient development 2.2.2 Operational knowledge management systems for low carbon city development
Component 3 Low-carbon technology investments in cities GEF budget: 1,917,598	
Outcome 3.1 Low Carbon Technology Investments in Cities	3.1.1 Applied design considerations into BRT for enhanced GHG emission reduction potential 3.1.2 Leveraged investments to support the scaling up of low carbon public transport systems 3.1.3 Validated and scaled-up green technology incentive scheme in target cities for households and SMEs 3.1.4 Leveraged investments in low carbon urban systems based on low carbon development plans 3.1.5 Approved pilot NAMA proposal for low carbon urban development
Outcome 3.2 More low carbon projects implemented in Malaysian cities	3.2.1 Operationalised electric vehicles and charging station infrastructure 3.2.2 A commissioned BRT system operating in Iskandar Development Region 3.2.3 A commissioned city cycleway in Putrajaya 3.2.4 Operationalised on-site waste processing projects in Petaling Jaya
Project management GEF Budget: USD 207,042	
TOTAL GEF budget: USD 4,354,794	

Project progress summary and MTR ratings

The main **findings** and **ratings** of the mid-term review are presented below:

Main criteria	Rating	Explanation
Progress towards results - Component 1 - Component 2 - Component 3	S - HS - S - MS	Most project progress has been made in *Component 1.* The Project has managed not only to engage the original five participating cities, but has reached out to more supporting cities, and supported the formulation of updating of low carbon blueprints or action plans. With the pending finalisation of the NLCCMP&PRM and, the project has actually gone beyond what was originally formulated in the Project Document, hence we give a HS rating. The above-mentioned activities have been accompanied by workshops, training and awareness events while the Institutional Framework study is reaching finalisation. Since many capacity building and awareness events of *Component 2* will only be organised after the NLCCMP&PRM, it may be too early to tell, but in 1-1.5 year the Project has been quite active so far, and hence we give a S rating. Regarding *Component 3*, a number of low-carbon initiatives have been delayed or initiation postponed, in particular, the Iskandar Malaysia BRT, by far the largest in size in terms of co-financing and expected GHG emission reduction. Other city-level low-carbon are initiatives regarding e-vehicles (e-buses, e-cars, e-scooters and e-bikes) that have been implemented, while others have been de-prioritised. To the credit of the Project Team, new avenues are explored, such as alternative low-carbon fuels and vehicles (in particular, the use of bio-CNG in CNG buses, in combination with bio-CNG production from biomass waste, i.e. palm oil effluent and the organic content in municipal wastewater and solid waste). However, the proof of the pudding will be in eating it. We give this Component a cautious MS rating
Relevance Design	- R - S	The Malaysian government stresses sustainable development efforts that are emphasised from the Eleventh Malaysia Plan (11 MP) 2016-2020 to down to sectoral national policies, master plans. We consider the Project as very relevant (R). The project's results framework of objective-outcomes-outputs-activities addresses the barriers to low-carbon policy-making and planning and to low carbon investments. The GTALCC still basically follows the original framework, although Outcome 3 will need some amendments due to changes in activities (which the Team is currently pursuing). This is sufficient enough to give us a satisfactory (S) rating
Implementation and adaptive management	S	The formulation of the project concept (PIF) and project concept had taken quite some time (2012-2015), which was followed by an equally long project start-up period (2015-2017). To compensate for the time lost, the GTALCC did start accelerating activities in 2018 and the project, in general, seems on track with most progress made in Component 1. We rate the implementation in the period 2015-2017 as unsatisfactory (U), but the accelerated approach 2018-present we regards as highly satisfactory (HS), giving an average rating for *implementation and adaptive management* as satisfactory (S)
Sustainability	ML	As per instruction in the UNDP/GEF *Guide in Mid-term Review,* the rating for sustainability should not be higher than the lowest rating of each of the categories. Low-carbon funding for projects and programmes is a major barrier; unless it is clear from the NLCCMP&RM how this barrier will be addressed we give a rating of marginally likely (ML) for financial sustainability (other categories, institutional and governance sustainability, environmental and social sustainability receive 'likely' rating), and, hence, the overall sustainability rating is 'marginally likely'(ML)

In conclusion, the Project has been instrumental in lowering barriers to more widespread application of the low-carbon planning and city and national level and to realising carbon-relevant investments.

Recommendations

Number	Recommendation	Entity Responsible
A	Outcome 1	
A1	One issue is where the NLCCMP&PRM will be based? This must be based in the climate change division of MESTECC. As discussed during stakeholders' engagement, ownership of this document should be shared with PLANMalaysia and Ministry of Housing and Local Government. The state government should also set up a climate change division to oversee the implementation of low carbon development plans/programs.	MESTECC and government entities
A2	The 12th Malaysia Plan (MP) process has already started and is expected to be tabled in Parliament and approved in October 2020, for implementation starting 2021-2025. The GTALCC project can play an important role in ensuring that the low-carbon agenda is properly reflected in the 12th Plan.	MESTECC, Government entities
B	Outcome 2	
B1	Have a detailed look, as part of NLCCMP&RM and Institutional Framework formulation how this inter-sectoral and inter-departmental coordination for low-carbon planning and actions can be best implemented to guarantee a longer-term impact, and how carbon-relevant funding (inter-sectoral and in cooperation with the private sector) can be mobilised in an optimal way.	MESTECC; Project Team
C	Outcome 3	
C1	The ProDocs in Output 3.1 of Component 3 indicates GTALCC support to selected on-going low-carbon investments by cities (IM-BRT, cycleways Putrajaya; waste Cyberjaya) or proposed by (public or private) companies, such as electric vehicles (e-buses, e-cars, e-bicycles). However, the time frame of these investments has changed (such as IM-BRT) or the GTALCC priorities in low-carbon investments change (e.g. electric vehicles and charging infrastructure is also addressed by other national and donor-supported initiatives). The new investments hinted at in Output 3.2 tend to be city-oriented, which as such is understandable in a project that promotes city involvement in low-carbon planning and project implementation. However, such investments also tend to be city-level; some may be replicated to other cities, but otherwise the longer-term impacts may be limited. This has led to some re-thinking by the Project Team on the technology focus of Component 3, in which GTALCC is positioned as addressing 'niche areas. One such as area is the use of bio-CNG replacing diesel in (public) transportation. The MTR Team fully endorses this creative way forward, in which a number of new (city- and national-level) initiatives have been proposed:	Project Team; related local government entities; private sector investors
C2	As a new project activity, the GTALCC project is contemplating to carry out a pilot to proof the bioCNG-for-transport concept, in cooperation with a bus operator and Gas Malaysia/Sime Darby Energy. The option of bio-CNG lends itself to a type of public-private partnership that the project tries to promote, in which national government (Ministry of Transport and agencies), companies (bus operator, palm oil companies, the distributor GasMalaysia), and local governments participate. The Project Team is contemplating to support a pilot project with about 10 bio-CNG buses. It would have been nice if this could be done with the IM-BRT, which is still in the design stage. A successful pilot may entice IM-BRT management to incorporate bio-CNG buses in their lines, and acquire bio-CNG buses on a larger scale in future BRT expansion works.	Project Team; SEDA
C3	We recommend that, apart from comparing the pros and cons of bio-CNG vs. electric buses vs. diesel-fuelled buses, GTALCC looks further into the techno-economic issues and options regarding the production of bio-CNG from methane recovered from palm oil waste, as well as from wastewater treatment facilities and landfills (incl. cost of installation of CNG-quality upgrading facilities and required economy of scale). This could be part of a wider analysis of waste	Project Team; SEDA

	management (reduce, recycle, re-use, separate), waste-to-energy options (for electricity generation of bio-CNG production) and the role of cities, State governments and private sector.	
C4	Another idea mooted is the installation of solar PV on rooftops of government buildings and installation on covered parking space and walkways (with solar PV installed on top). If designed in the right way, the additional cost of covering open parking spaces and walkways could be recovered by the sale of electricity to the grid. We recommend that the Project Team studies the issues, options, costs, and benefits and explores the possibility of setting up a pilot project in Putrajaya (covering parking spaces) or with one of the MRT or BRT stations (e.g. covering walkways that interconnect the BRT or MRT with other public transport modes).	Project Team; SEDA
C5	Regarding the latter, inter-modal connectivity can often be problematic. If people cannot get from A to B using various transport modes (BRT, MRT, bus, walking, cycling, car park options at connection points) in a reasonable time, they will avoid it, even if the mass transport system itself is very effective). The GTALCC should look into options on how to improve inter-modal connectivity.	Project Team; SEDA
D	**Project Implementation and adaptive management**	
D1	As explained in detail in Section 4.3.1, the table of outcomes-outputs-activities and indicators needs to be updated to reflect the changes that have occurred since project design in 2013-15 and to have outcome indicators that more realistically reflect the impact of the Project's actions rather than those of project partners. The MTR Team has made a revised logical framework (in discussion with UNDP CO and Project Team) that is presented in Box 24. We recommend that this is discussed at the National Steering Committee level and considered for further progress reporting and work planning	Project Team; SEDA; UNDP
D2	At the time of conceptualisation, the project was not designed to target women and girls specifically. The project should now make a gender strategy and action plan. This should include collecting a wider range of gender disaggregated data to be used for future analysis and planning for the advancement of gender equality and women empowerment. Another suggestion is to have a workshop on gender and climate change to strengthen the agenda of women participating as implementers and beneficiaries of low-carbon projects.	Project Team; SEDA; UNDP
D3	Although the original Project Document included contracting a Chief Technical Advisor (CTA) for a 3-year period, the CTA (currently Mr. H. Jensen) was not contracted until mid-2018 and only for half a year. We noted that the CTA position has allowed making valuable contributions and to be able to follow up and give good guidance on the above-mentioned nine recommended actions, we propose that the position of CTA is extended at least into 2020.	Project Team; SEDA; UNDP

Lessons learned

<u>Low-carbon planning</u>

The project team realized that there are several agencies which have similar and overlapping mandates. In realizing this, a conscious effort has been made to increase partnership and collaboration with these agencies with overlapping mandates and to synergize the project interventions. Second, there is a strong need for a national level low-carbon planning and institutional framework guided by a national strategy or master plan that is endorsed by an inter-sectoral range of cooperating ministries and agencies. Although not formulated as such in the ProDoc, the Project Team (with SEDA support) has rightly identified this as a fundamental gap that should be addressed and has focussed efforts on having a low carbon planning and an appropriate institutional framework in place (to promote horizontal and vertical integration on carbon-relevant decision-making).

Project formulation

Often UNDP/GEF projects face a long period from first project concept, PIF submission, PIF approval, project documentation formulation, CEO endorsement, project signatures, project inception to setting up the project management team. GTALCC confirms this and the whole period lasted some five years, and only by mid-2017 a fully functional project team was set up. Such a period is too long and brings the inherent danger that the project documentation is outdated already when the project activities really start. This has happened in the case of GTALCC was well, especially in Component 3 where investment opportunities have shifted or associated investments delayed.

A number of the project indicators measure the progress of the external partners that are outside the control and influence of the project. In the Project, a few indicators measure big investments by external partners and is counted this as part of co-financing and/or the UNDP/GEF project's direct greenhouse gas emission reduction. If the large investment has not occurred yet at the GEF project's end, then how can we report the co-financing (and associated GHG emission reduction? Does this mean that the UNDP/GEF project was not successful? Not really, the indicator measures the investment partner's progress basically, not the UNDP/GEF contribution. Second, if such an indicator makes sense in the logframe, it should be broken down in phases, e.g. with a sub-indicator for 'feasibility and business plan finalised', 'tendering and design completed', 'construction started and completed', so that the progress can make measured.

UNDP

With one of the MTR team consultants also involved in many UNDP/GEF project activities and the observation based on the GTALCC experience, we have a question: "why each time when a project is being formulated, the wheel of 'formulating the logframe set of indicators' needs to be reinvented?" Since most UNDP/GEF climate change mitigation usually have the same components, e.g. policy and institutional frameworks, capacity and institutional strengthening, financial mechanisms and a pilot/demonstration component, would it not be possible to formulate some 'guidance document' on how to formulate good indicators that are not only SMART, but are able to give an indication of the project's influence on outcome realization? Such a document could give generic examples of sets of indicators per component that can then be catered and finetuned by the project document designers based on the project's needs and circumstances.

1. INTRODUCTION

1.1 Purpose of the mid-term review (MTR) and objectives

1.1.1 Background

Cities and climate change have a causal relationship. Cities, as major emitters of greenhouse gases, contribute to climate change. Again, the changing climate can have severe impacts on cities, all the more important as they house a large, increasing, part of the population and productive assets. Malaysia and its cities must decouple its economic growth and GHG emissions or risk being locked into unsustainable development. The **low-carbon urban development (LCUD) approach** has become an emerging framework to address the challenge of climate change, which is cross-sectoral in nature covering, water, wastewater and solid waste management, energy, buildings, urban infrastructure and form, greenery and environment, transport, as well as urban policy, planning and institutional framework (see **Error! Reference source not found.**). Developing an integrated low-carbon development approach requires several key components to be in place or working together in an integrated way, including a low-carbon policy and regulatory framework and investment, appropriate institutional structures (urban governance and management, finance) and capacity development. Identifying strategic investments and developing a project pipeline is a crucial step in city planning.

However, demonstrating the relevance of low-carbon urban development concepts and approach to local authorities has been quite challenging. These include a) incomplete policy and regulatory framework for low carbon development, especially at the sub-national levels, b) lack of awareness and institutional capacity for evidence-based low carbon planning at the sub-national levels, and c) lack of capacity of cities to mobilise finance and incentives in promoting low carbon investments,

To address such challenges, UNDP and the MESTECC (Ministry of Energy, Science, Technology, Environment & Climate Change[1]) formulated the project *Green Technology Application for the Development of Low Carbon Cities (GTALCC),* with financing support provided by the Global Environment Facility (GEF). Under MESTECC as the lead agency, the Project is implemented by the Ministry of Energy, Science, Technology, Environment & Climate Change (MESTECC) with the Sustainable Energy Development Authority Malaysia (SEDA) as the lead consultant agency.

1.1.2 Purpose of the MTR

Being at the middle of its implementation period, a Mid-Term Review (MTR) needs to be undertaken of the project in accordance with the UNDP and GEF Monitoring and Evaluation (M&E) policies and procedures. The MTR has to be carried out by an independent consultant, i.e. not previously involved in project design or implementation. In a competitive process, two experts were chosen to undertake the MTR, Mr. Johannes (Jan) van den Akker (Netherlands) and Mr. Ghazali Talib (Malaysia), hereafter referred to as the "Reviewers".

The **objective** of the MTR is to "*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 and its risks to sustainability*."

[1] Formerly known as the Ministry of Energy, Green Technology and Water (MEGTW). Within MESTECC, the project now falls under the Environment and Climate Change Division

Box 1 Overview of low-carbon urban aspects and practices

Urban form and smart cities
- Land-use and mixed use development
- Landscape-level planning
- Roads and parking
- Integrated urban planning; urban densities
- Future expansion needs; land availability
- Green infrastructure and utility services

Urban greenery and environment
- Preservation natural ecology
- Green roofs; 'living' walls
- Water bodies and biodiversity
- Urban agriculture
- Green spaces
- Number of trees; tree planting
- Air quality
- Urban heat and cooling

Sustainable consumption and production
- Reduce wasteful consumption
- Efficient use of natural and other resources

Buildings
- Building design standards
- Rating systems
- Energy standards and labelling of efficient appliances
- Renewable energy
- Sustainable building materials
- Passive cooling

Industrial energy and resources use
- Efficient fuel and electricity use
- Lifecycle materials
- Industrial processes
- Renewable energy
- Combined heat and power (cogeneration)

Municipal, organic and solid waste
- 4R (reduce, re-use, recycle, recover)
- Sustainable treatment and disposal
- Source point separation
- Waste-to-energy; composting

Transport
- Transit-oriented development (TOD)
- Integrated urban transport planning
- Interconnectivity transport modes
- Multimodal transport; mass transit
- Low-carbon vehicles
- Low-carbon fuels
- Cycle paths and walkways
- Intelligent transport systems
- Traffic management

Planning and financing
- Dedicated low-carbon policy and planning (action plans)
- Mainstreaming low carbon in existing planning frameworks
- Dedicated low-carbon and links with other green funding
- Low-carbon incentives
- Institutional and technological capacity (strengthening)
- Appropriate national and subnational planning framework
- Climate-relevant disaster risk management
- GHG inventories
- Standard of living and quality of life

Water
- Watershed management
- Water resource and urban water management
- Water use savings and reduction
- Sustainable stormwater and drainage systems
- Rainwater harvesting
- Water-sensitive urban design
- Environmental sanitation,
- Wastewater treatment and waste re -use
- Waste-to-energy

Source: J. van den Akker, based on ADB Green City Development Toolkit (ADB, 2015) and GreenTech Malaysia website, LCCF

1.2 Scope and methodology

The MTR has been based on the following *sources of information*:

- Desk review of progress reports and project documents (listed in Annex C),
  - CEO Endorsement Request (CEO ER) and annexes; annual progress reports (PIRs, project implementation reviews); other progress reporting;
  - Overview of budget expenditures and realized co-financing; annual work plans
  - Project technical reports and description of outputs; project or counterparts' websites
  - National policy documents on (urban planning, waste, sustainable transport, energy, etc.) as well as other relevant reports, PowerPoint presentations, and documents from counterpart organizations.
- A review mission of 8 working days to meet UNDP, SEDA, and the Project Team and to hold interviews with project partners and stakeholders. A list of project partners and stakeholders met is provided in Box 5. The meetings and interviewed helped the reviewers to obtain in-depth information on impressions and experiences and to explore opinions about the Project and their understanding and identify opportunities
- A presentation of the initial findings was made at the end of the evaluation mission (on 16/04/2019).

Regarding *data analysis and methods for analysis*, a large number of relevant reports and documents was collected (where possible before the mission). The review of project and background documents (listed in Annex C) provided the basic facts and information for developing the terminal evaluation report, while the mission served to verify these basic facts, get missing data and to learn opinions of respondents to help interpret the facts. With respect to the latter, the interviews with individuals (representatives from project partners and stakeholders) were based on open discussion to allow respondents express what they feel as main issues, followed by more specific questions on the issues raised (guided by the list of interview questions, presented in Annex D). Triangulation has allowed validation of information through cross verification from two or more sources.

The rating has taken place according to the evaluation criteria and the rating scales identified in the UNDP *Guidance for Conducting Midterm Reviews of UNDP-supported, GEF-financed Projects* (2014)[2]. The ratings in this report have been determined based on the project progress reporting and the analysis the Reviewers carried out of the available information and comparing these with observations from the mission (interviews with stakeholders and site visits) and checking with information presented in project technical reports and policy and background documents.

1.3 Structure of the MTR report

This report contains the report body, executive summary, and annexes. The body of this report is structured around the following chapters; it starts with an introduction to the objectives, scope, and methodology of the terminal evaluation (Chapter One), description of the project context and a summary of project facts (such as start date, duration, the context in which the project started), its objectives and stakeholders (Chapter Two).

The assessment of the "review findings" has been guided by the questions of the "review evaluative matrix", of which a final draft was formulated at the inception stage of the assignment (see Annex D)[3]. The report follows the outline for midterm reviews of UNDP/GEF projects[4] but has split the suggested chapter on "Findings" in three parts for practical reasons due to the chapter size and to permit a more reader-friendly presentation of the information. Findings on relevance, design, and formulation are in Chapter Three. An overview of progress regarding the achievement of outcomes and outputs is given in Chapter Four, while the findings on project implementation and monitoring are presented in Chapter Five. Finally, Chapter 6 discusses the achievement presents findings on the replication effects and sustainability. Chapter Seven presents the conclusions, recommendations, and lessons learned from the project. These include actions that might be taken (by the Government) to help ensure the sustainability and continuity of project achievements, as well as steps that can be taken by UNDP (and GEF) to help improve the design and implementation of future projects.

In development projects, 'results' are the describable or measurable development change resulting from a cause-and-effect relationship. These results include project outputs, short- to medium-term outcomes, longer-term impacts, including global environmental and development benefits.

The achievement of the results and the longer-term sustainability thereof is influenced by the:

- way project was formulated and designed (discussed in Chapter 4);
- way the project was implemented by the various project partners (discussed in Chapter 6);
- occurrence and impact of internal and external risks (discussed in Chapter 7).

Annexes at the end of the report include the Terms of Reference (Annex A), mission details and list of organisations and people interviewed (Annex B), documents collected and bibliography (Annex C), evaluation questions and methodology (Annex D),.

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[2] Other guidelines consulted are those presented in the UNDP *Handbook on Planning, Monitoring and Evaluating for Development Results*, *Updated Guidance on Evaluation* (2012), the UNDP Discussion Paper: *Innovations in Monitoring & Evaluating Results* (2013) and the GEF *Review of Outcomes to Impacts (ROTI) Handbook* (2009). Regarding gender aspects, the evaluation refers to the *Guide to Gender Mainstreaming in UNDP Supported GEF Financed Projects* (2016).

[3] See the *Inception Report* of the Terminal Evaluation (J. Van den Akker, June 2017)

[4] See Annex F, 'Evaluation Report Outline' in the UNDP *Guidance for Conducting Terminal Evaluations* (2012)

2. PROJECT DESCRIPTION AND BACKGROUND

2.1 Context and problems that the project sought to address

Emissions from cities

Malaysia is one of the most rapidly urbanising countries in Asia with more than 75% (as of 2017) of the population living in urban areas[5]. The GHG emissions from Malaysian cities are a serious concern for long-term sustainability and competitiveness. Notably, the bulk of city emissions are energy-related and Malaysia's economy, buildings and transportation sector are relatively energy intensive. Waste management is increasingly a major concern for cities as space for landfills and treatment systems becomes constrained. Increasing urban sprawl and growth in incomes continue to put additional pressure on city authorities and emissions are set to increase. Underlying this sprawl is the continuing development of new areas of mostly rural land for new, low-density housing and industrial estates although. Local planning and development drive these issues, yet city emissions are also subject to a variety of contextual factors, including urban form, local climate, building design and technology, transportation modes and income levels.

Policy and institutional framework

Malaysia has made low carbon development a key feature of its development agenda. The Tenth and Eleventh Malaysia Plans (2011-2015 and 2016-2010 respectively) form the country's comprehensive blueprint and set forth the country's overarching strategy for low carbon development and sustainable urban development. The 11th Plan sets a target of 40% reduction in GHG emission intensity of GDP (compared to 2005 levels) and a 22% recycling rate of household waste. The Mid-Term Review of the 11th Plan (2018) increases these targets to 45%[6] and 30%, respectively, while mentioning adding 'encouraging low-carbon mobility', 'promoting green buildings', 'strengthening waste management' and 'expanding green market' as key focus areas.

Under the Malaysia Plan umbrella, the National Policy on Climate Change (NPCC), National Green Technology Policy (NGTP), National Renewable Energy Action Plan (NREAP), National Energy Efficiency Action Plan (NEEAP), National Solid Waste Management Policy, and the National Automotive Plan (efficient vehicles) and the National Biodiversity Plan subsequently establish the policy basis for the low carbon development. Environmental is covered by the National Environment Plan and National Policy on Biodiversity. A planning and guidelines framework is provided by the Low Carbon Cities Framework (LCCF), Green Technology Master Plan (GTMP), Green Neighbourhood Guidelines (GNG), Healthy Walkable Cities Guidelines (HWCG) and the standards MS 1525 (2014) and 2680 (2017) on application of energy efficiency and use of renewable energy in new and existing residential non-residential buildings, respectively. Indirectly related to low carbon are the National Physical Plan (NPP-3) and National Urbanization Plan (NUP-2); these set the framework for land-use planning within which, on a nominal 5-year cycle, the states prepare their State Structure Plans and the municipalities prepare the District Local Plans, the Municipal Council Plans, and Special Area Plans. These are supplemented in some cities and municipalities by Carbon Blueprints and Low Carbon Action Plans.

These policies and plans are delivered by a number of government entities at the federal level, including the MESTECC (Ministry of Energy, Science, Technology, Environment & Climate Change) and its agencies Energy Commission, Sustainable Energy Development Authority (SEDA), Malaysian Green Technology Corp (GreenTech), the Ministry of Housing and Local Government (KPKT), Ministry of Water, Land and Natural Resources (KATS), PLANMalaysia, Department of Standards, as well as State/regional level entities (e.g. State Economic Planning units) and local authorities (city and municipality councils). An overview of key policies and policy delivery responsibilities is given in Box 2.

[5] Up from 71% in 2010 (Census). www.statista.com

[6] The Nationally Determined Contributions (NDC), Malaysia has pledged to reduce its GHG emissions intensity of GDP by 45% by 2030 relative to the emissions intensity of GDP in 2005. This consists of 35% on an unconditional basis and a further 10% is conditional upon receipt of climate finance, technology transfer and capacity building from developed countries.

Box 2 Policy, planning and delivery responsibilities

	Sectoral policy	Direction and master plans	Development plans
Ministry of Economic Affairs (MEA) - Economic Planning Unit (EPU)		11th Malaysia Plan	
Ministry of Energy, Science, Technology, Environment & Climate Change (MESTECC) - Green Technology Division - Environment and Climate Change	National Policy on Climate Change (NPCC) National Green Technology Policy (NGTP) National Energy Efficiency Action Plan (NEEAP) 2016-2025		National Corporate GHG Reporting Programme
- Sustainable Energy Development Authority	National Renewable Energy Policy and Action Plan (NREPAP)		
- Malaysian Green Technology Corp (MGTC; GreenTech)		Green Technology Master Plan (2017-30)	Low Carbon Cities Framework (LCCF)
Ministry of Housing and Local Government (KPKT, *Kementerian Perumahan dan Kerjajaan Tempatan)* - National Solid Waste Management Dept (JPSPN, *Jabatan Pengurusan Sisa Pepejal Negara)* - Housing Dept - Local Government Dept	Solid waste management policy		
Ministry of Territories - PLANMalaysia (Fed. Dept. of Town and Country Planning, *Jabatam Perancangan Bandra dan Desa)*		National Physical Plan (NPP-3) National Urbanization Plan (NUP-2)	Green Neighbourhood Guidelines (GNG) Healthy Walkable Cities Guidelines (HWCG)
Ministry of Water, Land and Natural Resources (MWLNR, *Kementerian Air, Tanah dan Sumber Asli*, KATS)	National Policy on Environment National Water Resources Policy National Biodiversity Policy		
Ministry of International Trade and Industries - Dept. of Standards			MS 1525 (2014) - Code of Practice on EE and Use of RE for Non-Residential Buildings MS 2680 (2017) – Code of Practice on energy efficiency and use of renewable energy for residential buildings
Ministry of Transport	National Transport Policy (in preparation) National Public Transport Masterplan National Automotive Policy (being updated)		
State level - State EPU (Economic Planning Unit; UPEN, *Unit Perancang Ekonomi Negeri*) - Other departments (e.g. Planning, Environment) - Melaka GTC - IRDA		State structure plan Regional plans State Low Carbon Blueprints/Action Plans	Green Action Plans/Carbon Blueprints: - Melaka Green City Action Plan - Selangor Green Technology Action Plan - Johor Sustainability Policy
Local authorities (*pihak berkuasa tempatan,* PBT) - City and municipal councils			Council plans Special area plans Low-carbon action plans/Blueprints

There are various Acts covering various sectors, e.g. Local Government Act (1971), Town and Country Planning Act (1976), Federal Territory Planning Act (1982), Solid Waste and Management Act (2007), Environment Quality Act (174), Street Drainage and Building Act (1974), and Road Transport Act (1987). There is an Energy Efficiency and Conservation Act that is in the process of being developed.. However, there is no overall 'green technology' or 'low-carbon' act.

In Malaysia there are 156 local authorities (also referred to as PBT, *pihak berkuasa tempatan*), of which 14 cities headed by a City Council (*Majlis Bandaraya*, MB), 40 municipalities headed by a Municipal Council (*Majlis Perbandaran*, MP), 96 rural areas, headed by a District Council (Majlis Daerah), and 6 modified authoritites headed by a City Corporation (e.g. Putrajaya Corporation) or Development Board (e.g. Tioman Development Board,). The readiness and capacity regarding low-carbon urban planning may differ widely per local authority, ranging from pro-active (e.g. the five PBTs participating in GTALCC) to passive or not ready. Often, low-carbon is put on the agenda by a champion in a decision-making position, e.g. the Mayor put then is dropped when the Mayor leaves office. Other issues are inter-departmental cooperation and lack of financial resources.

An incomplete policy and regulatory framework to promote low carbon planning and development, especially at the sub-national levels. Currently, there is no national policy related to low carbon-built environment at the national level. While the national reduction target for GHG emission is set, these are not translated in sectoral or local-level targets that coherently fit together in one framework. Cities may set targets that are not linked with the national target. Sectoral targets (energy, waste) are not 'translated' in their carbon reduction equivalent. There is a multitude of entities at the national and local level involved without appropriate horizontal and vertical integration. Ministries tend to work in silos. National level guidelines or instructions are issued but may not be implemented at State or local level. At most local governments, there is no single or universal institutional structure to lead the low carbon initiatives. Coordination with other agencies is difficult and, consequently, cities find themselves unsupported during planning with regard to low carbon development as well as sectoral issues. Thus, cities and States have struggled to translate the national GHG emission reduction agenda into local action, while the potential of collaboration with the private sector in the delivery of services is under-utilized.

<u>GHG accounting and inventory</u>

The federal government has established national-level inventories. Malaysia report to the UNFCCC in its National Communications (the Third version was submitted in Sept 2018). The GHG inventory therein is based on national-level estimates, using the IPCC methodologies. However, there is no standard template for reporting GHG emission data from the bottom to the top level. On the other hand, the national level data are not disaggregated to the state and local levels

Box 3 Main areas and strategies to reduce carbon emissions in urban areas (LCCF)

Source: GreenTech Malaysia, *Low-Carbon Cities Framework,* 2018 (website)

for use by local government entities. The lack of city-level data undermines the ability for decision-makers to justify moving away from business-as-usual options towards low carbon options

The then MEGTW (a.k.a. KETTHA) launched the Low Carbon Cities Framework (LCCF) in 2011. It is a conceptual framework to assist cities in developing policy and planning, and also a technical framework upon which analytical tools for calculation of greenhouse gas emissions and the evaluation of low-carbon development options can be based. The support includes on-going technical assistance on quantifying GHG emissions of a city and identifying mitigation strategies and action plan for implementation. LCCF Track is an online carbon assessment system for cities and areas, which was designed to support the implementation of the Low Carbon Cities Framework (LCCF). Whilst the LCCF has been applied the participation of the cities has been on a voluntary basis only[7]. LCCF Track is a calculation tool for carbon impacts of interventions in a geographical area or a sector in a city under LCCF, focussing on four sectors (see Box 3).

LCCF Track is not meant as a GHG inventory tool. Some city and municipal councils use accounting frameworks, based on international GHG inventory tools, including the Global Protocol for Community-Scale Greenhouse Gas Emission Inventories (GPC), while others use other methods (e.g. the tool that comes with donor support) or their own method. In addition, MyCarbon, initiated by the then Ministry of Natural Resources and Environment (NRE), aims to encourage corporate and public organizations/entities to report their GHG emissions. A challenge with these different methods is to have consistent data throughout the various sectors (water, fuel, electricity, waste, transport), reported in a coherent way. Also some sectorscan only provide estimates other provide accurate statistical data. Some frameworks do not include all sectors, e.g. LCCF does not include forests and agriculture. Consequently, there is mismatch and incompatibility of data between various government entities; data sets are incomplete and difficult to monitor over a range of years.

Capacity building and awareness

There is a general lack of awareness and knowledge sharing on both low carbon development and integrated urban development in states and cities and this impacts on the ability of cities to plan and implement actions. Lack of awareness of the lifecycle costs of green technologies weakens the appraisal of green technology investment options, thereby creating market barriers. Especially at local government levels, there is a short supply of human resources capable of developing and implementing low-carbon strategies. This lack of expertise and of awareness and skills results in low buy-ins from State and local governments. Often professional officers that have acquired carbon-relevant skills move to other departments or divisions where they will do other work. Thus, skills in carbon accounting and calculating carbon emissions are lacking in city-level planning.

There are existing examples of local innovation by cities in low carbon practices. However, these are not being effectively shared and there are no mechanisms to gather and exchange best practices. There is no effective system to monitor, gather, analyse and disseminate information on low carbon development activities and progress. Often projects that have a green or low-carbon impact are not ‘labelled’ as such and then not taken into account. Consequently, lessons are often not well communicated and there is yet to emerge a consensus on best practices.

Finance and project implementation

Cities and their service providers are unable to access finance or overcome the high cost of entry for some green technologies. Most funds come from budget or grants from federal and state government, sometimes supplements by donors, but usually is limited, small and often on a one-time project basis, rather than as part of a longer-term programmatic planning. Especially the lack of continuity is counterproductive and often halts the goodwill and momentum created on low-carbon initiatives. One reason for lack of continuity is the lack of dedicated funding, due to unclear roles and responsibilities, political issues and lack of collaboration between government entities.

There is a lack of both public and private sector finance available for low carbon technologies and infrastructure, and incentive mechanisms are not easily accessible or poorly targeted. For example, despite a number of successful pilots and demonstrations of electric buses in Malaysia and in the region, bus operators have been unable or unwilling to access affordable finance for electric buses. Cities are responsible for local economic development and urban services yet the public financing mechanisms have no provision for prioritizing low carbon options or in reflecting lifecycle costs. Lack of

[7] By 2018, 28 cities had implemented LLCF. The baseline emissions of 23 entities have been certified, of which 8 received an award ‘diamond recoginition’).

data or inaccurate data on low carbon technologies, investment and lifecycle costs, and practices limits the capacity of urban system providers to assess investment risks associated with low carbon technologies.

The Government of Malaysia has formulated the Green Technology Applications for Development of Low Carbon Cities (referred to as GTALCC or as the 'Project' in this MTR report). The Project aspires to address the before-mentioned challenges and to transform the way cities plan and develop so as to promote the application of green low carbon technologies and mobilise cities to fully contribute to the national low carbon development agenda.

2.2 Project description and strategy

2.2.1 Objectives of the project; expected results and established indicators

The project has been formulated by UNDP and the MESTECC (Ministry of Energy, Science, Technology, Environment & Climate Change formerly known as Min. of Energy, Green Technology and Water). The **objective** of the project *is to facilitate the implementation of low carbon initiatives in at least five Malaysian cities and showcase a clear and integrated approach to low carbon development*, by means of addressing barriers and challenges to low carbon urban development (summarised in the previous Section 2.1).

The objective will be achieved by removing the before-mentioned barriers to integrated low carbon urban planning and development through 3 components:

1. Policy support for the promotion of integrated low carbon urban development, which will enable cities to implement and adopt integrated low carbon urban development plans and programmes;
2. Awareness and institutional capacity development, which will expedite appraisal, approval and the implementation of strategic urban development, and ensure cities are aware of planning and implementing low carbon technology applications, and;
3. Low-carbon technology investments in cities, where there is an increase in investment in low carbon technologies with more low carbon projects implemented.

The **outcomes, outputs, and main activities** of the project's results framework (as formulated in the Project Document, or ProDoc) are summarized in Box 4 below. Box 10 supplements this table by listing the outcome project indicators. Both boxes form the basis for the description of gives the baseline, target, and actual values of these indicators in Chapter 4, together with a detailed description of the planned and achieved results per component. The Chapter 4 then ends with qualitative conclusions on the achievement of results.

The Project targets 5 urban areas: Putrajaya (Federal Territory), Petaling Jaya (city), Iskandar Malaysia (Johor – covering 5 local authorities and represented by IRDA), Cyberjaya (Sepang) and Melaka (with emphasis on Hang Tuah Jaya)[8] that are referred to in the project documentation as 'participating cities'.

Funding was sought from the Global Environment Facility (GEF) with a contribution of USD 4,354,794[9]. GEF CEO endorsement was obtained in April 2015. The committed co-financing was USD 55,612,266 (of which USD 54,286,833 grant contributions from national and local government entities).

[8] They are not all strictly legally designated as "cities" but represent the different legal entities of Malaysian urban areas and are largely being referred to as "cities" in the Malaysian context. Participants in GTLACC include 1 city (Petaling Jaya), 1 municipality (Cyberjaya/Sepang), a federal territory (Putrajaya), a regional authority (Iskandar Malaysia), and a state (Melaka). The Iskandar Malaysia and Melaka areas encompass a further 8 local authorities being Johor Bahru, Iskandar Puteri, Kulai, Pontian and Pasir Gudang), and Melaka (Hang Tuah Jaya, Melaka Bandaraya Bersejarah and Alor Gajah).

[9] Under the GEF-5 funding cycle, GEF Trust Fund, as part of the climate change country allocation for Malaysia

Box 4 Summary of the project objective, outcomes, and outputs

Outcome	Output
Component 1 Policy support for the promotion of integrated LCUD GEF budget: USD 925,890	
Outcome 1.1 Major cities implemented and adopted integrated low carbon urban development plans and/or programmes	1.1.1 Approved city policies, legislation and regulations, and strengthened enforcement systems for integrated LCUD 1.1.2 Established GHG accounting framework and decision-making tools for national and sub-national levels
Component 2 Awareness and institutional capacity development GEF budget: USD 861,252	
Oucome 2.1 Expedient appraisal, approval, and implementation of strategic urban development plans/program and projects	2.1.1 Strengthened and operational coordination mechanisms for effective implementation of low carbon city policy
Outcome 2.2 Major cities are aware of, and are planning and implementing low carbon technology applications for integrated urban development	2.1.2 Complete training programs for policy decision-makers, local governments, green practitioners and financing institutions on strategic urban planning processes for low carbon and climate resilient development 2.2.2 Operational knowledge management systems for low carbon city development
Component 3 Low-carbon technology investments in cities GEF budget: 1,917,598	
Outcome 3.1 Low Carbon Technology Investments in Cities	3.1.1 Applied design considerations into BRT for enhanced GHG emission reduction potential 3.1.2 Leveraged investments to support the scaling up of low carbon public transport systems 3.1.3 Validated and scaled-up green technology incentive scheme in target cities for households and SMEs 3.1.4 Leveraged investments in low carbon urban systems based on low carbon development plans 3.1.5 Approved pilot NAMA proposal for low carbon urban development
Outcome 3.2 More low carbon projects implemented in Malaysian cities	3.2.1 Operationalised electric vehicles and charging station infrastructure 3.2.2 A commissioned BRT system operating in Iskandar Development Region 3.2.3 A commissioned city cycleway in Putrajaya 3.2.4 Operationalised on-site waste processing projects in Petaling Jaya
Project management GEF Budget: USD 207,042	
TOTAL GEF budget: USD 4,354,794	

2.2.2 Project start and duration; main project partners and stakeholders

The Project has been executed under the NEX (national execution) modality, with UNDP as the GEF Implementing Agency (IA) with the Ministry of Energy, Science, Technology, Environment and Climate Change (MESTECC)[10] as the Implementing Partner (GEF Executing Agency, EA). On behalf of MESTECC, the project has been executed by the Sustainable Energy Development Authority Malaysia (SEDA) as Lead Consultant.

[10] Implementing partner until 2018 was the Ministry of Energy, Green Technology and Water (MEGTW), better known by its Malaysian acronym KeTTHA. After the general elections in 2018, the entire component of the Ministry of Science, Technology and Innovation (MOSTI), Green Technology and Energy Components from) and related components of Climate Change and Environment from the Ministry of Natural resources and Environment (NRE) has been restructured and formed the Ministry of Energy, Science, Technology, Environment & Climate Change (MESTECC).

Although the project was approved by the GEF CEO in April 2015, the Project Document was not signed until June 2016. After the project's Inception Workshop (November 2016, the Project did not effectively start until May 2017, with the hiring of the National Project Manager and, in June 2017, of the three Component Managers). The 2018 general election was followed by a major restructuring of Ministries and agencies by the new government and by a temporary suspension of tendering activities, causing further delay for project implementation. To make up for time lost, the Project Team has been actively seeking to accelerate project implementation and is expected to be completed by the end of 2020.

Box 5 List of project partners and main stakeholders

Government entity	**Function/task/mandate** - **Relevant policy or plan** **(as related to GTALCC project)**	**Links with the GTALCC project**
Ministry of Economic Affairs (MEA) - Economic Planning Unit (EPU) - International Coop. Division	11th Malaysia Plan (2016) and Mid-Term review of the Plan (2018)	Linking low-carbon planning and targets with the 11th Malaysia Plan
1) MESTECC (Ministry of Energy, Science, Technology, Environment & Climate Change)[11]	Policy formulation, promotion, and implementation: - National Green Technology Policy (2009)	Implementing Partner NSC (chair) and PTC member Formulation of NLCCMP; IFLCC (Outputs 1.1.1, 2.1.1)
- Environment Management and Climate change Division	- National Policy on Climate Change (2009) - National Corporate GHG Reporting Programme (MyCarbon, 2014)	GEF focal point; national level carbon accounting and reporting LCCF Guidelines Formulation of NLCCMP; IFLCC (Outputs 1.1.1, 2.1.1)
Sustainable Energy Development Authority (SEDA), *Lembaga Pembangunan Tenaga Lestari*	Sustainable energy policy implementation, promotion, advisory services, and assessments: - National Renewable Energy Policy and Action Plan (2009)	Lead Consultant under MESTECC. NSC and PTC (chair) member Green, low carbon buildings and urban development; renewable energy (PV, other)
Energy Commission *(Suruhanjaya Tenaga*, ST)	Electricity and gas sector regulation; tariff setting; energy efficiency projects; Energy audits	PTC member Energy regulations and energy efficiency (e.g.standards) Energy balance/data (link with GHG emissions)
Malaysian Green Technology Corporation (MGTC), *Perbadanan Teknologi Hijau Malaysia*	Development, promotion, capacity development training and policy studies on green technology: - Green Technology Master Plan 2017-2030 (2017) - LCCF version 2 (2016)	PTC member GHG calculation (review of LCCF); 'Training of trainers' (Output 2.2) Low carbon mobility
2) KPKT (Ministry of Housing and Local Government, *Kementerian Perumahan dan Kerajaan Tempatan)*[12] - Local Housing Department - Solid Waste Management Dept	Urban well-being, housing and infrastructure facilities, e.g. solid waste management - National Solid Waste Management Policy (2016)	NSC member Formulation of NLCCMP; IFLCC (Outputs 1.1.1, 2.1.1) Training (Local Government Training Inst, LGTI)
3) KATS (Ministry of Water, Land and Natural Resources, *Kementerian Air, Tanah dan Sumber Asli)*	Natural and water resources management; sewerage services, surveying and mapping; biodiversity, forestry and national parks	NSC member Formulation of NLCCMP; IFLCC (Outputs 1.1.1, 2.1.1)

[11] The Ministry of Science, Technology and Innovation (MOSTI), Green Technology and Energy Components from the Ministry of Energy, Green Technology and Water (KeTTHA) and related components of Climate Change and Environment from the Ministry of Natural resources and Environment (MNRE) has been restructured and formed the Ministry of Energy, Science, Technology, Environment & Climate Change

[12] Formerly the MUWHLG (Ministry of Urban Wellbeing, Housing and Local Government

	- National Policy on Environment (2002)	
4) Ministry of Works - Public Works Dept (JKR, *Jabatan Kerja Raya)*	Public infrastructure and buildings	NSC member; NLCCMP formulation
5) Ministry of Transport (MOT, *Kementerian Pengangkutan)*	Ministry: formulation and implementation of national transportation policies/schemes - National Transport Policy (2018-2030; in preparation) APAD: Planning the development of land public transport system, including mass rail transit (MRT), light rail transit (LRT), rail transportation and bus systems. - National Land and Public Transport Masterplan (preparation uncertain) - National Automotive Policy (2014; 2019 under preparation)	NSC member Formulation of NLCCMP; IFLCC (Outputs 1.1.1, 2.2.1) Mainstreaming low carbon in (public) transportation; Electric and other low-carbon vehicles
5) Ministry of Federal Territories (KWT, *Kementerian Wilayah Persekut* - PLANMalaysia (Fed. Dept. of Town and Country Planning)	National physical plans, regional plans, structure plans. Formulation of city and spatial planning and guidelines to be used by the sub-national and local authorities - National Physical Plan (NPP-3), 2016 - National Urbanisation Plan (NUP-2), 2016	Green Neighbourhood Guidelines[13] Identification of low-carbon opportunities and mainstreaming in State and local planning (Outputs 1.1.1, 2.1.1)
6) Ministry of Economic Affairs - Economic Planning Unit (EPU)[14]	Formulation of the 5-year Malaysia plans and provides overall policy direction on national development including issues related to sustainable development and climate change - 11th Malaysia Plan	Incorporation of low-carbon development aspects in the overall planning

Regional and local government	**Function**/task/mandate - Relevant policy or plan	**Role in project** (to be finalised at MRT)
Participating state entities and cities		
State planning units (EPU) - Selangor, Melaka, Johor Melaka GreenTech Corp	- Melaka Green city Action Plan (2014) - Selangor Green Technology Action Plan (2015) - Johor Sustainability Policy (2017)	Mainstreaming low carbon in State-level planning
Cyberjaya - MPS - MP, *Majlis Perbandaran* Sepang (Selangor)	- Cyberjaya Smart Low Carbon City Action Plan 2025	On-site waste processing (Output 3.2.4) Cyberjaya Low-carbon City Action Plan (Output 1.1.1); GHG inventory (Output 1.1.2); IFCC (Output 2.1.1)
Hang Tuah Jaya (Melaka) - MP Hang Tuah Jaya (MPHTJ),	- Green City Masterplan HTJ	GHG inventory development ongoing (Output 1.1.2); IFCC (Output 2.1.1) Low-carbon projects, e.g. community composting (Output 3.2.4)

[13] Tenders are out to develop *Garis Panduan Perancangan Bandar Rendah Karbon* (Low Carbon Cities Planning Guidelines) and for the preparation for National Physical Plan No.4

[14] Before the government ministrties' reorganisation in 2018, EPUY was under the Prime Minister's Office

Regional and local government	**Function**/task/mandate - Relevant policy or plan	**Role in project** (to be finalised at MRT)
Iskandar Malaysia (Johor) - Iskandar Region Development Authority (IRDA) MB Johor Bahru, MB Iskandar Puteri, MP Kulai, MD Pontian and MP Pasir Gudang)	- Low Carbon Society Blueprint Iskandar Malaysia 2015	Low-Carbon Blueprint for Iskandar Malaysia (Output 1.1.1); GHG inventory (Output 1.1.2) Identification of low-carbon projects BRT project (Outputs 3.1.1, 3.2.2)
Petaling Jaya (Selangor) - City Council (MBPJ)	- MBPJ Low Carbon Action Plan 2015-2030	GHG inventory (Output 1.1.2), which is part of the MBPJ Low Carbon City Action Plan IFCC (Output 2.1.1) Incentive schemes (Output 3.1.3)
Putrajaya (Fed. Territory) - Corporation	- Towards Putrajaya Green City (2015)	Low carbon development plan supported by Putrajaya Green City 2025 plan (Output 1.1.1) GHG inventory (Output 1.1.2); IFCC (Output 2.1.1) Cycleways (Output 3.1.2) Electric buses (Output 3.1.1) Community composting (Output 3.2.4)
Other collaborating cities (non-GTALCC)		
- Kuala Lumpur City Hall - MP Ampang Jaya - MP Kajang (B. Baru Bangi) - MB Shah Alam - MP Langkawi - MP Subang Jaya - MP Seberang Perai	- KL Low Carbon Society Plan - MPAJ Low Carbon City Action Plan 2017-2030 - B.B. Bangi Low Carbon City Action Plan - Shah Alam Low Carbon City Action Plan 2030	- Low Carbon Island Model (Langkawi)

Private sector	**Role in project** (to be discussed and finalised during MTE)
- APUDG (AJM Planning and Urban Design Group)	NLCCMP-PR: National Low Carbon Cities Master Plan & Policy Roadmap (Output 1.1.1); Cyberjaya Low-Carbon City Action Plan
- CMS Consortium Sdn. Bhd	Development of a service platform for e- mobility solutions (users, infrastructure, operators, etc.)
- CH Green Sdn Bhd	Installation and operation of on-site waste processing plants
- Eclimo Sdn Bhd	Production and supply of e-scooters
- Mass Rapid Transit Corporation Sdn Bhd	MRT developer and asset owner
- GETSGlobal Sdn Bhd	Operator of Nadiputra Bus (Putrajaya)
- Voltron Malaysia Sdn Bdn	Electric bicycles
- UniLink Smart Venture	Business cases and financing for low-carbon (electric, bioCNG, other) buses (Output 3.2.1); Study on green technology incentives for households and SMEs (Output 3.1.3)q
Academia, other	
- UTM (Universiti Teknologi Malaysia)	Low-Carbon Islands Study and Model Low-Carbon Blueprint for Iskandar Malaysia
- CETDEM (Centre for Environment, Technology and Development)	PTC member Advocacy, awareness, and training
- Malaysian Institute of Planners (MIP) – Training Centre (MIPTC)	PTC member Study on IFLCC, Institutional Framework for Low Carbon Cities (Output 2.1.1); Training of Trainers (Output 2.2.1)

2.2.3 Project implementation arrangements

The project has been executed by SEDA under the responsibility of MESTECC (*Implementing Partner*), and reporting to MESTECC and UNDP, the GEF Implementing Agency. As local *Lead Consultant,* SEDA Malaysia manages and delivers project activities on behalf of MESTECC to achieve specified results including the procurement and delivery of the project activities and their use in producing outputs responsible and accountable for managing a project including the monitoring and evaluation of project interventions and achieving project outputs, and for the effective use of UNDP-GEF resources.

A **National Steering Committee** has been formed. The NSC is responsible for making management decisions, it ensures that reporting to UNDP and GEF is timely and accurate and is responsible for approving any minor changes in the Project Document and for alerting GEF Secretariat to significant deviations. The NSC is chaired by MESTECC with SEDA serving as providing services as Secretary and has met several times (Jun 2017, Feb 2018, Dec 2018). . Membership is summarised in Box 6. According to the Project Document, the NSC will ensure the overall strategic consistency of the project and will provide the high-level guidance and direction needed to ensure the project is executed according to the work plan and budget in agreement with the Project Document. The Inception Report and ProDoc mention the following functions:

- Endorse policies defining the functions, responsibilities, and delegation of powers for the implementing agency;
- Facilitating the coordination and implementation of project activities across institutions;
- Endorse the modification /revisions of activities, major project deliverables and their adherence to the work plan set forth in the project as may be necessary;
- Review and approve each year's proposed work plan and budget;
- Making decisions on the issue brought to its notice by UNDP and other cooperating institutions;
- Review issues raised and agreeing to action plans for the resolutions;
- resources are available for the project delivery in a timely manner and that the monitoring and evaluation systems are in place and effective.
- Appoint technical committees to carry out a specific task and report back to NSC for approval;
- Resolving amicably any dispute as to the interpretation of the project document and the implementation of the project.

A **Project Technical Committee (PTC)** guides the GTALCC with the following tasks:
Coordinate and supervise components and subcomponents of GTALCC projects;

- Propose policies defining the functions, responsibilities and delegation of powers for the implementing agency;
- Propose and discuss the modification /revisions of activities, major project deliverables and their adherence to the work plan set forth in the project as may be necessary;
- Update and discuss each year's proposed work plan and budget;
- Discuss amicably any dispute as to the interpretation of the project document and the implementation of the project.
- Appointment of relevant technical experts and the formation of working groups;
- Advising the NSC Committee on all aspects of the GTALCC project; and

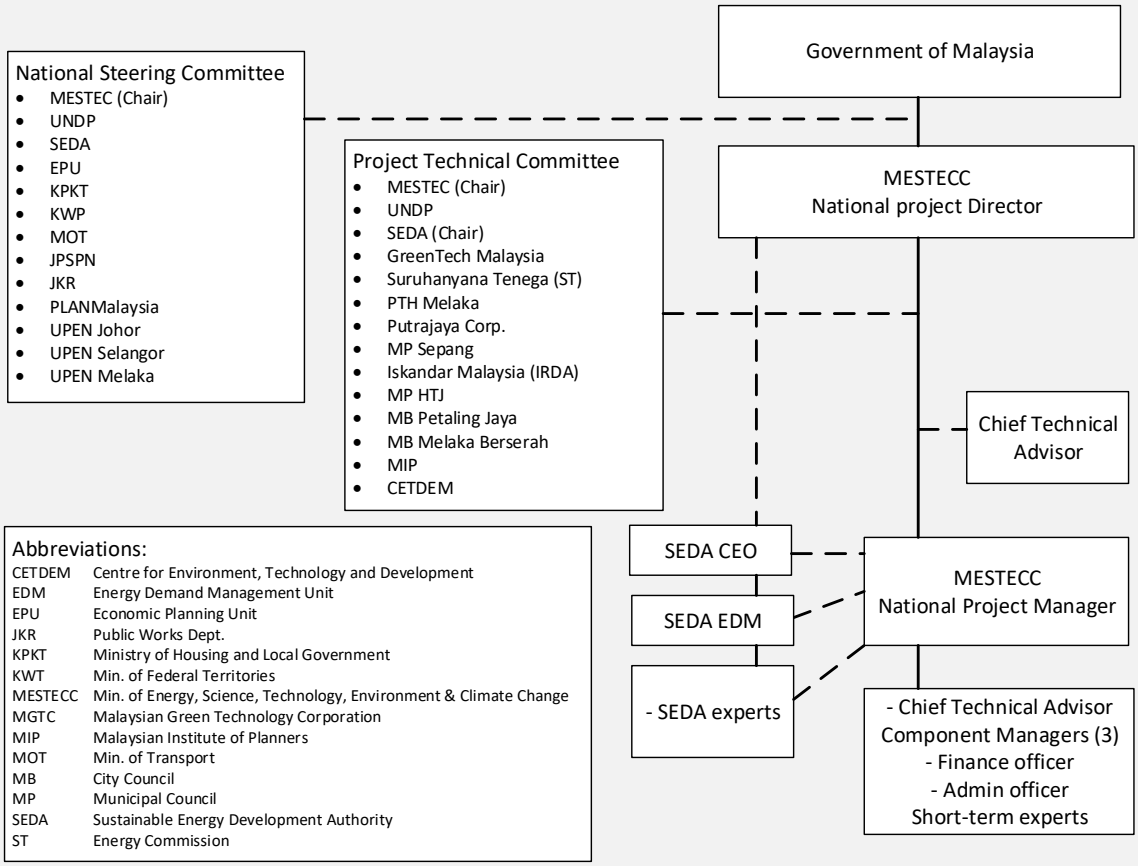
Responsible for the preparation and management of all requirements set up by UNDP and SEDA.

Chaired by SEDA, the participants have been more operational-level staff from than the representatives of the project partners in the NSC and may include (as needed) multi-domain technical and policy specialist from participating Ministries, cities and key stakeholder groups.

The **National Project Manager** (NPM) will focus on the administrative, operational and technical aspects of the project, and is responsible for implementation of the project, including mobilization of all project inputs, supervision of project staff, consultants and oversight of sub-contractors. The role is to provide managerial support and ensuring quality and timeliness of activities and delivery of outputs. The NPM is supported by three Component Managers. Project staff are (currently):

- Norizal Khushairi Mohamad Zamri (NPM)
- Deep Kumar Pravin Kumar (Component Manager 1)
- Mohammad Afiq Zambri (Component Manager 2)
- Siti Salwa Samsudin (Component Manager 3)
- Henrik Rytter Jensen (CTA)
- Nor Quyyum Mohd Noor (Admin Officer)
- Hani Izwani Azeman (Finance Officer)

Box 6 Project management structure



3. FINDINGS: PROJECT DESIGN AND STRATEGY

This part of the report presents an overview of the evaluation findings. Due to the size of the main text it has been divided over four chapters that cover a) project design & formulation, b) project results, c) project implementation and d) sustainability. The findings are based around a number of evaluative criteria and questions), so that the reader can make a link with what was asked and what was found. The questions in the orange-coloured boxes in this and other Chapters, are taking from the Evaluative matrix (Annex D), corresponding to a particular section in this report.

Chapter 3 looks first at the project relevance and country drivenness (at project design), and links with national and development. Second, it looks at the design logic (in the framework of outcomes and objectives to reach the objective) and how the design framework was formulated, including the definition of indicators and target values for outcomes and outputs.

3.1 Relevance and design

Country priorities and project strategy

- Relevance: is the project consistent with the GEF focal areas in Climate Change/operational program strategies of the GEF CC and with the UN and UNDP country programming in Malaysia

The UNDP Country Program Document (CPD) 2013-2015 served as a guideline for programming of activities if UNDP with the Government of Malaysia at the time of formulation of the Project. The CPD mentions as Outcome #2 "Strengthened institutional capacity in managing climate change, including achieving both the 2015 renewable energy target of 5.5% of total electricity generation mix" with the accompanying Outcome Indicator 2.3 "Establishment of framework on sustainable financing options for widespread green technology applications in low-carbon cities initiatives" and Indicator 2.2 "Percentage increase in the use of renewable energy sources in the total national electricity generation mix". Green growth and sustainable energy have remained a priority; the successor CPD 2016-2020 mentions "sustainable and resilient development" as one of the two priority areas.

The project, which aims at mitigating the impacts of climate change through the promotion of on-grid renewable energy in developing countries, is an element of the GEF-5 Resource Allocation Framework. The project idea fits squarely in its Climate Change programme #4 to "Promote Energy Efficient, Low-Carbon Transport, and Urban Systems" (CC-4). The Project responds to three Outcome areas under CC-4, namely 4.1: Sustainable transport and urban policy and regulatory frameworks adopted and implemented; 4.2: Increased investment in less-GHG intensive transport and urban systems, and 4.3: Increased investment in less-GHG intensive transport and urban systems.

- Relevance: are project outcomes contributing to national development priorities and plans in accordance with the national local policy legal and regulatory frameworks (country priorities)? Does the project adequately take into account the national realities, both in terms of institutional and policy frameworks in its design and implementation?

Efforts for sustainable development were further emphasised from the Eleventh Malaysia Plan (11 MP) 2016-2020, as well as in sectoral national policies and master plans and guidelines. Box 7 gives an overview of the various policies and plans that are directly and indirectly related to low carbon urban development

Box 7 Sustainable and low-carbon strategies and plans in Malaysia

National Direction

- The Eleventh Malaysia Plan (11 MP) 2016-2020
- Mid-Term Review of the Eleventh Malaysia Plan

National Policies (Directly related to Low Carbon)

- National Green Technology Policy
- National Policy on Climate Change
- National Renewable Energy Policy & Action Plan
- National Solid Waste Management Policy

National Policies (Indirectly related to Low Carbon)

- Third National Physical Plan (NPP-3)
- National Urbanization Policy 2 (NUP 2)
- National Policy on the Environment
- National Policy On Biological Diversity 2016–2025

National Low Carbon & Sustainability Framework & Programme

- Low Carbon Cities Framework Version 1
- Low Carbon Cities Framework Version 2
- Green Technology Master Plan 2017-2030
- National Corporate GHG Reporting Programme For Malaysia
- CIDB's Construction Industry Transformation Programme 2016-2020

Development Guidelines & Standards

- MS 1525: Energy efficiency and use of renewable energy for non-residential buildings - Code of practice
- MS 2680: Energy efficiency and use of renewable energy for residential buildings - Code of practice
- Green Neighborhood Guidelines
- Healthy Walkable City Guidelines

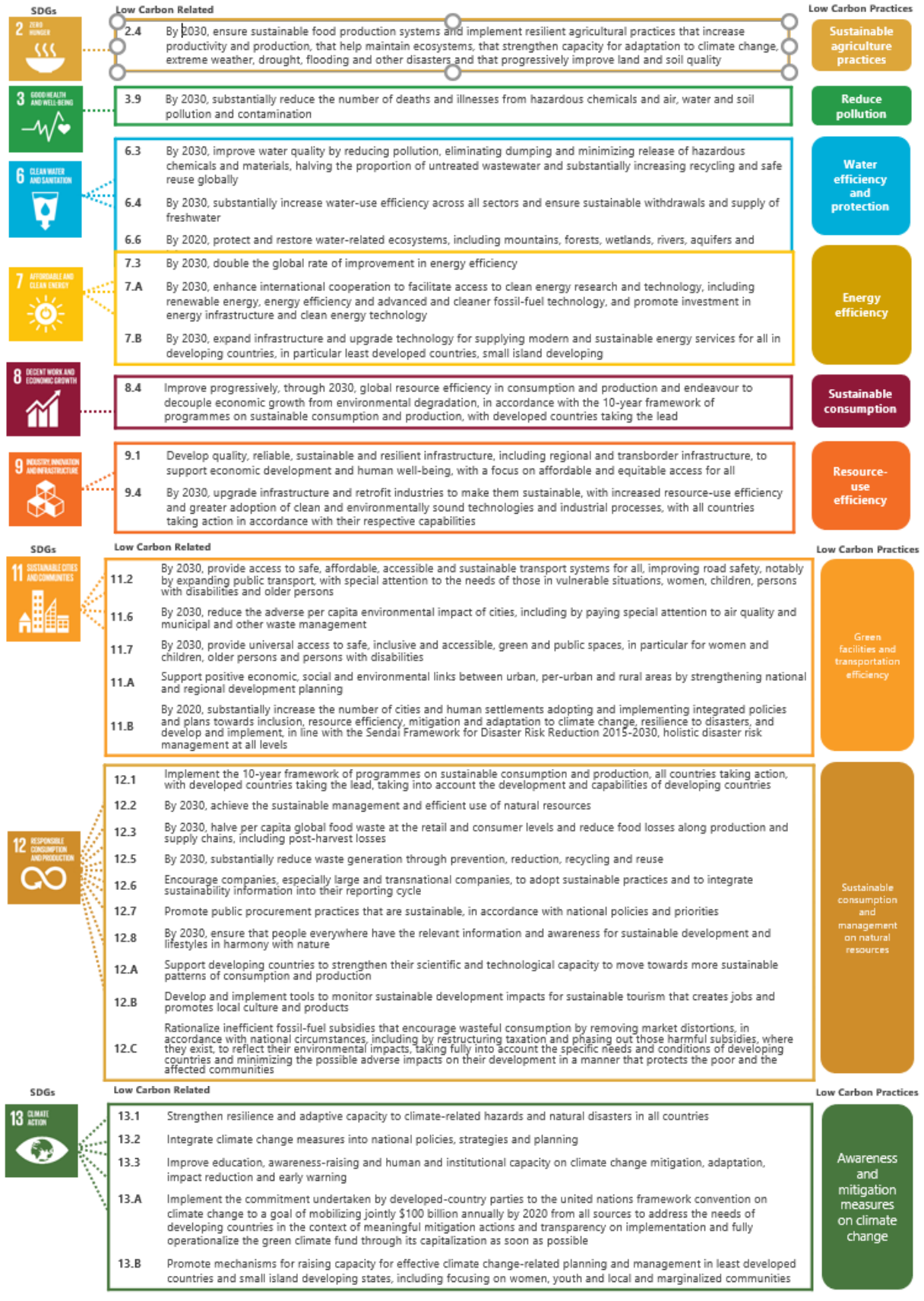
Source: NLCCP & PR, Inception Report (Jan. 2019), by APUDG

Stakeholder needs and design process

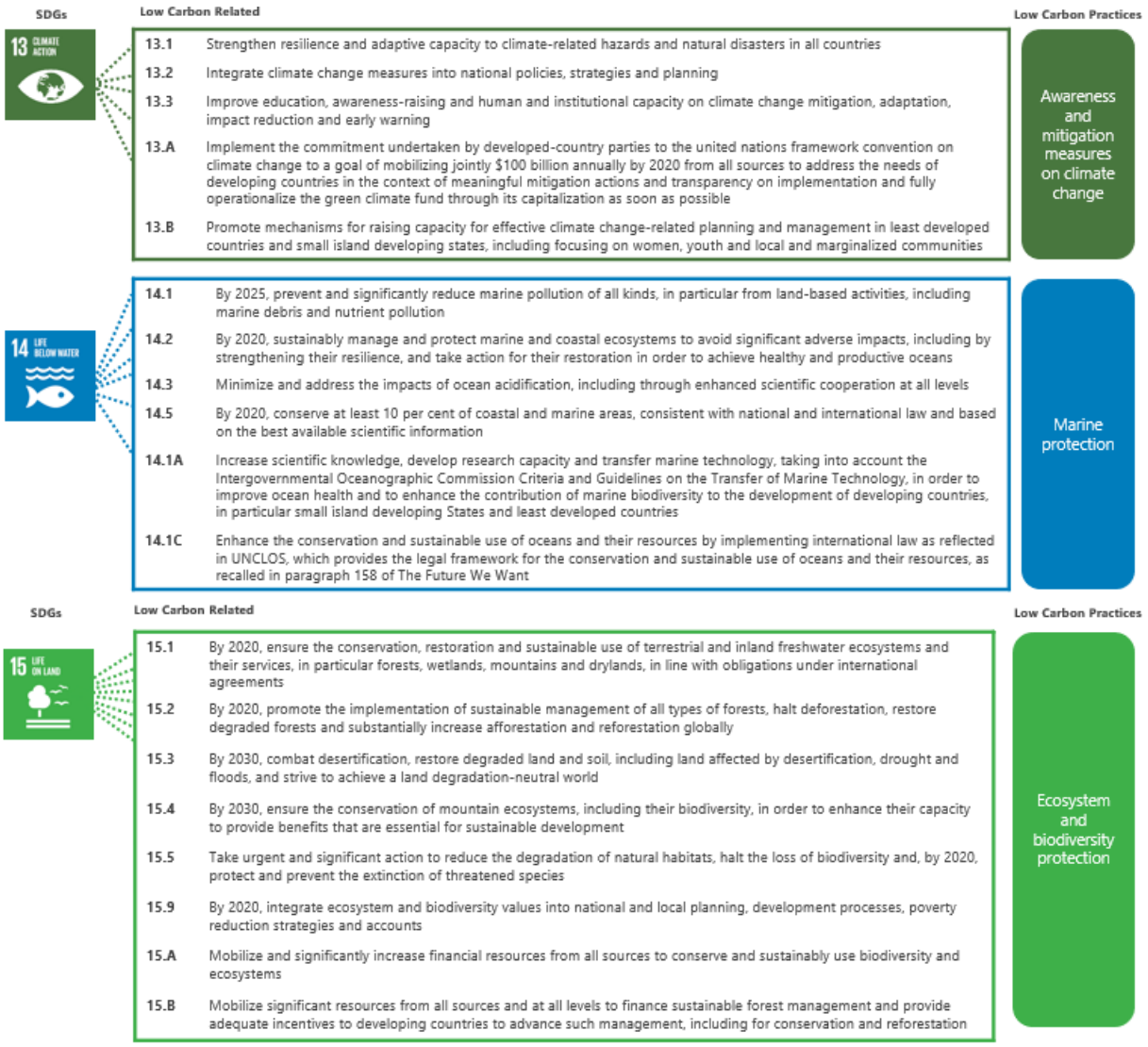
- Is the Project addressing the needs of the target beneficiaries? Relevance of the project's objectives, outcomes and outputs to the different target groups of the interventions.
- Are lessons from other relevant projects properly incorporated in the project design? Are the partnership arrangements properly identified and the roles and responsibilities negotiated prior to project approval?
- Are relevant gender issues raised in the project design? If there are major areas of concern, recommend areas for improvement.

The first project concept (PIF) of the GTALCC project was formulated in 2012. After GEF approval of the concept (June 2013), the project documentation was formulated during 2013-14 and endorsed by GEF CEO in April 2015. The conceptualisation phase appears to have included a range of stakeholders from government (various ministries and agencies), local government (the five participating cities), institutes (e.g. NIP and CETDEM) and private sector (e.g., BRT systems, e-vehicles). These participated in a number of workshops (Stakeholder Awareness and Logframe Analysis and Consultation workshops in 2013, Stakeholders Validation workshop in 2014).

Box 8 Links international goals for sustainability (SDGs) and low-carbon practices



Box (cont'd) Links international goals for sustainability (SDGs) and low-carbon practices



Source: National Low Carbon Cities Masterplan and Policy Roadmap, Progress Report 2 (2019)

Gender and sustainable aspects

Gender aspects are not particularly addressed in the Project Document. The current UNDP Project Document template (under GEF-6) includes a section on mainstreaming gender with a gender action plan to be annexed. One should note that at the time of project conceptualisation (2012-2015), gender mainstreaming was encouraged but not yet had a fixed place in the GEF-5 UNDP Project Document. Consequently, the GTALCC ProDoc had no section dedicated to gender and activities do not target women and girls specifically. The indicators in the logframe are not gender-relevant. The Project's SESP mentions that "By taking in account different gender roles, needs and preferences the project will further harness the capacities of communities, particularly women, on low carbon development policies and activities", but this has not been reflected in subsequent project progress reporting. The PIRs (2018, 2017) make some reference to gender considerations. For example, it is mentioned that "project interventions are taking into account the roles of women and men through a consultative process, to ensure that the interventions are designed for the benefit of both women and men" (see PIR 2018, pg.55).

3.2 Conceptualization and results framework

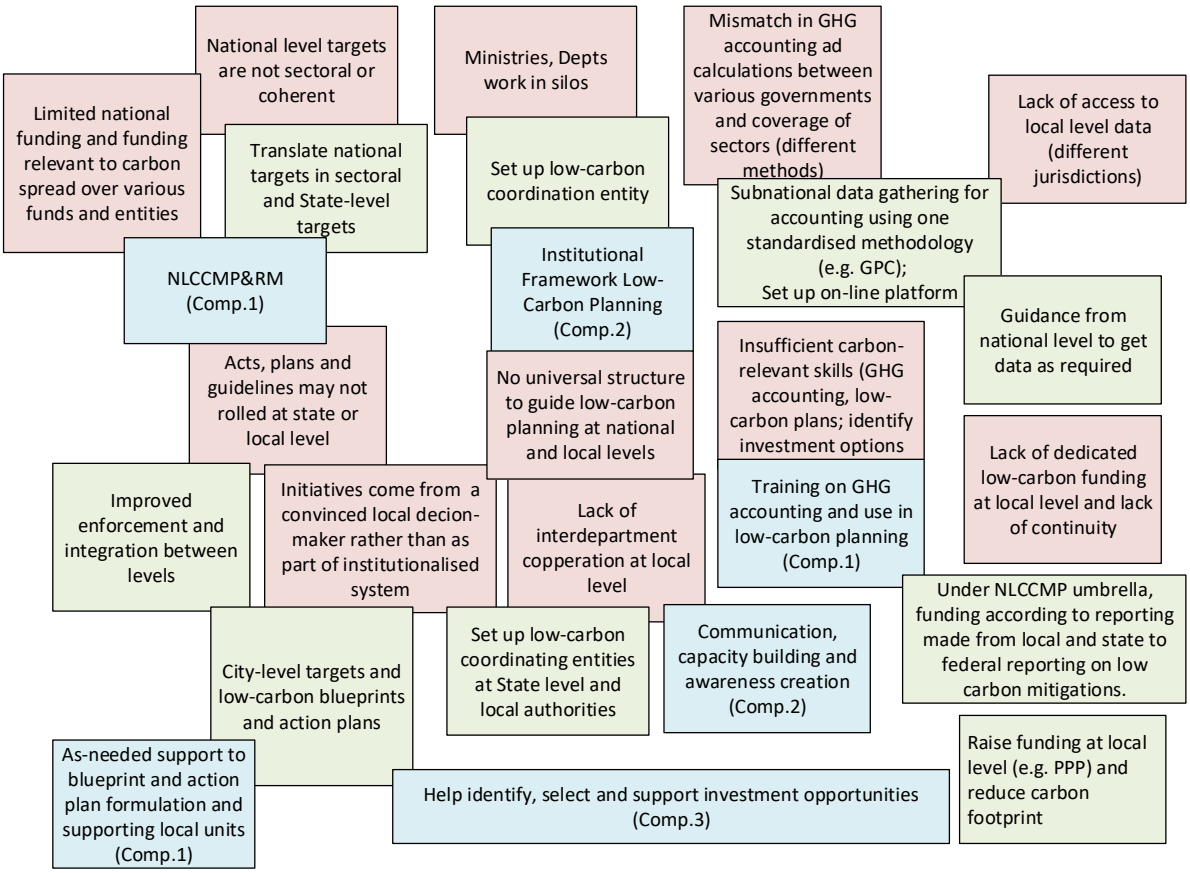
- Is the project's design (logframe) adequate to address the problems at hand?
- Was the project internally coherent in its design? Have any amendments to the assumptions or targets been made or planned during the Project's implementation? Have lessons from other projects been taken into account?
- Was the project was formulated based on the logical framework (project results framework) approach with verifiable indicators?

Addressing problems

The GTALCC project design does aim to address the barriers (discussed in Section 2.1) in a systematic way. The MTR team thinks that a good analysis of barriers and options was made. In current UNDP Project Documents this is referred to as 'theory of change', although the terminology was not used as such at the time of GTALCC formulation. An attempt to summarise the 'theory of change 'approach is presented in Box 9.

Another important assumption in project design is the presence of strong support from local authorities (city and municipal council) throughout the Project. The MTR team notes that baseline activities incorporated into the Project strategy were developed in close consultation with the national partners as well as local Councils and Authorities. As such,

Box 9 Overview of barriers, options and examples of GTALCC interventions



Source:
Diagram made by MTR team, based on text and diagrams provided in the *GTALCC Project Document* and *the National Low-Carbon Cities Master Plan and Road Map (NLCCMP&RM), First Progress Report* (March 2019)

the information collected from local partners appears to be an appropriate representation of baseline initiatives that should receive GTALCC project support, while avoiding duplication with other programmes.

The Project Result Framework includes a detailed overview of critical assumptions anticipated during project preparation. An initial risk assessment, also used to inform the project design, was prepared during project preparation. The key risks to the project implementation and the realisation of outcomes have been monitored throughout the implementation of the Project, documented in progress report and, where needed, risk mitigation measures have been taken. This is discussed further in Section 5.1 on adaptive management.

Analysis of the project results framework (logical framework or logframe)

The Reviewers have made a summary of the project results framework of outcomes and indicators (as given in the Project Document and PIR, progress reports). In many cases, the indicators can also be linked with specific outputs, as summarised in Box 10. Here, the reporting in project documentation and progress reports are confusing at times, in the sense that labels for results (outcome, outputs) and activities are mixed up. For example, what is labelled in ProDoc, CEO ER doc and PIR as "outcome" is referred to as 'output' in other documents, such as the Annual Work Plan (AWP) or in PowerPoint presentations. For example, Outcome 3 "Major cities are aware of, and are planning and implementing low carbon technology applications for integrated urban development" can also be referred to as Output 3.1, while Outcome 4 "More low carbon projects implemented in Malaysian cities" then becomes Output 3.2. The next layer is referred to as 'output' in ProDoc, but sometimes elsewhere as 'activity. Thus, Output 3.2.1 "Operationalised vehicles and charging infrastructure" is in ProDoC and CEO ER referred to as an Output, while the higher-level category it belongs to (i.e. Output 3.2, 'more low carbon projects') is sometimes in other documentation also referred to as an 'output' (which in the ProDoc and CEO ER, is referred as Outcome 4). What is a 'component' is often referred to as 'outcome' (notwithstanding that next lower level also gets the label 'outcome').

We suggest that these labels are used more consistently, distinguishing between Component/Outcome (level x), Output (level x.y) and Main Activity (level x.y.z). We have adopted this system throughout this MTR report.

The GTALCC logframe meets "SMART" criteria[15] and as such provide a good indication in general for the outcome level progress for the project as a while. A summary is provided in Box 10. Nonetheless, the MTR Team has a number of observations on the role of indicators in measuring progress in various components.

- The indicators mostly measure success at the outcome level (which UNDP's logframe methodology requires project designers to do). Putting in output-level indicators' (e.g. the number of seminars of workshops organised) is discouraged. The difference between an outcome and output is not only that the first is at a higher level (can be the result of one and more outputs), but outputs are within the project's control, while the achievement of an outcome (at a higher results level) depends on the combined efforts by the project *and* a range of stakeholders, and thus not per definition fully under the project's control.
- Let us look at two outcome indicators, namely 'number of low-carbon city action plans gazetted' and '% of BRT system completed'. As we will see in the next chapter, the BRT system considered (in Iskandar Malaysia, IM) will not start operations until 2022 (due to delays). The IM-BRT's realization is an important progress indicator, but its realisation and decision-making are totally outside the influence of the GTALCC project. The indicator has been put in under the expectation that the IM-BRT would be constructed by 2017/18 (and it plays an important role in GTALCC, contributing to most of the greenhouse gas emission reduction associated with GTALCC). However, the indicator does not give info at all on what is the role of GTALCC or on the support provided by GTALCC in the BRT's design process.
- Similarly, the indicator 'number of carbon plans gazetted' is tricky. What if the Project has helped formulation a number of such plans, but are still in the process of being gazetted at project's end; should we say then the indicator's target has not been met. Again, the indicator fails to show the project's inputs into this process. For example, has GTALCC been instrumental in formulating the city climate action plans? How many plans have been supported? Where these in the original five participating cities, or have new cities been added?
- On the other hand, the Project has done important work on low-carbon planning, notably the formulation of the NLCCMP&RM and Institutional Framework (see Box 9). Both form an important milestone and key outcome but are not reflected results framework's list if indicators.

[15] Specific, Measurable, Attainable, Relevant, Time-bound

- The values of indicators in the results framework are quantitative only, just a number, without proper indication what the number stands for or without describing how the number has been derived or justification of the target value of the indicator. Fortunately, the PIR 2017 and 2018 do give a detailed explanation of what is behind the achievement of the value of an indicator, so the reader can still get some idea on the actual achievements and GTALCC's role.

Box 10 Summary of project results framework (logframe) with outcomes and indicators (ProDoc)

Objective	Indicator
To facilitate the implementation of low carbon initiatives in at least five Malaysian cities and showcase a clear and integrated approach to low carbon development	1. Cumulative direct GHG project emission reductions (ER) resulting from the Project technical assistance and investments.
Component	
Outcome 1.1 Major cities implemented and adopted integrated low carbon urban development plans and/or programmes	2. Number of cities which have gazetted low carbon development plans by Year 3 3. Number of participating cities which have GHG inventories less than 5 years old by Year 2 4. Number of cities which have officially adopted GHG reduction targets by EOP
Component	
Outcome 2.1 Expedient appraisal, approval and implementation of strategic urban development plans/program and projects	5. Number of cities exceeding national benchmarks for appraisal and approval processes for local low carbon development projects 6. Average annual number of low carbon city projects per city identified in local plans, commencing implementation starting by Year 3.
Outcome 2.2 Major cities are aware of, and are planning and implementing low carbon technology applications for integrated urban development	7. Number of cities where evidence-based low carbon planning is integrated with normal urban development planning processes 8. Percentage of trainees who are effective in evidence-based integrated low carbon climate resilient development planning and project implementation by Year 2 and Year 4
Component	
Outcome 3.1 Low Carbon Technology Investments in Cities	9. Total amount of new investment leveraged through local plans of participating cities for low carbon projects by EOP 10. Amount of new investment leveraged for low carbon transport in participating cities by Year 3 11. Average amount of new investments by participants in council green incentive schemes starting in Year 3 12. Value of approved pilot Urban NAMA project in Year 5
Outcome 3.2 More low carbon projects implemented in Malaysian cities	13. Number of low carbon projects implemented in participating cities by Year 4 14. Number of operating electric cars by year 3 and year 5 15. Number of operating electric scooters by year 3 and year 5 16. Number of operating recharge stations in year 3 and year 5 17. % completion of BRT phase 1 by start of Year 3 18. Number of commercial onsite waste processing plants operating by EOP

The progress report PIR reports in indicators whose target (projected and achieved) are actually indicators for outcomes (the combined influence of projects and stakeholders' efforts), but fail to give a good description of GTALCC's contribution to the outcome. To more accurately describe project progress, the MTR Team would like to propose some changes in the List of Indicators. To be able to discuss this, it is necessary to have more insight in the achievement of the GTALCC up to date, for which the reader is referred to the next Chapter 4. Based on the actual results reporting, a revised list of outcomes, outputs, and indicators is presented in the Chapter, Conclusions, and Recommendations.

Links with past and ongoing activities and incorporation of lessons learned

The ProDoc refers to a number of activities that were undertaken by Malaysian entities. The MGTC launched the Low Carbon Cities Framework (LCCF) which is a conceptual framework to assist cities in developing policy and planning. It is also a technical framework upon which analytical tools for calculation of greenhouse gas emissions and evaluation of low

carbon development options can be based. The Green Neighbourhood Guidelines (GNG) were launched in 2013 as planning guidelines by FDTCP (PLANMalaysia). UNDP and Ministry of Natural Resources and Environment (MNRE) implemented the Low-Emission Capacity Building (LECB) programme during 2013-2015, which focussed on enhancing national greenhouse gas (GHG) inventory systems, promoting the uptake of nationally appropriate mitigation actions (NAMAs) as well as measuring, reporting and verification (MRV).

A number of projects have appeared after the project's formulation. Under the ADB Green Cities projects (2014-17), efforts were initiated to develop green city action plans and build the capacity of participating cities to meet the challenge of balancing economic growth with urban environmental sustainability and climate resilience across several countries in Southeast Asia. In Malaysia, the activity was started on a pilot basis in Melaka (2016-2017). UNIDO started (with GEF grant support) a project on electric vehicles and infrastructure (which is described in Box 14).

To the MTR team, the overall impression is that the design of GTALCC has taken these initiatives into account in the design, avoiding duplications of activities, or strengthening activities where needed and promoting coordination between various low-carbon initiatives. This also helps to explain why the GTALCC at first look seems to focus on certain investment areas within the broad low-carbon urban development scope, especially with respect to Component 3 which focusses on (public) transport, waste, and a few other areas (cycling), but that are a few interventions on energy-efficient buildings, renewable energy, water and wastewater management, for example. Here, it should be noted that the investment areas of Component 3 have been identified based on the five participating cities' priority indications, so this partly explains the focus on certain low-carbon sectors over others.

Second, advances have been made in certain low-carbon subsector more than in others, and efforts should not be duplicated. Regarding the buildings sector, Malaysia implemented the UNDP/GEF Building Sector Energy Efficiency Project (BSEEP) from 2010 to 2017. BSEEP has promoted passive and active design of buildings, energy management systems (EMS), energy performance contracting (EPC) and published a compendium on financial instruments for accelerating energy efficiency in the building sector. Other UNDP/GEF projects, MIEEIP (Malaysia Industrial Energy Efficiency Improvement Project, 2000-2008) and the Malaysia Building Integrated Photovoltaic (MBIPV) Project, were implemented during 2005-2011. Under MBIPV, the 'National Renewable Energy Policy and Action Plan' was prepared and approved by the Government of Malaysia in April 2010, followed by the development of the Renewable Energy Act which supports thefeed-in tariff (FiT) scheme. SEDA administers, manages and monitors the FiT scheme.

3.3 Ratings for project design

The UNDP/GEF rating requirements and criteria for MTRs do not include a '**rating on project design and formulation**', except for the item "M&E at design". This is surprising because we think that the 'design' is one of the main factors, alongside 'implementation' and 'external factors' that determine the achievement of 'results'. The MTR Team proposes to give a rating for 'design' of the GTALCC Project using a six-point rating scheme:

- Highly satisfactory (HS), no shortcomings
- Satisfactory (S), minor shortcomings
- Moderately satisfactory (MS), moderate shortcomings
- Moderately unsatisfactory (MU), significant shortcomings
- Unsatisfactory (U), major shortcomings
- Highly unsatisfactory (HU), severe shortcomings
- U/A = unable to assess.

The overall rating is **satisfactory**, although noting that the framework should have been better formulated with more realistic indicators and target values (marginally satisfactory). Note: "R" means 'Relevant' on a two-point scale of 'relevant' and 'not relevant'.

Box 11 Evaluation ratings of project design and formulation

Evaluation item	Corresponding section	Rating
Design logic and approach; addressing barriers	Section 3.2	S
Formulation of the log-frame with progress indicators and M&E design	Section 3.2	MS
Project integration: stakeholder participation and lessons learnt from other projects	Section 3.2	S
Overall project design and formulation		**S**
Relevance	Section 3.1	R

4. FINDINGS: PROGRESS TOWARDS OUTCOMES

4.1 Introduction

- To what extent have the expected outcomes and of the project been achieved?
- What outputs has the project achieved (both qualitative and quantitative results, comparing the expected and realized end-project value of progress indicators of each outcome/output with the baseline value)?
- Were there any unplanned effects? Which external factors have contributed or hinder the achievement of the expected results?
- Is the project proactively taking advantage of new opportunities, adapting its theory of change to respond to changes in the development context? Are there any unaddressed barriers?

This Chapter presents progress towards results. For each of the five project components, as mentioned in paragraph 1.2, this section assesses the progress in the implementation of the project's outcomes and outputs, following the 'project results framework' format and as reported by the Project Team in the annual UNDP/GEF *Project Implementation Reports (PIRs)* 2017 and 2018, annual progress reports (APR 2016, 2017,2018 and MYPR 2017, 2018) as well various PowerPoint presentations presented by the Project Team to the MTR reviewers. Section 4.2 describes the progress achieved in outputs and activities for each Component/Outcome, following the outline of outcomes and outputs of **Box 4** This section tries to provide a quantitative and descriptive overview of the achievements of outputs and outcomes, provides a re-assessment of results in terms of attainment of the objective and outcomes. Under each 'main activity', it reports the actual sub-activities been carried out or planned, and this also clarifies any changes that may have occurred since project conceptualisation and actual start (2013-2015/7).

Section 4.3 presents a summary of the achievements up to now of indicators. The baseline and target values of the indicators are taken from the project's logical framework (as reported in the ProDoc and PIRs), while the achievements (i.e. indicator value at project's end, is compiled from the project's PIR 2018 and PowerPoint presentations made by the project team for the MTR (April 2019), supplemented by additional info obtained during the mission (including interviews with respondents) and analysis of the outputs and reports produced during 2015-2017. The greenhouse gas emissions reported in the GEF Tracking Tool have also been reviewed; these are discussed in Section 4.3.2. The Chapter ends with Section 4.4, which gives a summary of the MTR Team's ratings towards results.

4.2 Progress in achieving outputs and outcomes

4.2.1 Component 1 Policy support for the promotion of integrated low carbon urban development

Output 1.1
Major cities implemented and adopted integrated low carbon urban development plans and/or programmes

Baseline activities
The national policy context for green technology and climate change is defined by the NGTP and NPCC. The Government has been planning a review and update of green technology and climate change-related policy, planning and development standards, and guidelines, including the LCCF, in the context of the latest NPP-3 and NUP-2, and strengthen the alignment with low carbon guidelines such as MGTC's LCCF and PLANMalaysia's Green Neighbourhood Guidelines (GNG).

Main actitvity	Description of subactivities (based on ProDoc)	Actual subactivities (based on MTR observation and project progress reports)
1.1.1 Approved city policies, legislations and regulations and strengthened enforcement systems for integrated LCUD	• Mainstreaming of low carbon urban development (LCUD) within national planning systems for the participating cities, including NUP and NPP • Training of council officers in the promotion and appraisal of development proposals with regards green technology regulations • Preparations of guidelines to support cities identify and establish public private partnerships (PPP) for low carbon infrastructure and services in cities • Development of by-laws and local regulations to improve community engagement in local planning and development.	• Mainstreaming of low carbon urban development (LCUD) within national planning systems: ○ Formulation and stakeholder consultation for *National Low Carbon Cities Masterplan and Policy Roadmap (NLCCMP & PR)* ○ *Development of guidelines in LCCF and GNG* ○ *Development of low-carbon island model and study* • Development of PPP guidelines • Training on green technology regulations and policies

Italics: revised or newly added sub-activities

Achievements

- A review took place in 2017 by the Project Manager and Component Coordinator of a number of national plans, such as NPP-3, NUP-2, GTMP, etc.). With support from the GTALCC Team and experts, the review has been followed by work on a national low-carbon policy formulation (that synergises the existing national and local strategies and plans over the various government entities, see Box 2and Box 7). This actually goes beyond the original description of Output 1.1 in the ProDoc and Inception Report, that merely refers to 'factoring in of low-carbon aspects' in national plans and to 'development of by-laws and regulations' in local planning. The Project team has correctly identified that low-carbon development needs a certain level of institutionalisation and official government approval. While various sectors have their own policies and/or master plans (e.g. environment, renewable energy, green technology, environment, solid waste), there is no policy related to low carbon urban development at the national level. The Project, therefore, has commissioned a study carried out by APUDG (AJM Planning & Urban Design Group) which will culminate in the formulation of the **National Low Carbon Cities Masterplan and Policy Roadmap (NLCCMP & PRM).** This assignment commenced by the end of 2018 with a Work Plan, followed by an Inception Report (Dec 2018), and first (March 2019) and second Progress Report (April 2019). A final draft should be ready by mid-2019. The process has been accompanied by focus group discussions (six in total over Dec '18-May '19) and frequent client-consultant meetings. It is important that the main ministries (MESTEC, MHLG, MEA and MFT, as well as MOT) are engaged in the process. The aim is not just to have the Master Plan and Roadmap but that it receives Cabinet approval. The Master Plan will focus on the policy framework (review of and integrating various sectoral policies and targets from GHG reduction perspective), implementation and management (legal aspects, role and responsibilities agencies at national and sub-national level; funding and financing), and urban planning & development (review of existing plans and planning process; tools used in planning, such as LCCF). The Action Plan part will look at existing stakeholder efforts, looks at issues in GHG reporting, institutional aspects and at achieving recognition status by the relevant authority of the city-level action plans)
- GTALCC collaborated with UTM Low Carbon Asia Research Center and Universiti Teknologi Malaysia to carry out the **Low Carbon Island Model Study** (with Langkawi as a case study).
- A number of **workshops** were held to train of council officers (on green technology regulations and standard MS 1525 on EE and RE in non-residential buildings) in Johor Bahru, Shah Alam (Selangor) and Georgetown (Penang) with participants from other States as well. GTALCC collaborated with Malayisa Green Buildings Confederation (MGBC) in a seminar on 'Net Zero Energy Buildings (Oct 2018 in KL).

Planned 2019

- Development of **Public-Private Partnership Guidelines**. The PPP guidelines are to support cities helping to identify and establish PPP for low carbon infrastructure and services in cities. Low carbon projects which are implemented via PPP may include building retrofits via Energy Performance Contracting, waste to energy plants and public transport services. The activity complements 1.3.4 (leveraged investments in low carbon urban systems

- Development of **guidelines for low carbon planning integrating LCCF and GNG** (during June-August '19, after work by LCCF reviewer has completed, see Output 2.2.1)
- **Training on green technology regulations and policies** will start in Q2 2019. These will include training on a number of topics (waste management and processing, spatial planning, low carbon mobility and transit-oriented development (TOD), energy performance contracting (EPC), standards 1525 and 2680; and climate policies.

Status: on-track (towards achievement)

Output	**Description of subactivities** (based on ProDoc)	**Actual subactivities** (based on MTR observation and project progress reports)
1.1.2 Established GHG accounting framework and decision-making tools for national and sub-national levels	• Establishment of a standard citywide GHG data model and ensure consistency with the guidelines for national GHG inventory to facilitate comparability and aggregation at the national level • Development of a web-based portal for collection and analysis of disaggregated data for bottom-up GHG accounting • Linking of the database with the MURNInets data systems[16] and in supporting the local authorities • Development of a standardized approach to support participating cities to prepare GHG marginal abatement cost curves and emission scenarios analysis for key sectors (linked with web portal)	• GHG stakeholder workshops on city-level GHG accounting, standardization of methodologies, and interaction with national level and data providers • Development of a web-based portal for collection and analysis of disaggregated data for bottom-up GHG accounting • Updating of GHG inventory systems • Training on GHG accounting and reporting • *GHG emission calculations for MRT Sungai-Bulch-Kajang line (new)*

Italics: revised or newly added sub-activities

Baseline activities

The baseline is formed by activities by MGTC and PLANMalaysia regarding LCCF and GNG, such as identifying and setting criteria for the collection of baseline data and development of baseline scenarios; establishing standardised data collection, and associated capacity building). GreenTech Malaysia (MGTC) has developed its own GHG calculator, called LCCF track. LCCF is calculation tool to estimate the carbon impact of low-carbon actions in an area or sector of a city. However, the LCCF not meant to be as a GHG an inventory tool for the city as a whole,

Achievements

- A number of **GHG accounting systems** were reviewed for applicability in Malaysia, including MGTC's LCCF and internationally available systems such as Global Protocol for Community-Scale Greenhouse Gas Emission Inventories (GPC)[17]. At a workshop (July 2018), the participating cities suggested using GHG Protocol for Cities (GPC) as a basis for city-scale accounting. This is a recommendation, as cities are not 'forced' to use a specific accounting tool, and some cities may prefer using the accounting tool they have been using so far.

Planned

- The web portal activity has been on hold until stakeholders of the participating and other cities decided on which accounting framework to use (preference is now given to GPC-based methodologies). This activity will start in 2019. A developer will be hired for a 1-year contract to develop the online portal based on existing reporting templates (i.e CIRIS[18]) and will also be responsible in filtering the database of electricity consumption data from TNB and for setting up a database on local emission factors specifically for transportation and waste sector. The activity will be accompanied by GHG reporting training workshops in Q3 2019.
- GTALCC has reviewed (see Box 12) and will be updating the GHG inventory of the above-mentioned 5 participating cities to test the data model (the CIRIS Excel spreadsheet based on GPC standard).

[16] Malaysian Urban-Rural National Indicators Network for Sustainable Development

[17] Jointly developed by ICLEI, WB and C40

[18] Based on the GPC standard, the City Inventory Reporting and Information System (CIRIS) is an Excel-based tool for managing and reporting city greenhouse gas inventory data.

- GHG emission calculation will be carried out for the Sungai Buloh-Kajang line, the first line of the Klang Valley MRT (running from northwest KL to Kajang, southeast of KL). The calculation will use results of a survey (to be undertaken among 1000 passenger) to estimate modal share and average distance travelled (per person km). The results will also feed in to GTALCC's support to the design of the Iskandar Malaysia BRT (see Output 3.1.1).

Box 12 Review and analysis of GHG inventory of participating cities

	Putrajaya	Petaling Jaya	Cyberjaya	Iskandar Malaysia
Accounting model	AIM model (2015)	Atkins (2016)	GPC (2014)	GPC (2015)
Total emissions ($ktCO_2$)	1,515	3,496	182	
Stationary energy ($ktCO_2$) - Buildings	991 (65%) - 802	2,210 (63%) - 1,140	100 (55%) - 94	10,211 (66%) - 4,355
Transport ($ktCO_2$)	429	1,278	70	4,450
Waste ($ktCO_2$	95	8	12	807

Source: PowerPoint GTALCC, *Review and analysis of Greenhouse Gas Inventory of Participating Cities*

Issues:

- One issue is the engagement with the Climate Change unit of MESTECC on how the city level accounting based on GPC can feed into the national GHG accounting based on the IPCC methodology. Where city-level data are not available, national level data need to be scaled down to fit the urban area concerned. National data gathering can profit from sub-national (and more accurate) data collection, but then local-level and national-level methodologies need to fit.
- All participating cities will have published their GHG inventory but have been using different GHG methodologies, and these are not linked with the national level inventory and accounting system. This will make benchmarking difficult. Also, the GTALCC five participating cities have their own GHG inventory and accounting.
  - Putrajaya, developed the GHG inventory in 2012 (2015 is the latest reporting year; see https://goo.gl/5yajTn)
  - Iskandar Malaysia, developed its GHG inventory for 2015, 2016 and 2017 using the GPC methodology (see https://goo.gl/b23i36)
  - Cyberjaya carried out a city-wide GHG inventory (2016) to establish baseline scenario using the consultants' methodology (Atkins)
  - Petaling Jaya has a baseline GHG emissions established for 2014 using GPC methodology (see https://goo.gl/1UVLxf). The GHG inventory is part of the MBPJ Low Carbon City Action Plan 2015 – 2030)
  - Huah Tuah Jaya has developed a GHG baseline for 2013 (using the MGTC's LCCF Track) and will have a GHG inventory ready in 2019 (now also using GPC)
- A second aspect is the acquisition of data for the city-level planning from other government agencies, in particular, detailed electricity consumption data (e.g. per postal code zone) from the utility Tenaga Nasional Bhd (TNB) and reaching an agreement with these data-owning agencies

Status: On track

Output	Description of subactivities (based on ProDoc)	Actual subactivities (based on MTR observation and project progress reports)
1.1.3 Completed and approved evidence-based low carbon development plans and investment programs for cities and precincts	• Stakeholder consultations, agreements and detailed work plan between ministries, local authorities and other key stakeholders ensuring partnership and coordination within an integrated planning process • Updating or development of GHG inventory and baselines for cities (using Output 1.1.2 GHG accounting system); Based on this analysis and abatement potential, define low carbon objectives and GHG emission reduction targets for the participating cities • Determine priority abatement options and identify planning and investment options; Preparation and approval of low carbon development and investment plans for each city	• Engagement with participating cities on GHG target reduction targets • Revision and updating of low carbon development plans, and support to new (supporting) cities with low carbon development and action plans aking into account the GHG inventory system update/development (Output 1.1.2) and the framework formulated in the NLCCMP & PR (Output 1.1.1)

Baseline

The participating cities have adopted **low carbon frameworks** to guide low carbon development :

- Putrajaya: The Putrajaya Structure Plan 2025 provides the legal basis for land use reforms required for transforming Putrajaya into a sustainable city by 2025 and led to the development of the "Towards Putrajaya Green City 2025" (PGC 2025; 2011)) study which identified a priority set of action plans (including integrated city planning and management, low carbon transportation, sustainable buildings, renewable energy, and gas district cooling).
- Iskandar Malaysia: IRDA has adopted and applied the Low Carbon Society framework (LCS) for the low carbon development of the Iskandar Malaysia region. 'The LCS Blueprint for Iskandar Malaysia 2025' which was launched in 2014 promotes the low carbon development of a city and provides the policy framework. IRDA covers the special development area of Iskandar Malaysia composed of four local authorities which are MB Johor Bahru (MBJB), MB Iskandar Puteri (MBIP), MP Pasir Gudang (MPPG) and MP Kulai (MPKU). All have incorporated the low carbon agenda in the revision of their local plan (*Rancangan Tempatan Daerah Johor Bahru dan Kulai*) and have city-level Low Carbon Action Plans.
- Melaka (and Hang Tuah Jaya): The state government has set up the Melaka Green Technology Corporation (MGTC) to oversee the planning and monitoring of green technology developments in the State. The State Government has developed the Melaka Green City Action Plan in its effort to become the country's first green technology city or 'Green' State by 2020. Huan Tuah Jaya has the *Pelan Induk Bandar Hijau Hang Tuah Jaya. Hang Tuah Jaya* has incorporated low carbon agenda in the revision of their local plan *(Rancangan Tempatan Majlis Perbandaran Hang Tuah Jaya (Pengubahan) 2025*
- Cyberjaya has formulated the Cyberjaya Smart Low Carbon City Action Plan (2017, prepared by APUDG for MP Sepang)

Achievements

- GTALCC participated in and provided support to be the above-mentioned baseline activities by means of several stakeholder workshops and meeting on low-carbon development and on updating their GHG accounting and reduction target setting. Putrajaya has adopted a GHG reduction target of 60% reduction in GHG emissions intensity by 2025, based on their action plan. GTALCC is currently assisting Perbadanan Putrajaya through several programmes to reduce carbon emissions in the building and transportation sector.

Planned

- GHG emission target setting workshops in the five participating cities (Q3 2019).
- Revision and updating of low carbon development plans, taking into account the GHG inventory system update/development (Output 1.1.2) and the framework formulated in the NLCCMP & PR (Output 1.1.1)

Status: On track

4.2.2 Component 2 Awareness and institutional capacity development

Output 2.1
Expedient appraisal, approval and implementation of strategic urban development plans/program and projects

Output	**Description of subactivities** (based on ProDoc)	**Actual subactivities** (based on MTR observation and project progress reports)
2.1.1 Strengthened and operational coordination mechanisms for effective implementation of low carbon city policy	• Identification of gaps and overlapping mandates among key municipalities, federal agencies and facilitate discussion and agreement in order to clarify structures and ToRs; • Definition and delineation of the roles and responsibilities and reporting arrangements within municipalities and with federal agencies, other national and regional authorities, and between sectors to support low carbon planning and investment in cities	• Institutional framework for low-carbon cities (IFLCC) (identification of gaps and barriers; capacity needs assessment; definition and delineation of the roles and responsibilities and reporting arrangements within municipalities and with federal agencies, other national and regional authorities) • Implementation of a national green technology and low carbon city benchmarking system for

	• Establishment and strengthening of existing city-level one-stop service centres so as to mainstream green technology and climate change advisory functions • Implementation of a national green technology and low carbon city benchmarking system for development application appraisal and approval by municipalities	development application appraisal and approval by municipalities

Baseline

There is no real mechanism that coordinates and find synergies between entities both vertically between federal and local levels, and horizontally across stakeholders at each level. As discussed in Section 2.1, there is a multitude of entities involved that make plans and policies with targets (e.g. GHG emission reduction, waste reduction, sustainable energy) that need to be consolidated. The progress report (March 2019) of NLCCMP & PR (by APUDG, see Output 1.1.1) gives a good overview. An appropriate low-carbon institutional framework will help to facilitate the successful implementation of low carbon development in this country and act as a platform to spell out the overall direction and key policy decisions concerning the matter

Achievement

- The project is working towards integrating elements for low carbon aspects into the appraisal and approval process and in coordination between various entities involved. GTALCC is carrying out a study on the Institutional Framework for Low Carbon Cities with specific mechanisms to facilitate the successful implementation and adoption of low carbon development into a normal urban planning system in Malaysia:
  - A number of discussions were held with important stakeholders such as PLANMalaysia, MHLG (Min of Housing and Local Government), MEA, MESTECC, GreenTech, SEDA and other stakeholders;
  - Finalise the comprehensive study on Institutional Framework for Low Carbon Cities by mid-2019. The framework will spell out: 1) a platform to disembark overall directions and key policy decisions concerning the low carbon development; 2) support and tools for effective planning control mechanism including appraisal and approval for planning permission process for low carbon development projects and; 3)) possibilities of 'one-stop-centres at Local Authorities to be strengthened (or established) as a centre for low-carbon advisory services which will provide advice and relevant services towards implementing low carbon projects within cities boundary.
    The study will be carried out by the MIP - Low Carbon Cities and Sustainability Centre, in close discussions with PLANMalaysia. An inception report was finalised in Jan 2019 with a final report ready by mid-2019. The study will also cover part of Output 2.2.1 (conduct a capacity needs assessment). In order to achieve synchronisation, the activity has been consulted with the LCCF Reviewer (Output 2.2.1) and the NLCCMP team (APUDG; Output 1.1.1). The MIP team has worked together with MPSJ, MBSA, MPHTJ, MBKT, MD Kerian, MPSP to understand current institutional framework, requirements, and challenges faced by cities.
- One of the participating cities (Iskandar Malaysia) has started the initiative by incorporating low carbon city requirements into its Local Plan. Comprehensive Development Plan II 2014-2035, a business strategy document of IM. The document was developed in-line with planning document available including Johor Structure Plan and District Local Plan of 5 local authorities within Iskandar Malaysia. GTALCC is proactively communicating with IRDA in identifying relevant projects to be low-carbon projects based on the prepared CDP-II. Sepang Municipal Council has developed the Cyberjaya Smart and Low Carbon Cities Action Plan 2025. Continuous discussions are being carried out with the municipal council to identify how the project can support the low carbon city projects in Cyberjaya.

Planned

- After the activities on Institutional Framework, the Output will focus more in 2019 on establishing/ strengthening the national benchmark for appraisal and approval processes, and activities aimed at increasing the capacity of cities to exceed the benchmark.

Status: On track

Output 2.2
Major cities are aware of, and are planning and implementing low carbon technology applications for integrated urban development

Output	**Description of subactivities** (based on ProDoc)	**Actual subactivities** (based on MTR observation and project progress reports)
2.2.1 Completed training programs for policy decision-makers, local governments, green practitioners and financing institutions on strategic urban planning processes for low	• Conduct a capacity needs assessment • Preparation and conduct of "training of trainer" courses (with LGTI and MIP). Training programmes will be mainstreamed within on-going baseline training programmes. Trainers will conduct a series of trainings over the duration of the project. • Conduct of demand-driven training and on-the-job technical advisory services for state and city officers. Tools and methodologies of Output 1.1.3 will be incorporated, while the training should be in sync with normative planning cycles to ensure the training will be effectively used	• Preparation and conduct of "training of trainer" courses (with LGTI and MIP). Training programmes will be mainstreamed within on-going baseline training programmes. Trainers will conduct a series of trainings over the duration of the project. • Demand-driven training and on-the-job technical advisory services for state and city officers (tools and methodologies of Output 1.1.3 will be incorporated, while the training should be in sync with normative planning cycles to ensure the training will be effectively used)

Baseline
A number of training activities are organised as part of the LCCF, LCEB and integrated urban development, provided by LGTI (Local Government Training Institute) and Malaysian Institute of Planners (MIP). The GTALCC project will enhance these baseline training activities.

Achievements
- The capacity needs assessment was carried out as part of Output 2.1.1 (see Institutional Framework study).
- GreenTech (MGTC) agreed (in Jun 2018) to collaborate together for the project to use the LCCF and its training module as a basis in developing the "Train the Trainer" curriculum for accreditation panel, facilitators and assessors/ verifiers. GTALCC has the intention to develop a comprehensive curriculum for a "Train the Trainers" module based on the LCCF, and is seeking to collaborate with GreenTech Malaysia as they are the custodians of the LCCF. The curriculum is intended to build national capacity with regards to low carbon cities planning and development in Malaysia. The participants of this train the trainer course will be equipped with comprehensive methods, tools, approaches and other relevant training. The training curriculum is based on the Low Carbon City Framework training module, owned by MESTECC, and developed by MGTC and Malaysian Institute of Planners. A draft training curriculum was ready by April 2019, which will be followed by mock training and the curriculum's finalisation, after which the training will be implemented by MGTC starting Q3 2019

Planned
However, there is a need to also focus on training for low carbon development/ planning for skills that are not covered under the LCCF framework, and to look at other demand-driven training for state and city officers in order to equip them with relevant knowledge (based on their current work) in implementing low carbon activities within the city's boundary. A series of trainings and seminars are planned for 2019-20 to be carried out as capacity development for relevant stakeholders once the Institutional Framework activity has been completed and the Development of Low Carbon Cities Assessment and Accreditation Panel, Facilitator and Accessor/Verifier Training Curriculum has been drafted. The series of training will consist of sessions according to regions; north, central, south, east coast spanning from June to November 2019 (costs borne by the Project).

Status: On track

Output	Description of subactivities (based on ProDoc)	Actual subactivities (based on MTR observation and project progress reports)
2.2.2 Operational knowledge management systems for low carbon city development	• Establishment of a National Low Carbon Cities Network (NLCCN) including links to global networks for experience sharing (hosted by MGTC) • Preparation of a GTALCC communication strategy and plan • Preparation and dissemination of knowledge products for specific target groups on designing, implementing, and financing green technology applications • Collection of case studies and dissemination of lessons and best practices for LCUD in partnership with green technology practitioners in Malaysia	• Establishment of a National Low Carbon Cities Network (NLCCN) • Preparation of a GTALCC communication strategy and plan • Preparation and dissemination of knowledge products for specific target groups on designing, implementing, and financing green technology applications • Collection of case studies and dissemination of lessons and best practices for LCUD in partnership with green technology practitioners in Malaysia

Baseline

The government plans to enhance its existing clearinghouse services to a national clearinghouse for low carbon cities information and knowledge products; strengthen a collaborative approach by establishing clear terms and agreements for information sharing, visibility, and utility. The activity will identify the suitable clearinghouse agency, additional computing and physical resources to ensure clearinghouse materials are accessible online. Additionally, the annual International Greentech and Eco Products Exhibition and Conference Malaysia (IGEM) forms a baseline activity.

Achievements

- A review the LCCF against internationally available frameworks, standards, and carbon calculators and to recommend improvements to the LCCF and LCCF Track to align with GPC. The activity has resulted in seven Task reports (over Feb-March 2019)[19].

Planned

- The establishment of the National Low Carbon Cities Network will be starting in 2019.
- Case studies from GTALCC participating cities, supporting cities and stakeholders on low carbon initiatives and programmes will feature on the GTALCC website, together with recurrent updates of project activities
- Formulation of the GTALCC Communications Strategy and Plan. GTALCC already participated in a number of conferences; for example, the in the Malaysia Urban Forum (MUF) Feb 2019 (as an exhibitor) and with SEDA at the Forum Bandar Rendah Karbon Putrajaya and Zero Energy Building Conference. As a number of studies and activities will be finalised soon (notably the NLCCMP&PR, Low Carbon Cites Institutional Framework, web-based portal, low carbon public transport study; study on green incentive schemes), it will be important to start the next phase of communication of these and other project results, by means of communications and promotion together with the parallel training activities of Output 2.2.1. Examples of planned activities in 2019 include:
  - Publish GTALCC website & active updates on activities as well as case studies; Knowledge products will be developed in the form of posters, pdf reports, presentations, videos and infographics that will be available on the website; Distribution of materials and posters on GTALCC to participating cities and strategic partners (PTC and NSC members) for promotion and visibility; GTALCC roadshows by region; north, central, south, east coast spanning from June to November 2019; coincide with on-demand training sessions
  - Planned-tentative participation in upcoming major conferences:
    i. Tentative launching of NLCCMP & PR at IGEM 2019
    ii. IGEM 2019 from 9-11 October 2019, iii.7th Asia Pacific Urban Forum (APUF) 2019 from 15-17 October 2019

[19] Ms. Rachael Jonassen (Washington University). Task reports are 1) and 2) Review, identify and strengthen gaps in LCCF and LCCF Track, 3) Recommendations for improvements, 4) ,Recommendatuions for alignging LCCF with GCF, 5) Recommendations for mitigation actions in LCCF, 6) Recommendations for LCCF as planning tools, 7) Recommendations for global recognition of LCCF

iv.National Planning Congress 2019; v. World Town Planning Day National Celebration

Status: Off track

4.2.3 Component 3 Low carbon technology investments in cities

Low carbon public transportation

Output	**Description of subactivities** (based on ProDoc)	**Actual subactivities** (based on MTR observation and project progress reports)
3.1.1 Applied design considerations into BRT for enhanced GHG emission reduction potential 3.2.2 A commissioned BRT system operating in Iskandar Development Region	• Stocktaking on the design and implementation practices for maximizing emission reductions and climate proofing of urban transport projects in Malaysia, including BRTs; Preparation of detailed recommendations on low carbon climate resilient strategies that will be incorporated in the design process of BRT Phase 2 in Iskandar Malaysia, based on the results of the stock take study • Design and implementation of a personal GHG emission calculator and dashboard that will be incorporated in the BRT Operational Management System (provides feedback to customers on their mobility options); Design, pilot and institutionalize a GHG monitoring and reporting framework	• BRT design review • Design and implementation of a personal GHG emission calculator and dashboard that will be incorporated in the BRT Operational Management System (provides feedback to customers on their mobility options); Design, pilot and institutionalize a GHG monitoring (3.2.2 is proposed by the MTR team to be merged with 3.1.1)

Baseline
Currently, coverage of public transport is limited to 39%. With population increasing from 1.9 million in 2018 to 3 million in 2025, if the current transport system continues, traffic will be building up with increased congestion (becoming three times as bad) and less accessibility. To address these issues, Iskandar Malaysia has published the Malaysia Transportation Blueprint 2010-2030. Smartt mobility is part of Iskandar Malaysia's Smart City Masterplan. In these plans, a Bus Rapid Transit System (BRT) will be the backbone of public transport in the region, supplemented by better rail and taxi services and better connectivity with other transport infrastructure and modes. The target is to improve the public transport coverage from 39% (current) to 90% in 2025 and to increase the public transport modal share from 15% to 40%.

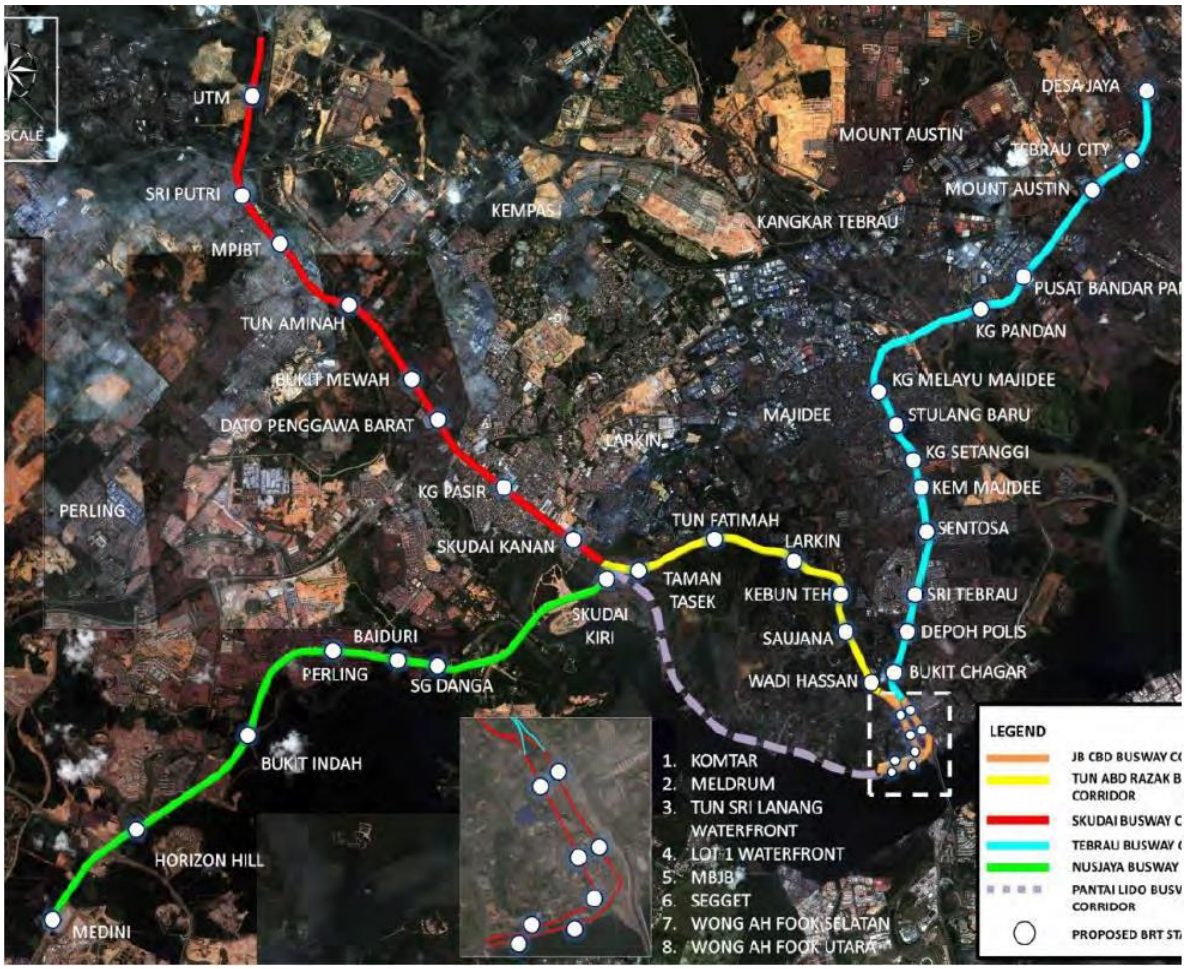
'The BRT corridor in Phase 1 Project' will have three trunk routes Johor Bahru CBD - Skudai (Skudai Corridor), Johor Bahru CBD - Medini (Medini Corridor) and Johor Bahru CBD - Terbau (Tebrau Corridor). The BRT will consist of 39 stations on high-capacity buses in special lanes, with pre-paid ticketing (trunk routes) that connect with 42 feeder and 16 direct bus routes (see Box 13). Existing local bus operators shall be invited to bid for selected IM-BRT packages. The system will be linked with trans-oriented development (TOD) in Tebrau, Medini and Skudai to encourage ridership and will promote non-motorised transport infrastructure (cycle-paths and walkways, bikesharing) for first and last mile connectivity[20]. Connectivity will be sought with future projects, such as the high-speed rail to KL and connection to the Senai International Airport, and with Singapore.

The BRT will be owned by BRTIM Sdn Bhd (fully owned by IRDA). The proposed BRT project includes the development of several BRT stations on a Private Funding Initiatives (PFI) basis. The BRT Phase 1 construction was expected to be commissioned by 2017, but due to delays, the commencement of construction is now scheduled for start early 2020 with commissioning scheduled towards the end of 2022.

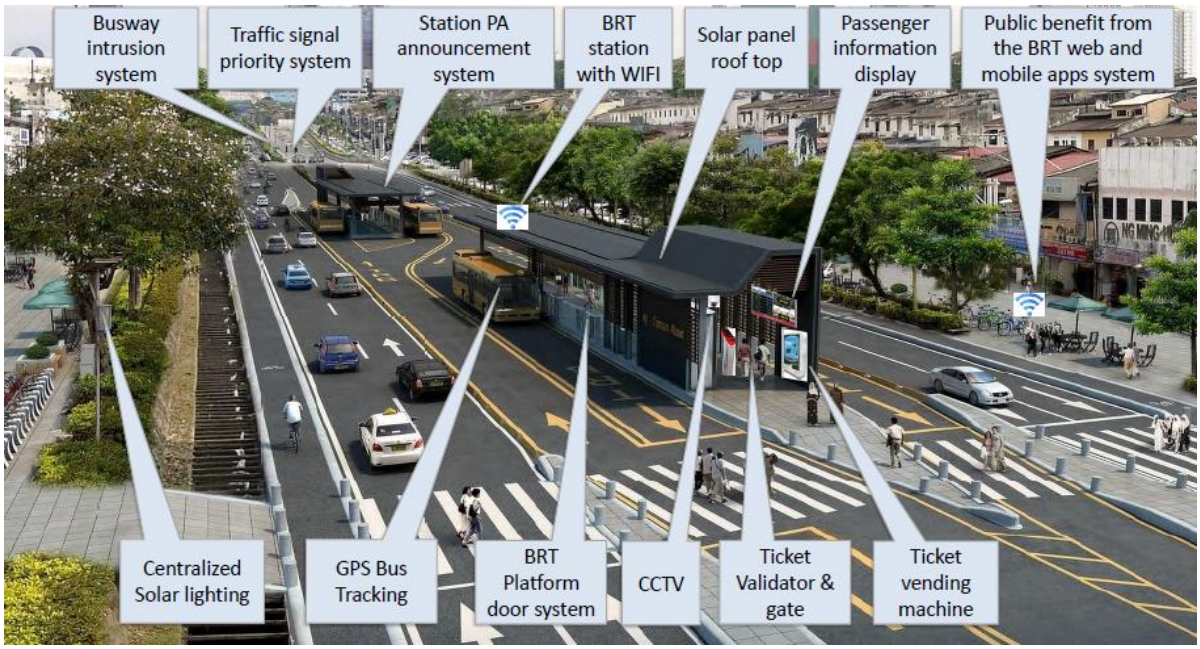
One aim of the BRT is to improve bus service quality and efficiency and increase ridership. A comprehensive BRT Operational Management Systems (BOMS) will be developed to support and monitor the operations and delivery of coordinated transportation services, and provide customer information. IRDA has implemented two monitoring systems which are the BOMS and the Mobility Management System (MMS) which are separate systems but are interrelated. BOMS is intended to provide data on routing to MMS and MMS will provide data which commuters can assess and use. MMS user's carbon footprint will be calculated through the MMS system.

[20] See PowerPoint *IM-BRT Lead Consultant Industry Briefing,* by: R. Azhar

Box 13 Iskandar Malaysia Bus Rapid Transit (IMBRT) system



Source: PowerPoint *Iskandar Malaysia Bus Rapid Transit System, Lead Consultant Industry Briefing*, by: R. Azhar



Artists impression, Jalan Tabrau station (indicating smart technology elements

The objective of GHG monitoring is for land transportation reporting, which will assist IRDA to get a robust bottom-up quantification of GHG emission inventory and the results will furthermore provide feedback for IRDA's Transport Master Plan and Low Carbon Plan for Iskandar Malaysia.

Planned

- GTALCC support will focus on a) BRT design peer review (August-Nov 2019) and b) remote monitoring system of GHG emissions (including ridership surveys) on the corridor from Jalan Tebrau to Jalan Skudai of Iskandar Malaysia's BRT (July 2019-March 2020).

Issues

- The schedule for the Iskandar Malaysia BRT has been delayed, and construction of Phase 1 will start in 2019 to be completed in 2022. For the GTALCC Project, this implies that the BRT will only start operating after the Project closes and this has raised the issue of how GHG emission reduction can be counted in a meaningful way. The issue will be discussed further in Section 4.3.

Status: off track

Electric and hybrid vehicles

Output	**Description of subactivities** (based on ProDoc)	**Actual subactivities** (based on MTR observation and project progress reports)
3.2.1 Operationalised electric vehicles and charging station infrastructure	• An EV infrastructure roadmap will be prepared in 3 participating • EV charging infrastructure will be installed for municipal fleets cities (procurement of equipment for at least 30 EV car-charging stations) • Schemes for the adoption of EVs for municipal fleets and for providing incentives for uptake by municipal service providers will be developed (feasibility studies and business plans)	• *Installation of electric vehicle charging stations for residential buildings (strata)* *Note:* activities as, EV infrastructure roadmap, EV charging infrastructure, and incentives for EV fleets appear to overlap with an ongoing UNIDO/GEF projects (see Box 14) and are not pursued. Given this situation, the GTRALCC team hasd decided to focus on charging options in residential areas as a niche area

Italics: revised or newly added subactivities

Baseline

The National Automotive Policy projects a 10% share of EVs in the total volume of new vehicles by 2020. In view of the expected EV market development, local companies (e.g. GoAuto) are producing electric buses and other e-vehicles. The infrastucture for charging of e-vehicles is still limited. The ChargEV Network currently has 251 charging stations (as of Feb 19), of which 157 in the KL-Selangor region, 23 in Johore and 20 in Penang (about 60 are on highway locations, and about 191 are in public locations[21]. There are 5600 registered e-vehicle users in Malaysia, according to ChargeEV. A number of car makers (e.g. Proton, BMW, Nissan) have introduced electric (EV) and plug-in hybrid (PHEV) cars on the market. BMW has an agreement with ChargeEV do use their charging systems.

Up to now, it has been difficult to have a hybrid or EV at a budget price range. In Malaysia, there were only a few models for the public to choose from. For example, the Nissan Leaf cost RM 180,000, Renault Zoe cost RM 145,000 and BMW i3 LCI sells for RM 279,000. New cheaper models are being introduced, e.g. the Nissan Almera EV sells for RM 70,000[22], more approaching fuel car prices of that type[23]. Apart from the initial costs of e-cars, other issues in moving towards an e-vehicle economy are formed by scaling up the production of electric vehicles, establishing the infrastructure of charging stations and enhancing interconnectivity with public transport options.

[21] Presentation by UNIDO for MTR discussion, Dorsett Putrajaya, 9 Apr 2019

[22] Nissan Malaysia website; website mycarsearch.my/news 20-07-17).

[23] www.carbase.my/body-type/hybrid-and-ev

Regarding the latter, Cohesive Mobility Solution (COMOS) provides an alternative mode of transportation enabling the last mile solution to current public transportation infrastructure by offering rental options of e-cars (currently the Renault Zoe and Twizy models) and cost-sharing services[24]. It will also offer corporate lease packages. The Cohesive Mobility Solution (COMOS) is a first of its kind initiative in Malaysia, which is developing a service platform for complete e-mobility solutions by integrating various parts of the EV ecosystem and value chain that includes approx. 1300 EVs, 17,000 EV users, EV charging providers, EV fleet operators, parking management operators and telecommunication network operators. Through this initiative, the project proponent, CMS Consortium Sdn. Bhd. aspires to roll out an EV sharing scheme in Malaysian cities and deploy public approx. 500 charging infrastructure, including centralized network management system that integrates both EVs and charging stations. It plans to initiate its operations based on direct-to-market approach subsequently working with fleet operators and has partnered with a telecommunications provider, Celcom for provision of telecommunications infrastructure for deployment. The market development activity is focusing in Melaka, Iskandar and Klang Valley. Although the plan for the next 5 years is quite ambitious, the initiative is experiencing administrative delays and challenges in forging a closer engagement with local authorities and cities.

Similarly, another private sector operator Eclimo Sdn. Bhd. is currently providing electric scooters for the Malaysian market as well as customer finance with an aim of providing low emission urban transport solutions for both public and private corporate use. Their business plan targets to support the deployment of more than 12,000 units in Melaka, Petaling Jaya, Johor and Putrajaya.

In an effort towards a low-carbon emission economy, the Petaling Jaya Council has switched most of their official vehicles to hybrid or NGV and is considering other municipal services to replace existing vehicles with EVs. Simultaneously, the council is providing free car parking spaces throughout the city for hybrid and EV cars and has made certain areas as "switch-off engine" zones where waiting vehicles must turn off their engines. They have also purchased 10 electric bicycles for public rental around parks and Section 52, which is one of the most congested areas in Petaling Jaya. Private sector electric car and scooter providers are working towards expanding EV sharing schemes including installation of charging stations and parking/drop-off points.

Box 14 UNIDO/GEF project on Energy Efficient Low Carbon Transport

The project is implemented by GreenTech Malaysia (MGTC) under MESTECC's responsibility with a USD 2 million GEF budget. It has two components, 1) Enabling policies and regulatory framework, strengthened institutional capacity, and enhanced awareness for electric vehicles (EV), and 2) Development and demonstration of infrastructure for EVs, and local EV manufacturing capacity.

Under Component 1, the project is supporting work on formulation of a Low Carbon Mobility and Action Plan, as well as a an EV Roadmap; apart from preparing the documentation, activities include stakeholder engagement workshops and focal group discussion. The Plan will also look at locakl manufacturing aspects anmd capacity building and technology transfer needs and options. Under Component 2, the project has provided technical assistance for the realisation of a number of demonstration projects (proposal; formulation; stakeholder workshops):

- Solar PV-ESS EV Charging at OBR Ayer Keroh, Plus Highway (completed)
- Solar PV-ESS EV Charging at BRT Station in Sunway, Klang Valley (completed), a collaboration of Prasarana Bd and Sunway Bd (Malaysia's first all electric BRT)
- Installation of 10 EV charging station at Langkawi Island (completed)
- Installation of 4 PV-EV Charging Station at Plus Highway R&R (due Mid 2019)
- Training Needs, Safety and Standard Development for EVs Infrastructure (due August 2019)

[24] Memberships is RM 25 a week, RM 50 a month and RM 200 a year. Usage rates will be charged at RM16 per half-hour (minimum usage), split into RM8 for every 15 minutes. See https://paultan.org/2015/05/30/comos-ev-car-sharing-service-launched/

Achievements

Private operators and cities (for municipal fleets) will cover cost of EVs. The Project will work with the project proponents to facilitate a strong engagement between private sector and cities authorities in order to ensure that EVs are integrated into urban systems. At the onset of the project, GTALCC has facilitated collaboration and engagement with key stakeholders on low carbon mobility. The project has had discussions with KeTTHA as the lead ministry and has been exploring collaboration with MGTC on their existing initiatives relating to electric cars and other EVs. However, there has been no substantial GTALCC intervention in 2017, partly due to efforts of the UNIDO project (see Box 14), which also features an ongoing Low Carbon Mobility study undertaken by MGTC

Output	**Description of subactivities** (based on ProDoc)	**Actual subactivities** (based on MTR observation and project progress reports)
3.1.2 Leveraged investments to support the scaling up of low carbon public transport systems	• Preparation of feasibility study for adoption of low carbon vehicles including electric buses for public transport in cities and associated clean energy charging stations. • Preparation of viable business cases for municipal fleets and public transport operators for the adoption of low carbon vehicles; Preparation of action plan for scaling-up financing for low carbon public transport providers. • Conduct of training for financial intermediaries on low carbon transport investments	• Preparation of study for adoption of low carbon vehicles public transport including viable business cases for municipal fleets and public transport operators for the adoption of low carbon vehicles and scaling-up of financing for low carbon public transport providers. • Conduct of training for financial intermediaries on low carbon transport investments • *Pilot project for low carbon public transportation on bioCNG*

Italics: revised or newly added subactivities

Baseline situation (at project formulation)

Mass transit systems have the potential of avoiding carbon emissions by a modal shift away from private car use. Carbon emissions can be further reduced by introducing low-carbon vehicles, such as electric or alternative fuel buses that replace diesel buses. The Project Document mentions that "the delivery of this output will entail building on the successful demonstrations of electric buses undertaken by KeTTHA[25] and MGTC, which have identified financing risks as a barrier to operator investment. Diesel buses are a major contributor to poor air quality and noise, and fuel costs expose bus operators to currency fluctuations and increase financial overheads. Whilst BRT systems, such as in Iskandar, will improve public transport and reduce overall transport GHG emissions, the diesel buses themselves will generate substantial emissions. Consequently, IRDA is considering conversion to low carbon buses, such as fully electric and hybrids. IRDA is contemplating carrying out a pilot of at least 20 electric buses.

The baseline activities also include the on-going trials of electric and hybrid buses in Putrajaya and Melaka for city routes. In Putrajaya, GetsGlobal manages a fleet of 165 natural gas buses and 10 electric buses. Costing RM 2 million each (about USD 485,000), the buses were obtained through an agreement between Malaysia and Japan government, which aims to demonstrate the benefits of EV buses and the accompanying with super-rapid charging system. The EV buses are currently servicing routes in Putrajaya and Cyberjaya. The plans are to move towards a fully electric bus fleet[26]

Public transportation is a priority in the Melaka Green City Action Plan is planning to develop a mobility plan for the state. Consequently, it has trialled operations with 40 electric buses going around the heritage areas. Commenced in 2012, this project has been operated under the state government subsidiary support through the Panorama Melaka Sdn. Bhd. (a state-owned bus company). However, in 2018 Panorama announced it might reduce the number of electric buses as a cost-reduction measure[27].

One barrier is formed by the up-front costs of electric buses that are substantially higher than of diesel buses, i.e. around USD 380,000 (RM 1.5 million) compared to about USD 190,000 for a standard diesel bus. Bus operators expect a payback

[25] Now: MESTECC

[26] Metro News, 18 Sep 2018

[27] The Star online 24-05-2018

of around 5 years for their standard diesel buses but yet are unsure how electric buses will perform in operational conditions.

Achievements

- A study on low carbon public transport (bus): scaling-up financing and preparation of viable business cases for cities. The study will be carried out by Uni-Link Smart Venture Sdn Bhd. Elements will include:
  - Review of existing investment and operational requirements that have been implemented since 2010 for the conversion of Bus Rapid Transit (BRT), city bus, stage and intercity bus services to low carbon vehicles
  - Review existing institutional setup, regulatory framework, legislation, and financial mechanisms and resource allocation in Malaysia to achieve rational investment of low carbon public transport
  - Identify shortfalls and barriers in all low carbon public transport consuming that currently hinder the adoption of low carbon public transport in Malaysia

Box 15 Biomass-derived transportation fuels

Biofuel is a renewable source of alternative fuel which is mainly produced from animal fats (tallow, lard, white or yellow grease, poultry fats, or fish oils); recycled greases (used cooking and frying oils); and most commonly, plant oils (from soybeans, corn, rapeseed, sunflowers, and cottonseeds, etc.). Currently, biodiesel, bioethanol and bio-CNG most promising biofuels being projected to replace conventional fossil fuels in transportation.

Bioethanol is an alcohol made by fermentation, mostly from carbohydrates produced sugar crops (e.g. sugarcane), starch crops (after converting starch into sugars, e.g. corn, wheat) and cellulosic materials (most difficult). The fluid obtained is distilled to get anhydrous (99-100%) or hydrous ethanol (95-96%); anhydrous ethanol can be blended with gasoline and hydrous ethanol as fuel for dedicated internal combustion engines

Biodiesel is synthesised through transesterification of vegetable oils with methanol and the aid of appropriate catalysts. It can be used to replace mineral diesel in internal combustion engines which has almost similar properties. In Malaysia, palm oil is the main source of biodiesel. Bioethanol can be used as a fuel for vehicles in its pure form (B100), but the engine needs modifications. Usually used as an additive to gasoline or diesel increase octane and/or improve vehicle emissions, as is the case in Malaysia (B5, B10).

Biodiesel and bioethanol are produced in dedicated crop plantations. There is debate about land-use change and deforestation in response to greater demand for crops to use for biofuel and the subsequent carbon emissions, soil erosion and loss of biodiversity. Other issues are water resources availabvility and the 'food-versus-fuel' issue.

Bio-CNG is a methane-based gas with similar properties to natural gas. Unlike biodiesel, potential sources of biogas in Malaysia is formed by effuent (produced by anaerobic digestion), such as landfills (landfill gas) and sewage and animal/agri-waste (e.g. palm oil waste). According to the Ministry of Primary Industries, there are 464 palm oil mills nationwide; out of which, 102 mills have installed biogas trapping facilities. Raw biogas produced from digestion is roughly 60% methane and 29% CO_2 with trace elements of H_2S. For use in in machine, the gas needs be treated to remove trace contaminants and the water and CO_2 content to have a gas with similar characterics as CNG. The bio-methane obtained can then be used in engines that normally burn mineral CNG. Biogas can be compressed, the same way as natural gas is compressed to CNG, and used to power motor vehicles (bio-CNG). Biogas can also be used for electricity generation, replacing CNG or other fossil fuels and for heating purposes.

The first commercial BioCNG Plant waqs opened in 2015 at the Felda Palm Oil Mil Tengi (in Kuala Kubu Bahru, Selangor). The plant is a result of strategic venture between the Malaysian Palm Oil Board (MPOB), Felda Industries Sdn Bhd (a subsidiary of Felda Global Venture, FGV), and Sime Darby Offshore Engineering Sdn Bhd (SDOE). SDOE and Gas Malaysia Berhad (GMB), the local natural gas distribution company in Malaysia, had also entered into a joint venture to off-take the BioCNG produced from this plant and transporting it by CNG trailers to industrial customers. Besides supplying the BioCNG to factories, SDOE and GMB are also looking at supplying BioCNG via trailers to NGVs (Natural Gas Vehicles) in Malaysia.

Sources: Article, *Sustainable Future Energy 2012 and 10th SEE Forum, Innovations for Sustainable and Secure Energy* 21-23 November 2012, Brunei Darussalam. www.awanireview.com/articles/2018/09/30/news/buses-go-bio-the-green-route-for-public-transport-423/. ANGV, Lee Giok Seng, Executive Director, 28 Oct 2015

- Identify examples of successful national low carbon public transport efforts in selected countries
- Develop aiable business cases for cities bus operators for the adoption of low carbon vehicles
- Develop an action plan for scaling-up financing for low carbon public transport providers

- A number of workshops have been organised with the participation of public transport companies (e.g. Prasarana[28], IM-BRT, GetsGlobal, MRTCorp), SIRIM[29] and government (MGTC, MOT, MESTECC, MIDA, BPM, and MPI[30])
- Training will be organised for financial intermediaries on low-carbon transport investments (Q2-Q4 2019)

Alternative low-carbon fuels and planned activities

Much attention in Malaysia transport policy has been given to electric vehicles as an alternative to fossil fuels (diesel, gasoline, CNG). An electric bus will be a lot more expensive than a diesel bus. However, taking all annual fuel and operating cost over its 15-20-year lifetime, then the average cost per kilometre of an electric bus is lower. Gas-fueled vehicles are only slightly more costly than diesel vehicles, so buses fuelled by gas are much cheaper over their lifetime than electric or diesel buses. Here, another alternative is formed by biomass-derived fuels, such as bio-CNG (see Box 15 for a description) that can be used in CNG buses. Here, it should be noted that an electrical vehicle will have a GHG emission from the electricity generation. In Malaysia the grid emission factor is high 0.694 tCO2/MWh. There will still be a significant GHG emission from using EV, while bio-CNG can be zero-carbon, if produced in a sustainable way.

The first bio-CNG plant from palm oil waste was opened in Malaysia in 2015. Sime Darby Energy, a partner in the bio-CNG plant and GMB are also looking at supplying BioCNG via trailers to power CNG vehicles in Malaysia. In 2015 there were around 74,100 natural gas vehicles and 178 natural gas refuelling stations in the country[31]. The Tengi palm oil facility could produce some 80,000 mmbtu of biogas per year. Taking into account the different heating values of the fuels[32], this is equivalent to 1.9 billion of m^3 bio-CNG, potentially replacing 1.8 billion litres of diesel. From a GHG reduction perspective this is very interesting; not only is emission reduced by fuel substitution (diesel for zero-emission bio-CNG; 4.8 $MtCO_2$), but also in view the 'methane kick', i.e. the large amount of methane emission is avoided (converted by burning into the CO_2 which gives 15 $MTCO_2$)[33].

As a new project activity, the GTALCC project is contemplating to carry out a pilot to proof the bioCNG-for-transport concept, in cooperation with a bus operator and Gas Malaysia/Sime Darby Energy. On the longer run, this could be followed by the development of new biogas plants as palm oil mills, sewage plants, landfills and the installation of CNG-quality upgrading facilities.

Status: activities have been re-formulated

Other low carbon projects and investments

Output	**Description of subactivities** (based on ProDoc)	**Actual subactivities** (based on MTR observation and project progress reports)
3.2.3 A commissioned city cycleway in Putrajaya	• Stocktaking of bicycle sharing schemes in Malaysia and the region to inform design to ensure integration of transport modalities for cycleways and to attract riders; Preparation of a pilot bicycle-sharing scheme either as a partnership with private sector or community organisations	• Promotion of cycling culture in Putrajaya starting with the use of bicycles, electric bicycles and e-scooters as a way to commute between government buildings

One example is in the form of the plan of making Putrajaya a 'bikeable and walkable city' (as referred to in the Putrajaya Putrajaya's Green City 2025). The project (Bikeable City Project) is part of Putrajaya's 'Integrated Precinct Level Special

[28] Together with the public bus operator Konsortium Transnasional Berhad (KTB), Prasarana is the largest public transport operator. Apart from bus and rail lines, is (under the name MRT Corp) operates the Klang Valley MRT (Mass Rapid Transit), the electric buses on the BRT Sunway Line, while a number of monorail and bus projects in various stages of preparation

[29] SIRIM is the industrial research and technology organisation in Malaysia; a wholly-owned company of the Malaysian Government under the Ministry of International Trade and Industry (MITI).

[30] MPI: Ministry of Primary Industries; BPMP: Malaysian Development Bank

[31] Source: ANGV

[32] Biogas: 33.66 MJ/m^3, bio-CNG: 35.95 MJ/m^3, natural gas: 35.61 MJ/m^3. Source: Henrik Jensen, GTALCC CTA (April 2019)

[33] The relative Global Warming Potential of methane is about 21, much higher than CO_2 (GWP=1)

Area Planning' programme than in particular addresses urban mobility. A number of operators are involved in e-bicycle sharing, including Public Bike Share (in Melaka and Johor), LinkBike (in Penang) and O-Bike (in Selangor and KL). However, these initiatives have not had the results as expected; O-Bike had to cease activities, for example.

Achievements

- The GTALCC project has facilitated a public-private partnership for the cycle-way with the introduction of 400 bicycles by O-Bike in Putrajaya (commercial buildings) and in Hang Tuah Jaya (200 bicycle in two universities). In general, e-bike ridesharing has met practical issues;
- Putrajaya Low Carbon Mobility activity aims to promote cycling culture in Putrajaya starting with the use of bicycles, electric bicycles, and e-scooters as a way to commute between government buildings (with Voltron Malaysia)

Planned activities

- Identify parking/storage area and requirements at Galeria PjH and Kompleks Perbadanan Putrajaya, as well as the purchase of 6 electric bicycles and 6 electric scooters for SEDA Malaysia & Perbadanan Putrajaya in April 2019.

Status: On track

Output	**Description of subactivities** (based on ProDoc)	**Actual subactivities** (based on MTR observation and project progress reports)
3.2.4 Operationalised on-site waste processing projects in Petaling Jaya	• A detailed feasibility study will be prepared to identify the most appropriate business model for scaling-up for on-site composting and/or on-site waste-to-energy. • Detailed site suitability study will identify demonstration sites suited to a range of system sizes and business models	• Support for on-site waste processing related activities in MP Sepang, MP Hang Tuah Jaya, Majlis Bandaraya Iskandar Puteri on Urban Farming, Community Garden and Composting

Baseline

The private sector service provider, CH Green Sdn. Bhd. is planning to introduce at least 95 on-site waste treatment plants of different capacities in Petaling Jaya. This is expected to result in a total daily throughput of approximately 23.5 tonnes of compostable waste. In collaboration with private service providers, the council will develop awareness raising and marketing programmes. However, it is likely that fewer plants will be installed, although with a higher volume per plant (to achieve certain economies of scaler). Another example, is the 'Municipal Solid Waste Management Initiative' in which Putrajaya has been working with community leaders and the private sector.

Achievements

- Desktop research has been conducted on existing policy and regulatory frameworks, as well as a review of existing standards from Ministry of Housing and Local Government (KPKT), MESTECC and Solid Waste Management Department (JPSPN), including an assessment of the existing policy and regulatory framework;
- Two commercial on-site waste processing plants in Petaling Jaya (PJ Eco Recycling Plaza; Smart PJ Waste Solution)
- A detailed site suitability and business model study for waste-to-energy project in Cyberjaya, in line the with Cyberjaya Smart and Low Carbon City Blueprint 2025. The study was carried out in 2018. Main solutions proposed include materials separation and recovery, i.e. organic (composting), plastics (for synthetic diesel) and recyclables (paper, aluminium, metals)
- In 2019 work will be supported GTALCC for the Putrajaya Waste Minimisation Action Plan (aiming at 50% waste reduction, in line with Putrajaya Green City 2025)

Status: On track

Output	**Description of subactivities** (based on ProDoc)	**Actual subactivities** (based on MTR observation and project progress reports)
3.1.3 Validated and scaled-up green technology incentive	• Preparation of business plan for councils for sustainable performance-based green technology schemes targeting households and SMEs	• Study on business plan on green technology incentive schemes for households and SMEs by local authorities

scheme in target cities for households and SMEs	• Preparation of policies and programmes for Petaling Jaya and one other city (to be determined by Year 3) to scale-up local incentive scheme for green technology investments • Preparation and implementation of marketing and awareness building programme to accelerate participation in incentive schemes	• Engagement with municipalities in the implementation of preferred schemes • Marketing and awareness to accelerate participation in incentive scheme;

Baseline

Introduced in 2011, the local incentive scheme in Petaling Jaya provides a rebate of up to 100% of property assessment rates in exchange for residences investing in green technologies such as rain harvesting systems, composting, and energy efficiency measures, and owning a hybrid vehicle. The Sepang Municipal Council commenced development of a local incentive scheme in 2013 that is similar to the Green Rebate Scheme in Petaling Jaya and proposes to provide a 5% rebate on the land assessment tax to encourage the uptake of green technologies. The schemes promote investment by households and SMEs in green technology.

Achievements

- A study has been carried out with the purpose to prepare business plans on green technology incentive schemes for households and SMEs to be adopted by the local authorities, which includes policy statements and programmes; and to improve and scale-up the incentive schemes.
- GTALCC is facilitating the development of a GHG monitoring system and mobile application users of the Green Rebate Scheme by Petaling Jaya City Council

Status: On track

Output	**Description of subactivities** (based on ProDoc)	**Actual subactivities** (based on MTR observation and project progress reports)
3.1.5 Approved pilot NAMA proposal for low carbon urban development	• Formulation: ○ Prioritization of actions to be included in the urban NAMAs (from Comp.1 ○ Conduct of a market readiness assessment and project screening that will lead to the identification of most bankable projects (Output 1.1.3) ○ Development of an institutional and MRV framework ○ Financing strategy • Formulation of NAMA document	• Activity has been cancelled

Baseline

The delivery of this output facilitates the Government of Malaysia to ensure sustainable financing option by developing a NAMA proposal for low carbon urban development.

Achievements

Rather than developing a NAMA proposal, the Project will during 2019-20 help in the development of concepts for urban projects to minimize GHG emissions for application for international funding (Global Environment Facility, Green Climate Fund) action project under the Global Environment Facility or Green Climate Fund and prepare the necessary targets, prioritization of action and accompanying studies, strategies and frameworks to track progress of the intended mitigation project.

Status: modified

Output	Description of subactivities (based on ProDoc)	Actual subactivities (based on MTR observation and project progress reports)
3.1.4 Leveraged investments in low carbon urban systems based on low carbon development plans	• Preparation of technical design and implementation documentation for priority integrated urban systems projects. Direct facilitation of deals with the private sector and through collaboration with sector ministries and private investment promotion agencies.	• Technical assistance in the preparation of project designs and mobilising investment and build partnerships

Baseline

The activities that will deliver this output will build on the planning undertaken in Output 1.1.3 and will involve cities to mobilise investment (co-financing) according to their plans. In particular, the delivery of this output includes preparation of technical designs and implementation documentation for priority integrated urban systems projects.

Achievements

Projects implemented by the five GTALCC participating cities are listed below:

Box 16 GTALCC-linked project implemented by cities

Cities	No.	Projects	Date of Program/Project Completion
Putrajaya	1	Putrajaya Bikeable City Program -Upgrading of Bicycle Lane Phase 1	Completed in 2017
Iskandar Malaysia	2	Iskandar Eco-Life Challenge	Started in 2011 (Annual Program)
	3	Kawan Iskandar Malaysia	Started in 2013 (Annual Program)
	4	Iskandar Malaysia Towards Low Carbon Society 2018	Annual Program
Hang Tuah Jaya Melaka	5	SIRIM Green Blue Packaging Project (Compost Machine)	Commenced in 2016
	6	MPHTJ Low Carbon Eco-Schools	Commenced in 2016
	7	Community Garden/ Urban Farming	Started in 2018
	8	LED Street Lighting	Started in 2014
	9	Smart Meter Program	Commenced in 2018
	10	KTP UNIKL-MPHTJ: Biochar Composting	Started in 2018
Cyberjaya	11	Solar Farm at 4 locations : Rooftops at CoPlace 2, Coplace 3, and Skytech Tower 1 Carpark at Cyberview Solar Farm	Completed in 2017
	12	iCycle Recycling Program	Commenced in 2016
	13	Eco-Friendly Ride Sharing E-scooter sharing	Commenced in 2018
	14	Upgrading of Bicycle Lane	Completed in 2015
	15	Myofficemyfarm@Sepang (Kebun Komuniti Untuk Warga Mpsepang	Completed in 2017
	16	Pembekalan dan Penyediaan 10 Unit Komponen Pengkomposan Sisa Makanan (Food Waste Composting) Serta Aksesori Berkaitan Di Atas Laluan Pejalan Kaki (Baru) Sepanjang 39 meter di belakang kafetaria Majlis Perbandaran Sepang di bawah Program Local Agenda 21 dan Inisiatif Low Carbon City untuk Majlis Perbandaran Sepang	Completed in 2017

Petaling Jaya	17	Smart PJ Waste Solution Lab SS2	Started in 2016
	18	PJ Eco Recycling Plaza SS8	Started in 2017
	19	Compost Campaign (Compost Machine 3 X 100kg)	Started in 2018
	20	Green Rebate Scheme	Started in 2014

Status: On track

4.3 Progress towards the objective

4.3.1 Progress indicators

The following table provides an overview of progress against the indicators reported in the project's results framework and a subsequent PIRs. The achievement is colour-coded, according to:

- Green: a completed or indicator shows successful achievements,
- Yellow: indicator shows expected completion by EoP (End of Project)
- Red: unlikely to be achieved by EoP

Box 17 Development progress (indicators of objective and outcomes)

		Achievement of target			
Outcome	**Indicator**	**Base**	**MTR** (PIR'18)	**Target at EoP**	**Observations by MTR team on indicator progress**
To facilitate the implementation of low carbon initiatives in at least five Malaysian cities and showcase a clear and integrated approach to low carbon development	1. Cumulative direct GHG project emission reductions (ER) resulting from the Project technical assistance and investments (in tCO_2)		17,967 (0)	346,442	Based on: - Green rebate, 10843 - EV cars, 2153 - EV scooters, 487 - Cycleway, 3808 - Waste plant, 667 (see *CTA Report on Status of GHG Emission Reductions* - Assessment of GHG emissions achieved by the GTALCC project activities as per end of 2018). For GHG emissions BRT, see Section 4.3.2)
Component/outcome 1	**Policy support for the promotion of integrated LCUD**				
Output 1.1 Major cities implemented and adopted integrated low carbon urban development plans and/or programmes	2. Number of cities which have gazetted low carbon development plans by Year 3	0	5 (0)	5	Putrajaya and Iskandar M haver gazetted low-carbon plans
	3. Number of participating cities which have GHG inventories less than 5 years old by Year 2	2	4 (3)	5	Putrajaya, Iskandar Malaysia, Cyberjaya Petaling Jaya
	4. Number of cities which have officially adopted GHG reduction targets by EOP	0	3 (1)	3	Putrajaya has 60% GHG reduction target
Component/outcome 2	**Awareness and institutional capacity development**				
Output 2.1 Expedient appraisal, approval and implementation of strategic urban development plans/program and projects	5. Number of cities exceeding national benchmarks for appraisal and approval processes for local low carbon development projects	0	0 (0)	5	The current system at national level to assess and approve development plans does not incorporate low carbon aspects
	6. Average annual number of low carbon city projects per city identified in local plans, commencing implementation starting by Year 3.	0	0 (0)	2	Specific projects on low carbon cities have not been identified in local plans
Output 2.2 Major cities are aware of, and are	7. Number of cities where evidence-based low carbon planning is integrated with	1	3 (0)	5	GTALCC is working together with some local authorities (IRDA, Kulai, Sepang) on

		Achievement of target			
Outcome	**Indicator**	**Base**	**MTR** (PIR'18)	**Target at EoP**	**Observations by MTR team on indicator progress**
planning and implementing low carbon technology applications for integrated urban development	normal urban development planning processes 8. Percentage of trainees who are effective in evidence-based integrated low carbon climate resilient development planning and project implementation by Year 2 and Year 4	0	50% (0)	75%	how to identify support the low carbon city projects in the development plans (see main text) According to progress reports
Component/outcome 3	**Low-carbon technology investments in cities**				
Output 3.1 Low Carbon Technology Investments in Cities	9. Total amount of new investment leveraged through local plans of participating cities for low carbon projects by EOP	0	3.89 M (-)	30 M	About RM 15.55 M: - Putrajaya, RM 6.46 M - Cyberjaya, RM 72 k - PJ, RM 9.02 M
	10. Amount of new investment leveraged for low carbon transport in participating cities by Year 3	48k	*153 M* (46 M)	*640 M*	IBRT: RM 1 billion PPPs: RM 1.56 billion
	11. Average amount of new investments by participants in council green incentive schemes starting in Year 3	0	1.2 M (-)	*153 M*	Petaling Jaya. Data and EoP target t.b.c. Q4 2019
	12. Value of approved pilot Urban NAMA project in Year 5	0	0	*NA*	Activity cancelled
Output 3.2 More low carbon projects implemented in Malaysian cities	13. Number of low carbon projects implemented in participating cities by Year 4	0	5	*20*	Putrajaya 1, Cyberjaya 6, Malacca 6, IM 3 and PJ 4
	14. Number of operating electric cars by year 3 and year 5	200	532 (234)	794-1504	Including PHEV cars about 4,682 (2015-18)
	15. Number of operating electric scooters by year 3 and year 5	350	500 (-)	3550-8750	KFC delivery 300, Municipal 150, other 50
	16. Number of operating recharge stations in year 3 and year 5	15	251 5%	155-670	Public chargers only (chargeEV)
	17. % completion of BRT phase 1 by start of Year 3	0	(5%) 2	100%	Tender stage; construction starts in 21
	18. Number of commercial on-site waste processing plants operating by EOP	1	(-)	95	95 target defined as in CH Green business plan, not likely to be achieved. Current: 2 sites in PJ

Note:
Italicised values have changed since project inception

The MTR team observes in general that:

1) Indicators are generally on-track in the first two components, but less so in Component 3. In particular, the construction of the Iskandar BRT has been delayed and will not commence until after the Project's end. This will have consequences for the Project's GHG emission reduction calculations, as the bulk of the reduction was supposed to be associated with the BRT;
2) In general, we have doubt on the whole set of indicators as an appropriate way of measuring project progress. The indicators measure more what project partners do than what GTALCC has contributed. For example, it is interesting to learn that after 5 years the number of e-scooters has increased tenfold, but it does not give an answer to the question what the project' role has been in achieving such a 10-fold increase is. In terms of impacts, many indicators are on too high a level in terms of impacts. For example, it's the cities that decide whether they gazette their low-carbon plans or not (the project has little influence on such a political process). The indicator 'plans gazetted' might could have been replaced with a less ambitious one, e.g. 'low-carbon plans formulated with GTALCC support'. Other indicators are notably absent. For example, GTALCC has done recommendable work on national-level and local level low-carbon planning and institutional improvements. This policy level work is not reflected in any indicator.

3) The logframe indicators are quantitative, and expressed by a simple number. This gives the impression that these are very SMART. However, the indicators in the logframe given no further details or description, therefore these are very difficult to interpret and it is not clear what the basis was for the formulation of their target values. Without such info is difficult to assess for reviewers or evaluators whether the indicators' base and target values are well defined or make sense. The reporting in the APRs and MYPRs (that has a more qualitative approach based on the description of realised outputs and implemented activities) needs to be consulted alongside the PIRs to get a full and clear picture.

The MTR team thinks that, within the overall framework of Components and Outputs, the logframe of indicators need to be adjusted so that it adequately describes progress at outcome level and in such a way that the indicator takes into account the role GTALCC remains clear. A proposal for an adjusted set of indicators linked with an adjusted list of outputs and activities is given in the Chapter 'Conclusions and recommendations'.

4.3.2 Greenhouse gas emission reduction

The Project Document provides the following targets for 'direct greenhouse gas (GHG) emission reductions ' as indicated in the table in Box 18 (over the project implementation period of 5 years, compared with the actual achieved GHG emission reduction (cumulative, 2015/16-2019).

Box 18 Emission reduction targets in the ProDoc and actual achievement

Initiative	Activity	Target (number) Planned End of project	Target (number) Achieved 2019	Planned emission reduction (tCO_2), as in ProDoc 2015-16	2016-17	2017-18	2018-19	2019-20	Cumulative	Actual cumulative 2015/16-2019
BRT (modal shift)	3.1.1/3.2.2	1	0	0	0	9,803	141,631	161,206	312,640	0
EV buses	3.1.2	50	0	0	53	88	88	88	318	0
Green rebate	3.1.3	1	1	2,367	2,501	2,679	2,926	3,275	13,748	10,843
EV cars	3.2.1	1,504	4,682	40	133	252	400	553	1,378	2,153
EV scooters	3.2.1	8,750	1,671	70	159	254	461	668	1,621	487
Cycle way	3.2.3	1	1	0	377	1,085	2,346	4,509	8,317	8,317
On-site waste plants	3.2.4	95	5	20	259	875	1,985	4,025	7,164	266
TOTAL				2,497	3,482	15,036	149,837	174,324	345,186	22,066

Data compiled from the Project Document; as well as the PowerPoint *GTALCC MTR Briefing* (April 2019) and the report *Status of GHG Emissions (as per end of 2019),* both by H. Jensen (CTA)

The Project Document (and also the CEO ER document, and subsequent PIRs) take the 'emission reduction over the project implementation period, i.e. 2015/16-2019/20' (column 1) as a measure for the 'direct emission reduction'. Two comments can be made:

1) This counting methodology is not correct; it only captures the emission of investments (initiated during the project implementation period) in the first few years of operation, while ignoring the much larger emission reduction over the rest of the lifetime of the investment.
2) The methodology tends to underestimate the emission reduction further, because investments are often delayed (thus fewer years in the project period can be taken into account) and sometimes only take place after the project's end. The latter occurs with the Iskandar Malaysia BRT, which construction has been delayed until 2021/22, i.e. after the GTALCC project has been closed. Other low-carbon investments associated with Component 3 are also delayed or have changed. For example, in case of waste to energy, there will not be 95 plants (this was based on a business plan by the private company CH Green Sdn BHd), but instead there will be about 5 public sector plants (of which two in Cyberjaya). However, these will be of a larger size than the proposed CH Green plants.

In line with the *Manual or Calculating GHG Benefits of GEF Projects: Energy Efficiency and Renewable Energy Projects*, GEF/C.33/Inf.18 (April 2008), '*direct emission reduction*' is defined as 'emission reduction attributable to investments made during the project implementation period calculated over the lifetime of the technology'. '*Post-project direct emission reductions*' are calculated as a result of a mechanism put in place and during the project and still operational

after the project's end. Usually this are linked with financial mechanisms (credit guarantees, risk mitigation, investment funds, etc.), but in this case we consider the BRT in Iskandar Malaysa as a 'mechanism', i.e. it is put in place during the project (i.e. tendering and design, 2018-2020; construction, 2020-2022) and that will be operational after the end of GTALCC.

Box 19 Recalculated direct emission and indirect emission reduction targets and achieved reduction

	Lifetime (yr)	Average annual GHG reduction	Number Baseline (B) (2015)	Number of units (target) Total (T) (2020)	Number of units (target) Incremental (T-B)	Cumulative reduction GHG (tCO_2)	Number of units (actual) Total (2018)	Number of units (actual) Incremental (T-B)	Cumulative reduction GHG (tCO2)
Direct emission reduction									
EV buses	10	88	0	25	25	22,000	0	0	0
Bio-CNG buses	10	863	0	25	25	215,750	0	0	0
Green rebate	10	4	488	2907	2,419	90,431	1,292	804	30,056
EV cars	10	0	200	5,042	4,842	19,922	4,682	4,482	18,441
PHEV cars (65% elec)	10	0	31,449	66,342	34,893	92,990	46,342	14,893	39,690
EV scooters	10	0	350	2,271	1,921	1,441	1,671	1,321	991
Cycle way	15	1,663	0	1	1	24,945	1	1	24,945
On-site waste plants	10	250	0	5	5	12,500	2	2	5,000
Total						479,979			119,123
Post-project direct									
BRT (modal shift)	15	200,355	0	1	1	3,005,325	0	0	0
Indirect (consequential) emission reduction (bottom-up)									
RF= 3						10,455,911			

Data recalculated based in information provided in the PowerPoint *GTALCC MTR Briefing* (April 2019) and the report *Status of GHG Emissions (as per end of 2019),* both by H. Jensen (CTA), as well as assumptions (lifetime, annual GHG reduction per unit) by the MTR Team)

'Indirect emission reduction' refers to the emphasis on capacity building, innovation, and catalytic action for replication of which largest impacts typically lie in the long-term GHG savings achieved after the GEF project's completion. There are two different approaches for estimating indirect effects, resulting in a range of likely indirect effects.

- The first one, referred to as "*bottom-up",* requires an expert judgment on the likely effectiveness of a project's demonstration and triggering effects. The direct and direct post-project impacts of a project are simply multiplied by the number of times that a successful investment under the project might be replicated (using a so-called replication factor, RF).
- The second, "top-down" approach assesses indirect impacts by estimating the combined technical and economic market potential for the technology within the 10 years after the project's lifetime. Most of the time, this is not purely the technical potential of a technology, because, during those 10 years, additional market barriers may emerge and prevent achieving the total potential. Using the maximum realizable market size further implies that there would be no baseline changes over considerable periods of time and that all emission reductions in that sector or market can be attributed entirely to the GEF intervention. Clearly, both of these assumptions are unlikely to hold in reality. Therefore, the assessment contains a correction factor, the "GEF causality factor (CF)", which expresses the degree to which the GEF intervention can take credit for these improvements.
- Which approach is used depends on data availability and type of technology; if a technology is small in scale with a limited number of owners/operators, the bottom-up approach is easier to use (e.g. replicate a number of large-scale wind parks or BRT systems). In case of large-scale dissemination of products implying a large number of end-users the impacts of market size can be easier calculated using the 'top-down' approach (e.g., the case of introduction of LEDs on the residential lighting market). Sometimes, both approaches can be used. In this case, the "top-down" estimate for the indirect benefits can be viewed as providing the upper limit of the range of indirect GHG benefits, and the 'bottom-up' the lower limit.

The *Guidelines for Greenhouse Gas Emissions Accounting and Reporting for GEF Projects* (GEF/C.48/Inf/09, May 2015) replace 'indirect emissions' with a new terminology, 'consequential emission reduction', defined as those projected emissions that could result from a broader adoption of the outcomes of a GEF project, plus longer-term emission reductions from behavioral change'. In GEF-7, the GEF Tracking Tools (Excel-based) are replaced by GEF Core Indicator Tables.

Based on the above, the MTR Team has taken the liberty of re-calculating the direct emission reduction (not cumulative over the project period 2015/16-2020/21 only, but assessing the technology *lifetime* emission reductions). These are presented in Box 19. It should be noted that the new activity of 'bio-CNG buses' has been added, as well as plug-in hybrid vehicles (PHEV). Since the BRT's construction has been delayed until 2020, but will be operational by 2021/22, the emission reduction has been re-labelled as 'post-project indirect'.

The new emission reduction figures are used as targets in the revised logframe of progress indicators, proposed in **Error! Reference source not found.**.

4.3.3 Ratings of progress towards the objective and outcomes

The table below gives a summary of the ratings of the 'progress towards results', based on the findings presented in Chapter 4. In assessing the progress towards results of the GTALCC Project at its mid-point, a six-point rating scheme is used:

- Highly satisfactory (HS), no shortcomings
- Satisfactory (S), minor shortcomings
- Moderately satisfactory (MS), moderate shortcomings
- Moderately unsatisfactory (MU), significant shortcomings
- Unsatisfactory (U), major shortcomings
- Highly unsatisfactory (HU), severe shortcomings
- U/A = unable to assess.

Box 20 Evaluation ratings of progress towards results

Evaluation item	Corresponding section	Rating
Objective achievement	Section 4.3.1	S
Component 1	Section 4.2.1	HS
Component 2	Section 4.2.2	S
Component 3	Section 4.2.3	MS
Overall progress towards results		**S**

5. FINDINGS: PROJECT IMPLEMENTATION

This part of the Evaluation Report describes the assessment and rating of the quality of the execution by the GEF Implementing Agency (IA), UNDP, and by the local Executing Agency SEDA. Building on the previous Chapter's critical look at project results, an assessment is made of the partnerships established and stakeholder interaction during implementation and the important role of adaptive management. The Evaluation Report presents an assessment and rating of the project monitoring and evaluation (M&E) plan design and implementation. A special section is dedicated to the budget, expenditures, and co-financing of the GTALCC Project.

5.1 Implementation and management

5.1.1 Management arrangements and adaptive management

- Were counterpart resources (funding, staff, and facilities), and adequate project management arrangements in place at project entry? Was any steering or advisory mechanism put in place?
- How efficient are partnership arrangements for the project? Did each partner have assigned roles and responsibilities from the beginning? Did each partner fulfil its role and responsibilities? Describe adaptive management practices
- Has the project produced results (outputs and outcomes) within the expected time frame? Was project implementation delayed, and, if it was, did that affect cost effectiveness or results? If there were delays in project implementation and completion, what were the reasons? Did the delays affect project outcomes and/or sustainability, and, if so, in what ways and through what causal linkages?

Delays in design and implementation

The formulation of the project concept (PIF) and project concept had taken quite some time (2012-2015), which was followed by an equally long project start-up period. After the CEO endorsement (Apr 2015), the project document was not signed (by UNDP, EPU, and the then KeTTHA) until 2016, with the National Project Manager joining only in May 2017, a first National Steering Committee meeting in June 2017, Inception workshop and report and the full Project Team (with Component Coordinators) not assembled until July 2017.

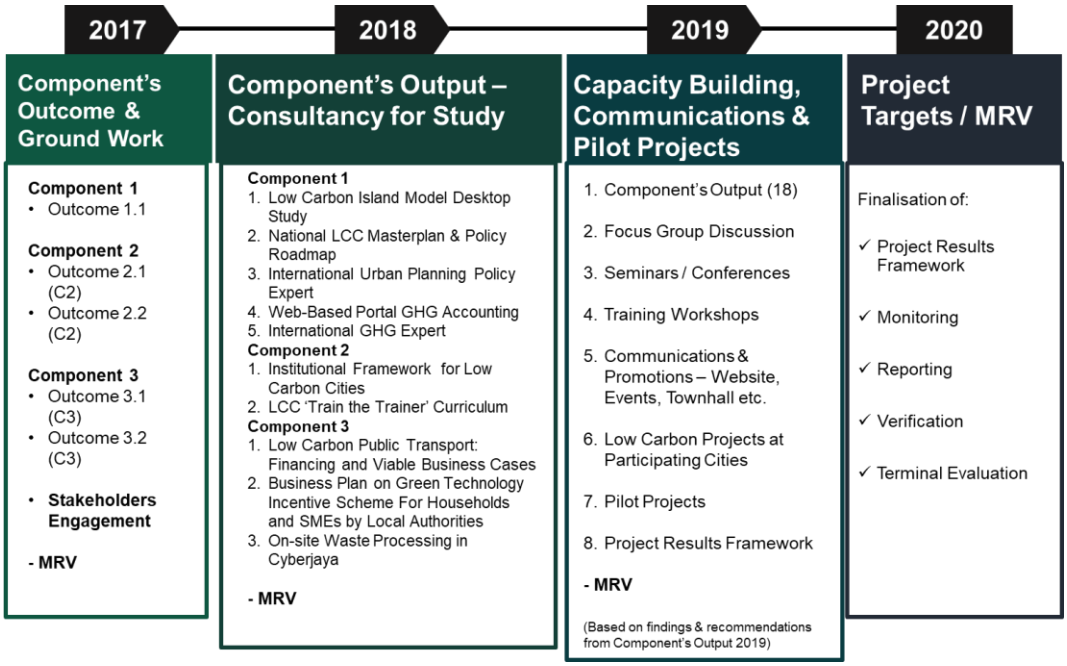
Malaysia's 14th General Election in May 2018 resulted in a new federal government. Since then, agencies and Corporations under ministries were subjected to a temporary suspension on procurement activities by the Treasury. This affected GTALCC's current procurement of services under SEDA Malaysia, and has affected a number of activities, causing delay in their start and implementation after May for about 3-4 months when the suspension was lifted.The issue was mitigated by using SEDA and the project team's internal resources to conduct the activities that do not need consultants first, and utilising UNDP's procurement channels for advertising and hiring experts. For example, the APUDG contract (Nov 18- Jun 19) for the NLCCMR activities was procured through UNDP.

To compensate for the time lost, the GTALCC did start accelerating activities in 2018. A Strategic Planning Workshop was organised in Oct 2018 (with UNDP, MESTECC, SEDA and GTALCC participation and, together with Steering Committee discussion has facilitated the new accelerated approach.

As discussed in the previous Chapter, most progress has been made in Component 1 and less so in the Components 2 and 3. This reflects a logical flow of activities, in which in a first phase 1 (2017-19) the basic tools and instruments must be in place (NLCCMP&PRM, institutional framework, standardised city-level GHG accounting, web-based

portal) before major capacity building and city-level awareness activities can take place, and in parallel promotion of specific low carbon projects (Phase 2 (2019-2020).

The new accelerated approach consists of the following elements:



5.1.2 Monitoring and evaluation

- M&E design. Does the project have an effective M&E plan to monitor results and track progress towards achieving project objectives?
- Was the information provided by the M&E system was used to improve performance and to adapt to changing needs; Are there any annual work plans?
- Was M&E was sufficiently budgeted for at the project planning stage and whether M&E was adequately funded and in a timely manner during implementation.
- Were progress reports produced accurately and timely, and did they respond to reporting requirements including adaptive management changes?
- Did UNDP and Project staff identify problems in a timely fashion and advice to the project, approve modifications in time, and restructure the project when needed? Did UNDP provide the right staffing levels, continuity, skill mix, and frequency of field visits for the project?

<u>M&E: design at entry and implementation</u>

The Project Document provided an elaborate structure for Monitoring & Evaluation, which follows the 'standard' M&E Plan with an inception activity (workshop, report), annual reporting (PIRs), project steering committee meetings, periodic status, financial and progress reporting, as well as audits, field visits and mid-term review and final evaluation reports. A total of USD 115,000 was allocated, about 2.5% of the total GEF budget, which is deemed sufficient for this type of projects.

<u>Reporting</u>

GTALCC progress is being reported and in a satisfactory way. Progress is reported extensively and regularly, in two PIRs (2017, 2018), annual progress reports (2016, 2017, 2018), mid-year progress reviews (2017, 2018) and the National Steering Committee and Project Technical Committee minutes of meeting. In addition, the project team made available

a set of technical project deliverables (reports, PowerPoints) and a good summary in PowerPoint on project progress (per component) for the MTR Team.

Internal communications

With the GTALCC Project office being located within the premises of SEDA's, there are frequent communications with the Project's Lead Consultant, in particular, the Energy Demand Management (EDM) section. The project has also strong communication lines with the UNDP Country Office.

5.2 Stakeholder involvement

- To what extent were partnerships/linkages between institutions/ organizations/private sector encouraged and supported?
- Which partnerships/linkages were facilitated? Which ones can be considered sustainable? What was the level of efficiency of cooperation and collaboration arrangements?

The Project has successfully facilitated partnerships with many stakeholders, all related to the low-carbon planning and investment projects in Malaysia. Along with the engagement of the main federal-level ministries and agencies involved (MESTECC, KPKT, MEA, PLAN Malaysia) as strategic partners, this has included:

- Other public sector stakeholders
- State level and local authorities, in particular, the five participating PBTs
- Private and public companies (BRT and MRT operators, waste management, electric vehicles, and others)
- NGOS and institutes (e.g. CETDEM, MIP, other).

The project team seems to have good relationships with these actors. The MTR reviewers did their mission based in a central spot in Putrajaya at which most of the various meetings with stakeholders were held. We believe that all the people would not have come out of their offices (sometimes as far as from Johore and Melaka) to visit us if not for their genuine interest and trust in the project and project team.

The GTALCC project is expanding beyond the 5 participating cities which were initially identified in the Project Document and in the project's logical framework. The project works as well with supporting cities (those that are not the 5 participating cities) to implement low carbon cities policies and projects. The Project is continuing building new relations with stakeholders as needed, e.g. in the area of bio-CNG with palm oil industry players, waste management companies, CNG vehicle providers and the distributor Gas Malaysia.

External communications

Communications between Project personnel and the various stakeholders of the GTALCC Project appear satisfactory. Communications with external stakeholders are mainly channeled through SEDA involving the Project Manager and three Component managers. The project has been working to strengthen low carbon city policies, including helping cities to develop low carbon action plans; and has supported capacity building for the federal and state governments, local authorities, and the private sector. The project utilizes platforms such as conferences and workshops to disseminate information and promote the discourse around low carbon cities. It should be noted that only now GTALCC is entering the phase of increased communication and awareness-raising activities with stakeholders, for which purpose a Communication Plan will be made in 2019. The project can be found at the website: https://www.gtalcc.gov.my and a description can also be found at http://www.seda.gov.my

Gender

Gender aspects are not clearly identified in the Project Document, probably because gender mainstreaming did not figure that prominently in the UNDP ProDoc and GEF CEO ER templates at that time. In some initiatives being undertaken by the project (e.g. workshop participation), there is an explicit target of at least 40% or more female participation. However, the evaluation found little gender-relevant reporting, maybe also because the log-frame's progress indicators were not defined in a gender-sensitive way.

5.3 Project finance and co-financing

- Did the project have appropriate financial controls, including reporting and planning, that allowed management to make informed decisions regarding the budget and allowed for timely flow of funds? Specifically, the evaluation will also include a breakdown of final actual project costs by activities compared to budget (variances), financial management (including disbursement issues)
- If there was a difference in the level of expected co-financing and the co-financing actually realized, what were the reasons for the variance? Did the extent of materialization of co-financing affect project outcomes and/or sustainability, and, if so, in what ways and through what causal linkages?
- Have funds been available and transferred efficiently (from donor to project to contractors) to address the project purpose, outputs, and planned activities?

The financial resources that were requested and made available by GEF and the actual expenditures (until end of 2018) are summarised in Box 21. The overview indicates that only part of the GEF budget was spent 30%. This is quite low, although the before-mentioned delays in issues in government procurement after the 2018 General Election should be taken into account. The accelerated approach taken by the Project team will imply an increased spending of USD 2.2 million, after which about 80% of the budget would be spent towards the end of 2020. According to this planning, a still substantial part (20%) would be unspent by the end of 2020. From a budget point of view, a budget-neutral extension of the Project (discussed in Chapter 7, Recommendation) into 2021 is possible.

Box 21 UNDP/GEF budget and actual expenditures and co-financing data

	Total (USD)				Component 1 (USD)		Component 2 (USD)		Component 3 (USD)_	
	Budget	Expenditure	Planned (19-20)	Balance	Budget	Expenditure	Budget	Expenditure	Budget	Expenditure
Internat consultant	558,000	272,574	110,446	174,980	180,000	133,454	48,000	54,120	330,000	85,000
Local consultant	1,913,658	777,532	776,369	359,757	432,540	173,016	875,562	173,016	605,556	431,500
Travel	216,175	6,148	73,948	136,079	35,350	325	79,750	829	101,075	4,994
Equipment	540,700	11,008	498,152	31,540			6,200		534,500	11,008
Miscellaneous	15,571	3,384		12,187	0	2,474	6,571		9,000	910
Contracts-company	259,498		241,152	18,346					259,498	0
Training, workshops	643,970	149,257	444,738	49,975	278,000	79,377	288,001	61,863	77,969	8,017
Project management	207,042	68,000	68,000	71,042						
TOTAL	4,354,614	1,287,903	2,212,805	853,906	925,890	388,646	1,304,084	289,828	1,917,598	541,429
		30%	51%	20%		42%		22%		28%

Note: The data are compiled from the *UNDP ProDoc* and the PowerPoint presentation *GTALCC, Project Brief and Progress, MTR mission* (April 2019)

Sources of Co-financing	Name of Co-financer	Type of Co-financing	Amount confirmed at CEO endorsement (USD)	Actual amount contributed at state of Midterm Review (USD)	Actual % of expected amount
GEF Partner Agency	UNDP	Cash	240,000	0	0%
GEF Partner Agency	UNDP	In kind	114,000	114,000	100%
Nat'l Government	MESTECC (formerly known as KETTHA)	Cash	22,476,341	33,569,555	149%
Nat'l Government	MESTECC (formerly known as KETTHA)	In kind	252,486	1,965,927	779%
Local Government	Perbadanan Putrajaya	Cash	1,261,830	1,320,528	105%
Local Government	Perbadanan Putrajaya	In kind	149,666	263,556	718%
Local Government	Majlis Bandaraya Petaling Jaya (MBPJ)	Cash	1,516,959	1,815,605	120%
Local Government	Majlis Bandaraya Petaling Jaya (MBPJ)	In kind	509,161	395,647	78%
Local Government	Majlis Perbandaran Sepang (MPS)	Cash	20,000	22,476	112%
Local Government	Majlis Perbandaran Sepang (MPS)	In kind	50,000	2,451	5%
Local Government	Iskandar Regional Development Authority	Cash	28,771,703	525,603	2%
Local Government	Iskandar Regional Development Authority	In kind	250,120	825,422	330%
		Cash	54,286,833	37,253,767	69%
		In kind	1,325,433	3,567,003	269%
		TOTAL	55,612,266	40,820,770	73%

5.4 Ratings of project M&E and project implementation/execution

The project formulation took considerable time (2012/13-2015), with a delay of almost two years (2015-2017) until the Project Team was put in place (May-June 2021), a process which we view as 'unsatisfactory'. Regarding the **rating of project implementation and execution,** a rating of **satisfactory** accurately captures the subsequent 'fast-track' implementation progress that has been achieved in the past 2 years, which we view as 'highly satisfactory'. A summary of ratings is given in Box 22. In assessing 'implementation and adaptive management' of the GTALCC Project at its mid-point, a six-point rating scheme is used:

- Highly satisfactory (HS), Implementation of all components, 1) management arrangements, work planning, reporting, project-level monitoring and evaluation, 2) stakeholder engagement and communications, 3) finance and co-finance, is leading to efficient and effective project implementation and adaptive management. The project can be presented as "good practice".
- Satisfactory (S), implementation of most of the components is leading to efficient and effective project implementation and adaptive management except for only few that are subject to remedial action
- Moderately satisfactory (MS), implementation of some of the components is leading to efficient and effective project implementation and adaptive management, with some components requiring remedial action.
- Moderately unsatisfactory (MU), implementation is not leading to efficient and effective project implementation and adaptive, with most components requiring remedial action.
- Unsatisfactory (U), implementation of most of the components is not leading to efficient and effective project implementation and adaptive management.
- Highly unsatisfactory (HU), implementation of none of the components is leading to efficient and effective project implementation and adaptive management.
- U/A = unable to assess.

Box 22 Evaluation ratings of project implementation and execution

Evaluation item	Corresponding report section	Rating
Adaptive management, management arrangements, M&E, work planning, reporting (UNDP, Project Team, SEDA)	Section 5.1.1	2015-17: U 2017-2019: HS
Stakeholder involvement; communications	Section 5.1.2	S
Budget, utilisation of GEF and co-financing	Section 5.1.3	S
Overall UNDP implementation and implementing partner execution		**S**

6. FINDINGS: SUSTAINABILITY AND IMPACTS

6.1 Sustainability and risks

- How likely will the Project outcomes be sustained and beyond Project termination? What are risks to sustainability?
  - Financial risks. Are there any financial risks that may jeopardize sustainability of project outcomes? What is the likelihood of financial and economic resources not being available once GEF assistance ends?
  - Social and environmental risks. 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 project benefits continue to flow? Is there sufficient public/stakeholder awareness in support of the project's long-term objectives? Are there any environmental risks that may jeopardize sustainability of project outcomes?
  - Institutional framework and governance risks. Do the legal frameworks, policies, and governance structures and processes within which the project operates pose risks that may jeopardize sustainability of project benefits? Are requisite systems for accountability and transparency, and required technical know-how, in place? Have partners and stakeholders successfully enhanced their capacities and do they have the required resources to make use of these capacities?

Sustainability is generally considered to be the likelihood of continued benefits after the project ends. Consequently, the assessment of sustainability considers the risks that are likely to affect the continuation of project outcomes (discussed in detail in Chapter 3 and the previous section 6.1). In fact, many risks are in one way or another related to the "barriers" mentioned in Section 2.1). One can argue that some of the "risks' the Project might face mean basically being unable to lower corresponding "barriers" substantially, thus negatively affecting the likeliness of "sustainability" of the project's interventions. The critical "assumptions" then is that the "internal risks" (i.e. risks that can be mitigated or managed by Project management), and 'external risks' have a low incidence and/or impacts, in such a way that sustainability remains (moderately) likely. The quality of adaptive management (mentioned in Section 6.1) is determined by the mitigation response of Project management to these external and internal risk factors as these manifests themselves more intensely and/or more frequently than expected.

In assessing the 'sustainability' of the GTALCC Project at its mid-point, a simple rating scheme is used:
• Likely (L): negligible risks to sustainability;
• Moderately Likely (ML): moderate risks to sustainability;
• Moderately Unlikely (MU): significant risks to sustainability; and
• Unlikely (U): severe risks to sustainability; and
• U/A = unable to assess.

Five main areas are considered in this section and then rated as to the likelihood and extent that risks will impede sustainability.

Governance and institutional sustainability

Project level
As discussed in the previous Chapter 5, project initiation has been fraught with a number of delays. Approved in 2015, it did not really start until mid-2017, when the whole Project team was in place. Malaysia's 14th General Election (in May 2018), the new federal government's organizational set-up involving review and revamp of ministries roles and functions, including the re-organisation of key staff of the ministries and the review of national projects. This brought some uncertainty in 2018, but this has mostly been resolved at the time of writing this report. The Project Team has however

been working in full speed to make up for time lost and plans to finalise in practice in a 4-year (by 2020) than the original five-year implementation.

National and city level
The project will help develop the Malaysia Low-Carbon City Masterplan and Policy Roadmap (NLCCMP&RM) and Institutional Framework. This will help in institutionalising and in mainstreaming low carbon development in city-level (and national) planning. Endorsement by the Cabinet will bring the necessary acceptance by various government entities and will strengthen the mandate power from national, state and local governments. Important is that there will be a common goal and understanding on the NLCCMP. The participating government should feel 'ownership' and an important question is 'who will be the custodian of the NLCCMP?'. Being cross-sectoral in nature, the danger is that if placed in one ministry or entity, it will be ignored by the other ministries. Maybe one way is to have a low-carbon inter-ministerial group (or council, or task force) to coordinate the NLCCMP Road map, in which at least MESTECC, MEA, KPKT, Ministry of Transport, KATS, PLANMalaysia, MGTC, SEDA would participate. This same applies to the State and local levels. For example, Hang Tuah Jaya in Melaka has a set up 'Special Unit for Green Technology and Sustainability' under the Mayor's office to facilitate with continuous engagements between state and local city departments to drive the low carbon city concept. Such units could lead to low-carbon initiatives and mainstreaming low-carbon in city-level structure and local plans.

Apart from the five participating cities, other cities are supporting low-carbon development. This is a positive indication that more cities become aware of and actively participate in green or low-carbon planning. For example, Kuala Lumpur has developed the Low Carbon Society Plan 2030 (2018), Shah Alam the Low Carbon City Action Plan (2017), Kajang has a draft Bandar Baru Bangi Low Carbon City Action Plan 2035, while Ampang Jaya developed in 2017 the Low Carbon City Action Plan (2017-22).

High staff mobility in Government entities remains an issue in general. We can only recommend for GTALCC to enter in a discussion with the Public Service Department. The NLCCMP&RM and recommendations of the Institutional Framework study form important steps forward for which the GTALCC project should be given credit At this stage the final versions are not ready yet, while their importance would depend on receiving government endorsement. At this stage the institutional and governance risks are relatively small; and sustainability is rated as <u>likely (L).</u>

<u>Environmental and social sustainability</u>

Project level
Realising low-carbon policies, strategies, plans, and subsequent low carbon investments contributes to sustainability. Using the method of calculation proposed by the MTR Team (see Section 5.3), the city investment projects associated with GTALCC will, as of 2019, lead to lifetime CO_2 emission reduction of about 119 kilotons of CO_2. Whether the 2020 target of 490 kilotons would be reached would depend on the realisation of a pilot with bio-CNG buses (lifetime CO_2 emission reduction of 216 ktCO_2).

A Social and Environmental Screening (SESP) was done in 2015. The project includes activities with minimal or no risks of adverse social or environmental impacts. As a precautionary approach, a few likely impacts associated with the baseline projects have been identified but they are considered as low and limited in scale. Moreover, the baseline projects have conducted SEIA as per the Government of Malaysia's standard requirement which also provides risk management measures.

National level
Some of the stakeholders met during the MTR mission, noted that some sectors have been given more attention than others, and some seem to have been left out of the GTALCC scope, notably water management, biodiversity and climate risks and disaster resilience. While these are indeed important in green urban planning, GTALCC is GEF climate change mitigation project and has an 'energy' focus,. Also, given the limited GEF funding (about USD 4 million), and the fact that some sectors (e.g. building, electric vehicles) had already been covered by past or ongoing national and/or donor-supported programmes, some prioritization with the broad scope of sectors was inevitable in project design, also to avoid duplication of efforts. Assuming that the areas of water management, biodiversity and natural resources management and climate change adaptation are integrated with the NLCCMP&PRM, the environmental sustainability is rated as <u>likely (L)</u>

Financial risks

Currently, most funds for implementing low carbon programs and initiatives arrive in the form of budget or grant from the federal / state government (and for local authorities, in the form of development grants). Usually the amount is small, limited and often on a one-off basis or project basis. Funds on arrival at the local level are being lumped together and not dedicated specifically for low carbon initiatives per se, although some sustainable initiatives may not be labelled as 'low carbon' or do indirectly contribute to low carbon targets. Efforts by the government in designing policy regulations and interventions to transform banking into a greener and more sustainable financial system have limited. Green finance is seen as public-sector led. To achieve sustainability, it will require involvement of capital market players and industry stakeholders.

These financial issues and potential mechanism have to be discussed as part of NLCCMP&PR. However, the current setting is that agencies are technically stranded in a system that is restrictive and has no standardized flow of funds (with low-carbon objectives). Too often, initiatives are led by an enthusiastic champion (e.g. a governor or mayor) or dependent on donor funding, and initiative stall when the champion leaves or donor funding stops. At this stage, the MTR Team rates the financial sustainability as marginally likely. To mitigate the risk, the MTR does not advocate setting up another financing instruments, but could have an activity assessing a) in the public sector how low-carbon financing can be properly identified and mainstreamed, at national and subnational level, moving away from a project-by-project to a more programmatic approach, and b) involving capital market players in setting up green financing (public-private partnerships)

6.2 Impacts

There are positive social and environmental impacts of the proposed shift to a low carbon city approach that will enhance urban systems and transform local economies to a more sustainable development pathway. These impacts include:

- *Reduced dependence on fossil fuels*. Malaysia's economy is sensitive to global energy prices. Whilst these financial risks are largely borne by the broader economy a significant portion is passed through to end-users. The regulated price of fuel includes a component, which is dependent on global energy prices that directly expose business to these financial fluctuations. The subsidies on fossil fuels present a major burden on public budgets and represent a split-incentive whereby they undermine low carbon subsidy and incentive programmes.
- *Improved air quality and waste management*. By improving the effectiveness of urban systems, especially transport and waste, and moving to low carbon options the GHG emissions will be reduced. Electric vehicles are not zero GHG emissions, depending on the carbon factor of the grid, which in Malaysia is quite high (grid emission factor, about 0.67-.69 for peninsular Malaysia[34]). Bio-CNG will have actual zero emission (provided the bio-CNG is produced in a climate-neutral way). However, while electric vehicles will not emit volatile organic compounds (VOCs) and other pollutants, bio-CNG vehicles do so, although these are cleaner than diesel or gasoline vehicles
- *Green jobs and market diversification.* All the cities involved in the project have prioritised tourism as a key motivating factor leading them to a low carbon approach. Attaining "green" status means that cities and local enterprise can differentiate themselves in the market place and Malaysian experience has demonstrated this to be an effective local development strategy. It is therefore expected that the project will lead to more green jobs in terms of producing and supplying green technologies and services. On the other hand, a reduction in the use of fossil fuel vehicles will decrease fuel usage and to some extent will, decrease the need for traditional mechanics (and is likely to impact the jobs within that supply chain).

[34] Source: IGES *Grid Emission Factors 10.4* (2019)

7. CONCLUSIONS AND RECOMMENDATIONS

7.1 General conclusions

The design, initiation, and implementation of the GTALCC Project are taking place at an opportune moment at in the right enabling environment. The Malaysian government stresses sustainable development efforts that are emphasised from the Eleventh Malaysia Plan (11 MP) 2016-2020 to down to sectoral national policies, master plans, and programmes as well as development. However, while there are several sectoral policies and plans, there is no policy or master plan that covers low-carbon (urban) development as a whole. Institutionally, a range of ministries and agencies are involved that tend to work in silos regarding low-carbon issues and options, and this implementation structure is similar at subnational level with no single structure to lead low-carbon initiatives. There are several agencies which have similar and overlapping mandates. In realizing this, a conscious effort has been made by the Project to increase partnership and collaboration with these agencies with overlapping mandates, and to synergize the project interventions. At the national level, there is a strong need to bring key players together (e.g. MESTECC, KPKT, MEA, Ministry of Transport and PLANMalaysia) together in a low carbon coordinating entity. The GTALCC attempts to remedy the situation by means of supporting the formulation of an institutional framework study with recommendations and the National Low Carbon Cities Master Plan and Policy Road Map NLCCMP&PRM) and that both are in the final stages of formulation.

The Malaysian government has formulated a national greenhouse gas reduction target, but this not easily translated into a subnational or sectoral target. Some progress has been achieved through the improvement of methodologies, guidelines, and standards for GHG calculation. Apart from GreenTech and a handful of cities, many local government entities do not have the expertise to calculate their GHGs. GTALCC assist by capacity building and awareness creation efforts so that in future the right human resources and skills for low carbon division will be available. Tools redundancy is also a problem as they are currently too many tools available. Information pertaining to resources are often kept at the responsible agency and access to specific bottom-level data is difficult. The GTALCC rightly is addressing the gap with trying to harmonise GHG accounting and reporting in an adequate reporting structure.

The number of cities that are formulating low-carbon action plans or blueprints already goes beyond the five cities that participate in GTALCC. After the NLCCMPR&RM has been finalised (and endorsed by Cabinet), this will propagate and expedite the understanding and implementation of low carbon cities agenda as a whole. GTALCC will continue with capacity building and awareness to get more cities on board. However, having a low carbon city plan is one matter, but getting specific projects or programmes identified in these plans implemented is another issue. Usually, a planning department leads at the local authority level, but may have a range of objectives other than low carbon; while also the lack of inter-departmental collaboration hinders low-carbon investments. GTALCC thus promotes low-carbon institutionalisation in which a local entity coordinates and leads carbon-relevant initiatives. Even having the right structure will not be enough, if funding is not available. Despite some allocations from various sources (both national, local and international), the total amount of money accrued is still too small and therefore insufficient for pushing low carbon agendas to the level intended. Many cities are unable to generate additional incomes (e.g. from the reviewing of parking fee, taxes, and charges) to finance their low carbon initiatives and programmes. Public-private partnership help to fund low carbon cities programs in many cities all over the world. Unfortunately, in Malaysia, the number (of partnerships) is still very small, and are inclined towards bigger cities and urban areas. Here, GTALCC can play a role in the coming years in leveraging the private sector's' capacity for funding, and in increasing local public funding (by harmonising carbon-relevant funding at national and state level and look into options for local government to raise additional low carbon funding).

The rating in the last Project Implementation Review (PIR) 2018, carried out in July 2018, gives the rating of 'marginally satisfactory', due to the fact that many activities were 'not on track' yet, due to the delay to sort out the implementing arrangements for the project and the temporary suspension of government procurement after the General Elections in May 2018. However, by adopting an 'accelerated mode' by the Project Team, the overall progress of activities has increased markedly in such way that the MTR Team increases the rating level to 'satisfactory', as explained in detail in Box 23.

Box 23 MTR rating and achievements summary

Main criteria	Rating	Explanation
Progress towards results - Component 1 - Component 2 - Component 3	S - HS - S - MS	Most project progress has been made in *Component 1.* The Project has managed not only to engage the original five participating cities, but has reached out to more supporting cities, and supported the formulation of updating of low carbon blueprints or action plans. With the pending finalisation of the NLCCMP&PRM and, the project has actually gone beyond what was originally formulated in the Project Document, hence we give a HS rating. The above-mentioned activities have been accompanied by workshops, training and awareness events while the Institutional Framework study is reaching finalisation. Since many capacity building and awareness events of *Component 2* will only be organised after the MCCMP&RM, it may be too early to tell, but in 1-1.5 year the Project has been quite active so far, and hence we give a S rating. Regarding *Component 3*, a number of low-carbon initiatives have been delayed or initiation postponed, in particular, the Iskandar Malaysia BRT, by far the largest in size in terms of co-financing and expected GHG emission reduction. Other city-level low-carbon are initiatives regarding e-vehicles (e-buses, e-cars, e-scooters and e-bikes) that have been implemented, while others have been de-prioritised. To the credit of the Project Team, new avenues are explored, such as alternative low-carbon fuels and vehicles (in particular, the use of bio-CNG in CNG buses, in combination with bio-CNG production from biomass waste, i.e. palm oil effluent and the organic content in municipal wastewater and solid waste). However, the proof of the pudding will be in eating it. We give this Component a cautious MS rating
Relevance	- R	The Malaysian government stresses sustainable development efforts that are emphasised from the Eleventh Malaysia Plan (11 MP) 2016-2020 to down to sectoral national policies, master plans. We consider the Project as very relevant (R). The project's results framework of objective-outcomes-outputs-activities addresses the barriers to low-carbon policy-making and planning and to low carbon investments. The GTALCC still basically follows the original framework, although Outcome 3 will need some amendments due to changes in activities (which the Team is currently pursuing). This is sufficient enough to give us a satisfactory (S) rating
Design	- S	*Note:* The numbering system in the various project document and progress reports is confusing; sometimes a component is an outcome, an outcome and output, and an output labelled an activity. The logframe consists of outcome indicators. Now, the outcomes' realization is only partly influenced by the project (note: obly rthe lower-level outputs are directly under a project's control) and partly by the project partner's action. In this case, the results level has been chosen so high that the project's indicators seem to measures the project partner's intervention only and therefore are not good indicators for the project's influence on the outcomes.
Implementation and adaptive management	S	The formulation of the project concept (PIF) and project concept had taken quite some time (2012-2015), which was followed by an equally long project start-up period (2015-2017). To compensate for the time lost, the GTALCC did start accelerating activities in 2018 and the project, in general, seems on track with most progress made in Component 1. We rate the implementation in the period 2015-2017 as unsatisfactory (U), but the accelerated approach 2018-present we regards as high satisfactory (HS), giving an average rating for *implementation and adaptive management* as satisfactory (S)
Sustainability	ML	As per instruction in the UNDP/GEF *Guide in Mid-term Review,* the rating for sustainability should not be higher than the lowest rating of each of the categories. Low-carbon funding for projects and programmes is a major barrier; unless it is clear from the NLCCMP&RM how this barrier will be addressed we give a rating of marginally likely (ML) for financial sustainability (other categories, institutional and governance sustainability, environmental and social sustainability receive 'likely' rating), and, hence, the overall sustainability rating is 'marginally likely'(ML)

7.2 Recommendations

Number	Recommendation	Entity Responsible
A	**Outcome 1**	
A1	One issue is where the NLCCMP&PRM will be based? This must be based in the climate change division of MESTECC. As discussed during stakeholders' engagement, ownership of this document should be shared with PLANMalaysia and Ministry of Housing and Local Government. The state government should also set up a climate change division to oversee the implementation of low carbon development plans/programs.One issue is where the NLCCMP&PRM will be based? This must be based in the climate change division of MESTECC. As discussed during stakeholders' engagement, ownership of this document should be shared with PLANMalaysia and Ministry of Housing and Local Government. The state government should also set up a climate change division to oversee the implementation of low carbon development plans/programs.	MESTECC and government entities
A2	The 12th Malaysia Plan (MP) process has already started and is expected to be tabled in Parliament and approved in October 2020, for implementation starting 2021-2025. The GTALCC project can play an important role in ensuring that the low-carbon agenda is properly reflected in the 12th Plan.	MESTECC, Government entitiess
B	**Outcome 2**	
B1	Have a detailed look, as part of NLCCMP&RM and Institutional Framework formulation how this inter-sectoral and inter-departmental coordination for low-carbon planning and actions can be best implemented to guarantee a longer-term impact, and how carbon-relevant funding (inter-sectoral and in cooperation with the private sector) can be mobilised in an optimal way.	MESTECC; Project Team
C	**Outcome 3**	
C1	The ProDoc in Output 3.1 of Component 3 indicates GTALCC support to selected on-going low-carbon investments by cities (IM-BRT, cycleways Putrajaya; waste Cyberjaya) or proposed by (public or private) companies, such as electric vehicles (e-buses, e-cars, e-bicycles). However, the time frame of these investments has changed (such as IM-BRT) or the GTALCC priorities in low-carbon investments change (e.g. electric vehicles and charging infrastructure is also addressed by other national and donor-supported initiatives). The new investments hinted at in Output 3.2 tend to be city-oriented, which as such is understandable in a project that promotes city involvement in low-carbon planning and project implementation. However, such investments also tend to be city-level; some may be replicated to other cities, but otherwise the longer-term impacts may be limited. This has led to some re-thinking by the Project Team on the technology focus of Component 3, in which GTALCC is positioned as addressing 'niche areas. One such as area is the use of bio-CNG replacing diesel in (public) transportation. The MTR Team fully endorses this creative way forward, in which a number of new (city- and national-level) initiatives have been proposed.	Project Team/SEDA; related local government entities; private sector investor
C2	As a new project activity, the GTALCC project is contemplating to carry out a pilot to proof the bioCNG-for-transport concept, in cooperation with a bus operator and Gas Malaysia/Sime Darby Energy. The option of bio-CNG lends itself to a type of public-private partnership that the project tries to promote, in which national government (Ministry of Transport and agencies), companies (bus operator, palm oil companies, the distributor GasMalaysia), and local governments participate. The Project Team is contemplating to support a pilot project with about 10 bio-CNG buses. It would have been nice if this could be done with the IM-BRT, which is still in the design stage. A successful pilot may entice IM-BRT management to incorporate bio-CNG buses in their lines, and acquire bio-CNG buses on a larger scale in future BRT expansion works.	Project Team; SEDA

C3	We recommend that, apart from comparing the pros and cons of bio-CNG vs. electric buses vs. diesel-fuelled buses, GTALCC looks further into the techno-economic issues and options regarding the production of bio-CNG from methane recovered from palm oil waste, as well as from wastewater treatment facilities and landfills (incl. cost of installation of CNG-quality upgrading facilities and required economy of scale). This could be part of a wider analysis of waste management (reduce, recycle, re-use, separate), waste-to-energy options (for electricity generation of bio-CNG production) and the role of cities, State governments and private sector.	Project Team; SEDA
C4	Another idea mooted is the installation of solar PV on rooftops of government buildings and installation on covered parking space and walkways (with solar PV installed on top). If designed in the right way, the additional cost of covering open parking spaces and walkways could be recovered by the sale of electricity to the grid. We recommend that the Project Team studies the issues, options, costs, and benefits and explores the possibility of setting up a pilot project in Putrajaya (covering parking spaces) or with one of the MRT or BRT stations (e.g. covering walkways that interconnect the BRT or MRT with other public transport modes).	Project Team; SEDA
C5	Regarding the latter, inter-modal connectivity can often be problematic. If people cannot get from A to B using various transport modes (BRT, MRT, bus, walking, cycling, car park options at connection points) in a reasonable time, they will avoid it, even if the mass transport system itself is very effective). The GTALCC should look into options on how to improve inter-modal connectivity.	Project Team; SEDA
D	**Project Implementation and adaptive management**	
D1	As explained in detail in Section 4.3.1, the table of outcomes-outputs-activities and indicators needs to be updated to reflect the changes that have occurred since project design in 2013-15 and to have outcome indicators that more realistically reflect the impact of the Project's actions rather than those of project partners. The MTR Team has made a revised logical framework (in discussion with UNDO CO and Project Team) that is presented in Box 24. We recommend that this is discussed at the National Steering Committee level and considered for further progress reporting and work planning	Project Team; SEDA; UNDP
D2	At the time of conceptualisation, the project was not designed to target women and girls specifically. The project should now make a gender strategy and action plan. This should include collecting a wider range of gender disaggregated data to be used for future analysis and planning for the advancement of gender equality and women empowerment. Another suggestion is to have a workshop on gender and climate change to strengthen the agenda of women participating as implementers and beneficiaries of low-carbon projects.	Project Team; SEDA; UNDP
D3	Although the original Project Document included contracting a Chief Technical Advisor (CTA) for a 3-year period, the CTA (currently Mr. H. Jensen) was not contracted until mid-2018 and only for half a year. We noted that the CTA position has allowed making valuable contributions and to be able to follow up and give good guidance on the above-mentioned nine recommended actions, we propose that the position of CTA is extended at least into 2020.	Project Team; SEDA; UNDP

Outcome	Indicator	Baseline	Target	Source of Verification	Comments	Corresponding outputs
Outcome 1.1 Major cities implmented and adoped integated low carbn urban deveopment plan and/or progammes	1.1 Status of national low-carbon planning and institutional framework	No Framework	Framework developed and adopted	Official Government documents	At MTR: NLCCMP&PRM drafted It is expected that the master plan and policy road map is being adopted by MESTECC and elements are included in the 12th Malaysia Plan.	Output 1.1.1 Formulated and adopted framework and coordination mechanism for low-carbon urban plannin
	1.2 GHG Accounting Online Portal established and used by cities	0	5	Number of cities actively using the on-line portal	At MTR: 4 The GHG portal will provide data for GHG inventories for cities as well as request cities to input data. The 5 participating cities are expected to provide updated data for their GHG emission inventories	
	1.3 Number of cities with adopted GHG reduction targets	0	3	Official documents by cities e.g. low carbon city plan	At MTR: 3 GHG targets in low carbon city plans are expected confirmed by the city officials.	Output 1.1.3 Formulated and adopted low carbon development and investment plans for citie
Outcome 2.1 Expedient appraisal, approval, and implementation of strategic urban development plans/program and projects	2.1 Status of institutional framework for LCCUD	No Framework	Framework developed and adopted	Official Government documents	At MTR: Institutional framework prepared and disseminated to local authorities and government agencies	Output 2.1.1 Strengthened operational coordination mechanism for effective implementation of low carbon city policy
Outcome 2.2 Major cities are aware of, and are planning and implementing low carbon technology	2.2 Number of cities with clear organisational setup for low carbon planning	0	5	Information from planning departments in local authorities	A clear identification of the main body responsible for low carbon planning within the local authority and interaction with state and federal levels	
	2.3 Number of cities with low carbon urban development plans	0	5	Official documents from local authorities	At MTR: 9 Documents that clearly describe the baseline and targets for GHG emissions and planned activities	

Outcome	Indicator	Baseline	Target	Source of Verification	Comments	Corresponding outputs
applications for integrated urban development	2.4 Number of trainees trained in integrated low carbon planning (% of women)	0 (0%)	200 (40% women)	Participant lists from trainings and evaluation forms.	At MTR: 30% women's share The trainings are expected have participants from a majority of the local authorities in Malaysia.	Output 2.2.1 Completed training programmes for policy decision-makers, local governments, green practitioners and financing institutions on strategic urban planning processes for low carbon and climate resilient development
	2.5 Status of Low Carbon Cities Network	None	Established and operational	Number of participating local authorities and information about activities	At MTR: none Focal point for the network is clearly identified and web-site established and information is available	Output 2.2.2 Operational knowledge management systems for low carbon city development
Outcome 3.1 Increased investments in low carbon technology applications in cities	3.1 Total amount of investments leveraged funding for low carbon projects	0	USD 185 Million	Budgets from local authorities and information from government and finance institutions on funds	At MTR: USD 157 million (see Box 17) Total funding made available for low carbon projects by local authorities, state and federal government and finance institutions	Output 3.1.1 Leveraged investments in low carbon projects and initiatives
Outcome 3.2 More low carbon projects implemented in Malaysian cities	3.2 Investment projects in low carbon transportation	0	2	Case reports from local authorities and project team describing the projects	At MTR: 0 The projects are expected to cover different types/scopes of transportation e.g. public transport and cycling	Output 3.2.1 Low carbon transport projects and initiatives
	3.3 Investment projects in low carbon energy	0	2	Case reports from local authorities and project team describing the projects	The projects are expected to cover different types/scopes of energy e.g. energy efficiency and solar power	Output 3.2.2 Low carbon energy projects and initiatives
	3.4 Investment projects in low carbon waste management	0	2	Case reports from local authorities and project team describing the projects	At MTR: 2 The projects are expected to cover different types/scopes of waste management e.g. recycling and waste to energy	Output 3.2.3 Low carbon waste management projects and initiatives

Objective	Indicator	Base	MTR (report by CTA, 03/2019)	Target at EoP	Observations by MTR team on indicator progress
To facilitate the implementation of low carbon initiatives in at least five Malaysian cities and showcase a clear and integrated approach to low carbon development	1 Cumulative direct GHG project emission reductions (ER) resulting from the Project technical assistance and investments (in tCO_2)	0	17,383	345,186	Based on: - Green rebate, 10843 - EV cars, 2153 - EV scooters, 487 - Cycleway, 3808 - Waste plant, 667

See CTA Report on Status of GHG Emission Reductions - Assessment of GHG emissions achieved by the GTALCC project activities as per end of 2018). For GHG emissions BRT, see Section 4.3.2)

7.3 Lessons learnt

Low-carbon planning

The project team realized that there are several agencies which have similar and overlapping mandates. In realizing this, a conscious effort has been made to increase partnership and collaboration with these agencies with overlapping mandates and to synergize the project interventions. Second, there is a strong need for a national level low-carbon planning and institutional framework guided by a national strategy or master plan that is endorsed by an inter-sectoral range of cooperating ministries and agencies. Although not formulated as such in the ProDoc, the Project Team (with SEDA support) has rightly identified this as a fundamental gap that should be addressed and has focussed efforts on having a low carbon planning and an appropriate institutional framework in place (to promote horizontal and vertical integration on carbon-relevant decision-making).

Project formulation

Often UNDP/GEF projects face a long period from first project concept, PIF submission, PIF approval, project documentation formulation, CEO endorsement, project signatures, project inception to setting up the project management team. GTALCC confirms this and the whole period lasted some five years, and only by mid-2017 a fully functional project team was set up. Such a period is too long and brings the inherent danger that the project documentation is outdated already when the project activities really start. This has happened in the case of GTALCC was well, especially in Component 3 where investment opportunities have shifted or associated investments delayed.

A number of the project indicators measure the progress of the external partners that are outside the control and influence of the project. In the Project, a few indicators measure big investments by external partners and is counted this as part of co-financing and/or the UNDP/GEF project's direct greenhouse gas emission reduction. If the large investment has not occurred yet at the GEF project's end, then how can we report the co-financing (and associated GHG emission reduction? Does this mean that the UNDP/GEF project was not successful? Not really, the indicator measures the investment partner's progress basically, not the UNDP/GEF contribution. Second, if such an indicator makes sense in the logframe, it should be broken down in phases, e.g. with a sub-indicator for 'feasibility and business plan finalised', 'tendering and design completed', 'construction started and completed', so that the progress can make measured.

UNDP

With one of the MTR team consultants also involved in many UNDP/GEF project activities and the observation based on the GTALCC experience, we have a question: "why each time when a project is being formulated, the wheel of 'formulating the logframe set of indicators' needs to be reinvented?" Since most UNDP/GEF climate change mitigation usually have the same components, e.g. policy and institutional frameworks, capacity and institutional strengthening, financial mechanisms and a pilot/demonstration component, would it not be possible to formulate some 'guidance document' on how to formulate good indicators that are not only SMART, but are able to give an indication of the project's influence on outcome realization? Such a document could give generic examples of sets of indicators per component that can then be catered and finetuned by the project document designers based on the project's needs and circumstances.

ANNEX A. TERMS OF REFERENCE (TOR)

Mid Term Review Lead Consultant, Green Technology Application for the Development of Low Carbon Cities Project

Location :	Home-based with One mission to Putrajaya, MALAYSIA
Application Deadline :	11-Dec-18 (Midnight New York, USA)
Time left :	1d 11h 5m
Type of Contract :	Individual Contract
Post Level :	International Consultant
Languages Required :	English
Starting Date :	11-Mar-2019
Duration of Initial Contract :	1.5 months (11 March - 3 May 2019)
Expected Duration of Assignment :	20 man-days over the period of 12 weeks

Background

This is the Terms of Reference (ToR) for the UNDP-GEF Midterm Review (MTR) of the full-sized project titled Green Technology Application for the Development of Low Carbon Cities (PIMS#4283) implemented through the Ministry of Energy, Science Technology, Environment & Climate Change (MESTECC), which is to be undertaken in April 2019. The project started on June 2016 and is in its third year of implementation. This ToR sets out the expectations for this Mid-Term Review (MTR).

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 expert from Malaysia. 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.

Objectives

The objective of the project is to facilitate the implementation of low carbon initiatives in at least five Malaysian cities and showcase a clear and integrated approach to low carbon development. The objective will be achieved by removing barriers to integrated low carbon urban planning and development through 3 components: 1) policy support for the promotion of integrated low carbon urban development, which will enable cities to implement and adopt integrated low carbon urban development plans and programmes; 2) awareness and institutional capacity development, which will expedite appraisal, approval and the implementation of strategic urban development, and ensure cities are aware of planning and implementing low carbon technology applications, and; 3) low carbon technology investments in cities, where there is an increase in investment in low carbon technologies with more low carbon projects implemented. The project is implemented over 5 years in Cyberjaya, Iskandar Malaysia, Melaka, Petaling Jaya, and Putrajaya. It is expected to generate direct GHG emission reductions of 346,442 tCO2eq by End of Project and 2,152,032 tonnes CO2eq over the lifetime of project investment.

The total budget for the project is 4.35 Million USD from the Global Environment Facility. The Implementing Partner of the project is the Ministry of Energy, Science Technology, Environment & Climate Change (MESTECC), with the Sustainable Energy Development Authority (SEDA) as the executing agency.

The project document and other relevant GEF documents can be downloaded at:
https://www.thegef.org/project/green-technology-application-development-low-carbon-cities-gtalcc
Information on the UNDP evaluation process and experience from other countries can be referred to at the Evaluation Resource center at the following link: https://erc.undp.org/

The Detailed Terms of Reference (TOR), including annexes A to F can be downloaded from the following web: http://www.my.undp.org/content/dam/malaysia/docs/Procurement/Detailed%20TOR.pdf

Duties and Responsibilities

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 and its risks to sustainability.

The MTR process must follow the guidance outlined in the document Guidance For Conducting Midterm Reviews of UNDP-Supported, GEF-Financed Projects (http://web.undp.org/evaluation/documents/guidance/GEF/mid-term/Guidance_Midterm%20Review%20_EN_2014.pdf).•
Introduction;

- Project background information;
- Objectives of the MTR;
- MTR approach and methodology;
- Detailed scope of the MTR;
- Timeframe;
- Deliverables;
- MTR arrangements;
- Team composition;
- Payment modalities and specifications.

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 the UNDP GEF Technical Advisor, UNDP Country Office, Implementing Partner and Executing Agency, project team, consultants and key experts in low carbon cities, project stakeholders, local government, Project Board, academia, CSOs and other project partners relevant to the outcome of the Project. Additionally, the MTR team is expected to conduct a field mission to Putrajaya, including project sites in Putrajaya and the Greater Kuala Lumpur region. 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.

Deliverables and Timeline:

The total duration of the MTR will be approximately 20 working days over a time period of 10 weeks. The tentative MTR timeframe is as follows:

Activity	Number of working days	Approximate completion date
Document review and preparing MTR Inception Report (MTR Inception Report due no later than 2 weeks before the MTR mission)	4 days	15 March 2019
MTR mission: stakeholder meetings, interviews, field visits (3-11 April 2019)	7 days	11 April 2019
Presentation of initial findings- last day of the MTR mission	1 day	12 April 2019
Preparing draft report (due within 3 weeks of the MTR mission)	5 days	3 May 2019
Finalization of MTR report/ Incorporating audit trail (see Annex G) from feedback on draft report (due within 1 week of receiving UNDP comments on the draft)	3 days	31 May 2019

Terms of Payment:

	Indicator	% of Payment	Expected Completion Date
1	Upon approval of the final MTR inception report	10	15 March 2019
2	Upon submission and approval of the 1st draft MTR report	30	3 May 2019
3	Upon submission and approval (UNDP Malaysia and UNDP RTA) of the final MTR report	60	31 May 2019

Competencies

- Competence in adaptive management, as applied to climate change mitigation·
- Demonstrable analytical skills.

Required Skills and Experience

Master's degree in environmental science, environmental engineering, town planning, engineering, climate change or other closely related field.

Experience:

- More than 10 years working experience in climate change mitigation projects with good knowledge of state-of-the-art approaches and best practices of similar projects;
- Recent experience working with result-based management evaluation methodologies
- Experience in evaluating UNDP/GEF evaluations for climate change mitigation is preferred;
- Experience applying SMART indicators and reconstructing or validating baseline scenarios;
- Demonstrated understanding of issues related to gender and climate change; experience in gender sensitive evaluation and analysis;

Language:

- Excellent writing and communication skills in English.

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.

Technical score		Score weight	Points obtainable
1	Experience of bidder	35%	250
2	Technical capability	35%	250
Financial score			
1	Bid price	30%	-

ANNEX B. ITINERARY OF THE EVALUATION MISSION

DAY 2 – 9 APRIL 2019 | TUESDAY | DORSETT HOTEL, PUTRAJAYA	
9:00 - 10:00	Meeting with UNDP
10:00-12.30	Kick-off meeting & briefing with GTALCC team, CTA, MESTECC & SEDA Malaysia
12:30 – 13:30	Lunch
13:30-14:30	**Meeting with Project Consultant: National Low Carbon Cities Masterplan & Policy Roadmap (NLCCMPR)** Mr. Peter Ong Kok Vui Senior Town Planner AJM Planning And Urban Design Group Sdn. Bhd. (APUDG)
14:30-15:30	**Meeting with Project Consultant:** **i. Local Authorities Business Plan on Green Technology Incentive for Household and SMEs** **ii. Low Carbon Public Transport (Bus): Scaling Up Financing and V viable Business Cases for Cities** Dato'Leong Kim Mun Project Director Uni-Link Smart Venture Sdn Bhd

DAY 2 – 9 APRIL 2019 | TUESDAY | DORSETT HOTEL, PUTRAJAYA	
15:30-16:30	**Meeting with Project Consultant:** **i. Study On Institutional Framework For Low Carbon Cities;** **ii. Consultancy For The Development Of Low Carbon Cities Assessment And Accreditation Panel, Facilitator and Acessor/Verifier Training Curriculum Under 'Train The Trainer'** Datin Mazrina binti Khalid Honorary Secretary MIP Training Centre Sdn. Bhd. (MIPTC)
16:30-17:30	-reserve slot-

DAY 4 – 11 APRIL 2019 | THURSDAY | DORSETT HOTEL, PUTRAJAYA	
9:00-10:00	**Meeting with PLAN Malaysia** TPr Jasmiah binti Ismail Deputy Director Land Use, Industry, Commercial, Housing, Social Facilities, Infrastructure and Land Utilities Research Unit & Pn. Noraida binti Abdul Rani Head of Environment and Risk Management Unit
10:00-11:00	- Reserve Slot –
11:00-12:00	**Meeting with Hang Tuah Jaya Municipal Council (MPHTJ)** TPr. Rozaidi bin Mahat Head of Green Technology Unit
12:00-13:00	**Meeting with Iskandar Regional Development Authority (IRDA)** Mr. Boyd Dionysius Joeman | Mrs. Kamisah Mohd Ghazali Head Environment Division Senior Vice President
13:00 – 14:00	Lunch

DAY 4 – 11 APRIL 2019 | THURSDAY | DORSETT HOTEL, PUTRAJAYA	
14:00-15:00	**Meeting with Universiti Teknologi Malaysia (UTM) Low Carbon Asia Research Center via Skype** TPr. Chau Loon Wai Co-Director, Department of Urban and Regional Planning UTM-Low Carbon Asia Research Centre
15:00-16:00	**Meeting with Melaka Green Technology** Mr. Chandru Suparmaniam | Mr. Mohd Hafizam bin Mustaffa, Chief Executive Officer Operation Manager
16:00-17:00	**Meeting with Putrajaya Corporation** Mrs. Norzita binti Abd Razak | Ms. Wang Tze Wee Director Senior Assistant Director Putrajaya Green City Section Putrajaya Green City Section

DAY 2 – 9 APRIL 2019 | TUESDAY | DORSETT HOTEL, PUTRAJAYA	
9:00 - 10:00	Meeting with UNDP
10:00-12.30	Kick-off meeting & briefing with GTALCC team, CTA, MESTECC & SEDA Malaysia
12:30 – 13:30	Lunch
13:30-14:30	**Meeting with Project Consultant: National Low Carbon Cities Masterplan & Policy Roadmap (NLCCMPR)** Mr. Peter Ong Kok Vui Senior Town Planner AJM Planning And Urban Design Group Sdn. Bhd. (APUDG)
14:30-15:30	**Meeting with Project Consultant:** **i. Local Authorities Business Plan on Green Technology Incentive for Household and SMEs** **ii. Low Carbon Public Transport (Bus): Scaling Up Financing and V viable Business Cases for Cities** Dato'Leong Kim Mun Project Director Uni-Link Smart Venture Sdn Bhd

DAY 1 – 8 APRIL 2019 | MONDAY | SEDA MALAYSIA	
11.00-12.30	Project meeting with National Project Manager (NPM) , Chief Technical Advisor (CTA) & UNDP Programme Manager
12:30-13:30	Lunch
13.30-14.30	**Meeting with SEDA Malaysia (Lead Consultant)** Mr. Steve Anthony Lojuntin Director Energy Demand Management Division
14:30-15:30	Meeting with Component Managers
16.00-17.00	**Meeting at MESTECC (Parcel C)** Mr. Jaya Singam Rajoo Senior Under Secretary (Climate Change & Environment Division), GEF Operational Focal Point

DAY 7 – 16 APRIL 2019 | TUESDAY | DORSETT HOTEL, PUTRAJAYA	
9:00 - 12:00	Presentation of preliminary findings & wrap up with GTALCC Team, CTA, MESTECC, SEDA Malaysia & UNDP
12.00-13.00	Lunch

DAY 3 – 10 APRIL 2019 | WEDNESDAY | DORSETT HOTEL, PUTRAJAYA	
9:00 – 10:00	**Meeting with Project Consultant:** **Technical Expert for On-Site Waste Processing Detail Site Suitability Study and Business Model in Cyberjaya via video call** Ir Mohamad Adan Yusof (Mensilin Sdn Bhd)
10:00-11:00	**Meeting with Ministry of Housing and Local Government & agencies** Puan Juliana Hii Li Li Senior Principal Assistant Secretary Policy & Inspectorate Division
11:00 – 12:00	**Meeting with Malaysian Green Technology Corporation** Mr. Saiful Adib Abdul Munaff Head of Smart Sustainable Cities, Low Carbon City Framework, Low Carbon Mobility Pn. Wan Nadiah

DAY 4 – 11 APRIL 2019 | THURSDAY | DORSETT HOTEL, PUTRAJAYA	
14:00-15:00	**Meeting with Universiti Teknologi Malaysia (UTM) Low Carbon Asia Research Center via Skype** TPr. Chau Loon Wai Co-Director, Department of Urban and Regional Planning UTM-Low Carbon Asia Research Centre
15:00-16:00	**Meeting with Melaka Green Technology** Mr. Chandru Suparmaniam | Chief Executive Officer Mr. Mohd Hafizam bin Mustaffa, Operation Manager
16:00-17:00	**Meeting with Putrajaya Corporation** Mrs. Norzita binti Abd Razak | Director, Putrajaya Green City Section Ms. Wang Tze Wee | Senior Assistant Director, Putrajaya Green City Section

DAY 5 – 12 APRIL 2019 | FRIDAY | DORSETT HOTEL, PUTRAJAYA	
9:00-10:00	-Reserve Slot-
10:00 – 11:00	-Reserve Slot
11:00 – 12:00	**Meeting with Centre for Environment, Technology and Development (CETDEM), Project Technical Committee member** Engr. Gurmit Singh K.S Chairman
12:00-15:00	Friday Prayer / Lunch
15:00-16:00	**Meeting with Petaling Jaya City Council** TPr. Lee Lih Shyan Director Department of Solid Waste and Public Cleansing Management
16:00-17:00	**Skype call with UNDP RTA** Usha Rao, UNDP Regional Technical Advisor on Climate Change Mitigation

DAY 6 – 15 APRIL 2019 | MONDAY | DORSETT HOTEL, PUTRAJAYA	
9:00 - 10:00	-Reserve Slot-
10.00 – 11.00	Meeting session with MESTECC, CTA & NPM Dr Nagulendran Kangayatkarasu Deputy Secretary General (Planning & Commercialization) MESTECC
11:00 – 12:00	-Reserve Slot -
12:00-13:00	**Voltron Malaysia Sdn Bhd (Electric Bicycle)** Mr. Tan You Soon Chief Executive Officer
13:00 – 14:00	Lunch
14:00 – 15:00	**Meeting with Sepang Municipal Council** Mrs. Ruhaila binti Abdul Rahman Senior Assistant Director Urban Planning Department
15:00-17:00	Working Session- MTR Reviewers

ANNEX C. LIST OF DOCUMENTS COLLECTED AND REVIEWED

Project design documents and progress reports

UNDP Project Document
GEF CEO Endorsement Request document
Annual Progress Reports (2016, 2017)
Project Implementation Reviews (2016, 2017, 2018)
Mid-Year Progress Reports (2017, 2018)
Status of GHG Emissions Reduction (prepared by H.R. Jensen, CTA; March 2019)

PowerPoint Points for MTR mission (April 2019)
- Project brief and progress
- GTALCC Timeline of activities
- GTALCC Component 1, Project status report
- GTALCC Component 2, Status report
- GTALCC Component 3, Project status report
- GTALCC, Briefing by CTA

Documents related to Component 1

National Low Carbon Cities Master Plan and Road Map
- Workplan (Dec 2018)
- Milestone 2: Inception Report, Baseline Studies (Jan 2019)
- Milestone 3: Progress Report 1 (March 2019)
- Progress Report 2: Considerations and initial directions (April 2019)
- Meeting with MTR evaluators (April 2019)

Building Sector Energy Efficiency Project
- Building EE Technical Guideline for Active Design
- Building EE Technical Guideline for Passive Design
- Compendium of Policy and Financial Instruments for Accelerating Buildings Sector Energy Efficiency
- Energy Performance Contracting Guidebook
- Guidelines on the Development and Implementation of an Energy Management System for Building Facilities

Case studies, MBIPV Project: Enhancing Renewable Energy Opportunities
PowerPoint, Green building and low carbon building, Overview and options for implementation (by, S.A. Lojuntin, EDM Unit, SEDA)

City-level low carbon plans and reports:
- Cyberjaya Smart City Low Carbon City Action Plan 2025 (2017)
- Low Carbon Society Blueprint for Iskandar Malaysia 2025 (2014)
- Low Carbon Island Model and Desktop Study (by UTM-LCARC)
- MB Petaling Jaya, Carbon Management Plan 2015-2020 (by Carbon Trust)
- MB Petaling Jaya, Low Carbon City Action Plan 2015-2030 (by Carbon Trust)
- Putrajaya Green City 2025, Baseline and Preliminary Study (2012)

- Putrajaya Structure Plan 2025 (2012)
- PTHM Corporate Profile 2019 (Melaka Green Technology Corporation)
- Policy Options for Low Carbon Cities, Johor Bahru and Pair Gudang (www.smartcities.org;

Low Carbon Cities Framework (LCCF)
- LCCF and Assesment System (KeTTHA, 2011)
- PowerPoint, LCCF Track Introduction Methodology (2018)
- List of yearly data input needed, Version 1.1 (July 2018)
- LCCF Review Report (by R. Johanesson, 2019)
  - Task 1-2, LCCF and LCCF Track review; Identification of strengths and gaps
  - Task 3, Recommendations and improvements for LCCF and LCCF Track
  - Task 4, Recommendations of alignment of LCCF with GPC
  - Task 5, Recommendations for mitigation actions in LCCF
  - Task 6, Recommendations for improvement of LCCF as a planning tool
  - Task 7, Recommendations for making LCCF a globally recognized tool

Greenhouse gas inventories and reports:
- GTALCC Review and analysis of greenhouse gas inventory of GTALCC participating cities'
- Iskandar Malaysia Greenhouse Gas Inventory 2015, Executive Summary
- Iskandar Malaysia Greenhouse Gas Inventory 2016, Final Report
- Malaysia Third National Communications to UNFCCC (2018)
- Towards Putrajaya Green City 2025, Building Sector Carbon Emissions Monitoring and Reporting
- PowerPoint Cyberjaya Carbon data project
- GPC, Global Protocol for Community-Scale Greenhouse Gas Emission Inventories, an Accounting and Reporting Standard for Cities (WRI, C40, ICLEI;

Documents related to Components 2 and 3

Development of Low Carbon Cities Assessment and Accreditation Panel, Facilitator and Assessor/Verifier Training Curriculum under the 'Train the Trainer' Activity
- Inception report (Jan 2019)
- Interim report (March 2019)

PowerPoint, IM-BRT Lead consultant, Industry briefing (by R. Azhar)
PowerPoint Cyberjaya Carbon data project
Powerpoint, Low Carbon City Initiatives HTJM Council, Melaka (Feb 2019)
GTALCC, List of projects implemented by cities (April 2019)

National policy and planning documents

- Green Technology Master Plan 2017-2030 (by KeTTHA, 2017)
- Incentives for Renewable Energy, Energy Efficiency and Green Buildings (by KeTTHA)
- National Urbanisation Policy (PLANMalaysia)
- National Physical Plan No.2 (2010)
- National Energy Efficiency Action Plan (by KeTTHA, 2014)
- National Renewable Energy Policy and Action Plan (KeTTHA, 2008)

UNDP
Country Programme Action Plan (between Government of Malaysia and UNDP, 2013-2015)
Country Programme Document for Malaysia (2016-2020), by UNDP, 2015

ANNEX D. QUESTIONNAIRE AND EVALUATION MATRIX

Contents	Model evaluation criteria and/or questions Indicators	Means and sources of information	Sources of verification and information triangulation
3. Findings: Relevance and design	Relevance: • Are project outcomes contributing to national development priorities and plans in accordance with the national local policy legal and regulatory frameworks (country priorities)? Does the project adequately take into account the national realities, both in terms of institutional and policy frameworks in its design and implementation? Consistency with the GEF focal areas in Climate Change/operational program strategies of the GEF CC and with the UN and UNDP country programming in Malaysia • Is the Project addressing the needs of the target beneficiaries? Relevance of the project's objectives, outcomes and outputs to the different target groups of the interventions. • Are lessons from other relevant projects properly incorporated in the project design? Are the partnership arrangements properly identified and the roles and responsibilities negotiated prior to project approval? • Are relevant gender issues raised in the project design? If there are major areas of concern, recommend areas for improvement. <u>Indicators</u>: • Extent to which Project supports national energy priorities, policies, and strategies; Adequacy of project design and implementation to national realities and existing capacities • Extent to GEF climate change focal area is incorporated • Degree to which the project supports aspirations and/or expectations of stakeholders (see Annex D) and beneficiaries (incl. females) Design and results framework • Is the project's design (logframe) adequate to address the problems at hand? • Was the project internally coherent in its design? Have any amendments to the assumptions or targets been made or planned during the Project's implementation? Have lessons from other projects been taken into account? • Was the project was formulated based on the logical framework (project	• Desk review of project design and technical documents; Documents from GEF; national policies and strategies; • Interviews with project staff management, project partners (incl. former staff), stakeholders (local and national government entities, private sector, universities/NGOs) and UNDP staff	• Interviews with project partners (Annex B) ○ Project manager ○ SEDA-EDM ○ MESTECC ○ PLANMalaysia ○ Ministry of Economic Affairs • Document and report analysis (Annex C) ○ National policy documents ○ Project Document (ProDoc) ○ Project progress reports ○ MTR briefing (PowerPoints) ○ Newspaper articles

	results framework) approach with verifiable indicators? Indicators • Degree of involvement of government partners and other stakeholders in the Project design process; Coherency and complementarity with other national and donor programmes • Number and type of performance measurement indicators (SMART indicators)		
4. Findings: Results and effectiveness	Results and effectiveness • To what extent have the expected outcomes and of the project been achieved? • What outputs has the project achieved (both qualitative and quantitative results, comparing the expected and realized end-project value of progress indicators of each outcome/output with the baseline value)? • Were there any unplanned effects? Which external factors have contributed to or hinder the achievement of the expected results? • Is the project proactively taking advantage of new opportunities, adapting its theory of change to respond to changes in the development context? Are there any unaddressed barriers? Indicators: • Level of achievement (as laid out in the logframe) • Achievement of outputs (qualitative, quantitative) and description of activities • Evidence of adaptive management and/or early application of lessons learned	• Desk review of project design and technical documents other relevant docs • Interviews with project staff management, project partners (incl. former staff), stakeholders (local and national government entities, private sector, universities/NGOs) and UNDP staff • Interviews with project experts (national and international)	• Interviews with project partners and stakeholders: ○ UNDP, MESTECC, SEDA ○ Project team ○ All the stakeholders met and interviewed (see the list in Annex B) • Document and report analysis (Annex C) ○ Project Document ○ Progress reports and MTR briefings by Project team ○ Technical reports and PowerPoints (see Annex C) • Check with publicly available information ○ Newspapers articles (referred to in footnotes in the main text)
5. Findings: Implementation, processes	Management arrangements and adaptive management • Were counterpart resources (funding, staff, and facilities), and adequate project management arrangements in place at project entry? Was any steering or advisory mechanism put in place? • How efficient are partnership arrangements for the project? Did each partner have assigned roles and responsibilities from the beginning? Did each partner fulfil its role and responsibilities? Describe adaptive management practices • Has the project produced results (outputs and outcomes) within the expected time frame? Was project implementation delayed, and, if it was, did that affect cost-effectiveness or results? If there were delays in project implementation and completion, what were the reasons? Did the delays affect project outcomes and/or sustainability, and, if so, in what ways and through what causal linkages?	• Desk review of project design and technical documents (incl, PIRs; data on budget; other relevant docs; media coverage, official notices and press releases • Interviews with project staff management, project partners (incl. former staff), stakeholders (local and national government entities, private sector, universities/NGOs) and	• Interviews with project partners and stakeholders: ○ Project team ○ UNDP, SEDA, MESTECC • Report analysis (Annex C) ○ Project progress reports, ○ Excel sheet with overview of budget, expenditures and co-financing

	Indicators • Extent to which project partners committed time and resources to the project • Extent of commitment of partners to take over project activities • Evidence of clear roles and responsibilities for operational and management structure Assessment of M&E system • M&E design. Does the project have an effective M&E plan to monitor results and track progress towards achieving project objectives? • Was the information provided by the M&E system was used to improve performance and to adapt to changing needs; Are there any annual work plans? • Was M&E was sufficiently budgeted for at the project planning stage and whether M&E was adequately funded and in a timely manner during implementation. • Were progress reports produced accurately and timely, and did they respond to reporting requirements including adaptive management changes? • Did UNDP and Project staff identify problems in a timely fashion and advice to the project, approve modifications in time, and restructure the project when needed? Did UNDP provide the right staffing levels, continuity, skill mix, and frequency of field visits for the project? Indicators • Mid-tern targets in logframe; M&E work plan • Actual use of the M&E system to change or improve decision-making/adaptive management • Share of M&E in the budget • Quality and quantity of progress reports Stakeholder involvement • To what extent were partnerships/linkages between institutions/ organizations/private sector encouraged and supported? • Which partnerships/linkages were facilitated? Which ones can be considered sustainable? What was the level of efficiency of cooperation and collaboration arrangements? Indicators • Extent to which project partners committed time and resources to the project • Extent of commitment of partners to take over project activities	UNDP staff • Interviews with project experts (national and international)	

	Financial planning and procurement • Did the project have appropriate financial controls, including reporting and planning, that allowed management to make informed decisions regarding the budget and allowed for timely flow of funds? Specifically, the evaluation will also include a breakdown of final actual project costs by activities compared to budget (variances), financial management (including disbursement issues) • If there was a difference in the level of expected co-financing and the co-financing actually realized, what were the reasons for the variance? Did the extent of materialization of co-financing affect project outcomes and/or sustainability, and, if so, in what ways and through what causal linkages? • Have funds been available and transferred efficiently (from donor to project to contractors) to address the project purpose, outputs, and planned activities? <u>Indicators:</u> • Extent to which inputs have been of suitable quality and available when required to allow the Project to achieve the expected results; • Timely delivery of funds, mitigation of bottlenecks. • Level of satisfaction of partners and beneficiaries in the use of funds Efficiency and cost-effectiveness • Has the project produced results (outputs and outcomes) within the expected time frame? Was start and project implementation delayed, and, if it was, did that affect cost-effectiveness or results? If there were delays in project implementation and completion, what were the reasons? Did the delays affect project outcomes and/or sustainability, and, if so, in what ways and through what causal linkages? • Have the inputs from the donor, UNDP and Government/counterpart been provided as planned, and were they adequate to meet requirements? Was the quality of inputs and services as planned and timely? <u>Indicators:</u> • Extent to which results have been achieved (compared with logframe and workplans) • Planned vs. actual budget and co-finance realization • Percentage of budget for management and operations (vs. other activities);		
6. Findings: sustainability	Sustainability • How likely will the Project outcomes be sustained and beyond Project termination? What are risks to sustainability? • Financial risks. Are there any financial risks that may jeopardize the sustainability of project outcomes? What is the likelihood of financial and	• Desk review of project design and technical documents (incl, PIRs; other relevant docs) • Interviews with project	• Interviews with project partners and stakeholders: ○ Project team ○ UNDP, SEDA, MESTECC

	economic resources not being available once GEF assistance ends? • Social and environmental risks. 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 project benefits continue to flow? Is there sufficient public/stakeholder awareness in support of the project's long-term objectives? Are there any environmental risks that may jeopardize sustainability of project outcomes? • Institutional framework and governance risks. Do the legal frameworks, policies, and governance structures and processes within which the project operates pose risks that may jeopardize sustainability of project benefits? Are requisite systems for accountability and transparency, and required technical know-how, in place? Have partners and stakeholders successfully enhanced their capacities and do they have the required resources to make use of these capacities? <u>Indicators:</u> • Extent to which risks and assumptions are adequate and are reflected in the project documentation • Extent to which project is likely to be sustainable beyond the project; • Extent to which main stakeholders plan to provide sustainability to the project's results in the future, including commitment of financial resources • Extent to which partners and stakeholders are applying new ideas outside of the immediate project context	staff management, project partners (incl. former staff), stakeholders (local and national government entities, private sector, universities/NGOs) and UNDP staff	• Report analysis (Annex C) ○ Project progress reports, Project Document, MTR briefings
7. Conclusions and recommendations	• Evaluation conclusions related to the project's achievements and shortfalls (comprehensive and balanced statements which highlight the strengths, weaknesses, and results of the project), including a summary of ratings • What lessons can be learnt from the project regarding efficiency • What recommendations, if any, can be made to o follow up or reinforce initial benefits from the project; Proposals for future directions related to the main objectives <u>Indicators:</u> • Perceptions of or actual levels of relative effectiveness and/or efficiency of the project cf. with other projects; Perceptions of partners, and other stakeholders as to tangible development results from activities • Lessons that have been learned regarding the achievement of outcomes and efficiency (implementation) • Changes could have been made (if any) to the design to improve the achievement of the results	• Interviews with project staff and partners • Desk review of project docs and reports as well as external policy and other docs	• Interviews with project partners and stakeholders (see the list in Annex C) and analysis thereof • Document and report analysis (as above)

ANNEX E. CONSULTANT CODE OF CONDUCT FORM

Evaluators/reviewers:

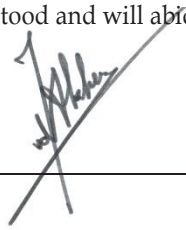
1. Must present information that is complete and fair in its assessment of strengths and weaknesses so that decisions or actions taken are well founded
2. Must disclose the full set of evaluation findings along with information on their limitations and have this accessible to all affected by the evaluation 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.

Evaluation/reviewer Consultant Agreement Form

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

Name of Consultant: J.H.A. VAN DEN AKKER (Team Leader)
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 Westerhoven, Netherlands
Signature: _____



ANNEX F. ABOUT THE REVIEWERS

Mr. Jan van den Akker is a technology management scientist with a Master's degree from Eindhoven University of Technology (Netherlands), specializing in international development cooperation. He is an expert on sustainable energy policy and technologies. Mr. Van den Akker specializes in studies and analytical work, project design and development, project coordination and implementation, project monitoring and evaluation, knowledge management, capacity strengthening and public-private partnerships in the field of sustainable energy strategies, energy efficiency, energy technologies and supply, climate change and the Clean Development Mechanism. He has lived and worked abroad for over 7 years in Zambia, Mexico, and Thailand. In addition, has undertaken numerous short missions to about 45 countries in Africa, Latin America, and Asia & the Pacific.

In 2003/2004, he founded ASCENDIS, as an independent office, and has been providing consultancy on sustainable energy and climate change, specializing in development issues. ASCENDIS is based in Westerhoven, Netherlands, but offers services in Africa, Asia and the Pacific, Europe and Latin America & the Caribbean, often by associating itself with local freelance experts, professionals, and organizations. As a long-term expert with the United Nations system, Mr. Van den Akker has provided advice to governments and organizations on the design of investment and capacity building programs for UNEP, UNDP and UNIDO (mostly in GEF-funded activities), UNFCCC, European Commission and for NGOs/consultancy companies (e.g., Practical Action Consulting, Winrock, GFA) in the area of renewable energy, energy efficiency and sustainable transportation.

As an independent consultant, he has reviewed and evaluated about 30 GEF-funded sustainable energy projects and assisted in the design of about 36 sustainable energy projects. He worked as UNDP Regional Technical Advisor on climate change mitigation (in Eastern and Southern Africa) during 2007-2009 and as Key Expert in the European Union Technical Assistance Facility for Sustainable Energy for All (2015-16). He also worked as Technical Advisor in the implementation of individual projects in Guatemala, Peru, and currently, in Malawi.

Mr. Ghazali Talib

Ghazali has vast experience is issues relating to energy efficiency and renewable energy including a few UNDP/GEF projects. He was part of the pioneer Malaysian Industrial Energy Efficiency Improvement Programme team at Malaysia Energy Center (now Greentech Malaysia) and has conducted numerous energy audits and implemented various energy efficiency projects. When he was at Petronas, he has helped to save the company RM151 million per annum in savings by successfully establishing an Energy and Loss Management Monitoring system for downstream plants. He has also undertaken various studies on Malaysian biomass supply chain and has advised on renewable energy planning. In addition, he has also conducted training and system development for ISO 50001: Energy Management System. He is also demonstration project consultant for HPMP Malaysia Phase 1.

He holds a bachelor in Chemical Engineering degree from UTM (1997) and an M.Sc. (Energy Technology) from UKM (2003). He is a Registered Electrical Energy Manager with Energy Commission, an auditor for ISO50001 Energy Management System for SIRIM and a Certified Energy Auditor by The Association of Energy Engineers, USA.

ANNEX G. AUDIT TRAIL

To the comments received on the draft report (dated May 2019) of the Mid-term Review of Mid-term Review of GREEN TECHNOLOGY APPLICATION FOR THE DEVELOPMENT OF LOW CARBON CITIES PROJECT (GTALCC); GEF Project ID: 5329 – UNDP PIMS ID 4283)

The following comments were provided to draft Mid-Term Review Report (May 2019); they are referenced by institution ("Author") and location (if linked to a specific page):

Author	#	Comment location	Comment/Feedback on the draft TE report	Evaluator's response and actions taken
Consoli-dated comments, UNDP (Nasha.C. H. Lee) and Project Team (Norizal K.M. Zamri; D. Kumar; L.P. Kumar; J.H. Rytter)	1.	3-4	Editorial comment, abbreviations	Corrected
	2.	8	Editorial comment	
	3.	9, 70, general	All the outputs mentioned are outcomes in original prodoc. outcomes. And the original formulation of outcomes are not so suitable as outputs.	The terminology in used in (progress) reports, presentation is sometimes confusing mixing outcomes and outputs. This may have an origin in the UNDP ATLAS system where an outcome (in the ProDoc) is labelled as an output, and outputs as 'activity results'. In the report, we have corrected in such a way that the outcome-output terminology is used as in the ProDoc.
	4.	9	Missing Output 1.1.3	Corrected (added)
	5.	10 (and other pages)	MLCCMP&RM	Throughout the report the acronym "MLCCMP&RM" has been used, which should be "NLCCMP&PRM". This has been corrected throughout the report.
	6.		The recommendations have a heavy focus on new proposals to be implemented, which as we know is not yet set in stone and might undergo change in form. Would like to suggest that the recommendation section should firstly focus on improving the management and implementation of the project. Are there any recommendations for strengthening project governance/ monitoring, stakeholder involvement etc? Any recommendations on how we can improve the implementation of existing project activities? This is important for us to correctly identify what needs to be done for the rest of the project period to achieve project objectives.	The "recommendations section" has been revised taking into account the comment. As such, given the project's progress over the last 1-2 yrs, we see little need for changes in project management, why change a winning team? We do recommend to have the CTA on board (as was planned anyhow in the original project design)
	7.			
	8.	14, 16	Two editorial comments	Corrected
	9.	18, 19	Editorial comments	Suggested text added
	10.	20,21	Various editorial comments	Corrected and text added
	11.	22	Box 4	The terminology in used in (progress) reports, presentation

				is sometimes confusing mixing outcomes and outputs. This may have an origin in the UNDP ATLAS system where an outcome (in the ProDoc) is labelled as an output, and outputs as 'activity results'. In the report, we have corrected in such a way that the outcome-output labelling is used as in the ProDoc.
	12.	25	Box 5; editorial comments	Corrected
	13.	26	Editorial comments	Accepted and corrected
	14.	32, 33	Editorial comments	Corrected
	15.	34	Editorial comments; Box 10	The word 'output' in the Box is replaced by 'outcome'
	16.	35, 36	Editorial comments	Corrected
	17.	37, 38	Editorial comments	Corrected
	18.	40, 41	Editorial comments	Corrected
	19.	43, 46	Editorial comments	Corrected
	20.	50	It may be worth to mention that electrical vehicles will have a GHG emission from the electricity generation. In Malaysia the grid emission factor is high 0.694 tCO2/MWh. So there will still be a significant GHG emission from using EV	Text has been added
	21.	54-55	Box 17: suggestion to change some numbers	Numbers have been changed
	22.	56, 57	Editorial comments	Corrected
	23.	59,	Editorial comment	Accepted
	24.	58, 68	Ratings in the boxes 20 and 23 differ. Some editorial comments	Ratings in Box 20 had an error. The ratings given in Box 23 are the correct ones. The minor editorial comments have been accepted and corrected
	25.	62	Editorial comment. Tables have been revised with actual expenditure figures as per the Combined Delivery Report	Editorial comment accepted and new table (Box 21) inserted with latest figures
	26.	65	This is a GEF CC Mitigation project and so would naturally focus on sectors which to enable the reduction of greenhouse gas emissions. I think the discussion here should be how can we create positive co-benefits for water, biodiversity and climate change adaptation within the scope/sectors of the project.	Text has been slightly changed based on the comment
	27.	66	How do you suggest minimising the financial risks identified here, within the framework of the project? Should the project be focusing on establishing financial instruments/ mechanisms to ensure the available financing once the project ends?	Text has been added to address the comment (To mitigate the risk, the MTR does not advocate setting up another financing instruments, but could have an activity assessing a) in the public sector how low-carbon financing can be properly identified and mainstreamed, at national and subnational level, moving away from a project-by-project to a more programmatic approach, and b) involving capital market

				players in setting up green financing (public-private partnerships)
	28.	67	Editorial comments	Corrected
	29.	Summary Summary Section 7.2 Summary Section 7.2	The recommendations have a heavy focus on new proposals to be implemented, which as we know is not yet set in stone and might undergo change in form. Would like to suggest that the recommendation section should firstly focus on improving the management and implementation of the project. Are there any recommendations for strengthening project governance/ monitoring, stakeholder involvement etc? Any recommendations on how we can improve the implementation of existing project activities? This is important for us to correctly identify what needs to be done for the rest of the project period to achieve project objectives On specific low-carbon investments (Component 3) Could the niche areas be reformulated to development of new areas for application of low carbon technologies, which can be implemented in cities in a wider scale We are also suggesting that the focus in component 3 is towards projects within the 3 main GHG emission sectors: Energy, Transport and Waste. It is correct that we are pursuing the use of bio-CNG, but it has yet to materialise in a specific pilot project. We may also be looking into other zero carbon fuels such as B100 biodiesel. Suggestion is 12 months. Justification of project extension should not be focused on Component 1 but also Component 2 & 3 especially on demonstration projects and dissemination of knowledge products to cities. Extension is needed mainly for us to complete all the planned and new activities under Component 3. The 12th MP process has already started and is expected to be tabled in Parliament and approved in October 2020, for implementation starting 2021-2025. Support to the 12MP should not be included as a justification for project extension because of the timeline (the 12MP document will be finalised before end of project). However, agreed that the project should play an important role to make sure that the low-carbon agenda is reflected in the 12MP and this needs to be reflected somewhere else (maybe under the section on recommendations).	The section 7.2 on recommendations has been re-arranged, and recommendations are presented per outcome and per management/general categories in a table. Regarding the revised logical; framework, the evaluator's proposal was discussed by the Project Team and UNDP who provided consolidated comments plus suggestions for a final version of the revised logframe. The Evaluators recognize the number and type of changes proposed needs to be balanced with the likelihood of acceptance at NSC and GEF level. We therefore thank UNDP/Project Team for considering our suggestions and we endorse the final version proposed by UNDP CO/Project Team. This is presented in Box 24.

ANNEX H. MTR REPORT CLEARANCE FORM

Midterm Review Report Reviewed and Cleared By:

Commissioning Unit

Name: Asfaazam Kasbani
Assistant Resident Representative
UNDP Malaysia

Signature: _____ Date: 22 July 2019

UNDP-GEF Regional Technical Advisor

Name: K Usha Rao, Ph.D

Signature: _____ Date: 30 July 2019